

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

Case: IPR2024-00534

U.S. Patent No. 9,138,862

PATENT OWNER'S SUR-REPLY TO THE PETITION

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U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
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I. INTRODUCTION

Proceeding as if the Institution Decision splitting the original Ground 1 into Ground 1A for anticipation and Ground 1B for obviousness were of no consequence, Petitioners seek to distract the Board from the Petition's failure to make out a complete case for either anticipation or obviousness. Petitioners' Reply instead confirms the deficiencies of the Petition by refusing to distinguish Petitioners' anticipation arguments from Petitioners' obviousness arguments, and failing to identify the specific supporting evidence for *each such Ground in the Petition*. But the Reply cannot do so, because the Petition failed to identify numerous limitations as present in Sung '026 alone as anticipation requires and likewise lacked any substantive obviousness arguments beyond a bare-bones "obvious to try" theory only addressing Limitation [1C]. Simply put, the POR's identification of the legally deficient arguments, lack of supporting evidence, and technological *non sequiturs* in the Petition remains notwithstanding the Reply's deliberate vagueness about exactly what the Petition argued and cited.

II. PETITIONERS HAVE FAILED TO SHOW BY A PREPONDERANCE OF THE EVIDENCE THAT SUNG '026 INVALIDATES THE CHALLENGED CLAIMS OF THE '862 PATENT UNDER EITHER AN ANTICIPATION OR OBVIOUSNESS STANDARD (GROUNDS 1A & 1B)

A. Petitioners Have Not Shown that Sung '026 Discloses the Specifics of Limitation [1A]

Despite the Board's splitting of the proposed Ground 1 into separate Grounds 1A for anticipation and 1B for obviousness Petitioners do not even attempt to argue

in Reply that Limitation [1A] is obvious in view of Sung '026. Nor do Petitioners advance an inherency argument, because Petitioners unambiguously failed to rely upon either basis in their Petition for the purported disclosure of this limitation in Sung '026. As was explained in the POR, that is because the Petition facially fails to make out a complete argument for either anticipation or obviousness.

And so Petitioners can only argue that Sung '026's description of a generic result achievable in numerous ways discloses somehow *teaches* one particular and non-exclusive way of accomplishing that result. But Petitioners are incorrect; even if a POSITA did appreciate that one particular method would be a *possible* way to accomplish the result described in Sung '026, such recognition does not import that method within the four corners of the reference as required for anticipation. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008).

Lacking the ability to make a new argument or argue obviousness only for the first time in Reply and *with no rebuttal opinion* from their own expert, Petitioners cling to the attorney argument that “*because* abrasion, friction, and pressures are achieved by *pressing two objects against each other*, Sung '026” purportedly “teaches pressing a CMP pad dresser against a CMP pad.” (Reply at 6-7 (final emphasis added)). Petitioners remain incorrect. Simply put, a POSITA's understanding that a particular method is one non-exclusive way of producing a

generic result described in the reference does not transmute that result description into a disclosure or “teaching” of the method. Petitioners’ *ipse dixit* cannot bridge the gap from Sung ’026’s implicit disclosure of two objects being in contact in some undisclosed generic fashion to the ***one particular way of those two objects being retained in contact*** that a valid anticipation argument would require here.

It is important to be clear on the crux of the parties’ lack of disagreement:

- Petitioners do not dispute that there are multiple ways for two objects (such as a CMP pad dresser and a CMP pad) to be retained in contact.
- Petitioners do not dispute that Sung ’026 does not specify ***how*** the forces and stresses resulting from the contact between the CMP pad dresser and the CMP pad are produced, including whether they result from an external applied force.
- Petitioners do not dispute that Sung ’026 ***never describes pressing the CMP pad dresser against the CMP pad.***

Notwithstanding the reference’s silence, Petitioners contend Limitation [1A] is nevertheless disclosed because Dr. Tsai “admits that a POSITA would have reasonably understood Sung ’026 to teach limitation [1A].” (Reply at 4-7). But that assertion both misreads Dr. Tsai’s deposition testimony and misapplies the relevant legal standards for anticipation. Petitioners conflate what a POSITA would have

reasonably understood to be possible or likely *in view of* Sung '026 with the anticipation standard of what is “disclose[d] within the four corners of the document.” *See Net MoneyIN*, 545 F.3d at 1371. But as explained in the Response, and as Dr. Tsai testified, the specific method of pressing a CMP pad dresser against a CMP pad recited by Limitation [1A]—not required to achieve the described result—is simply absent from the four corners of Sung '026. That missing disclosure is fatal to Petitioner's anticipation arguments as a matter of law.

1. Anticipatory References Cannot be Vague or Ambiguous; They Require Sufficient “Precision and Detail” on the Alleged Disclosure

Petitioners first misapply the relevant standards for anticipation, citing only a single case of minimal applicability. A POSITA's recognition that a generic result described in a reference *could* be readily accomplished in one particular fashion does not obviate the need for Petitioners to show that Sung '026 discloses within its four corners the one particular (and non-exclusive) way of achieving it that Limitation [1A] recites.¹ *See Net MoneyIN*, 545 F.3d at 1371.

¹ Notably, Petitioners do not advance an inherency argument, which would require “showing that the allegedly anticipatory feature is consistent, *necessary*, and inevitable, not simply possible or probable—and it should be clear that it would be so recognized by” POSITAs. *Atofina v. Great Lakes Chemical Corp.*, 441 F.3d 991,

Rather, “anticipation requires that a single reference describe the claimed invention *with sufficient precision and detail* to establish that the subject matter existed in the prior art. For this reason, it has long been understood that ambiguous references do not, as a matter of law, anticipate a claim.” *Wasica Fin. GmbH v. Cont’l Auto. Sys.*, 853 F.3d 1272, 1286-87 (Fed. Cir. 2017) (cleaned up; emphasis in *Wasica*); see *Verve, LLC v. Crane Cams, Inc.*, 311 F.3d 1116, 1120 (Fed. Cir. 2002).

That required “precision and detail” regarding Limitation 1A is exactly what is missing here, where Sung ’026 is (at best) ambiguous as to how the CMP pad and dresser are retained in contact. Sung ’026 simply does not address any specific scenario as to how the contact between the CMP pad and dresser occurs to produce the described frictional forces and mechanical stresses . Rather, it is completely

1000 (Fed. Cir. 2006); *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). That is because Petitioners cannot do so: Inherency “may not be established by probabilities or possibilities,” and “the mere fact that a certain thing *may* result from a given set of circumstances is not sufficient.” to show inherent anticipation. *Id.* at 745. Petitioners cannot argue inherency without both making an inherency argument and meeting the inherency standard, but neither has been done here (let alone in the Petition, as was required). The Board should reject Petitioners’ effort to not only effectively argue inherency in all-but-name, but to do so without satisfying the predicates of making such an argument.

silent as to whether an external force is applied to the pad, the dresser, both the pad and the dresser, or neither.

Wasica—which likewise addressed an insufficiently specific reference—is instructive here. In *Wasica*, the Federal Circuit affirmed the Board's rejection of an argument that a reference disclosing transmitters being tuned to a "common" working frequency satisfied a claim limitation requiring a "constant" frequency for each transmitted signal. 853 F.3d at 1284. The Board instead credited expert testimony that while the disclosed "common" working frequency could be constant, it could also fluctuate (such as through frequency shift-keying) while remaining "common." *Id.* The Board determined that the reference was "at best 'unclear' whether its transmissions occurred at an unchanging, fixed frequency" as the relevant limitation required. *Id.*

The Federal Circuit agreed. *Id.* Because the record suggested that the reference "could use signals of either constant or non-constant frequency," it was "thus ambiguous as to whether it disclose[d] the pertinent features" requiring a constant frequency. *Id.* "Ambiguous references do not anticipate a claim." *Id.*

In *Wasica*, the disclosure of a "common" working frequency was ambiguous and could not anticipate as a matter of law because it could have been accomplished without using the recited "constant" frequency. The ambiguity (indeed, the complete

silence) in Sung '026 regarding the method of contact between the CMP pad and dresser is similarly fatal to Petitioners' argument here. Sung '026's generic description of frictional forces and mechanical stresses resulting from contact between the CMP pad and dresser fails to resolve the ambiguity as to how that contact is occurred, let alone with the specificity and precision necessary to conclude that it must be as Limitation [1A] recites.

2. Petitioners Misapprehend and Misapply the POR's Figures Explaining What Limitation [1A] Recites

It is also important to clarify that Petitioners' argument in Reply and questioning of Dr. Tsai are based on Petitioners' fundamental misapprehension of figures in the POR. (Reply at 4, citing POR at 19.) Contrary to Petitioners' misunderstanding (Reply at 4), it is clear that the orange arrows in the diagrams in the POR (at 16-19) do not represent a free-body diagram of all forces in the system. So Petitioners' assertion that scenario (iii) is disclosed in Sung '026 based on Newton's Third Law (Reply at 6) simply misreads the POR and the figures.

Rather, as the POR explains, the orange arrows indicate "where the same net force was applied," in different scenarios i.e., "the object[s] to which the force was applied to bring the cutting surface into contact" with the object being cut. (POR at 17.) In other words, for these three categories of scenarios where an external force is applied to maintain two objects in contact the orange arrows indicate the object(s)

that are being pressed against the other(s) *via external applied forces*, with the same “two arrows” worth of external force distributed across the two objects in a different way in each of the three scenarios.

Of course, as Dr. Tsai explained, there is a fourth category of scenario in which there is *no external force applied* to either the CMP pad or the dresser—so neither object is pressed against the other in any fashion (let alone the specific method recited in Limitation [1A]),² even if they remain in contact.

3. Dr. Tsai Confirmed that Sung '026 is Ambiguous as to How Contact is Retained Between the Pad and Dresser

As the Response explained, and as Dr. Tsai elaborated at his deposition, Sung '026 is similarly “at best unclear” as to how the contact between the CMP pad and dresser are maintained:

² To the extent that Petitioners now seek to argue that the recited “*pressing* a CMP pad dresser against a CMP pad” encompasses merely *placing* the dresser itself against or *resting* it upon the pad and letting gravity and friction hold them in contact, this should be rejected as an untimely claim construction argument that was not raised in the Petition and thus is waived. But in any event, Petitioners fail to rebut the POR's explanation, as Dr. Tsai elaborated, that describing the existence of frictional forces and mechanical stresses occurring between the pad and the dresser does not require or teach the recited *pressing the dresser against the pad*, or even pressing anything at all with an external force.

- Dr. Tsai explained that “[t]here are several ways” to use a CMP pad to polish a dresser. Ex. 1049 at 70:8-10.
- “There are many ways” to bring a CMP pad in contact with a dresser, and Dr. Tsai is unaware about what is performed throughout various experiments that take place throughout the industry, and “do[es] not know about other people’s condition” of bringing a dresser and CMP pad into contact. *See id.* at 18:5-19, 28:3-9.
- “[T]raditionally, they usually rely on its own weight” to bring the dresser in contact with the CMP pad to perform the dressing operations. *See id.* at 17:20-18:2. This “use[s] its own weight to press down” so there is no need to apply an external load or force. *See id.* at 70:8-17.
- In such circumstances, the dresser and CMP pad are in contact such that dressing is performed due to “the own weight of [the dresser], plus the tips of the diamond together,” even though the dresser and pad are not pressed against each other. *See id.* at 71:24-72:5.
- But if the weight of the dresser is insufficient, a dressing setup will “add more load, more weight” and “apply a load to it.” *See id.* at 22:12-22.

Contrary to the Reply, Petitioners identify nothing in Dr. Tsai’s testimony (or elsewhere), nor did they provide any rebuttal opinion from their own technical

expert, that would have led a POSITA to conclude that Sung '026 *teaches* the specific step recited in Limitation [1A]—which requires *pressing* the dresser against the pad, not simply placing it or resting it thereupon—simply because the pad and dresser in Sung '026 are somehow in contact such that dressing occurs.

4. Conclusion for Limitation [1A]

Because—as Dr. Tsai's expert testimony has elaborated—Sung '026's disclosure of a pad and dresser being in contact such that dressing occurs can be produced in multiple ways, the ambiguity of that description fails as a matter of law to support Petitioners' anticipation argument regarding the purported disclosure of Limitation [1A]. *See Wasica*, 843 F.3d at 1284-87. As a result of this absence, Petitioners cannot satisfy the anticipation standard, and so Ground 1A must be denied on the merits, and the challenged claims upheld in their entirety.

Moreover, because Petitioners failed to argue in the Petition that Limitation [1A] would have been obvious to a POSITA *in view of* Sung '026, they have thus waived such argument. The gap between the generic result disclosed within the four corners of Sung '026 and the specific method recited Limitation [1A] cannot be bridged by untimely attorney arguments about what a POSITA would have understood about one option for how a particular result *might be* accomplished. Petitioners' obviousness argument masquerading as anticipation is too little, too late.

As such, Ground 1B must be denied on the merits as well, and the challenged claims upheld in their entirety.

B. The Reply Confirms that Sung '026 Did Not Disclose Combining Its Separate “Aspects” As Specifically Required by Limitations [1C] and [1D]

1. Generic Boilerplate Language Provides No Substantive Disclosure as a Matter of Law and Cannot Teach a Specific Combination of Different Aspects

As an initial matter, Patent Owner first addresses Petitioners' use of boilerplate language from Sung '026 to elicit a “gotcha” response from Dr. Tsai at his deposition regarding its purported disclosure of the particular permutations of embodiments asserted to satisfy Limitations [1C] and [1D]. Specifically, Petitioners pointed to stock verbiage from paragraph 105 of Sung '026, substantively indistinguishable from similar language in hundreds of thousands (if not millions) of other issued patents, stating only that:

“Numerous modifications and alternative arrangements may be devised by those skilled in the art without departing from the spirit and scope of the present invention and the *appended claims are intended to cover such modifications and such arrangements.*”

(Reply at 9.) Even more than Petitioners' deficient reliance upon a different vague description for the purported disclosure of Limitation [1A], this generic template language lacks any specificity whatsoever, let alone the detail and precision necessary to teach a POSITA to have combined various different “aspects” of Sung

'026 in the specific fashion and with the exact parameters required by Limitations [1C] and [1D]. It is, by its own language, completely boundless; by purporting to cover everything without limit. It effectively covers nothing.

Petitioners are surely aware that the Federal Circuit has repeatedly explained that “the boilerplate language that modifications can be made to the original disclosed invention does not even suggest a [particular] embodiment of the disclosed invention.” *Forum US, Inc. v. Flow Valve, LLC*, 926 F.3d 1346, 1352 (Fed. Cir. 2019).³ That is why such “boilerplate language at the end of the . . . specification is not sufficient to show adequate disclosure of the actual combinations” recited. *See D Three Enters.*, 890 F.3d at 1051.

To make matters worse, while the Reply elsewhere excoriates Dr. Tsai elsewhere for his alleged lack of familiarity with the substance of patent law (e.g.,

³ *See also D Three Enters., LLC v. SunModo Corp.*, 890 F.3d 1042, 1050 (Fed. Cir. 2018) (rejecting any effect of specification boilerplate language that a POSITA “will recognize certain modifications, permutations, additions and sub-combinations therefore. It is therefore intended that the following appended claims hereinafter introduced are interpreted to include all such modifications, permutations, additions and sub-combinations are within their true spirit [sic] and scope.”); *IP Innovation, L.L.C. v. ECollege.com*, 165 Fed. Appx. 317, 321 (Fed. Cir. 2005) (dismissing any disclosure effect from such “common boilerplate language that does not specifically address the inventive features in any detail”).

Reply at 23), Petitioners had no compunction about taking advantage of Dr. Tsai's lack of legal training to provide a misleading and incorrect impression of how he should have understood Sung '026. At the very least, Petitioners were disingenuous in implying during Dr. Tsai's deposition that this language had any meaning or effect regarding the disclosure of Sung '026 and in suggesting that it should have done anything to change Dr. Tsai's opinion at all. The Board should accord this "gotcha" testimony just as much weight as the Federal Circuit gives to the vague and generic boilerplate language that Petitioners used to elicit it.

**2. The Reply's Claim Dependency Charts Confirm that Sung '026
*Does Not Disclose the Specific Combinations of Aspects
Required by Limitations [1C]-[1D]***

What Petitioners' claim dependency charts confirm is that not even in the claims of Sung '026 (which never issued as a patent) were these "different aspects" combined as recited in Limitations [1C]-[1D], let alone with the specific parameters that just so happen to satisfy their specific numerical requirements. Petitioners instead have confirmed that each of these individual aspects is (at most) disclosed independently, never simultaneously "arranged or combined as recited in the claim" as required to anticipate the '862 claims. And Petitioners merely claimed in conclusory fashion that it would have been "obvious to try" their exact proposed combination.

Rather than attempt to make a belated obviousness theory that was absent from the Petition, Petitioners instead advance the self-refuting argument that these “different aspects” were combined “together in *many* of its claims.” (Reply at 10.) Not so. As Petitioners’ own chart reveals, Sung ’026 never made any combination was ever made that even facially includes each “aspect” of the hindsight combination that Dr. Shanfield cobbled together to make out a disclosure of Limitation [1C].

As explained in detail in the POR (at 21-23), this hindsight “disclosure” requires combining these three or four distinct aspects that Sung ’026 *never* describes existing simultaneously (because they relate to different embodiments). Dr. Shanfield’s *post hoc* creation specifically requires a planar profile for its particular permutation of aspects and parameters to even attempt to satisfy Limitation [1C]. (POR at 21). But Petitioners’ dependency chart confirms that the planar designated profile aspect 1, recited in dependent claims 8 and 37, *is never arranged or combined with the variation aspect 2* recited in claims 12 and 41.

For Petitioners’ argument to hold up, claims 12 and 41 must depend from the planar profile embodiments disclosed in claims 8 and 37. But they do not. Petitioners reveal that they depend instead from, respectively, the generic designated profile aspect of claim 7 (claim 8’s parent) and the generic protrusion height aspect of claim 31 (claim 37’s grandparent).

The same holds true for the predetermined height “variation” aspect 4, corresponding to [0073] in Sung '026 ; it is only recited in claim 33 (depending from claim 31). (*See* Reply at 12.). Missing from this aspect is any dependency on or reference to claims referencing aspect 2 (variance from the designated profile) or aspect 1 (protrusion *to* a predetermined profile), let alone both. The dependency chart in the Reply does not refute Patent Owner's argument regarding Sung '026's failure to actually disclose the combination Dr. Shanfield identifies—it confirms it.

This same defect is exacerbated for Limitation [1D]. which Petitioners confirm is never disclosed in Sung '026 as combined with Limitation [1C]. Instead, this dependency chart confirms that Sung '026 *never discloses* the cutting depth recited in Limitation [1D] as being performed *by the specific dresser recited in Limitations 1B-1C*. All that is disclosed for “aspect 5” is a cutting depth of 10-20μm being produced by using an abrading tool in which the majority of superabrasive particles protrude to some predetermined height. (Reply at 10, 12).

Yet again, Petitioners confirm that the POR correctly identified the deficiencies in Petitioners' argument (*see* POR at 23-31): Sung '026 does not explain *what predetermined height* produces this cutting depth, nor does it identify any other structural features of such cutting tool—let alone connect it to the numerous specific requirements of Limitation [1C] as Limitation [1D] requires.

3. Petitioners Fail to Support Their Attorney Argument that a POSITA Would Have “*At Once*” Envisaged the Recited Combination

Contrary to Petitioners' misreading of Dr. Tsai's testimony (Reply at 8-9), at no point did Dr. Tsai “admit[] that a POSITA would have been able to ‘at once envisage’” the combination of “aspects” recited in Limitations [1C]-[1D]. This is evident from comparing Dr. Tsai's testimony and the excerpts in the Reply to the applicable legal standards. Dr. Tsai's deposition testimony about how *he* would view Sung '026 at the present time fails to address that question for several reasons.

First, Dr. Tsai is a person of *extraordinary* skill in the art, with expertise, based on his Ph.D education and decades of experience (in addition to over one hundred papers published in the context of CMP pad conditioners). *See* Ex. 2011 ¶¶ 6-10 (summarizing Dr. Tsai's extensive experience) & internal Ex. A (Dr. Tsai's CV). Dr. Tsai's level of skill is not only well beyond Patent Owner's definition of a POSITA—it is even further beyond Petitioners' expert's inadequate definition (under which even Patent Owner's lead counsel of record, who has used and operated numerous CMP equipment as part of his bachelor and master degrees specializing in semiconductor manufacturing and fabrication during the relevant time frame, would qualify as a POSITA). So what an expert like Dr. Tsai would have

appreciated *at all* says nothing about what one of merely ordinary skill—whatever that skill level is—would have appreciated at *any point*.

It is also clear from the Reply that Dr. Tsai's answers are phrased in the present tense, and his testimony seems to address what he would do *now* given his current knowledge:⁴ e.g., “But *for me, if I want* to achieve a very perfect diamond disk, that is the way *I would do*.” (Reply at 9 (quoting Ex. 1049, emphases added).) But Dr. Tsai's testimony about his *present-day approach* sheds no light on how someone of lesser skill would have viewed the disclosure of Sung '026 over a decade earlier at the time of the invention of the '862 patent.

Finally, the Reply identifies no testimony from Dr. Tsai as to how long it would have taken him—let alone how long it would have taken one of merely ordinary skill—to have envisaged the combination recited in Limitations [1C]-[1D]. This silence cannot establish that a POSITA would have “*at once*” envisaged the combination. All Dr. Tsai states is that “for '026 to achieve that, I personally think that they should achieve those conditions . . . that is the way I would do.” Petitioners

⁴ At the very least, Petitioners have failed to show that Dr. Tsai's testimony was responsive to the applicable legal standard of *what a POSITA would have “at once envisaged” at the time of the invention of the '862 patent*, as opposed to answering the very different question of what he would do in view of Sung '026 today.

failed to inquire of Dr. Tsai whether he (let alone a mere POSITA) would have envisaged that combination “at once” or whether it would have taken more time. Once again, silence and generalities relied upon by Petitioners fail to support the specific showings required.

In sum, Dr. Tsai's purported “admission” about what a POSITA “*would have been*” able to “at once envisage” was not a person of *extraordinary* skill, seems to have been framed from a present-day perspective, and said nothing about how long it would have taken him to recognize that combination.

III. PETITIONERS' ATTORNEY ARGUMENT IN REPLY CANNOT SHOW A REASONABLE EXPECTATION OF SUCCESS

Petitioners' claims that a POSITA would have had a reasonable expectation of success to modify Limitation [1C] are simply unsupported by facts in the record. The Reply provides only a single short paragraph of attorney argument with conclusory assertions that fail to explain, once again, how these vague generalities cited satisfy the specific requirements of Limitation [1C] other than with hindsight bias. (Reply at 13.) Tellingly, the Reply fails to identify where Petition argued a reasonable expectation of success for the proposed modification, let alone provide the required supporting explanation. That is because both the argument and supporting explanation are absent from the Petition, as the POR explains in detail. (POR at 41-44). And having failed to even make the argument (let alone support it)

in the Petition, it has been waived in Reply. *See Wasica*, 853 F.3d at 1286-87 (affirming Board's rejection of an obviousness challenge as "insufficiently precise and underdeveloped" where the petition "offered only a conclusory and sweeping allegation" instead of making out its case).

The Reply's cursory excuse that vague generalities about results somehow supported the specific modifications with the exact parameters crafted by Dr. Shanfield is, yet again, well short of the specificity required to support Petitioners' conclusory and legally defective "obvious-to-try" theory here. (*See* POR at 41-44.). As such, the Board should reject Petitioners' underdeveloped fallback "obvious-to-try" argument for Limitation [1C], and with it, the Ground 1B obviousness challenge.

IV. DEPENDENT CLAIMS AND GROUNDS 2-6

As discussed in detail in the POR (44-46), Petitioners' invalidity arguments regarding the dependent claims of the '862 patent fail are doomed by the same flaws that undermine the invalidity attacks on claim 1. The Reply offers no elaboration sufficient to fix those flaws.

The same holds true for Petitioners' efforts to invalidate the '862 patent on Grounds 2-6, where the deficiencies identified above for Limitations [1A], [1C], and

[1D] in Grounds 1A-1B are unfilled by material from the secondary references in both the Petition and the Reply. (*See* POR at 47-49.)

V. PETITIONERS MISREPRESENT DR. TSAI'S TESTIMONY REGARDING SUNGICPT

Petitioners claim that “Dr. Tsai admits that the area within radius a in SungICPT Figure 1 does not have any superabrasive particles,” and that Dr. Shanfield's testimony remains unrebutted. (Reply at 22.) Petitioners are incorrect on both counts.

Dr. Tsai's testimony is quite clear that only someone with sufficient CMP experience (unlike Dr. Shanfield) would be able to make that assessment of what is within radius a . (*See* Ex. 1049, 54:23:55-3 & 55:14-20.) But that plainly excludes Dr. Shanfield's ability to support Petitioners' argument. Thus, Dr. Shanfield's statement about the contents of radius a is at best unsupported guesswork given his lack of relevant experience in this area. And as discussed above, Dr. Tsai's probabilistic assessment was based on his extensive professional experience, which renders him well beyond the POSITA whose understanding matters. (*See id.* at 55:10-56:18.) Yet while crediting the substance of Dr. Tsai's extraordinary level of skill in the art in agreeing with his assessment, Petitioners simultaneously refuse to accept Dr. Tsai's explanation for the level of skill required to make that assessment. Petitioners cannot pick-and-choose so finely—and unfairly.

Petitioners failed to establish that the area within radius *a* was *necessarily* devoid of superabrasive particles. Dr. Tsai's testimony reflects his very-educated guess, based on his experience, as to the contents (or lack thereof) within radius *a*, but it is not factually determinative. The absence of evidence cited by Petitioners does not constitute the evidence of absence that Petitioners need to provide.

VI. PETITIONERS FAIL TO REHABILITATE THEIR EXPERT'S QUALIFICATIONS

Instead of addressing their expert's qualifications, Petitioners focus on Dr. Tsai's testimony regarding what the adequate level of experience for a POSA should be. (Reply at 1-3.) Petitioners miss the point; Dr. Tsai identified numerous reasons why Dr. Shanfield's lack of experience in designing or developing CMP pad conditioning renders him unqualified as a POSITA here and his opinions thus deficient. (*See* Ex. 1049, 85:11-87:24.) Indeed, under Dr. Shanfield's overinclusive definition, any engineers with general experience in semiconductor manufacturing—including Patent Owner's lead counsel who has used and operated numerous CMP equipment as part of his educational studied in semiconductor manufacturing and fabrication during the relevant time frame—would be equally qualified as a POSITA to opine on the structural characteristics of pad conditioners in the context of the '862 patent.

Petitioners' cherry-picked phrases referring to CMP in general, stripped from any context as to why they were cited in prosecution (Reply at 3), unwittingly makes Patent Owner's point. But while there is no dispute that CMP is ubiquitous in semiconductor manufacturing, the anodyne statements cited by Petitioners do not establish that generic semiconductor manufacturing experience offers any insight on CMP pad dresser design, development, or manufacturing. That is because it logically does not; mere experience using a multi-component CMP tool does not qualify someone as an expert in designing or developing a component within that multi-component CMP tool. (*See* Ex. 1049, 85:15-7:24.) Something more must be required. Accepting Petitioners' argument would otherwise require accepting that every man who shaves regularly is similarly qualified to design equipment for sharpening razor blades or even the blades themselves. This is particularly true where, as here, Petitioners' expert, Dr. Shanfield, is a "professional" expert who has served as an expert on a wide spectrum of technologies that have no bearing on CMP. His declaration (Ex. 1002) confirms this lack of qualification—never once did Dr. Shanfield opine that he designed or developed CMP pad conditioners. And when he does mention the use of CMP equipment, it is either that the laboratory where he worked acquired such systems without him declaring that he actually used such equipment (*id.* at ¶ 5) or that he "worked directly with engineers" who used such

equipment (again, without him declaring that he actually used such equipment personally) (*id.* at ¶ 3). Dr. Shanfield's CV is equally illuminating—never once does he identify *any* experience in the use of CMP equipment (*id.* at 88-90).

Combined with Dr. Shanfield's own admitted lack of experience with fabrication and measurement of CMP pad conditioners (POR at 3), Dr. Tsai's un rebutted testimony regarding the standard of knowledge and experience of a POSITA places Dr. Shanfield's declaration well outside of the realm of evidence which may assist the Board to understand the technical issues in dispute here. *See* Fed. R. Evid. 702. Accordingly, Dr. Shanfield's testimony should be rejected wholesale.

VII. PETITIONERS' UNWARRANTED ATTACKS ON DR. TSAI'S CREDIBILITY ARE IRRELEVANT TO THE ISSUES IN DISPUTE

In keeping with the strategy of attempting to distract from their ability to meet their burden of proof by attacking Patent Owner's expert, Petitioners dedicate a section of their Reply to Dr. Tsai's alleged lack of credibility. But this attack fails because nearly all of the purported flaws with Dr. Tsai's testimony relate to legal concepts that do not affect Dr. Tsai's opinions proffered as a technical expert.

For example, Dr. Tsai was appropriately circumspect about his lack of expertise with legal principles, consistent with his role as a technical expert . His statement that "I don't have *much* understanding about them," (Reply at 23 (quoting

Ex. 1047, 18:14-18) does not mean that he was uninformed, only that his understanding of those legal concepts was appropriately limited to what had been provided to him by counsel and as explicitly set forth in his declarations. (*See* Ex. 2011, § II.) Tellingly, Petitioners do not argue that any of the legal principles upon which Dr. Tsai relied were in fact incorrect as he explained them.

Petitioners' distortions of other aspects of Patent Owner's testimony are similarly flagrant. For example, his statement that he "generally" reviewed the claims of the '862 patent (Reply at 23-24) is unsurprising given that his declaration does not address every claim of the patent in detail.

Finally, Petitioners grossly misrepresent Dr. Tsai's relationship with Kinik and Dr. Sung. It is no scandal that Dr. Tsai, a well-respected professor focusing on CMP, collaborated with other scientists and engineers in the highly specialized field in which he works, or that he received financial and material support for his research from a company involved in developing pad conditioners.

On the contrary, Dr. Tsai only named Dr. Sung as a co-author on one or two articles as a typical Taiwanese cultural way of thanking Kinik for providing funding and equipment for his research. (Ex. 1047 at 60:13-23.) Dr. Tsai's testimony that he never worked with or for Dr. Sung and has had no professional relationship with

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Patent Owner further confirms the limited role that Patent Owner played in Dr. Tsai's research and publications.

VIII. CONCLUSION

In light of Petitioners' failure to introduce any rebuttal evidence that might overcome the opinions of Dr. Tsai or arguments in the POR, Patent Owner respectfully requests that the Board determine that all of the challenged claims of the '862 patent are valid.

Dated: April 16, 2025

Respectfully submitted,

/Alex Chan/

Alex Chan (Reg. No. 52,713)

Counsel for Patent Owner

Chien-Min Sung

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that there are 5598 words in this paper, excluding any table of contents, table of authorities, mandatory notices under 37 C.F.R. § 42.8, certificate of word count, certificate of service, or appendix of exhibits. This certification relies on the word count of the world-processing system used to prepare this paper.

Dated: April 16, 2025

/Alex Chan/
Alex Chan
Reg. No. 52,713
1526 Gilpin Avenue
Wilmington, DE 19806
Phone: (302) 449-9010
achan@devlinlawfirm.com

Attorney for Patent Owner

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), the undersigned certifies that on April 16, 2025, the foregoing document is being served via electronic mail upon the following counsel of record for Petitioners:

LEAD COUNSEL	BACKUP COUNSEL
Yung-Hoon Ha (Reg. No. 56,368) Desmarais LLP 230 Park Ave New York, NY 10169 Telephone: (212) 351-3400 Email: yha@desmaraisllp.com	Laura Avena (Reg. No. 78,920) Desmarais LLP 230 Park Ave New York, NY 10169 Telephone: (212) 351-3400 Email: lavena@desmaraisllp.com Taeg Sang Cho (Reg. No. 69,618) Desmarais LLP 230 Park Ave New York, NY 10169 Telephone: (212) 351-3400 Email: tcho@desmaraisllp.com

/Alex Chan/
Alex Chan
Reg. No. 52,713