

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDIATEK, INC.
Petitioner,

v.

MOSAID TECHNOLOGIES INC.,
Patent Owner

Inter Partes Review No. IPR2024-00599
Patent No. 7,224,563

PATENT OWNER'S PRELIMINARY RESPONSE

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37 C.F.R. §42.107	1
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PATENT OWNER'S EXHIBIT LIST

Exhibit	Description
2001	Declaration of William Henry Mangione-Smith, Ph.D.
2002	Joint Claim Construction and Prehearing Statement, <i>MOSAID Tech. Inc. v. MediaTek, Inc.</i> , No. 2-23-cv-00129 (May 9, 2024) ECF No. 64
2003	Rabaey et al., <i>Digital Integrated Circuits</i> (2d ed. 2003)
2004	<i>Standard Dictionary of Electrical and Electronics Terms</i> (1988)
2005	<i>Microsoft Press Computer Dictionary</i> (3d ed. 1997)
2006	Horowitz et al., <i>The Art of Electronics</i> (2d ed. 1990)
2007	Tendler et al., <i>POWER4 System Microarchitecture</i> , 1 IBM J. Res & Dev. 5 (2002)
2008	Ian Cutress, <i>Intel 12th Gen Core Alder Lake for Desktops: Top SKUs Only, Coming November 4th</i> , AnandTech Oct. 27, 2021, https://www.anandtech.com/show/16959/intel-innovation-alder-lake-november-4th (last visited Jun. 25, 2024)

I. INTRODUCTION

MOSAID Technologies Inc. submits its Patent Owner Preliminary Response under 37 C.F.R. §42.107, supported by Dr. William Henry Mangione-Smith’s expert declaration (Ex. 2001) and other cited exhibits. The Petition asserts four voluminous and excessively redundant grounds of alleged invalidity. All challenged claims of U.S. Patent No. 7,224,563 (Ex. MTK-1001, “the ’563 Patent”) are patentable over the asserted grounds.

Institution of the Petition should be denied. As detailed herein, the Petition fails to demonstrate a reasonable likelihood that the Petitioner would prevail on any challenged claim because, among other failings, each ground fails to demonstrate the cited prior art discloses: (1) determining an appropriate frequency for a portion of an integrated circuit; or (2) providing an appropriate frequency to a portion of an integrated circuit. Further, the Petition improperly incorporates expert testimony without providing appropriate explanations. Disregarding this testimony leaves the Petition without sufficient evidence regarding any challenged claim. Lastly, discretionary denial under 35 U.S.C. §314(a) is warranted because the Petition has excessively redundant grounds of alleged invalidity.

First, element (b) of each challenged independent claim requires “determining an appropriate frequency for the portion of the integrated circuit.” Claim 1; *see also* claims 23 (“at least one logic block to determine an appropriate frequency from the

delivered voltage for the portion of the integrated circuit”), 35 (“a plurality of logic blocks arranged to determine an appropriate frequency for each said portion from said delivered voltages”). None of the Petition’s references disclose determining an appropriate frequency for a portion of an integrated circuit. Tam and Huard, merely disclose determining a single variable frequency for an entire integrated circuit. Norman ’259 and Norman ’851 do not determine a frequency at all. Instead, they disclose maintaining a pre-selected frequency based on various frequency adjustments. Naffziger ’788 also does not determine a frequency, but determines a voltage instead. This failure alone compels the denial of institution for all challenged claims.

Second, element (c) of each challenged independent claim requires “providing the appropriate frequency to said portion of said integrated circuit.” Claim 1; *see also* claims 23 (“at least one circuitry arrangement to provide the appropriate frequency to the portion of the integrated circuit”), 35 (“a plurality of circuitry arrangements to provide each said portion its associated appropriate frequency”). As an initial matter, because the references do not disclose “determining” an appropriate frequency they necessarily cannot disclose providing that appropriate frequency either. Regardless, none of the references disclose providing an appropriate frequency to the required “portion” of the integrated circuit. These failures also compel the denial of institution for all challenged claims.

Third, the Petition's citations to the Min Declaration are provided without discussion or explanation for many claims. For example, the Petition's arguments for elements 35[a] and 35[c] of Ground 3 rely on citations to twenty-seven paragraphs of the Min Declaration, fourteen of which the Petition never explains or comments on, and for the remainder the Petition provides no explanation of how the specific limitations of elements 35[a] and 35[c] are met. Such citations amount to improper incorporation by reference and should be disregarded.

Further, the Petition's obviousness arguments rely repeatedly on the Min Declaration, often with only conclusory statements and without any meaningful explanation. The Min Declaration itself provides little or no additional analysis or basis for its conclusory statements other than Dr. Min's opinion. For example, in Ground 4, the Petition makes conclusory statements that the limitations of the element 1[b] are obviousness and relies on the Min Declaration alone. The Min Declaration simply repeats these statements nearly verbatim, providing no additional supporting evidence or technical reasoning to explain why a POSITA would understand anything beyond the explicit teachings of Naffziger '788. The Min Declaration repeats this pattern for many of the arguments and is almost verbatim of the Petition's arguments, thus lending no actual support. For each of these reasons, the Min Declaration opinion should be given little (if any) weight.

Fourth, the Petition challenges 18 claims. Three challenged claims are included in two grounds, seven are included in three grounds, and eight are included in all four grounds (including all three challenged independent claims). Thus, the Petition presents unnecessarily redundant grounds that will require the Board to waste scarce resources. The Board should exercise its discretion to deny institution under 35 U.S.C. §314(a) because to do otherwise would be an inefficient administration of the Office and not in the interests of the integrity of the patent system.

For each of these independent reasons, MOSAID requests denial of institution of *inter partes* review.

II. SUMMARY OF THE PETITION’S GROUNDS

The Petition challenges the ’563 Patent on four substantially overlapping and unnecessarily cumulative obviousness grounds:

Ground	References	Claims
1	Tam	1-10, 23-24, 31, 32, 35
2	Tam and Huard	1-11, 23-24, 31-35
3	Norman ’259 and Norman ’851	1-11, 23-24, 31-35
4	Naffziger ’788	1, 3, 10, 23, 24, 31, 32, 35

III. LEVEL OF ORDINARY SKILL

MOSAID states that, for the purposes of this proceeding, a POSITA would have at least bachelors of science degree in electrical engineering or computer engineering and at least two years of clock network design and/or power

management design for processors or large system-on-chip (“SoC”) integrated circuits (“ICs”).

IV. CLAIM CONSTRUCTION

The Board construes claim terms based on their ordinary and customary meaning as understood by a POSITA. 37 C.F.R. §42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). The specification is the “best source for understanding a technical term,” to be supplemented, “as needed, by the prosecution history.” *Id.* at 1315.

A. MOSAID Requests Claim Construction.

MOSAID seeks construction of the term “appropriate frequency,” which appears in challenged claims 1, 3, 7, 11, 23-24, 33, and 35. A POSITA, at the time of the ’563 Patent, would understand “appropriate frequency” to mean “a frequency adapted to be at or below a maximum frequency possible at the delivered voltage.” In other words, a POSITA reading the ’563 Patent would understand an “appropriate frequency” to be one that is adjusted in response to fluctuations in a voltage delivered to a portion of the integrated circuit in order to support higher average frequencies while still avoiding timing failures in that portion of the integrated circuit. Ex. 2001, ¶¶23-29. This is the focus of the specification, which describes the appropriate frequency as being a frequency derived from the delivered voltage that varies as the voltage varies in order to provide more optimal power consumption. *See, e.g.,*

MTK-1001, Fig. 3, 1:14-58, 2:9-10, 4:29-35, 4:56-5:5, 5:34-40, 6:4-9, 6:28-31, 7:9-19, claim 3; Ex. 2001, ¶¶24-25. Stated another way, dealing with voltage fluctuation rapidly enough to prevent malfunctions while still using the highest possible operating frequency at all times is the reason d'être of the patent.

Petitioner has taken the position in the co-pending district court litigation that “appropriate frequency” allegedly is indefinite. Ex. 2002, 3. As explained herein, the term is definite and should be construed. However, the Petition’s failure to address Petitioner’s claimed indefiniteness of the term “appropriate frequency” undercuts the credibility of each argument contained therein.

V. NATURE OF THE PROBLEM AND OVERVIEW OF INVENTOR’S SOLUTION

As the '563 Patent recognized, the large, sudden changes in power consumption caused by powering units of an integrated circuit up and down can challenge the device’s power delivery system, because “there is always some resistance and inductance between the components and the power supply.” MTK-1001, 3:34-37. Further, a sudden spike in power to dormant areas can result in a voltage drop to other already powered sections causing operational and timing problems. MTK-1001, 3:37-39. For these and other reasons, the voltage actually delivered to an integrated circuit is not completely fixed, but rather “ripples and varies with time.” MTK-1001, 1:38-40.

Some prior art solutions took a “safe” approach, selecting an operating frequency for all times. The chosen frequency was sufficiently low that the circuit would not malfunction even in the worst-case of any expected voltage drop. *See, e.g.,* MTK-1001, 1:23-29. While the ’563 Patent refers to these solutions as “safe,” such an approach left significant performance potential on the table because the operating frequency could theoretically be higher during the periods where supply voltage was nominal. MTK-1001, 7:9-17. The prior art could not adjust sufficiently fast, however, to operate at higher frequencies during nominal voltage supply while still dropping frequency quickly enough to avoid malfunctions when voltage dropped suddenly. MTK-1001, 3:30-42.

Other prior art solutions attempted to look ahead and predict the demand side, estimating expected computing demands and adjusting operating frequency accordingly. MTK-1001, 2:48-3:4. But such approaches can lag behind the system’s needs, particularly where the predictions are inaccurate. MTK-1001, 2:48-3:4.

At the time of the invention, “[m]any power-management solutions use[d] software to minimize excess computer power of microprocessors and other like devices.” MTK-1001, 2:18-20. Based on the expected load of the entire integrated circuit, processor speed could be determined and the speed of operation adjusted to reduce power consumption in devices. MTK-1001, 2:18-27. This still resulted in inefficient power usage, in part because setting the speed of operation for maximum

computing power is not always optimal. MTK-1001, 2:28-56. Other existing systems sometimes “shut off parts of an integrated circuit that are not in use.” MTK-1001, 3:23-25. But turning parts of an integrated circuit on and off can result in operational and timing problems. MTK-1001, 3:32-39.

Mr. Naffziger identified that “[a] system that understood exactly how fast the integrated circuit could operate for a given voltage, combined with a system that could operate the chip at a frequency matched to that voltage, would result in significant efficiency gains” over simply varying frequency based on the expected load. MTK-1001, 3:7-11. This ability to adjust rapidly allowed for the use of optimal frequencies throughout operation because the system knows how to appropriately reduce frequency as voltage changes dynamically. MTK-1001, 4:9-24.

Further, because the power consumption can vary throughout an integrated circuit, Mr. Naffziger applied his techniques to portions of the integrated circuit. MTK-1001, 4:12-24. As contemplated in the ’563 Patent, portions of an integrated circuit are subsets of the integrated circuit distinguished by, for example, location in the integrated circuit or functional capability, such as a floating-point processing unit. MTK-1001, 3:23-39, 6:37-52. Rather than one single clock signal for the entire integrated circuit, “the clock frequency on an integrated circuit may not be universal.” MTK-1001, 6:64-65. By adjusting the voltage and frequency together in different parts of the integrated circuit, Mr. Naffziger improved the efficiency of

integrated circuits practicing his invention and allowed them to “adapt very rapidly to changes in voltage induced by sudden changes in power consumption.” MTK-1001, 3:40-42. As a result, the claimed inventions of the ’563 Patent allow for more precise control of operating frequency in response to operating voltage changes, including a higher average operating frequency. MTK-1001, 5:2-5. And, by applying his invention separately to portions of the integrated circuit, Mr. Naffziger reduced or eliminated problems related to starting and stopping portions of an integrated circuit. MTK-1001, 6:43-7:19.

VI. BRIEF OVERVIEW OF THE ASSERTED PRIOR ART

A. U.S. Patent No. 6,762,629 (“Tam”).

Tam describes methods and systems of varying a single clock frequency for an entire processor. MTK-1004, Fig. 3, 6:33-45. Tam’s processor is made up of a clock generator, at least one sensor, and the rest of the processor core. MTK-1004, 6:36-44. When the sensor detects a voltage change, the clock generator adjusts the operating frequency for the rest of the processor core. MTK-1004, 7:34-50. Despite voltages varying across the processor, the frequency is only determined based on the lowest voltage detected for the entire processor. MTK-1004, 6:12-18. Tam acknowledges that this allows the entire processor core to continue operating despite resulting in non-optimal voltage conditions for some parts of the processor. MTK-1004, 7:48-50.

B. U.S. Patent No. 6,885,233 (“Huard”).

Huard describes methods and systems of varying a clock frequency of a load circuit as a function of the operating temperature and supply voltage of the load circuit. MTK-1005, 1:20-24. The load circuit is an entire device, such as a microprocessor. MTK-1005, 3:41-43. The clock generator provides one clock signal to the entire load circuit and varies the frequency of that clock signal based on the detected voltage and temperature. MTK-1005, 3:47-48, 3:57-65. Huard identifies that the advantage of its invention is to allow the system to be run at a slightly higher performance level than the power supply or voltage regulator would normally permit without impairing reliability. MTK-1005, 4:49-63. This also yields higher performance. MTK-1005, 4:49-63.

C. U.S. Patent No. 6,853,259 (“Norman ’259”).

Norman ’259 describes methods and systems for providing a self-calibrating ring oscillator as an onboard clock for the entirety of an integrated circuit. MTK-1006, 1:6-7. 2:28-37. Typical onboard ring oscillators vary in frequency output due to “process differences, voltage variations and temperature excursions,” resulting in large performance variations that “can adversely affect the speed and/or reliability of the flash memory system.” MTK-1006, 2:14-25. Norman ’259 focuses on reducing or eliminating these issues by providing a ring oscillator that can be calibrated such that its “operating characteristics can be made to operate in a tighter

range of frequency variation.” MTK-1006, 2:11-12. The result is an onboard system clock that has less variation in clock frequency, remaining close to the desired, ideal value for the operation of the entire integrated circuit. MTK-1006, 3:11-18.

Norman '259 addresses the clock frequency of a system as a whole and describes how to compensate for the temperature shift by “dynamically making adjustments in clock frequency” to “keep the system running at the ideal frequency.” MTK-1006, 3:22-23, 4:5-6. Norman '259 monitors both the temperature and voltage of the entire system and these values are used to determine an adjustment vector that can be used to “lengthen[] or shorten[] the ring delay to maintain the desired operating point.” MTK-1006, 4:6-31.

Norman '259, does not change the frequency of operation to optimize power consumption of the integrated circuit. *See, e.g.*, MTK-1006, 3:66-4:7. Instead, Norman '259 teaches adjusting the frequency of the onboard clock based on environmental conditions to “produce a desired center frequency that operates as close as possible to the desired frequency when operating at nominal temperature and voltage.” MTK-1006, 4:65-5:3. In this way, Norman '259 “eliminates the majority of timing variations in the oscillator due to the process differences” and keeps the clock frequency for the entire integrated circuit close to a single known value. MTK-1006, 3:16-17.

D. U.S. Patent Pub. No. 2003/0034851 (“Norman ’851”).

Norman ’851 describes methods and systems for providing a self-calibrating oscillator as an onboard clock for an entire integrated circuit. MTK-1007, ¶¶1, 5. Norman ’851 describes that oscillators “lack the frequency accuracy of crystal oscillators” and, due to the oscillator’s “analog components hav[ing] many parameters that vary with process, temperature, or power supply,” variation in the frequency output from an oscillator can “induce substantial errors in the operation of the integrated circuit.” MTK-1007, ¶5.

The goal of Norman ’851 is to “minimize[] wide variations in clock signal frequency over operating parameter variables such as voltage and temperature” for the entire integrated circuit. MTK-1007, ¶9. This is accomplished by “calibrat[ing] the chip’s mixed signal circuits to generate a precise, repeatable clock signal.” MTK-1007, ¶9.

Norman ’851 describes placing “various sensors 46-48 ... at predetermined locations in the IC 10 to sense environmental variations.” MTK-1007, ¶19. “By monitoring the temperature of the IC 10, the processor 12 can detect whether the oscillator 42 is deviating from its specified frequency.” MTK-1007, ¶23. Likewise, “the system can also detect the supply voltage that the system is presently operating at.” MTK-1007, ¶24. “If the operating voltage is not at a nominal value, the controller adjusts the ring oscillator delay path to compensate for the voltage

differential.” MTK-1007, ¶24. In both cases, the temperatures and voltages sensed from are around the integrated circuit are respectively averaged together in order to determine one frequency adjustment for the entire integrated circuit. MTK-1007, ¶¶26-27.

“For example, if the temperature gets hotter (indicating slower silicon and slower ring oscillator) the flash system will move the oscillator settings to the faster settings to compensate for the slow down because of increased temperature or a corresponding decrease in operating voltage.” MTK-1007, ¶27. In other words, rather than determining an appropriate frequency to optimize the power consumption of the integrated circuit, Norman ’851 instead determines an adjustment to the oscillator as the environmental conditions change “[t]o keep a constant clock frequency.” MTK-1007, ¶29.

E. U.S. Patent No. 6,509,788 (“Naffziger ’788”).

Naffziger ’788 generally relates to managing power consumption and dynamically generating a single clock frequency for an entire integrated circuit based on the voltage draw of the integrated circuit. MTK-1008, 1:16-21. Naffziger ’788 discloses an integrated circuit with an on-chip oscillator that is used to provide this single clock signal. *See, e.g.*, MTK-1008, 1:16-21, 4:12-17, 6:57-59, claim 1. The supply voltage for the core circuitry of the chip is monitored and, in response to variations in the supply voltage, control circuitry is used to vary the voltage supplied

to the oscillator. MTK-1008, 7:9-17. The oscillator is a voltage-controlled oscillator whose frequency varies based on the voltage input. MTK-1008, 7:24-25. In this way, the system regulates its power consumption. MTK-1008, 7:40-45.

VII. [GROUND 1] THE PETITION FAILS TO SHOW A REASONABLE LIKELIHOOD THAT TAM RENDERS ANY CHALLENGED CLAIM UNPATENTABLE

The Petition fails to establish a reasonable likelihood of prevailing that Tam renders any challenged claim unpatentable. First, Tam does not disclose determining an appropriate frequency for a portion of an integrated circuit as required by elements 1[b], 23[b], and 35[b]. Second, Tam does not disclose providing an appropriate frequency to a portion of an integrated circuit as required by elements 1[c], 23[c], and 35[c]. Third, a POSITA would not find it obvious to modify the disclosures of Tam to meet these missing limitations. Because the Petition fails to establish a reasonable likelihood regarding each challenged independent claim, it necessarily follows that it also fails to do so regarding all the challenged dependent claims. Ground 1 provides no basis for institution.

Each independent claim will be addressed in turn.

A. Claim 1.

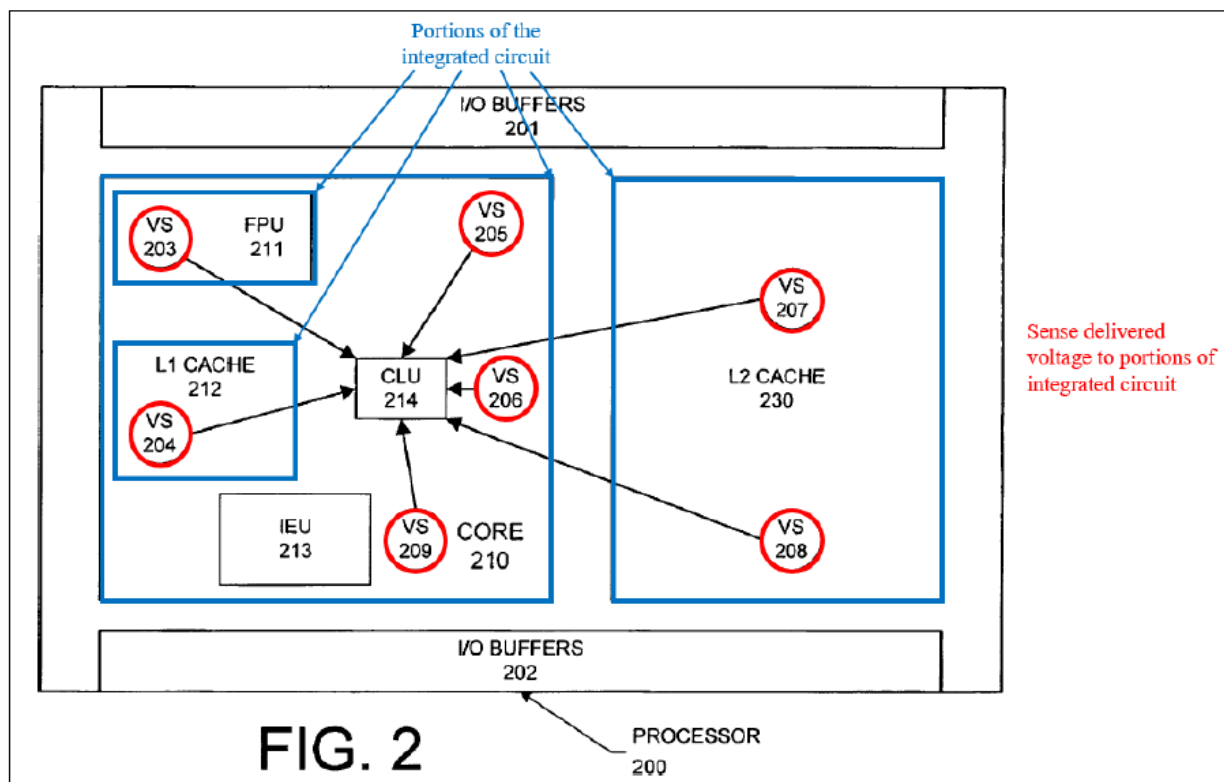
1. Element 1[b].

Element 1[b] requires “determining an appropriate frequency for the portion of the integrated circuit.” The Petition fails to show that Tam discloses element 1[b] at least because (1) the Petition points to a different structure of Tam to meet element

1[a] than is proposed to meet element 1[b], and (2) Tam does not disclose determining an appropriate frequency for the portion of the integrated circuit.

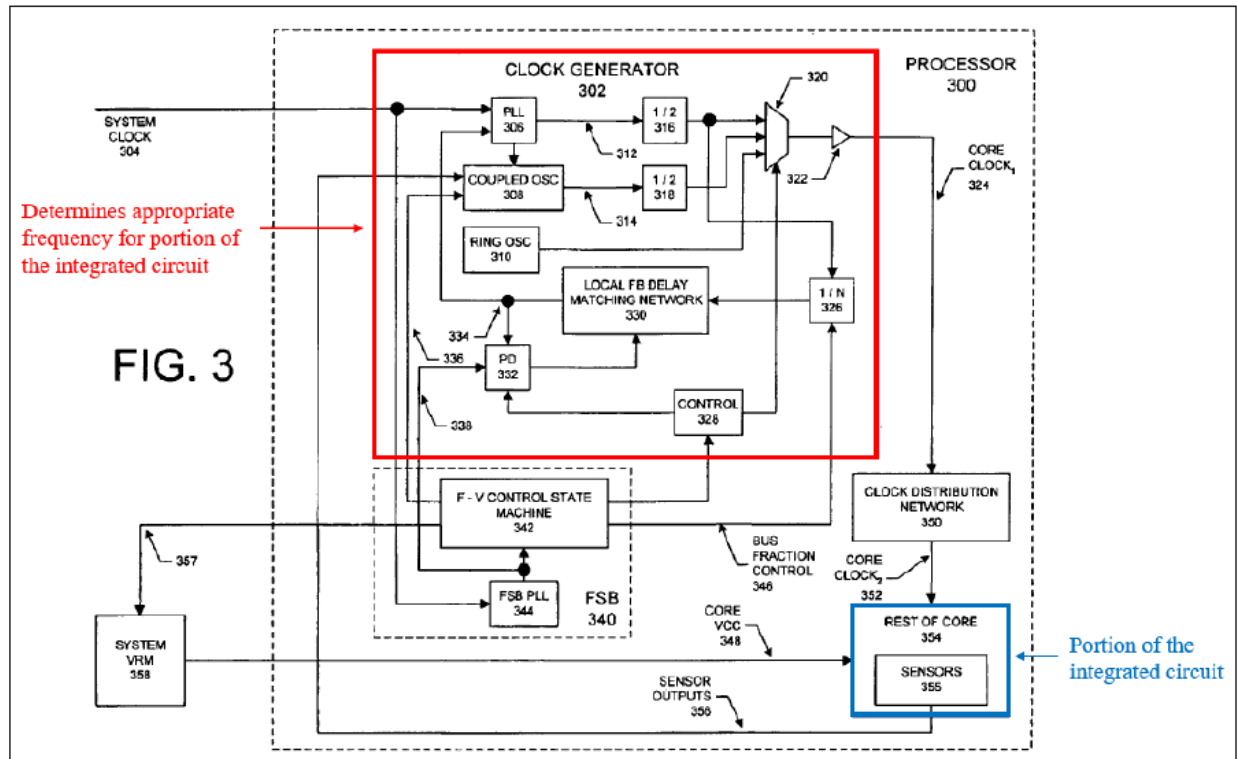
- (i) **The Petition points to different structures for “the portion of the integrated circuit” between elements 1[a] and 1[b].**

The Petition fails to show element 1[b] because it fails to point to the same “portion” for elements 1[a] and 1[b]. Element 1[b] relies on “the portion of the integrated circuit” claimed in element 1[a] for antecedent basis. MTK-1001, Claim 1. It is evident the claim thus requires the same structure satisfy both elements. However, the Petition relies on different structures. First, for element 1[a], the Petition relies upon Figure 2’s FPU 211, L1 cache 212, L2 cache 230, and core 210 as a portion of an integrated circuit. Pet., 13-14.



Pet., 14 (MTK-1004, Fig. 2, with the Petition's annotations).

For element 1[b], however, the Petition switches to a different embodiment depicted in Fig. 3 and points to “rest of core” 354 as the required portion of the integrated circuit. Pet., 15-17.



Pet., 16 (MTK-1004, Fig. 3, with the Petition's annotations)

The Petition makes no showing that the “portions” are the same between Fig. 2 and 3 or that a POSITA would somehow have been motivated to combine these two embodiments. These failings are a fatal lack of proof.

(ii) Tam fails to disclose element 1[b].

Element 1[b] requires that “an appropriate frequency” be determined “for the *portion of* the integrated circuit.” MTK-1001, Claim 1 (emphasis added). The

Petition's cited support fails on both aspects. First, it does not disclose determining an appropriate frequency. Second, it only discloses determining a frequency or clock speed for the entire integrated circuit and not a portion thereof. *See* Pet., 15-17.

Appropriate frequency. As explained above, “appropriate frequency” means “a frequency adapted to be at or below a maximum frequency possible at the delivered voltage.” *Supra* IV(A). An “appropriate frequency” is one that is adjusted in response to fluctuations in a voltage delivered to a portion of the integrated circuit in order to support higher average frequencies while still avoiding timing failures in that portion of the integrated circuit. *Supra* IV(A); Ex. 2001, ¶¶23-29. The Petition's citations to Tam discuss dynamic frequency adjustments for the processor based on measured voltage variations at various locations on the processor. Pet., 15-17; MTK-1004, 6:12-18; Ex. 2001, ¶40. However, as Tam recognizes, the frequency adjustment for the entire chip based on one area of voltage droop will still result in “non-optimal voltage conditions at certain locations in the die.” Ex. 1004, 7:48-50; Ex. 2001, ¶¶41, 44. The Petition also relies on other embodiments and aspects of Tam without explanation as to their relevance, but these teachings also only address adjusting frequency for the entire chip. Ex. 2001, ¶¶39, 42-43. A POSITA would understand that, because Tam's frequency is for the entire integrated circuit and provides a sub-optimal frequency to any part of the chip not at the same voltage as

the sensor driving the frequency change in Tam, it is not determining an “appropriate frequency” as required. Ex. 2001, ¶44; *see* MTK-1004, 7:48-50.

Portion of. As just discussed, Tam discloses adjustments to the frequency of an entire chip, not portions thereof. *See, e.g.,* MTK-1004, 5:2-5; *see also* Ex. 2001, ¶38. The portions of Tam upon which the Petition relies only show and describe that a frequency is determined for the entire system. Pet., 15-17; Ex. 2001, ¶¶39-41. For example, Tam describes adapting the clock frequency of the processor based on changes in VCC, which is the source voltage of the processor. MTK-1004, 3:44-4:5, 4:36-7:50; Ex. 2001, ¶44.

2. Element 1[c].

Element 1[c] requires “providing the appropriate frequency to said portion of said integrated circuit.” The Petition fails to show that Tam discloses element 1[c] at least because (1) the Petition points to a different structure of Tam for the portion of the integrated circuit between elements 1[a] and [c], and (2) Tam does not disclose providing an appropriate frequency to the portion of the integrated circuit.

(i) The Petition points to different structures for “the portion of the integrated circuit” between elements 1[a] and 1[c].

The Petition fails to show element 1[c] because it fails to point to the same “portion” between elements. Element 1[c] relies on “said portion of said integrated circuit” claimed in element 1[a] and [b] for antecedent basis. MTK-1001, Claim 1. Although the Petition relies on its arguments for element 1[b], Pet., 17, this does not

solve the Petition’s fatal problem of pointing to different “portions” between elements 1[a] and [b]. *See supra* VII(A)(1). The Petition identifies no other structure or additional arguments on this point for element 1[c].

(ii) Tam fails to disclose element 1[c].

Claim element 1[c] requires “providing *the appropriate frequency to said portion of said integrated circuit.*” MTK-1001, Claim 1 (emphasis added). The Petition’s cited support fails on both aspects. First, it does not disclose providing an appropriate frequency. Second, it only discloses providing a frequency or clock speed for the entire integrated circuit and not a portion thereof. Pet., 17-18.

Appropriate frequency. As discussed for element 1[b], the cited portions of Tam do not determine an “appropriate frequency.” To the contrary, Tam teaches that its changes to the overall clock speed/frequency for the entire chip based on localized voltage values will result in non-optimal conditions within locations of the chip, including a sub-optimal frequency to any part of the chip not at the same voltage as the sensor driving the frequency change. *Supra* VII(A)(1); MTK-1004, 7:48-50; Ex. 2001, ¶¶45-47. As a result, a POSITA would understand that Tam, it is not providing an “appropriate frequency” as required. Ex. 2001, ¶¶45-47; *see* MTK-1004, 7:48-50.

Portion of. As just discussed, Tam discloses adjustments to the frequency of an entire chip, not portions thereof. *See, e.g.,* MTK-1004, 5:2-5; Ex. 2001, ¶46. The

portions of Tam upon which the Petition relies only show and describe that a frequency is determined for and provided to the entire system. Pet., 17-18; Ex. 2001, ¶¶45-47. For example, Tam provides the adapted clock frequency to the processor, not a portion thereof. *Supra* VII(A)(1); MTK-1004, 3:44-4:5, 4:36-7:50; Ex. 2001, ¶¶45-47.

3. Tam does not render any missing element obvious.

As an initial matter, the Petition's inclusion of Ground 2 (Tam and Huard) is an admission that Tam alone does not render any challenged claim unpatentable as obvious. As discussed above, Tam does not disclose at least elements 1[b] and [c]. *See supra* VII(A)(1), VII(A)(2). The Petition's arguments that a POSITA would find these elements obvious in view of Tam are conclusory, at best, and fail for a lack of evidence. Pet., 16, 18.

Further, as discussed in Section XI(A), the Min Declaration. should be given little to no weight because it is nearly verbatim to the Petition and adds no additional analysis or evidence. *Compare, e.g.,* MTK-1003, ¶64, *with* Pet., 16-17; MTK-1003, ¶65, *with* Pet., 17-18.

Element 1[b]. The Petition (and the Min Declaration) rely on Tam's disclosure of intelligently managing the clock frequency of an integrated circuit. Pet., 16-17; MTK-1003, ¶64; MTK-1004, 3:51-54, 7:45-50. Tam teaches that this solves the problem of performance loss from excessive guard banding resulting from

non-optimal voltage conditions in the processor. *See* MTK-1004, 3:51-4:5, 7:45-50; Ex. 2001, ¶¶56-57. Tam also discloses that its systems and methods avoid performance errors and maintain constant power draw, despite the non-optimal conditions that result on the processor by providing a frequency that is not optimal for certain locations on the processor. MTK-1004, 6:9-18, 7:45-50; Ex. 2001, ¶¶56-57. A POSITA reading Tam would understand that the problems purportedly solved by Tam are just that—solved by Tam—and a POSITA would not be motivated to modify Tam based on that disclosure alone. Ex. 2001, ¶57-58. Bereft of any other evidence, the Petition’s and the Min Declaration’s suggestion that a POSITA would modify Tam to satisfy the limitations of element 1[b] are conclusory and based on impermissible hindsight. *See* Pet., 16-17; MTK-1003, ¶64; *see also* Ex. 2001, ¶¶55, 58.

Element 1[c]. The Petition’s only cited evidence that element 1[c] would be obvious in view of Tam is paragraph 65 of the Min Declaration. Pet., 17-18. The Petition and declaration are verbatim on this issue and point to an annotated version of Fig. 3. Pet., 18. The annotations provide no additional evidence or motivation to modify Tam other than the direct disclosures of Tam that have been addressed above. *See supra* VII(A)(2). Such conclusory and unsupported assertions cannot “substitute for a disclosure in a prior art reference itself.” Consolidated Trial Practice

Guide, <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf?MURL=Tr>
ialPracticeGuideConsolidated, November 2019, p. 35-36.

B. Claim 23.

1. Element 23[b].

Element 23[b] requires “at least one logic block to determine an appropriate frequency ... for the portion of the integrated circuit.” The Petition fails to show that Tam discloses element 23[b] at least because (1) the Petition points to a different structure of Tam for the portion of the integrated circuit between elements 23[a] and [b], and (2) Tam does not disclose determining an appropriate frequency for the portion of the integrated circuit.

(i) The Petition points to different structures for “the portion of the integrated circuit” between elements 23[a] and 23[b].

The Petition fails to show element 23[b] because it fails to point to the same “portion” between elements 23[a] and [b]. Element 23[b] relies on “the portion of the integrated circuit” claimed in element 23[a] for antecedent basis. MTK-1001, Claim 23. The Petition solely relies on the previous arguments for “portion” in elements 1[a] and 1[b], which suffer from a fatal lack of evidence. Pet., 27; *supra* VII(A)(1). As such, the Petition fails for the same reasons discussed in Section VII(A)(1) both as to element 23[b] and all challenged claims depending on claim 23.

(ii) Tam fails to disclose element 23[b].

Element 23[b] requires that at least one logic block determines “an *appropriate frequency* from the delivered voltage for *the portion of the integrated circuit*.” MTK-1001, Claim 23 (emphasis added). The Petition’s cited support fails on both aspects. First, it does not disclose determining an appropriate frequency. Second, it only discloses determining a frequency or clock speed for the entire integrated circuit and not a portion thereof. Pet., 27.

Appropriate frequency. The Petition relies on its incorrect argument for element 1[b] regarding the disclosure of an “appropriate frequency” for element 23[b]. Pet., 27. Although the Petition adds some discussion of a “logic block” it points to the same clock used for the entire circuit as in element 1[b]. As such, the Petition fails for the same reasons discussed in Section VII(A)(1). *See also* Ex. 2001, ¶49.

Portion of. The Petition also relies on its incorrect argument for element 1[b] regarding the disclosure of a frequency being applied to portions of an integrated circuit for element 23[b]. Pet., 27. As before, the added “logic block” discussion does nothing to cure the fatal defects already discussed regarding element 1[b]. As such, the Petition fails for the same reasons discussed in Section VII(A)(1). *See also* Ex. 2001, ¶49.

2. Element 23[c].

Element 23[c] requires “at least one circuitry arrangement to provide the *appropriate frequency to the portion of the integrated circuit.*” MTK-1001, Claim 23 (emphasis added). The Petition fails to show that Tam discloses element 23[c] at least because (1) the Petition points to a different structure of Tam for the portion of the integrated circuit between elements 23[a] and [c], and (2) Tam does not disclose providing an appropriate frequency to the portion of the integrated circuit.

(i) The Petition points to different structures for “the portion of the integrated circuit” between elements 23[a] and 23[c].

The Petition fails to show element 23[c] because it fails to point to the same “portion” between elements. Element 23[c] relies on “the portion of the integrated circuit” claimed in element 23[a] and [b] for antecedent basis. MTK-1001, Claim 23. The Petition primarily relies on its arguments for elements 1[b] and [c], but adds a discussion of a “circuitry arrangement.” Pet., 27-29. This added discussion does not solve the Petition’s fatal problem of pointing to different “portions” between elements 1[a] and [b]. *See supra* VII(A)(1)-VII(A)(2). The Petition fails regarding element 23[c] for the same reasons.

(ii) Tam fails to disclose element 23[c].

Claim element 23[c] requires that a circuitry arrangement “provide the *appropriate frequency to the portion of the integrated circuit.*” MTK-1001, Claim 23 (emphasis added). The Petition’s cited support fails on both aspects. First, it does

not disclose providing an appropriate frequency. Second, it only discloses providing a frequency or clock speed for the entire integrated circuit and not a portion thereof. Pet., 27-29.

Appropriate frequency. As noted, the Petition primarily relies on its arguments for elements 1[b] and [c] for this element along with discussion of a “circuitry arrangement.” Pet., 27-29. The “circuitry arrangement” does not solve the failings regarding “appropriate frequency” discussed in Sections VII(A)(1) and VII(A)(2). The Petition fails regarding element 23[c] for the same reasons. *See also* Ex. 2001, ¶49.

Portion of. The Petition’s discussion of “circuitry arrangement” likewise does nothing to cure the fatal defects regarding “portion of” discussed in Section VII(A)(1) and VII(A)(2). The Petition fails regarding element 23[c] for the same reasons. *See also* Ex. 2001, ¶49.

3. Tam does not render any missing element obvious.

To the extent it even makes an obviousness argument for elements 23[b] and [c], the Petition relies exclusively on its arguments for elements 1[b] and [c]. *See* Pet. 27-29 (failing to discuss obviousness). Accordingly, any obviousness arguments fail for the same reasons as discussed in Section VII(A)(3). *See also* Ex. 2001, ¶¶56-58.

C. Claim 35.

1. Tam fails to disclose element 35[a].

Element 35[a] requires “a plurality of voltage sensors arranged to sense a delivered voltage to different portions of an integrated circuit.” MTK-1001, Claim 35. The Petition relies on the arguments in element 1[a] and discussion of Fig. 2 in Tam as disclosing the plurality of voltage sensors. Pet., 30-32. However, the sensors disclosed for Fig. 2 are different than the sensors the Petition points to for its “Multiprocessor Circuit” based on Fig. 3. Pet., 13-14, 30-32. The Petition provides no explanation for how the disclosures related to Fig. 2 discussed regarding element 1[a] support its contentions regarding element 35[a] based on Fig. 3.

2. Element 35[b].

Element 35[b] requires “a plurality of logic blocks arranged to determine an appropriate frequency for each said portion from said delivered voltages.” The Petition largely relies on its previous arguments regarding elements 1[b] and 23[b]. Pet., 32-33. Although the Petition adds some discussion of “multiprocessor” systems, it fails to explain how multiple processors solve the issues discussed herein regarding Tam. *See supra* VII(A)-VII(B). As such, the Petition fails to show that Tam discloses element 35[b] at least because (1) the Petition points to different structure of Tam between different elements, and (2) Tam does not disclose determining an appropriate frequency for each said portion of an integrated circuit.

(i) The Petition points to different structures for the “portions of an integrated circuit” between elements.

The Petition fails to show element 35[b] because it fails to point to the same “portion” between elements 35[a] and [b]. Element 35[b] relies on “portions of an integrated circuit” claimed in element 35[a] for antecedent basis. MTK-1001, Claim 35. The Petition relies on the previous arguments for “portion” in elements 1[a], 1[b], 23[a], and 23[b] containing a fatal lack of evidence. Pet., 32-33. The Petition also compounds the problem by citing to yet another “portion” in element 35[a] without explanation as to how that cures the earlier defects upon which the Petition purports to rely. Pet., 30-32. As such, for the same reasons discussed in Sections VII(A)(1) and VII(B)(1), the Petition fails to show that Tam discloses element 35[b].

(ii) Tam fails to disclose element 35[b].

Element 35[b] requires that “a plurality of logic blocks ... determine an *appropriate frequency* for *each said portion*” of an integrated circuit. MTK-1001, Claim 35 (emphasis added). The Petition’s cited support fails on both aspects. As before, it does not determine an appropriate frequency or determine such frequency for each said portion. *See supra* VII(A)(1), VII(B)(1).

The Petition additionally contends that by stacking multiple of the system described in Tam, the claimed limitations in element 35[b] can be met. Pet., 32-33. As an initial matter, pointing to frequency changes for each duplicated Tam system as a whole concedes the fact that a single Tam system suffers from the fatal defects

discussed herein regarding elements 1[b] and 23[b]. *See supra* VII(A)(1), VII(B)(1). Stacking the system also does not cure the fact that, even at the system level, Tam does not disclose determining an appropriate frequency for any of the portions because Tam's system provides sub-optimal frequency to any part of the system not at the same voltage as the sensor driving the frequency change. *Supra* VII(A)(1), VII(B)(1); Ex. 2001, ¶51. As such, the Petition fails to show that Tam discloses element 35[b].

3. Tam fails to disclose element 35[c].

Element 35[c] requires “a plurality of circuitry arrangements to provide *each said portion* its associated *appropriate frequency*.” The Petition relies on its prior arguments for elements 1[b] and 1[c], 23[b] and 23[c], and 35[a] and 35[b], and discussions of Tam's clock. Pet. 33-34. The Petition's cited support fails on both aspects. As just discussed for element 35[b], none of the cited material discloses that Tam determines an “appropriate frequency.” *See supra* VII(A)-VII(B), VII(C)(2). It necessarily follows that none of these materials can disclose providing the determined “appropriate frequency” either. Ex. 2001, ¶51. As such, the Petition fails to show that Tam discloses element 35[c].

4. Tam does not make it obvious to apply Tam's teachings to multiprocessor integrated circuits.

Elements 35[a], 35[b], and 35[c] require “a plurality” of voltage sensors, logic blocks, and circuitry arrangements. MTK-1001, Claim 35. For all three of these

elements, the Petition makes the same argument that it would be obvious to use Tam in a multiprocessor environment by combining multiple copies of Tam into one integrated circuit. Pet., 30-34. The Petition’s primary basis is that Tam discusses that “embodiments can [be] included in a multiprocessor system.” MTK-1004, 4:39-42, 13:12-20. The Min Declaration also refers to Tam’s discussion of a single processor system on chip, but provides no analysis. MTK-1004, 5:36-39; Ex. 2001, ¶59. Notably, Tam does not disclose or teach that a multiprocessor system on chip or a multiprocessor system on a single integrated circuit. *See id*; Ex. 2001, ¶53.

At the time of Tam and the ’563 Patent, multiprocessor integrated circuits were in their infancy and were not a default choice. Ex. 2001, ¶54. Even today, many architectures do not combine all components in a multiprocessor system onto a single integrated circuit. Ex. 2001, ¶54. As part of Tam’s limited disclosure relating to multiprocessor systems, Tam describes that “the overall system may have the capability to control all of the processor either through a hardware pin or software inputs.” MTK-1004, 13:18-20. A POSITA would understand that this is describing communicating with the processors through external pins of an integrated circuit. Ex. 2001, ¶54. Thus, a POSITA would understand that Tam is suggesting connecting multiple processors on separate integrated circuits, rather than combining them onto a single integrated circuit, as otherwise the pins would not need to be used. Ex. 2001,

¶54. Accordingly, a POSITA would not understand that Tam discloses or teaches multiple copies of Tam combined into a single integrated circuit. Ex. 2001, ¶54.

The Petition also relies on the Min Declaration in support of its conclusion, but both only point to various other sources in support of their conclusion, all of which are just generic references to multi-processor systems and disclose the unremarkable fact that such systems exist. *See* MTK-1001, 1:19-23; MTK-1003, ¶93; MTK-1009, 488; MTK-1010, 460, 833; MTK-1011, 223; MTK-1012, 22-4; MTK-1020, ¶¶6-17; Ex. 2001, ¶59. The Petition and the Min Declaration provide no analysis of these references and do not explain why a POSITA would understand to combine multiple copies of Tam, which each would be separate integrated circuits, into a single integrated circuit with multiple processors rather than leaving them as multiple separate integrated circuits. *See* Pet., 30-34; MTK-1003, ¶¶92-98.

**VIII. [GROUND 2] THE PETITION FAILS TO SHOW A REASONABLE
LIKELIHOOD THAT TAM AND HUARD RENDERS ANY
CHALLENGED CLAIM UNPATENTABLE**

The Petition fails to establish a reasonable likelihood of prevailing that Tam in view of Huard renders any challenged claim unpatentable. First, as discussed in Ground 1, Tam does not disclose all the elements of the challenged claims, including determining an appropriate frequency for a portion of an integrated circuit (elements 1[b], 23[b], and 35[b]) or providing an appropriate frequency to a portion of an integrated circuit (elements 1[c], 23[c], and 35[c]). The Petition's sparse discussion

of Huard—largely comprising conclusions with no explanation—does not solve these deficiencies. Because the Petition fails to establish a reasonable likelihood regarding each challenged independent claim, it necessarily follows that it also fails to do so regarding all the challenged dependent claims. Ground 2 provides no basis for institution.

Each independent claim will be addressed in turn.

A. Claim 1.

1. Tam in view of Huard fails to disclose element 1[b].

Element 1[b] requires “determining an appropriate frequency for the portion of the integrated circuit.” The Petition fails to show that Tam in view of Huard discloses element 1[b]. As discussed for Ground 1, Tam fails to disclose at least determining an appropriate frequency and the “portion of” limitations. *Supra* VII(A)(1).

The Petition primarily discusses a motivation to combine Tam and Huard to make use of Huard’s lookup table, which appears to relate to claim 3 (which is not addressed herein). Pet., 35-38. The Petition is unclear on how it relies on Huard for claim 1, but it discusses Huard’s disclosure of “a load circuit” presumably as disclosing “the portion of” element of 1[b]. Pet., 39-40. However, Huard only describes determining the frequency for the entire load circuit, not a portion of it. *See, e.g.*, MTK-1005, 1:20-24, 3:38-65; Ex. 2001, ¶¶63-64. As such, a POSITA

would not understand Huard to disclose “determining an appropriate frequency for the portion of the integrated circuit.” Ex. 2001, ¶65.

The Petition also fails to explain how Huard’s “load circuit” would be combined with any of Tam’s systems upon which the Petition relies. *See* Pet., 39-40; Ex. 2001, ¶66. This is an additional fatal deficiency.

2. Tam in view of Huard fails to disclose element 1[c].

Element 1[c] requires “providing the appropriate frequency to said portion of said integrated circuit.” The Petition fails to show that Tam in view of Huard discloses element 1[c]. Pet., 40; Ex. 2001, ¶70. As discussed for Ground 1, Tam fails to disclose at least providing an appropriate frequency and the “portion of” limitations. *Supra* VII(B)(2); Ex. 2001, ¶69.

The Petition again discusses Huard’s disclosure of “a load circuit.” However, Huard only describes determining the frequency for the entire load circuit, not a portion of it. *See, e.g.*, MTK-1005, 1:20-24, 3:38-65; Ex. 2001, ¶68. As such, because Huard does not disclose the determining aspect it also does not disclose “providing the appropriate frequency to said portion of said integrated circuit.” MTK-1001, Claim 1; Ex. 2001, ¶¶67-68.

The Petition also fails to explain how Huard’s “load circuit” would be combined with any of Tam’s systems upon which the Petition relies. Ex. 2001, ¶69. This is an additional fatal deficiency.

3. Tam in view of Huard does not render any missing element obvious.

As discussed above, Tam in view of Huard does not disclose at least elements 1[b] and [c]. *See supra* VIII(A)(1)-VIII(A)(2). The Petition's arguments that a POSITA would find these elements obvious in view of Tam and Huard are conclusory, at best, and fail for a lack of evidence. Pet., 39-40.

As discussed in Section XI(A), the Min Declaration should be given little to no weight because it is nearly verbatim to the Petition and adds no additional analysis or evidence. *Compare, e.g.,* MTK-1003, ¶¶103-108, 111-112, *with* Pet., 35-40.

Element 1[b]. Without citation to anything beyond the alleged disclosures of Tam and Huard, the Petition (and Min Declaration) simply conclude that the limitations of element 1[b] would be obvious in view of the combination. Pet., 39-40; MTK-1003, ¶111; Ex. 2001, ¶74. Bereft of evidence or analysis, the Petition's suggestion that a POSITA would modify Tam and Huard to satisfy the limitations of element 1[b] is conclusory and based on impermissible hindsight. *See* Pet., 39-40; MTK-1003, ¶111; *see also* Ex. 2001, ¶¶74-76.

Element 1[c]. The Petition (and Min Declaration) makes the same conclusory and unsupported assertion for element 1[c]. Pet., 40; MTK-1003, ¶112; Ex. 2001, ¶74. These assertions likewise fail for lack of evidence. The Petition fails to show that element 1[c] would be obvious in view of Tam and Huard. Ex. 2001, ¶¶74-76.

B. Tam in View of Huard Fails to Disclose Claim 23.

For claim 23, the Petition relies on citations to its prior Ground 1 arguments, the limited additional arguments regarding Huard for claim 1, and unexplained paragraphs from the Min Declaration. Pet., 44. As discussed at length herein, the Petition's discussion of Tam and Huard fail to disclose the requisite elements of at least claim 1 and elements 23[b] and 23[c]. *Supra* VII(A)-VII(B), VIII(A); Ex. 2001, ¶¶72. Unexplained paragraphs from an expert declaration cannot cure these fatal defects. *See infra* XI.

The Petition and Min Declaration offer no additional arguments as to how Tam and Huard would make claim 23 obvious, other than those previously presented for claim 1. Pet., 44. As already discussed, those arguments are insufficient, *see supra* VIII(A)(3), and, for the same reasons, a POSITA would also not find claim 23 obvious in view of Tam and Huard. Ex. 2001, ¶¶74-76.

C. Tam in View of Huard Fails to Disclose Claim 35.

For claim 35, the Petition relies on citations to its prior Ground 1 arguments, the limited additional arguments regarding Huard for claim 1 and incorporated into claim 23, and unexplained paragraphs from the Min Declaration. Pet., 45. As discussed at length herein, the Petition's discussion of Tam and Huard fail to disclose the requisite elements of at least claims 1 and 23 and elements 35[a], 35[b], and

35[c]. *Supra* VII, VIII(A)-(B); Ex. 2001, ¶¶72-73. Unexplained paragraphs from an expert declaration cannot cure these fatal defects. *See infra* XI.

The Petition and Min Declaration offer no additional arguments as to how Tam and Huard would make claim 35 obvious, other than those previously presented for claim 1. Pet., 45. As already discussed, those arguments are insufficient, *see supra* VIII(A)(3), VIII(B), and, for the same reasons, a POSITA would also not find claim 35 obvious in view of Tam and Huard. Ex. 2001, ¶¶74-76.

IX. [GROUND 3] THE PETITION FAILS TO SHOW A REASONABLE LIKELIHOOD THAT THE NORMAN REFERENCES RENDER ANY CHALLENGED CLAIM UNPATENTABLE

The Petition fails to establish a reasonable likelihood of prevailing that Norman '259 in combination with Norman '851 renders any challenged claim unpatentable. First, the Norman references do not disclose determining an appropriate frequency for a portion of an integrated circuit as required by elements 1[b], 23[b], and 35[b]. Second, the Norman references do not disclose providing an appropriate frequency to a portion of an integrated circuit as required by elements 1[c], 23[c]. and 35[c]. Third, a POSITA would not find it obvious to modify the Norman references to meet these missing limitations. Because the Petition fails to establish a reasonable likelihood regarding each challenged independent claim, it necessarily follows that it also fails to do so regarding all the challenged dependent claims. Ground 3 provides no basis for institution.

Each independent claim will be addressed in turn.

A. Claim 1.

1. The Norman references fail to disclose element 1[b].

Element 1[b] requires that “an appropriate frequency” be determined “for the portion of the integrated circuit.” MTK-1001, Claim 1. The Petition’s cited support fails to disclose this limitation.

“[A]ppropriate frequency” is “a frequency adapted to be at or below a maximum frequency possible at the delivered voltage.” *Supra* IV(A). An “appropriate frequency” is one that adjusted in response to fluctuations in a voltage delivered to a portion of the integrated circuit in order to support higher average frequencies while still avoiding timing failures in that portion of the integrated circuit. *Supra* IV(A); Ex. 2001, ¶¶23-29.

The Norman references do not disclose a system or method that determines an appropriate frequency, but instead the operating frequency for these references is pre-selected. MTK-1006, 3:65-4:7; MTK-1007, ¶¶23, 029; Ex. 2001, ¶¶79, 81. The Norman references disclose attempting to maintain an integrated circuit at a predetermined ideal or constant frequency based on determining corrective values that should be applied under specific operating parameters. MTK-1006, 3:1-3, 3:65-4:7, 4:64-5:1; MTK-1007, ¶¶23-24, 029; Ex. 2001, ¶¶80, 82. The Norman references determine “one or more corrective vectors” to maintain the pre-selected frequency,

not the frequency itself. *See, e.g.*, MTK-1006, 2:28-37; Ex. 2001, ¶¶80, 82. “[A] corrective value from a corrective table” is used “to produce a desired center frequency.” MTK-1006, 3:1-3, 3:65-4:7; MTK-1007, ¶¶23-24, 29; Ex. 2001, 82.

The Petition incorrectly equates this corrective value adjustment with the required “appropriate frequency,” using the two terms interchangeably, even though they are different. *See* Pet., 53-55; Ex. 2001, ¶83. Contrary to the Petition’s claim, this is not the determination of anything other the corrective value to be applied to return to the desired center frequency. Ex. 2001, ¶84. A POSITA would not understand the determination of a corrective value adjustment disclosed in the Norman references to be the determination of an appropriate frequency as element 1[b] requires. Ex. 2001, ¶¶84-85.

2. The Norman references fail to disclose element 1[c].

Element 1[c] requires “providing the appropriate frequency to said portion of said integrated circuit.” The Petition’s cited support fails to disclose this limitation. As an initial matter, the Petition’s sole reliance that this limitation “would have been obvious” is an admission that the Norman references do not explicitly disclose the limitation. *See* Pet., 55-56.

Indeed, as just discussed, the Norman references do not *determine* an “appropriate frequency.” *Supra* IX(A)(1); Ex. 2001, ¶86. Because the Norman references do not disclose determining “an appropriate frequency” in element 1[b],

they cannot disclose *providing* “the appropriate frequency” in element 1[c]. Ex. 2001, ¶87. The Petition’s focus on adjustment vectors as the “appropriate frequency” simply misses the mark. *See* Pet., 55-56.

Further, the corrective value the Norman references determine is not provided to the portion of the integrated circuit identified by the Petition in annotated Fig. 1. Pet., 51-56; Ex. 2001, ¶88. Rather, the corrective value is used to change the frequency of the on-board clock and is never provided to the portion identified in the Petition. MTK-1006, 3:6-8, 3:62-64, 4:27-32, 4:38-41, claim 19; MTK-1007, ¶¶19, 23-27; Ex. 2001, ¶88 This does not change even if the Norman references disclosures are applied to sub-systems of an integrated circuit. MTK-1007, ¶30; Ex. 2001, ¶89-90.

The Petition also incorrectly assumes without support that the frequency provided by the disclosed “oscillator” would have to be “the appropriate frequency.” Pet., 55. While it is the case that the ring oscillator will be responsible for generating a clock signal because that is the purpose of such physical components, the ring oscillator’s generated clock frequency is not an “appropriate frequency” as that term is used in the challenged claims. Ex. 2001, ¶¶82-86.

3. The Norman references do not render any missing element obvious.

As discussed, the Norman references do not disclose at least elements 1[b] and 1[c]. *Supra* IX(A)(1)-IX(A)(2). The Petition’s arguments that a POSITA would

find these elements obvious in view of the Norman references are conclusory, at best, and fail for a lack of evidence. Pet., 53-56. Such conclusory and unsupported assertions cannot “substitute for a disclosure in a prior art reference itself.”

Consolidated Trial Practice Guide,
<https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf?MURL=TrialPracticeGuideConsolidated>, November 2019, p. 35-36.

Additionally, as discussed in Section XI(A), the Min Declaration should be given little to no weight because it is nearly verbatim to the Petition and adds no additional analysis or evidence. *Compare, e.g.,* MTK-1003, ¶158, *with* Pet., 54-55.

Element 1[b]. The Petition (and the Min Declaration) relies on the Norman references’ corrective value table as the basis for the conclusion that it would have been obvious to a POSITA that the Norman references determine an appropriate frequency. Pet., 54-55; MTK-1003, ¶158. But this conclusory position is unsupported by any explanation or evidence that a POSITA would actually do so. *See* Pet., 54-55; MTK-1003, ¶158; Ex. 2001, ¶¶79-86. The Petition is silent as to why a POSITA would find it obvious for a corrective value adjustment to be the determination of an appropriate frequency. Ex. 2001, ¶¶94-96.

Element 1[c]. The Petition’s discussion of “multiple ‘voltage sensors’” does nothing to establish that it would have been obvious that the Norman references disclose providing an appropriate frequency to a portion of an integrated circuit. Pet.,

55-56; Ex. 2001, ¶¶88-89. Further, the Petition fails to explain how it would have been obvious that the use of corrective value adjustments would make obvious the concept of providing an appropriate frequency to the requisite portions of an integrated circuit. *See* Pet., 55-56; MTK-1003, ¶¶160-61; Ex. 2001, ¶95. As already discussed, the Norman references do not disclose determining or providing a frequency, appropriate or otherwise, but instead determine and provide a correction to return the system’s frequency of operation to a desired center frequency. *See supra* IX(A)(1)-IX(A)(2); Ex. 2001, ¶94. Simply restating these disclosures does not provide any rationale supporting the Petition’s unfounded conclusion. Ex. 2001, ¶¶94-96.

B. Claim 23.

1. The Norman references fail to disclose element 23[b].

Element 23[b] requires “at least one logic block to determine an appropriate frequency from the delivered voltage for the portion of the integrated circuit.” MTK-1001, Claim 23. The Petition’s cited support fails to disclose this limitation.

For the non-“logic block” portions of this claim element, the Petition relies on its discussion for Element 1[b]. Pet., 64. Accordingly, for the same reasons already addressed, the Petition fails to show that the Norman references disclose determining an appropriate frequency. *Supra* IX(A)(1); Ex. 2001, ¶92.

2. The Norman references fail to disclose element 23[c].

Element 23[c] requires “at least one circuitry arrangement to provide the appropriate frequency to the portion of the integrated circuit.” MTK-1001, Claim 23. The Petition’s cited support fails to disclose this limitation.

For the non-“circuitry arrangement” portions of this claim element, the Petition relies on its discussion for Element 1[b] and 1[c]. Pet., 64. Accordingly, for the same reasons already addressed, the Petition fails to show that the Norman references disclose providing an appropriate frequency. *Supra* IX(A)(1)-IX(A)(2); Ex. 2001, ¶¶92.

3. The Norman references do not render any missing element obvious.

The Petition does not make any new obviousness arguments for elements 23[b] or [c] beyond those made for elements 1[b] or 1[c]. For the same reasons already addressed, the Petition fails to show that any missing elements were obvious. *Supra* IX(A)(3); Ex. 2001, ¶¶94-96.

C. Claim 35.

1. The Norman references fail to disclose element 35[b].

Element 35[b] requires “a plurality of logic blocks arranged to determine an appropriate frequency for each said portion from said delivered voltages.” MTK-1001, Claim 35. The Petition’s cited support fails to disclose this limitation.

For the non-“plurality of logic block” portions of this claim element, the Petition relies on its discussion for elements 1[b] and 23[b]. Pet., 69. Accordingly,

for the same reasons already addressed, the Petition fails to show that the Norman references disclose determining an appropriate frequency. *Supra* IX(A)(1), IX(B)(1); Ex. 2001, ¶92.

In addition, although the Petition adds some discussion of “multiprocessor” systems, it fails to explain how multiple processors solve the issues discussed herein regarding the Norman references. *See supra* IX(A)(1), IX(B)(1); Ex. 2001, ¶93.

2. The Norman references fail to disclose element 35[c].

Element 35[c] requires “a plurality of circuitry arrangements to provide each said portion its associated appropriate frequency.” MTK-1001, Claim 35. The Petition’s cited support fails to disclose this limitation.

The Petition relies on its discussion for elements 1[b] and [c], and 23[b] and [c], and 35[b]. Pet., 71. Consequently, for the same reasons already addressed, the Petition fails to show that the Norman references disclose providing an appropriate frequency. *Supra* IX(A)(2), IX(B)(2); Ex. 2001, ¶¶92-93.

3. The Norman references do not render any missing element obvious.

The only new obviousness argument the Petition makes regarding elements 35[b] or [c], beyond those incorporated by reference and previously addressed, is regarding “multiprocessor” systems. *See* Pet., 69-71. For the incorporated arguments, for the same reasons already addressed, the Petition fails to show that

any of these missing elements were obvious. *Supra* IX(A)(3), IX(B)(3); Ex. 2001, ¶¶94-96.

Regarding “multiprocessor” systems, the Petition fails to explain why a POSITA would have been motivated to modify the Norman references into such systems. Ex. 2001, ¶93. The Petition’s claim relies without explanation solely on the Min Declaration’s general discussion of the mere existence of such multiprocessor systems. Pet., 69-71. The mere existence of such systems alone does not support the conclusion. Ex. 2001, ¶93.

X. [GROUND 4] THE PETITION FAILS TO SHOW A REASONABLE LIKELIHOOD THAT NAFFZIGER ’788 RENDERS ANY CHALLENGED CLAIM UNPATENTABLE

The Petition fails to establish a reasonable likelihood of prevailing that Naffziger ’788 renders any challenged claim unpatentable. First, Naffziger ’788 does not disclose determining a frequency. Second, Naffziger ’788 does not disclose a plurality of voltage sensors, logic blocks, or circuitry arrangements. Third, a POSITA would not find it obvious to modify the disclosures of Naffziger ’788 to meet these missing limitations. Because the Petition fails to establish a reasonable likelihood regarding each challenged independent claim, it necessarily follows that it also fails to do so regarding all the challenged dependent claims. Ground 4 provides no basis for institution.

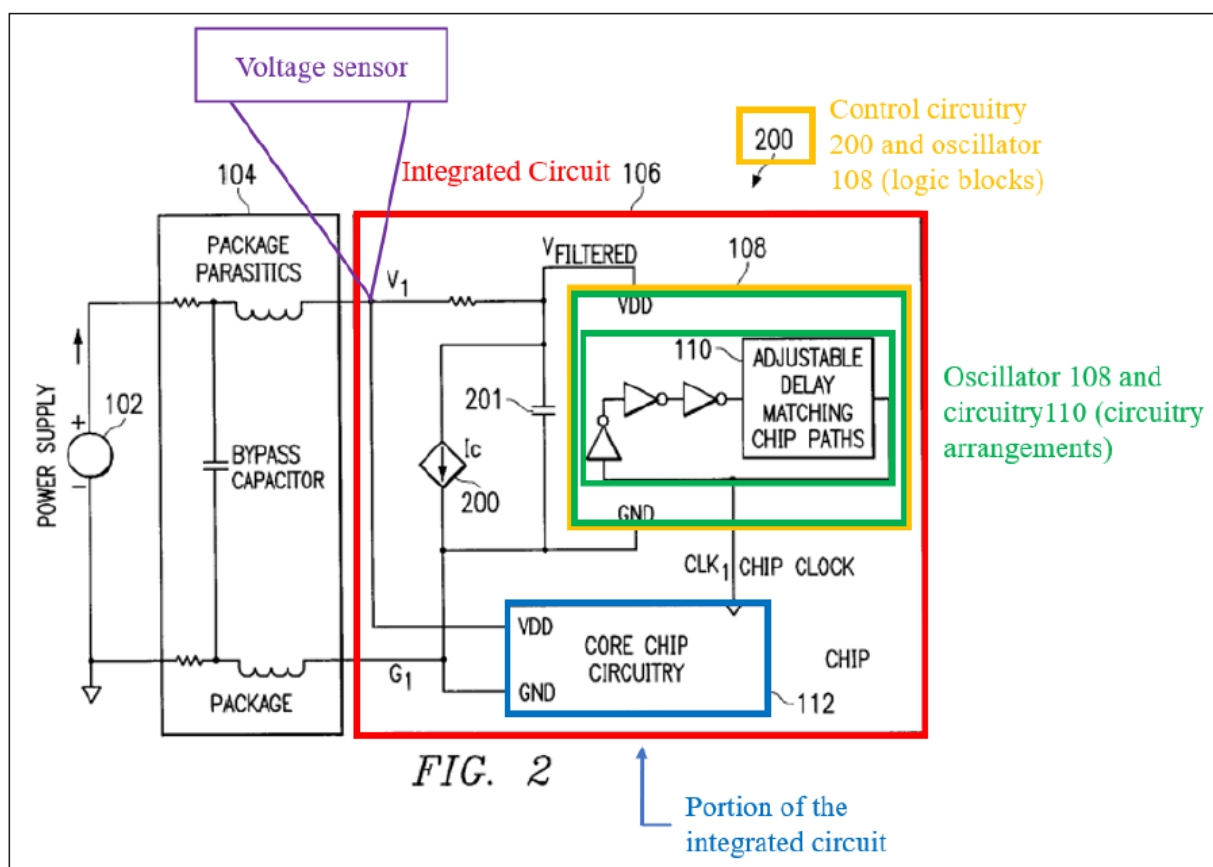
Each independent claim will be addressed in turn.

A. Claim 1.

1. Naffziger '788 fails to disclose element 1[b].

Element 1[b] requires “*determining* an appropriate frequency for the *portion of* the integrated circuit.” MTK-1001, Claim 1 (emphasis added). The Petition’s cited support fails to disclose determining an appropriate frequency. *See* Pet., 76-78.

Naffziger '788 discloses two main embodiments, of which the Petition relies on the second, disclosed in Fig. 2. MTK-1008, 3:62-4:3; *see* Pet., 76; Ex. 2001, ¶¶101-102. Naffziger '788 explains that a measured voltage drawn by core circuitry 112 is provided to control circuit 200, which can adjust the voltage supplied to the oscillator 108. MTK-1008, 7:9-40; Ex. 2001, ¶¶99, 101. A POSITA would understand that a ring oscillator like oscillator 108 in Naffziger '788 does not determine a frequency output, but rather simply varies its frequency output based on the voltage input. Ex. 2001, ¶102. Accordingly, a POSITA would understand that no determination of frequency is needed because Naffziger '788’s control circuit 200 determines a voltage instead. *See* MTK-1008, 7:9-40; Ex. 2001, ¶¶102-103.



Pet., 78 (MTK-1008, Fig. 2, with the Petition's annotations).

2. Naffziger '788 fails to disclose element 1[c].

Element 1[c] requires “providing *the appropriate frequency to said portion of said integrated circuit.*” MTK-1001, Claim 1 (emphasis added). The Petition’s cited support fails because no appropriate frequency is determined and therefore cannot be provided. Pet., 78.

As discussed for element 1[b], the cited portions of Naffziger '788 do not determine an “appropriate frequency,” but instead determine a voltage. *Supra* X(A)(1), Ex. 2001, ¶105. The antecedent basis of claim 1 requires that the

appropriate frequency provided in element 1[c] be the one determined in element 1[b]. MTK-1001, claim 1; Ex. 2001, ¶104. But because Naffziger '788 does not determine an appropriate frequency, there is no appropriate frequency to provide, and the Petition's evidence fails. Ex. 2001, ¶105.

3. Naffziger '788 does not render any missing element obvious

As discussed above, Naffziger '788 does not disclose at least elements 1[b] and 1[c]. *See supra* X(A)(1)-X(A)(2). The Petition's arguments that a POSITA would find these elements obvious in view of Naffziger '788 are conclusory, at best, and fail for a lack of evidence. Pet., 76-78.

Further, as discussed in Section XI(A), the Min Declaration should be given little to no weight because it is nearly verbatim to the Petition and adds no additional analysis or evidence. *Compare* Pet., 76-78, *with* MTK-1003, ¶¶216-217; Pet., 80-81, *with* MTK-1003, ¶230 (comparing for element 35[a]); MTK-1003, ¶232, *with* Pet., 81-82 (comparing for element 35[b]); MTK-1003, ¶234, *with* Pet., 81-82 (comparing for claim 35[c]).

Element 1[b]. The Petition (and the Min Declaration) only make a conclusory statement that element 1[b] is obvious and point to no evidence beyond the disclosure of Naffziger '788. Pet., 76-78. However, because Naffziger '788 fails to disclose determining an appropriate frequency, the Petition fails for a lack of support. *See* Pet., 78. The Min Declaration's repetition of the conclusory statement

in the Petition points to no additional evidence and provides no technical analysis. MTK-1003, ¶217; Ex. 2001, ¶¶116-118. Bereft of any evidence, the Petition's suggestion that a POSITA would modify Naffziger '788 to satisfy the limitations of element 1[b] are conclusory and based on impermissible hindsight. *See* Pet., 76-78; MTK-1003, ¶217. Such conclusory and unsupported assertions cannot “substitute for a disclosure in a prior art reference itself.” Consolidated Trial Practice Guide, <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf?MURL=TrialsPracticeGuideConsolidated>, November 2019, p. 35-36.

Element 1[c]. The Petition provides no additional arguments for element 1[c] to explain how or why this element would be obvious, and simply cites to earlier arguments for element 1[b] and a paragraph of the Min Declaration with no accompanying explanation. Pet., 78. As discussed above, the Petition's arguments for element 1[b] fail to show why that element would be obvious and further fail to show why element 1[c] would be obvious for the same reasons. *Supra* X(A)(3); Ex. 2001, ¶¶116-118. Unexplained paragraphs from an expert declaration cannot cure these fatal defects. *See infra* XI.

B. Naffziger '788 Fails to Disclose Claim 23.

For claim 23, the Petition relies on citations to its prior Ground 4 arguments for claim 1 and unexplained paragraphs from the Min Declaration. Pet., 79-80. As discussed herein, the Petition's discussion of Naffziger '788 fails to disclose the

requisite elements of at least claim 1 and elements 23[b] and 23[c]. *Supra* X(A); Ex. 2001, ¶107. Unexplained paragraphs from an expert declaration fail to cure these fatal defects. *See infra* XI.

C. Claim 35.

1. Naffziger '788 fails to disclose element 35[a].

Element 35[a] requires “a plurality of voltage sensors arranged to sense a delivered voltage to different portions of an integrated circuit.” MTK-1001, Claim 35.

The Petition relies on the earlier arguments for element 1[a] but provides no explanation for how those arguments support its contentions regarding elements 35[a]. Pet., 80-81. At best, these show that a POSITA would understand to include a voltage sensor in Naffziger '788 to measure the voltage supplied to the entire chip and its core circuitry 112. *See* Pet., 76; MTK-1008, Fig. 2, 4:28-31, 7:13-16; Ex. 2001, ¶¶109, 111. The Petition claims to identify missing limitations of different portions and multiple voltages, but points to nothing in Naffziger '788 that actually discusses these and instead relies on the Min Declaration. Pet., 80-81; Ex. 2001, ¶111. The Min Declaration's conclusory analysis assumes without explanation that Naffziger '788's reference to “components of the chip” means that different components are disclosed. MTK-1003, ¶230; Ex. 2001, ¶111. However, the word “different” never appears in Naffziger '788 and the detailed disclosure of Naffziger

'788 only refers to a single voltage for the core circuitry 112. *See* MTK-1008, 5:64-7:45; Ex. 2001, ¶111. A POSITA would understand that Naffziger '788 is referring to the components of the chip as a group, not addressing them as separate elements and, accordingly, would not find that Naffziger '788 discloses measuring multiple voltages with multiple sensors for different portions of the inventions of Naffziger '788. Ex. 2001, ¶111.

2. Naffziger '788 fails to disclose element 35[b].

Element 35[b] requires “a plurality of logic blocks arranged to determine an appropriate frequency for each said portion from said delivered voltages.” MTK-1001, Claim 35.

The Petition relies on the arguments for claims 1 and 23 but, as discussed above, Naffziger '788 does not disclose at least elements 1[b] or 23[b]. *See supra* X(A)(1), X(A)(3), X(B). The Petition and Min Declaration add nothing that resolves these fatal defects. Ex. 2001, ¶¶109, 113. Accordingly, Naffziger '788 fails to disclose element 35[b]. *See* Pet., 81-82; MTK-1003, ¶231-232.

3. Naffziger '788 fails to disclose element 35[c].

Element 35[c] requires “a plurality of circuitry arrangements to provide each said portion its associated appropriate frequency.” MTK-1001, Claim 35. The Petition's cited support fails to disclose this limitation.

The Petition relies on the arguments for claims 1 and 23 and element 35[b] but, as discussed above, Naffziger '788 does not disclose at least elements 1[b], 23[b], or 35[b]. *See supra* X(A)(1), X(A)(3), X(B), X(C)(2). The Petition and Min Declaration add nothing that resolves these fatal defects. Ex. 2001, ¶¶109, 115. Accordingly, Naffziger '788 fails to disclose element 35[c]. *See* Pet., 82; MTK-1003, ¶233-34.

4. Naffziger '788 does not render any missing element obvious.

The Petition makes some obviousness arguments regarding elements 35[a], 35[b], and 35[c], as well as incorporating by reference those previously addressed for claim 1. *See* Pet., 80-82. For the incorporated arguments, for the same reasons already addressed, the Petition fails to show that any of these missing elements were obvious. *Supra* X(A)(3).

Element 35[a]. The Petition (and the Min Declaration) only make a conclusory statement that element 35[a] is obvious and point to no evidence beyond the disclosure of Naffziger '788. Pet., 80-81. As already discussed, Naffziger '788 does not disclose element 35[a]. *Supra* X(C)(1). Beyond this evidentiary failure, the Petition and Min Declaration provide no additional analysis as to why element 35[a] would be obvious in view of Naffziger '788. MTK-1003, ¶217; Ex. 2001, ¶116. Such conclusory and unsupported assertions cannot “substitute for a disclosure in a prior art reference itself.” Consolidated Trial Practice Guide,

<https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf?MURL=TrialsPracticeGuideConsolidated>, November 2019, p. 35-36. A POSITA would not find that Naffziger '788 makes it obvious to use multiple voltage sensor to measure voltages in different portions of an integrated circuit. Ex. 2001, ¶¶111, 117-118.

Element 35[b]. The Petition (and the Min Declaration) only make a conclusory statement that element 35[b] is obvious and point to no evidence beyond the disclosure of Naffziger '788. Pet., 81-82. As discussed above, Naffziger '788 fails to teach determining an appropriate frequency, and none of the Petition's arguments address this. *Supra* X(C)(2).

The Petition also argues it would be obvious that Naffziger '788 can be applied to multiple portions of the integrated circuit. Pet., 81-82. The Petition points to nothing in Naffziger '788 that discloses this and relies on the Min Declaration to fill in the gaps. Pet., 81-82. However, the Min Declaration is nearly a verbatim copy of the Petition and provides no additional evidence or technical analysis. *Compare* MTK-1003, ¶232, *with* Pet., 81-82.

The Petition also argues that a POSITA would find it obvious that the oscillator 108 and control circuitry 200 are made up of a plurality of logic blocks. Pet. 81; MTK-1003, ¶232. However, Naffziger '788 directly contradicts this claim because it describes a single oscillator 108 and control circuit 200 for a single core circuitry 112. MTK-1008, Fig. 2, 6:45-7:45; Ex. 2001, ¶113. A POSITA would not

find it obvious that the oscillator 108 and control circuitry 200 are made up of “a plurality of logic blocks to determine an appropriate frequency for each portion” of the integrated circuit, as required by claim 35. Ex. 2001, ¶113.

The Petition fails to show that Naffziger ’788 teaches at least the limitations of element 35[b] and the Petition’s arguments for element 35[b] are conclusory, without supporting evidence and lacking in explanation. *See* Pet., 81-82; MTK-1003, ¶232; Ex. 2001, ¶¶116-118. Bereft of any evidence, the Petition’s suggestion that a POSITA would modify Naffziger ’788 to satisfy the limitations of element 35[b] are conclusory and based on impermissible hindsight. *See* Pet., 81-82; MTK-1003, ¶232. Such conclusory and unsupported assertions cannot “substitute for a disclosure in a prior art reference itself.” Consolidated Trial Practice Guide, <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf?MURL=TrialPracticeGuideConsolidated>, November 2019, p. 35-36.

Element 35[c]. The Petition relies on earlier arguments for claims 1 and 23 and element 35[b]. Pet., 82. As discussed above, these arguments both fail to disclose the limitations of the claims or make them obvious, and fail to show why element 35[c] is obvious for the same reasons. *Supra* X(A)-X(B), X(C)(3)-X(C)(4).

The Petition also argues it would be obvious that Naffziger ’788 can be applied to multiple portions of the integrated circuit. Pet., 82. The Petition points to nothing in Naffziger ’788 that disclose this and relies on the Min Declaration in an

effort to fill in the gaps. Pet., 82. However, the Min Declaration is nearly a verbatim copy of the Petition and provides no additional evidence or technical analysis. *Compare* MTK-1003, ¶234, *with* Pet., 82.

The Petition also argues that a POSITA would find it obvious that the oscillator 108 and circuitry 110 are made up of a plurality of circuitry arrangements. Pet. 82. As discussed, this ignores the disclosure of Naffziger '788, which describes a single oscillator 108 with circuitry 110 providing a frequency to a single core circuitry 112. MTK-1008, Fig. 2, 6:45-7:45; Ex. 2001, ¶115. A POSITA would not find it obvious that the oscillator 108 and circuitry 110 are made up of “a plurality of circuitry arrangements to provide each said portions its associated appropriate frequency,” as required by element 35[c]. Ex. 2001, ¶115.

The Petition fails to show that Naffziger '788 teaches at least the limitations of element 35[c] and all of the Petition's and the Min Declaration's arguments for element 35[c] are conclusory, without supporting evidence and lacking in explanation. *See* Pet., 82; MTK-1003, ¶234; Ex. 2001, ¶¶116-118. Bereft of any evidence, the Petition's and the Min Declaration's suggestion that a POSITA would modify Naffziger '788 to satisfy the limitations of element 35[c] are conclusory and based on impermissible hindsight. *See* Pet., 82; MTK-1003, ¶234. Such conclusory and unsupported assertions cannot “substitute for a disclosure in a prior art reference itself.”

Consolidated Trial Practice Guide,

<https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf?MURL=TrialsPracticeGuideConsolidated>, November 2019, p. 35-36.

XI. THE MIN DECLARATION IS CONCLUSORY AND IMPROPERLY INCORPORATED BY REFERENCE

The Petition relies heavily on the Min Declaration in support of its claim that the challenged claims are unpatentable, including its claims a POSITA would find missing claim elements obvious. However, in many instances the Min Declaration is virtually verbatim to the Petition’s conclusory statements, identifies no supporting evidence, provides no technical reasoning, and fails to show the underlying facts or data upon which Dr. Min’s opinion relies. Accordingly, the Min Declaration should be afforded little or no weight.

Further, the Petition improperly incorporates by reference large sections of the Min Declaration without sufficiently explaining those citations. The Board should disregard any arguments incorporated by reference in this manner.

A. The Min Declaration is Conclusory and Unsupported.

For many of its obviousness arguments, the Petition relies only on the Min Declaration as evidence to support finding obvious limitations of the challenged claims in light of the references or the knowledge of a POSITA. Pet., 16-18, 55, 65-71, 76-78, 80-82. However, in these cases, the Min Declaration adds nothing to the Petition because it repeats nearly verbatim the contents of the Petition. MTK-1003, ¶¶64-65, 158, 187-188, 191, 201-202, 217, 230, 232, 234.

As a whole, considering only claim elements 1[b], 1[c], 23[b], 23[c], 35[b], and 35[c], which are primarily addressed herein, and ignoring arguments where the Petition cites to the Min Declaration with no discussion whatsoever, the Petition cites to 38 paragraphs of the Min Declaration. Pet., 15-18, 27-34, 39-40, 53-56, 64-71, 76-78, 80-82. In those 38 paragraphs, the Min Declaration only adds two new paragraphs and about six additional sentences. *Compare id.*, with ¶¶62-65, 84-88, 93-98, 110-112, 156-161, 186-191, 200-202, 215-217, 231-234. Comparing those pages and paragraphs, the only other changes make no material difference, as the Min Declaration only changes the Petition to recite the claim language, add a quotation to a citation, or slightly alter the language so that the Min Declaration can offer an opinion. In other words, of the cited paragraphs, the Min Declaration is adding a de minimis amount of new substantive material. This is especially problematic considering the conclusory nature of the Petition. And, for some specific arguments, the Min Declaration adds nothing beyond what is stated in the Petition, other than quoting claim language, block quotes to a reference, or statements like “in my opinion.”

For example, in Ground 1 for element 1[b], the Petition relies on the Min Declaration to supply limitations missing from the prior art, including “the portion of the integrated circuit.” Pet., 16-17. The Min Declaration repeats nearly verbatim the content of the Petition, without any supporting evidence or additional technical

reasoning. *Compare, e.g.,* MTK-1003, ¶64, *with* Pet., 16-17. To the extent that the Petition does provide some rationale based on Tam, the Min Declaration and Petition never explain why these teachings would lead a POSITA to supply the limitation that is not expressly taught in Tam. MTK-1003, ¶64; Pet., 16-17; *see also supra* VII(A)(3), VII(B)(3), VII(C)(4), VIII(A)(3)-VIII(C), IX(A)(3), IX(B)(3), IX(C)(3), X(A)(3), X(B), X(C)(4).

The Petition also relies on the Min Declaration in Ground 1 to argue that element 1[c] is obvious in view of Tam. Pet., 17-18. Again, the Min Declaration is an almost verbatim repeat of the Petition, pointing to no supporting evidence or additional technical reasoning, and instead only repeating the conclusory assertion for which the Min Declaration is supposed to provide support. *Compare* MTK-1003, ¶65, *with* Pet., 17-18. The Min Declaration fails to provide sufficient facts and data to draw the conclusion that element 1[c] is obvious in view of Tam, especially given the failure of Tam to teach element 1[c]. *See supra* VII(A)(2).

As another example, in Ground 3 for element 1[b], the portion of the Min Declaration upon which the Petition purports to rely for support simply contains a nearly verbatim recitation of the Petition devoid of actual additional support. *Compare, e.g.,* MTK-1003, ¶158, *with* Pet., 55. The Min Declaration discloses no underlying facts or data that would support a conclusion of obviousness other than the explicit teachings of the Norman references that are used to show what the

Norman references actually disclose. MTK-1003, ¶158. As discussed above, the Norman references do not disclose element 1[b], and the Min Declaration does not provide sufficient facts or data to show that a POSITA would find element 1[b] obvious in view of the Norman references. *See supra* IX(A)(1).

As still another example, for element 23[b] in Ground 3, the Petition relies on the Min Declaration to show that a POSITA would understand that limitations are taught by the Norman references. Pet., 65-66. As before, the Min Declaration is nearly verbatim to the Petition and provides no additional supporting evidence or technical reasoning. *Compare* MTK-1003, ¶¶187-188, *with* Pet., 64-66. The Min Declaration provides no evidence and reasoning to explain why the alleged explicit teachings of the Norman references teach anything other than what they say, and instead attempts to supply the missing element of “appropriate frequency” with nothing but a conclusory statement that parrots the same conclusory statement in the Petition. MTK-1003, ¶187-188; *see supra* IX(A)(1), IX(B)(1) (discussing that “appropriate frequency” is not taught by the Norman references).

The Petition repeats this pattern for element 23[c] of Ground 3, relying on the Min Declaration to supply the missing element of “appropriate frequency” without any supporting evidence or technical reasoning, and instead repeating the conclusory statements of the Petition nearly verbatim. *Compare* MTK-1003, ¶191, *with* Pet.,

66-68; *see supra* IX(A)(1)-IX(A)(2), IX(C)(1)-IX(C)(2) (discussing that “appropriate frequency” is not taught by the Norman references).

As a further example, for element 35[b] of Ground 3, the Petition relies on a single generic statement in Norman ’259 and the Min Declaration as allegedly showing that creating a multi-chip module would be obvious in light of the Norman references. Pet., 69-71. While the cited portions of the Min Declaration do cite to other references that explain the general idea of multi-chip modules, it otherwise repeats nearly verbatim the conclusory statement from the Petition and provides no technical reasoning as to why a POSITA would use this general disclosure of multi-chip modules to modify the Norman references specifically. *Compare* MTK-1003, ¶¶201-202, *with* Pet., 69-71; *see also supra* IX(C)(1).

In Ground 4 for element 1[b], the Petition again makes conclusory statements of obviousness and relies solely on the Min Declaration to fill in the gaps. Pet., 77. The Min Declaration, however, merely repeats the conclusory statements of the Petition nearly verbatim and provides no additional supporting evidence or technical reasoning. *Compare* Pet., 76-78, *with* MTK-1003, ¶217. As discussed, the explicit teachings of Naffziger ’788 do not disclose the limitations of element 1[b], *supra* X(A)(1), the Min Declaration’s conclusory statements do not cure this defect. MTK-1003, 217; *see* Consolidated Trial Practice Guide,

<https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf?MURL=TrialsPracticeGuideConsolidated>, November 2019, p. 35-36

The Petition continues its pattern of conclusory statements supported only by citation to nearly verbatim portions of the Min Declaration for element 35[a] of Ground 4. Pet., 80-81. The Min Declaration purports to supply the missing elements of a plurality of voltage sensors sensing delivered voltages to different portions of the integrated circuit, but actually provides no supporting evidence or technical reasoning explaining why such would be obvious and only repeats, nearly verbatim, the conclusory statements of the Petition. *Compare* Pet., 80-81, *with* MTK-1003, ¶230; *see also supra* X(C)(1).

The Petition applies this same approach for element 35[b] of Ground 4. Pet., 81-82. As before, the Min Declaration is nearly verbatim to the Petition, cites to no evidence that shows that Naffziger '788 discloses the limitations of element 35[b], and provides no analysis other than a conclusory statement that it would be obvious to meet the limitations of element 35[b] based on Naffziger '788 alone. *Compare* Pet., 81-82, *with* MTK-1003, ¶232; *see also supra* X(C)(2).

Similarly, for element 35[c] of Ground 4, the Petition again relies on nearly verbatim language in the Min Declaration, cites to no evidence, and provides no analysis other than a conclusory statement that it would be obvious to meet the

limitations of element 35[c]. *Compare* Pet., 82, with MTK-1003, ¶234; *see also supra* X(C)(3).

Because the Min Declaration only repeats the conclusory assertions for which his testimony is offered as support without any supporting evidence or technical reasoning, the Min Declaration is entitled to little weight. *See Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 14-16 (Aug. 24, 2022) (precedential); 37 C.F.R. § 42.65(a); *see also* Consolidated Trial Practice Guide, <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf?MURL=TrialsPracticeGuideConsolidated>, November 2019, p. 35-36.

B. The Petition Improperly Incorporates By Reference Portions of the Min Declaration.

The Petition repeatedly and improperly attempts to incorporate wholesale portions of the Min Declaration without any discussion. *See* Pet., 25, 27, 30, 32-33, 38-41, 44-45, 62, 64, 66, 68-69, 71, 78, 80-82. The Board should not consider any arguments that are not made in the Petition, but are instead incorporated by reference.

For example, in Ground 2 for claim 35, the Petition cites to four paragraphs of the Min Declaration with no accompanying discussion, along with internal cross-citations to Ground 1 for claims 1, 23, and 35 and Ground 2 for claims 1 and 23. Pet., 45. These cross-citations refer to another thirty-one paragraphs of the Min

Declaration, ten of which also include no explanation or discussion whatsoever. Pet., 11-18, 26-29, 30-34, 38-40, 44.

Another example is Ground 3, elements 35[a] and 35[c], which cite to ten paragraphs of the Min Declaration, along with internal cross-citations to Ground 3, claims 1 and 23 and element 35[b], all with no explanation of how those citations address or apply to the different limitations of elements 35[a] and 35[c]. Pet., 69, 71. Those internal cross-references include another seventeen paragraphs of the Min Declaration, four of which are accompanied by no specific explanation or discussion. Pet., 56, 64-68.

As still another example, in Ground 4 for claim 23, the Petition cites to four paragraphs of the Min Declaration with only a single short sentence regarding the preamble and no discussion of the specific limitations of claim 23 that are different from other claims in the '563 Patent. Pet., 79, 80. The Petition also includes internal cross-citations to Ground 4's discussion of claim 1, which includes citations to another seven paragraphs of the Min Declaration, one of which has no explanation. Pet., 74-78.

The Board has held that citing to large portions of another document, such as an expert declaration, without sufficiently explaining those citations is incorporation by reference. *Cisco Sys., Inc. v. C-Cation Tech, LLC*, IPR2014-00454, Paper 12 at 8 (Aug. 29, 2014) (informative). The Board will “not consider arguments that are not

made in the Petition, but are instead incorporated by reference to the cited paragraphs.” *Cisco Sys., Inc. v. C-Cation Tech, LLC*, IPR2014-00454, Paper 12 at 10 (Aug. 29, 2014) (informative). Accordingly, the Board should not consider any arguments incorporated by reference in the Petition.

XII. THE BOARD SHOULD EXERCISE ITS DISCRETION AND DENY INSTITUTION

To the extent the Board determines the Petition has demonstrated a reasonable likelihood of success as to any challenged claim, the Board should exercise its discretion to deny institution under 35 U.S.C. §314(a). *Chevron Oronite Co. v. Infineum USA L.P.*, IPR2018-00923, Paper 9 at 10-11 (Nov. 7, 2018) (informative) (denying institution when “Petitioner demonstrate[d], at most, a reasonable likelihood of prevailing with respect to two dependent claims out of a total of twenty challenged claims”); *Deeper, UAB v. Vexilar, Inc.*, IPR2018-01310, Paper 7 at 41-43 (Jan. 24, 2019) (informative) (denying institution when “Petitioner challenged twenty-three claims under four asserted grounds of unpatentability, with each claim being the subject of two separate grounds” and “demonstrate[d] a reasonable likelihood of prevailing with respect to only two claims on one asserted ground”). Like the discretionarily denied Petitions in *Chevron* and *Deeper*, the Petition here presents excessive grounds of questionable merit. *See supra* VII-X.

The Petition challenges 18 claims across four highly overlapping grounds. Pet., 1. Three challenged claims are included in two grounds, seven are included in

three grounds, and eight are included in all four grounds (including all three challenged independent claims). The only grounds that share a common prior art reference are grounds 1 and 2, which share Tam. The Petition provides no explanation or justification for why it contains such a high level of overlapping and redundant grounds.

Compounding this problem is the Petition's improper incorporation by reference of large sections of the Min Declaration and the nearly verbatim language shared between the two. *See supra* XI.

Taken as a whole, the Petition would force the Board to waste scarce resources in order to address the highly redundant, excessive, and improperly supported claims. As such, granting institution is not “in the interests of efficient administration of the Office and the integrity of the patent system” and, accordingly, the Petition should be denied under 35 U.S.C. §314(a). *Adaptics Ltd. v. Perfect Co.*, IPR2018-01596, Paper 20 at 17, 18 (Mar. 6, 2019); *see also Chevron Oronite Co. v. Infineum USA L.P.*, IPR2018-00923, Paper 9 at 10-11 (Nov. 7, 2018); *Deeper, UAB v. Vexilar, Inc.*, IPR2018-01310, Paper 7 at 41-43 (Jan. 24, 2019).

The Petition addressed numerous discretionary denial bases, but was silent on this specific issue. Pet., 83-88. The Board should not allow the Petitioner a reply opportunity to address this foreseeable issue that should have been addressed in the Petition.

XIII. CONCLUSION

For at least the reasons set forth herein, Petitioner cannot meet its burden to prove that any challenged claim is unpatentable over any of the obviousness combinations of references asserted in the Petition's Grounds 1-4. None of the challenged claims is unpatentable. To the extent that MOSAID has not addressed a specific claim element in this response, it is not a concession that the element is disclosed in the prior art, but a reflection of the preliminary nature of this response and the restriction the word count places on the number of arguments that MOSAID can make in response.

Dated: June 28, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §42.6(e), I hereby certify that on June 28, 2024, I electronically filed the foregoing document and served a copy of the same on counsel for Petitioner at the following e-mail address, as authorized in the Petition:

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Dated: June 28, 2024

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David W. Higer

CERTIFICATE OF WORD COUNT

The undersigned certifies that the foregoing Patent Owner Response, exclusive of the parts exempted by 37 C.F.R. §42.24, contains 13,694 words, according to the word processing program used to prepare it, and therefore complies with the limitations of 37 C.F.R. §42.24.

Dated: June 28, 2024

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