

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.

IPR2024-00535
Patent 9,724,802 B2

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

HOSKINS, *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. 9,724,802 B2 (Ex. 1001, “the ’802 patent”), claims 1–21. Patent Owner Chien-Min Sung² has filed a Preliminary Response (Paper 10, “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 invoke this 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 that standard on behalf of the Director (37 C.F.R. § 42.4(a)), we institute the petitioned *inter partes* review.

¹ Petitioner 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.

² We refer to “Dr. Sung” when discussing actions he has taken personally, or “Patent Owner” when discussing actions taken by counsel on his behalf.

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 as the real party-in-interest. *See* Paper 6, 1.

The parties identify three district court litigations involving the '802 patent. *See* Pet. 1; Paper 6, 1; Prelim. Reply 1–2. The first is *Sung v. Kinik Co.*, No. 1:20-cv-00247 (D. Del.) (“the Kinik Litigation”), which has been terminated. The second is *Sung v. Samsung Electronics Co. Ltd., et al.*, No. 4:23-cv-00752 (E.D. Tex.) (“the Samsung Litigation”), which remains pending. The third is *Sung v. Texas Instruments, Inc.*, No. 4:23-cv-00753 (E.D. Tex.) (“the TI Litigation”), which remains pending.

The '802 patent also was challenged in *Kinik Co. v. Sung*, IPR2021-00638 (PTAB), which was terminated due to settlement prior to a decision on institution.

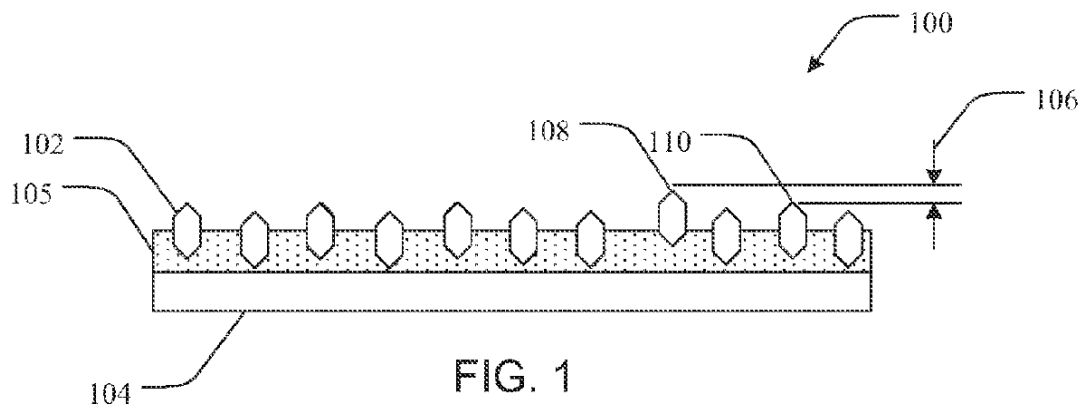
Petitioner has also filed IPR proceedings to challenge two other patents owned by Patent Owner that are related to the '802 patent. *See* Pet. 1. They are IPR2024-00533 (U.S. Patent No. 8,974,270 B2) and IPR2024-00534 (U.S. Patent No. 9,138,862 B2).

B. *The '802 Patent Specification*

The '802 patent concerns a pad dresser — that is, a disk that is rotated and pressed against a polishing pad to “condition” the pad, “by removing dirt and debris (i.e. deglazing the pad), as well as opening up asperities in the pad surface to capture and hold chemical slurry during a polishing procedure.” Ex. 1001, codes (54) and (57), 4:10–12, 9:23–30, 9:50–54;

see also Ex. 1002 ¶¶ 38–43 (Petitioner’s expert witness explaining how pad dressers are used). The pad dresser has “superabrasive particles” on a substrate, to cut into the polishing pad and thereby open up asperities. Ex. 1001, 1:58–65, 2:18–21, 9:50–58. The polishing pad in turn is rotated and pressed against a silicon wafer, applying an abrasive slurry, to generate a “very flat and smooth surface[.]” on the wafer in a Chemical Mechanical Polishing (CMP) process. *Id.* at 1:40–54, 9:23–30.

Figure 1 of the ’802 patent is reproduced below.



’802 Patent, Figure 1.

Figure 1 is a schematic side view of CMP pad dresser 100, including a monolayer of superabrasive particles 102 coupled to support substrate 104 with binding material 105. *See id.* at 3:35–37, 18:26–29. Particles 102 may be diamond grits. *See id.* at 4:13–37, 18:43–51.

“Each superabrasive particle in the monolayer protrudes to a protrusion distance from the support substrate,” and “[t]he 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 described as the protrusion difference.” *Id.* at 18:29–35; *see also id.* at 14:28–41 (discussing the term “protrusion difference”). “In one aspect,” protrusion difference 106 “is less than or equal to about 50 microns,” and

“the difference in protrusion distance between the highest 1% of the protruding tips . . . is within about 80 microns or less.” *Id.* at 2:36–42, 14:34–35, 14:50–61, 17:50–62, 18:35–36.

Further, the particle tips may “align along a designated profile,” which “can include any geometric configuration that can be useful in dressing a CMP pad,” such as “a plane, a slope, a curved shape, a dome shape, and the like.” *Id.* at 1:65–2:1, 2:12–17, 17:5–15; *see also id.* at 6:21–28 (defining “profile” to mean “a predetermined contour above a support substrate to which a plurality of superabrasive particles or other cutting elements are intended to align”). In one exemplary embodiment, the particle tips “align along [the] designated profile with a tip variation of from about 5 microns to about 100 microns.” *Id.* at 1:65–2:2, 11:49–52; *see also id.* at 10:63–11:45 (discussing “leveled tips” as being “compared against the designated profile to determine the variance, or degree of ‘leveling’ achieved,” wherein “some level of deviation may occur [as] a result of the design or manufacturing process”), 17:8–15 (substantially the same).

C. The '802 Patent Claims

The '802 patent includes twenty-one claims, all of which are challenged here. *See* Ex. 1001, 27:54–29:15; Pet. 5–6. Claim 1 is the sole independent claim, and it recites, adding Petitioner’s identifiers [1Pre] through [1F]³ and line breaks in the “monolayer” limitation:

³ Patent Owner utilizes a slightly different labeling scheme. *See* Prelim. Resp. 12, 14, 16, 25 (splitting Petitioner’s limitation [1D] into two limitations [1D] and [1E], then continuing through [1G]). We utilize Petitioner’s scheme throughout this Decision for internal consistency.

1. [1Pre] A CMP pad dresser, comprising:
 - [1A] a rigid support substrate; and
 - [1B] a monolayer of a plurality of superabrasive particles coupled to the support substrate,
 - [1C] wherein each superabrasive particle in the monolayer extends away from the support substrate to a protrusion distance,
 - [1D] wherein a tip of each of the plurality of superabrasive particles aligns along a designated profile with a tip variation of from about 5 microns to about 100 microns, and
 - [1E] 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 50 microns, and
 - [1F] the difference in protrusion distance between the highest 1% of the protruding tips of the monolayer of superabrasive particles are within about 80 microns or less.

Ex. 1001, 27:55–28:4.

D. Asserted Prior Art

Petitioner relies on the following three references as alleged prior art against all claims of the '802 patent. *See* Pet. 3–4.

Name	Reference	Exhibit No.
Tsai	M.Y. Tsai, P.H. Li, & J.C. Sung, <i>Organic Diamond Disk Versus Brazed Diamond Disk for Dressing a Chemical-Mechanical Polishing Pad</i> , <u>Diamond & Related Materials</u> (vol. 23, pgs. 144–149) (2012)	1004
Sung '026	US 2007/0060026 A1	1005
Sung '146	US 2012/0302146 A1	1029

Patent Owner argues Tsai, Sung '026, and Sung '146 are not prior art against claims 1–7 and 13–21, based on three potential priority filing dates for those claims. *See infra* Section IV.G. For reasons provided below, based on the preliminary record presented, we conclude Tsai, Sung '026, and Sung '146 are each prior art against all claims of the '802 patent. *See id.*

E. Asserted Grounds

Petitioner asserts the following three grounds of unpatentability. *See* Pet. 5–6.

35 U.S.C. §⁴	Reference(s)	Claims Challenged
102 / 103	Tsai	1–5, 13, 15, 19–21
103	Tsai, Sung '026	1–3, 6–14, 16–18
103	Sung '146, Sung '026	1–7, 13–21

F. Testimonial Evidence

Petitioner relies on the proffered expert witness testimony of Stanley Shanfield, Ph.D. (Exhibit 1002). Patent Owner does not rely on opposing expert witness testimony at this time.

⁴ Amendments to 35 U.S.C. §§ 102 and 103 enacted by the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”) took effect on March 16, 2013. The '802 patent issued from an application filed in October 2014, asserting priority as a continuation-in-part of several parent applications filed before March 16, 2013. *See* Ex. 1001, codes (22) and (63), 1:4–38. As discussed below in Section IV.G, we conclude none of the '802 patent claims is entitled to the benefit of those earlier filing dates, so we apply the AIA versions of §§ 102 and 103 here.

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

Patent Owner, relying on *Fintiv*, *supra*, and *NHK Spring Co. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 (PTAB Sept. 12, 2018) (precedential) (“*NHK Spring*”), contends we should deny institution under 35 U.S.C. § 314(a) based on the status of the Samsung Litigation. *See* Prelim Resp. 53–65; Prelim. Sur-reply 1–5. Petitioner disagrees. *See* Pet. 84–86; 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*, 584 U.S. 357, 366 (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.”).

When determining whether to exercise discretion to deny institution in view of a parallel district court proceeding, we consider the following six factors (“*Fintiv* 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.

Fintiv, at 5–6. 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 “there is some overlap among these factors” and “[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”).⁵ 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

⁵ Available at: https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf.

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.

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*].” *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 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. 1031) (“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 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, “*Fintiv* Factor 1 considers stays ***related to the substance of the Petition***, not ***completely unrelated*** stays.” *Id.* (citing *Fintiv*, at 6–9). 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. 8,974,270 (“the ’270 patent”) 9,138,862 (“the ’862 patent”), and the ’802 patent at issue in the present IPR proceeding. *See* Ex. 3002 ¶¶ 23–29; *see also id.* at pgs. 10 (Count I), 18 (Count II), 26 (Count III). The ’270 patent is the subject of IPR2024-00533. The ’862 patent is the subject of IPR2024-00534. 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 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^[6] and any necessary pretrial deadlines.

Ex. 1031. We decline to speculate on the reason or reasons why the Transfer stay was entered.⁷ 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.

⁶ We have not been directed to any evidence in the proceeding before us that a specific trial date has been established in the Samsung Litigation. The District Court’s Scheduling Order submitted in this IPR proceeding (*see* Exs. 1019 & 1032 (duplicate copies of the Scheduling Order)) states “Jury Selection and Trial” are at a date “[t]o be determined.” Ex. 1019, 5. Thus, a reference to a “new trial date” more accurately should be a reference to a “trial date.”

⁷ 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).

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

(i) *The TI Litigation and Stay*

In the TI Litigation, which is pending before the same District Court as the Samsung Litigation, Patent Owner filed a similar patent infringement complaint against Texas Instruments, Inc. (“TI”). *See* Ex. 3003. The same three patents at issue in the Samsung Litigation also are at issue in the TI Litigation. *See 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. *See* Ex. 1034. As of the date of mailing this Decision, this TI Litigation stay is still in effect.

In the Samsung Litigation, Petitioner has filed Motion to Stay Pending Resolution of TI’s Motion for Summary Judgment of Invalidity. *See* Ex. 1035. 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; *see also* Ex. 1036, 8 (Patent Owner stating “Dr. Sung has already conceded by agreeing to stay [the Samsung Litigation] at the end of *Markman* briefing” in the Samsung Litigation).

The TI Litigation complaint was filed the same day (August 21, 2023) as the Samsung Litigation complaint. *See* Ex. 3003, 1 (the TI Litigation complaint); Ex. 3002, 1 (the Samsung Litigation complaint). The TI and Samsung Litigations are both pending before Judge Sean Jordan. The ’802 patent at issue in the present IPR proceeding also is the subject of the

alleged infringement in the TI Litigation. *See* Ex. 3003 ¶ 21; Count II, p. 18). The same patents that are involved in the related '533 and '534 IPRs also are involved in the TI Litigation. *See id.* ¶¶ 19, 23; *see also id.* at Count I, p. 10; Count III, p. 26.

In the TI Litigation, 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. *See* Ex. 1034, 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 Litigation] 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. 1036, 8⁸); *see also* Ex. 1039, 15 (Patent Owner stating to the District Court it "is not opposed to staying [the Samsung Litigation] 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")⁹; *see also* Prelim. Resp. 57 ("The

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

⁹ The citation to Exhibit 1031 is an error. Exhibit 1031 is a 1-page Order from the District Court staying the Samsung Litigation pending Petitioner's motion to transfer that litigation to California.

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 notified the Court of its intent to file a motion for such a stay if the Board institutes review. *See id.* (citing Ex. 1037).

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. 56–57 (citing Ex. 2005). 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 Fintiv Factor 1

As described above, the current stay of the Samsung Litigation involves a motion to transfer that case from Texas to California. 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 a stay exists and the likelihood of a future or continuing stay is reasonably high. Thus, *Fintiv* 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. 85 (citing Ex. 1019, 5). Petitioner also argues the median time from filing to trial in the Eastern District of Texas is about 21 months. *See id.* (citing Ex. 1030). Thus, Petitioner expects 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, our Final Written Decision in the proceeding before us and the two related IPR proceedings will be in mid-September 2025.

Patent Owner responds that the Court’s stay Order in the Samsung Litigation 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*, at 9); *see* Prelim. Resp. 57–59 (citing Ex. 1019, 5). Patent Owner also disputes the data underlying Petitioner’s speculation as to when Judge Jordan might rule on the motion for summary judgment pending in the TI Litigation. *See* Prelim. Sur-reply 3 & n.1.

As discussed above, a specific trial date has not been scheduled in the Samsung Litigation, but 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. 59 (section title modified). In particular, according to Patent Owner, there has been “extensive, hard-fought third-party discovery already obtained, and continuing to be obtained, by both parties.” *Id.* Further: “[T]he parties have spent or will have spent considerable time and resources in completing claim construction,” with that briefing now having been completed despite the delay of the *Markman* hearing due to the Court’s stay. *See id.* at 59 (citing Ex. 1019, 2). Patent Owner asserts the Board has previously denied institution under *Fintiv*, on facts “very similar” to those presented here. *See*

id. at 60 (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 the Samsung Litigation. Prelim. Reply 4–5 (section title modified) (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.” *Id.* at 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 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 *Fintiv* 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 ’802 Patent,” and the Petition includes the same or substantially the same grounds, arguments, and evidence as in the Samsung Litigation. Prelim. Resp. 54–55, 61. Patent Owner further asserts “Petitioner has not presented a complete *Sotera*-type stipulation^[10] and is thus free to assert substantially the same grounds of invalidity” in both proceedings. *Id.* at 61–62.

Based on the status of the Samsung Litigation, we have not been directed to any persuasive evidence that Petitioner has filed a substantive Answer in the Samsung Litigation. Petitioner 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). *See* Ex. 3004. Thus, on the record before us, there is no persuasive evidence of what substantive defenses Petitioner 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. *See* Prelim. Sur-reply 5.

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

¹⁰ *See Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 13 (PTAB Dec. 1, 2020) (precedential).

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. 63–64. 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, 15 (PTAB May 13, 2020)).

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 ’802 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. 64.

Based on our review of the arguments and evidence on the merits, we determine 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, *Fintiv* factor 6 is neutral in deciding whether to exercise our discretion to deny institution.

7. Conclusion

As noted in the *Fintiv*, we take “a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Fintiv*, 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 — Priority of Filing Date

The '802 patent is entitled to priority to the filing date of an earlier-filed U.S. application if, among other requirements, the earlier-filed application discloses the claimed invention “in the manner provided by [35 U.S.C.] section 112(a) (other than the requirement to disclose the best mode).” 35 U.S.C. § 120 (first sentence).¹¹ Thus, the earlier-filed U.S. application must provide written description support under 35 U.S.C. § 112(a) for the claimed subject matter in the later-filed U.S. application. *See Tronzo v. Biomet, Inc.*, 156 F.3d 1154, 1158 (Fed. Cir. 1998).

“To satisfy the written description requirement, a patent’s specification must ‘reasonably convey[] to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.’” *Novartis Pharms. Corp. v. Accord Healthcare, Inc.*, 38 F.4th 1013, 1016 (Fed. Cir. 2022) (citing *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc)). The written description “test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art.” *Ariad*, 598 F.3d at 1351.

C. Legal Standards — Anticipation

A patent claim is unpatentable as anticipated under 35 U.S.C. § 102 “if each and every limitation is found either expressly or inherently in a

¹¹ The AIA versions of 35 U.S.C. §§ 112 and 120 apply to patents filed on or after September 16, 2012, including the '802 patent. *See* AIA § 4(c), 4(e) (§ 112 amendment effective Sept. 16, 2012); *id.* §§ 15(b), 15(c) (§ 120 amendment effective Sept. 16, 2011); Ex. 1001, code (22) ('802 patent filed Oct. 3, 2014).

single prior art reference.” *WhitServe, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 21 (Fed. Cir. 2012) (quoting *Celeritas Techs., Ltd. v. Rockwell Int’l Corp.*, 150 F.3d 1354, 1361 (Fed. Cir. 1998)). An anticipatory reference must further “disclose those elements ‘arranged as in the claim.’” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)).

D. Legal Standards — Obviousness

A patent claim is unpatentable 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 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) objective evidence of nonobviousness, if made available in the record, which has not happened here. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

E. Level of Ordinary Skill in the Art

Petitioner contends a person having ordinary skill in the art pertaining to the ’802 patent “would have had . . . at least a bachelor’s degree in an engineering related field, such as 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. 23; Ex. 1002 ¶¶ 21–23, 78–79. Further: “A higher level of education or specific skill might make up for less experience, and vice versa.” Pet. 23; Ex. 1002 ¶ 79.

“Patent Owner does not contest the definition of POSITA provided by” Petitioner, for purposes of institution. Prelim. Resp. 5.

For purposes of this Decision, we are satisfied that Petitioner’s formulation of ordinary skill generally comports with the level of skill necessary to understand and implement the teachings of the ’802 patent and the asserted prior art, so we apply that formulation here.

F. Claim Construction

We interpret the ’802 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 parties agree that the ’802 patent provides several lexicographic definitions of terms found in the ’802 patent claims. *See* Pet. 23–24; Prelim. Resp. 5; *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”).

Specifically, the ’802 patent provides “DEFINITIONS” such that “[i]n describing and claiming the present invention, the following

terminology will be used.” Ex. 1001, 4:4–9. The defined terms found in claim 1 include “about” (*id.* at 8:29–36), “comprising” (*id.* at 8:37–41), “particle” (*id.* at 4:33–38), “profile” (*id.* at 6:21–28), “substrate” (*id.* at 7:59–8:8), “superabrasive” (*id.* at 4:13–32), and “tip” (*id.* at 5:9–17). The ’802 patent also defines the term “protrusion” found in claim 1, albeit outside of the “DEFINITIONS” section. *See id.* at 16:24–26. The ’802 patent further defines the term “working superabrasive particles” found in claims 6–12. *See id.* at 4:46–59. We identify and apply these definitions below in our analysis of Petitioner’s patentability challenges.

Moreover, we consider the meaning of the term “tip variation” in claim 1 below in Section IV.H.2(v)(b).

Apart from the foregoing terms, and based on the arguments and evidence presented at this time, we determine no explicit construction is needed to resolve the parties’ controversy. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

G. Priority Filing Date of the ’802 Patent Claims

1. Introduction

The parties dispute the priority filing date of the ’802 patent claims.

Petitioner argues claim 1 is entitled only to the ’802 patent’s actual filing date of October 3, 2014, so Sung ’026 (published in March 2007), Tsai (published by January 2012), and Sung ’146 (published in November 2012) are prior art against all claims of the ’802 patent. *See* Pet. 4 (Tsai

publication date), 12–23 (priority date of ’802 patent claims); Ex. 1005, code (43) (Sung ’026 publication date); Ex. 1029, code (43) (Sung ’146 publication date); Ex. 1002 ¶¶ 58–77.

Patent Owner argues claims 1–7 and 13–21 are entitled to priority to the filing dates of three different parent applications, two which pre-date all three of Petitioner’s references, and one which pre-dates Tsai and Sung ’146. *See* Prelim. Resp. 1, 5–34, 37–38, 49, 52–53. Patent Owner agrees with Petitioner that claims 8–12 are entitled only to the ’802 patent’s actual filing date, albeit for different reasons. *See id.* at 35–37, 49.

We agree with Petitioner, for reasons that follow. However, as an initial evidentiary issue, we note that when issues of priority filing date arise, the controlling evidence is the parent application *as filed*, not the parent application *as later published*. *See, e.g.*, 35 U.S.C. § 120 (referring to “an application previously filed in the United States”). Therefore, if the priority filing date of the ’802 patent claims continues to be disputed during the trial instituted by this Decision, the parties shall enter into the record and refer to the pertinent parent application(s) *as filed* with the USPTO, rather than relying on a later publication of the application as a proxy.

2. U.S. Patent Application No. 13/802,112

The ’802 patent was filed as a continuation-in-part of U.S. Patent Application No. 13/802,112 (“the ’112 Application”). *See* Ex. 1001, code (63), 1:4–7. The ’112 Application eventually issued as the ’862 patent, which is challenged by Petitioner in IPR2024-00534.

Petitioner argues claim 1 of the ’802 patent is not entitled to the filing date of the ’112 Application, for three reasons. *See* Pet. 16–23. First,

Dr. Sung “disclaimed” any such priority in a Declaration he signed as part of the Kinik Litigation. *See id.* at 16–20 (citing Ex. 1011 ¶¶ 17–21, 24; Ex. 1012, 2). Second, the ’112 Application does not support limitation [1D] reciting “a tip of each of the plurality of superabrasive particles aligns along a designated profile with a tip variation of from about 5 microns to about 100 microns.” Ex. 1001, 27:61–64; *see* Pet. 20–21 (arguing the ’112 Application supports limitations [1E] (blue) and [1F] (orange), but not limitation [1D] (green)); Ex. 1002 ¶¶ 71–74, 77. Third, in IPR2021-00638 which challenged the ’802 patent, the petition was “based on the fact that ‘Sung expressly disclaimed all claim of priority to the Parent Patents,’” which Patent Owner did not dispute in the preliminary response. Pet. 22–23 (citing IPR2021-00638, Papers 1, 6, 8, and 9).

Patent Owner does not address directly whether claim 1 of the ’802 patent is entitled to the filing date of the ’112 Application. *See* Prelim. Resp. 5–27. For example, Patent Owner does not cite any disclosure in the ’112 Application that might demonstrate possession of limitation [1D]. *See id.* Patent Owner does assert that Petitioner “misconstrues” Dr. Sung’s Declaration from the Kinik Litigation, which according to Patent Owner “did **not** disclaim ‘all earlier priority dates’” for all claims of the ’802 patent. *Id.* at 5–6, 36. Patent Owner implicitly suggests Dr. Sung’s Declaration was limited to claims 8–12, and did not apply to claim 1. *See id.* at 5–27 (arguing priority of claim 1), 35–36 (arguing priority of claims 8–12), 37 (conclusion as to priority). Patent Owner also asserts the IPR2021-00638 preliminary response was not “a waiver of earlier priority dates” because it “did **not** address the merits of Kinik’s invalidity arguments at all” and it was not necessary to do so. *See id.* at 37 (citing Ex. 2003; 37 C.F.R. § 42.107).

Based on the preliminary record presented, we agree with Petitioner's contention that claim 1 of the '802 patent is not entitled to the filing date of the '112 Application, because the '112 Application does not support limitation [1D] reciting particle tips aligning along a designated profile with a tip variation of from about 5 microns to about 100 microns. Patent Owner does not cite any disclosure in the '112 Application that might demonstrate possession of limitation [1D], so Dr. Shanfield's testimony on behalf of Petitioner in this regard is un rebutted in the present record. *See* Ex. 1002 ¶¶ 71–74, 77.

Further, Dr. Sung's Declaration from the Kinik Litigation stated he "invented the subject matter that forms the basis of the ['802 patent]" *after* his joint venture with Kink terminated on October 28, 2013, whereas the '112 Application was filed on March 13, 2013. Ex. 1011 ¶¶ 17–18; Ex. 1001, code (63), 1:6–7 (filing date of the '112 Application). Dr. Sung also stated "this new subject matter, which is claimed in the '802 Patent . . . is not disclosed in *any* of the patents or patent applications to which the '802 Patent claims priority." *Id.* ¶ 18 (emphasis added). Dr. Sung then addressed the '862 patent (which issued from the '112 Application), stating it does not "disclose the claimed subject matter of the '802 Patent," specifically because it does not disclose "a designated profile with a tip variation associated with the superabrasive particles or a tip variation at, for example, about 100 microns, all of which was discovered by me after the joint venture had terminated." *Id.* ¶¶ 19–21. Patent Owner successfully relied on this testimony to argue that the Court in the Kinik Litigation should deny Kinik's motion to stay the case, "because the ['802 patent] cannot be the subject of the joint venture." Ex. 1012 (Order Denying Stay), 2 (also:

“Plaintiff [Dr. Sung] has clearly stated that he only claims priority to October 3, 2014.”).

The foregoing testimony from Dr. Sung supports Dr. Shanfield’s opinion on behalf of Petitioner that claim 1 of the ’802 patent is not entitled to the filing date of the ’112 Application. *See* Ex. 1002 ¶¶ 71–74, 77. Patent Owner’s present assertion that Dr. Sung’s Declaration “did **not** disclaim ‘all earlier priority dates’” for all claims of the ’802 patent (Prelim. Resp. 5–6, 36) is belied by the plain language of the Declaration that “[t]his invention [of the ’802 patent] is not disclosed in any of the patents or patent applications to which the ’802 Patent claims priority” (Ex. 1011 ¶ 18). Claim 1 is the sole independent claim of the ’802 patent, so the “invention” of the ’802 patent referenced by Dr. Sung must include at least the subject matter of claim 1. Dr. Sung did not parse between claim 1 and its dependent claims 8–12 in this regard, as Patent Owner would now have it. *See* Ex. 1011 ¶¶ 17–21. In fact, Dr. Sung referred expressly to limitation [1D] as being missing from the ’862 patent which issued from the ’112 Application. *See id.* ¶ 21.

We agree with Patent Owner, however, that the history of IPR2021-00638 does not aid Petitioner’s cause, on the present record. Even if the petition in that proceeding was premised on Dr. Sung’s Declaration from the Kinik Litigation disclaiming any priority filing date for the ’802 patent as Petitioner alleges (*see* Pet. 22–23), there is no indication in the record presented here that Patent Owner conceded that point in the preliminary response (*see id.*). Further, IPR2021-00638 was terminated prior to a decision on institution being entered. *See id.* at 23.

We conclude on the preliminary record presented that claims 1–21 of the ’802 patent are not entitled to the filing date of the ’112 Application, because the ’112 Application does not support limitation [1D] reciting particle tips aligning along a designated profile with a tip variation of from about 5 microns to about 100 microns.

3. *U.S. Provisional Application No. 61/489,074*

As just discussed, the ’802 patent was filed as a continuation-in-part of the ’112 Application. *See supra* Section IV.G.2. The ’112 Application in turn was filed as a continuation-in-part of U.S. Patent Application No. 13/479,148 (“the ’148 Application”), which asserted the benefit of U.S. Provisional Application No. 61/489,074 (“the ’074 Provisional”). *See* Ex. 1001, codes (60) and (63), 1:4–11. The ’148 Application eventually issued as the ’270 patent, which is challenged by Petitioner in IPR2024-00533.

Patent Owner argues claim 1 of the ’802 patent is entitled to the May 23, 2011 filing date of the ’074 Provisional, which nullifies Tsai (published by January 2012) and Sung ’146 (published in November 2012) as prior art against claim 1. *See* Prelim. Resp. 8–27, 37–38, 52–53. Petitioner only indirectly addresses whether claim 1 of the ’802 patent might be entitled to the filing date of the ’074 Provisional, via Petitioner’s arguments directed to the intervening ’112 Application discussed above in Section IV.G.2.

Based on the preliminary record presented, we conclude the ’074 Provisional does not provide written description support for limitation [1D] reciting “a tip of each of the plurality of superabrasive

particles aligns along a designated profile with a tip variation of from about 5 microns to about 100 microns.” Ex. 1001, 27:61–64. As discussed above, based on this record, we have agreed with Petitioner’s contention that the intervening ’112 Application does not support limitation [1D].

Patent Owner’s argument for why the ’074 Provisional provides written description support for the “tip variation” requirement of limitation [1D] is as follows:

[A]s discussed above, Petitioners have construed “designated profile” and tip variation therefrom as the “average protrusion distance of the diamond tips” (Pet. at 36–38.) Patent Owner does not agree with Petitioner’s construction but under Petitioners’ construction, [the ’074 Provisional] discloses the claimed range:

- 23:5–11 (“[T]he difference in protrusion distance between the highest protruding tip and the next highest protruding tip of the first monolayer of superabrasive particles is less than or equal to about 20 microns, and where the difference in protrusion distance between the highest 1% of the protruding . . . tips of the first monolayer of superabrasive particles, excluding the highest protruding tip, are within about 80 microns.”)

Prelim. Resp. 14–15 (citing Ex. 2002, 23:5–11).

Thus, Patent Owner’s argument is premised on an alleged claim construction proffered by Petitioner, “constru[ing] ‘designated profile’ and tip variation therefrom as the ‘average protrusion distance of the diamond tips.’” *Id.* The Preliminary Response indicates this alleged construction is “discussed above” in the Preliminary Response. *Id.* at 14. However, the Preliminary Response does not specify exactly where the pertinent discussion is provided (*see id.*), and we were unable to find any such discussion. We are left with the Preliminary Response’s quotation of one

sentence in the '074 Provisional as allegedly demonstrating possession of limitation [1D], without any supporting explanation from Patent Owner. *See id.* at 14–15.

The cited sentence in the '074 Provisional says two things. First, “the difference in protrusion distance between the highest protruding [particle] tip and the next highest protruding [particle] tip . . . is less than or equal to about 20 microns.” Ex. 2002, 23:6–8. It is not clear to us, and Patent Owner does not explain (*see* Prelim. Resp. 14–15), how this disclosure demonstrates possession of particle tips aligning along a designated profile with a tip variation of from about 5 microns to about 100 microns. In particular, this '074 Provisional disclosure relates to only two particle tips — the highest tip, and the next highest tip. That has very little if anything to do with “each” tip aligning along a “designated profile” per limitation [1D], much less each tip doing so within any particular tip variation as further required by limitation [1D].

The '074 Provisional sentence cited by Patent Owner secondly says “the difference in protrusion distance between the highest 1% of the protruding tips . . . excluding the highest protruding tip, are within about 80 microns.” Ex. 2002, 23:9–11. It is not clear to us, and Patent Owner does not explain (*see* Prelim. Resp. 14–15), how this disclosure demonstrates possession of particle tips aligning along a designated profile with a tip variation of from about 5 microns to about 100 microns. In particular, this '074 Provisional disclosure relates to only the highest 1% of the particle tips, leaving the remaining 99% of the particle tips unconstrained. That has very little if anything to do with “each” tip aligning

along a “designated profile” per limitation [1D], much less each tip doing so within any particular tip variation as further required by limitation [1D].

Patent Owner suggests the cited ’074 Provisional sentence is akin to the Tsai disclosures cited by Petitioner as corresponding to limitation [1D]. *See* Prelim. Resp. 14–15 (citing Pet. 36–38). We disagree. Petitioner relies on Tsai disclosing a minimum particle protrusion distance (13.2 μm), an average particle protrusion distance (24.2 μm), and a maximum particle protrusion distance (33.0 μm), among *all* the particles of Tsai’s pad dresser. *See* Pet. 36–38. There is no corresponding disclosure in the ’074 Provisional sentence cited by Patent Owner, which is limited to the *highest 1%* of particle tips. *See* Ex. 2002, 23:5–11.

Moreover, as discussed above in Section IV.G.2, Dr. Sung’s Declaration from the Kinik Litigation stated “[t]his invention [of the ’802 patent] is not disclosed in *any* of the patents or patent applications to which the ’802 Patent claims priority” prior to October 28, 2013. Ex. 1011 ¶¶ 17–18 (emphasis added). That includes the ’074 Provisional, which was filed on May 23, 2011. *See* Ex. 1001, code (60), 1:6–11 (filing date of the ’074 Provisional).

Dr. Sung’s Declaration did not directly compare the ’074 Provisional disclosure with claim 1 of the ’802 patent. *See* Ex. 1011 ¶¶ 17–23. However, as discussed above in Section IV.G.2, Dr. Sung did directly compare the intervening ’112 Application (which issued as the ’862 patent) with claim 1 of the ’802 patent, and he stated the ’112 Application does not disclose limitation [1D]. *See id.* ¶¶ 17–21. Dr. Sung also directly compared the other intervening ’148 Application (which issued as the ’270 patent) with claim 1 of the ’802 patent, and he stated the ’148 Application similarly does

not disclose limitation [1D], as Petitioner points out. *See id.*; Pet. 16–17 (“Sung intentionally disclaimed any claim to an earlier priority date off the ’862 and ’270 Patents’ priority chain.”).

We conclude on the preliminary record presented that claims 1–21 of the ’802 patent are not entitled to the filing date of the ’074 Provisional, because the ’074 Provisional does not support limitation [1D] reciting particle tips aligning along a designated profile with a tip variation of from about 5 microns to about 100 microns.

4. *U.S. Patent Application No. 11/560,817*

The ’802 patent was filed as a continuation-in-part of U.S. Patent Application No. 13/797,704 (“the ’704 Application”), which was filed as a continuation-in-part of U.S. Patent Application No. 11/560,817 (“the ’817 Application”) through several intermediary applications. *See* Ex. 1001, code (63), 1:11–23.

Petitioner argues claim 1 of the ’802 patent is not entitled to the filing date of the ’817 Application, for three reasons. *See* Pet. 16–23. First, Dr. Sung “disclaimed” any such priority in the Declaration he signed as part of the Kinik Litigation. *See id.* at 16–20 (citing Ex. 1011 ¶¶ 17–18, 22–24; Ex. 1012, 2). Second, the ’817 Application does not support limitation [1E] reciting “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 50 microns,” or limitation [1F] reciting “the difference in protrusion distance between the highest 1% of the protruding tips of the monolayer of superabrasive particles are within about 80 microns or less.” Ex. 1001, 27:64–28:4; *see* Pet. 20–21 (arguing the

'817 Application supports limitation [1D] (green), but not limitations [1E] (blue) and [1F] (orange)); Ex. 1002 ¶¶ 71–74, 77. Third, in IPR2021-00638 which challenged the '802 patent, the petition was “based on the fact that ‘Sung expressly disclaimed all claim of priority to the Parent Patents,’” which Patent Owner did not challenge in the preliminary response. Pet. 22–23 (citing IPR2021-00638, Papers 1, 6, 8, and 9).

Petitioner further acknowledges that, during prosecution of the '802 patent, Patent Owner argued limitation [1D] “is fully supported in the ['817 Application], from which the current ['802 patent] application claims priority” in an attempt to pre-date two cited references (Dinh-Ngoc and Sung '869¹²). Pet. 12–15 (quoting Ex. 1003, 194) (citing Ex. 1003, 2–4, 129–131, 235–241). Petitioner also acknowledges the Examiner stated Patent Owner’s argument was “persuasive,” as part of allowing the '802 patent claims. *Id.* at 15 (citing Ex. 1003, 207, 235–241). Petitioner nonetheless maintains the allowance was “without any analysis of the proper priority date” (*id.*), and Patent Owner “later changed course during his litigation against Kinik” (*id.* at 14 n.4).

Patent Owner responds that claim 1 of the '802 patent is entitled to the November 16, 2006 filing date of the '817 Application, which nullifies Tsai (published by January 2012), Sung '146 (published in November 2012), and Sung '026 (published in March 2007) as prior art against claim 1. *See* Prelim. Resp. 8–27, 37–38, 49, 52–53. Patent Owner cites various

¹² US 2008/0292869 A1 to Chien-Min Sung.

disclosures in the '817 Application (Exhibit 2001)¹³ as supporting limitations [1E] and [1F] challenged by Petitioner. *See* Prelim. Resp. 16–18, 25–26. Patent Owner also relies on the arguments discussed above in Section IV.G.2 concerning Dr. Sung’s Declaration from the Kinik Litigation and Patent Owner’s preliminary response in IPR2021-00638. *See id.* at 5–6, 36–37. Patent Owner further argues the prosecution history of the '802 patent cited by Petitioner supports Patent Owner’s position. *See id.* at 6–7, 37.

We consider limitations [1E] and [1F] separately.

(i) *Whether the '817 Application Supports Limitation [1E]*

Based on the preliminary record presented, we conclude the '817 Application does not provide written description support for limitation [1E] reciting “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 50 microns.” Ex. 1001, 27:64–67.

Patent Owner’s argument for why the '817 Application supports limitation [1E] is as follows:

[The '817 Application] at 14:14–16 (“As such, in one aspect a majority of the plurality of cutting elements is arranged such that the tips vary from the designated profile by ***from about 1 micron to about 150 microns . . . [or] from about 5 microns to about 100 microns.***”)

...

¹³ Patent Owner identifies Exhibit 2001 as “U.S. Patent Pub. No. 2007/0155298,” which is the post-filing publication of the '817 Application. Prelim. Resp. i. However, Exhibit 2001 is the '817 Application *as filed*.

Also, as discussed with respect to Sung '026, Petitioners have construed “designated profile” and “tip variation” therefrom as the “average protrusion distance of the diamond tips” (Pet. at 36–38.) Patent Owner does not agree with Petitioner’s construction but under Petitioners’ construction, [the '817 Application] also discloses the claimed difference in protrusion distance.

For example, for a difference in protrusion distance of 0–50 microns, the [’817 Application] discloses:

- 14:14–15:4 (“As such, in one aspect a majority of the plurality of cutting elements is arranged such that the tips vary from the designated profile by *from about 1 micron to about 150 microns. . . . from about 10 microns to about 50 microns . . . by less than about 5 microns. . . . [or] by less than about 1 micron.*”)

As another example, for a difference in protrusion distance of 10–20 microns, [the '817 Application] discloses:

- 14:29–15:1 (“Additionally, in one aspect, they are arranged such that their tips vary from the designated profile *by less than about 20 microns. . . . [or] by less than about 10 microns.*”)

As another example, for a difference in protrusion distance of 20–50 microns, [the '817 Application] discloses:

- 14:24–26 (“In a further aspect, they are arranged such that their tips vary from the designated profile by *from about 20 microns to about 50 microns.*”)

Prelim. Resp. 14, 16–18 (citing Ex. 2001, 14:14–15:6).

Patent Owner’s argument is not persuasive. All of the cited disclosures in the '817 Application pertain to particle tips *varying from a designated profile* within variously specified tolerances. *See* Ex. 2001, 14:6–15:6. Those disclosures relate to limitation [1D] which defines the tolerance as a range of from about 5 microns to about 100 microns. *See, e.g., id.* at 14:16–17. Limitation [1E] is different, because it concerns the

difference in protrusion distance between the two highest particle tips. *See* Ex. 1001, 27:58–60 (claim 1 defines “protrusion distance”), 27:64–67 (limitation [1E]). It is not clear to us, and Patent Owner does not explain (*see* Prelim. Resp. 16–18), how the ’817 Application’s disclosure pertaining to particle tips varying from a designated profile within variously specified tolerances demonstrates possession of limitation [1E] which concerns the difference in protrusion distance between the two highest particle tips.

Patent Owner suggests the cited ’817 Application disclosures are akin to the Tsai disclosures cited by Petitioner as corresponding to limitation [1E]. *See* Prelim. Resp. 16 (citing Pet. 36–38). We disagree. Petitioner relies on Tsai disclosing a minimum particle protrusion distance (13.2 μm), an average particle protrusion distance (24.2 μm), and a maximum particle protrusion distance (33.0 μm), among all the particles on Tsai’s pad dresser. *See* Pet. 36–38. There is no corresponding disclosure in the ’817 Application passages cited by Patent Owner, which pertain to *particle tips varying from the designated profile* (limitation [1D]), rather than *the difference in protrusion distance between the two highest particles* (limitation [1E]). *See* Ex. 2001, 14:14–15:6.

Moreover, as discussed above in Section IV.G.2, Dr. Sung’s Declaration from the Kinik Litigation stated “[t]his invention [of the ’802 patent] is not disclosed in *any* of the patents or patent applications to which the ’802 Patent claims priority” prior to October 28, 2013. Ex. 1011 ¶¶ 17–18 (emphasis added). That includes the ’817 Application, which was filed on November 16, 2006. *See* Ex. 1001, code (63), 1:22–23 (filing date of the ’817 Application).

Dr. Sung's Declaration did not directly compare the '817 Application disclosure with claim 1 of the '802 patent. *See* Ex. 1011 ¶¶ 17–23.

However, Dr. Sung stated the intervening '704 Application does not “disclose the claimed subject matter of the '802 Patent.” *Id.* ¶ 22. Further, as discussed above in Section IV.G.2, claim 1 is the sole independent claim of the '802 patent, so Dr. Sung's Declaration concerning the '704 Application is consistent with Dr. Shanfield's opinion on behalf of Petitioner that claim 1 of the '802 patent is not entitled to the filing date of the '817 Application. *See* Ex. 1002 ¶¶ 71–74, 77; Ex. 1011 ¶¶ 17–18, 22.

Next, concerning the '802 patent prosecution history, neither Patent Owner nor the Examiner identified during that prosecution any disclosures in the '817 Application that might demonstrate possession of limitation [1E]. *See* Ex. 1003, 192–95 (Patent Owner's argument), 207 (Examiner's response to Appellant's argument). Indeed, Patent Owner's argument focused on limitation [1D] rather than limitation [1E]. *See id.* at 192 (line 21) – 193 (line 6), 195 (lines 14–27). Thus, although it appears that the '802 patent claims were allowed in reliance on Patent Owner's alleged priority to the '817 Application, there were no findings of fact to support that reliance as to limitation [1E] which is presently at issue in this proceeding.

Finally, we agree with Patent Owner's argument that the history of IPR2021-00638 does not aid Petitioner's cause, on the present record, as discussed above in Section IV.G.2.

We conclude on the preliminary record presented that claims 1–21 of the '802 patent are not entitled to the filing date of the '817 Application, because the '817 Application does not support limitation [1E] reciting the

difference in protrusion distance between the two highest particle tips is less than or equal to about 50 microns.

(ii) *Whether the '817 Application Supports Limitation [1F]*

Based on the preliminary record presented, we conclude the '817 Application does not provide written description support for limitation [1F] reciting “the difference in protrusion distance between the highest 1% of the protruding tips of the monolayer of superabrasive particles are within about 80 microns or less.” Ex. 1001, 28:1–4.

Patent Owner’s argument for why the '817 Application supports limitation [1F] firstly refers back to Patent Owner’s argument for limitation [1E]. *See* Prelim. Resp. 25 (accounting for the difference between the parties’ limitation labeling schemes). However, Patent Owner does not explain any sort of inter-relationship between the two limitations [1E] and [1F] that would justify Patent Owner’s argument for the former applying to the latter. *See id.* at 16–18 (discussing limitation [1E] and the '817 Application disclosure), 25–26 (discussing limitation [1F] and the '817 Application disclosure). We do not discern such a relationship from the plain language of the claim. Thus, Patent Owner’s brief cross-reference does not persuade us that limitation [1F] has support in the '817 Application, whatever the case may be for limitation [1E].

Patent Owner then adds additional argument for limitation [1F], as follows:

- *See also* [the '817 Application] at 14:14–16 (“As such, in one aspect **a majority** of the plurality of cutting elements is arranged such that the tips vary from the designated profile by **from about 1 micron to about 150 microns.**”)

- [The '817 Application] at 14:16–21 (“In another aspect, the plurality of cutting elements are arranged such that their tips vary from the designated profile by from about 5 microns to about 100 microns . . . from about 10 microns to about 75 microns . . . [or] from about 10 microns to about 50 microns. . . .”)

Prelim. Resp. 25–26 (citing Ex. 2001, 14:14–21).

Patent Owner’s argument is not persuasive. All of the cited disclosures in the '817 Application pertain to particle tips *varying from a designated profile* within variously specified tolerances. *See* Ex. 2001, 14:6–26. Those disclosures relate to limitation [1D] which defines the tolerance as a range of from about 5 microns to about 100 microns. *See, e.g., id.* at 14:16–17. Limitation [1F] is different, because it concerns the *difference in protrusion distance* between the highest 1% of particle tips. *See* Ex. 1001, 27:58–60 (claim 1 defines “protrusion distance”), 28:1–4 (limitation [1F]). It is not clear to us, and Patent Owner does not explain (*see* Prelim. Resp. 25–26), how the '817 Application’s disclosure pertaining to particle tips varying from a designated profile within variously specified tolerances demonstrates possession of limitation [1F] which concerns the difference in protrusion distance between the highest 1% of particle tips being 80 microns or less.

Moreover, for substantially the same reasons articulated above in Section IV.G.4(i) in the context of limitation [1E], Dr. Sung’s Declaration from the Kinik Litigation concerning the '704 Application is consistent with Dr. Shanfield’s opinion on behalf of Petitioner that claim 1 of the '802 patent is not entitled to the filing date of the '817 Application. *See* Ex. 1002 ¶¶ 71–74, 77; Ex. 1011 ¶¶ 17–18, 22.

Next, concerning the '802 patent prosecution history, neither Patent Owner nor the Examiner identified during that prosecution any disclosures in the '817 Application that might demonstrate possession of limitation [1F]. *See* Ex. 1003, 192–95 (Patent Owner's argument), 207 (Examiner's response to Appellant's argument). Indeed, Patent Owner's argument focused on limitation [1D] rather than limitation [1F]. *See id.* at 192 (line 21) – 193 (line 6), 195 (lines 14–27). Thus, although it appears that the '802 patent claims were allowed in reliance on Patent Owner's alleged priority to the '817 Application, there were no findings of fact to support that reliance as to limitation [1F] which is presently at issue in this proceeding.

Finally, we agree with Patent Owner's argument that the history of IPR2021-00638 does not aid Petitioner's cause, on the present record, as discussed above in Section IV.G.2.

We conclude on the preliminary record presented that claims 1–21 of the '802 patent are not entitled to the filing date of the '817 Application, because the '817 Application does not support limitation [1F] reciting the difference in protrusion distance between the highest 1% of particle tips are within about 80 microns or less.

5. *U.S. Patent Application No. 11/223,786*

As just discussed, the '802 patent was filed as a continuation-in-part of the '817 Application. *See supra* Section IV.G.4. The '817 Application in turn was filed as a continuation-in-part of U.S. Patent Application No. 11/223,786 (“the '786 Application”). *See* Ex. 1001, code (63), 1:26–29.

Petitioner argues claim 1 of the '802 patent is not entitled to the filing date of the '786 Application, for various reasons discussed above, and further because the '786 Application does not support limitation [1E] or limitation [1F]. *See* Pet. 20–21 (arguing the '786 Application supports limitation [1D] (green), but not limitations [1E] (blue) and [1F] (orange)); Ex. 1002 ¶¶ 71–74, 77.

Patent Owner responds that claim 1 of the '802 patent is entitled to the September 9, 2005 filing date of the '786 Application, which nullifies Tsai (published by January 2012), Sung '146 (published in November 2012), and Sung '026 (published in March 2007) as prior art against claim 1. *See* Prelim. Resp. 8–27 (discussing Sung '026, which is the post-filing publication of the '786 Application), 37–38, 49, 52–53. Patent Owner cites various disclosures in the '786 Application¹⁴ as supporting limitations [1E] and [1F] challenged by Petitioner. *See* Prelim. Resp. 16–27. Patent Owner also relies on the arguments discussed above in Section IV.G.2 concerning Dr. Sung's Declaration from the Kinik Litigation and Patent Owner's preliminary response in IPR2021-00638. *See id.* at 5–6, 36–37.

We consider limitations [1E] and [1F] separately.

(i) Whether the '786 Application Supports Limitation [1E]

Based on the preliminary record presented, we conclude the '786 Application does not provide written description support for limitation [1E] reciting “the difference in protrusion distance between the highest protruding tip and the second highest protruding tip of the monolayer of

¹⁴ Patent Owner cites to Exhibit 1005, which is Sung '026.

superabrasive particles is less than or equal to about 50 microns.” Ex. 1001, 27:64–67.

Patent Owner quotes various disclosures in the ’786 Application as supporting the two highest particle tips differing in protrusion distance by less than or equal to 50 microns, emphasizing various snippets in bold and italic type. *See* Prelim Resp. 16–20 (citing Ex. 1005 ¶¶ 56, 73, 85, 88, 96, claims 12, 13, 14, 15, 17, 32, 41). Patent Owner also provides three explanatory notes. *See id.* at 16 (“Note: . . .”), 18 (“in other words, . . .”), 19 (“In other words, . . .”). Patent Owner further asserts Petitioner has “construed ‘designated profile’ and ‘tip variation’ therefrom as the ‘average protrusion distance of the diamond tips,’” which Patent Owner argues also leads to the ’786 Application disclosing the two highest particle tips differing in protrusion distance by less than or equal to 50 microns in three alleged “example[s].” *See id.* at 20–25 (citing Pet. 36–38; Ex. 1005 ¶¶ 56–57, claims 12, 13, 14, 17, 21, 32, 33, 41, 42, 53).

Patent Owner’s argument is not persuasive. None of the cited ’786 Application disclosures *directly* pertains to *the difference in protrusion distance between the two highest particle tips* being less than or equal to about 50 microns, as recited in limitation [1E]. *See* Ex. 1005 ¶¶ 56–57, 73, 85, 88, 96, claims 12, 13, 14, 15, 17, 21, 32, 33, 41, 42, 53. Perhaps, with more explanation, some of these disclosures might demonstrate possession of limitation [1E], but such explanation is lacking in the preliminary record before us.

Moreover, as discussed above in Section IV.G.2, Dr. Sung’s Declaration from the Kinik Litigation stated “[t]his invention [of the ’802 patent] is not disclosed in *any* of the patents or patent applications to

which the '802 Patent claims priority” prior to October 28, 2013. Ex. 1011 ¶¶ 17–18 (emphasis added). That includes the '786 Application, which was filed on September 9, 2005. *See* Ex. 1001, code (63), 1:26–29 (filing date of the '786 Application).

Dr. Sung’s Declaration did not directly compare the '786 Application disclosure with claim 1 of the '802 patent. *See* Ex. 1011 ¶¶ 17–23. However, Dr. Sung stated the intervening '704 Application does not “disclose the claimed subject matter of the '802 Patent.” *Id.* ¶ 22. Further, as discussed above in Section IV.G.2, claim 1 is the sole independent claim of the '802 patent, so Dr. Sung’s Declaration concerning the '704 Application is consistent with Dr. Shanfield’s opinion on behalf of Petitioner that claim 1 of the '802 patent is not entitled to the filing date of the '786 Application. *See* Ex. 1002 ¶¶ 71–74, 77; Ex. 1011 ¶¶ 17–18, 22.

Finally, we agree with Patent Owner’s argument that the history of IPR2021-00638 does not aid Petitioner’s cause, on the present record, as discussed above in Section IV.G.2.

We conclude on the preliminary record presented that claims 1–21 of the '802 patent are not entitled to the filing date of the '786 Application, because the '786 Application does not support limitation [1E] reciting the difference in protrusion distance between the two highest particle tips is less than or equal to about 50 microns.

(ii) Whether the '786 Application Supports Limitation [1F]

Based on the preliminary record presented, we conclude the '786 Application does not provide written description support for limitation [1F] reciting “the difference in protrusion distance between the highest 1%

of the protruding tips of the monolayer of superabrasive particles are within about 80 microns or less.” Ex. 1001, 28:1–4.

Patent Owner’s argument for why the ’786 Application supports limitation [1F] firstly refers back to Patent Owner’s argument for limitation [1E]. *See* Prelim. Resp. 25 (accounting for the difference between the parties’ limitation labeling schemes). However, Patent Owner does not explain any sort of inter-relationship between the two limitations [1E] and [1F] that would justify Patent Owner’s argument for the former applying to the latter. *See id.* at 16–25 (discussing limitation [1E] and the ’786 Application disclosure), 25–27 (discussing limitation [1F] and the ’786 Application disclosure). We do not discern such a relationship from the plain language of the claim. Thus, Patent Owner’s brief cross-reference does not persuade us that limitation [1F] has support in the ’786 Application, whatever the case may be for limitation [1E].

Patent Owner then quotes disclosures in the ’786 Application as supporting the highest 1% of particle tips differing in protrusion distance by within about 80 microns or less, emphasizing various snippets in bold and italic type, and with a short explanatory note. *See id.* at 25–26 (citing Ex. 1005 ¶ 73). Patent Owner also asserts “Petitioners’ construction of ‘designated profile’ to mean the ‘average protrusion distance of the diamond tips’” leads to the ’786 Application disclosing the highest 1% of particle tips differing in protrusion distance by within about 80 microns or less. *Id.* at 26–27 (citing Pet. 36–38; Ex. 1005 ¶ 56).

Patent Owner’s argument is not persuasive. None of the cited ’786 Application disclosures *directly* pertains to the highest 1% of particle tips differing in protrusion distance by within about 80 microns or less, as

recited in limitation [1F]. *See* Ex. 1005 ¶¶ 56, 73. Perhaps, with more explanation, some of these disclosures might demonstrate possession of limitation [1F], but such explanation is lacking in the preliminary record before us.

Moreover, for substantially the same reasons articulated above in Section IV.G.5(i) in the context of limitation [1E], Dr. Sung’s Declaration from the Kinik Litigation is consistent with Dr. Shanfield’s opinion on behalf of Petitioner that claim 1 of the ’802 patent is not entitled to the filing date of the ’786 Application. *See* Ex. 1002 ¶¶ 71–74, 77; Ex. 1011 ¶¶ 17–18, 22.

Finally, we agree with Patent Owner’s argument that the history of IPR2021-00638 does not aid Petitioner’s cause, on the present record, as discussed above in Section IV.G.2.

We conclude on the preliminary record presented that claims 1–21 of the ’802 patent are not entitled to the filing date of the ’786 Application, because the ’786 Application does not support limitation [1F] reciting the difference in protrusion distance between the highest 1% of particle tips are within about 80 microns or less.

6. *Combination(s) of Parent Applications*

To the extent Patent Owner argues the *combination* of the ’074 Provisional, the ’817 Application, and the ’786 Application demonstrates possession of claim 1 of the ’802 patent prior to Petitioner’s alleged prior art references, we disagree. *See* Prelim. Resp. 6–8. As Petitioner points out, a patentee “cannot show possession of an invention based upon a combination of several distinct previous applications unless he shows that one of the applications discloses the invention,” such that “a

claim that relies upon a combination of previously-filed applications is not to be entitled to an earlier filing date because the applicant has not demonstrated possession of the complete invention at the time of an earlier application.” *Studiengesellschaft Kohle, M.B.H. v. Shell Oil Co.*, 112 F.3d 1561, 1564 (Fed. Cir. 1997); *see* Pet. 20. Thus, in order to pre-date Petitioner’s alleged prior art references, *one* of the ’802 patent’s parent applications must have been filed prior to those references and must include written description support for the claimed subject matter.

7. *Copending Application Requirement*

Finally, we note that none of the ’074 Provisional, the ’817 Application, and the ’786 Application was copending with the application that issued as the ’802 patent. Thus, priority to one of those parent applications additionally requires one or more intervening applications to create “a continuous chain of copending applications each of which satisfies the requirements of § 112 with respect to the subject matter presently claimed” in the ’802 patent, such that “if any application in the priority chain fails to make the requisite disclosure of subject matter, the later-filed application is not entitled to the benefit of the filing date of applications preceding the break in the priority chain.” *Hollmer v. Harari*, 681 F.3d 1351, 1355 (Fed. Cir. 2012).

In the event Patent Owner continues to rely on one or more of the ’074 Provisional, the ’817 Application, and the ’786 Application as providing a priority filing date for the ’802 patent’s claims during the trial instituted by this Decision, we encourage both parties to address whether there are the requisite intervening application(s) per *Hollmer* and related

case law. For example, so far as we can tell from the preliminary record, of all the intervening applications leading from the '817 Application and the '786 Application to the '802 patent, only the '704 Application was ever copending with the '802 patent. Yet, Dr. Sung's Declaration from the Kinik Litigation stated the '704 Application does not "disclose the claimed subject matter of the '802 Patent." Ex. 1011 ¶ 22.

8. *Conclusion Regarding Priority of the '802 Patent Claims*

We conclude on the preliminary record presented that claims 1–21 of the '802 patent are not entitled to a filing date prior to the '802 patent's actual filing date of October 3, 2014. As a result, Tsai, Sung '146, and Sung '026 are each prior art against claims 1–21 of the '802 patent.

H. *Ground One — Anticipation by or Obviousness over Tsai*

Petitioner asserts claims 1–5, 13, 15, and 19–21 of the '802 patent are unpatentable as anticipated by Tsai, or alternatively as having been obvious over Tsai. *See* Pet. 5–6, 27–56. Patent Owner disagrees. *See* Prelim. Resp. 1–2, 37–48.

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. First we summarize the disclosure of Tsai, then we consider the parties' opposing contentions concerning claim 1.

1. *Summary of Tsai*

Tsai is a research article, co-authored by Dr. Sung, that compares *organic* diamond dresser disks (ODDs) versus conventional *brazed* diamond dresser disks (BDDs). *See* Ex. 1004, Title, Authors ("J.C. Sung"), Abstract;

Prelim. Resp. 4 (“Tsai . . . was co-authored by Patent Owner Dr. Sung”). ODDs utilize “polymer-bonded diamond grits,” whereas BDDs utilize “braze-bonded diamond grits.” Ex. 1004, Abstract (lines 2–6).

Tsai’s ODDs are manufactured by firstly “level[ing] [the diamond grits] on the surface of a mold,” and then secondly “reverse casting” a polymer substrate on to the grits, and removing the mold. *See id.* at Abstract (lines 6–8); *id.* at Figs. 2–3, 3:10–4:1, 5:19–6:20. By contrast, in BDDs, the diamond grits are brazed on to a metal substrate, and they “are not leveled to the same height.” *Id.* at Abstract (lines 3–4); *see id.* at Fig. 1, 4:8–5:18. The authors found that “[t]he diamond tips of the ODD are leveled to less than 15 μm ,” whereas “[d]iamond leveling (height distribution of the diamond grits) for the BDD is . . . greater than 50 μm .” *Id.* at Abstract (lines 9–11); *see id.* at Fig. 6, 8:19–24.

2. *Independent Claim 1*

Petitioner provides arguments and evidence in support of contending independent claim 1 is unpatentable as anticipated by Tsai, or alternatively as having been obvious over Tsai, including supporting testimony from Dr. Shanfield. *See* Pet. 27–45; Ex. 1002 ¶¶ 81–86, 106–146. Patent Owner opposes. *See* Prelim. Resp. 1–2, 37–48.

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.

(i) *[1Pre] — “A CMP pad dresser, comprising:”*

Petitioner argues that, assuming the claim preamble [1Pre] is limiting, Tsai discloses a CMP pad dresser. *See* Pet. 29 (citing Ex. 1004, Title,

Abstract (lines 4–6)); Ex. 1002 ¶ 108. We conclude this contention, which Patent Owner does not oppose at the present time, is supported sufficiently by the evidence of record to justify institution of review. In particular, Tsai provides a “pad conditioner[]” consisting of an organic diamond disk (ODD), wherein “ODD-dressed pads produce fewer defects in wafers” utilizing a “chemical-mechanical polishing (CMP)” process than conventional BDD pad conditioners.¹⁵ Ex. 1004, Abstract.

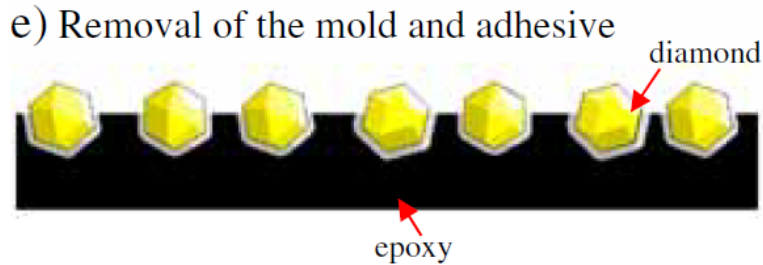
(ii) [1A] — “a rigid support substrate”

Petitioner argues Tsai’s ODD includes a rigid support substrate. *See* Pet. 29–31 (citing Ex. 1001, 7:59–63, 8:2–5, 24:64–25:19, 25:23–32; Ex. 1004, Fig. 2, 5:20–6:6); Ex. 1002 ¶¶ 109–113. We conclude this contention, which Patent Owner does not oppose at the present time, is supported sufficiently by the evidence of record to justify institution of review, as follows.

The ’802 patent defines the term “substrate” to mean “a portion of a pad conditioner that supports superabrasive materials, and to which abrasive materials and/or superabrasive segments that carry abrasive materials may be affixed,” including “relatively hard polymers or other organic materials.” Ex. 1001, 7:59–8:5. “Further, the substrate may include a material that aids in attaching abrasive materials to the substrate.” *Id.* at 8:5–8; *see also id.* at 24:64–25:10 (discussing how a “support substrate” can be formed of various organic matrix materials including “epoxy resins”).

¹⁵ We note, although it has little bearing on the present Decision, that the ’802 patent defines the term “comprising” to “have the meaning ascribed to [it] in U.S. Patent law and can mean ‘includes,’ ‘including,’ and the like, and [is] generally interpreted to be open ended.” Ex. 1001, 8:37–41.

Tsai's ODD is illustrated in Figure 2(e), reproduced below.



Tsai, Figure 2(e).

Ex. 1004, pg. 2. Figure 2(e) is a schematic side view of Tsai's ODD, including a “polymer” substrate comprising “an organic matrix (e.g. epoxy)” (colored black), diamond grits (colored yellow), and an electroplated nickel layer bonding the diamond grits to the substrate. *Id.* at 5:19–6:10. Further, as discussed in the next Section IV.H.2(iii), the diamond grits are superabrasive particles.

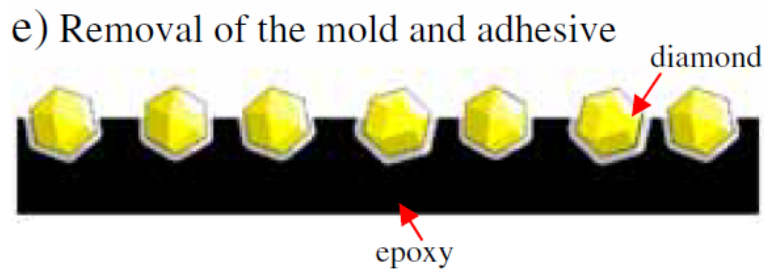
(iii) [1B] — “a monolayer of a plurality of superabrasive particles coupled to the support substrate”

Petitioner argues Tsai's ODD includes a monolayer of a plurality of superabrasive particles coupled to the support substrate. *See* Pet. 32–34 (citing Ex. 1001, 4:13–25, 4:33–38, 8:29–32; Ex. 1004, Figs. 2, 3, 5, and 8, 5:5–11, 5:23–6:6); Ex. 1002 ¶¶ 114–122. We conclude this contention, which Patent Owner does not oppose at the present time, is supported sufficiently by the evidence of record to justify institution of review, as follows.

The '802 patent defines the term “superabrasive” to mean “any crystalline, or polycrystalline material, or mixture of such materials that has a Mohr's hardness of about 8 or greater.” Ex. 1001, 4:13–16. Further, “[s]uitable superabrasive material examples can include” “diamond” and

“polycrystalline diamond (PCD),” which “may be incorporated into various tools in a variety of forms including particles [and] grits.” *Id.* at 4:20–27. The ’802 patent also defines the term “particle” to mean “a particulate form of superabrasive particle,” and states “[s]uch particles may take a variety of shapes, including round, oblong, square, euhedral, etc., [and] can be either single crystal or polycrystalline.” *Id.* at 4:33–38.

Tsai’s ODD is illustrated in Figure 2(e), reproduced below.



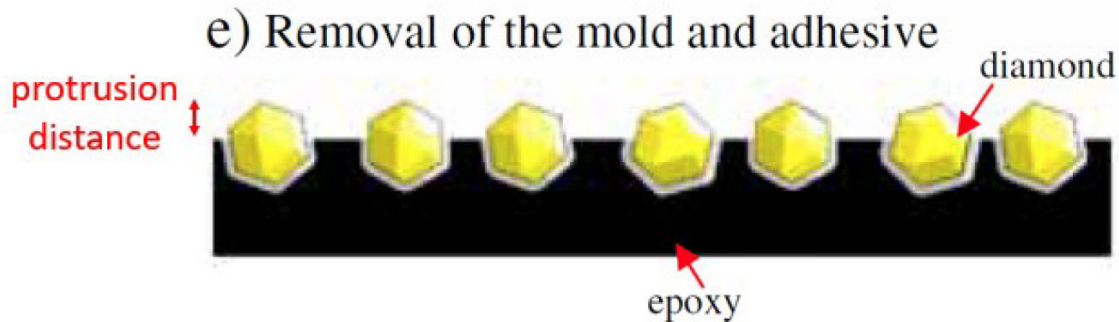
Tsai, Figure 2(e).

Ex. 1004, pg. 2. Figure 2(e) is a schematic side view of Tsai’s ODD, including diamond grits (colored yellow) bonded to an epoxy substrate (colored black). *Id.* at 5:19–6:5. We credit Dr. Shanfield’s testimony that “Tsai’s diamond grits are superabrasive particles” per the ’802 patent’s lexicographic definitions, in part because “[d]iamond has a Mohs hardness of 10.” Ex. 1002 ¶ 117 (citing Ex. 1001, 4:13–16, 4:19–25; Ex. 1007 (“A Dictionary of Weights, Measures, and Units”), 3); *see* Pet. 33.

(iv) [1C] — “wherein each superabrasive particle in the monolayer extends away from the support substrate to a protrusion distance”

Petitioner argues Tsai’s diamond grits extend away from the support substrate to a protrusion distance. *See* Pet. 35 (citing Ex. 1001, 16:24–26; Ex. 1004, Figs. 2(e), 3, 5, and 8, 8:14–16); Ex. 1002 ¶¶ 123–126. We conclude this contention, which Patent Owner does not oppose at the present

time, is supported sufficiently by the evidence of record to justify institution of review. In particular, Petitioner’s supporting annotations to Tsai’s Figure 2(e) are reproduced below.



Tsai, Figure 2(e) (As Annotated at Pet. 35).

Figure 2(e) is a schematic side view of Tsai’s ODD, including diamond grits (colored yellow) bonded to an epoxy substrate (colored black), which Dr. Shanfield has annotated to identify how each diamond grit particle extends away from the epoxy by a “protrusion distance” (double-headed red arrow). Pet. 35; Ex. 1002 ¶ 124; Ex. 1004, 5:19–6:5; *see also* Ex. 1001, 16:24–26 (“[F]or the purposes of the [’802 patent] disclosure, the term ‘protrusion’ refers to the height of a particle relative to some reference point.”). We also credit Dr. Shanfield’s testimony, citing other disclosures in Tsai, that the diamond grits of Tsai’s ODD protrude above the substrate by “about 30 microns.” Ex. 1002 ¶ 124 (citing Ex. 1004, 8:14–16); *see* Pet. 35.

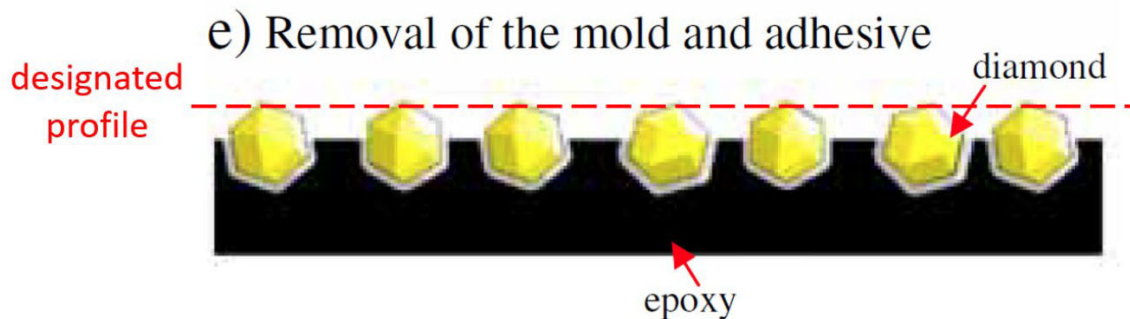
(v) [1D] — “wherein a tip of each of the plurality of superabrasive particles aligns along a designated profile with a tip variation of from about 5 microns to about 100 microns”

Petitioner argues “Tsai discloses and/or renders obvious” that Tsai’s diamond grits have tips that align along a designated profile, with a tip variation of from about 5 microns to about 100 microns. Pet. 36. Patent

Owner opposes, arguing: (1) Tsai does not disclose the claimed *designated profile* for the particle tips; and (2) Tsai does not disclose or render obvious the claimed *tip variation* from a designated profile. *See* Prelim. Resp. 38–46. We consider each disputed issue in turn.

(a) *Whether Tsai Discloses a Designated Profile for the Particle Tips*

Petitioner argues Tsai discloses that its diamond grit tips each align along a designated profile. *See* Pet. 36–37 (citing Ex. 1001, 5:9–12, 6:21–25; Ex. 1004, Figs. 2(e) and 5(b), 5:23–24, 6:8–10, 8:14–16, 8:22–24); Ex. 1002 ¶¶ 127–129, 131–132. Petitioner’s supporting annotations to Tsai’s Figure 2(e) are reproduced below.



Tsai, Figure 2(e) (As Annotated at Pet. 37).

Figure 2(e) is a schematic side view of Tsai’s ODD, including diamond grits (colored yellow) bonded to an epoxy substrate (colored black), which Dr. Shanfield has annotated to identify the “designated profile” (dotted red line) of the diamond grit tips.

Petitioner asserts and Dr. Shanfield testifies that “Tsai explains that it designates *a flat contour* above the epoxy resin to which each of the tips of the diamond particles is intended to align.” Pet. 36–37 (emphasis added) (citing Ex. 1004, 5:23–24, 6:8–10, 8:14–16, 8:22–24); Ex. 1002 ¶¶ 131–132. Thus, Petitioner’s and Dr. Shanfield’s identified “designated profile” in

Figure 2(e) above correspondingly shows “a flat contour can be designated above the epoxy resin substrate to which the tips of the diamond particles are intended to align (*e.g.*, the average protrusion distance of the diamond tips) and leveled,” wherein “some tips can protrude above or below that flat ‘designated profile.’” Pet. 37; Ex. 1002 ¶¶ 131–132.

In particular, as discussed in more detail below, Petitioner and Dr. Shanfield “*tak[e] the average protrusion distance to be the designated profile*” corresponding to Tsai’s desired flat contour of diamond grit tips. Pet. 38 (emphasis added); Ex. 1002 ¶ 133. Petitioner and Dr. Shanfield then extrapolate from Tsai’s disclosure in Figure 6 of one exemplary ODD having a minimum protrusion height of about 13.2 μm , an average protrusion height of about 24.2 μm , and a maximum protrusion height of about 33.0 μm , as also disclosing that the tip variation from the designated profile (that is, a flat contour at the average protrusion height) will fall within the range specified in claim 1. *See* Pet. 37–39; Ex. 1002 ¶¶ 131–134.

Patent Owner argues in opposition that “[t]here is no explicit disclosure of a ‘profile’ or ‘designated profile,’ let alone of ‘a tip of each of the plurality of superabrasive particles [that] aligns along a designated profile’ *anywhere* in Tsai.” Prelim. Resp. 38–39. Patent Owner asserts Dr. Shanfield’s annotated dotted red line in Figure 2(e) of Tsai “cannot substitute for the absence of this element from [Tsai], which is fatal to [Petitioner’s] anticipation ground.” *Id.* at 39. Patent Owner’s view is: “In Tsai, no such [designated] contour is discussed or even defined as a design parameter,” “nor does Tsai discuss any particular alignment that would yield such a design parameter” including the specific “plane” contour recited in

dependent claim 19. *Id.* at 39–40, 41–42 (citing Ex. 1001, 2:15–17, 6:22–25, 13:15–18, 13:41–43, 17:16–20, 17:43–45).

Patent Owner particularly asserts Tsai’s desire to achieve “leveling of diamond tips” (Ex. 1004, 3:7–10) is unrelated to the tips “align[ing] along a designated profile” as recited in claim 1 (Ex. 1001, 27:61–62), because the ’802 patent “teach[es] that ‘traditional CMP pad dresser manufacturing methods’ included ‘techniques for leveling superabrasive particle tips prior to fixation.’” Prelim. Resp. 42–43 (citing Ex. 1001, 9:36–38; Ex. 1004, 3:1–10).

Patent Owner further asserts Petitioner’s alleged “designated profile” in Tsai “fundamentally mischaracterizes the ‘designated profile’ and would read this term out [of claim 1] completely because it fails to account for ‘deviation’ from the designated profile as required in” claim 1. *Id.* at 39. Patent Owner reasons that “[a] profile that simply traces the heights of the diamonds,” which Patent Owner alleges Dr. Shanfield’s annotated dotted red line does, “could never deviate from any profile, because that profile would have *no tip deviation*” whereas claim 1 expressly contemplates “a *tip variation*” from the designated profile. *Id.* at 39–40 (citing Ex. 1001, 6:22–25, 11:24–27, 11:45–12:3; Ex. 1002 ¶ 131); *see also id.* at 41 (“A flat profile as contemplated by Dr. Shanfield *would not yield any tip deviation.*”).

We conclude Petitioner’s contention that Tsai discloses a “designated profile” for its diamond grit tips is supported sufficiently by the evidence of record to justify institution of review.

First, the ’802 patent defines the term “tip” to mean “a portion of a cutting element or particle that protrudes the greatest distance from the

support substrate, e.g., that is the first portion of the cutting element that contacts a CMP pad when in use.” Ex. 1001, 5:9–12. The ’802 patent also defines the term “profile” to mean “a *predetermined contour* above a support substrate to which a plurality of superabrasive particles or other cutting elements are *intended to align*.” *Id.* at 6:21–25 (emphasis added). Further: “Examples of such profiles may include, without limitation, *flat or planar profiles*.” *Id.* at 6:25–28 (emphasis added).

Second, we find on the present record that Tsai intends for its ODD diamond grit tips to be “leveled to the same height” — that is, as contemplated by the ’802 patent, to form a flat or planar profile. Ex. 1004, Abstract (lines 3–11); Ex. 1001, 6:25–28. For example, Tsai states that in conventional BBDs “the tips of the diamond grits are not leveled to the same height,” which disadvantageously means that “less than 10% of the diamond grits are engaged in cutting the polishing pad” and “[t]he rest of the grits remain unused on the disk.” Ex. 1004, 2:10–17. Tsai’s ODD, by contrast, “remarkably improves the leveling of diamond tips” such that “[t]he better-leveled ODD has more cutters that can dress the pad, and thus, they share an equal dressing load.” *Id.* at 3:7–10, 8:9–26, 11:16–18; *see also id.* at 6:8–10 (stating “the diamond tips [of the ODD] can be leveled by compressing the disk with a flat plate to reduce the variation in the heights of the diamond tips”). Based on the present record, we agree with Dr. Shanfield’s testimony that Tsai’s “designated profile” is “a *flat profile . . . to which each of the tips of the [diamond grits] should align*,” despite Tsai’s recognition that “[s]ome tips may protrude above or below (i.e., vary from) the designated profile.” Ex. 1002 ¶¶ 131–132 (emphasis added).

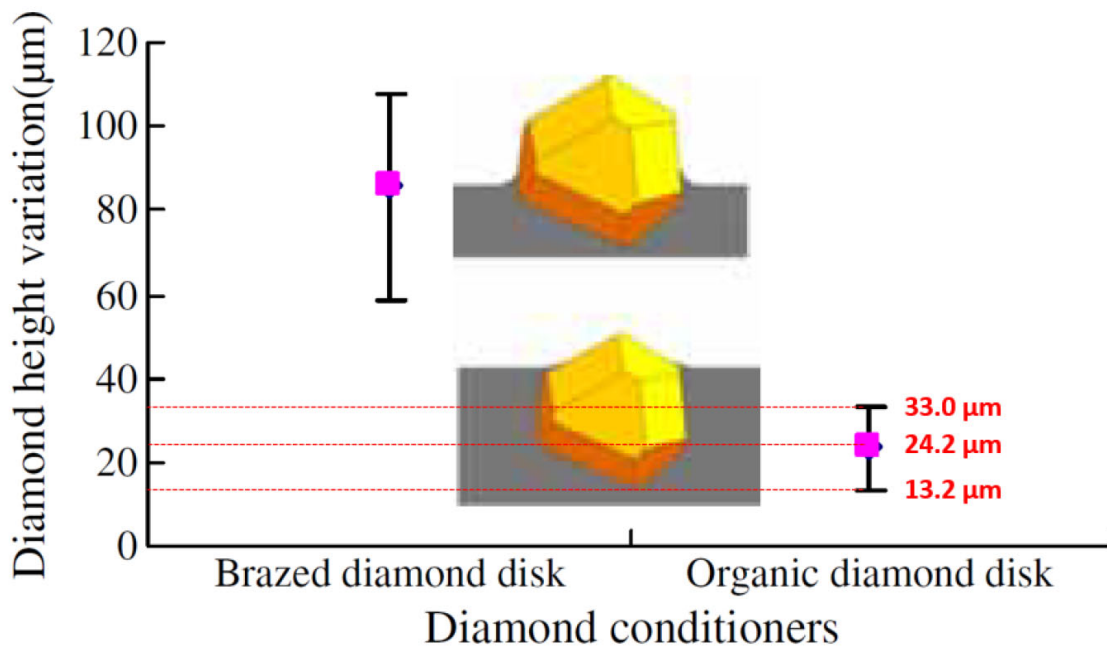
Thus, we disagree with Patent Owner’s characterization of Dr. Shanfield’s testimony as identifying the “designated profile” in Tsai to be “[a] profile that simply traces the heights of the diamonds” such that there is “*no tip deviation*” in Tsai. Prelim. Resp. 39, 43. Instead, Dr. Shanfield identifies the “designated profile” in Tsai to be “a flat profile” that corresponds to “the average protrusion height” in Tsai, which means that any diamond grit tip having a different height than the average height will vary from the designated profile by some distance. Ex. 1002 ¶¶ 131–134.

We also disagree with Patent Owner’s assertion that Dr. Shanfield misunderstands the scope of claim 1 as excluding a “conventional levelling of diamond particles” from the claimed “designated profile.” Prelim. Resp. 40–41. Dependent claim 19 confirms that one example of a “designated profile” in claim 1 is a “plane” configuration. Ex. 1001, 29:5–8. The ’802 patent specification similarly confirms the claimed “designated profile” can correspond to “*substantially leveled tips across the working surface of the finished CMP pad dresser,*” wherein “the term ‘leveling’ with respect to superabrasive particles can refer to *superabrasive particles that are leveled with respect to a planar profile,*” although “there may be some height deviation between cutting elements that occur[s] due to limitations inherent in the manufacturing process.” *Id.* at 10:63–11:11 (emphases added), 13:1–13.

For the foregoing reasons, we conclude Petitioner’s contention that Tsai discloses a “designated profile” for its diamond grit tips is supported sufficiently by the evidence of record to justify institution of review.

(b) Whether Tsai Discloses a Particle Tip Variation from the Designated Profile of From About 5 Microns To About 100 Microns

Petitioner next argues Tsai discloses its diamond grit tips vary from Tsai's designated flat contour profile within the range specified in claim 1, in two ways. *See* Pet. 37–40; Ex. 1002 ¶¶ 127–135. First, Petitioner relies on Tsai's Figure 6, reproduced below as annotated by Petitioner.



Tsai, Figure 6 (As Annotated at Pet. 38).

Figure 6 is a graph titled “Height variation in tips for diamond conditioners,” which plots “Diamond height variation” in microns along the vertical axis, for an exemplary conventional BDD (in the left region of the x-axis) and an exemplary ODD (in the right region of the x-axis). Ex. 1004, pg. 4 (Fig. 6).

As described in Tsai, Figure 6 shows that:

For the ODD, the burial depth of each diamond is about twice that of the exposed portion. Consequently, the risk of displacement of diamonds from the matrix while dressing the pad is minimal. The height variation in the diamond tips of the ODD is significantly smaller than that in the diamond tips of the BDD. In the case of the BDD, the diamond tips are leveled

to more than 50 μm . However, as shown in Fig. 6, in the case of the ODD, the diamond tips of the ODD can be leveled to less than 15 μm because the diamond tips are already leveled. The better-leveled ODD has more cutters that can dress the pad, and thus, they share an equal dressing load.

Id. at 8:19–26. In addition, Dr. Shanfield has annotated Tsai’s Figure 6 by adding three dotted red lines between the ODD diamond height variation data and the y-axis values, corresponding to the minimum of the data at about 13.2 μm , a purple box in the middle of the data at about 24.2 μm , and the maximum of the data at about 33.0 μm . *See* Ex. 1002 ¶ 132; Pet. 38.

Petitioner argues “Tsai’s Figure 6 . . . discloses ‘with a tip variation of from about 5 microns to about 100 microns’” as recited in claim 1. Pet. 37–39. Dr. Shanfield testifies in support that his annotations in Figure 6 identify the minimum, average, and maximum *protrusion height* of the diamond grits in Tsai’s ODD. *See* Ex. 1002 ¶ 132 (citing Ex. 1004, Fig. 6, 5:23–24, 6:8–10, 8:14–16, 8:22–24); Pet. 37–38. In other words, according to Dr. Shanfield, *all* of the diamond grit tips in Tsai’s ODD fall within a height distribution envelope that is 19.8 μm wide ($33.0\ \mu\text{m} - 13.2\ \mu\text{m} = 19.8\ \mu\text{m}$) and that is roughly centered around an average value of 24.2 μm . *See* Ex. 1002 ¶¶ 132–134; Pet. 37–38. Dr. Shanfield then testifies that, based on those constraints, and taking Tsai’s average diamond tip height of about 24.2 μm as Tsai’s flat contour designated profile per claim 1, it follows that “the tip-to-designated profile variation disclosed by Tsai is approximately 8.8 microns ($33.0\ \text{microns} - 24.2\ \text{microns}$) or 11 microns ($24.2\ \text{microns} - 13.2\ \text{microns}$),” thereby falling with the range specified in claim 1. Ex. 1002 ¶ 133–134; *see* Pet. 38–39.

Second, Petitioner argues and Dr. Shanfield testifies that Tsai discloses its diamond grit tips vary from Tsai's designated flat contour profile within the range specified in claim 1, in stating that "the diamond tips of the ODD *can be leveled to less than 15 μm* ," thereby "teach[ing] that even better leveling can be achieved over [the] specific example shown in Figure 6." Pet. 39 (citing Ex. 1004, 8:22–24); Ex. 1002 ¶ 135. Petitioner asserts in support that: "Because Tsai's disclosed range of 'less than 15 μm ' overlaps with the claimed range of 'from about 5 microns to about 100 microns,' it is a prima facie case of anticipation, which can only be rebutted by the patentee establishing that the claimed range is critical to the operability of the claimed invention." Pet. 39 (citing *UCB, Inc. v. Actavis Laboratories UT, Inc.*, 65 F.4th 679, 687 (Fed. Cir. 2023)). Petitioner argues and Dr. Shanfield testifies such criticality cannot be shown in the '802 patent. *Id.* at 39–40 (citing Ex. 1001, 8:29–32); Ex. 1002 ¶ 135.

Petitioner and Dr. Shanfield also apply an alternative claim construction, whereby the "tip variation" of claim 1 refers to a "*tip-to-tip* variation" rather than the "*tip-to-designated profile* variation" discussed above. Pet. 38 (emphasis added); Ex. 1002 ¶¶ 133–134. Their view is that, even under this alternative "tip-to-tip" construction, Tsai still discloses the "tip variation" of claim 1. *See* Pet. 38; Ex. 1002 ¶¶ 133–134.

Patent Owner argues in opposition that "Tsai does not teach or disclose a designated profile" as discussed above in Section IV.H.2(v)(a), so "it follows that Tsai also does not teach or suggest a tip variation from a designated profile." Prelim. Resp. 43. Patent Owner then attacks Petitioner's alternative "tip-to-tip" claim construction of the "tip variation" term in claim 1, as being contradicted by Dr. Shanfield's testimony in the

Samsung Litigation. *See id.* at 43–44 (citing Ex. 2008 ¶ 110, and reproducing Dr. Shanfield’s illustration of Petitioner’s alternative claim constructions at Ex. 2008 ¶ 111). Patent Owner maintains that the language of claim 1 and the ’802 patent specification are “clear as to the scope and meaning of ‘tip variation,’” indicating Petitioner’s alternative “tip-to-tip” construction cannot be correct. *Id.* at 44–46 (citing Ex. 1001, 9:36–41, 11:24–27, 12:3–5; Ex. 2004, 121:15–21, 124:20–125:10).

We conclude Petitioner’s contention that Tsai discloses its diamond grit tips vary from Tsai’s designated flat contour profile within the range specified in claim 1 is supported sufficiently by the evidence of record to justify institution of review.

First, as a matter of claim construction, we agree with Patent Owner’s argument that the claim term “tip variation” must refer to Petitioner’s “tip-to-designated profile” claim construction, not Petitioner’s “tip-to-tip” claim construction. This is established by the plain language of limitation [1D], reciting that “a tip of each of the plurality of superabrasive particles *aligns along a designated profile with a tip variation* of from about 5 microns to about 100 microns.”¹⁶ Ex. 1001, 27:61–64 (emphasis added). That is, the claim language sets the benchmark for the “variation” of a given tip to be the designated profile, not some other tip. Limitations [1E] and [1F], by contrast, refer to “the difference in protrusion distance between” two tips, which corresponds to Petitioner’s alternative “tip-to-tip”

¹⁶ We note, although it has little bearing on the present Decision, that the ’802 patent defines the term “about” as “provid[ing] flexibility to a numerical range endpoint by providing that a given value may be ‘a little above’ or ‘a little below’ the endpoint.” Ex. 1001, 8:29–36.

claim construction, but that language is not used in limitation [1D]. *See id.* at 27:64–28:4. The ’802 patent specification similarly reflects that limitation [1D] refers to “the plurality of superabrasive particles are arranged such that *their tips vary from the designated profile* by from about 5 microns to about 100 microns.” Ex. 1001, 11:46–52 (emphasis added); *see also id.* at 11:24–28 (“[T]he actual distribution of protrusion distances across the plurality of superabrasive particles in a finished dresser can be *compared against the designated profile* to determine the variance, or degree of ‘leveling’ achieved.” (emphasis added)).

Second, we find on the present record that Tsai discloses its diamond grit tips vary from Tsai’s designated profile (i.e., a flat contour located at the average height of all of Tsai’s diamond grit tips) by between about 5 microns and about 100 microns. Specifically, Dr. Shanfield’s testimony relying on Tsai’s Figure 6 and written description in column 8 (lines 22–24) as disclosing this claim requirement stands unopposed by argument from Patent Owner, much less contrary expert testimony. *See* Ex. 1002 ¶¶ 127–135. On this record, Dr. Shanfield’s testimony is sufficient to justify institution of review.

For the foregoing reasons, we conclude Petitioner’s contention that Tsai discloses its diamond grit tips vary from Tsai’s designated flat contour profile within the range specified in claim 1 is supported sufficiently by the evidence of record to justify institution of review.

(c) Whether Tsai Renders Obvious a Particle Tip Variation from the Designated Profile of From About 5 Microns To About 100 Microns

Petitioner moreover argues that, even if Tsai does not disclose its diamond grit tips vary from Tsai’s designated flat contour profile within the

range specified in claim 1, “the overlapping range of” Tsai’s ODD diamond tips being “leveled to less than 15 μm ” (Ex. 1004, 8:22–24) and claim 1’s tip variation range of about 5–100 μm creates a presumption of obviousness. Pet. 40 (citing *UCB*, 65 F.4th at 689); Ex. 1002 ¶¶ 135–138. Petitioner asserts and Dr. Shanfield testifies that “Patent Owner cannot overcome this presumption of obviousness” because the prior art does not teach away from the claimed range, and the evidence does not reflect that the claimed range produces new and unexpected results. Pet. 40 (citing *UCB*, 65 F.4th at 689–90); Ex. 1002 ¶ 135.

Further according to Petitioner and Dr. Shanfield, even if there is no presumption, Tsai still renders the claimed tip variation obvious because a person of ordinary skill in the art “would have been motivated to obtain tip variation values that overlap with the claimed ranges” based on Tsai’s explanation “that if ‘the tips of the diamond grits are not leveled to the same height’ a number of disadvantages arise” such as fewer particles engaging the polishing pad and shortening the pad lifespan. Pet. 40–41 (citing Ex. 1004, 2:13–17, 2:20–22); Ex. 1002 ¶ 136. Dr. Shanfield also testifies that obtaining the claimed range of tip variation would have been a routine optimization, achievable with a reasonable expectation of success. *See* Pet. 41–42; Ex. 1002 ¶¶ 137–138 (citing Ex. 1001, 25:14–22; Ex. 1004, 5:23–24, 6:8–10).

Patent Owner does not oppose Petitioner’s obviousness contentions, apart from arguments we have addressed above. *See* Prelim. Resp. 38–46.

We conclude Petitioner’s foregoing contentions of obviousness are supported sufficiently by the evidence of record to justify institution of review.

(vi) [1E] — “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 50 microns”

Petitioner argues Tsai discloses and/or renders obvious that the difference in protrusion distance between Tsai’s two highest diamond grit tips is less than or equal to about 50 microns. *See* Pet. 42–43, 44–45. Patent Owner opposes. *See* Prelim. Resp. 46–48.

(a) *Whether Tsai’s Two Highest Protruding Tips Have a Difference in Protrusion Distance of Less Than or Equal to About 50 Microns*

Petitioner argues “Tsai discloses” its ODD’s two highest diamond grit tips differ in protrusion distance by less than or equal to 50 microns. Pet. 42; Ex. 1002 ¶¶ 139–141. Petitioner relies on its previous argument that Tsai’s Figure 6 discloses the ODD’s “**tip-to-tip variation** for all superabrasive diamond particles is about 19.8 μm ” — that is, as discussed above, *all* of the diamond grit tips fall within a height distribution envelope that is 19.8 μm wide (33.0 μm – 13.2 μm = 19.8 μm). Pet. 42–43; Ex. 1002 ¶ 140; *see supra* Section IV.H.2(v)(b). Petitioner also relies on Tsai’s alleged “more generalized teaching that the tip-to-tip variation ‘can be less than about 15 μm .’” Pet. 42–43 (citing Ex. 1004, Figs. 5–6, 8:22–24); Ex. 1002 ¶ 140; *see supra* Section IV.H.2(v)(b). Petitioner reasons that, based on the 19.8 μm or 15 μm wide envelope for *all* diamond grit tip protrusion distances, the protrusion distance difference between the two highest diamond grit tips will necessarily be less than 50 μm . *See* Pet. 43; Ex. 1002 ¶ 141. Petitioner cites *Ineos USA LLC v. Berry Plastics Corp.*, 783 F.3d 865, 869 (Fed. Cir. 2015), as holding that “[w]hen a patent claims a range, as

in this case, that range is anticipated by a prior art reference if the reference discloses a point within the range.” Pet. 38, 43.

Patent Owner responds that Tsai’s ODD “fails to teach or suggest” the two highest diamond grit tips differing in protrusion distance by less than or equal to 50 microns. Prelim. Resp. 1–2, 46–48. Patent Owner asserts “it is axiomatic that illustrations are not drawn to scale,” yet Petitioner and Dr. Shanfield “speculate[]” that Tsai’s Figure 6 is drawn to scale. *Id.* at 46–47 (citing Ex. 1002 ¶¶ 140–142). Patent Owner further asserts “Tsai is completely silent on the highest [and] second highest . . . protruding tips,” and to the extent Petitioner seeks to address this deficiency in Tsai, we should further consider “Patent Owner’s evidence regarding entitlement of priority” which allegedly applies Petitioner’s treatment of Tsai to various parent applications of the ’802 patent. *Id.* at 47 & n.4.

We conclude Petitioner’s contention that Tsai discloses its ODD’s two highest diamond grit tips differ in protrusion distance by less than or equal to 50 microns is supported sufficiently by the evidence of record to justify institution of review. Tsai’s Figure 6 expressly includes a scale along its vertical axis, which represents a range of 0–120 microns in even hash marks at every 20 microns along the range. *See* Ex. 1004, pg. 4. Thus, Tsai’s Figure 6 is expressly drawn to scale along the vertical axis. And, applying that scale, Dr. Shanfield’s otherwise unopposed testimony as summarized above is sufficient to justify institution of review. *See* Ex. 1002 ¶¶ 139–141. Finally, we have addressed Patent Owner’s arguments as to priority above in Section IV.G.

(b) Whether Tsai Renders Obvious that the Two Highest Protruding Tips Have a Difference in Protrusion Distance of Less Than or Equal to About 50 Microns

Petitioner next argues that, even if Tsai does not disclose its two highest diamond grit tips differ in protrusion distance by less than or equal to 50 microns, a person of ordinary skill in the art “would have found the claimed range[] obvious for the same reasons discussed” above in Section IV.H.2(v)(c). Pet. 44–45; Ex. 1002 ¶ 146. Patent Owner responds that “Dr. Shanfield does not even provide a motivation for manufacturing these specific tips or set of tips with the claimed range[].” Prelim. Resp. 47. We conclude Petitioner’s contentions of obviousness are supported sufficiently by the evidence of record to justify institution of review, as discussed above. *See supra* Section IV.H.2(v)(c) (summarizing Petitioner’s contentions of obviousness).

(vii) [1F] — “the difference in protrusion distance between the highest 1% of the protruding tips of the monolayer of superabrasive particles are within about 80 microns or less”

Petitioner argues Tsai discloses and/or renders obvious that the difference in protrusion distance between Tsai’s highest 1% of diamond grit tips are within about 80 microns or less. *See* Pet. 42–43, 44–45. Patent Owner opposes. *See* Prelim. Resp. 46–48.

(a) Whether Tsai’s Highest 1% of Protruding Tips Have a Difference in Protrusion Distance Within About 80 Microns or Less

Petitioner argues “Tsai discloses” the difference in protrusion distance between the highest 1% of diamond grit tips in Tsai’s ODD are within about 80 microns or less, for substantially the same reasons discussed above in

Section IV.H.2(vi)(a) in relation to Tsai’s two highest diamond grit tips differing in protrusion distance by less than or equal to 50 microns. *See* Pet. 42–43; Ex. 1002 ¶¶ 139–140, 142.

Patent Owner similarly responds as discussed above in Section IV.H.2(vi)(a). *See* Prelim Resp. 1–2, 46–47. Patent Owner further argues “the variation across multiple tips as claimed in the ’802 Patent is distinct from the values claimed in *Ineos* cited by Petitioner[.]” *Id.* at 47. Patent Owner asserts that in *Ineos*, “the teaching of a prior art reference of a **single** value was found to anticipate a claimed range for a single value,” but “[t]hat is distinct from claim 1 of the ’802 Patent, where ‘tip variation’ encompasses **multiple** values of **multiple** superabrasive tips.” *Id.* at 47–48 (citing *Ineos*, 783 F.3d at 868). Patent Owner concludes “Tsai’s disclosure of a single potential value of ‘less than 15 microns’ is insufficient to show multiple values of distinct superabrasive tips” as recited in claim 1. *Id.* at 48 (citing *Colas Sols., Inc. v. Blacklidge Emulsions, Inc.*, 759 Fed. Appx. 986, 990 n.7 (Fed. Cir. 2019)).

We conclude Petitioner’s contention that Tsai discloses the difference in protrusion distance between the highest 1% of diamond grit tips in Tsai’s ODD are within about 80 microns or less is supported sufficiently by the evidence of record to justify institution of review, for substantially the same reasons discussed above in Section IV.H.2(vi)(a). Moreover, based on the present record, we conclude the *Ineos* decision has little bearing on Petitioner’s case. That is, as we understand it, Petitioner and Dr. Shanfield posit that Tsai’s Figure 6 and disclosure in column 8 (lines 22–24) indicate *all* of the diamond grit tips, including the highest 1% of tips, fall within a height distribution envelope that is 19.8 μm or 15 μm wide, which means

that the differences in protrusion distance among the highest 1% of tips will necessarily be within about 80 microns or less. *See* Pet. 43; Ex. 1002 ¶ 142. Based on the present record, which does not contain any opposing argument or testimony on this point, Dr. Shanfield’s testimony is persuasive.

(b) Whether Tsai Renders Obvious that the Highest 1% of Protruding Tips Have a Difference in Protrusion Distance Within About 80 Microns or Less

Petitioner next argues that, even if Tsai does not disclose the difference in protrusion distance between the highest 1% of diamond grit tips in Tsai’s ODD are within about 80 microns or less, a person of ordinary skill in the art “would have found the claimed range[] obvious for the same reasons discussed” above in Section IV.H.2(v)(c). Pet. 44–45; Ex. 1002 ¶ 146. Patent Owner responds that “Dr. Shanfield does not even provide a motivation for manufacturing these specific tips or set of tips with the claimed range[.]” Prelim. Resp. 47. We conclude Petitioner’s contentions of obviousness are supported sufficiently by the evidence of record to justify institution of review, as discussed above. *See supra* Section IV.H.2(v)(c) (summarizing Petitioner’s contentions of obviousness).

(viii) 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 Tsai, to demonstrate a reasonable likelihood that Petitioner would prevail with respect to this challenge at trial.

3. *Dependent Claims 2–5, 13, 15, and 19–21*

Petitioner provides arguments and evidence in support of contending dependent claims 2–5, 13, 15, and 19–21 are unpatentable as anticipated by Tsai, or alternatively as having been obvious over Tsai, including supporting testimony from Dr. Shanfield. *See* Pet. 42–56; Ex. 1002 ¶¶ 81–86, 140–167. Patent Owner opposes, relying solely on arguments we have considered above in connection with claim 1. *See* Prelim. Resp. 1–2, 48.

“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 v. Iancu*, *supra*, 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, 64.¹⁷ 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 claim 1, we do the same for claims 2–5, 13, 15, and 19–21. *See supra* Section IV.H.2; 37 C.F.R. § 42.108(a); CTPG 5–6, 64. Further, Patent Owner does not address these claims apart from arguments we have already considered

¹⁷ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

above in connection with claim 1, so there is nothing further for us to address with respect to these claims at this time. *See* CTPG 5–6, 64.

I. Ground Two — Obviousness over Tsai and Sung ’026

Petitioner asserts claims 1–3, 6–14, and 16–18 of the ’802 patent are unpatentable as having been obvious over Tsai and Sung ’026. *See* Pet. 5–6, 56–75. Patent Owner disagrees. *See* Prelim. Resp. 2, 49–52.

As discussed above, because we have decided to grant institution on Ground One (anticipation or obviousness over Tsai), we do the same for Ground Two (obviousness over Tsai and Sung ’026). *See supra* Section IV.H.3; 37 C.F.R. § 42.108(a); CTPG 5–6, 64. Nonetheless, we will address Patent Owner’s arguments concerning Ground Two separately from Ground One, to provide guidance to the parties for the upcoming trial. *See* CTPG 6, 64.

1. Claims 1–3, 6, 7, 13, 14, and 16–18

Concerning claims 1–3, 6, 7, 13, 14, and 16–18, Patent Owner’s sole opposition to Ground Two is that neither Tsai nor Sung ’026 is prior art against these claims, as discussed above in Section IV.G. *See* Prelim. Resp. 49–50. We do not agree, for the reasons provided above in Section IV.G, based on the present record.

2. Claims 8–12

Claims 8–12 each depend from claim 1, and require “*working* superabrasive particles” of various numbers — “at least 100” in claim 8, “at least 1000” in claim 9, “from about 1000 to about 6000” in claim 10, “from about 2000 to about 5000” in claim 11, and “at least about 1000” in

claim 12. Ex. 1001, 28:22–47 (emphasis added). We focus on claim 9 here because it is representative of the issues disputed between the parties at this preliminary stage of the proceeding.

The '802 patent defines the term “working superabrasive particles” to mean “superabrasive particles that cut or otherwise deform a CMP pad during a dressing or conditioning procedure.” *Id.* at 4:46–54; *see also id.* at 4:55–59 (defining “non-working superabrasive particles” to mean “superabrasive particles in a CMP pad dresser that do not significantly cut or deform the pad”).

Petitioner argues Tsai’s ODD includes working particles because its “diamond particles act as cutters and share an equal dressing load during the dressing or conditioning procedure.” Pet. 60 (citing Ex. 1004, Fig. 5b, 2:14–16, 8:13–14, 8:24–26); Ex. 1002 ¶¶ 178–180. Petitioner then contends “Tsai teaches or Tsai and Sung ’026 render obvious” the at least 1000 working particles required by claim 9. *See* Pet. 62–66; Ex. 1002 ¶¶ 153–157, 180, 186–193.

Specifically, as to Tsai’s disclosure, Dr. Shanfield extrapolates that the ODD illustrated in Tsai’s Figure 3 contains a total of about 154,800 particles. *See* Ex. 1002 ¶¶ 153–155, 187 (citing Ex. 1004, Fig. 3, 3:10–4:1, 6:19–20, 7:10–11); Pet. 62–63. Dr. Shanfield makes similar calculations for the ODDs illustrated in Tsai’s Figure 5 (about 24,768 total particles) and Figure 8 (also about 24,768 total particles). *See* Ex. 1002 ¶¶ 156–157, 188 (citing Ex. 1004, Figs. 5 and 8); Pet. 63–64. Dr. Shanfield then testifies that “Tsai discloses that *all* the diamond particles on the CMP pad dressers are cutters and share an equal dressing load when conditioning CMP pads,” thereby satisfying the requirement of at least 1000 working particles in

claim 9. Ex. 1002 ¶¶ 180, 189 (emphasis added) (citing Ex. 1004, Fig. 5, 2:14–17, 8:13–14, 8:24–26); *see* Pet. 64.

Dr. Shanfield alternatively concludes the combination of Tsai and Sung '026 renders the subject matter of claim 9 obvious. *See* Ex. 1002 ¶¶ 190–193; Pet. 64–66. Dr. Shanfield testifies “Sung '026 discloses that, during CMP pad conditioning, frictional forces are distributed equally across each superabrasive particle” which “minimizes the stress placed on individual particles and prevents them from displacing from the organic material layer.” Ex. 1002 ¶ 191 (citing Ex. 1005 ¶¶ 51, 75, claim 2). Dr. Shanfield opines that: “If each superabrasive particle is experiencing the same force when conditioning a CMP pad, each superabrasive particle is itself cutting asperities in the CMP pad and is a working superabrasive particle.” *Id.* Further: “Sung '026 discloses that a ‘majority’ of the superabrasive particles protrude to a predetermined height above the rigid epoxy support layer” in order to “produce cutting depths ‘that [are] essentially the distance[s] of protrusion.’” *Id.* ¶ 192 (citing Ex. 1005 ¶¶ 52, 76, claims 3–6). “Therefore,” according to Dr. Shanfield, “at least the majority of the superabrasive particles on the disclosed CMP pad dressers are working superabrasive particles” which, when applied to Tsai’s ODDs discussed above, would lead to “at least 77,400 or 12,384” working particles being present. *Id.* ¶¶ 192–193.

Patent Owner argues Petitioner’s combination of Tsai and Sung '026 does not teach or disclose *at least 1000 working particles*, as required by claim 9. *See* Prelim. Resp. 2, 49–52. Patent Owner particularly objects to Dr. Shanfield’s opinion that “*all*” of Tsai’s diamond grit particles “*are cutters* and share an equal dressing load when conditioning CMP pads,” as

“based on nothing more than his conclusory opinion” and as unsupported by Tsai’s teachings. Ex. 1002 ¶ 189 (emphasis added); Prelim. Resp. 50. Patent Owner’s view is that “there is no telling as to how many diamond grits are *working* superabrasive particles” in Tsai, as demonstrated by Dr. Shanfield’s testimony “that ‘ODD can be leveled to less than 15 microns’ in Tsai.” Prelim. Resp. 50 (emphasis added); *see also* Ex. 1002 ¶¶ 135, 140, 152 (“Tsai discloses that the tips of the superabrasive particles can be leveled to less than 15 microns.”). Patent Owner asserts Tsai also “teaches that its ODD . . . ‘has more cutters that can dress the pad’” than the conventional BDD, “but provides no indication of what a typical number of ‘cutters’ in a conventional [BDD] pad dresser would be, or how many more cutters are present on an ODD.” Prelim. Resp. 51 (citing Ex. 1004, 8:24–25). Patent Owner therefore concludes Dr. Shanfield’s extrapolations of working particle numbers from Tsai’s Figures are faulty, because they are based on his “faulty assumption that ‘all’ diamonds on Tsai’s ODD are ‘cutters.’” *Id.* at 51–52 (citing Ex. 1002 ¶¶ 180, 186–189).

Patent Owner further objects to Dr. Shanfield’s reliance on Sung ’026 for obviousness, because his conclusion that “*each* superabrasive particle is itself cutting asperities in the CMP pad and is a working superabrasive particle” in Sung ’026 (Ex. 1002 ¶ 191 (emphasis added)) “is similarly infirm and is contradicted by Sung ’026’s teaching[s].” *Id.* at 52 (citing Ex. 1005 ¶¶ 51, 80). In particular, according to Patent Owner, “Sung ’026’s teaching of ‘uniform distribution of frictional force’ does not dictate that all particles must be working particles, only that individual particles will not be overstressed.” *Id.* (quoting Ex. 1005 ¶ 51). Patent Owner moreover asserts “Sung 026’s disclosure that ‘[t]he protruding superabrasive particles 12 *can*

cut into the CMP pad to a depth that is essentially the distance of the protrusion’ does not dictate that all particles of all protrusion depths actually do cut into the CMP pad.” *Id.* (quoting Ex. 1005 ¶ 76).

We conclude Patent Owner may have a point as to the limited nature of Tsai’s disclosure, based on the present record. Dr. Shanfield’s testimony directed to claim 9 appears to rely on his conclusion that *all* of the diamond particles in Tsai’s ODD are *working* particles. *See* Ex. 1002 ¶¶ 180, 189 (“Tsai discloses that all the diamond particles on the CMP pad dressers are cutters and share an equal dressing load[.]”) (citing Ex. 1004, Fig. 5, 2:14–17, 8:13–14, 8:24–26). The cited disclosures in Tsai state that the conventional BDD had “less than 10% of the diamond grits [being] engaged in cutting the polishing pad,” whereas Tsai’s ODD has regularly distributed diamond cutters with a protrusion height of “*approximately 30 μm*” such that “[t]he *better-leveled* ODD has *more cutters that can dress the pad*, and thus, they share an equal dressing load.” Ex. 1004, 2:10–17, 8:10–16, 8:24–26 (emphases added); *see also id.* at 11:16–18 (“The height variation in the diamond tips of the ODD is significantly smaller than that in the diamond tips of the BDD.”). It is not clear to us, and Dr. Shanfield does not explain persuasively, how Tsai’s disclosure that its ODD has more cutters (i.e., working particles per claim 9) than the conventional BDD leads to his conclusion that all of the diamond particles in the ODD are cutters. For example, Tsai’s description of “an equal dressing load” refers to the *cutters* sharing an equal dressing load among themselves, not to *all* particles sharing an equal dressing load. Ex. 1004, 8:24–26.

Dr. Shanfield’s alternative reliance on Sung ’026 for obviousness appears to be on better footing, based on the present record. He testifies

“Sung ’026 discloses that, during CMP pad conditioning, frictional forces are distributed equally across *each* superabrasive particle” which achieves certain benefits. Ex. 1002 ¶¶ 191–192 (emphasis added) (citing Ex. 1005 ¶¶ 51–52, 75–76, claims 2–6). That testimony appears to be supported by the cited disclosures in Sung ’026. *See* Ex. 1005 ¶¶ 51–52, 75–76, claims 2–6. And, when applied to Tsai’s ODD, it appears that the resulting pad dresser would have at least 1000 working particles per claim 9. *See* Ex. 1002 ¶¶ 191–192.

J. Ground Three — Obviousness over Sung ’146 and Sung ’026

Petitioner asserts claims 1–7 and 13–21 of the ’802 patent are unpatentable as having been obvious over Sung ’146 and Sung ’026. *See* Pet. 5–6, 75–80. Patent Owner disagrees. *See* Prelim. Resp. 2, 52–53.

As discussed above, because we have decided to grant institution on Ground One (anticipation or obviousness over Tsai), we do the same for Ground Three (obviousness over Sung ’146 and Sung ’026). *See supra* Section IV.H.3; 37 C.F.R. § 42.108(a); CTPG 5–6, 64. Further, Patent Owner’s sole opposition to Ground Three is that neither Sung ’146 nor Sung ’026 is prior art against the challenged claims, as discussed above in Section IV.G. *See* Prelim. Resp. 2, 52–53. We do not agree, for the reasons provided above in Section IV.G, based on the present record.

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 ’802 patent challenged in the Petition. Therefore, we institute an *inter partes* review of all challenged

claims 1–21 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 1–21 of the ’802 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.

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