

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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TESLA, INC.,  
Petitioner

v.

RELINK US LLC,  
Patent Owner

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Case IPR2024-00389  
U.S. Patent 9,793,755

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**PATENT OWNER'S PRELIMINARY RESPONSE**

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**PATENT OWNER'S APPENDIX OF EXHIBITS**

| <b>Exhibit</b> | <b>Description</b>                                                                                                                                                                                                                                  |
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| <b>EX2001</b>  | Declaration of Dr. David S. Ricketts                                                                                                                                                                                                                |
| <b>EX2002</b>  | Dr. David S. Ricketts Curriculum Vitae                                                                                                                                                                                                              |
| <b>EX2003</b>  | E. Serban and H. Serban, "A Control Strategy for a Distributed Power Generation Microgrid Application With Voltage- and Current-Controlled Source Converter," in IEEE Transactions on Power Electronics, vol. 25, no. 12, pp. 2981-2992, Dec. 2010. |
| <b>EX2004</b>  | The Authoritative Dictionary of IEEE Standard Terms, Seventh Edition (2000), p. 468.                                                                                                                                                                |
| <b>EX2005</b>  | McGraw-Hill Dictionary of Scientific and Technical Terms, Third Edition (1984), p. 65.                                                                                                                                                              |
| <b>EX2006</b>  | Selected Excerpt from Prosecution History of U.S. Appl. No. 13/092,916                                                                                                                                                                              |
| <b>EX2007</b>  | USPTO Documents & transaction history for US Patent 8,159,178                                                                                                                                                                                       |
| <b>EX2008</b>  | Website Printout entitled "Function   Definition, Types, Examples, & Facts   Britannica," available at <a href="https://www.britannica.com/science/function-mathematics">https://www.britannica.com/science/function-mathematics</a>                |
| <b>EX2009</b>  | Rashid, Muhammad H., editor. Power Electronics Handbook : Devices, Circuits, and Applications Handbook. Third Edition, Butterworth-Heinemann, an imprint of Elsevier, 2011.                                                                         |
| <b>EX2010</b>  | Assignment Records for US Patent 9,793,755                                                                                                                                                                                                          |

## I. INTRODUCTION

The Board should deny institution of *inter partes* review of U.S. Patent No. 9,793,755 (the “755 patent”) because (1) of discretionary considerations under §§ 325(d) and 314(a) and (2) Petitioner fails to demonstrate a reasonable likelihood that any challenged claim is anticipated or obvious.

Applying the *Advanced Bionics* framework, the Board should deny the Petition under § 325(d). During prosecution, the applicants twice submitted the relevant disclosures of the Serban reference via a short IDS. The Examiner initialed those references and signed a document confirming he analyzed and considered them. Petitioner thus carries the burden to show the Examiner erred. But Petitioner’s only theory that the Examiner erred is incorrect and belied by the record.

Recognizing the strong considerations under § 325(d), Petitioner adds a set of additional grounds based on the Somani reference, even though Petitioner contends that the Serban grounds, alone, invalidate all claims. But this attempt to end-run § 325(d) only compounds the case for discretionary denial: it results in voluminous and excessive grounds, which alone warrants denial of institution under § 314(a). Seeking to avoid the word count, Petitioner adds an appendix of analysis. But even

without the appendix, the Petition is over the word count limit.<sup>1</sup> More importantly, the Petition fails to describe its theories with particularity. It provides scant limitation-by-limitation analysis, and repeatedly ignores key claim language. It includes a “catch-all” ground, asserting that claimed features were obvious with no explanation at all. Moreover, in seeking to demonstrate Somani is prior art by comparing Somani to its provisional, Petitioner provides no analysis and instead merely string cites to full pages of Somani. As the Petition fails to meet the “particularity” requirement because of the excessive and voluminous grounds, the Petition should be denied under *Adaptics* and its progeny.

On the merits, Petitioner has no reasonable likelihood of success. The inventors of the '755 patent invented an electrical power system that could provide power both to the electrical grid and backup power. To do so, the system uses a current-source inverter that adjusts an output power as “a function of a frequency” of the AC voltage source. As each frequency is mapped to a particular power output,

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<sup>1</sup> Patent Owner converted the Petition to a Microsoft Word .docx file using Microsoft’s “save as” feature and removed the table of contents, exhibit list, mandatory notices (Section II), certificates of service, word count, and the “Claim Listing.” See 37 CFR § 42.24(a)(1). As counted by Microsoft Word, the word count of the remaining material is 14,107, which exceeds the word limit.

the inventors invented a new controller to provide fine-tuned control of a current-source inverter by adjusting a frequency of the AC voltage source. Serban, on the other hand, requires two controllers that adjust through communications signals and are thus unlike the claimed controller where the power output is controlled as a function of frequency. This is apparent from the teachings of Serban where a given frequency does not correlate to a specific change in power. Indeed, the graphs in Serban show that when there is a change in frequency, there is not a corresponding change in power output. This definitively confirms that Serban teaches away from and prohibits the control described in the '755 patent.

Somani, the add-on reference, is not even prior art and does not disclose control of a current-source inverter, as a function of frequency, or otherwise. To even attempt to make an argument, Petitioner must mischaracterize Somani's disclosure. And even with the mischaracterization, Somani's disclosure still fails for several reasons, including that Somani's controller performs two completely different functions: (1) controlling the power converters for synchronization and (2) commanding a renewable resource, such as a solar array, to trip or shut off. In addition, and just like Serban, there is no component of Somani's system that adjusts an output power *as a function* of frequency. There is no reasonable expectation of success for any challenged claim.

This POPR is supported by the testimony of Dr. David Ricketts, who is a preeminent expert having highly targeted experience in the technology of the '755 patent, in both industry and academia. EX2001, ¶¶ 6-18. Dr. Ricketts holds a Ph.D. from Harvard and has held appointments at MIT, Harvard, and Carnegie Mellon. EX2002, 2-3. During this time, Dr. Ricketts taught courses in power systems and power management IC design. EX2001, ¶ 8.

After his appointments, Dr. Ricketts spent nearly a decade in industry, culminating as the manager for New Product Development, where he oversaw the development of power electronics circuitry and power converters that are at the front-and-center of the issues here. *Id.*, ¶¶ 11-14. Moreover, during his time in industry, Dr. Ricketts designed uninterruptable power supplies (the systems claimed in the preambles of the '755 patent claims) which included inverters originally designed for solar power systems, including those for powering homes and to provide energy to the grid, and power converters. *Id.*, ¶ 11. Dr. Ricketts has highly relevant, hands-on industry experience designing and developing the precise types of systems that are related to the '755 patent; Petitioner's expert has no industry experience at all. *See generally* EX1004.

Currently, Dr. Ricketts is a full professor at North Carolina State University, where he leads the university's group that researches and designs electronic power circuitry and systems. EX2001, ¶ 6. Dr. Ricketts is a highly accoladed and highly

respected expert in the precise technology field at issue here, and thus his technical opinions should carry considerable weight.

In sum, the Board’s discretionary considerations strongly favor denial, but regardless, the Petition’s arguments are fatally and incurably flawed. The Board should deny institution.

## II. THE ’755 PATENT

In 2015, Paul Garrity and Aaron Jungreis invented the technology of the ’755 patent. The ’755 patent is titled “Uninterruptible power supply and method for managing power flow in a grid-tied photovoltaic system.” EX1001.

As the inventors recognized, “customers would prefer a system that can provide **both** grid-tied capability and backup power in the event of an outage,” and “[u]tilities would ... prefer to cut costs,” which can be achieved by “grid-tied battery systems.” EX1001, 1:55-2:11 (emphasis added). To achieve these ends, Mr. Garrity and Dr. Jungreis invented a new system that included, inter alia, a new controller configured to control a current source inverter as a function of frequency of a voltage source. *See, e.g., id.*, claim 1. Specifically, the inventive system includes a “current-source inverter [that] is configured to adjust an output power as a function of a frequency of the [AC] voltage source.” *See id.*, claim 1. That is, each frequency results in one output power. EX2001, ¶¶ 47-49, 54, 57. Knowing this, the controller “may set the frequency,” and thereby “regulate a power flow of the current-source

inverter.” EX1001, 2:45-53, claim 1. With this new control technique, a renewable energy source, such as a solar panel, can produce energy while the system is grid-tied, while also continuing to safely produce energy—in a highly controlled manner—in the event of grid failure. *Id.*, 1:41-59, 6:23-37.

Mr. Garrity and Dr. Jungreis first assigned the ’755 patent to Garrity Power Services LLC, (“Garrity Power”) a company that is owned and managed by Mr. Garrity, that develops, sells, and patents new technologies related to power systems, including systems for generating and transferring power. *See* EX2010, 1. In 2018, Garrity Power assigned the ’755 patent to Relink Limited, a company based in the United Kingdom, so that Mr. Garrity and his partners could attempt to commercialize the technology in Europe. *See id.*, 2. Relink Limited subsequently assigned the ’755 patent stateside to Patent Owner, a Texas limited liability company managed by Mr. Garrity in Rockwall, Texas. *Id.*, 3.

**A. Person of Ordinary Skill in the Art (POSITA)**

A POSITA would include someone who had a bachelor’s or graduate degree in electrical engineering or related degree, with knowledge of uninterruptible power supply systems and approximately two years of industry experience with uninterruptible power supply systems, including those having power sources and converter. EX2001, ¶ 33.

Petitioner contends that a POSITA would have had “at least a bachelor’s degree and a master’s degree in electrical engineering or a related degree, as well as possessing at least two years of experience with grid-tied power supplies having electric energy sources including photovoltaic and battery systems.” Pet., 15. While Petitioner’s definition is somewhat similar, Patent Owner does not agree that a POSITA necessarily would have a master’s degree. Moreover, it is unclear why Petitioner’s definition focuses on certain electrical components including “photovoltaic ... energy sources,” which are not required by the claims, but not other components, such as inverters, which are. Nevertheless, Patent Owner’s arguments and Dr. Ricketts’ opinions are fully applicable under either definition. EX2001, ¶ 35.

While Dr. Ricketts is qualified to offer expert testimony under either definition, Petitioner has not shown that its expert qualifies as a POSITA, as he does not have industry experience in the pertinent field of the ’755 patent. *See generally* EX1004.

### **III. THE BOARD SHOULD EXERCISE ITS DISCRETION TO DENY THE PETITION UNDER 35 U.S.C. § 325(D).**

The Board should exercise its discretion and deny institution under its precedential *Advanced Bionics* decision. There is no question that the Office considered the relevant disclosure of Serban during prosecution. Nor was there any

mistake in the Office's consideration: as discussed below, Serban is far from anticipating or rendering obvious any claim.

There are strong considerations for denying institution. Petitioner, likely recognizing that SAS requires wholesale institution or denial, tosses in some additional grounds based on the Somani reference. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348 (2018). Petitioner admits a reason for doing so is an attempt to end-run *Advanced Bionics*. Pet., 12 (arguing that § 325(d) should not apply because “Somani is a brand new reference.”).

That Somani was added primarily for § 325(d) purposes is strongly supported by the November 2019 Consolidated Trial Practice Guide (“TPG”) which contemplates two Petitions when there is a dispute about a priority date. TPG, 59. Here, the parties dispute whether Somani qualifies as prior art. But two petitions would not help Petitioner's § 325(d) problem; so instead the Petition (which itself is over the word limit by Patent Owner's count), squeezes two different sets of grounds together, often with little or no analysis for many key aspects of the claims and no actual analysis of whether Somani qualifies as prior art.

The Board should reject the tactic of adding additional grounds to avoid § 325(d). Allowing this conduct would eviscerate § 325(d) and the strong statutorily based policy concerns behind it.

**A. The two-part *Advanced Bionics* framework supports discretionary denial.**

The Board has discretion to deny instituting a petition where “the same or substantially the same prior art or arguments previously were presented to the Office.” 35 U.S.C. § 325(d). The Board’s precedential decision in *Advanced Bionics*, “restat[ed] the framework in [§ 325(d)’s] statutory language” as a “two-part framework.” *Advanced Bionics v. Med-El Elektromedizinische Geräte GMBH*, IPR2019-01469, Paper 6 at 7-11 (P.T.A.B. Feb. 13, 2020) (precedential). The policy undergirding “this framework reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown.” *Id.* at 9.

With respect to the Serban reference here, the applicants twice submitted the same disclosure to the Office. In a short IDS, the applicants identified U.S. Patent No. 8,159,178 (“Serban Patent”), which is the issued version of the Serban publication at issue here. *See* EX1002, 36. Further, the applicants identified a December 2010 IEEE article by Serban (“Serban Paper”). *Id.*, 37. As discussed below, both the Serban Patent and the Serban Paper include the same relevant disclosure of Serban identified in the Petition.

Recognizing the Examiner considered the Serban Patent, Petitioner invents an Examiner error. However, the supposed error is belied by the record and the statements made by the Examiner during prosecution. Moreover, Petitioner ignores

that the Examiner considered the Serban Paper. There was no error. Thus, under the *Advanced Bionics* framework, the Board should decline to institute to perform a de facto de novo review of the Examiner.

**1. Part 1: Petitioner advances the same or substantially the same art that was previously presented to the Office.**

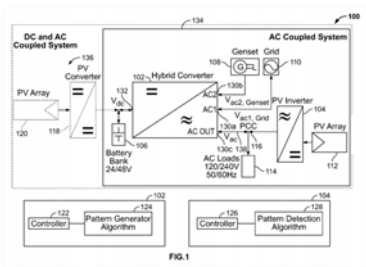
The first part of the *Advanced Bionics* framework considers “whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 8.

The answer is yes. Here, Petitioner relies on the published version of the Serban application (“Serban” or “Serban Publication”), while in prosecution, the applicants submitted to the Office both the Serban Patent (the issued version of Serban), and the Serban Paper (an article describing the exact same system). EX1002, 36-37. Under the *Advanced Bionics* framework, “previously presented art” unquestionably includes art provided by the applicants via an IDS. *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8, 17-18 (P.T.A.B. Dec. 15, 2017) (precedential as to § III.C.5, first paragraph). After considering both the Serban Patent and the Serban Paper, the Examiner properly allowed the claims.

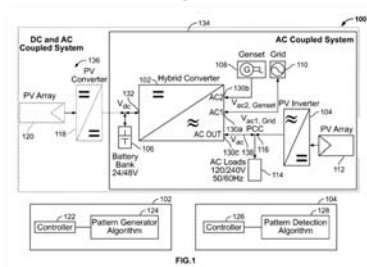
Petitioner does not dispute that the Serban Patent presented to the Examiner is substantially identical to the Serban Publication. *See* Pet., 11-12. Moreover, the Petition ignores the Serban Paper, perhaps because the applicants’ presentation of the Serban Paper cannot be explained under Petitioner’s unfounded and legally erroneous theory that the applicants somehow “misled” the Examiner, as discussed below. *See id.* Nevertheless, there can be no dispute that all three references, the Serban Publication asserted here (EX1005), the Serban Patent (EX1015), and the Serban Paper (EX2003), are all “the same or substantially the same art previously presented to the Office,” under the first part of the *Advanced Bionics* framework.

Indeed, the Serban Publication and the Serban Patent include identical disclosures, including identical system illustrations. The system illustration is likewise near-identical in the Serban Paper.

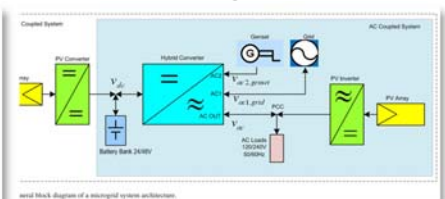
**Serban Publication  
(EX1005), Fig. 1**



**Serban Patent,  
(EX1015)  
Fig. 1**



**Serban Paper,  
(EX2003)  
Fig. 1**



In addition, all relevant disclosures are in all three references. Ricketts Dec., ¶¶ 76-79. The Serban Patent is the issued version of the Serban Publication. As no

amendments were made to the application after publication, the disclosures of the Serban Publication and the Serban Patent are identical. EX2007 (Serban docket summary showing no amendments after publication). For the Serban Paper, not only are the system figures near-identical, but the textual disclosures are also substantially similar, and often verbatim. EX2001, ¶ 77. A comparison of portions of the Serban Publication and the Serban Paper confirms that the three Serban references are substantially identical. Any portion of the Serban Publication and the Serban Patent relied upon by Petitioner as purportedly invalidating, also has a nearly verbatim disclosure in the Serban Paper.

| Serban Publication / Patent                                                                                                                                                                                                                                                                                                                                                                           | Serban Paper                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Claim 1[P]</b><br><br>Fig. 1<br><br>¶ 19 (grid-connect mode, island mode)<br><br>¶ 25 (“The AC loads 114 can be powered by both the PV inverter 104 and the utility grid”)<br><br>¶¶ 24, 27 (In islanded mode “[e]nergy for the AC loads 114 can be sourced by either or both of the PV array 112 and the battery 106”)<br><br>¶ 24 (“seamless transfer of power when the utility grid 110 fails”) | <b>Claim 1[P]</b><br><br>Fig. 1<br><br>2982 (“grid-connected mode” and “islanded mode”)<br><br>2984 (“The ac loads can be powered by both PV inverter and utility grid”)<br><br>2984 (“In island mode ... energy can be sourced by one or both of ... solar array and battery bank”)<br><br>2983 (“seamless transfer of [power from] hybrid converter when utility grid fails”) |

| Serban Publication / Patent                                                                                                                                                                                                                                                                                                                                                                                                              | Serban Paper                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Claim 1[A]</b></p> <p>Fig. 1 (“hybrid converter”)</p> <p>¶ 11 (“four-quadrant pulse width modulated (PWM) bidirectional energy converter”)</p> <p>¶ 27 (“voltage-controlled source mode” “controls the AC voltage and frequency on the AC line”)</p>                                                                                                                                                                               | <p><b>Claim 1[A]</b></p> <p>Fig. 1 (“hybrid converter”)</p> <p>2982 (“four-quadrant PWM bidirectional energy converter”)</p> <p>2982 (“voltage-controlled source converter” where the ac voltage and frequency are controlled”)</p>                                                                                                                                                                                      |
| <p><b>Claim 1[B]</b></p> <p>Fig. 1 (left side arrow between “hybrid converter” and <math>v_{dc}</math>)</p> <p>¶ 22 (“DC port”)</p>                                                                                                                                                                                                                                                                                                      | <p><b>Claim 1[B]</b></p> <p>Fig. 1 (left side arrow between “hybrid converter” and <math>v_{dc}</math>)</p> <p>2986 (“dc port”)</p>                                                                                                                                                                                                                                                                                      |
| <p><b>Claim 1[C]</b></p> <p>Fig. 1 (bottom right-side arrow between “AC OUT” and “PCC”)</p> <p>¶ 21, 22 (PV inverter receives DC input from PV array and outputs an AC current)</p> <p>Abstract (“vary[ing] the line frequency” ... “to cause a PV inverter to modify its power output”)</p> <p>¶ 28 (inverter detects “the modified output and, in response to that detection causes the current or voltage applied” to be changed)</p> | <p><b>Claim 1[C]</b></p> <p>Fig. 1 (bottom right-side arrow between “AC OUT” and “PCC”)</p> <p>2984 (“The PV inverter harvests the dc solar energy and operates in ac current-controlled mode”)</p> <p>2991 (“varying the microgrid line frequency” and then “the PV inverter adjusts its output”)</p> <p>2988 (“PV inverter [] will sense a specific frequency change pattern and ... adjust its local ac current”)</p> |

| Serban Publication / Patent                                                                                                                                                                                                                                                                                        | Serban Paper                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ¶ 28 (disconnect or reduce current produced)                                                                                                                                                                                                                                                                       | 2986 (“inverter may disconnect”); 2988 (“adjust local ac current”)                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Claim 1[D]</b><br><br>Fig. 1 (hybrid converter, PV inverter, and respective controllers and pattern algorithms)<br><br>¶ 17 (hybrid converter includes a controller that modifies output at a first AC output)<br><br>¶¶ 17, 20, 55 (controller of PV inverter detects pattern and changes current or voltage). | <b>Claim 1[D]</b><br><br>Fig. 1 (hybrid converter, PV inverter, and respective controllers and pattern algorithms)<br><br>3986 (“hybrid converter with ... control structure” for “line-frequency control variation”)<br><br>2988 (“PV inverter with frequency-detection function control”); <i>id.</i> (“frequency-detection function is proposed for implementation of the PV inverter, which will sense a specific frequency change pattern and to adjust its local ac current”) |

Petitioner alleges that the remaining independent claims include all the limitations of claim 1. *See* Pet., 41 (entire analysis is “Claim 18 combines claims 1-2 and 5-7); Pet., 65 (analysis is “Claims 19 and 20 each combine claims 1-3, 5-8, and 13”). As such, a determination that the Serban Publication does not disclose or render obvious the elements of claim 1 necessarily means that the Serban Publication likewise does not disclose or render obvious the elements of independent claims 18 and 20. Nevertheless, comparison of the three references likewise demonstrates, unsurprisingly, that the alleged disclosures are substantially identical. EX2001, ¶ 79.

There can be no question that the Serban Patent and the Serban Paper presented to the Examiner via an IDS are both substantially the same art as the Serban Publication.

Petitioner's arguments under part 1 fail. Although the same disclosures of the Serban Publication were twice considered during prosecution, Petitioner presents a smattering of arguments that step 1—whether the same or substantially the same art that was previously presented to the Office—is not satisfied. **First**, Petitioner argues that the Serban Publication is not “substantially the same art” as the Serban Patent because it is a “different published document.” See Pet., 11. However, the *disclosure* of the two documents is the *exact* same, as there were no amendments to the application after it published. EX2007. There is no material difference.

**Second**, Petitioner incorrectly argues that step 1 is inapplicable because the Serban Patent was not “substantively considered” by the Examiner during prosecution. Pet., 11. On the contrary, the Examiner submitted a “List of References Considered,” initialed his name next to both the Serban Patent and the Serban Paper (indicating each “reference [was] considered”), and signed his name, to confirm the references were “Considered.” EX1002, 36-37. As the Board recognized in the precedential *Advanced Bionics* decision, the listing of the Serban Patent and the Serban Paper in the IDS and the Examiner's notation that the reference was considered satisfies the first step regardless of whether it was used as a basis for

rejection. *Advanced Bionics*, IPR2019-01469, Paper 6 at 7-8 (PTAB Feb. 13, 2020) (precedential) (“[p]reviously presented art includes art made of record . . . such as on an Information Disclosure Statement (IDS).”).

To support its argument, Petitioner relies on *Bowtech*, a pre-*Advanced Bionics*, non-precedential decision, to argue that a reference must be applied to satisfy the first step. Pet., 11. To the extent Petitioner’s summary of *Bowtech* is correct, it was abrogated by *Advanced Bionics*. See *Roku*, IPR2019-01619, Paper 17 at 7-8 (panel recognizing that it is “bound by the precedential *Advanced Bionics* Decision” which mandates the first step is met if “the same or substantially the same art” was previously presented, regardless of its “evaluation during examination.”); see also *Cultec, Inc. v. StormTech LLC*, IPR2017-00777, Paper 7 (P.T.A.B. Aug. 22, 2017) (informative) (submissions were considered by Examiner where Examiner indicated “ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH” and no references were lined though); *Boragen, Inc. v. Syngenta Participations AG*, IPR2020-00124, Paper 16 at 22, 35 (P.T.A.B. May 5, 2020) (denying institution under § 325(d) after finding that a reference was “presented during prosecution” when it was “cited among a relatively short list of references . . . in the Information Disclosure Statement as well as the International Search Report submitted early in the prosecution.”). As the Board has recognized in *Boragen*—which post-dates *Bowtech*—“a rejection applying a reference . . . is not a prerequisite

to a finding that such reference was already presented to the Office under § 325(d).”  
*Boragen*, Paper 16 at 21-22.

Even if *Bowtech* were not abrogated, the facts here are inapposite. In *Bowtech*, the Examiner listed a reference amongst numerous others in a “Notice of References Cited by the Examiner” with no indication that the Examiner considered or was familiar with the references. *Bowtech*, IPR2019-00379, Paper 14 at 17-18. Here, on the contrary, the applicants submitted an IDS of only 8 references, with two of them being substantially similar, if not identical, disclosures of the Serban Publication; the Examiner initialed both the Serban Patent and the Serban Paper and signed his name to confirm that he considered both documents. EX1002, 36-37.

Moreover, the Examiner was already familiar with the teachings of Serban, as he considered the Serban Publication in examination of at least one previous patent application. EX2006, 8 (Examiner Deberadinis initialed that “ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH”—Serban is not lined through). The Serban art was not only presented to the Office, it was also substantively considered. *See Adkins Universal Imaging Indus., LLC v. Lexmark Int’l, Inc.*, IPR2019-01387, Paper 7 at 15-16 (PTAB Feb. 27, 2020) (Examiner’s familiarity with presented reference weighs against institution even when the reference was not used as a basis for rejection).

**Third**, Petitioner argues that none of Serban's secondary references were before the Examiner. Pet., 11. But Petitioner does not, and cannot, explain how this would have made a difference, because it would not. The Petition alleges that the Serban Publication alone **anticipates** independent claim 1 (as well as claim 18). Pet, 10. For the remaining independent claim 20 (as well as independent claim 18), Petitioner alleges that it includes all the elements of claim 1. *Id.*, 102-03. Thus, Petitioner alleges that every claim includes the elements recited in independent claim 1. And while Petitioner may include other grounds with combinations for other claims, Petitioner does not seek to cure the deficiencies of the Serban Publication with respect to claim 1 with any other reference. *See* Pet., 48. As such, none of the additional secondary references could have changed the Examiner's conclusion.

**Fourth**, Petitioner admits that it included additional grounds using the Somani reference in an attempt to end-run § 325(d). Pet., 12. This tactic must fail, as it would eviscerate § 325(d) by allowing Petitioners to include an additional ground based on a weak reference that is not even prior art, just as Petitioner did here. Moreover, throwing in a "sacrificial" ground to avoid § 325(d) is directly contrary to the stated purpose of *Advanced Bionics*, "to defer to previous Office evaluations of the evidence of record unless material error is shown." IPR2019-01469, Paper 6 at 9.

In a last-ditch effort, Petitioner argues **fifth** that its expert declaration is "new evidence." Pet., 12. Again, if true, this would eviscerate § 325(d). That an expert

declaration should not move the needle on the § 325(d) analysis is particularly strong here when the declaration does little (if anything) more than parrot the Petition. Indeed, in his invalidity analysis, Dr. Collins often does little more than provide quotes from the Serban Publication and conclude, without explanation, that a POSITA would have understood them to have disclosed the claim element. *See, e.g.*, EX1003, ¶¶ 124-127, 132-136. Nevertheless, Petitioner's fifth argument is legally erroneous because *Advanced Bionics* mandates that step 1 is satisfied whenever the same or substantially similar art is presented, regardless of whether it is accompanied by an expert declaration in the Petition. *See Roku*, IPR2019-01619, Paper 17 at 7-8; *see also Medtronic Corevalve LLC v. Speyside Medical, LLC*, IPR2021-00310, Paper 9 at 36 (PTAB July 23, 2021) (fact that expert testimony was not in front of the Office unpersuasive when Petitioner does not identify specific testimony that, if in front of Examiner, would have overcome Examiner's conclusion that claim 1 is patentable.)

The Office has twice considered the same disclosures of Serban that Petitioner asks the Board to reconsider here. The Board should decline to do so.

**2. Part 2: Petitioner fails to identify material error in the Office's previous evaluation of the art and arguments.**

Under the second part of the *Advanced Bionics* framework, "if either condition of [the] first part of the framework is satisfied, [the Board determines] whether the

petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.” IPR2019-01469, Paper 6 at 8. Examples of material error include “misapprehending or overlooking specific teachings of the relevant prior art where those teachings impact patentability of the challenged claims” and “an error of law, such as misconstruing a claim term, where the construction impacts patentability of the challenged claims.” *Id.* at 8-9, n.9.

The Petitioner carries the burden of demonstrating material error: “[i]f a condition in the first part of the framework is satisfied and the petitioner fails to make a showing of material error, the Director generally will exercise discretion not to institute *inter partes* review.” *Id.* at 8-9; *see also Becton, Dickinson*, IPR2017-01586, Paper 8 at 17-18 (considering “whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art.”). Notably, “[i]f reasonable minds can disagree regarding the purported treatment of the art or arguments, it cannot be said that the Office erred in a manner material to patentability. At bottom, this framework reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 9. Accordingly, Petitioner has the burden to demonstrate how the Office erred to avoid discretionary denial.

Petitioner cannot meet its burden here. Petitioner alleges that “[t]he examiner only found claim 1 allowable because ‘the prior art of record does not disclose or

suggest, inter alia, a first alternating current power port as claimed.” Pet., 12 (citing EX1002, 24). Petitioner then rewrites this statement—removing “inter alia” and “as claimed”—to urge that the Examiner found only that the prior art did not disclose an AC power port. *See, e.g.*, Pet., 8; EX1003, ¶ 83. But this is demonstrably incorrect: on the same page the Examiner stated that the Yu reference **did** disclose an alternating power port coupled to a bi-directional converter. EX1002, 24.

The prior art does not disclose an “AC power port” limitation, *as claimed*, i.e., the claimed limitation referred to as 1[c] in the Petition. Moreover, the Examiner explicitly did not limit his findings to the AC power port; he unambiguously stated that “the prior art of record does not disclose or suggest, **inter alia**, a first alternating current power port as claimed.” *See* EX1002, 24 and Pet., 12 (emphasis added). There was no Examiner error. A POSITA would have understood that the Examiner committed no error, and further that the Examiner did not allow the claims only because the prior art did teach an “AC power port.” EX2001, ¶¶ 63-64.

Petitioner then suggests that the Examiner was “led to error” and overlooked Serban’s disclosure related to an AC power port because the Examiner was “led astray” by an IDS indicating that “only” “Claims 1-20” were relevant. Pet., 11-12. This argument fails for multiple distinct reasons. First, the Petition’s excerpt of the IDS does not include the applicant’s identification of the Serban Paper, which undisputedly does not limit the “relevant” portions. EX1002, 24. And the Serban

Paper has the **exact** disclosure as the Serban Publication identified in the Petition as relevant to the “AC power port” limitation. *Compare* Pet., 21-22 with EX2003, at Fig. 1. At best, Petitioner’s argument that the Examiner overlooked the disclosure applies only to the Serban Patent, and not the identical disclosure of the Serban Paper.

Second, the Examiner did not limit his review to “claims 1-20”: the MPEP instructs the Examiner to consider the entire reference, and the Examiner is “presumed to have done [his] job.” *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1574 (Fed. Cir. 1992); MPEP 609.01 (examiners to analyze documents cited in IDS in the same manner as they consider any other documents found during a search). Third, even if the Examiner did limit his review to “Claims 1-20,” the claims **still** disclose the relevant functionality that Petitioner relies upon. EX1015, at, e.g., claim 1 (“controller ... coupled to ... at least one source of AC energy”).

And while not relevant here, there was no deceptive intent in the IDS. The Serban disclosures were provided to the Examiner in multiple ways in a short IDS. EX1002, 36-37.

Petitioner cannot meet its burden to show that the Examiner materially erred. Its only theory—that the Examiner overlooked art having an AC power port—cannot be reconciled with the facts of record where the Examiner unambiguously stated that

a prior art reference (i.e., Yu) did have an AC power port. As discussed below, Serban, along with the Serban Patent and the Serban Paper, teach a completely different and incompatible technique than disclosed in the '755 patent, and thus the Examiner properly found that neither Serban reference invalidated the claims.

#### **IV. THE BOARD SHOULD DENY INSTITUTION UNDER § 314(A).**

The basis of an IPR petition must be identified “with particularity.” *Adaptics Ltd. v. Perfect Co.*, IPR2018-01596, Paper 20, at 15 (P.T.A.B. Mar. 6, 2019) (quoting 35 U.S.C. § 312(a)(3)). Petitioner “has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016). “The statutory requirement for particularity in a petition for IPR takes on heightened importance when considered in conjunction with SAS’s ‘all-or-nothing’ approach” of institution: because institution requires one binary choice for all grounds, every ground must meet the particularity requirement. *Adaptics*, Paper 20, at 17. When the Petition fails the particularity requirement for any ground, the Board may exercise its discretion under § 314(a) to deny institution. *Id.*

Here, Petitioner uses Serban as the primary, or only, reference in five grounds to contend that every claim of the '755 patent is invalid. See Pet., i-iv. Although Petitioner contends that all claims are invalid, it nevertheless adds a new, distinct set of grounds using Somani as the primary, or only, reference, attacking exactly the

same claims. *Id.* While this tactic is a transparent attempt to avoid discretionary denial under § 325(d), it renders the grounds of the Petition excessive and voluminous such that the Petition fails to satisfy the “particularity” requirement. As such, the Board should deny institution.

By including two full, different sets of distinct grounds, the Petition far exceeds the word limit. While the Petition certifies that it “includes 13,977 words,” (Pet., 105), buried in Appendix-A of non-counted words is an analysis of the claims, analogizing elements of some claims with others. Pet., 100-103. And Petitioner relies on this analysis throughout the Petition. *See, e.g., id.* at 41 (invalidity theory for a full claim is one sentence, supported by Appendix-A). The analysis in non-counted Appendix-A is not a mere “claim listing” as contemplated by 37 CFR § 42.24(a)(1). And even without considering the improper Appendix-A, the Petition still fails to comply with the word limit by Patent Owner’s count as discussed above.

What is more important is that because the grounds are voluminous and excessive, the Petition falls far short of the particularity requirement. As one example, Petitioner recognizes that for Somani to qualify as prior art, the relied-upon disclosure must “also be in the Somani provisional.” Pet., 7. Yet, Petitioner offers no analysis, particular or otherwise, that the Somani provisional includes the required disclosures. Instead, Petitioner merely cites to its claim-by-claim analysis (Sections XIV-XVI). *Id.* But there, Petitioner does not discuss the provisional at all.

At best, Petitioner string cites full pages of the provisional, with zero discussion of those pages. *See, e.g.*, Pet., 69. Moreover, Petitioner does not even attempt to back up some cites to Somani with cites to the provisional. *See, e.g.*, Pet., 70. Petitioner’s expert likewise does not provide any analysis. *See, e.g.*, EX1003, ¶¶ 89, 278-294. For this reason alone, the Petition should be denied. *See Forescout Technologies, Inc. v. Fortinet, Inc.*, No. IPR2021-01328, Paper 12, at 9-10 (PTAB Jan. 27, 2022).

Another issue is Petitioner’s “catch-all” of ground 2. *See* Pet., 48. In ground 1, Petitioner contends that Serban anticipates claims 1-7, 13, and 18. *Id.* at i-ii. In ground 2, Petitioner backtracks, arguing that “if PO contends that certain features were not anticipated, those were at least rendered obvious.” *Id.*, 48. In the following two paragraphs, Petitioner provides some “examples,” (that do not discuss a claim or claim language) of things that would purportedly be obvious, all without providing any reason. Only in a third example does Petitioner provide some analysis of modifying Serban, but again without pointing to any claim or limitation. Petitioner’s hedge, which explicitly seeks to wait and see why “PO contends” Serban fails is impermissible, as Petitioner fails to satisfy its “burden from the onset” to particularly disclose its theories. *See Harmonic*, 815 F.3d at 1363. Indeed, Patent Owner *does* contend Serban fails to anticipate elements of every claim, including, *e.g.*, element 1[c], as discussed below. Thus, ground 2 necessarily includes an

obviousness allegation regarding that element. The problem is, there is no analysis for it at all.

Moreover, the “analysis” that Petitioner did provide likewise fails the particularity requirement. Over and over, the Petition merely quotes portions of references and concludes, with scant analysis, if any, that the quotes meet the claims. This problem is pervasive, as shown by the following examples: Pet., 21-23 (limitation 1[c]), 30 (claim 4), 31 (claim 6).

Likewise, Petitioner’s expert provides no additional insight, as the expert’s claim-by-claim discussion is near verbatim as that of the Petition. Indeed, the expert’s discussion is “conclusory and add[s] little to the assertions the testimony was offered to support.” *See Xerox Corp. v. Bytemark*, IPR2022-00624, Paper 12, at 2 (PTAB Feb. 10, 2023) (Director review designating institutional denial decision as precedential, where institution was denied when declaration merely parroted petition, “was conclusory and added little to the assertions the testimony was offered to support.”). The lack of particularity is readily apparent in the deficiencies of the references discussed below where Petitioner offers no explanation regarding the deficiency of Serban and modifies a quotation of the Somani reference with no explanation. The Board should exercise its discretion to deny institution under § 314(a).

**V. THE PETITION FAILS TO DEMONSTRATE A REASONABLE  
LIKELIHOOD OF SUCCESS AS TO ANY CHALLENGED CLAIM.**

The Petition presents eight grounds, all of which fail to teach or suggest multiple limitations of the '755 patent. Grounds 1-4 and 7 include Serban as the primary (or only) reference. Grounds 5-6 and 8 include Somani as the primary (or only) reference.

Each independent claim—and thus every claim—of the '755 patent requires:

(1) a “current-source inverter is configured to adjust an output power as a function of a frequency of the alternating current voltage source”; and

(2) “a controller configured to regulate a power flow of the current-source inverter by adjusting a frequency of the alternating current voltage source.” EX1001, claims 1, 18, and 20.

For both the Serban-based grounds and the Somani-based grounds, Petitioner relies only on Serban and Somani for these limitations. The problem with the Petition is that neither Serban nor Somani disclose or suggest the novel control functionality described and claimed in the '755 patent. EX2001, ¶¶ 66-72; 80-88.

Serban fails to disclose—and teaches away from—a current-source inverter configured to “adjust an output power as a function of a frequency” of the AC voltage source. Serban’s controller may vary the frequency or voltage of the AC line. EX1005, ¶¶ 1, 4, 27, 29, 30, 31. The alleged current-source inverter requires a

controller that receives command communications via a “specific pattern” that differs from other devices, such as a hybrid converter, in a system. EX1005, ¶¶ 39, 45. The “specific pattern” is a short ripple that is anomalous or even undetectable by system components. EX2001, ¶¶ 68-70. Because Serban only uses short ripples, the controller does not *set* the frequency as described in the ’755 patent. As claimed in the ’755 patent, an output power is adjusted as a function of a frequency, meaning that each frequency results in a single power output. EX2001, ¶ 54. This allows the controller to adjust the frequency and thereby regulate power flow, as it is known for each frequency to which power output it maps. Serban uses a different technique where a given frequency maps to any number of output powers. The controller varies only the frequency or voltage of the AC line using a predetermined pattern generation and detection. EX 1005, ¶¶ 1, 4, 27, 29, 30, 31. There is no “adjusting” of the AC output power as a function of frequency. Moreover, because Serban’s communication signals do not provide for a change in frequency to result in any specific change in power output, the output power is not adjusted ***as a function of*** the frequency. EX2001, ¶¶ 66-72; 91-99. Indeed, other than quoting the entire limitation, the Petition all but ignores the “***as a function***” limitation. *See, e.g.,* Pet., 22-23. It is therefore no surprise that the Examiner allowed the claims over Serban.

Somani’s alleged current-source inverter is a “power converter,” what Petitioner calls a “PV inverter” that receives DC energy from an array of solar panels

and converts it to AC energy. For its invalidity theory, Petitioner alleges that the PV inverter may be tripped offline. The problem for Petitioner, however, is that Somani does not disclose this functionality—Somani instead clearly discloses that the alleged controller “trips the **renewable resource** offline.” Pet., 75 (quoting EX1007, ¶ 90) (emphasis added). To account for Somani’s lack of the claimed control techniques, the Petition misrepresents this disclosure of Somani, by rewriting the disclosure (via bracketed insertions in quotes) to say that the “renewable resource” includes the alleged current-source inverter. *See id.* But this characterization is unexplained, unsupported and, indeed, incorrect: Somani is clear that the “renewable resource” is the solar panels, while the alleged current-source inverter is a different component of the system. EX2001, ¶¶ 81-82, 88, 114-121. Moreover, even under Petitioner’s misreading of Somani, the alleged current-source inverter is not configured to adjust power output as a function of frequency. *Id.*, ¶ 121. The Petition fails to present any reasonable likelihood of success as to any ground.

#### **A. The ’755 Patent Claimed Solution**

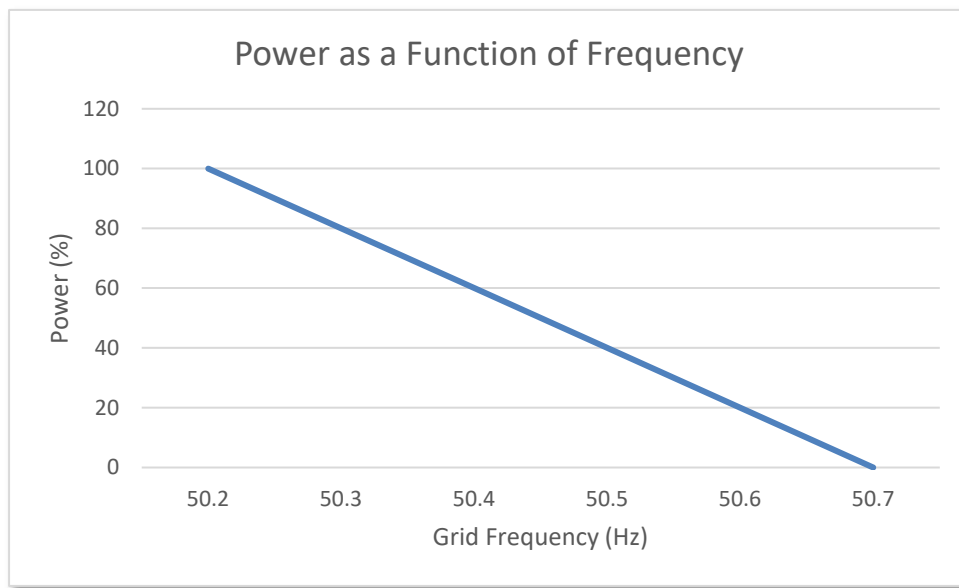
The deficiencies of Serban and Somani are apparent when juxtaposed against the disclosure and claims of the ’755 patent. Conventionally, photovoltaic inverters included either (1) grid-tied inverters—current-source inverters “used to pump power into the utility grid”—or (2) stand-alone inverters—voltage-source inverters used to power loads in the absence of the grid. EX1001, 1:41-46; EX2001, ¶ 51. Mr.

Garrity and Dr. Jungreis recognized the benefits of a system that could “provide both grid-tied capability and backup power in the event of an outage, as long as the cost of the final system is not substantially higher than the grid-tied system alone.” EX1001, 1:55-59.

Therein lied the conundrum: while grid-tied inverters were more prevalent and cost efficient, they were not used in stand-alone setups because, unlike grid-tied scenarios where they could “pump” a seemingly endless amount of current into the grid, stand-alone setups have a limit on the amount of current they can receive. *Id.* 1:41-46; EX2001, ¶ 52. For example, in a home-back up system, if the home has less current than produced by the current-source inverter, then that unused current would nevertheless continue to flow into the home, causing safety concerns and damaging the home’s electronics. *Id.* Stand-alone systems used voltage-source inverters, which allowed the home’s electronics or other electrical components to draw current only as needed but were generally inoperable without grid connection. *Id.*, ¶ 53.

As Mr. Garrity and Dr. Jungreis recognized at the time of the invention, some grid-tied current-source inverters were configured to “gradually reduce output power when the grid frequency deviate[d] beyond a set limit.” EX1001, 1:28-30; EX2001, ¶54. Those “current-source inverters [were] designed to limit power when the frequency of the grid ... varies by a predetermined amount.” *Id.*, 6:29-34; *Id.* As the ’755 patent explains, “current-source inverters may be designed to linearly decrease

their power output from 100% to 40% when the frequency increases from 50.2 Hz to 50.5 Hz.” *Id.* That is, in this example, the current-source inverter operates at 100% at a grid frequency of 50.2 Hz, 80% at 50.3 Hz, 60% at 50.4 Hz, and 40% at 50.5 Hz. Each frequency directly correlates to a single output power, i.e., the output power is a *function of* frequency. EX2001, ¶¶47-49. In the example above, the function is  $\text{Power (\%)} = 200 \times (50.7 - \text{Frequency (Hz)})$ .



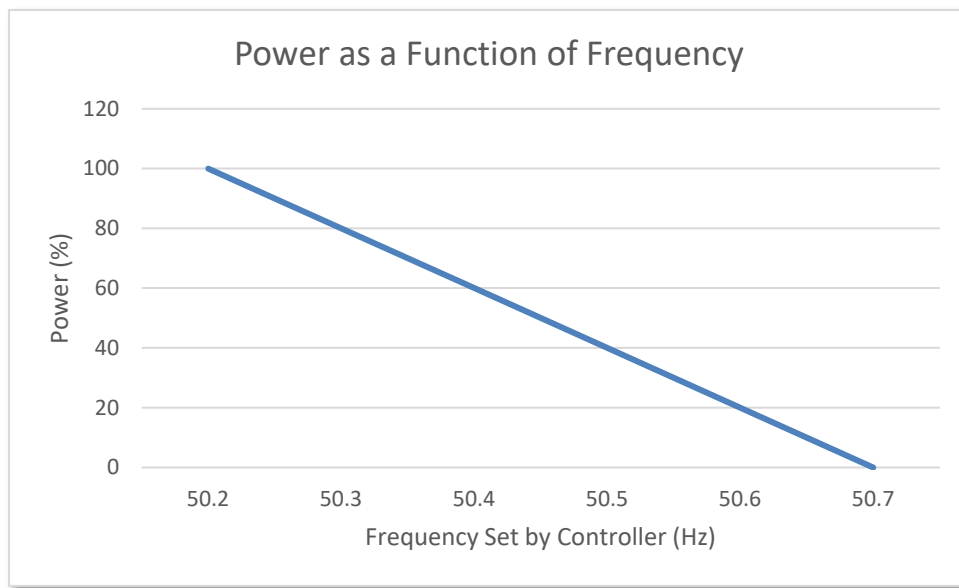
EX2001, ¶ 54.

The issue, however, is that this adjustment of power output as a function of grid frequency does not do much good in a backup event during grid failure, as the grid provides no frequency at all. EX2001, ¶ 55. An inventive leap of the '755 patent was to implement a new component in the system: a controller that could “trick” certain current-source inverters into adjusting their power output, even without the

presence of grid frequency. The new controller of the '755 patent is used to control frequency to mimic grid frequency by “produc[ing] a sinusoidal voltage having a frequency that [could be] used to limit (and thus regulate) power produced by the micro-inverters.” EX1001, 6:65-7:2. Because each frequency maps to a single power output, the controller could regulate a power output by adjusting a frequency. This allowed, for example, the controller to control a current-source inverter to charge a battery: when the battery is low, the controller “sets the frequency ... to the nominal frequency [e.g., 50.2 Hz in the example above], thus allowing maximum power flow from the micro-inverters.” *Id.* at 8:58-64. As the battery becomes fully charged, “the controller 301 adjusts the frequency ... to cause the micro-inverters to reduce their power output until the battery ... is being trickle-charged.” *Id.* Using the function above, for example, the controller could raise the system frequency to 50.69 Hz, which would result in a 2% power output from the current-source inverter. *Id.*, 6:29-34; EX2001, ¶ 56.

As described and claimed, the current-source inverter is “configured to adjust an output power **as a function of** a frequency of the [AC] voltage source.” EX1001, claims 1, 18, 20. That is, just as is described in the specification, the current-source inverter is configured to provide a specific output power for each frequency during operation, as shown in the below example. A function is a well-known concept where each input results in one specific output. EX2001, ¶¶ 47-49. As the current-

source inverters could adjust an output power as a function of a frequency, meaning that each frequency results in one specific output power, the controller could thus set the system frequency to control the output power current-source inverter. EX1001 at 2:46-53. EX2001, ¶ 57. By using this concept, the claimed controller can control a power flow by “adjusting a frequency” because each frequency maps to a particular power output, as shown in the below example.



EX2001, ¶¶ 57-58. Thus, as claimed, the controller is “configured to regulate a power flow of the current-source inverter by adjusting a frequency of the [AC] voltage source.” EX1001, claims 1, 18, 20.

With Mr. Garrity and Dr. Jungreis’s elegant solution, a current-source inverter could pump all power generated from an array of solar panels into the grid while grid-connected, while providing only the amount of current needed for system

components in off-grid mode, thus providing “a system that can provide both grid-tied capability and backup power in the event of an outage, [with] the cost of the final system [] not [being] substantially higher than that of the grid-tied system alone.” EX1001, 1:55-59; EX2001, ¶¶ 59-60.

The claimed control functionality of the ’755 patent differs from Serban—where a frequency can result in any number of different power outputs. Simply put, there is no disclosure in Serban of the inverter adjusting its output power as *a function of* frequency. Serban thus lacks the novelty of the ’755 patent.

The claimed control functionality of the ’755 patent is likewise far afield from Somani, where the alleged current-source inverter does not adjust its power as a function of frequency. Instead, Somani merely discloses that solar panels are tripped (disconnected) from the system.

The Petition fails.

**B. There is no Likelihood of Success for the Serban-Based Grounds (1-4, 7)**

Serban’s system is used in a different environment and implements a different control functionality than the system described and claimed in the ’755 patent. Rather than adjusting an output power of a current-source inverter as a function of frequency, Serban instead teaches generating patterns to communicate with the alleged current-source inverter, differing drastically from the claimed solution of the

'755 patent. Because of the differences in the control functionality, Serban fails to disclose or suggest the two novel limitations shown in red below, both of which are recited in every independent claim:

| Claim 1                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1[p] An uninterruptible power supply comprising:                                                                                                                                                                                                                                                       |
| 1[a] a bi-directional converter configured to operate as an alternating current voltage source;                                                                                                                                                                                                        |
| 1[c] a direct current power port configured to be coupled to a battery;                                                                                                                                                                                                                                |
| 1[d] a first alternating current power port coupled to the bi-directional converter and configured to be coupled to a current-source inverter, wherein the current-source inverter is configured to adjust an output power as a function of a frequency of the alternating current voltage source; and |
| 1[e] a controller configured to regulate a power flow of the current-source inverter by adjusting a frequency of the alternating current voltage source.                                                                                                                                               |

**a) Serban's disparate control functionality is fundamentally different than the '755 patent.**

The Serban Publication, Serban Patent and Serban Paper each describe a system with different control functionality. Unlike the invention of the '755 patent, which could be used for "small residential-sized systems," (EX1001 at 2:7-11), Serban was concerned with distributive systems where components were "positioned far away from each other." EX1005, ¶ 29. Serban recognized that control devices could control other components via "wired communication," but that the wired communication "prevents control devices from being placed far apart from

one another and requires additional control wiring.” *Id.* ¶ 2. Serban’s proposed solution was to remove dedicated communication lines and instead send the communications via the electrical transfer wire that was already present between components. *Id.* ¶ 4.

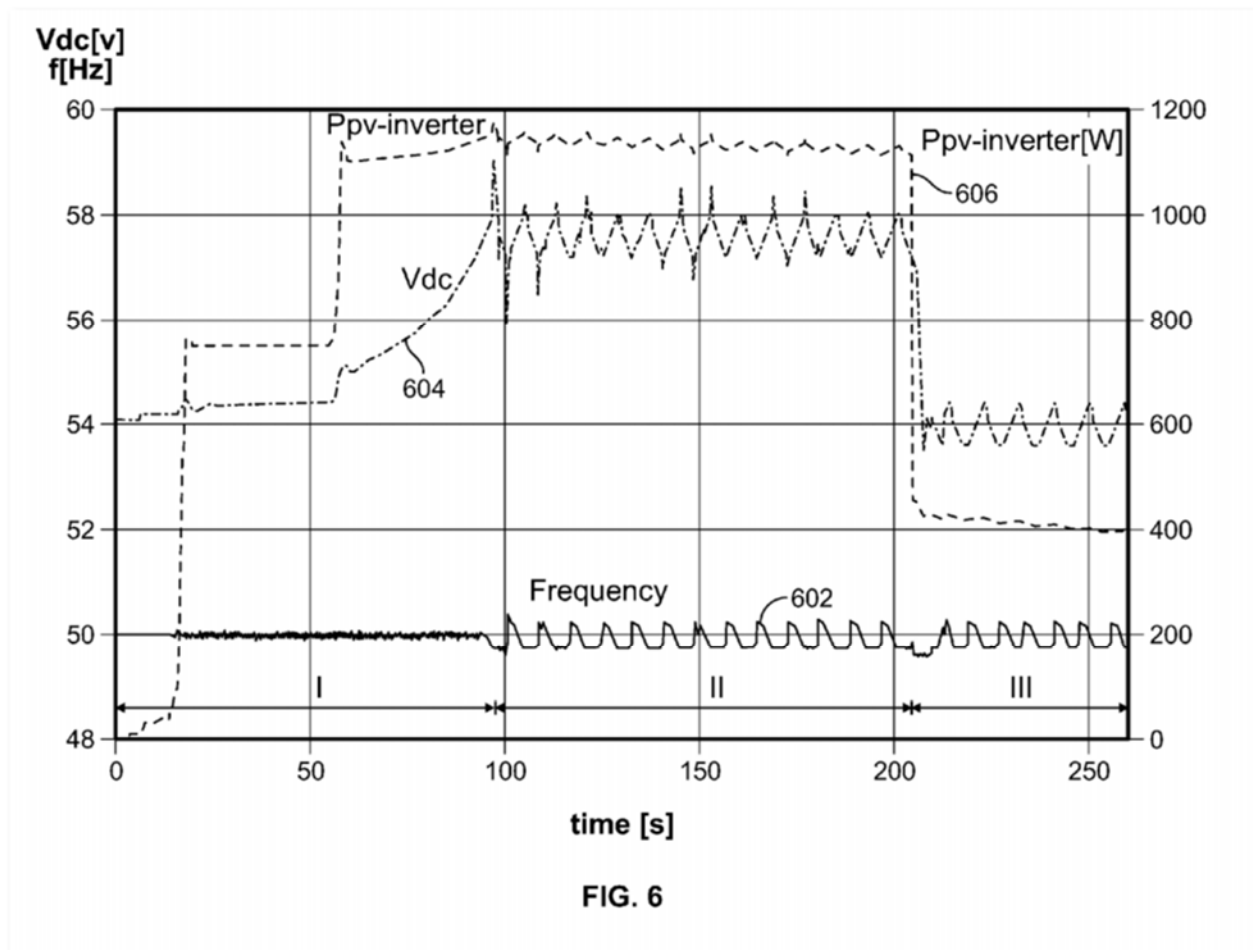
Serban proposed a “hybrid converter” with a “pattern generator algorithm” configured to output a communication pattern. The pattern is sent over the preexisting “AC line” by injecting the pattern in the “frequency or voltage” of that line. *Id.* ¶ 4. For example, the pattern generator algorithm may use a look-up table to a command and then send that pattern by modulating the frequency, phase angle, and amplitude on the AC line. *Id.* ¶ 31.

Serban describes the communication pattern being generated by various, complex “control alternatives”: “Fast Fourier Transform,” “proportional-integral-derivative control,” “fuzzy logic,” and “a wavelet” that are injected in the line as a command packet. *Id.* ¶ 46. Unlike the ’755 patent, these methods inject a short anomaly into the line. *Id.*; EX2001, ¶ 68. For example, Serban discloses a “wavelet,” which is a short “ripple” in the line. EX1005, ¶¶ 47-51. Importantly, Serban recognized that the communications in the form of frequency variation must precisely follow a “specific pattern,” for the communication to work. *Id.* ¶¶ 4, 45. And for the system to work, that specific pattern must “be distinguishable from other patterns created by electrical devices in the power system that cause the frequency

or voltage of the AC line to vary.” *Id.* ¶ 39. The ’755 patent is diametrically opposed to Serban’s approach, as it uses control techniques that are expressly intended to use patterns created by electrical devices in the power system and, indeed, patterns that are typically seen in a system. Unlike the ’755 patent’s approach, Serban’s hybrid-converter explicitly cannot “mimic” the grid. EX2001, ¶ 70.

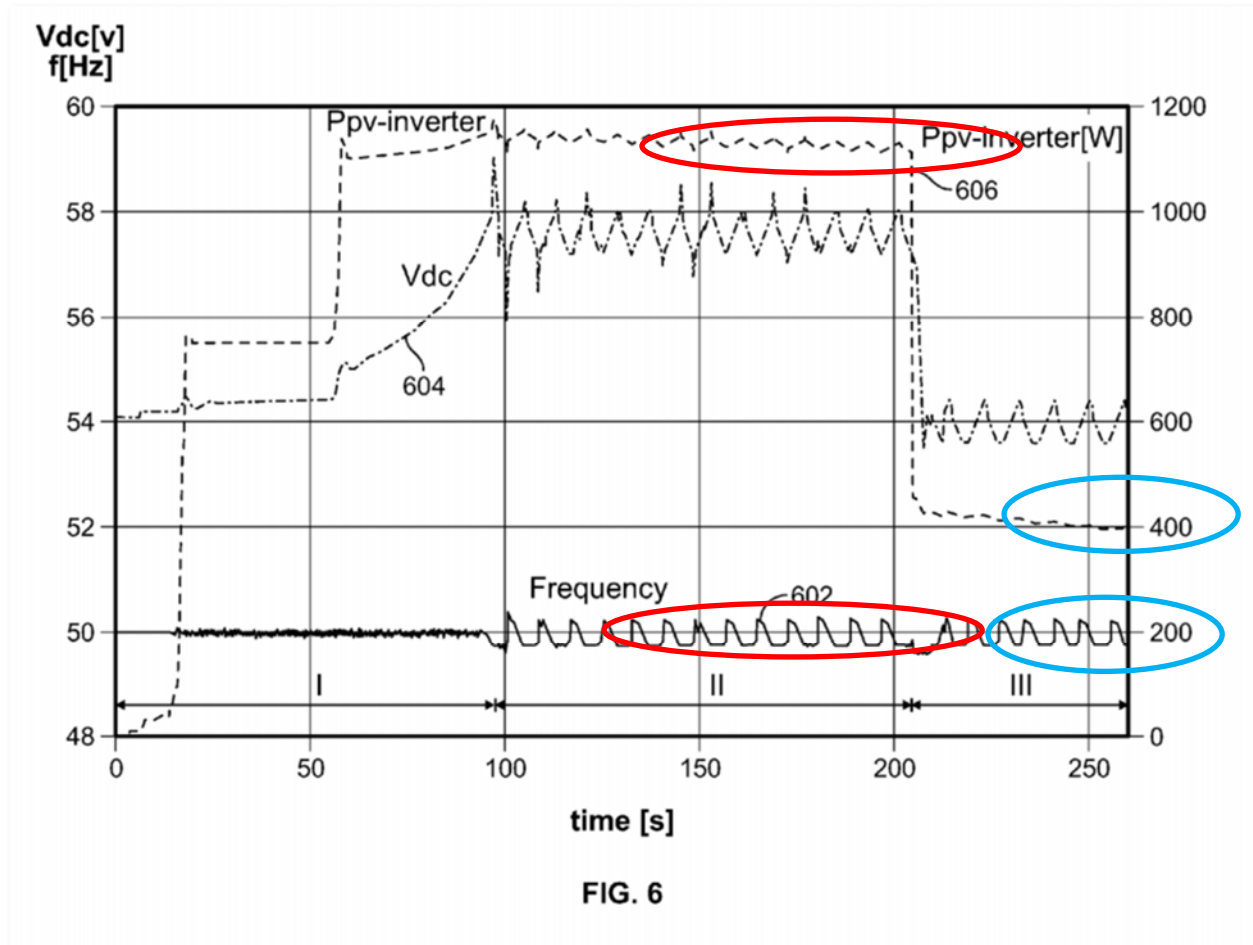
Moreover, unlike the claimed solution discovered by Mr. Garrity and Dr. Jungreis, which utilized current-source inverters in a new way, Serban’s approach requires a “PV inverter,” (the alleged current-source inverter) with components that are intrinsically predicated on Serban’s proposed hybrid converter. Specifically, the alleged current-source inverter, must include a “second controller” that carries out pattern detection. EX1005, ¶¶ 19-21. The second controller detects the pattern sent from the hybrid converter and can change its operation based on that communication via “pattern variation.” *Id.* ¶ 43; *see also id.* at claim 1 (“second controller programmed with machine-readable instructions for carrying out the pattern detection algorithm”). For example, the second controller senses a pattern and then uses a look up table to determine how to operate after receiving that patterned communication. *Id.* ¶ 44. To sense the pattern, the second controller utilizes a “PI frequency controller” or “wavelet frequency tracking WT and pattern,” which can detect “Morlet wavelet transform.” *Id.* ¶ 52.

Serban illustrates his control technique in Fig. 6:



The frequency is shown as line 602, and the power output of the inverter ( $P_{pv}$ ) is shown as line 606. See EX1005, ¶ 55. Although the frequency remains seemingly unchanged at 50 Hz before and after the 50 second mark, the power output of the PV inverter,  $P_{pv}$ , ramps up significantly. Further, even though the frequency line 602 is identical in parts II and III (e.g., 175 and 225 second marks),  $P_{pv}$  is dramatically different (e.g. 1000 watts vs. 400 watts). EX2001, ¶ 72. In short,

Serban's power output is not adjusted as "a function of frequency": one frequency can, and does, map to any number of different power outputs.



As shown in the red circles above, for example, the frequency is often exactly at 50 Hz, and the power is near 1200W (as is true for the left side of the graph where the power is both at ~55 watts and ~58 watts). In the blue circle, the frequency is likewise exactly at 50 Hz many times, but the power is near 400W. Even within the blue circles, the frequency is exactly at 50 Hz many times, but the power is decreased each time. In short, Serban's system instead uses patterned communications and is

not configured to control power output as a function of a frequency of the AC voltage source. Accordingly, **in Serban, Ppv is not controlled as a function of the frequency: a change in frequency does not result in any specific corresponding change to power output.** EX2001, ¶ 72.

**b) Serban does not anticipate or render obvious any claim of the '755 patent.**

Serban uses a different control algorithm to address a different problem (i.e., controlling components far away from one another) than the solution claimed in the '755 patent. Serban thus fails to disclose or suggest numerous exemplary limitations of claim 1 below, which are also included in independent claims 18 and 20:

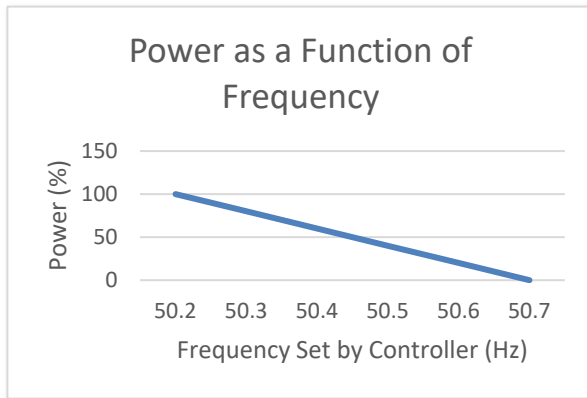
| <b>Claim 1</b>                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1[p]</b> An uninterruptible power supply comprising:                                                                                                                                                                                                                                                       |
| <b>1[a]</b> a bi-directional converter configured to operate as an alternating current voltage source;                                                                                                                                                                                                        |
| <b>1[c]</b> a direct current power port configured to be coupled to a battery;                                                                                                                                                                                                                                |
| <b>1[d]</b> a first alternating current power port coupled to the bi-directional converter and configured to be coupled to a current-source inverter, wherein the current-source inverter is configured to adjust an output power as a function of a frequency of the alternating current voltage source; and |
| <b>1[e]</b> a controller configured to regulate a power flow of the current-source inverter by adjusting a frequency of the alternating current voltage source.                                                                                                                                               |

**First**, the '755 patent requires a current-source inverter that is configured to “adjust an output power *as a function* of a frequency of the AC voltage source.” That

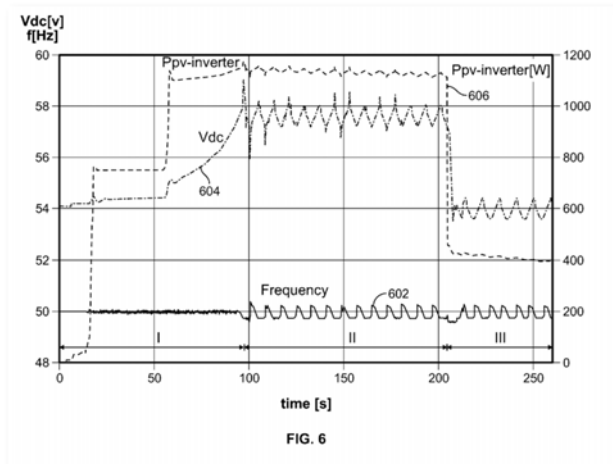
is, power correspondingly adjusts as the frequency adjusts. Every frequency results in one specific output power, allowing for a regulation of power flow via an adjustment of frequency. EX2001, ¶ 57. This is precisely what is discussed in the '755 patent, where the power output described in the embodiment of the specification is determined by the following function:  $\text{Power Output (\%)} = 200 * (50.7 - \text{Frequency (Hz)})$ . EX1001, 6:29-34; EX2001, ¶ 54. And this is precisely how Messrs. Garrity and Jungreis were able to develop the cost-effective solution that could be used with conventional grid-tied-only inverters to “gradually reduce output power when the grid frequency deviate[d] beyond a set limit” in order to create a home backup system. EX1001, 1:28-30.

Serban, on the other hand, teaches to **not** use the conventional grid-tied current source inverters, but to develop a PV inverter that has its own internal controller. But these Serban inverters do not “adjust an output power as a function of a frequency,” as claimed: the output power cannot be expressed as a function of frequency. Indeed, in Serban, at a given a frequency, one could not determine what the output power would be. EX2001, ¶ 95. Unlike the invention described in the '755 patent, where the output power is a function of the frequency, any frequency of Serban can result in any power output:

### '755 Solution



### Serban Solution



EX2001, ¶¶ 93-94.

The Petition and Collins declaration do not—and cannot—account for the different control techniques of the '755 patent versus Serban. Indeed, they provide little-to-no analysis of the “as a function” requirement of the claims. The Petition notes that the Serban inverter can “modif[y] its output power ... in response to frequency changes,” i.e., patterns, but makes no attempt to explain how this modification is *a function of* the frequency of the AC voltage source. See Pet., 23-24; see also Collins Dec., EX1003, ¶¶ 131-136, which is a near-verbatim recitation of the Petition for this claim element. For the power output to be regulated as a function of a frequency, each frequency correlates to one specific power output. EX2001, ¶ 97. This is what allows the power output to be determined based on the frequency. EX2001, ¶ 92. Moreover, this is what is described and claimed in the '755 patent. Given Serban's different techniques, it does not disclose a “current-

source inverter is configured to adjust an output power *as a function of a frequency* of the alternating current voltage source.” Petitioner and its expert offer no analysis to the contrary and instead simply quote Serban and make the conclusory assertion that the entire limitation is met.

**Second**, Serban also does not teach or suggest “regulat[ing] a power flow of the current source inverter by *adjusting* a frequency of the *alternating current voltage source*.” As discussed above, Serban—at best—discloses sending a short communication on the AC line. There is no “adjustment” of the *voltage source* for control, as any pattern wavelet in the AC line does not adjust the system frequency of the voltage source. EX2001, ¶ 98. Indeed, Serban expressly prohibits *adjusting* the frequency of the *AC voltage source* as taught in the ’755 patent because the Serban system requires distinct patterns that cannot be created or detected by other portions of the system. EX1005, ¶ 39; EX2001, ¶ 99. Here, the Petition recognizes that the alleged “adjustment” is a mere pattern generation, and not an overall adjustment to the AC voltage source. *Id.* In Serban, for example, the same two frequencies may result in different output powers, meaning that the control is not due to an adjustment in frequency of the source, but instead to short communication patterns within the source. *Id.*, ¶¶ 93-94. Nevertheless, the Petition provides no explanation of how Serban’s different technology satisfies the claims. Pet., 24-25; *see also* Collins Decl., EX1003, ¶¶ 137-141 (again a near-verbatim recitation of the

Petition for this claim element). As such, the AC line frequency is not adjusted. EX2001, ¶ 97.

These deficiencies of Serban apply to all Serban-based grounds (1-4 and 7). While Petitioner attempts to address other deficiencies of Serban by including additional references in grounds 2-4 and 7, none of these additional references cure the deficiencies of Serban discussed above. EX2001, ¶ 100. As such, Serban is missing two limitations found in each independent claim, and therefore all Serban-based grounds fail to establish a reasonable expectation of success for any challenged claim.

**C. There is no Likelihood of Success for the Somani-Based Grounds (5-6, 8)**

The Petition fails to present any likelihood of success regarding the Somani-based grounds. First, Somani is not prior art. Somani was not filed until June 29, 2016, eleven months after Messrs. Garrity and Jungreis filed the '755 patent. As such, Somani cannot be prior art if the portions relied upon in the Petition are not in Somani's provisional application. Petitioner recognizes this, but offers no analysis; instead, Petitioner scatters citations to entire pages of the provisional in string cites. *See, e.g.*, Pet., 7, 69-86. Here, this is insufficient for Petitioner to carry its burden, as Petitioner relies upon portions of Somani that are not included in the Somani provisional. The Petition does not demonstrate that Somani is prior art.

Second, even if Somani were prior art, the Petition fails to demonstrate that Somani discloses or suggests the challenged claims. To even attempt to make an argument, Petitioner quoted a portion of Somani, and then *modified* the quoted disclosure by adding new disclosure in brackets. Petitioner and its expert offer no reason or rationale for changing the disclosure of Somani. Without the mischaracterization of Somani, the Petition presents no theory of how Somani is invalidating—and even with the mischaracterization, it is not. There is no reasonable likelihood of success.

**a) The Petition fails to demonstrate that Somani is prior art.**

Somani was filed eleven months after the filing of the '755 patent. As such, Somani can only be prior art if the Somani provisional describes the subject matter relied upon in the Petition. *See Forescout Technologies, Inc. v. Fortinet, Inc.*, No. IPR2021-01328, Paper 12, at 9-10 (PTAB Jan. 27, 2022); *Google LLC v. Ikorongo Technology LLC*, No. IPR2021-00058, Paper 14, at 11 (P.T.A.B. May 10, 2021) (“the provisional application must provide sufficient support for the subject matter relied upon for prior art purposes in the reference patent or published patent application”). The Petitioner has the burden to “explain[] in the Petition” and “particularly articulate” why Somani is entitled to the date of its provisional application. *Forescout*, Paper 12, at 9-10. If Petitioner relies upon material that is

not in the provisional, it must explain why the material is supported; a Petitioner cannot “require[] Patent Owner (and the Board) to guess as to what Petitioner might have argued had it attempted to explain how the [provisional] provides support for the alleged subject matter of the [reference] relied upon in the Petition.” *Id.* at 8. Here, the Petition repeatedly relies upon portions of Somani that are not included in the Somani provisional. As such, there is no reasonable expectation of success.

Petitioner provides no explanation at all how this disclosure is supported in the Somani provisional. Instead, Petitioner generally includes citations to entire pages of the Somani provisional in string cites. As an initial matter, Petitioner includes citations to Somani that do not even include a corresponding cite to the Somani provisional. *See, e.g.*, Pet., 71 (relying on Somani’s disclosure of a “bi-directional power inverter” with no corresponding cite to Somani provisional; Somani does not mention a “bi-directional power inverter.”). Moreover, the unexplained, page long string cites to the Somani provisional do not provide support for the differing disclosure in Somani. As one example, independent claim 18 and other dependent claims in the ’755 patent require that “the current-source inverter is configured to disconnect from the alternating current voltage source for a predetermined outage period when the alternating current voltage source frequency goes outside of a predetermined frequency limit . . . .” For this limitation, Petitioner relies upon quotes from Somani. Pet., 82-84. However, there is no corresponding

disclosure in the Somani provisional. Indeed, the only portion of the provisional that Petitioner cites as allegedly disclosing this limitation is Figure 2, which is a virtually illegible flowchart that makes no mention of any predetermined outage period or predetermined frequency limit. *See id.*; EX1008, Fig. 2; EX2001, ¶¶ 105-106.

As another example, each of the independent claims (1, 18 and 20) require a controller configured to regulate a power flow of the current-source inverter . . . .” For this limitation Petitioner relies heavily on Somani’s Figure 2 depicting a “Master Controller” and a “Power Converter Controller.” Pet., 76-78. Petitioner misleadingly suggests that Figure 2 in Somani is the same as Figure 4 of the Somani provisional. *See id.* But Figure 4 of the provisional is plainly different and does not disclose the controller components that Petitioner highlighted in Somani’s Fig. 2; indeed, the provisional figure does not disclose any controller component at all:

**Figure 2 in Somani  
(Pet., 77)**

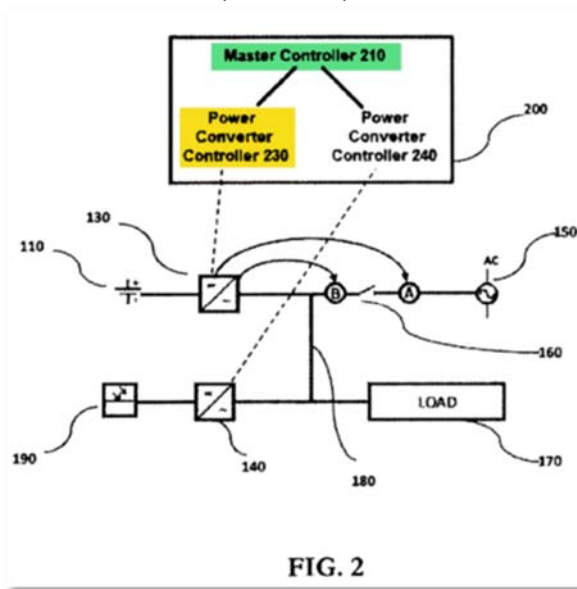
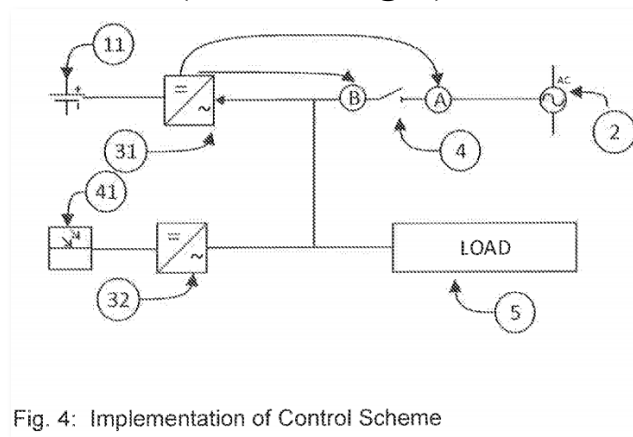


**Figure 4 in Somani provisional  
(EX-1008, Fig. 4)**

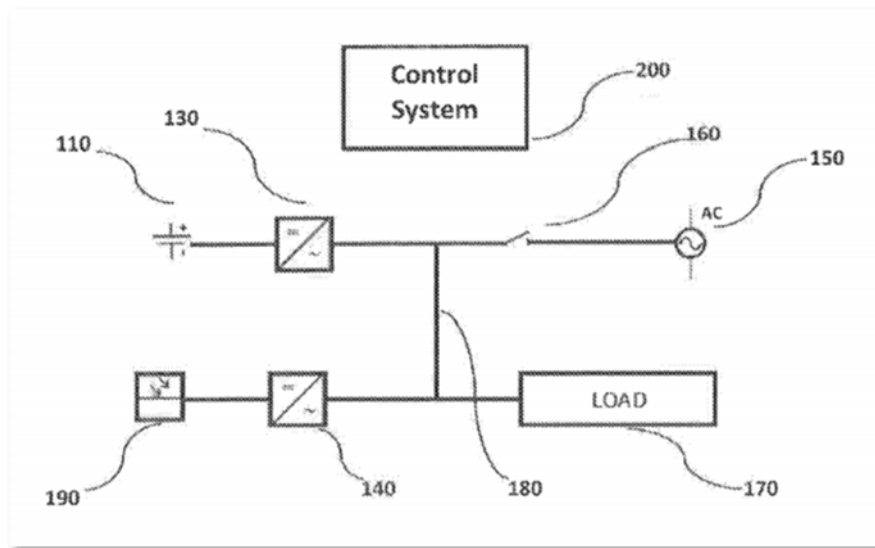


Petitioner cites generically to “page 19” of the Somani provisional as being “similar,” but provides no explanation of what on that page is similar, or how it is similar. See Pet., 76. Page 19 does not describe the “Master Controller” or “Power Converter Controller” functionality illustrated in Somani’s Fig. 2. EX2001, ¶¶ 107-108.

Unsupported by any analysis or explanation, Petitioner explicitly relies on passages and illustrations that are not present in the Somani provisional. Indeed, a POSITA would recognize that the new material of Somani is not supported by its provisional. EX2001, ¶ 110. The Petition fails to demonstrate that Somani is prior art.

**b) Somani's disparate functionality is fundamentally different than the '755 patent.**

Not only does Petitioner fail to establish that Somani is prior art, but Petitioner further fails to establish that the Somani grounds present any reasonable expectation of success. Somani discloses a “microgrid system” having “a variety of interconnected distributed energy resources,” including “distributed power sources (e.g., distributed generators, battery banks, and/or renewable resources such as solar panels or wind turbines) to provide power supply to a grid (e.g., a microgrid having local loads and/or a utility grid).” EX1007, ¶¶ 4-5. Each of these distributed power sources is coupled to a “power converter,” which converts power from a power source from one form to another. *Id.* ¶ 4. For example, the converter takes the power it receives and converts it from DC to AC, AC to DC, or takes AC power and modulates its phase or frequency. *Id.*; EX2001, ¶ 81. In Somani's system, these “power converters” are “coupled to a load” via a PCC (i.e., a point of common connection) to “provide a combined power converter output to the load.” *Id.*, Abstract. Somani illustrates an embodiment of his system in Fig. 1B:



As shown in Fig. 1B, the system includes “energy sources ... to provide power to the load,” including a “battery 110” and an array of solar panels, “solar array 190.” EX1007, ¶¶ 70, 77. As illustrated, each of these energy sources is coupled to a “power converter,” (either 130 or 140) for converting the power sourced from the respective energy source and providing it to a load 170. *Id.*, Abstract.

As shown in Fig. 1B, Somani’s system includes a disconnect switch 160, which “disconnects the grid 150 from the microgrid,” thus placing the system in islanded (i.e., off-grid) mode. *Id.*, ¶ 65. For example, “[u]pon failure of the utility 150, such as a blackout, disconnect 160 is opened via commands from control system 200,” and the load may be powered using the distributed power sources 110 (battery) and 190 (solar panels). *Id.*, ¶ 72. To power the load in islanded mode, the power converters are synchronized together to the last grid voltage, frequency, and phase, via control system 200:

To facilitate the transition and synchronization, the power system 200 saves the last known grid voltage, grid frequency, and grid phase angle. Thus, when disconnect 160 disconnects from grid 150, the control system has a snapshot of the sine wave of grid 150 at the time the plurality of power converters disconnected from grid 150. Through the control system 200, the power converters can know where the sine wave is at the point where the islanding switch is commanded by power system 200 to open, and the power converters can pick up the sine wave from that spot so the critical loads do not see much of a transient, if any, as they transition from grid-tied mode to microgrid mode.

*Id.*, ¶ 81. The system then uses this information “to synchronize the plurality of power converters” including the “output frequency of the power converter.” *Id.*, ¶ 83. Synchronizing output frequency of the power converters “facilitates the sharing of active power among the power converters.” *Id.*, ¶¶ 84-87. As Dr. Ricketts explains, the synchronization is to control the direction of power flow in the system as well as to provide stable power to a load; it does not affect the amount of power output from the power converter. EX2001, ¶ 85.

For control system 200, Somani proposes using “fast communication signals ... between ... devices to make sure that all of the devices are aligned and operating at the same frequency as the frequency of the microgrid.” EX1007, ¶ 93. Under either

configuration, the controller “adjustments” are to synchronize the power converters by synchronizing their phase or frequency. EX2001, ¶ 87.

“In addition” to the synchronization control, Somani recognized that when the system includes both a battery and “renewable generation,” the controller may monitor the battery to determine whether it is “getting overcharged.” *Id.*, ¶ 88. To prevent overcharging, Somani proposes communicating—not with the power converter—but with the renewable resource itself to “turn[] off the generation,” “commanding the renewable resource to produce less,” “signal the resource to produce less,” or, under Petitioner’s invalidity theory here, to remove the renewable resource from the system entirely by “tripping the renewable resource offline by changing the microgrid frequency beyond the nominal frequency.” *Id.*, ¶ 90.<sup>2</sup> Thus, unlike the claimed control of the ’755 patent, where the current source inverter (the

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<sup>2</sup> Petitioner only relies on the “tripping the renewable resource offline” functionality of Somani. And for good reason: the other functionalities also do not disclose or suggest the claims of the ’755 patent and have the same flaw. As Petitioner (and its expert) offers no argument or analysis to the contrary, the other functionalities cannot be considered for purposes of this IPR. *Netflix, Inc. v. Divx, LLC*, 84 F.4th 1371,1377-78 (Fed. Cir. 2023) (finding any argument not raised to the Board is forfeited).

alleged “power converter” of Somani) is “configured to adjust an output power,” Somani instead proposes that the solar array 190 be tripped or removed from the system. Somani does not disclose that the power converter is configured to make any adjustment of power output at all. EX2001, ¶ 88.

**c) Somani does not anticipate or render obvious any claim of the ’755 patent.**

Because of Somani’s disparate approach, it fails to disclose numerous elements of the independent claims, including the exemplary limitations below, which are also included in independent claims 18 and 20:

| <b>Claim 1</b>                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1[p]</b> An uninterruptible power supply comprising:                                                                                                                                                                                                                                                       |
| <b>1[a]</b> a bi-directional converter configured to operate as an alternating current voltage source;                                                                                                                                                                                                        |
| <b>1[c]</b> a direct current power port configured to be coupled to a battery;                                                                                                                                                                                                                                |
| <b>1[d]</b> a first alternating current power port coupled to the bi-directional converter and configured to be coupled to a current-source inverter, wherein the current-source inverter is configured to adjust an output power as a function of a frequency of the alternating current voltage source; and |
| <b>1[e]</b> a controller configured to regulate a power flow of the current-source inverter by adjusting a frequency of the alternating current voltage source.                                                                                                                                               |

**First**, Somani fails to disclose or suggest a “current-source inverter [that] is configured to adjust an output power as a function of a frequency of the alternating current voltage source,” as required by all claims of the ’755 patent. EX2001, ¶¶ 91-

97; *see also id.* ¶¶36-46. To even present this theory, Petitioner must rewrite the disclosure of Somani to say that a renewable energy source is a power converter. But, as taught in Somani—and as a POSITA would readily understand—Somani’s renewable energy source is a different component from the alleged current-source inverter. *Id.*, ¶¶ 115-117. Because of Petitioner’s mischaracterization of Somani, its invalidity theory is not even disclosed in Somani. And even if it were, it would nevertheless fail.

For this limitation, Petitioner relies on Somani’s disclosure at paragraphs 90 and 95, which describes the functionality of the Somani system when a “battery storage is getting overcharged.” EX1007, ¶ 90. Specifically, Somani discloses “curtail[ing] generation of the renewable power resource,” by “tripping the *renewable resource* offline by changing the microgrid frequency.” *Id.* (emphasis added); *see also* Pet., 75. Once the battery storage is able to “accept charge again,” “the *renewable devices* may be brought back online by restoring the microgrid frequency.” EX1007, ¶ 95.

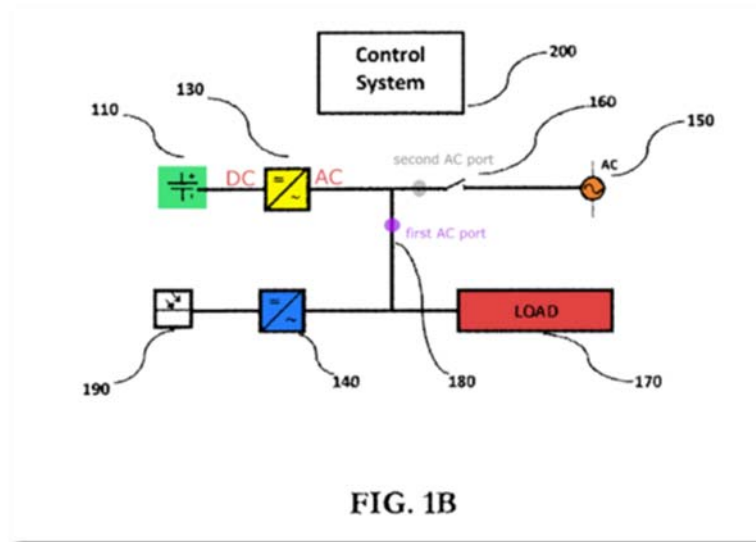
Importantly, this functionality of Somani, which is exclusively relied upon by Petitioner, does not mention Somani’s “power converter” (the alleged current-source inverter) at all, and thus does not disclose or suggest the power converter being configured to do anything. Instead, this disclosure of Somani discusses a different component of the system, the “renewable power resource.” EX1007, ¶¶ 90, 95;

EX2001, ¶¶ 114-120. Specifically, Somani discloses that the controller controls the “renewable power resource,” and Petitioner specifically relies on the clause of Somani saying the control includes “increasing the microgrid frequency to signal **the resource [not the power converter]** to produce less or tripping the **renewable resource [not the power converter]** offline by changing the microgrid frequency. Pet., 75-76 (quoting Somani, ¶ 90) (emphasis added). Somani fails to teach a “current-source inverter [that] is configured to adjust an output power” at all. Instead, Somani discusses commanding a different component, the “renewable resource.” *Id.* ¶ 90. EX2001, ¶¶ 114-120.

Attempting to account for Somani’s deficiency, Petitioner handwaves by lumping the PV inverter 140 and solar array 190 together as the “renewable source”:

Somani’s master power converter may “trip[] the renewable resource [e.g., PV inverter 140 and solar array 190] offline by **changing the microgrid frequency**

Pet., 75. But there is no basis for treating the separate components together as one: Somani explicitly teaches that the PV inverter and solar array are two distinct components. EX1007, ¶ 4; *see also id.* Pet., 75 (Petitioner’s modified Fig. 1B separately coloring power converter 140 from solar array 190):



Somani explains that the “renewable resource” is the solar panels (an array of panels, or a solar array) or a wind turbine. *Id.*, ¶ 4. And Somani is clear that the solar array is a renewable resource, but the separate “PV inverter” is not. EX1007, ¶ 4; EX2001, ¶¶ 118-120. Indeed, even without Somani’s clear disclosure, a POSITA would have readily understood that the solar array and power converter are separate components of the system. *Id.*, ¶ 121.

Indeed, other than modifying its quotation of Somani to baldly state that an example of the “renewable resource” is the “PV inverter 140 **and** solar array 190,” Petitioner provides no explanation or citation as to why it contends the term is different than as clearly described in Somani. Other than modifying its quotation of Somani to baldly state that an example of the “renewable resource” is the “PV inverter 140 **and** solar array 190,” Petitioner provides no explanation or citation as to why it contends the “renewable resource” encompasses the separate PV inverter.

See EX1007, ¶ 4. While Petitioner does not cite to its expert for this proposition, the expert likewise provides no basis; he merely parrots the Petition. EX1003, ¶ 290. In fact, earlier in his declaration, Petitioner’s expert recognized that the “renewable resource” is “solar panels,” and not the separate power converter. *Id.* ¶ 91. Petitioner’s expert’s conclusory assertion, which is a mere echo of the Petition, is a pervasive problem throughout the declaration, and, as such, the declaration cannot support a finding of obviousness. *Xerox Corp. v. Bytemark*, IPR2022-00624, Paper 12, at 2 (Feb. 10, 2023) (institution denied when declaration merely parroted petition, “was conclusory and added little to the assertions the testimony was offered to support.”).

Any discussion in Somani of controlling the “power converters” is in an unrelated scenario that is not relied upon by Petitioner—i.e., controlling the separate renewable energy source in the battery charging scenario. As discussed in Section V.C.b., Somani discloses controlling an alleged current source inverter to synchronize power converters (e.g., their frequency or voltage) so that their respective power generators can share the load. EX2001, ¶ 113. And Somani is explicit throughout that in this synchronization scenario, it is the **power converter** that is controlled. The power converter is not performing a controlling function. EX1007, ¶ 80 (the control system 200 transitions the plurality of power converters ... and synchronizes the power converters), ¶ 81 ([t]hrough the control system 200,

the power converters can know where the sine wave is” and “the power converters can pick up the sine wave from that spot so the critical loads do not see much of a transient”), ¶ 83 (controller reducing *frequency* to synchronize converters); ¶ 87 (in transitioning from grid mode, synchronizing power converters); ¶ 80 (“The power converters transition together using a single disconnect 160 on the same microgrid.”).

The synchronization disclosed in Somani does not regulate the power output, and Petitioner makes no argument to the contrary. Petitioner does not rely on any of the foregoing examples of synchronization control of the power converter, as they do not disclose any power converter being “configured to adjust an output power as a function of a frequency of the alternating current voltage source.” See Pet., 75-76.

Instead, Petitioner relies on the battery charging scenario, which Somani explicitly describes as an “addition[al],” different control scenario. EX1007, ¶ 90. But as described above, the battery scenario does not discuss the alleged current source inverter, must less describe it as being configured to “adjust an output power as a function of a frequency.”

A fundamental problem for Petitioner is that the synchronization disclosed in Somani does not adjust the power output, and Petitioner makes no argument to the contrary. Petitioner does not rely on any of the foregoing examples of synchronization control of the power converter, as they do not disclose any power

converter being “configured to adjust an output power as a function of a frequency of the alternating current voltage source.” See Pet., 75-76.

Instead, Petitioner relies on the battery charging scenario, which is described after the synchronization scenario. Somani explicitly describes the battery charging scenario as an “addition[al],” different control scenario. EX1007, ¶ 90.

In sum, Petitioner’s attempt to modify the disclosure of Somani must be rejected. Somani is clear that the controller performs two different functions, one that controls the power converters for synchronization and a second one that commands a renewable resource to trip or shut off. By rejecting Petitioner’s misguided summary of Somani, the power converter 140 does not “adjust an output power as a function of a frequency of the alternating current voltage source,” as required by the claims of the ’755 patent. Somani fails to disclose the power converter being configured to adjust its output power at all. At best for Petitioner, the separate “solar array 190,” what Somani discloses as a “renewable energy source,” is configured to adjust its output power in response to communications from the controller, which is irrelevant to the claims of the ’755 patent. EX2001, ¶¶ 114, 117.

**Second**, Somani’s controller is not configured to “regulate a power flow of the current-source inverter.” EX2001, ¶ 123. As just discussed, under Petitioner’s theory, Somani’s alleged controller does not do anything to the power-source

converter at all. *Id.*, ¶ 121. While tripping the solar array offline may cut off power going to the power converter, the power converter is nevertheless still converting 100% of the power it receives—there is no regulation of power flow.

**Third**, Somani fails to teach or disclose the alleged current source inverter—or any other component of the system—being configured to adjust an output power **as a function** of frequency. EX2001, ¶ 122. The solar panel tripping itself offline, alone, is not an adjustment of output power as a function of frequency. While some frequencies may cause the solar array to trip, and others may bring it online, Somani does not disclose any power control as a function of frequency where each frequency results in a specific power output. *Id.*, ¶¶ 47-49. Petitioner did not address the “as a function” limitation at all or identify any function disclosed or suggested in Somani. *Id.*, ¶ 122. The Petition fails.

Somani fails to disclose the claimed control functionality of the ’755 patent. These deficiencies of Somani apply to all Somani-based grounds (5-6 and 8). While Petitioner attempts to address other deficiencies of Somani by including additional references in grounds 6 and 8, none of these additional references cure the deficiencies of Somani discussed above, and Petitioner makes no argument to the contrary. Indeed, for ground 6, which includes claims 1 and 18, Petitioner and its expert state only that “Somani’s features relied on for anticipation ... remain in [the combination],” thus making the combination render claims 1 and 18 obvious.

EX1003, ¶ 321; Pet., 88. For the remaining independent claim (claim 20), Petitioner again incorporates ground 1, and does not attempt to address Somani’s failures discussed above. EX2001, ¶¶ 124-125. As such, all Somani-based grounds fail to establish a reasonable expectation of success for any challenged claim.

## **VI. SECTION 311(B) OF THE AIA AND THE SCOTUS RULING IN *SAS* PREVENT INSTITUTION**

The Petition must be denied under 35 U.S.C. § 311(b). Regardless of whether Somani is prior art under 35 U.S.C. § 102, it cannot be used for IPR. While Section 102 identifies numerous disclosures that qualify as “prior art,” an IPR may only be instituted on a subset of that art. Specifically, §311(b) allows *inter partes* review “only on the basis of prior art consisting of patents or printed publications.” 35 U.S.C. § 311(b). Petitions thus may not be instituted on prior art consisting of “public use” or “sales,” as recited in §102(a)(1) or a patent application that was filed before the effective date, but published after, as contemplated in §102(a)(2).

Somani is not “prior art consisting of patents or printed publications” as required by § 311(b). Somani is a patent publication, and thus not prior art consisting of a patent. EX1007, 1. Moreover, Somani was not published until January 5, 2017 (*id.*), well after the July 28, 2015 filing date of the ’755 patent (EX1001,1). Petitioner makes no argument that Somani was publicly available before its publication. As such, Somani is not prior art consisting of a printed publication because “[f]or a

reference to qualify as a printed publication, ‘before the critical date the reference must have been sufficiently accessible to the public interested in the art.’” *See, e.g., Valve Corp. v. Ironburg Inventions Ltd.*, 8 F.4th 1364, 1373 (Fed. Cir. 2021) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1568 (Fed. Cir. 1988)). As such, the Petition cannot be instituted based on Somani.<sup>3</sup>

Moreover, because the Supreme Court’s decision in *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348 (2018) prohibits institution on fewer than all petitioned grounds, the entirety of the Petition, including non-Somani grounds, must be denied. Under SAS, because institution is not authorized for the Somani-based grounds, institution is not authorized for any additional grounds.

## **VII. CONCLUSION**

The Board need not reach the merits here and should exercise its discretion to deny the Petition. Should the Board reach the merits, Petitioner fails to demonstrate a reasonable likelihood of prevailing. Not only is Somani not prior art, both Serban and Somani fail to disclose or suggest the novel control functionality claimed in the ’755 patent.

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<sup>3</sup> Petitioner recognizes and notes that this issue is currently on appeal before the Federal Circuit in *Lynk Labs, Inc. v. Samsung Elecs. Co.*, No. 2023-2346 (Fed. Cir.).

Dated: May 8, 2024

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**CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATION,  
TYPEFACE REQUIREMENTS, AND TYPE STYLE REQUIREMENTS**

1. This Patent Owner's Preliminary Response complies with the type-volume limitation of 14,000 words, comprising 13,462 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

2. This Patent Owner's Preliminary Response complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2016 in 14 point Times New Roman.

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**CERTIFICATE OF SERVICE**

Petitioner has consented to e-mail service in this proceeding. Pursuant to 37 C.F.R. §42.6, the undersigned certifies that on May 8, 2024, a copy of the foregoing document was served by email upon the following counsel at the below email addresses:

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