

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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**JIANGSU FAVORED NANOTECHNOLOGY CO., LTD.,**

**Petitioner**

**v.**

**P2I LTD.,**

**Patent Owner**

**Case No. IPR2024-00380  
U.S. Patent No. 11,041,087**

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**PATENT OWNER'S SUR-REPLY**

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Patent Trial and Appeal Board  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

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### UPDATED LIST OF EXHIBITS

| EXHIBIT NO. | TITLE                                                                                                                                                                                                                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2007        | Declaration of Jay J. Senkevich, Ph.D.                                                                                                                                                                                                                                                                     |
| 2008        | <i>Curriculum vitae</i> of Jay J. Senkevich, Ph.D.                                                                                                                                                                                                                                                         |
| 2009        | Mozetic, A. Vesel, G. Primc and R. Zaplotnik, “Chapter 2 - Introduction to Plasma and Plasma Diagnostics” <i>Non-Thermal Plasma Technology for Polymeric Materials</i> (2019)                                                                                                                              |
| 2010        | Y. Yin, M.M.M. Bilek and D.R. McKenzie, "The Origins of self-bias on dielectric substrates in RF plasma processing" <i>Surface and Coatings Technology</i> (2006)                                                                                                                                          |
| 2011        | J. Kadir Khanov, C.-L. Yang, Z.-X. Chang, R.-M. Zhu, C.-Y. Pan, Y.-Z. You, W.-J. Zhang and C.-Y. Hong, “In situ cross-linking polymerization-induced self-assembly not only generates cross-linked structures but also promotes morphology transition by the cross-linker” <i>Polymer Chemistry</i> (2021) |
| 2012        | F. Loyer, S. Bulou, P. Choquet and N.D. Boscher, “Pulsed plasma initiated chemical vapor deposition (PiCVD) of polymer layers – A kinetic model for the description of gas phase to surface interactions in pulsed plasma discharges” <i>Plasma Processes and Polymers</i> (2018)                          |
| 2013        | B. Tonpheng, J. Yua and O. Andersson, “Effects of cross-links, pressure and temperature on the thermal properties and glass transition behaviour of polybutadiene” <i>Physical Chemistry Chemical Physics</i> (2011)                                                                                       |
| 2014        | T. Takeichi, N. Furukawa, “5.25 - Epoxy Resins and Phenol-Formaldehyde Resins” <i>Polymer Science: A Comprehensive Reference</i> , Volume 5 (2012)                                                                                                                                                         |
| 2015        | Supplemental Declaration of Jay J. Senkevich, Ph.D.                                                                                                                                                                                                                                                        |
| 2016        | Transcript of Jan. 15, 2025 Deposition of Karen Gleason, Ph.D.                                                                                                                                                                                                                                             |
| 2017        | U.S. News 2024 “Best Chemical Engineering Programs”                                                                                                                                                                                                                                                        |
| 2018        | IEEE Xplore Author Profile for Scott J. Limb                                                                                                                                                                                                                                                               |

## **I. INTRODUCTION**

Petitioner's Reply (Paper 14) fails to rebut Patent Owner's showing that the relevant POSITA would *not* have been motivated to (or capable of) combining the cited references in the manner proposed in the Petition.

In its Response (Paper 12), Patent Owner explained how Petitioner had grossly overestimated the knowledge and abilities of the relevant POSITA (who, the parties agree, would hold only a bachelor's degree and two years of relevant experience).

Now, Petitioner cites anecdotal evidence of the purported abilities of a handful of graduate students from the top-ranked chemical engineering graduate program at one of the world's leading research institutions (MIT). As explained below, the *extraordinary* capabilities of these *exceptional* students is not (and cannot be) evidence of the abilities of the relevant person of *ordinary* skill.

For these reasons, and others discussed below, the Board should issue a final written decision rejecting all grounds of challenge and confirming that the Challenged Claims are not unpatentable.

## **II. PETITIONER IMPROPERLY ELEVATES THE KNOWLEDGE ATTRIBUTED TO THE RELEVANT POSITA**

For purposes of this proceeding, Petitioner and Patent Owner agree that the relevant person of ordinary skill in the art ("POSITA" or "POSA") would have had at least a bachelor's degree in a field such as chemistry, physics, or chemical

engineering, and two years of experience with plasma-polymerization techniques. Pet. at 20; Pat. Owner's Resp. (Paper 12) at 13.

In its Reply, Petitioner attempts to inflate the qualifications and understanding of the relevant POSITA, hoping to create the illusion that the claims of the '087 Patent would be obvious *that* "POSITA." This approach improperly reduces Petitioner's burden of proof by shifting the perspective from the actual (ordinary) POSITA to one with extraordinary, exceptional knowledge and abilities. By misrepresenting the level of skill required to evaluate the challenged claims' obviousness, Petitioner undermines the proper legal standard for obviousness. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 420 (2007) ("The question is not whether the combination was obvious to the patentee but whether the combination was obvious *to a person with ordinary skill in the art.*") (emphasis added).

Dr. Gleason asserts that the relevant POSITA would be "more than capable of modifying reaction parameters and analyzing properties of a resulting coating." Ex. 1059 ¶ 13; Petitioner's Reply ("Reply") at 16. Attempting to support this assertion, Dr. Gleason references several first-year graduate students, most notably Scott J. Limb, who she states had "no prior experience with plasma polymerization techniques." Ex. 1059 ¶ 13.

Specifically, Dr. Gleason claims that Mr. Limb "[i]n his first year as graduate student, designed and constructed a reactor for pulsed plasma polymers" and

“reported the selection of a monomer from the literature, optimization of deposition conditions, including pulse cycle timing, and the analysis of the coatings his first journal publication.” Ex. 1059 ¶ 13.

Though Mr. Limb’s research (on the topic of pulsed plasma-enhanced chemical vapor deposition) was published in 1998, he earned his bachelor’s degree in 1991 (and presumably began his graduate studies shortly thereafter). Ex. 2015 ¶¶ 8-9; Ex. 2018. Dr. Gleason claims that the lengthy gap (seven years) between the start of Mr. Limb’s research and the subsequent publication was due to “the pulsed plasma work [being]... put aside by Scott” due to work on another project (which modified the reactor to not use plasma). Ex. 2016 at 38.

It is highly improbable that Mr. Limb completely disregarded his work on plasma polymerization between the start of his research (in or about 1991-1992) and the publication of his research (in 1998). Ex. 2015 ¶¶ 8-9. If anything, Mr. Limb likely gained experience and knowledge concerning plasma polymerization during this multi-year gap (between the creation of the reactor and the release of his publication). *Id.* As such, the plasma polymerization research Mr. Limb published in 1998 was informed by far more than two years of experience with plasmas. Mr. Limb’s research, therefore, cannot be representative of the capabilities of the operative POSITA. *Id.*

Dr. Gleason also references four other graduate students whom she claims

“select[ed] monomers” and “optimiz[ed] pulsed plasma polymer deposition and coating characterization in their first year as graduate students” without prior knowledge of plasmas. Ex. 1059 ¶ 13. Yet Dr. Gleason offers no evidence (e.g., transcripts, resumes, or coursework) showing that the referenced students lacked prior experience with plasmas. Ex. 2015 ¶¶ 12-13. Instead, Dr. Gleason merely states that she doesn’t recall “being excited that [Mr. Limb] had plasma experience, [... and she] would have been thrilled to find somebody who had plasma experience.” Ex. 2016 at 34. However, these graduate students would not be able to complete such complex, original projects such as “selecting monomers, optimiz[ing variables] of pulsed plasma polymer deposition and [obtaining optimized] coating characterization in their first year as graduate students” (Ex. 1059 ¶ 13) without prior knowledge of plasmas, even if these projects were completed under the advisory of a professor. Ex. 2015 ¶ 13. Notably, it is uncommon for first or second year graduate students (even at MIT) to be able to undertake original research, or independently publish or patent their work. *Id.* Such achievements usually do not come until later in a student’s academic career. *Id.*

Further, Dr. Gleason spent her entire academic career at MIT. Ex. 1059 ¶ 13. Her perspective appears limited to overseeing students at one of the “top ten graduate programs” in the nation. Ex. 2016 at 18. Anecdotal evidence of the abilities of these exceptional graduate students is not indicative or reflective of the capabilities of the

relevant POSITA. Ex. 2015 ¶¶ 14-16. MIT is one of the most well-known and highly regarded universities in the world, with MIT's Chemical Engineering graduate programs being ranked as the #1 Best Chemical Engineering Program (out of over 130 universities) by U.S. News & World Report. Ex. 2015 ¶¶ 14-16; Ex. 2016 at 13; Ex. 2017. The graduate students listed by Dr. Gleason also include students with undergraduate degrees from similarly well-regarded schools such as Stanford and Cornell. Ex. 2015 ¶¶ 14-16; Ex. 2016 at 30-31.

As such, the purported knowledge and abilities of the MIT chemical engineering graduate students identified by Dr. Gleason, cannot be reasonably understood as reflective of the relevant POSITA. These *exceptional* students are not proper examples of people with *ordinary* skill in the art. Ex. 2015 ¶¶ 14-16. *See Corning Optical Commc'ns LLC v. Dali Wireless, Inc.*, No. IPR2021-00762, 2022 WL 6789483, at \*9 (P.T.A.B. Oct. 11, 2022) (“...a person of ordinary skill is not a person of extraordinary skill.”); *10x Genomics, Inc. v. Bio-Rad Lab'ys, Inc.*, No. IPR2020-00087, 2021 WL 1618028, at \*4 (P.T.A.B. Apr. 26, 2021) (“...the legal standard for obviousness... is to be determined from the viewpoint of a person of ordinary, not extraordinary, skill.... [S]ection 103 is not concerned with the actual skill of the inventors—whose skill may be extraordinary—but rather with the level of ordinary skill in the art.”) (citing *Stewart-Warner Corp. v. City of Pontiac, Mich.*, 767 F.2d 1563, 1570 (Fed. Cir. 1985)).

Finally, it is notable that Dr. Gleason can only cite a handful of exceptional graduate students (at least some of which, like Mr. Limb, appear to have held *more than* two years of experience with plasmas) as examples of individuals who (supposedly) were able to select monomers, optimize parameters, and create a coating with specific characteristics utilizing plasma polymerization. *Id.* The fact that Petitioner must resort to highlighting the capabilities of these extraordinary students (in lieu of those with *ordinary* abilities) reinforces that the relevant POSITA in 2015 would *not* have been able to arrive at the claimed coating of the '087 Patent.

### **III. COHEN AND FRANCESCH ARE NONANALOGOUS ART**

#### **A. The Specification Supports Restricting the Field of Endeavor to Electronic and Electrical Devices and Components Thereof**

Petitioner observes that the patent's "full disclosure" must inform its field of endeavor (citing *In re Bigio*, 381 F.3d 1320, 1323, 1326 (Fed. Cir. 2004)), but then attempts to broaden the '087 Patent field of endeavor by improperly cherry-picking from its "Field of Invention" section.

Petitioner also argues that the '087 Patent's "Field of the Invention" does not specify that the components being coated must be "electronic or electrical." Reply at 4. Yet Petitioner overlooks that the '087 Patent's field of invention specifically states that it relates to "protective coatings for electronic or electrical devices and components *thereof*." Ex. 1001, 1:15-16. "Thereof," as used in the '087 Patent, refers to components *of* the electronic or electrical devices. Petitioner's misleading attempt

to ignore the term “thereof” in order to advance an incorrect understanding of the Field of Invention and the Statement of Invention (which also states “components thereof”) results in an incorrect understanding the Field of Endeavor and thus the non-analogous nature of Cohen and Francesch.

Moreover, dependent claims 11-14 further reflect that the field of endeavor of the '087 Patent is restricted to electronic and electrical devices. These dependent claims recite specific types of electronic devices on which the claimed plasma polymerized coatings are deposited, including sound and audio equipment (claim 12), personal audio equipment (claim 13), or computers or components thereof (claim 14). Ex. 1001, 20:61-21:13. The specification also discloses additional electrical or electronic devices, without mentioning examples of any other substrates. Ex. 1001, 14:38-57.

#### **B. The Preamble of Claim 1 is Limiting**

Moreover, claim 1's preamble recites “[a]n electronic or electrical device or electronic or electrical component thereof comprising a protective crosslinked polymeric coating on a surface of the device or component[.]”

Petitioner notes that “[i]n general, a preamble limits the invention if it recites essential structure or steps, or if it is ‘necessary to give life, meaning, and vitality’ to the claim.” *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (citation omitted); Reply at 23. But “a claim preamble has the import

that the claim as a whole suggests for it” so “[w]here a patentee uses the claim preamble to recite structural limitations of his claimed invention, the PTO and courts give effect to that usage.” *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997) (internal citation omitted).

The preamble of claim 1 of the '087 Patent recites essential structural limitations. It is thus necessary to give “life, meaning, and vitality” to the claim. As noted, the “electronic or electrical device or electronic or electrical component thereof” is a substrate limitation to claim 1. Petitioner appears to concede as much, noting that “the '087 patent explains that the inventors sought polymers that could protect electronic devices and would remain stable and in place once applied,” (Reply at 6) showing that the parameters, monomers, and crosslinkers chosen by the inventors of the '087 Patent had to be optimized to apply the plasma deposited coatings to the electronic devices or components thereof. Ex. 2007 ¶¶ 39, 71.

Further, Petitioner improperly compares the “electronic or electrical” adjectives in claim 1’s preamble to the qualifier “handheld” in *Sharkninja v. Dyson*. Reply at 24. Petitioner’s attempted analogy fails because, as discussed above, the adjectives “electronic or electrical” in claim 1 describe a specific type of substrate for which the plasma polymerized coating is deposited, which affects the numerous parameters, the monomer, and the crosslinker used when carrying out claim 1 of the '087 Patent, due to the structure and characteristics of the electronic or electrical

device or component thereof, such as the type of material and texture on the surface, the size, and the optimal characteristics of the plasma-deposited polymer coating.

This structural limitation thus confirms that claim 1's preamble is limiting.

**C. The Specification Supports Restricting the Field of Endeavor to Plasma Polymerized Coatings**

As noted, Petitioner argues that the '087 Patent's specification does not restrict the field of endeavor to plasma polymerized coatings by improperly cherry-picking portions of the field of invention, and parts of the specification, to support this argument. Reply at 4.

In fact, Examples 1-5, Figures 1-6, and claim 1 of the '087 Patent, all support restricting the field of endeavor to plasma polymerized coatings. Ex. 1001, FIGs. 1-6, 15:17-40, 15:45-18:22, 18:30-35. Notably, the specification lists numerous parameters affecting *only* plasma polymerization and is silent as to any other polymer deposition methods. Ex. 1001, 13:18-14:15. The mere fact that the '087 Patent is written using permissive language does not mean the field of endeavor as described in the specification is no longer relevant or necessary to the invention. Stated differently, the fact that the '087 Patent's disclosure is not limited *solely* to "new or improved plasma polymerization techniques" (Ex. 1059 ¶ 9) does not detract from plasma polymerization being the focus of the patent.

As Petitioner concedes (Reply at 2), the field of endeavor is "not limited to

the specific point of novelty [....]” *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1001 (Fed. Cir. 2016). Thus, the field of endeavor is still restricted to plasma polymerized coatings as plasma polymerization (and its various parameters) is necessary to achieve the optimized characteristics for deposition onto electrical or electronic devices or components thereof as recited in the claims of the ’087 Patent. Ex. 2007 ¶ 121. *See* Ex. 1001 18:30-35 (“wherein the protective cross-linked polymeric coating *is obtained by exposing the device or component to a plasma* comprising a monomer compound and a crosslinking reagent for a period of time sufficient to allow formation of the protective cross-linked polymeric coating on a surface thereof”) (emphasis added).

**D. Cohen is Not From the Same Field of Endeavor Nor Reasonably Pertinent to the Problem Faced by the Inventors**

As discussed in length in Patent Owner’s Response (Paper 12), Cohen focuses solely on *conventional* polymerization reactions involving DVTMDS. Ex. 1004 1:31-63; Pat. Owner’s Resp. at 20. Cohen provides no information on *plasma* polymerization, nor protective coatings for electrical or electronic devices, or components thereof, obtained via plasma polymerization.

For the same reasons, Cohen is not reasonably pertinent to the problem faced by the inventors of the ’087 Patent. Cohen describes only a new compound (DVTMDS), how to synthesize this compound, and how it may be copolymerized

using *conventional* polymerization methods. Ex. 1004, Examples 1-5; Pat. Owner's Resp. at 20-21.

Since the '087 Patent's field of endeavor is plasma polymerized protective coatings for electronic devices, Cohen is not from the same field of endeavor. The relevant POSITA thus would *not* have reasonably consulted Cohen because it is not reasonably pertinent to the problem faced by the inventors of the '087 Patent.

**E. Francesch is Not From the Same Field of Endeavor Nor Reasonably Pertinent to the Problem Faced by the Inventors**

Like Cohen, Francesch is also not from the same field of endeavor as the '087 Patent, nor reasonably pertinent to the problem faced by the inventors. As noted in Pat. Owner's Resp., Francesch relates solely to coatings for bioactive surfaces. Ex. 1006 at 605-606, 610. The type of substrate used (bioactive surfaces in Francesch, and electronic devices in the '087 Patent, respectively) affects the parameters and methods utilized in plasma polymerization. Francesch is therefore not from the same field of endeavor, due to the vastly different method of optimizing parameters for plasma polymerization, based on the intended substrate used (bioactive surfaces) and the characteristics of the coating sought to be produced.

Francesch itself notes that it addresses problems including targeting cells, biocompatibility, and problems tailored to surface characteristics of these bioactive substrates. *Id.* at 605. Such problems are irrelevant to the inventors of the '087

Patent. And the relevant POSITA would not look to plasma polymerization on bioactive surfaces to create improved protective coatings of electronic devices formed via plasma polymerization. Ex. 2007 ¶ 89.

**IV. LIMITATION 1[A] IS NOT RENDERED OBVIOUS BY GROUND 1 NOR GROUND 2 DUE TO LACK OF MOTIVATION TO COMBINE**

Dr. Gleason attempts to bolster Petitioner’s assertion that plasma polymerization was well-known to the relevant POSITA in 2015 by citing two works by Yasuda: a paper published in 1977 (“Some Aspects of Plasma Polymerization Investigated by Pulsed R.F. Discharge;” Ex. 1061) and a textbook excerpt from 1985 (“Effect of Pulsed Radio Frequency Glow Discharge;” Ex. 1062). Ex. 1059 ¶ 17.

These exhibits merely discuss a simplified version of plasma deposition. Ex. 2015 ¶¶ 17-22. The 1977 paper (Ex. 1061) only discusses “some aspects” of plasma polymerization of *organic* compounds. But it fails to discuss any plasma polymerization including substrates such as electronic devices or components thereof. *Id.*

Likewise, the 1985 textbook (Ex. 1062) discusses only a handful of variables in a simplified manner. This material would not provide a POSA with sufficient knowledge as to the optimization of all variables required to create the claimed coatings. Ex. 2015 ¶¶ 17-22.

Additionally, as discussed in length in Patent Owner’s Response, the relevant

POSITA would lack motivation to combine Cohen and Legein in the manner proposed in Ground 1 of the Petition. Legein merely discloses continuous plasma polymerization, without the addition of a crosslinker. Ex. 1005 at 39:1314; Ex. 2015 ¶¶ 24-25. Cohen fails to teach use of the claimed crosslinking reagent. *Id.* As such, the POSITA would not have been motivated to combine Legein and Cohen. *Id.* And even had the relevant POSITA decided to combine Cohen and Legein, there would be no reasonable expectation success due to the lengthy trial and error required to optimize the parameters of the pulsed plasma polymerization. *Id.*

Further, as discussed in length in Patent Owner's Response, the POSITA would lack motivation to combine Francesch and Legein in the manner proposed in Ground 2 of the Petition. Francesch is directed to the fabrication of bioactive surfaces using plasma polymerization. Ex. 1006 at 605-606. The relevant POSITA would not be able to combine the PFM monomer and the BDVE crosslinking reagent (as disclosed in Francesch) with the simplified plasma polymerization technique in Legein, to arrive at the coating claimed in the '087 Patent. Ex. 2015 ¶¶ 26-27. And even had a POSITA decided to combine Francesch and Legein, the numerous parameters not listed in Legein, and the unpredictability and complexity of the variables in pulsed plasma polymerization, would be outside the capabilities of such a POSITA. *Id.* The POSITA would therefore not have a reasonable expectation of success in combining Francesch and Legein.

**V. CONCLUSION**

For the foregoing reasons, and those outlined in Patent Owner's response (Paper 12), the Board should issue a final written decision finding that Petitioner has not proven by a preponderance of the evidence that any of the Challenged Claims of the '087 Patent are obvious based on any of the Grounds asserted in the Petition.

Respectfully submitted,  
BOCHNER PLLC

Dated: February 4, 2025

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**CERTIFICATE OF WORD COUNT**

The undersigned hereby confirms that the foregoing Patent Owner's Response complies with the type-volume limitation of 37 C.F.R. § 42.24(d).

Dated: February 4, 2025

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**CERTIFICATE OF SERVICE**

Pursuant to 37 C.F.R. § 42.6(e), the undersigned hereby certifies that the foregoing document was electronically served on February 4, 2025 on Petitioner, who has consented to service by electronic means.

Respectfully submitted,  
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