

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,

Petitioners,

v.

CHIEN-MIN SUNG,

Patent Owner

IPR2024-00534
U.S. Patent No. 9,138,862

PATENT OWNER'S REQUEST FOR DIRECTOR'S REVIEW

TABLE OF CONTENTS

I.	INTRODUCTION.....	1
II.	APPLICABLE LEGAL STANDARDS	1
A.	Anticipation.....	1
B.	Obviousness	2
C.	The Final Written Decision is Limited to the Specific Arguments and Evidence Presented in the Petition Itself.....	2
D.	Director Review is Appropriate to Correct a Final Written Decision that Presents Abuses of Discretion, Erroneous Findings of Material Fact, or Erroneous Conclusions of Law ...	3
III.	THE PETITION AND THE FINAL WRITTEN DECISION.....	4
IV.	ARGUMENT	5
A.	The Board Abused Its Discretion by Basing the FWD on the False Premise That Petitioner’s Arguments for Limitation [1D] Were Unopposed and Unrebutted.....	5
B.	The Board Abused its Discretion by Supplementing the Disclosure of Sung ’026 in Order to Find Anticipation	8
C.	The Board Abused its Discretion by Combining Separate Embodiments of Sung ’026 in Order to find Anticipation.....	10
D.	The Board Abused Its Discretion by Applying Obviousness to Claim Limitations Where the Petition Only Argued Anticipation	12
V.	CONCLUSION	13

TABLE OF AUTHORITIES

	Page(s)
Cases	
<i>Arendi S.A.R.L. v. Apple Inc.</i> , 832 F.3d 1355 (Fed. Cir. 2016)	2
<i>Atofina v. Great Lakes Chemical Corp.</i> , 441 F.3d 991 (Fed. Cir. 2006)	2, 9
<i>CQV Co., Ltd. v. Merck Pat. GmbH</i> , 130 F.4th 1344 (Fed. Cir. 2025)	5
<i>Eurand, Inc. v. Mylan Pharms., Inc.</i> , 676 F.3d 1063 (Fed. Cir. 2012)	2
<i>In re Robertson</i> , 169 F.3d 743 (Fed. Cir. 1999)	2, 9
<i>Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.</i> , 821 F.3d 1359 (Fed. Cir. 2016)	3
<i>Net MoneyIN, Inc. v. VeriSign, Inc.</i> , 545 F.3d 1359 (Fed. Cir. 2008)	2, 6, 11, 13
<i>Sirona Dental Sys. GmbH v. Institut Straumann AG</i> , 892 F.3d 1349 (Fed. Cir. 2018)	3
<i>Wasica Fin. GmbH v. Cont'l Auto. Sys.</i> , 853 F.3d 1272 (Fed. Cir. 2017)	2
Statutes	
35 U.S.C. § 102	1
35 U.S.C. § 312(a)(3)	2
Regulations	
37 CFR § 42.71	1
37 CFR § 42.75	1

I. INTRODUCTION

Pursuant to 37 CFR §§ 42.75 and 42.71(d), Patent Owner Dr. Chien-Ming Sung (“PO”) submits this Request for Director Review of the Board’s final written decision (Paper 36, “FWD”) invalidating claims 1-20 of U.S. Patent No. 9,138,862 (“’862 patent”) as anticipated over Sung ’026 and obvious over Sung ’026 alone or in combination with the knowledge of a POSITA and/or other references. The Board’s unpatentability decision rests on erroneous findings of material fact and erroneous conclusions of law and is an abuse of discretion and violation of the APA at least because the Board based the FWD on arguments absent from the Petition, misapplied the legal standards for anticipation and obviousness, and for one limitation of the independent claim, simply overlooked PO’s arguments and erroneously adopted Petitioner’s arguments as not opposed. Consequently, the FWD should be reversed and claims 1-20 upheld as valid.

II. APPLICABLE LEGAL STANDARDS

A. Anticipation

For anticipation under 35 U.S.C. § 102, a reference must “disclose[] within the four corners of the document . . . all of the limitations claimed,” and that disclosure *must* be “arranged or combined in the same way as recited in the claim.” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008). “[A]mbiguous 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). Different

embodiments in a single reference may not be combined, nor may missing limitations—no matter how minor—be supplemented in proving anticipation. *See Net MoneyIN* at 1371. Anticipation via inherency cannot be satisfied by mere probabilities or possibilities, no matter how likely, and instead requires a showing that the allegedly anticipatory feature is *necessary* and inevitable. *See In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999); *Atofina v. Great Lakes Chemical Corp.*, 441 F.3d 991, 1000 (Fed. Cir. 2006).

B. Obviousness

“[W]hile ‘common sense’ can be invoked, even potentially to supply a limitation missing from the prior art, it must still be supported by evidence and a reasoned explanation.” *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1363 (Fed. Cir. 2016). Especially when “proffered in support of an ‘obvious-to-try’ theory,” evidence of obviousness “is insufficient unless it indicates that the possible options skilled artisans would have encountered were ‘finite,’ ‘small,’ or ‘easily traversed.’” *Eurand, Inc. v. Mylan Pharms., Inc.*, 676 F.3d 1063, 1072 (Fed. Cir. 2012).

C. The Final Written Decision is Limited to the Specific Arguments and Evidence Presented in the Petition Itself

“[T]he Petition must “identif[y] in writing *and with particularity* . . . the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge to each claim.”¹ 35 U.S.C. § 312(a)(3); *see*

¹ All emphases added unless otherwise indicated.

also Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd., 821 F.3d 1359, 1369 (Fed. Cir. 2016) (describing this requirement as “of the utmost importance”). Thus, the Board must assess what the Petition *actually presents*; it is *not* “free to adopt arguments on behalf of petitioners that could have been, but were not, raised by the petitioner.” See *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016). The Board cannot “deviate from the grounds in the petition and raise its own” theories of invalidity. *Sirona Dental Sys. GmbH v. Institut Straumann AG*, 892 F.3d 1349, 1356 (Fed. Cir. 2018).

D. Director Review is Appropriate to Correct a Final Written Decision that Presents Abuses of Discretion, Erroneous Findings of Material Fact, or Erroneous Conclusions of Law

“Requests for Director Review of a Board’s [FWDs] . . . shall be limited to decisions presenting (a) an abuse of discretion, (b) important issues of law or policy, (c) erroneous findings of material fact, or (d) erroneous conclusions of law.” USPTO, *Director Review Process*, § 2.B, available at <https://www.uspto.gov/patents/ptab/decisions/director-review-process> (last updated March 18, 2025). The Board’s FWD is an abuse of discretion if it “(1) is clearly unreasonable, arbitrary, or fanciful; (2) is based on an erroneous conclusion of law; (3) rests on clearly erroneous fact finding; or (4) involves a record that contains no evidence on which the Board could rationally base its decision.” *Intelligent Bio-Systems, Inc. v. Illumina Cambridge, Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016).

III. THE PETITION AND THE FINAL WRITTEN DECISION

The Petition primarily focused on independent claim 1 of the '862 patent, and the limitations in dispute are presented below as identified in the Petition:

1. A method of conditioning a CMP pad, comprising:
 - [1A] pressing a CMP pad dresser against a CMP pad,
 - [1B]² the dresser including a monolayer of a plurality of superabrasive particles protruding from a matrix layer,
 - [1C] wherein the difference in protrusion distance between the highest protruding tip and the second highest protruding tip of the monolayer of superabrasive particles is less than or equal to about 10 microns and the difference in protrusion distance between the highest 10 protruding tips of the monolayer of superabrasive particles are within about 20 microns or less; and
 - [1D] rotating the dresser against the CMP pad such that asperities are cut into the CMP pad having a maximum cutting depth of about 60 microns.

Importantly, Limitation [1D] does not simply claim a cutting depth, but rather *specifically requires* that the recited cutting depth that results is produced *by a particular dresser satisfying the structural characteristics recited in [1B] and [1C]*.

The Petition initially presented Ground 1 (“anticipation and/or obviousness”), which the Board split into Grounds 1A (Anticipation) and 1B (Obviousness) in the Institution Decision. (Paper 14 at 33.) The Petition only argued obviousness for Limitation [1C], and even there, only advanced a fallback obvious-to-try theory. (Paper 17 at 2, 39-41). The FWD seemingly acknowledges that Petitioner did “not

² PO does not dispute that Sung’026 discloses Limitation [1B].

explain the obviousness of [those] claim limitations,” in dispute, [1A] and [1D], which Petitioner argued “[we]re fully disclosed in a cited reference.” FWD at 49.

IV. ARGUMENT

A. The Board Abused Its Discretion by Basing the FWD on the False Premise That Petitioner’s Arguments for Limitation [1D] Were Unopposed and Unrebutted

In the FWD, after spending seven lines summarizing the Petition’s assertions that Sung ’026 allegedly disclosed limitation [1D], the Board concludes (without citation) that “Patent Owner’s [*sic.*] does not oppose these contentions.” (FWD at 50-51.) Based on nothing more, the Board concludes that Sung ’026 discloses [1D]. (*Id.* at 51.) It does not.

Not only is the Board wrong, but the it abused its discretion by simply ignoring the extensive record to the contrary in order to reach this clearly erroneous conclusion. This is clear legal error because “[t]he Board must consider the entirety of the record and provide a satisfactory explanation for its findings, with a rational connection between the facts and conclusion.” *CQV Co., Ltd. v. Merck Pat. GmbH*, 130 F.4th 1344, 1346 (Fed. Cir. 2025). That was absent here.

Specifically, the FWD concluded that “the disclosed cutting depth in Sung ’026 of about 10–20 microns meets the limitation stated in clause 1[D] that it is less than 60 microns.” (FWD at 51.) However, that is not what limitation [1D] states, as indicated by the very header preceding the Board’s unexplained and erroneous conclusion. (*See* FWD at 50.). Rather, what [1D] requires is that the resulting cutting

depth is produced *by a particular pad dresser that satisfies the structural characteristics recited in Limitations [1B] and [1C]*. That is nowhere in Sung '026.

To make matters worse, Sung '026 did not just describe one particular superabrasive tip arrangement, or even a handful of such arrangements, but instead identified a wide range of numerous independent parameters (and provided certain examples of each) for arrangements of superabrasive particle tips that could all be varied. (*See* Paper 17 at 20-23; Paper 25 at 13-15.) That is why Dr. Shanfield had to create his counterfactual mock-up image that selected one specific permutation of the various disclosed parameters at particular values that just happened to satisfy [1C]—because it was not found in Sung '026, as discussed in greater detail below. Nevertheless, the Board relied on that post hoc creation of Dr. Shanfield to support its view of what Sung '026 disclosed “within its four corners” “arranged or combined as recited in the claim.” (FWD at 44-47.)

Here, the record is clear that Patent Owner expressly disagreed with Petitioner’s contentions regarding the purported disclosure of limitation [1D] in Sung '026. (Paper 17 at 23-28; Paper 25 at 15.) Moreover, Patent Owner extensively pointed out how Sung '026 *did not* disclose “within its four corners” what was actually recited in [1D] (let alone claim 1 as a whole) “arranged or combined as recited.” *See Net MoneyIN*, 545 F.3d at 1371.

Specifically, Sung '026 provided no connection *at all* between the generic cutting depth that it described as achievable and the structural arrangement of the predetermined superabrasive particle tips that would be used; it described neither the cutting depth that would result from any particular arrangement (let alone one satisfying [1C]) of the particle tips, nor the structural arrangement of particle tips that was used (or could be used) to produce the achievable cutting depth generically described in Sung '026. (Paper 17 at 23-28; Paper 25 at 15.)

And if there were any doubt that [1D] remained in dispute, Patent Owner addressed it at the evidentiary hearing that Petitioners' arguments regarding limitation [1D] were specifically disputed. *See* Paper 35 (Hrg. Tr.) at 92:7-19, 93:10-19, 102:24-106:2.

All of that was ignored by the Board in the ten lines of the FWD addressing [1D]. (FWD at 50-51.) Instead, the Board simply (and erroneously) assumed that because Sung '026 *generically* disclosed a cutting depth that satisfied the range recited in [1D], Sung disclosed [1D] itself. But the Board ignored in its conclusion that, unlike what Claim 1 recited, Sung '026 disclosed *nothing* about the structure producing the cutting depth it disclosed, which is expressly part of the claim recitation but a part that the FWD failed to address. So any disclosure of cutting depth in Sung '026 is not "arranged or combined as recited" in either limitation [1D]

or claim 1 as a whole. That is both legal and factual error, and an abuse of discretion that ignores the record.

Thus, the Board’s conclusion that “Patent Owner’s [*sic.*] does not oppose these contentions” was incorrect, misreading both the claim limitation at issue and the record, and the Board abused its discretion by crediting Petitioners’ arguments as unopposed notwithstanding the extensive rebuttal to those flawed arguments that Patent Owner provided on the record.

B. The Board Abused its Discretion by Supplementing the Disclosure of Sung ’026 in Order to Find Anticipation

In the FWD, the Board concluded that “Sung ’026 discloses pressing a CMP pad dresser against a CMP pad.” This erroneous conclusion is an abuse of discretion that misreads Dr. Tsai’s testimony, ignores contrary testimony, and erroneously uses probabilities instead of the necessity required to satisfy anticipation—when inherency was never even argued in the Petition.

Importantly, there is no dispute that Sung ’026 does not expressly describe pressing the dresser against the pad within its four corners. (*See* Paper 25 at 3.) In reply, Petitioner pivoted, arguing instead that this limitation is satisfied because “a POSITA would have reasonably understood Sung ’026 to teach.” But that is not anticipation; rather, it is a belated obviousness argument “in view of” Sung ’026, or at best, a legally insufficient attempt to argue inherency without meeting its stringent requirements. The FWD’s adoption of an anticipation argument that was not made

in the Petition (*see* Paper 17 at 16, 19; Paper 25 at 2-5 & n.1) is itself an abuse of discretion by the Board and contrary to law.

Even if the Board were correct (and it is not) that pressing the dresser against the pad were the “only ***known and commonly used procedure*** . . . for using a CMP pad dresser for conditioning a CMP pad” (FWD at 42-43), that still would not satisfy what is needed for anticipation. Rather, what anticipation requires is that based on what is disclosed “within the four corners” of Sung ’026, pressing the pad against the dresser is “necessary, and inevitable, not simply possible or probable.” *Atofina v. Great Lakes Chem. Corp.*, 441 F.3d 991, 1000 (Fed. Cir. 2006); *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). Thus, no matter how well-known or commonly-used it was to condition a CMP pad by pressing a dresser against the pad, Sung ’026 cannot anticipate unless it were ***the only possible way*** of performing that conditioning, such that it ***necessarily*** could not occur otherwise.

But here, as even the FWD concedes, “[t]here are several ways to do it.” (FWD at 42.) That renders Board’s conclusion clear legal error. And even the cherry-picked portions of Dr. Tsai’s testimony identifies two such ways. (*Id.*) And the record is replete with additional evidence (which the Board ignored) that there are multiple other ways to use a pad dresser to condition a CMP pad with the two retained in contact. To be sure, the dresser can certainly be pressed against the pad, and this is indeed the most common and frequent way that the conditioning occurs.

But it is not necessary or inevitable, because that contact *can* be maintained (such that conditioning can occur) *without* pressing the dresser against the pad at all, i.e., by pressing the pad against the dresser or by allowing the weight of the dresser to hold it in contact with the pad. (Paper 17 at 16-19; Paper 25 at 7-10; FWD at 42.)

C. The Board Abused its Discretion by Combining Separate Embodiments of Sung '026 in Order to find Anticipation

On Limitation [1C], the FWD relies extensively on a counterfactual diagram created by Dr. Shanfield purporting to illustrate “the disclosure” of Sung '026 regarding the structural arrangement of superabrasive particle tips that cherry-picks specific values of particular parameters in just the right permutation that happens to meet the requirements of Limitation [1C]. (FWD at 44-49.) Of course, this diagram was created by Petitioners’ expert because it is not found within the four corners of the reference. At most, it illustrates what a POSITA could have or would have been able to make *in view of* Sung '026’s overall disclosure, with careful selection of particular parameters with specific values. But that is not sufficient for anticipation.

Compounding the error, the FWD relies Dr. Tsai’s testimony regarding what Sung '026 “intends” or “is trying,” before erroneously concluding that Dr. Tsai agrees that “Sung '026 discloses all of the aspects recited in claim 1 together in a single embodiment.” (FWD at 48-49). The Board is incorrect on the law of anticipation and ignores record evidence and argument that explains how these

embodiments involve separate parameters that are never disclosed “within the four corners” of Sung ’026 “arranged or combined as recited.”

Initially, the Board’s reliance on statements of “intent” or characterizations of what Sung ’026 was “trying” to do from outside “the four corners” of the reference are legally insufficient to satisfy what the reference discloses within its four corners “arranged or combined as recited.” This bootstrapping of obviousness arguments to satisfy the stringent anticipation standard is legal error—it is, at best, a motivation-to-combine argument, or what a POSITA would understand “in view of” Sung ’026; it cannot establish the content of what Sung ’026 actually discloses within its four corners, let alone constitute a description of the particular structural arrangement “arranged or combined as recited” in Limitation [1C].

Instead, the Board simply adopted, without explanation or legal citation, Petitioner’s attorney argument that these disparate embodiments of numerous different aspects in which the arrangement of superabrasive particle tips could be varied constituted some “unified whole” that made *Net MoneyIN* inapplicable. (FWD at 48.) Even if that conclusion were not legally erroneous—and it is—this still elides how the particular numerical values of each of those embodiments were disclosed precisely as recited.

Not only was the FWD incorrect that “Dr. Tsai’s deposition testimony essentially agreed” that Sung ’026 disclosed, what was “arranged or combined as

recited” in Limitation [1C], the Board ignored substantial evidence from Patent Owner and Dr. Tsai that these are separate embodiments that cannot support an anticipation argument. (Paper 17 at 20-23; Paper 15 at 13-15.)

In addition, as discussed extensively above in Section IV.A, the Board improperly found that Limitation [1D] was disclosed in Sung ’026 by ignoring the claim recitation requiring that the recited cutting depth be performed by a pad dresser satisfying the prior Limitations [1B] and [1D]. Thus, the improper embodiment combination for Limitation [1C] is only compounded by combining it with the resulting cutting depth recited in [1D] when Sung ’026 never discloses the [1C] structure within its four corners “arranged or combined as recited” *nor describes any cutting depth produced by any particular arrangement of particle tips*.

D. The Board Abused Its Discretion by Applying Obviousness to Claim Limitations Where the Petition Only Argued Anticipation

The Petition failed to raise *any obviousness argument* for Claim Limitations [1A] and [1D] (Pet. at 26-29, 36-27); the obviousness argument only addressed Claim Limitation [1C], and even there, simply argued that it would have been “obvious to try” to level the tips as recited. Pet. at 34; *see also id.* at 35-36. The FWD seemingly acknowledges that Petitioner did “not explain the obviousness of [those] claim limitations,” which Petitioner argued “[we]re fully disclosed in a cited reference.” FWD at 49. But as shown above, these limitations were *not* disclosed

“within the four corners” of Sung ’026 “arranged or combined as recited”—which is what is required for an allegedly anticipatory reference.

And as shown above, the Board abused its discretion in finding unpatentability on Ground 1A (Anticipation) because “all of the limitations” in claim 1 of the ’862 patent are *not* disclosed “within the four corners” of Sung ’026 “arranged or combined in the same way as recited,” as the FWD conceded at several points. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008). This applies to each of Limitations [1A], [1C], and [1D]. Because the Petition itself did not argue that there were any gaps to be filled in the disclosures of Sung ’026 to satisfy [1A] and [1D], the FWD’s obviousness conclusion is an abuse of discretion based on the same deficiencies in its anticipation finding.

V. CONCLUSION

In sum, the Board abused its discretion and violated the APA by: (A) misreading Limitation [1D] and treating its purported disclosure as unopposed while ignoring Patent Owner’s extensive arguments to the contrary; (B) adopting an inherency argument that was never advanced and finding that Limitation [1A] was disclosed within the four corners of Sung ’026 because a POSITA would have recognized a “commonly used procedure” that was not necessarily or inevitably required; (C) improperly combining distinct embodiments (and at particular numerical values for each) to support anticipation when Sung ’026 does not disclose

them “arranged or combined as recited” within its four corners; and (D) finding obviousness notwithstanding the numerous deficiencies of the disclosure of Sung ’026, at least as to Limitations [1A] and [1D].

For these reasons, the FWD should be reversed and all challenged claims (1-20) upheld as valid.

Dated: October 17, 2025

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CERTIFICATE OF SERVICE

The undersigned certifies that on October 17, 2025, pursuant to 37 C.F.R. § 42.6(e), a copy of **PATENT OWNER'S REQUEST FOR DIRECTOR'S REVIEW** was served via email (as consented to by counsel) to counsel of record for Petitioner as follows:

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