

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MERCEDES-BENZ USA, LLC,

Petitioner,

v.

DAEDALUS PRIME LLC,

Patent Owner.

Case No.: IPR2023-01335

U.S. Patent No. 8,775,833

PATENT OWNER'S SUR-REPLY

TABLE OF CONTENTS

I.	INTRODUCTION AND SUMMARY OF ARGUMENTS ..	1
II.	LEVEL OF ORDINARY SKILL IN THE ART	3
III.	CLAIM CONSTRUCTION	6
IV.	MB USA FAILED TO DEMONSTRATE THAT FINKELSTEIN TEACHES OR SUGGESTS THE INVENTION RECITED IN CLAIM 1	7
V.	MB USA FAILED TO DEMONSTRATE THAT CONROY TEACHES OR SUGGESTS POWER SHARING VALUES IN DIFFERENT STORAGES, AS REQUIRED BY CLAIM 13.....	8
VI.	MB USA FAILED TO SHOW THAT CLAIMS DEPENDING FROM CLAIM 13 ARE OBVIOUS IN VIEW OF CONROY	11
A.	MB USA Has Not Shown That Conroy Teaches or Suggests “A Power Sharing Logic to Determine a Variable Power Budget for a Current Time Interval,” as Recited in Claim 14.....	11
B.	Claim 16 has not been shown to be obvious in view of Conroy-Bose	12
VII.	MB USA HAS NOT SHOWN THAT CLAIM 13 IS UNPATENTABLE IN VIEW OF NUSSBAUM	14
VIII.	MB USA HAS NOT SHOWN THAT CLAIMS DEPENDING FROM CLAIM 13 ARE OBVIOUS IN VIEW OF NUSSBAUM.....	15
IX.	CLAIM 1 IS NOT OBVIOUS IN VIEW OF CONRY AND FINKELSTEIN	17
X.	THE REMIAINING ARE NOT OBVIOUS IN VIEW OF CONROY-FINKELSTEIN	18
XI.	CONCLUSION.....	18

TABLE OF AUTHORITIES

CASES

<i>Abington Textile Machinery Works v. Carding Specialists (Canada) Ltd.</i> , 249 F. Supp. 823 (D.D.C. 1965)	6
<i>Al-Site Corp. v. VSI Int’l Inc.</i> , 174 F.3d 1308 (Fed. Cir. 1999).....	4
<i>Env’t Designs, Ltd. v. Union Oil Co.</i> , 713 F.2d 693 (Fed. Cir. 1983).....	5
<i>Innovention Toys, LLC v. MGA Entm’t, Inc.</i> , 637 F.3d 1314 (Fed. Cir. 2011).....	4
<i>Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.</i> , 821 F.3d 1359 (Fed. Cir. 2016).....	12
<i>KSR Int’l Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007)	5
<i>Microsoft Corp. v. D3D Technologies, Inc.</i> , IPR2021-00647 (PTAB Aug. 3, 2022)	3
<i>Qualcomm Incorporated v. Daedalus Prime LLC</i> , IPR2023-00550 (PTAB Sep. 19, 2023)	15
<i>Samsung Electronics Co., Ltd. v. GUI Global Products Ltd.</i> , IPR2021-00335 (PTAB Jun. 29, 2022).....	4

OTHER AUTHORITIES

Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019)	6, 12
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I. INTRODUCTION AND SUMMARY OF ARGUMENTS

MB USA's Reply offers no convincing rationale for the Board to find in its favor. For example, as to the correct level of ordinary skill in the art, MB USA mistakenly believes that definition that encompass experts in the field are entirely appropriate. This is not so, and panels of the Board routinely reject such definitions. Getting the POSITA definition correct is important and since Dr. Horst used an incorrect definition of a POSITA in his analyses, the Board should accord little weight to his opinions.

As to MB USA's challenges to the claims, its reliance on Finkelstein is misplaced because even its own declarant agreed that the "unused" budget $W_{ki}E^k - E_{high}^i$ is *not* the power budget of *the processor*, as required by claim 1, but only excess of a power budget of an individual power plane. As it was MB USA that relied on this unused budget to teach this element of the claim, it cannot now complain that by pointing out the flaw in its analysis, Daedalus Prime has somehow taken things out of context.

As to the challenges based on Conroy, MB USA would have the court read out the requirement of separate storages in independent claim 13 and instead read these elements as referring to a communal memory. Only by doing so does MB USA's reliance on Conroy's power distribution tables being stored in a single memory work for its challenge. But claim 13 is clear

that separate storages are required and, to that end, the '833 patent describes an example of two configuration registers. Indeed, this example was distinguished for other possible storage arrangements, such as a single memory. As claim 13 is directed to the separate storage embodiment, MB USA's challenge based on Connelly falls short.

The challenges based on Nussbaum fare no better. MB USA argues that in Nussbaum, computational units might include multiple cores. Even so, Dr. Brogioli explained that, "If Nussbaum is read to describe a domain with multiple cores, . . . then each one of the cores in such a domain will, necessarily, have its own frequency (or boost) sensitivity. And, any distribution of power headroom among those cores will be based on those cores' individual sensitivities to frequency changes." Thus, the frequency sensitivities described by Nussbaum remain per-core, rather than per-domain attributes and MB USA has not shown that claim 13 is unpatentable in view of Nussbaum.

Finally, MB USA's challenges based on Conroy-Finkelstein fail because even if a person of ordinary skill in the art would have made such a combination—they wouldn't—that combination still would not teach or suggest separate domains to operate at independent voltage and frequency, as recited in claim 1. The claim requires separately controllable voltages and

frequencies, whereas in a Conroy-Finkelstein combination throttle settings may result in different voltages and frequencies but there is no indication they are separately controllable.

II. LEVEL OF ORDINARY SKILL IN THE ART

In its Reply, MB USA demonstrates an important misunderstanding concerning the level of ordinary skill in the art, calling it a “floor, not a ceiling,” and arguing, “One with greater than ‘ordinary’ skill necessarily meets the definition of a POSITA.” Reply at 2. In MB USA’s world, an “expert” thus suddenly becomes a POSITA. This is *not* how the level of ordinary skill for purposes of an obviousness analysis is to be understood.

Panels of this Board regularly recognize that proposed definitions of a POSITA that recite “at least” certain education, knowledge, and/or levels of skill are improper because they encompass more than just persons of “ordinary” skill. *See, e.g., Microsoft Corp. v. D3D Technologies, Inc.*, IPR2021-00647, Paper 32, slip op. at 7-8 (PTAB Aug. 3, 2022) (deleting the qualifier “at least” from a proposed definition of a POSITA “to keep the articulation from extending to the realm of an expert”); *Samsung Electronics Co., Ltd. v. GUI Global Products Ltd.*, IPR2021-00335, Paper 26, slip op. at 9-10 (PTAB Jun. 29, 2022) (deleting the phrase “at least” in

the definition of a POSITA's level of education "to avoid ambiguity in the definition of the level of skill"). The rationale here is that someone with lesser experience is likely to see a purported invention as patentable; while someone with a very-high level of skill might see the same advance as obvious. *See Innovention Toys, LLC v. MGA Entm't, Inc.*, 637 F.3d 1314, 1323 (Fed. Cir. 2011) ("A less sophisticated level of skill generally favors a determination of nonobviousness . . . while a higher level of skill favors the reverse.").

Policing the definition of a POSITA in this fashion is important because the POSITA is the "prism or lens through which a judge or jury views the . . . invention." *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999). Indeed, the POSITA's vantage point is considered so foundational that virtually every patent textbook and judicial opinion emphasizes that doctrinal outcomes in patent cases are tied to this perspective. *See, e.g., Env't Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 697 (Fed. Cir. 1983) (emphasizing the importance of specifying the correct level of skill in the art, and differentiating the skill level of an ordinary artisan from that of "the judge," "a layman," "those skilled in remote arts," or "geniuses in the art at hand."). By definition, certain individuals, including those of exceptional skill and/or knowledge are *not* POSITAs. In

KSR, the Supreme Court characterized the PHOSITA in realistic terms: as a member of a technological community that is subject to market pressures, as a person who can implement *predictable* variations of pre-existing technology, and as a person of *ordinary* creativity. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 419-421 (2007). Someone with beyond the ordinary level of skill, whether by education or experience or both, cannot be equated with the POSITA contemplated by § 103 because that individual is, by his/her very nature, unordinary. *See, e.g., Abington Textile Machinery Works v. Carding Specialists (Canada) Ltd.*, 249 F. Supp. 823, 829 (D.D.C. 1965).

By including individuals with more than just two years of experience in “the research, design, development, or testing of electronic circuits or components or software for controlling electronic circuits or components, or the equivalent,” Petitioner’s definition of a POSITA necessarily includes persons with more than *ordinary skill* in the art and Petitioner admits as much. Reply at 2. To that end, Petitioner’s definition of a POSITA is improper and it should not be accepted by Board in its proffered form. Moreover, because Dr. Horst used this improper definition in his analyses, Ex. 1029 at ¶ 30; Ex. 2001 at 10:5-15, the Board should accord little weight to his opinions. Patent Trial and Appeal Board Consolidated Trial Practice

Guide (Nov. 2019) (“Consol. TPG”) at p. 35 (“The Board has broad discretion to assign weight to be accorded expert testimony.”).

III. CLAIM CONSTRUCTION

MB USA attempts to frame Dr. Brogioli’s deposition testimony as somehow construing “independent” to mean “different” in the context of the claims. Reply at 2-3. He did not. In fact, Dr. Brogioli reiterated that in the context of the claims, “independent” means separately controlled:

Q. Okay. And then, getting into the claims, for instance, in Claim 1, it's noting that the first and second domain have operated independent voltage and frequency.

Do you agree with that?

A. That the -- the claim says the first -- sorry -- a first domain and a second domain, each of the first and second domains, to operate at an independent voltage and frequency, is talking about these domains -- when we look at the equations or the formulas -- and as I talk about in my Declaration, they are related, but each of the values or budgets for the domains can be -- can be set or operated independently.

Ex. 1032 at 24:12-24. As noted in Patent Owner’s Response, this is consistent with the way in which the term “independent” is used throughout

the specification. POR at 12-15; *and see* Ex. 2002 at ¶¶ 32-35. Whether the result of this separate control means that any particular values of the voltage and frequency of the first domain and the second domain are the same or different is not the point and will ultimately depend on how a power budget for the processor is allocated among the different domains. Ex. 1001 at 5:9–12 (each respective portion of the processor’s power budget “can be allocated to each of the domains by controlling their frequency and/or voltage accordingly”). What matters is a person of ordinary skill in the art would recognize that claim 1 is reciting separate control of voltages and/or frequencies of the different domains. Ex. 2002 at ¶ 33.

IV. MB USA FAILED TO DEMONSTRATE THAT FINKELSTEIN TEACHES OR SUGGESTS THE INVENTION RECITED IN CLAIM 1

MB USA criticizes Patent Owner for taking statements in Finkelstein out of context. Reply at 3. But it was MB USA, not Daedalus Prime that relied on the “distribut[ion] among the rest of the power planes [domains] proportionally to their weights” of an “unused” budget for domain i , defined as a variable $W_{ki}E^k - E_{high}^i$, as teaching claim 1’s requirement of dynamically allocating a power budget of the processor. Pet. at 24. And, it is clear that any “unused” budget $W_{ki}E^k - E_{high}^i$ is *not* the power budget of

the processor. It is an excess of a power budget of a power plane. Ex. 1005 at [0035]; Ex. 2002 at ¶ 41; *and see* Ex. 1032 at 38:21 – 39:9, 43:15 – 44:7. Even Dr. Horst confirmed that this expression concerns allocation of a portion of a budget of an individual power plane. *See* Ex. 2001 at 25:17 – 26:1 (Dr. Horst confirming that in Finkelstein’s Equation 2, “*i*” denotes a portion of a power budget that correspond to a particular power plane for the system). Hence, MB USA failed its requirement to demonstrate that claim 1 is unpatentable in view of Finkelstein.

V. MB USA FAILED TO DEMONSTRATE THAT CONROY TEACHES OR SUGGESTS POWER SHARING VALUES IN DIFFERENT STORAGES, AS REQUIRED BY CLAIM 13

MB USA alleges, “both Conroy and the ’833 Patent store ‘power sharing values’ in separate registers (‘storages’) within a larger ‘memory.’” Reply at 5. First, ’the 833 patent nowhere indicates that the separate configuration registers that store the policy values illustrated in Table 1 are part of the same memory. Indeed, the ’833 patent describes “two such configuration registers” and in claim 13 separate first and second storages are recited. Ex. 1001 at 4:9-10, 12:59-62. Second, Conroy is clear that all of power distribution tables are stored in *a single memory*. Ex. 1006 at [0201].

There is no mention of individual registers of a memory and MB USA's arguments distort the actual teachings of Conroy.

In an attempt to justify its position MB USA claims Dr. Brogioli described memories as being made up of registers. Reply at 5. He did not. Dr. Brogioli distinguished registers from memory by the manner in which they are employed by a machine. Ex. 1032 at 12:21 – 13:23. MB USA also misapprehends the specification of the '833 patent by alleging the power sharing values are stored in a power control storage 357, thereby indicating a single memory. Reply at 5. But in the very next sentence, the '833 patent indicates, "Although shown at this location in the embodiment of FIG. 6, understand that . . . the storage of this information can be in other locations, such as configuration registers, non-volatile storage or the like." Ex. 1001 at 8:63-67. That is, the '833 patent specifically distinguishes the use of configuration registers from a single power control storage (a single memory, in MB USA's view) and it is this use of separate (first and second) storages that is recited in claim 13. If anything, MB USA's highlighting of the different embodiments—a single power control storage vs. configuration registers—confirms that claim 13 is not met by Conroy's storage of multiple tables in a single memory. Notably, MB USA cannot point to any text in

Conroy, or its own declarant's testimony for that matter, that discloses the use of separate storages for the power distribution tables.

As to MB USA's contention that "Conroy's storage of 'throttle settings' in 'registers' teaches storage of 'power sharing value[s]' in 'registers,'" Reply at 6, Dr. Brogioli merely confirmed that Conroy describes storing a determined throttle setting in a register of a microcontroller. Ex. 1032 at 49:5-8. As he earlier explained in his declaration, this passage does not indicate "a departure from the use of a memory to store tables of power weighting arrangement settings." Ex. 2022 at ¶ 49. "The microcontroller stores the throttle settings determined by the sensor measurements in registers and uses that information to control the subsystems." *Id.* (citing Conroy at [0097]). MB USA offers no rebuttal testimony from Dr. Horst to contradict this reading of Conroy.

Thus, MB USA failed its requirement to demonstrate that claim 13 is unpatentable in view of Conroy.

VI. MB USA FAILED TO SHOW THAT CLAIMS DEPENDING FROM CLAIM 13 ARE OBVIOUS IN VIEW OF CONROY

A. MB USA Has Not Shown That Conroy Teaches or Suggests “A Power Sharing Logic to Determine a Variable Power Budget for a Current Time Interval,” as Recited in Claim 14

Recognizing that its Petition suffered from a fatal flaw by alleging that $T+\Delta$ was a current time interval, Pet. at 63, MB USA now embarks on a new theory and alleges that it doesn’t matter. Reply at 7. This is not how *inter partes* reviews are to be conducted and petitioners cannot just adopt new theories of unpatentability mid-stream. *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (“It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’”) (citing 35 U.S.C. § 312(a)(3)); *see also* Consol. TPG at 74-75. Moreover, it is clear from Conroy that the computation referenced by MB USA computes an allowable power budget for “*the next time interval (e.g., for time $T+\Delta$)*.” Ex. 1006 at [0070], *and see* Ex. 2002 at ¶¶ 53-54. Determining a power budget for a *next* time interval is not determining a power budget for a *current* time interval, as required by claim 14. Hence, MB USA has failed to show that claim 14 is unpatentable over Conroy.

B. Claim 16 has not been shown to be obvious in view of Conroy-Bose

The Reply falsely alleges that “Patent Owner implicitly concedes that Conroy and Bose disclose each element of claim 16.” Reply at 8. In fact, Patent Owner’s response stated, “Insofar as claim 16 depends, indirectly, from claim 13, and the petition relies on Conroy for teaching or suggesting the limitations of claim 13, then claim 16 is not obvious in view of Conroy-Bose for at least the reasons set forth with respect to claim 13.” POR at 39-40. That is, because claim 16 includes the requirement of power sharing values in separate storages, a feature absent from Conroy and one which MB USA does not allege is taught by Bose, Conroy-Bose does *not* disclose each element of claim 16.

Nor has MB USA showed that a person of ordinary skill in the art would combine the teachings of Conroy and Bose, as alleged. The Reply argues that the Patent Owner response ignores Conroy’s disclosure of requests to change throttle settings, which correspond to changes in allocated power. Reply at 8. That is not so. The point made in the Response was that, in Conroy, “[P]ower draw is allocated to and allowed for the subsystem having a higher workload.” Ex. 1006 at [0006]. Power usage is monitored and predictions about the need for power in future time intervals are made.

Id. at [0072]. The settings corresponding to the predicted power usage are used until new power measurements reveal the need for a change. *Id.* at [0130]. Rather than “requests” for changed settings then, Conroy relies on monitored power usage and predicted power needs for varying throttle settings.

Even the passage of Conroy referred to in the Reply confirms this understanding of Conroy. Power settings are determined on a substantially continuous basis and varied as and when necessary, according to predicted power needs. *Id.* at [0131]. In some cases, to avoid too frequent changes, current power settings may be maintained unless the predictions show a significant change in power requirements is imminent. *Id.* But, in all cases, it is the predicted power needs, not a request for power, that is the basis for changing power settings. Thus, contrary to MB USA’s position, a person of ordinary skill in the art would have no need to look to teachings of Bose to understand how to address “requests” for power setting changes. Ex. 2002 at ¶¶ 57-58. Consequently, MB USA has not shown claim 16 to be unpatentable in view of Conroy and Bose.

VII. MB USA HAS NOT SHOWN THAT CLAIM 13 IS UNPATENTABLE IN VIEW OF NUSSBAUM

MB USA cites a non-final, institution decision from IPR2023-00550 for the proposition that Nussbaum's computational units may include cores. Reply at 10. That decision from the Board specifically recognized that any findings of fact it might have included were not evaluated with the requirement to meet the preponderance of evidence standard. *Qualcomm Incorporated v. Daedalus Prime LLC*, IPR2023-00550, Paper 13, slip op. at 36 (PTAB Sep. 19, 2023). Accordingly, it is not a proper basis for this panel on which to base any decision.

Moreover, that Nussbaum's computational units might include multiple cores does not diminish or negate the fact that in Nussbaum, frequency sensitivities are per-component, e.g., per-core, attributes, **not** per-domain attributes. Ex. 2002 at ¶ 63. Dr. Brogioli has already stated, "If Nussbaum is read to describe a domain with multiple cores, as I understand the petition alleges, Pet. at 35-38, then each one of the cores in such a domain will, necessarily, have its own frequency (or boost) sensitivity. And, any distribution of power headroom among those cores will be based on those cores' individual sensitivities to frequency changes." *Id.* The Reply does not contest this point and Dr. Horst's testimony that "Nussbaum 'distribut[es]' TDP 'power headroom among the computational units' and

‘allocate[s] power between’ them,” Reply at 11 (quoting Horst Decl., ¶ 136), simply reinforces the points that Dr. Brogioli makes. Tellingly, the Reply does not grapple with the fact that Nussbaum expressly distinguishes a per-domain approach from its prescribed process of changing power consumption on a per-core basis. *See* Ex. 1007 at [0017]. As Nussbaum states, “[t]he rationale for that is to not waste power by boosting cores whose performance will not be increased.” *Id.* at [0040]. Thus, MB USA has not shown that claim 13 is unpatentable in view of Nussbaum.

VIII. MB USA HAS NOT SHOWN THAT CLAIMS DEPENDING FROM CLAIM 13 ARE OBVIOUS IN VIEW OF NUSSBAUM

MB USA’s Reply offers no separate rebuttal to Patent Owner’s argument that Nussbaum does not teach or suggest the allocation of a variable power budget as recited in either of claims 14 or 15 and, therefore, that these claims are not unpatentable in view of Nussbaum.

As to claim 18, the Reply essentially agrees with the Patent Owner Response, which argued that “The ‘output value’ of step 601 is not used to ‘allocate the variable power budget,’ but rather to adjust the amount of power budget that is available.” POR at 53. The Reply quotes Nussbaum as stating, “In 601, CPU-bounded or GPU-bounded applications are identified...*the power headroom made available through throttling is*

provided in 609 to the computational unit(s) executing the CPU-bounded and/or GPU-bounded application.” Reply at 12-13 (emphasis in original) (quoting Nussbaum at [0047]). In other words, the Reply has retreated from the Petition’s allegation that “if the output value of step 601 identifies an application as GPU-bounded, then CPU cores may be throttled to release power margin available to the GPU.” Pet. at 50. Petitioner thus now admits the output value is used to throttle CPU cores and create more power budget, but no power budget is allocated using the output of step 601. The output of step 601 is simply an identification. Ex. 1007 at [0047]. Hence, claim 18 is not obvious in view of Nussbaum as alleged in the Petition.

Finally, with respect to claim 16, the Reply does not contest Patent Owner’s explanation that in Nussbaum, the “boost values” are physical characteristics calculated based on performance level and utilization metrics, and that while they are periodically re-evaluated, they are not “incremented” in response to a request. POR at 56. Accordingly, there is no reason for a person of ordinary skill in the art to adopt a scheme such as in Bose for incrementing a token count to determine when to satisfy a request inasmuch as there are no such requests to be satisfied in Nussbaum. Hence, a person of ordinary skill in the art would not make the proposed combination of Nussbaum and Bose and MB USA does not convince otherwise.

IX. CLAIM 1 IS NOT OBVIOUS IN VIEW OF CONROY AND FINKELSTEIN

The Reply contends that a person of ordinary skill in the art would have been motivated to combine the teachings of Conroy and Finkelstein for reasons of size and weight and to improve reliability and power efficiency. Reply at 15. But such generalized considerations do not support a motivation to combine where, as here, the teachings of Conroy and Finkelstein, are directed to different levels within a system. Ex. 2022 at ¶ 74. Nothing in the Petition nor the Reply explains how solutions intended for these different aspects of a system can or, more importantly, would be applied in the context of the other.

Further, as explained in the Patent Owner Response, modifying Conroy in view of Finkelstein would not result in the claimed invention. POR at 58. The Reply essentially admits that any such modification would only add a Finkelstein-like component within Conroy's system, Reply at 15, but as Dr. Brogioli already explained, that would not alter the power management approach of Conroy. Ex. 2002 at ¶ 75. The resulting Conroy-Finkelstein combination would therefore still not include subsystems to operate at independent voltage and frequency, as recited in claim 1. While the throttle settings are variable, there is no teaching in Conroy they are separately controllable—that is, independent—and merely because the

throttle settings may relate to different voltages and frequencies, Reply at 16, is insufficient. *Id.* at ¶ 76.

X. THE REMAINING ARE NOT OBVIOUS IN VIEW OF CONROY-FINKELSTEIN

MB USA's Reply alleges "Patent Owner implicitly agrees with Petitioner's arguments that [claims 2-5, 7, 14-15, 17, and 18] are unpatentable over Finkelstein and Conroy. Reply at 17. This is not the case. In fact, Patent Owner's Response specifically noted that since MB USA did not allege that any of these claims is obvious for any specific reasons, the Petition failed to demonstrate any of these claims are obvious in view of Conroy-Finkelstein. POR at 60, 61. MB USA's intimation otherwise is inappropriate.

XI. CONCLUSION

For at least the foregoing reasons, and those in the Patent Owner's Response, the Board should find that Petitioner MB USA has failed to prove the unpatentability of any of the challenged claims.

Dated: September 25, 2024

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WORD-COUNT CERTIFICATE

I certify that the foregoing document complies with the type-volume limitation of 37 C.F.R. § 42.24(a) and (b) and contains 3,893 words (including words in drawings created by the Patent Owner or as annotations added by the Patent Owner to images reproduced in this document) based on the word count indicated by Microsoft® Word for Mac v. 16.89, excluding those portions exempted by the rule.

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing:

PATENT OWNER'S SUR-REPLY

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The parties have agreed to electronic service in this proceeding.

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