

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SONY ELECTRONICS INC.,
Petitioner,

v.

JAWBONE INNOVATIONS, LLC,
Patent Owner.

IPR2023-01118
Patent 8,321,213 B2

Before GEORGIANNA W. BRADEN, NORMAN H. BEAMER, and
SCOTT RAEVSKY, *Administrative Patent Judges*.

RAEVSKY, *Administrative Patent Judge*.

DECISION

Denying Institution of *Inter Partes* Review

35 U.S.C. § 314

Dismissing Petitioner's Motion for Joinder

35 U.S.C. § 315(c); 37 C.F.R. § 42.122

I. INTRODUCTION

Sony Electronics Inc. (“Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–13 in U.S. Patent No. 8,321,213 B2 (Ex. 1001, “the ’213 patent”). Paper 1 (“Pet.”). Jawbone Innovations, LLC (“Patent Owner”) filed a Preliminary Response. Paper 8 (“Prelim. Resp.”).

Concurrently with the Petition, Petitioner filed a Motion for Joinder seeking joinder as a party in *Amazon.com, Inc. v. Jawbone Innovations, LLC*, IPR2023-00279 (“the Amazon IPR”) and consolidation with the Amazon IPR. Paper 3, 1. Patent Owner filed an Opposition to Petitioner’s Motion for Joinder. Paper 7. Subsequently, the Amazon IPR terminated based on settlement. IPR2023-00279, Paper 17. We therefore dismiss Petitioner’s Motion for Joinder as moot.

Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless it is determined that there is a reasonable likelihood that the petitioner would prevail with respect to at least one of the claims challenged in the petition. After considering the parties’ arguments and evidence, and for the reasons set forth below, Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to at least one of the challenged claims of the ’213 patent. Accordingly, we decline to institute an *inter partes* review.

II. BACKGROUND

A. The ’213 Patent

The ’213 patent relates generally “to noise suppression” and more particularly “to noise suppression systems, devices, and methods for use in acoustic applications.” Ex. 1001, 1:16–19, code (57). The ’213 patent explains that the “ability to correctly identify voiced and unvoiced speech is

critical to many speech applications including speech recognition, speaker verification, noise suppression, and many others.” *Id.* at 1:23–26. In “the speaker’s environment,” however, “there may exist one or more noise sources that pollute the speech signal, the signal of interest, with unwanted acoustic noise.” *Id.* at 1:28–31. The unwanted acoustic noise “makes it difficult or impossible for the receiver, whether human or machine, to understand the user’s speech.” *Id.* at 1:31–32.

The ’213 patent discloses “Acoustic Voice Activity Detection (AVAD) methods and systems” that use physical microphones “to generate virtual directional microphones which have very similar noise responses and very dissimilar speech responses.” Ex. 1001, 3:57–62, code (57); *see id.* at 4:21–25, 5:35–52, 17:44–51. “The ratio of the energies of the virtual microphones is then calculated over a given window size and the ratio can then be used with a variety of methods to generate a VAD signal.” *Id.* at 3:62–65, code (57). “The virtual microphones can be constructed using either a fixed or an adaptive filter.” *Id.* at 3:65–66, code (57); *see id.* at 4:27–30.

The ’213 patent’s Figure 3 (reproduced below) is a diagram depicting an example of a virtual microphone V_2 :

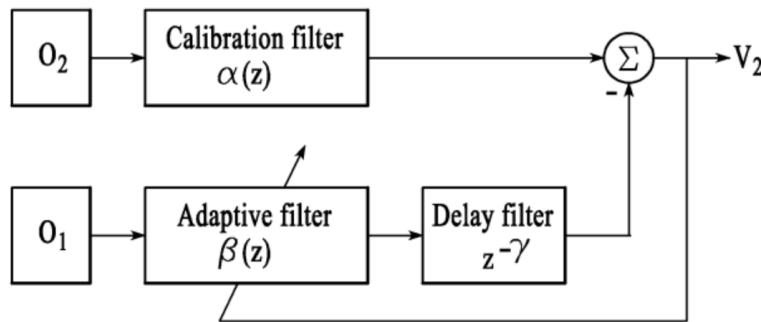


FIG.3

Figure 3 illustrates the following components where “ z ” denotes a discrete frequency domain and “ γ ” is a fixed delay that depends on the size of the microphone array:

- (1) a physical omnidirectional microphone O_1 providing a signal to an adaptive filter $\beta(z)$;
- (2) the adaptive filter $\beta(z)$ providing a signal to a delay filter $z^{-\gamma}$;
- (3) a physical omnidirectional microphone O_2 providing a signal to a calibration filter $\alpha(z)$;
- (4) a summing circuit (Σ) summing (i) a positive signal from the calibration filter $\alpha(z)$ and (ii) a negative signal from the delay filter $z^{-\gamma}$ to form a virtual microphone V_2 ; and
- (5) the virtual microphone V_2 providing a signal to the adaptive filter $\beta(z)$.

See Ex. 1001, 1:62–63, 4:41, 5:22–33, 6:1–16, Fig. 3.

B. Challenged Claims

Claim 1 is illustrative of the challenged claims:¹

1. [1pre] An acoustic voice activity detection system comprising:

[1a] a first virtual microphone comprising a first combination of a first signal and a second signal, wherein the first signal is received from a first physical microphone and the second signal is received from a second physical microphone;

[1b] a filter, wherein the filter is formed by generating a first quantity by applying a calibration to at least one of the first signal and the second signal, generating a second quantity by applying a delay to the first signal, and forming the filter as a ratio of the first quantity to the second quantity; and

¹ We use the same numbers and letters that Petitioner uses to identify the claim language. See Pet. viii (Listing of Challenged Claims). These annotations do not impact our analysis.

[1c] a second virtual microphone formed by applying the filter to the first signal to generate a first intermediate signal and summing the first intermediate signal and the second signal,

[1d] wherein acoustic voice activity of a speaker is determined to be present when an energy ratio of energies of the first virtual microphone and the second virtual microphone is greater than a threshold value.

Ex. 1001, 37:4–22.

C. Asserted Challenges to Patentability

Petitioner asserts the following challenges to patentability (Pet. 1):

Claim(s) Challenged	35 U.S.C. §²	Reference(s)/Basis
1–3, 5–9, 12, 13	103(a)	Avendano '880, ³ Hou ⁴
4, 10, 11	103(a)	Avendano '880, Avendano '252, ⁵ Hou

To support these challenges, Petitioner relies on the declaration of Thomas W. Kenny, Ph.D. (Ex. 1003). Patent Owner has not submitted testimonial evidence at this stage.

IV. ANALYSIS

A. Legal Principles: Obviousness

“In an IPR, the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v.*

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 285–88 (2011), revised 35 U.S.C. §§ 102, 103 effective March 16, 2013. The '932 patent was filed before March 16, 2013, so we apply the pre-AIA versions of §§ 102, 103. Ex. 1001, code (22).

³ US 8,194,880 B2, issued June 5, 2012 (Ex. 1005).

⁴ US 7,155,019 B2, issued Dec. 26, 2006 (Ex. 1008).

⁵ US 8,204,252 B1, issued June 19, 2012 (Ex. 1006).

Avid Tech., Inc., 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)).

A patent may not be obtained “if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a) (2006). An obviousness analysis involves underlying factual inquiries including (1) the scope and content of the prior art; (2) differences between the claimed invention and the prior art; (3) the level of ordinary skill in the art; and (4) where in evidence, objective indicia of nonobviousness, such as commercial success, long-felt but unsolved needs, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18, 35–36 (1966). We analyze the obviousness issues according to these principles.

B. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art (“POSITA”) would have had “at least a bachelor of science in electrical engineering, computer engineering, computer science, mechanical engineering, or a related discipline, with at least two years of relevant experience in a field related to acoustics, speech recognition, speech detection, or signal processing.” Pet. 6–7 (citing Ex. 1003 ¶¶ 22–23). Petitioner also asserts that “[a]dditional education or industry experience may compensate for a deficit in the other.” *Id.* Patent Owner proposes a nearly identical definition and asserts that “Petitioner generally agrees with this level of skill in the art.” Prelim. Resp. 14 (citing Ex. 1003 ¶¶ 22–23).

Based on the current record, we accept Petitioner’s description of an ordinarily skilled artisan as consistent with the ’213 patent and the asserted prior art.

C. Claim Construction

In *inter partes* review, we construe a claim using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. 37 C.F.R. § 42.100(b) (2022).

The Petition construes no terms. Pet. 7. The Preliminary Response proposes construing “filter, wherein the filter is formed,” as “adaptive filter comprising a signal ratio, wherein the filter is formed.” Prelim. Resp. 12–14. We determine that we need not construe this term because, for the reasons we explain below, Petitioner has not met its institution burden regardless of the construction of this term. We further determine that no other terms require construction. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

D. Alleged Obviousness over Avendano ’880 and Hou

Petitioner contends that claims 1, 3, 5–9, 12, and 13 are unpatentable over the combination of Avendano ’880 and Hou. *See* Pet. 7–66.

We determine below that Petitioner has not met its burden to show a reasonable likelihood that Avendano ’880 and Hou would have rendered

independent claim 1 obvious. As the remaining claims all depend from claim 1 and Petitioner's second challenge only addresses dependent claims, Petitioner's failure to meet its burden on this challenge is dispositive, and we need not address Ground 2. *See* Pet. 1.

1. Overview of Avendano '880

Avendano '880 discloses systems and methods “for utilizing inter-microphone level differences (ILD) to attenuate noise and enhance speech.” Ex. 1005, 2:5–7, 3:13–17, code (57). Preferably, “the ILD is based on energy level differences of a pair of omni-directional microphones.” *Id.* at 2:7–9, code (57). Avendano '880's Figure 4a (reproduced below) is a diagram depicting several modules, including differential microphone array (DMA) module 302, frequency-analysis module 304, energy module 306, ILD module 308, and noise-reduction system 310:

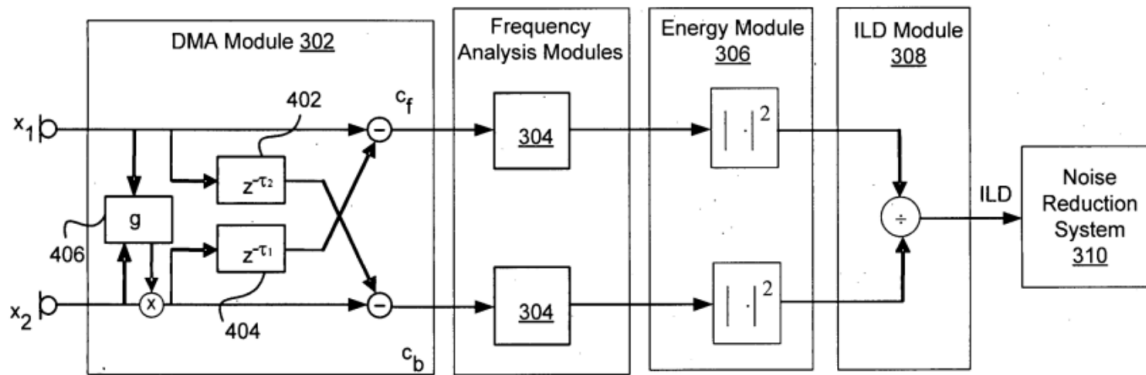


FIG. 4a

Id. at 2:61–63, 5:15–17, 6:36–40; *see id.* at 2:20. The DMA module 302 of Figure 4a receives first and second signals x_1 and x_2 . *Id.* at 5:15–24. Of note, DMA module 302 determines “sounds and signals in a front and back cardioid region about” audio device 104 by “delaying and subtracting the acoustic signals captured by the microphones 106 and 108.” Ex. 1005,

4:29–33. By doing so, DMA module 302 creates “directional patterns” for the microphones. *Id.* at 4:27–29; *see id.* at 4:40–46.

2. *Overview of Hou*

Hou describes a multi-microphone array that can selectively enhance sounds coming from certain directions while suppressing interference coming from other directions. Ex. 1008, 1:30–32. To “achieve good directionality,” however, the sensitivities of the microphones must match. *Id.* at 1:48–50; *see id.* at 1:67–2:2. “When the sensitivities of the microphones are not properly matched, then the directionality is substantially degraded and thus the ability to suppress interference coming from a particular direction is poor.” *Id.* at 1:50–53; *see id.* at 1:53–62, Figs. 2(a)–2(d).

Hou's Figure 5 (reproduced below) is a diagram depicting a two-microphone directional processing system:

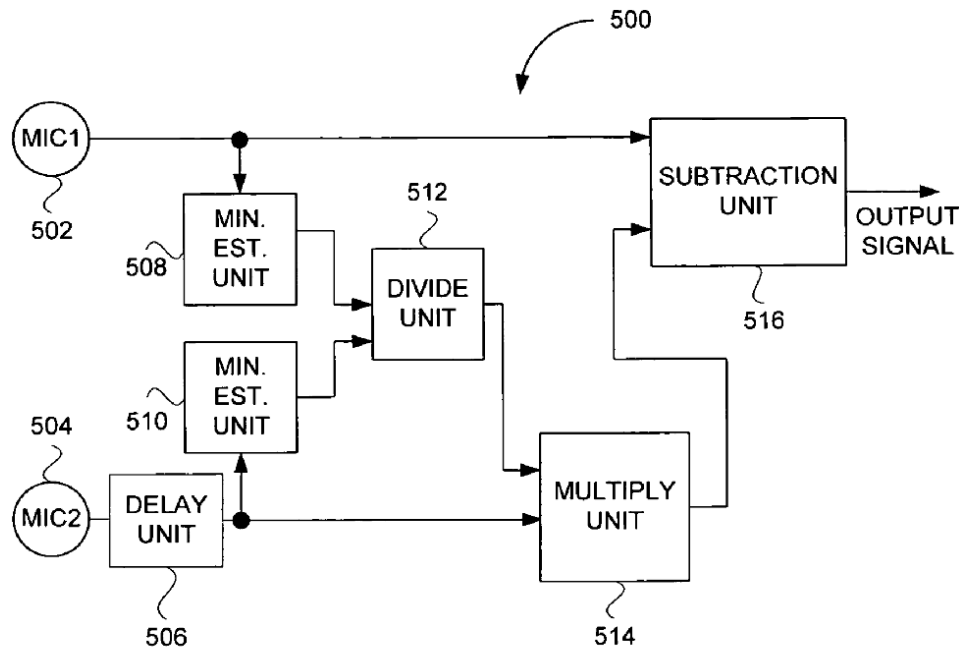


FIG. 5

Figure 5 illustrates minimum estimate units 508, 510 that estimate minimums for first and second electronic sound signals. Ex. 1008, 5:36–39. Divide unit 512 “produces a quotient by dividing the first minimum estimate by the second minimum estimate.” *Id.* at 5:42–43. The “quotient represents a scaling amount that is sent to” multiplication unit 514. *Id.* at 5:43–45. “The second electronic sound signal is then multiplied with the scaling amount to produce a compensated sound signal.” *Id.* at 5:45–47. “The compensated sound signal is thus compensated (or corrected) for the relative difference in sensitivity between the mismatched first and second microphones 502 and 504.” *Id.* at 5:47–50. Subtraction unit 516 “subtracts the compensated electronic sound signal from the first electronic sound signal to produce an output signal.” *Id.* at 5:50–52, Fig. 5. Thus, “the output

signal has been processed by the two-microphone directional processing system 500 to have robust directionality despite a mismatch between the first and second microphones 502 and 504.” *Id.* at 5:52–56.

3. *Independent Claim 1*

Patent Owner disputes that the combination of Avendano ’880 and Hou disclose limitation [1b]. Prelim. Resp. 17–22. We agree that Petitioner fails to establish a reasonable likelihood that Avendano ’880 and Hou disclose limitation [1b].

- a. *[1b] a filter, wherein the filter is formed by generating a first quantity by applying a calibration to at least one of the first signal and the second signal, generating a second quantity by applying a delay to the first signal, and forming the filter as a ratio of the first quantity to the second quantity*

Petitioner contends that the combined disclosures of Avendano ’880 and Hou teach limitation [1b]. *See* Pet. 34–39. We address solely Petitioner’s argument with respect to the “generating a first quantity by applying a calibration to at least one of the first signal and the second signal” portion of this limitation.

Petitioner begins its argument based on an annotated version of Figure 4a of Avendano ’880 reproduced below with red arrows showing where to apply calibration, the location of Avendano ’880’s second signal x_2 , and to Hou’s upper signal pathway:

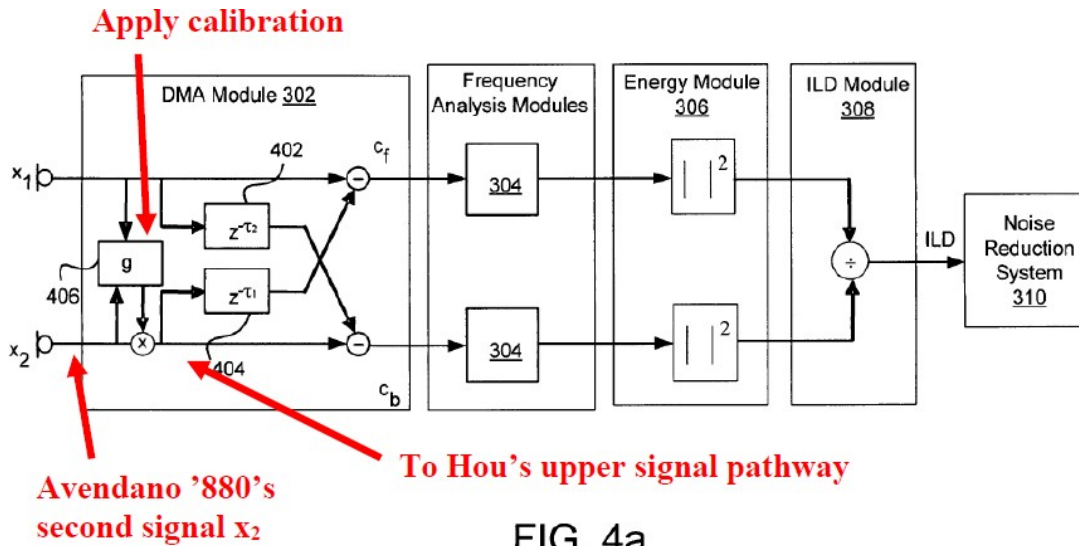


FIG. 4a

Pet. 34–35. Petitioner explains that Figure 4a of Avendano '880 depicts a “gain factor, g ” and/or multiplexor, which would apply a calibration to second signal x_2 . *Id.* at 34 (citing Ex. 1005, 5:36–39, 9:54–59; Ex. 1003 ¶ 134). Petitioner further annotates Figure 4a to show where an output allegedly would be provided “[t]o Hou’s upper signal pathway.” *Id.* at 35.

Petitioner next reproduces an annotated version of Hou’s Figure 5, reproduced below as receiving an input from Avendano '880’s Figure 4a with red arrows showing the input for Avendano '880’s second signal x_2 and a first quantity:

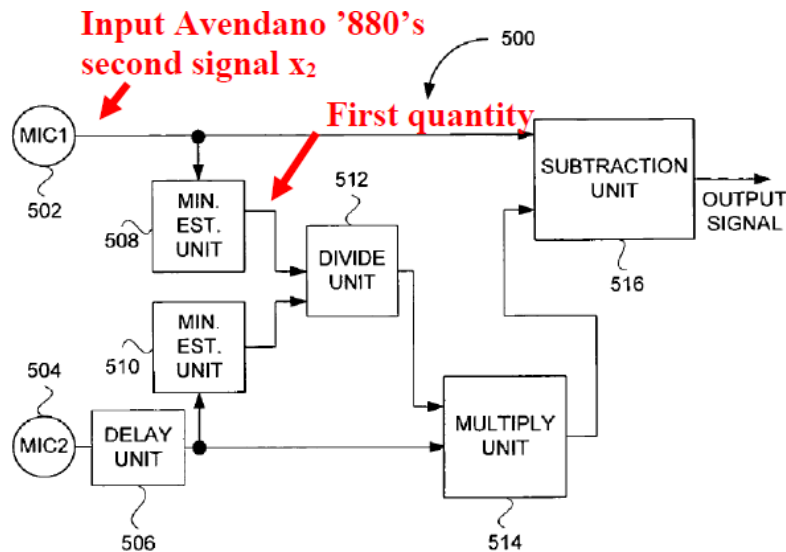


FIG. 5

Id. at 36. In Figure 5 above, an input from Avendano '880's second signal x_2 is received (in the proposed combination) by first minimum estimate unit 508, which outputs the claimed "first quantity," according to Petitioner. *Id.* at 34. Petitioner contends, "[t]he calibrated second signal x_2 would be subsequently processed to generate a 'first quantity' (e.g., by processing the calibrated second signal x_2 using Hou's 'first minimum estimate unit 508')." *Id.* (citing Ex. 1008, 5:36–38; Ex. 1003 ¶ 134).

As an alternative argument for generating the claimed first quantity, Petitioner contends that "a calibration also would be applied to the second signal x_2 by Hou's 'first minimum estimate unit 508' to generate a first quantity." *Id.* at 36–37 (citing Ex. 1008, 5:36–38; Ex. 1003 ¶ 135).

Patent Owner primarily raises arguments that depend on Patent Owner's proposed construction for "filter," which we have not adopted, so we do not address them. Prelim. Resp. 17–22. Patent Owner also contends that "[e]ven if the calculated gain were the claimed filter . . . , it is not *formed* as claimed." *Id.* at 21. For example, Patent Owner notes that

“Petitioner alleges that ‘a calibration would be applied to the second signal x_2 using Avendano ’880’s gain factor, g and/or multiplexer.’” *Id.* (citing Pet. 35 (internal quotations omitted)). But “***subsequent*** processing results in the ‘first quantity,’” Patent Owner contends. *Id.* And “the subsequent processing is the use of Hou’s minimum estimate unit 508,” according to Patent Owner. *Id.* We find these statements, as we expand on in our analysis below, persuasive.

Limitation [1b] requires, in part, “generating a first quantity by applying a calibration to at least one of the first signal and the second signal.” Petitioner’s proposed combination does not disclose this portion of limitation [1b] because Avendano ’880’s alleged calibration does not generate the first quantity. Rather, Petitioner relies on Avendano ’880’s gain to generate a calibrated second signal, which “would be *subsequently processed* to generate a ‘first quantity.’” Pet. 34 (emphasis added). That is, Petitioner relies on Hou’s “first minimum estimate unit 508” to subsequently process the calibrated second signal to generate the first quantity. *Id.* But the combination does not meet the claim because claim 1 requires the *calibration* to generate the first quantity: “generating a first quantity *by applying a calibration*,” and Petitioner relies on subsequent processing *after* Avendano ’880’s alleged calibration to generate the first quantity.

Petitioner’s alternative argument, that “[a]s another example, a calibration also would be applied to the second signal x_2 by Hou’s ‘first minimum estimate unit 508’ to generate a first quantity,” also fails. *Id.* at 36–37. This argument is untenable because Hou’s first minimum estimate unit 508 merely “estimates the minimum for the first electronic sound signal.” Ex. 1008, 5:36–38. Hou does not describe unit 508 as performing a

calibration. Nor does Petitioner explain how Hou's minimum estimate constitutes a calibration. Pet. 36–37. And Petitioner's expert merely parrots the Petition. Ex. 1003 ¶ 135. Thus, Petitioner's conclusory assertion is unpersuasive.

b. Summary as to Claim 1

For the above reasons, Petitioner has failed to meet its burden to show a reasonable likelihood that claim 1 would have been obvious over Avendano '880 and Hou.

4. Dependent Claims 2, 3, 5–9, 12, and 13

As Petitioner has failed to meet its burden on claim 1, it also fails to meet its burden for dependent claims 2, 3, 5–9, 12, and 13.⁶

V. CONCLUSION

We determine that Petitioner has not demonstrated a reasonable likelihood of prevailing on its challenges as to at least one challenged claim. Accordingly, we do not institute *inter partes* review.

VI. ORDER

Accordingly, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review is *denied*; and

FURTHER ORDERED that Petitioner's Motion for Joinder is *dismissed*.

⁶ As we note above, Petitioner's challenge based on Avendano '880, Avendano '252, and Hou for dependent claims 4, 10, 11 also necessarily fails.

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