

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SOLUS ADVANCED MATERIALS CO., LTD.,
Petitioner,

v.

SK NEXILIS CO., LTD.,
Patent Owner.

Case IPR2024-01461
Patent 10,811,689

PETITIONER'S REQUEST FOR REHEARING

I. INTRODUCTION

Petitioner respectfully requests rehearing pursuant to 37 C.F.R. § 42.71(d) for claims 1-10 of U.S. Patent No. 10,811,689 (the “’689 Patent”). In its Decision on Institution (“DI” or “Decision”), the Board misapprehended or overlooked: (1) Khatibi’s disclosure, as well as Petitioner’s evidence and explanation thereof, as it relates to limitation [1d]; (2) the teachings of Shinozaki, along with Petitioner’s evidence and explanation thereof, as they relate to limitation [1e]; and (3) Petitioner’s evidence regarding Griesi and its R_{pc} value as they relate to limitation [1g].

First, for Grounds 1 and 2, the Decision concluded with respect to limitation [1d] that “the CTE measurement method” was missing from the prior art. DI, 18, 22-23. That is, while acknowledging that Khatibi disclosed a coefficient of thermal expansion (CTE)—an exceedingly well-known and common measurement—overlapping with the claimed CTE range of 16 to 22 $\mu\text{m}/(\text{m}\cdot^{\circ}\text{C})$, the Decision found it fatally deficient that Khatibi did not use the same CTE measuring equipment and specific measurement settings mentioned in the claim. *Id.* In doing so, the Decision overlooked the four pages of detailed analysis provided by Dr. Randall—an industry veteran with over 40 years of relevant experience—who thoroughly explained and provided support for why the measurement details of [1d] do not warrant patentable weight. *See* SOLUS-1003, ¶¶57-60. Indeed, when the examiner during prosecution

of the '689 Patent similarly pointed out the lack of patentable weight attributable to such measurement details, applicant simply acquiesced and proceeded to add the peak count limitation. *See* SOLUS-1002, 67-68; *see also* Petition, 3. The Decision's narrow focus on "the CTE measurement method" misapprehends/overlooks the full disclosure of Khatibi and the proper scope of limitation [1d], as well as Dr. Randall's careful analysis regarding the same, which is the only evidence of record on this point.

Second, for Ground 1, the Decision similarly acknowledged that the claimed tensile strength—another well-known and common measurement—was disclosed in the prior art (*i.e.*, Shinozaki), but this time found it fatally deficient that Shinozaki did not mention measuring its tensile strength after "heat treatment at 190° C for 1 hour" as mentioned in the claim. DI, 20. Here, the Decision again overlooked Dr. Randall's analysis on this point, in particular his explanation and support for why these measurement details are insignificant and should not be given patentable weight. *See* SOLUS-1003, ¶¶61-62. The Decision further overlooked Dr. Randall's explanation that the "15 hours"¹ of heat treatment disclosed in Khatibi, albeit at a slightly lower temperature of 150° C, would have yielded substantially the same

¹ Because limitation [1d] recites measuring the tensile strength "after" heat treatment for 1 hour, heat treatment for 15 hours satisfies this requirement.

tensile strength measurement even if conducted at a higher temperature as in Sano. *See* SOLUS-1003, ¶61 (citing SOLUS-1008).

Third, for Ground 2 based on Kim-Khatibi-Griesi, the Decision acknowledged that Griesi discloses the claimed Pc (or Rpc) value but wrongly concluded that “Petitioner does not persuasively explain why such an incidental, unexamined finding would lead one of ordinary skill in the art to import Griesi’s Pc value into Kim’s copper foil, *absent a hindsight desire* to reconstruct the claimed invention.” DI, 24. This misapprehends Petition’s argument, which explained why a POSITA could and would have incorporated Griesi’s Rpc teachings into Kim, based not on hindsight but rather independent teachings of third party reference disclosures that further corroborate the expert testimony from Dr. Randall. *See* Petition, 58-61. For example, Dr. Randall explained—based on references such as Gadelmawla—that Pc “was a generally known spacing parameter that could be controlled to obtain better bonding of finishes and a more uniform finish of the electrolytic copper foil surface.” SOLUS-1003, ¶160 (citing SOLUS-1016, 7 (“By controlling spacing parameters [e.g., Pc] it is possible to obtain better bounding of finishes, more uniform finish of plating.”)); *see* SOLUS-1003, ¶106 (citing SOLUS-1016, 7; SOLUS-1005, Abstract, 8, 11, FIGS. 8, 11; SOLUS-1004, [0073]). The Petition’s reliance on Dr. Randall’s testimony and related corroborating evidence to support the combination is thus entirely proper, as that testimony “takes into account

only knowledge which was within the level of ordinary skill in the art at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure.” *In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971). That is, obviousness arguments that take into account the knowledge of a POSITA are necessarily based on “hindsight reasoning,” but such “hindsight reasoning” is not impermissible. *Id.*

II. LEGAL STANDARD

“A party dissatisfied with a decision may file a single request for rehearing without prior authorization from the Board” and “must specifically identify all matters the party believes the Board misapprehended or overlooked, and the place where each matter was previously addressed in a motion, an opposition, or a reply.” 37 C.F.R. § 42.71(d). When reconsidering a decision on institution, the Board reviews the decision for an abuse of discretion. 37 C.F.R. § 42.71(c). “An abuse of discretion occurs if the decision (1) is clearly unreasonable, arbitrary, or fanciful; (2) is based on an erroneous conclusion of law; (3) rests on clearly erroneous fact findings; or (4) involves a record that contains no evidence on which the Board could rationally base its decision.” *Redline Detection, LLC v. Star Envirotech, Inc.*, 811 F.3d 435, 442 (Fed. Cir. 2015).

III. ARGUMENT

A. The Decision Misapprehended or Overlooked Petitioner's Arguments Regarding Khatibi and Its CTE

The Decision overlooked evidence and well-established precedent of claim interpretation in concluding that Petition's treatment of limitation [1d] in Grounds 1 and 2 was deficient because, although Khatibi discloses the claimed CTE measurements, it did not use the same CTE measuring equipment and specific measurement settings of Claim 1 in doing so. *See* DI, 18, 22-23. But as noted above, Dr. Randall explained and provided support for why such measurement details should not be given patentable weight, especially in view of Khatibi's comprehensive disclosure regarding CTE. *See* SOLUS-1003, ¶¶57-60. For instance, Dr. Randall noted that there is simply "nothing special or inventive about the claimed range of CTE" and the mentioned measurement equipment/settings, in particular explaining that "Khatibi's measurements" of CTE should actually be even "more precise with minimal error" compared to what is mentioned in Claim 1. *Id.* Thus, Dr. Randall's analysis is grounded in both the teachings of Khatibi and the knowledge of a POSITA. Moreover, the fact that Khatibi's electrodeposited copper foil has substantially the same range of CTE—again, an exceedingly well-known and common measurement value—as recited in the claims should be enough to establish a prima facie case of obviousness. *See In re Best*, 562 F.2d 1252, 1255 (CCPA 1977) (holding that, where a prior art composition is identical or

substantially identical in structure or composition to a claimed one, a prima facie case of either anticipation or obviousness has been established with respect to claims directed to the properties of the claimed composition).

B. The Decision Misapprehended or Overlooked Petitioner's Arguments Regarding Shinozaki and Its Tensile Strength

The Decision also misapprehended or overlooked Petitioner's arguments in concluding that Shinozaki (Ground 1) did not disclose limitation [1e] because the "heat treatment at 190° C for 1 hour" limitation was allegedly missing from the prior art. DI, 20. In doing so, the Board appears to have overlooked evidence provided in the Petition that ties the 15-hour heat treatment of Shinozaki to the high temperature heat treatment of Sano. *See* Petition, 18-19; SOLUS-1003, ¶61; SOLUS-1008, Table 2. Indeed, as Dr. Randall explained, changes in heat treatment conditions "had insignificant effect on changes on tensile strength." *Id.* Accordingly, the Decision improperly overlooked Petitioner's proffered evidence and background references, which evidence a desire to provide a copper foil exhibiting the claimed range of tensile strength, measured after a long and high-temperature heat treatment.

Moreover, as Dr. Randall explained, such measurement details should not be given patentable weight, especially in view of Shinozaki's comprehensive disclosure regarding tensile strength and other prior art's confirmation that minor measurement

details (such as high temperature heat treatment) do not lead to appreciable differences. SOLUS-1003, ¶61. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of obviousness is established. *See In re Best*, 1255.

C. The Decision Misapprehended or Overlooked Petitioner’s Evidence Regarding Griesi and Its Pc Value

Despite acknowledging that Griesi discloses the Pc (or Rpc) value as claimed, the Decision concluded that “Petitioner does not persuasively explain why such an incidental, unexamined finding would lead one of ordinary skill in the art to import Griesi’s Pc value into Kim’s copper foil, *absent a hindsight desire* to reconstruct the claimed invention.” DI, 24.

As explained in the Petition, a POSITA would have recognized that a roughness-related parameter not explicitly mentioned in Kim—namely Pc (or Rpc) as per Griesi—was “a potentially useful parameter that can be optimized to further enhance uniformity or generally improve Kim’s copper foil surface.” Petition, 59; SOLUS-1003, ¶159. This is because Pc “was a generally known spacing parameter that could be controlled to obtain better ‘bonding finishes and a more uniform finish of the electrolytic copper foil surface.” Petition, 59; SOLUS-1016, 7; SOLUS-1003, ¶160. And as explained in the Petition, a POSITA in possession of Kim would have

been motivated to, considering Griesi's disclosure of Pc values and further in view references like Gadelmawla that recognize controlling parameters like Pc to obtain more uniform surface finishes that can lead to improved surface adhesion, optimize Kim's foil to arrive at the claimed Pc range. *See* Petition, 59-60; SOLUS-1003, ¶¶162-163.

Here, the Petition's reliance on Dr. Randall's testimony and related corroborating evidence to support the combination does not amount to impermissible hindsight, as that testimony "takes into account only knowledge which was within the level of ordinary skill in the art at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure." *In re McLaughlin*, 1395.

Indeed, none of the theories offered for the combinability of Kim and Griesi rely on information gleaned from the '689 Patent. Instead, the proposed combination is supported by independent teachings of third party references such as Gadelmawla (SOLUS-1016) and Fabian (SOLUS-1005) that further corroborate Dr. Randall's expert testimony, which demonstrates the obviousness of the challenged claims with reference to the specific teachings of the applied prior art references, as they would have been understood by a POSITA at the time of the claimed invention. *See, e.g.*, SOLUS-1003, ¶¶104-106, 157-164. The Petition's reliance on Dr. Randall's testimony and related corroborating evidence is entirely proper, as that testimony

“takes into account only knowledge which was within the level of ordinary skill in the art at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure.” *In re McLaughlin*, 1395.

IV. UPDATED STIPULATION

To the extent the Board is concerned that this IPR will not be a true alternative to the district court case, for instance because invalidity assertions based on combinations of art with “unpublished systems prior art” may not necessarily outweigh other *Fintiv* factors that favor discretionary denial, Petitioner provides an expanded stipulation to address such concerns. *Motorola Solutions, Inc. v. Stellar, LLC*, IPR2024-01205, Paper 19 at 3-4 (PTAB March 28, 2025) (“*Motorola*”). Specifically, in addition to the *Sotera* stipulation of March 3, 2025 (SOLUS-1044), it is hereby further stipulated that, should the Board grant this Petition, Petitioner will not pursue in district court litigation any invalidity assertions based on combinations of prior art patents or printed publications with “unpublished system prior art.” *Motorola*, 3-4. Thus, this updated stipulation moots not only “combinations of the prior art asserted in these proceedings with unpublished system prior art” referenced in the *Motorola* Director Review decision but also combinations of *any* prior art patents or printed publications with such system art. *Id.*, 4.

V. CONCLUSION

For the foregoing reasons, and those discussed in the Petition, Petitioner respectfully requests the Board reconsider its Decision and institute *inter partes* review of the challenged claims of the '689 Patent.

Dated: May 23, 2025

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR § 42.6(e), the undersigned certifies that on May 23, 2025, a complete and entire copy of this Petitioner's Request for Rehearing by the Director was provided by email, to the Patent Owner, by serving the correspondence address of record as follows:

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