

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO. LTD and
SAMSUNG ELECTRONICS AMERICA, INC,
Petitioner

v.

ZOPHONOS, INC.,
Patent Owner

Case IPR2026-00084
U.S. Patent No. 11,204,736

**PATENT OWNER PRELIMINARY RESPONSE
UNDER 37 C.F.R. § 42.107(a)**

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PATENT OWNER'S UPDATED EXHIBIT LIST

Exhibit No.	Description
2001	File History of U.S. Application No. 18/084,081
2002	Invalidity Contentions, <i>Zophonos Inc. v. Samsung Elecs. Co., Ltd.</i> , Case No. 2:25-cv-00752 (E.D. Tex. Jan. 19, 2026)
2003	Declaration of Justin D. Matthew, Ph.D. in Support of Patent Owner Preliminary Response
2004	<i>Curriculum Vitae</i> of Justin D. Matthew, Ph.D.
2005	Am. Speech-Language-Hearing Ass'n, Audiogram, https://www.asha.org/public/hearing/Audiogram/

I. INTRODUCTION

U.S. Patent No. 11,204,736 (“the ’736 patent”) addresses a common real-world problem: delivering clear and safe audio in environments with competing background noise. The patent describes systems that monitor surrounding sound conditions and automatically adjust audio output so that desired sounds remain intelligible while harmful or excessive sound levels are avoided. The ’736 patent discloses systems and methods for multi-frequency sensing and autonomous environmental control using clusters of computing devices. The ’736 patent addresses the technical challenge of managing sound quality, intelligibility, and user safety in acoustically complex environments by deploying clusters of consumer devices to sense ambient signals and by using a processor to identify and isolate sounds, determine whether frequencies exceed predetermined thresholds, and alter audio outputs in response. *See* EX1001, 1:55-63, 2:40-46, cl. 1.

Ground 1A fails for multiple independent reasons. First, the Petition never identifies a single, coherent configuration of DiCenso641 that satisfies Claim 1. The claim requires a computing device that communicates with a data source via an electronic bus while a processor identifies and isolates sounds and evaluates frequency thresholds, yet the Petition relies on incompatible embodiments: it invokes an unprocessed audio stream transmitted to a mobile device to satisfy the data-source and bus limitations, but attributes sound identification and isolation to

the wearable's internal DSP, which performs local processing. The Petition never explains how the same signal can simultaneously remain unprocessed for transmission and already processed for analysis, nor does it cite any disclosure describing such a system. Second, the Petition never identifies the required cluster architecture. Claim 1 recites a data source communicating with both (i) a cluster of at least one computing device and (ii) a separate output device, but Petitioner assigns both roles to the same earbuds and, in any event, DiCenso641 discloses no cluster at all. Third, the mapping fails for the "electronic bus" limitation because Petitioner offers no construction and instead implicitly equates a bus with a wireless transceiver. That unstated redefinition is improper and unsupported: the intrinsic record characterizes a bus as an internal wired data pathway, while the dependent claims separately add wireless communication, confirming wireless is an additional feature rather than the bus itself. Finally, the Petition does not establish a technically coherent combination of DiCenso641 with Smith. Smith relies on full-spectrum environmental frequency analysis of an aggregate audio signal, whereas DiCenso641 first segments the signal into discrete sound types before modification. Implementing one approach would defeat the other, and the Petition provides only conclusory assertions without explaining how both could operate together or why a skilled artisan would expect success. Accordingly,

Petitioner fails to show a motivation to combine or a reasonable expectation of success.

Ground 1A fails because the Petition never identifies a single configuration of DiCenso641 that satisfies Claim 1 as mapped. Claim 1 recites an architecture in which a computing device communicates with a data source through an electronic bus while a processor identifies and isolates sounds and evaluates frequency thresholds. Yet the Petition relies on incompatible theories: to meet the data-source and bus limitations it depends on an embodiment where the wearable transmits an unprocessed audio stream to a mobile device, while to meet the processor limitations it attributes sound identification and isolation to the wearable's internal DSP, which discloses local processing. The Petition never explains how the same audio stream can be both unprocessed for transmission and already processed for analysis, nor does it cite any disclosure in DiCenso641 describing such a system.

Ground 1A independently fails because the Petition never identifies the cluster-based system architecture recited by Claim 1. The claims recite a data source communicating with two distinct components: (i) a cluster of at least one computing device and (ii) a separate output device, but the Petition relies on inconsistent characterizations of the same earbuds to satisfy both roles. Here, Petitioner's mapping fails both because it reassigns roles among identical hardware and because DiCenso641 never discloses a cluster at all.

Ground 1A also fails as to the “electronic bus” limitation. The Petition never proposes a construction for this material claim term, instead asserting ordinary meaning while implicitly redefining “electronic bus” to cover a wireless transceiver solely to fit the prior art. That approach is legally insufficient because unpatentability must be evaluated against the claims as properly construed, not an unstated interpretation. On the merits, neither the intrinsic record nor the reference supports equating a bus, an internal data pathway within a computing device, with over-the-air wireless communication. The prosecution history characterizes the bus as a wire connection, and the dependent claims separately add wireless communication, confirming it is an additional feature rather than the bus itself. Because Petitioner never shows that DiCenso641 teaches an electronic bus under any reasonable construction, the mapping fails.

Ground 1A also fails because the Petition does not establish a motivated and technically coherent combination of DiCenso641 and Smith. Smith depends on full-spectrum environmental analysis of an aggregate audio signal, evaluating frequencies relative to an environmental baseline before segmentation. DiCenso641, by contrast, uses an separation-first approach that divides the ambient signal into discrete sound types before modification. Once segmented as DiCenso641 discloses, the full spectrum signal necessary for Smith’s detection \no longer exists, while reversing the order would contradict DiCenso641’s core

operation. The Petition offers only a conclusory assertion that the processing can be layered together and never explains how both models could function in a single operable system or why a skilled artisan would expect success. Because the proposed combination would undermine the functionality of one reference or the other, the Petition fails to show a motivation to combine or a reasonable expectation of success.

The dependent claims fare no better. Claims reciting automatic operation are mapped to manual, user-driven controls. Claims reciting frequency-based hearing-risk determinations are satisfied only by equating audibility with harm or by relying on extraneous references that are not a part of the ground and unsupported expert opinion. Claims reciting notification tied to threshold exceedance, or autonomous output adjustment based on signal energy sensed within or across clusters, are reduced to user preference selection or local, single-device behavior, contrary to the claim language.

Taken together, these deficiencies reveal that Ground 1A does not fail at the margins, but at the foundation. Because the Petition never articulates a consistent system architecture, never grounds its mappings in the disclosures of the applied references, and repeatedly relies on hindsight reconstruction to bridge missing elements, it fails to establish a reasonable likelihood of prevailing as to any

challenged claim. Institution should therefore be denied as to Ground 1A in its entirety.

Grounds 1B-1E all fail because they challenge claims that depend directly from the independent claims challenged in Ground 1A. Separately, and independently, Ground 1B fails on its own terms because the Petition never identifies a prior-art disclosure corresponding to the claimed “interfacing mechanism.” Instead of mapping the specific structural and functional limitations recited in Claims 2 and 12, the Petition improperly equates any generic user interface with the claimed mechanism, disregarding the claim language and the dependent-claim structure.

All of Ground 2 (Grounds 2A-2E) fare no better. Petitioner introduces Goldstein⁸⁷³ only as a contingent fallback—invoked “to the extent” the Board were to find that DiCenso⁶⁴¹ does not disclose earpieces including a wireless transceiver. That limited reliance underscores the defect in Ground 2: Goldstein⁸⁷³ is not offered to cure the substantive failures that defeat Ground 1A, and it does not do so. For these reasons, the Board should deny institution of this proceeding.

II. THE '736 PATENT

A. Novel techniques for multi-frequency sensing and adaptive control using mobile-based clusters.

The '736 patent is directed to systems/methods for multi-frequency sensing and autonomous environmental control using clusters of computing devices. The patent discloses an architecture in which ubiquitous smart devices are used to “sense various types of phenomena like sound, blue light exposure, RF and microwave radiation” and to “in real-time analyze, report and/or control outputs (e.g., displays or speakers).” EX1001, Abstract. The invention addresses longstanding technical challenges in managing sound quality, safety, and intelligibility across complex environments such as stadiums, theaters, transportation hubs, vehicles, and other shared venues, where individual listener experiences vary significantly. *Id.*, 16:22-27.

At a high level, the '736 patent discloses a sensing architecture in which clusters of computing devices are deployed at defined physical locations within a venue. The system includes “at least one cluster of at least one computing device,” which may comprise “wearable glasses, wearable watch, and a smartphone.” *Id.*, 11:37-40. Each cluster is associated with a “given location 110 (i.e. specified location) to accurately isolate and associate the sensed data,” allowing the system to capture how sound is actually perceived in localized “micro-areas within a larger venue.” *Id.*, 12:46-50, 8:9-14. Through this sensing, the system develops

localized “sound ‘fingerprints’” that visualize environmental conditions across the venue. *Id.*

Based on data received from one or more clusters, the system executes instructions for “identifying one or more sounds within the noise,” “isolating the one or more sounds and” determining whether a sound includes “a frequency determined to pose a risk of harm.” *Id.*, 5:9-26, 5:50-56, 6:25-67, cl. 1[e]. Output control is expressly location-aware, as the system can “adjust a given output device 160 based on its proximity to a given location 110 of a cluster.” *Id.*, 12:48-52.

A key aspect of the invention is the collaborative cluster logic illustrated in Method 200 and Figure 4. Devices within a cluster continuously sense ambient signals to determine whether a “predefined threshold or EQ setting is breached.” *Id.*, 13:27-30. When a breach is detected, “the first device that sensed the breach will (preferably, wirelessly) communicate its signal measurements to other devices within its cluster.” *Id.*, 13:29-35. Those peer devices then “conduct the same audio measurements to confirm the threshold breach,” thereby “provid[ing] more robust data sets.” *Id.*, 13:35-37. Only after this breach-confirmation step does the system escalate the data for corrective action. *Id.*, 13:37-43. This peer-to-peer validation improves robustness and prevents false positives based on anomalous local readings, while still enabling venue-wide analysis and localized remediation.

Figures 5 and 6 disclose a multi-stage signal-processing workflow executed by the system. The workflow includes sensing environmental phenomena, “identifying and isolating” specific sounds, manipulating “the signal amplitude of each instrument” to balance the mix, and determining whether the sensed audio includes frequencies “predetermined to be hazardous to human ears.” *Id.*, 13:63-14:3, 15:62-64. If hazardous conditions are detected, the system may notify the user via audible or visual alerts, although the patent teaches that “if automatically corrected, the user need not always be notified.” *Id.*, 16:2-3. The workflow further includes controlling the dynamic range of the sensed audio through “compression or limiting,” “panning” like frequencies, applying “equalization,” and adding “effects that add depth and texture” to the sensed audio. *Id.*, 9:4-10, 16:4-16. In Step 350, the system generates predictive automation to anticipate environmental conditions such as “echoes and audio wind steers,” allowing volume and effects to be “autonomously programmed.” *Id.*, 16:16-21.

Although the invention is illustrated extensively with respect to audible sound, the ’736 patent expressly teaches that the same architecture applies to non-acoustic phenomena, and that “the underlying functionality... generally remains the same, regardless of the input phenomena sensed.” *Id.*, 14:11-16. The system may sense “infra/ultra-sonic waves (e.g., mm waves), visible light... and radio waves,” using appropriate “ultrasonic,” “infrasonic,” “microwave,” or “electro-

optical” transducers. *Id.*, 6:19-24. The ’736 patent further emphasizes health-oriented applications, including hearing loss prevention, noting that audio engineers “find it difficult to granularly control the loud perception of a given individual listener while managing loudness perception for the remainder of the audience.” *Id.*, 2:10-14.

Thus, the ’736 patent teaches a venue-level environmental management system that uses clusters of consumer devices as sensing nodes to inform an audio control source, which then autonomously varies outputs such as speakers or in-ear monitors based on spatial conditions and proximity to detected events. By integrating sensing, collaborative validation, a data source and output control, the ’736 patent provides a technical solution for managing sound quality, safety, and intelligibility across complex, shared environments in real time.

B. Level of Ordinary Skill in the Art

A person of ordinary skill in the art (“POSITA”) at the time of the ’736 patent would have had a bachelor’s degree in electrical engineering, computer engineering, computer science, audio engineering, or a similar discipline, as well as at least two to three years of academic or industry experience in digital signal processing, audio systems, embedded or mobile computing, and wireless communication systems, including experience with sensor-based data acquisition and real-time signal analysis. Alternatively, a POSITA could have had additional

industry experience in audio signal processing, sound reinforcement systems, or sensing systems in lieu of formal education. EX2003, ¶18-22.

C. Claim Construction

Absent lexicography or disavowal, claim terms in an IPR are given their plain and ordinary meaning in light of the specification and prosecution history. *Sisvel Int’l. S.A. v. Sierra Wireless, Inc.*, 81 F.4th 1231, 1236 (Fed. Cir. 2023).

1. Electronic bus

’736 Claim 1 recites each computing device within the cluster include “an electronic bus which is configured to transmit and receive data from the data source.” EX1001, cl. 1. Although the specification does not expressly state “electronic bus,” Petitioner was required to provide their meaning because the term materially affects the patentability analysis and their mapping of the art.

a. Ordinary Meaning to a POSITA

A POSITA would have understood “electronic bus” as a well-known hardware construct referring to an internal data pathway transferring data between components of a computing device, such as a processor, memory, sensing mechanisms, and peripheral interfaces. In computer architecture, a “bus” is a recognized term denoting a shared communication structure within a device, rather than a general reference to any mechanism capable of transmitting data.

A POSITA knew electronic bus was commonly implemented as a wired communication medium, using conductors, traces, and associated signaling

protocols to enable bidirectional data transfer among internal components of a computing device. Buses serve as internal conduits over which data is routed to and from functional elements, including interfaces that may themselves support external communications. This understanding reflects the conventional and ordinary meaning of “bus” in the technical field. EX2003, 53-54.

b. The Specification Distinguishes Electronic Buses from Wireless Transceivers

The intrinsic record reinforces this ordinary-meaning. The ’736 patent expressly describes wireless communication components. For example, the specification explains computing devices may “include one or more wireless transceivers” used to “wirelessly share sensed data with each other” and with an “audio control source.” EX1001, 11:63-65, 13:9-11.

These disclosures concern external communication interfaces operating over wireless channels, not internal data pathways. Nothing in the specification equates a wireless transceiver with an electronic bus, suggests the bus itself operates wirelessly, or indicates the term “electronic bus” was intended to encompass over-the-air communication links. To the contrary, the specification’s separate treatment of wireless transceivers confirms they are distinct architectural components from any internal bus structure.

c. Claims Confirm the Distinction

The claim structure further supports this construction. Claim 1 recites the electronic bus as a structural component of the computing device itself, configured to transmit and receive data from the data source. Dependent claims then separately add wireless communication capabilities using “further comprising” language. EX1001, cls. 2, 25-26.

This claim hierarchy reflects a system architecture in which internal data movement is handled by an electronic bus, while wireless communication is an optional, additional feature layered onto the base system. If Claim 1’s “electronic bus” already encompassed a wireless transceiver, the dependent claims expressly reciting wireless transmission mechanisms would be redundant or superfluous, contrary to established principles of claim differentiation.

d. Construction Applied for Institution

For purposes of institution “electronic bus,” consistent with its ordinary and customary meaning, is an internal data pathway within a computing device, rather than as a wireless transceiver or external communication link. At a minimum, the term cannot be presumed, without analysis or support, to encompass a wireless transceiver, as the Petition asserts. Because the Petition fails to address this distinction or explain how the asserted prior art satisfies “electronic bus” under a construction consistent with the intrinsic record, it fails to carry its burden at institution.

III. OVERVIEW OF THE CITED ART

A. DiCenso641 Describes a User-Centric Wearable System for Personalized Audio Processing

DiCenso641 teaches a system in which a user wears earpieces equipped with microphones and speakers that continuously capture ambient sound in the user's immediate surroundings and modify that sound according to user-selected preferences. DiCenso explains that it enables a wearer to “selectively cancel, add, enhance, and/or attenuate auditory events for the user,” so that control over sound perception is exercised at the level of the individual listener. EX1005, ¶0001; *id.*, ¶0022.

In DiCenso641, the wearable device itself functions as the primary locus of audio analysis and manipulation. DiCenso641 discloses that the wearable may be implemented as headphones or earbuds “that each contain an associated speaker and one or more microphones or transducers,” enabling local sensing and closed-loop processing at the user's ear. *Id.*, ¶0022. Ambient sound is captured locally and processed either directly on the wearable device or in coordination with a paired mobile device, before being rendered back to the same user through integrated speakers. For example, DiCenso641 explains that “an unprocessed audio stream may be sent to [a] mobile device ... which processes the audio stream and sends this modified audio stream back” to the wearable digital signal processor (DSP).

Id., ¶0039. In all cases, however, the processing pipeline is oriented around modifying sound for delivery back to the same individual user.

DiCenso641 reinforces this user-centric and closed-loop design. While a mobile device such as a smartphone may be used to provide a user interface or “additional processing power,” DiCenso makes clear that such devices operate in a supporting role, augmenting the capabilities of the wearable system rather than acting as a controller. *Id.*, ¶0027. Likewise, DiCenso describes an “audio source 340” that may provide “context-sensitive sounds or data streams,” such as those from “a music player, an alert broadcaster, a stadium announcer, [or] a store or theater.” *Id.*, ¶0041. That audio source is a content provider, supplying audio streams to downstream components, not a controller that identifies sounds, isolates sounds, applies threshold determinations, or manages outputs across devices.

Critically, DiCenso assigns its sound-processing functions to the DSP within the wearable device, not to the smartphone or the audio source. The DSP is responsible for identifying types of sounds in the ambient environment, separating the ambient signal into component sounds, and modifying those sounds through amplification, attenuation, cancellation, equalization, or substitution before outputting the modified signal to the wearable’s speakers. *Id.*, ¶¶0004, 0007, 0042-0044; EX2003, ¶33-40.

B. Smith Analyzes the Overall Sound Environment Rather Than Individually Identified Sounds

Smith is directed to systems and methods for providing hearing enhancement and hearing protection for an individual user through wearable audio devices. Smith explains that “[m]ethods and systems for providing hearing enhancement and/or protection are provided for one or more embodiments,” including applications in “military, police, and civilian” contexts. EX1006, ¶0004. Smith’s system is implemented using an occluding earpiece worn by a user, which provides both passive and electronic hearing protection. *Id.*, ¶¶0005, 0030. Smith’s architecture is thus expressly designed around individualized hearing protection delivered through personal, wearable hardware.

At the core of Smith’s system is a digital signal processor that evaluates the ambient acoustic environment as a combined, full-spectrum signal. The DSP “receive[s] a digital audio signal containing the environmental noise and the information” and processes that signal to attenuate noise and provide a digitally processed output to the wearer. *Id.*, ¶0005. Smith further teaches that the DSP “can be configured [to] perform Fourier analysis on the digital audio signal to facilitate a determination of an environmental noise frequency content thereof,” confirming that its analysis operates across the frequency spectrum of the combined ambient signal. *Id.*, ¶0108.

Thus, Smith's detection logic is different from that of DiCenso641. EX2003, ¶41-47. Rather than operating on separated sounds (DiCenso641), Smith determines environmental noise characteristics by evaluating the aggregate signal against environmental noise signatures derived from the surrounding acoustic context. Smith explains that "the audiogram and the frequency spectrum of the environment can be used to modify an electronic signal to attenuate noise and to amplify information," and that gain is "varied on a frequency basis such that the gain is reduce[d] for noise and increased (within predefined limits) for information." EX1006, ¶¶0006, 0019. These determinations occur before any separation of the signal into individual components and rely on full-spectrum environmental information to distinguish harmful noise from information-bearing sounds such as speech or alarms. EX2003, ¶41-47.

Consistent with this approach, Smith's processing pipeline tracks changes in a transient frequency spectrum to assess sound intensity, spectral distribution, and temporal characteristics. For example, Smith describes measuring, storing, and analyzing transient response of the user's environment, and explains that the DSP can modify environmental acoustic information "in a manner that enhances situational hearing while simultaneously providing hearing protection." EX1006, FIG. 4, step 407, ¶0080. In this way, Smith's ability to determine whether a sound

poses a risk of harm arises from comparing that sound against a broader environmental baseline captured in the combined signal. EX2003, ¶41-47.

Smith further teaches applying wearer-specific hearing profiles, such as audiograms, after this environmental analysis. Smith explains that the system modifies the signal by “using the audiogram and the frequency spectrum of the environment,” where “the frequency spectrum can be an average frequency spectrum over a period of time.” EX1006, ¶0117. Frequency-dependent gain, attenuation, and compression curves are thus applied only after the environment-wide assessment of sound levels and frequency content has been performed. Smith’s operation is therefore based on evaluating the overall sound environment, with detection logic determination occurring before any sound-specific adjustment. EX2003, ¶41-47.

IV. GROUND 1A: DICENSO641 IN VIEW OF SMITH DOES NOT RENDER OBVIOUS THE CHALLENGED CLAIMS

The Petition fails to establish a reasonable likelihood of prevailing because it does not demonstrate that DiCenso641 in view of Smith discloses the architectural recitations in the challenged claims. Rather than mapping a single, coherent system that satisfies the claim elements as written, the Petition relies on recharacterizations, internal inconsistencies, and unsupported role assignments that cannot be reconciled with the claim language or the prior art’s actual disclosures.

A. The Petition Fails to Show That Its DiCenso641 Mapping Operates Coherently Under Claim 1 of the '736 Patent

The Petition's mapping of DiCenso641 to the independent claims of the '736 patent fails because it does not present a coherent account of how the claimed components operate together under Petitioner's own theory.

Claim 1 recites, among other elements, (i) a data source (Claim 1[a]); (ii) at least one computing device that includes an electronic bus configured to transmit and receive data from the data source (Claim 1[c][ii]); and (iii) a processor configured to execute instructions that perform functions including identifying sounds, isolating sounds, and determining whether an isolated sound includes a frequency outside a predetermined threshold (Claim 1[e][i]-[iii]). To meet its burden at institution, the Petition must show that the prior art discloses a system in which these elements can operate together as mapped. As relevant here, the Petition's mapping relies on the same audio stream to satisfy multiple limitations of Claim 1 and therefore must account for how that stream is processed (or not processed) across those limitations within a single operative configuration of the prior art system, without relying on incompatible factual characterizations or toggling between incompatible processing states. EX2003, ¶61.

The Petition does not satisfy this standard. Instead, it relies on mutually exclusive descriptions of how audio is processed in DiCenso641. To satisfy the data-source and electronic bus limitations, the Petition relies on an embodiment in

which DiCenso641's wearable device transmits an unprocessed audio stream to a mobile device for downstream processing. To satisfy the processor-driven limitations, however, the Petition maps sound identification and isolation as being performed by the wearable device's internal DSP. The Petition never explains how or why these distinct embodiments, describing mutually exclusive processing modes for the same audio stream, would be combined into a single operable system, nor does it cite any disclosure in DiCenso641 suggesting or explaining how the same audio stream can be both unprocessed for transmission and already processed for isolation within a single operable system. Absent such an explanation, the Petition impermissibly picks and chooses among embodiments to cobble together the claimed system, which is insufficient to establish unpatentability.

1. To Satisfy the “Data Source” and “Electronic Bus” Limitations, the Petition Relies on an Unprocessed Audio Stream Leaving the Wearable Device

For purposes of Claims 1[a] and 1[c][ii], the Petition relies expressly on DiCenso641's offloading disclosure. In that embodiment, wearable device 130 transmits an unprocessed audio stream to a separate mobile device 320, which performs processing and returns a modified audio stream to a separate wearable device. Specifically, the Petition points to DiCenso641's statement that “an unprocessed audio stream may be sent to mobile device 320, which processes the

audio stream and sends this modified audio stream back to DSP 310,” and on that basis concludes that the mobile device constitutes the claimed “data source.” Pet., 12-13 (citing EX1005, ¶0039).

The Petition reinforces that same premise when mapping the electronic bus limitation. It asserts that the wearable device includes a wireless transceiver (a term never used or disclosed by DiCenso641 and satisfies Claim 1[c][ii] by “sending ... an unprocessed audio stream and receiving back a modified audio stream” from the mobile device. Pet., 18-19 and 56. Under the Petition’s theory, the electronic bus limitation is satisfied specifically by a send-raw / receive-processed data offloading sequence. That description is not merely background context. It is the factual predicate on which the Petition relies to characterize the mobile device as providing the processing necessary to satisfy the data-source and bus limitations

That mapping depends on Petitioner’s express factual premise that the audio stream transmitted from the wearable device to the mobile device has not yet undergone the identifying or isolating operations mapped elsewhere in the Petition, such that the mobile device provides the processing relied upon to characterize it as the claimed “data source.” If the wearable device had already identified or isolated sounds before transmission to the mobile device, the stream would no longer be “unprocessed,” and the Petition’s rationale for treating the mobile device as providing “additional processing power” would collapse. EX2003, ¶62.

2. To Satisfy the “Processor” Limitation, the Petition Relies on Local Identification and Isolation by the Wearable DSP

When addressing Claim 1[e], however, the Petition abandons the offloading premise that it used for earlier claim elements and maps the claimed processing steps to the wearable’s internal DSP 310. The Petition identifies DSP 310 as the claimed “processor” and asserts that it performs the core functions recited in Claim 1[e].

Specifically, the Petition argues that “DiCenso641 teaches DSP 310 identifying at least one of a plurality of types of sounds” to satisfy Claim 1[e][i]. Pet., 21-22 (citing EX1005, ¶¶0040, 0042). It further asserts that “DiCenso641 teaches DSP 310 separating sounds or dividing signals associated with particular sounds (‘isolating the one or more sounds’)” to satisfy Claim 1[e][ii]. Pet., 24 (citing EX1005, ¶0044). These mappings are the Petition’s express basis for meeting the processor-driven limitations of Claim 1.

Under this theory, the wearable DSP performs substantive processing on the audio stream, including identification and isolation, before system output is generated. Said differently, under this mapping the DSP performs the identifying and isolating operations on the audio stream that the Petition relies on to satisfy Claim 1[e]. And the Petition never identifies any disclosure in which the identifying and isolating operations mapped to Claim 1[e] can be performed while

preserving the audio stream in the “unprocessed” state that the Petition itself relies on. EX2003, ¶63.

3. The Petition’s Two Processing Theories Cannot Both Be True for the Same Claimed System

The Petition never explains how its offloading-based theory for Claims 1[a] and 1[c][ii] can coexist with its local-processing theory for Claim 1[e]. As mapped, the two positions involve incompatible processing states for the same audio stream. EX2003, ¶64.

First, if DSP 310 performs isolation as mapped for Claim 1[e], then the stream leaving the wearable device cannot be “unprocessed.” The Petition’s own claim 1[e] mapping states that DSP 310 “separat[e] sounds or divid[e] signals” to isolate sounds. Pet., 24. If that isolation occurs before transmission from the wearable device, then the transmitted outgoing stream has already been processed, which contradicts the Petition’s express reliance on an “unprocessed audio stream” being sent to the phone for Claim 1[a] and Claim 1[c][ii]. Pet., 11-13, 15-19; EX2003, ¶65.

Second, if the transmitted outgoing stream is “unprocessed” as mapped by the Petition for Claim 1[a] and Claim 1[c][ii], then DSP 310 cannot yet have performed the identifying and isolating functions recited by Claim 1[e]. The Petition’s electronic bus theory depends on the wearable sending raw audio for the phone to process. Pet., 20-21. That is inconsistent with the Petition’s processor

theory that DSP 310 has already identified and separated, i.e., processed, the sounds. Pet., 24; EX2003, ¶66.

The Petition offers no bridge between these two modes. It does not identify any disclosure in DiCenso641, or any explanation in the Petition, demonstrating that the audio stream relied upon to satisfy Claim 1[e] is distinct from, or operates independently of, the audio stream that the Petition characterizes as “unprocessed” for purposes of Claims 1[a] and 1[c][ii]. Nor does the Petition explain how a POSITA would understand DiCenso641 to implement parallel or forked processing paths in a manner that resolves the Petition’s inconsistent treatment of the same audio stream across different claim limitations. EX2003, ¶67.

4. Conclusion

The Petition’s mapping fails because it merges two mutually exclusive DiCenso641 embodiments into a single claim analysis without explaining how they operate together. Under the Petition’s theory, the audio stream relied upon to satisfy the data-source and electronic-bus limitations is characterized as lacking the identifying and isolating operations that the Petition elsewhere relies upon to satisfy Claim 1[e]. The Petition never explains how both characterizations can apply to the same mapped system, nor does it cite any disclosure teaching such an arrangement.

That unresolved inconsistency is not a matter of claim construction or implementation detail. It is a failure of proof. At institution, the burden is on Petitioner to show not only that individual claim elements appear somewhere in the prior art, but that the mapped elements operate together in the manner asserted. Because the Petition does not demonstrate that DiCenso641 teaches a system in which the elements of Claim 1, as mapped, can function together, the Petition fails to meet its burden at institution. The Petition never identifies a point in time at which all of the mapped limitations of Claim 1 are simultaneously satisfied. Institution should therefore be denied.

B. DiCenso641 Does Not Disclose The Claimed Cluster Architecture

Ground 1A independently fails because the Petition never identifies the system architecture recited by Claim 1. The claims recite a data source in electronic communication with two distinct components: (i) “at least one cluster of at least one computing device” and (ii) “at least one output device.” Each computing device within the cluster must include a sound sensing mechanism and an electronic bus, such that the cluster operates as a coordinated sensing entity. Thus, Petitioner must identify, in the prior art, a component or grouping of components that is reasonably disclosed as a *cluster* with which the data source separately communicates. The Petitioner attempts to manufacture this topology by arbitrarily assigning different claim roles to identical components of DiCenso641’s

single “wearable device,” a mapping that finds no support in the reference’s disclosure. EX2003, ¶¶50-51.

To satisfy the claimed “cluster” (Element 1[b]), the Petition points to DiCenso641’s “wearable device 130,” specifically identifying the “pair of earpieces 134” as the claimed cluster. Pet., 13-14 EX1005, ¶0025). However, to satisfy the separate claimed “output device” (Element 1[c][iii]), the Petition recycles the exact same hardware, asserting that the second earpiece constitutes the output device. Pet, 18-19. This mapping creates a fatal architectural mismatch. DiCenso641 describes the earpieces 134 as constituting a single, unified “wearable device 130” that communicates with the mobile device via a single logical connection. EX1005, ¶0025 (describing “Wearable device 130... equipped with wireless communication...to connect with...external user interface”). The Petition cites no disclosure in DiCenso641 suggesting that the “first earpiece” functions as a distinct sensing cluster while the “second earpiece” functions as a distinct output device, or that the mobile device manages them as separate entities. EX2003, ¶¶50-51.

The artificiality of Petitioner’s theory is exposed by the communication limitation (Element 1[c][iii]). The Petition asserts that the mobile device is in communication with *both* the “cluster” (first earpiece) and the “output device” (second earpiece). Pet., 19-20. Yet, the Petitioner relies on the same wireless link

(Link 360) described in DiCenso641 for both connections. Pet., 16 (citing EX1005, ¶0039 and FIG. 3). DiCenso641 explicitly depicts and describes a single “wireless communications link 360” between the mobile device 320 and the wearable device’s DSP 310. EX1005, ¶0039; *id.* at Fig. 3. By treating the Left and Right earpieces as separate claim elements to satisfy the “cluster” and ‘output device’ respectively, the Petitioner asks the Board to assume a network architecture that DiCenso641 does not disclose.

This failure of proof is specific to the Petitioner’s reliance on DiCenso641. While a single physical product (such as a pair of earbuds) may indeed perform multiple functions, the prior art reference must actually disclose the capability to operate in the manner claimed. DiCenso641 describes a closed-loop system where the wearable device 130 acts as a singular entity for both sensing and outputting. EX1005, ¶0042 (“The modified signal is output to... speaker(s) 316”). The Petitioner offers no evidence that DiCenso641’s system architecture recognizes or manages the “cluster” (sensing function) distinct from the “output device” (output function) as recited by Claim 1. Consequently, the Petition fails to establish a *prima facie* case that DiCenso641 can be used to render obvious the claimed system architecture. EX2003, ¶52.

C. The Petition Fails to Carry Its Burden on the “Electronic Bus” Limitation

The Petition fails to establish a reasonable likelihood of prevailing because it never meaningfully addresses the meaning, scope, or construction of the term “electronic bus,” a limitation that materially affects claim scope and is central to Petitioner’s unpatentability theory. Instead, Petitioner (i) asserts that the specification does not define the term, (ii) declines to propose any construction, (iii) implicitly redefines “electronic bus” to mean a wireless transceiver to fit the prior art, and (iv) ignores intrinsic evidence, including the prosecution history and dependent-claim structure, that contradicts its interpretation. This failure is fatal procedurally, legally, and on the merits.

1. Petitioner’s Failure to Construe a Material Claim Term Is a Threshold Legal Defect

As a matter of law, a validity analysis must compare the prior art to the claims as properly construed, not to an unstated or outcome-driven interpretation. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc). Where the scope of a claim term is disputed and material to the unpatentability analysis, the proponent of invalidity must articulate and justify a construction grounded in the intrinsic record. *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1361–62 (Fed. Cir. 2008).

Petitioner did not do so here. Petitioner affirmatively asserts that the '736 patent specification does not define or even use the term “electronic bus.” ’736 Pet., 16 (“The specification of the '736 patent does not refer to a ‘bus’ or an ‘electronic bus.’”); EX1002, ¶85. Yet Petitioner then declines to propose any construction of the term, stating instead that “no express constructions” are necessary and that the claims should be given their “ordinary meaning.” Pet., 10.

That approach is legally insufficient. Petitioner cannot simultaneously argue that a claim term is undefined and avoid its obligation to explain what the term means to a POSITA and why the asserted prior art satisfies that meaning where, as here, the construction materially affects the unpatentability analysis. Invoking “ordinary meaning” without articulating what that meaning is or how it applies in view of the intrinsic record does not satisfy Petitioner’s burden at institution. Nor may the Board assess patentability on the basis of an unstated or unexplained construction or supply one on Petitioner’s behalf. *In re Power Integrations, Inc.*, 884 F.3d 1370, 1376–77 (Fed. Cir. 2018).

2. The Petition’s Interpretation of “Electronic Bus” Fails on the Merits

On the merits, the Petition fails because its implied interpretation of “electronic bus” is unsupported by the intrinsic record, contradicted by the prosecution history, and irreconcilable with the claim structure. Rather than construing the term, the Petition simply asserts, without analysis, that a POSITA

would read the limitation broadly enough to encompass unspecified wireless communication hardware. Pet., 15-19. DiCenso⁶⁴¹ itself never identifies any “wireless transceiver,” never describes an electronic bus architecture, and never discloses a component that transfers data between internal computing components. Instead, Petitioner relies solely on attorney argument and a conclusory expert opinion to equate DiCenso’s wireless communication capability with the claimed electronic bus. That is not claim construction and it is not a disclosure, and it cannot satisfy Petitioner’s burden to show that the limitation is taught by the prior art.

The Petition offers no intrinsic or extrinsic analysis explaining why an “electronic bus”—a term that in computing systems ordinarily denotes an internal data pathway between system components—would encompass a wireless transceiver that communicates over the air. Nor does it explain how such a transceiver performs the claimed bus function within the system architecture recited in Claim 1, or why that interpretation is consistent with the claim language, claim structure, or prosecution history. Unsupported assertions that a claim term is “broad enough” to encompass the prior art do not establish unpatentability.

EX2003, ¶¶53-56.

The Petition’s interpretation also squarely conflicts with the prosecution history. During examination, the Examiner expressly characterized the claimed

“electronic bus” as a “**wire connection**” when distinguishing the closest prior art, explaining that the prior art disclosed “an electronic bus (wire connection) which is configured to transmit and receive data from the data source.” EX1004, 487. The Petition never addresses this statement. It does not explain why the Examiner’s express understanding should be disregarded, reinterpreted, or overridden. Where the prosecution history reflects a specific understanding of a claim term that informed allowance, a petitioner must meaningfully grapple with that understanding when challenging patentability. *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298–1301 (Fed. Cir. 2015). The Petition’s silence on this point underscores its failure to carry its burden.

Finally, the claim structure confirms that wireless communication is an added feature, not the “electronic bus” itself. The Petition attempts to justify its interpretation by pointing to dependent Claim 25, which recites “a transmission medium comprising a wireless transceiver.” Pet., 20. According to Petitioner, Claim 25 demonstrates that the “electronic bus” in Claim 1 must already encompass wireless technology. That argument is backwards and contradicted by the claim structure. While claim differentiation is not dispositive, it is highly probative here because the dependent claims repeatedly and expressly recites wireless communication as an additional feature, confirming that wireless capability is not inherent in the base “electronic bus” of Claim 1. Claim 25 uses the

transition phrase “further comprising,” which signals the addition of a new, distinct component, not a redefinition of an existing one. EX1001, cl. 25. If the “electronic bus” of Claim 1 were already a wireless transceiver, Claim 25 would be redundant.

Other dependent claims reinforce this structure. Claim 2 adds an interfacing mechanism that includes a network adapter configured for both wired and wireless communication. Claim 26, the method analogue of Claim 25, likewise uses “further comprising” to add a wireless transmission medium. Claim 30 separately specifies that a sensing device is “in wireless communication” with the computing device. Taken together, these claims provide strong structural evidence that wireless communication is treated as an additional feature layered onto the base system, not an inherent attribute of the “electronic bus” itself. EX2003, ¶¶56-60.

In short, the Petition’s attempt to redefine “electronic bus” as a wireless transceiver is unsupported by the specification, contradicted by the prosecution history, and foreclosed by the dependent-claim structure. Because Petitioner never demonstrates that the asserted prior art teaches the “electronic bus” limitation under any reasonable interpretation consistent with the intrinsic record, its arguments fail on the merits.

D. The Petition Fails to Establish a Motivated and Technically Coherent Combination of DiCenso641 and Smith

Independently, the Petition fails because the proposed combination of DiCenso641 and Smith is not supported by a technically coherent integration of the

two references. Although the Petition asserts that the references can be combined to satisfy the signal-processing limitations of the independent, it never explains, at a technical level, how the fundamentally different processing architectures disclosed in DiCenso641 and Smith could be reconciled into a single, operable system.

Petitioner relies on the proposed combination to supply the sequence of audio-processing functions recited in the claims, including identifying sounds within noise, isolating sounds, and altering the sound prior to output. EX1001, cls. 1[e], 11[e]; Pet., 24-28. But establishing obviousness requires more than assembling individual steps from separate references. Petitioner must articulate how a person of ordinary skill would have combined the references in a manner that preserves their respective processing logic and yields a functioning system.

The Petition does not do so. Instead, it assumes, without analysis, that the processing taught by DiCenso641 can simply be overlaid with the processing taught by Smith. Where, as here, the references rely on materially different signal-processing models, such a conclusory assertion is insufficient. The Petition offers no explanation of how the respective processing flows would interact, how conflicts between them would be resolved, or why a skilled artisan would reasonably expect the resulting system to operate as intended.

As explained below, DiCenso641 and Smith rely on incompatible signal-processing architectures. Because the Petition neither reconciles those differences nor explains how the claimed processing could be achieved without negating the core functionality of one reference or the other, it fails to establish a motivation to combine or a reasonable expectation of success. Accordingly, the Petition does not demonstrate a reasonable likelihood of prevailing. EX2003, ¶68.

1. Smith Relies on Full-Spectrum Environmental Analysis Prior to Any Signal Segmentation

Smith operates by assessing the overall sound environment rather than individual, separately identified sounds. Its system is designed to enhance hearing and provide protection by first characterizing the acoustic environment as a whole. Smith teaches determining a “frequency spectrum of an environment” and using that holistic characterization to “modify an electronic signal to attenuate noise and to amplify information.” EX1006, Abstract, ¶¶0006, 0019. The “noise” addressed by Smith includes environmental hazards such as “gunfire, explosions, car motors, aircraft engines, or generators,” while “information” includes sounds such as “human voice, dog barking, sirens, bells, [and] alarms.” *Id.*, ¶¶0006, 0019. Smith’s processing therefore begins with a holistic environmental baseline against which different frequency components are evaluated. EX2003, ¶69.

That environmental baseline is central to Smith’s hazard-detection logic. Smith evaluates whether sounds pose a risk of harm or are undesirable by

comparing frequency-based gain levels against noise floors derived from the surrounding acoustic environment. EX1006, ¶¶0080-0081. Rather than treating sounds as separate sound types, Smith relies on relative contrast across the combined signal, reducing gain for frequencies associated with environmental noise while increasing gain for frequencies associated with meaningful information. *Id.*, ¶¶0019.

Smith further emphasizes the importance of using the full spectrum by tracking transient and nominal acoustic signatures. Smith teaches that the “transient response of the user’s environment can be measured, stored, and analyzed,” and that “frequency-specific compression” is used to manage “acoustic transients and nominal acoustic signature[s] to within predetermined limits.” *Id.*, ¶¶0080-0081, 0114-0116. By determining a “transient frequency spectrum of the environment,” Smith identifies the frequency content of short-lived impulse sounds, such as “gunshots, explosions, bullet impacts, [and] engine noises,” and attenuates those sounds relative to the broader environment, while facilitating amplification of communications such as speech. *Id.*, ¶¶0114-0116.

Critically, Smith’s processing logic depends on access to an unsegmented, full-spectrum environmental signal. Smith’s determination of noise floors, transient behavior, and risk of harm arises from comparisons across the aggregate signal, not from analysis of pre-segmented sound types. *Id.*, ¶¶0019, 0080-0081,

0114-0116. This aggregate, overall sound-environment analysis approach stands in direct contrast to DiCenso641's separation-based system, which expressly teaches "dividing the signal into a plurality of component signals each representing one of the plurality of types of sounds" before any modification or manipulation occurs. EX1005, ¶¶0007, 0044, cls. 8, 23. If the ambient signal were segmented into isolated sound types at the outset, as DiCenso641 discloses, the aggregate environmental baseline on which Smith's detection logic and transient analysis depend would no longer exist. Without that baseline, Smith's model could not meaningfully determine noise floors, assess relative gain, or distinguish transient hazards from nominal sounds based on environmental contrast. EX2003, ¶70.

In short, Smith's signal-processing model is inherently full spectrum-dependent. Its detection and situational enhancement logic arise from comparisons across a combined environmental signal. The Petition's attempt to layer this model onto DiCenso641's separation-based system never explains how Smith's required environmental full spectrum would be preserved once the signal has been divided into discrete sound types, highlighting a fundamental technical incompatibility between the two references. EX2003, ¶¶69-70.

2. DiCenso641 Uses Separation-Based Signal-Processing Architecture

In contrast, DiCenso641 is built around a separation-based, sound type-oriented signal-processing pipeline that is fundamentally different from Smith's

full spectrum, aggregate-signal model. Rather than evaluating the acoustic environment as a whole, DiCenso641 explicitly teaches that ambient audio is first separated into component signals before any manipulation or enhancement occurs. EX2003, 71.

At the outset of processing, DiCenso641 teaches that the received ambient audio signal is processed by “dividing the signal into a plurality of component signals each representing one of the plurality of types of sounds.” EX1005, ¶0007. Only after this division occurs does the system proceed to modify those individual components based on user preferences. *Id.* DiCenso641 reiterates this sequencing by explaining that its DSP separates the ambient audio signal into “component signals each corresponding to one of a plurality of groups of sounds,” and then modifies those component signals in response to user-selected controls. *Id.*, ¶0009; cl. 23; EX2003, ¶71-72.

DiCenso641 makes clear that separation precedes manipulation as a matter of architectural design. DiCenso641 describes the signal-processing flow as one in which the DSP “may separate sounds or divide signals associated with particular sounds,” after which “[e]ach sound type or group may be modified or manipulated.” *Id.*, ¶0044. The disclosure thus identifies separation or division of signals as a prerequisite step that must occur before any attenuation, amplification, cancellation, or other sound modification is applied. EX2003, ¶73.

Consistent with this separation-based, sound type-oriented signal-processing approach, DiCenso641 teaches that modification is performed on a per-sound basis. The system selectively adjusts individual component signals by “attenuating the component signal, amplifying the component signal, equalizing the component signal, [and/or] cancelling the component signal,” depending on the type of sound and the user’s selected preferences. EX1005, ¶0007; cl. 10. Each sound type is therefore treated independently, allowing different processing techniques to be applied to different sound types within the same ambient environment. EX2003, ¶74.

DiCenso641 further confirms that its architecture is built around a three-stage workflow: separation, modification, and recombination. The system executes code to “separate the ambient audio signal into component signals,” “modify the component signals,” and then “combine the component signals after modification to generate an output signal.” EX1005, ¶0009; cl. 23. With this approach, the original ambient signal does not persist as a unified entity during processing; it is replaced by a collection of discrete sound types that are independently manipulated and then recomposed into an output. EX2003, ¶75.

Accordingly, DiCenso641’s signal-processing logic operates exclusively at the sound type level. Sound modification is expressly performed on isolated component signals, not on a combined, environmental frequency spectrum, and

only after the ambient signal has been segmented into discrete sound types. This separation-based architecture is central to DiCenso641's design and stands in sharp contrast to approaches, such as Smith, that rely on evaluating frequencies relative to an aggregate environmental baseline. EX2003, ¶76. Indeed, DiCenso641 explicitly contrasts its approach with "aggregate" processing. DiCenso641 distinguishes its invention from prior art systems by noting that traditional methods operate on the entire environmental signal indiscriminately, whereas its system operates selectively on separated sounds. (EX1005, ¶0003: "Noise cancelling systems usually cancel or enhance the overall sound field, but do not distinguish between various types of sounds or sound events. . . In contrast . . . wearable device 130 cancels only the sound events that the user chooses not to hear . . ." ; id. ¶0029 (reiterating the contrast with systems that "attempt to reduce any/all noise")). EX2003, ¶77.

3. The Petition Fails to Reconcile the Incompatible Processing Pipelines of DiCenso641 and Smith

The Petition never reconciles the fundamentally incompatible signal-processing approaches disclosed in DiCenso641 and Smith. But, the references do more than disclose different approaches: they have different principles of operation. A POSITA would understand from Smith that its detection logic depends on evaluating an intact environmental spectrum, while DiCenso641 expressly separates that spectrum into independently processed sound types before

manipulation. Combining the references would require modifying at least one so that it no longer operates in the manner it describes. Such a modification is the hallmark of non-obviousness based on change of operation.

Under Petitioner's own theory, DiCenso641 performs the separation or division of signals. Pet., 22-24. But that step is not a neutral preprocessing operation. It fixes the signal-processing architecture and governs all subsequent processing. Once the ambient signal is divided into discrete sound types, the aggregate full spectrum signal on which Smith expressly relies no longer exists. Smith's analysis, which compares frequencies against an environmental noise floor and tracks transient responses across the full spectrum, presupposes access to an unsegmented, holistic signal. Without that baseline, Smith's detection logic collapses. The system can no longer determine whether a frequency poses a risk of harm or meaningfully distinguish transient information from background noise. EX2003, ¶82.

Reversing the processing order does not cure the defect. Applying Smith's aggregate detection logic first would bypass and directly contradict DiCenso641's architectural principle that the signal is separated before any manipulation occurs. Doing so would negate the sound separation/division processing that DiCenso641 identifies as central to its operation. In short, there is no sequencing in which both references can operate as disclosed. One reference's required processing step

necessarily disables the other's core functionality. EX2003, ¶¶80-81. Thus, regardless of sequencing, one reference necessarily defeats the other. Applying DiCenso641's signal separation eliminates the full-spectrum signal Smith requires. Preserving Smith's full-spectrum signal would require abandoning the separation-based processing described by DiCenso641.

The Petition attempts to evade this incompatibility with a conclusory sequencing assertion, stating that the combined system would first separate sound types before performing the further processing taught by Smith. Pet., 24-28. But the Petition never confronts the technical consequence of that choice. It offers no explanation for how Smith's full spectrum detection logic, which is explicitly tied to an unsegmented environmental spectrum, could function once that spectrum has been destroyed by DiCenso641's separation-based processing.

Indeed, Smith relies on a frequency-domain analysis of the aggregate environment, using Fourier Transforms to identify energy across the spectrum that may be associated with multiple different sounds simultaneously. EX1006, ¶¶0043, 0050. In contrast, DiCenso641 relies on a time-based separation logic, identifying specific sound types and generating inverted phase signals to cancel them individually. EX1005, ¶0037. These methods are technically distinct and destructive to one another. As explained by Patent Owner's expert, Dr. Mathew, *Smith* utilizes non-linear compression algorithms on the aggregate frequency

spectrum to manage transients. If DiCenso641's separation step occurs first (as the Petition suggests), the aggregate frequency spectrum required for *Smith's* thresholding and compression logic is destroyed, rendering *Smith's* algorithms inoperable on the separate sound types. Conversely, if *Smith's* broad-spectrum compression occurs first, it alters the wave characteristics required for DiCenso641 to accurately identify and phase-cancel specific sound types. The Petition offers only conclusory assertions, not a viable engineering theory, to bridge this gap. EX2003, ¶78-79.

A petitioner may not satisfy its burden by reconstructing the claimed invention through hindsight or by asserting a motivation to combine that is merely conclusory, particularly where the prior art teachings point in inconsistent directions. The Federal Circuit has made clear that prior art must be considered as a whole, and it is impermissible to "pick and choose" isolated disclosures while ignoring teachings that would undermine the proposed combination. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994); *In re Kotzab*, 217 F.3d at 1371.

The same flaw defeats any showing of a reasonable expectation of success. A POSITA would readily understand that *Smith's* detection logic depends on preserving an environmental baseline, while DiCenso641's pipeline expressly eliminates that baseline before any sound manipulation occurs. The Petition does not explain how either reference would retain its intended functionality in the

proposed combination, much less how a skilled artisan would expect such a system to work. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007); *Magnum Oil Tools Int'l, Ltd. v. McClinton Energy Grp., LLC*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

Because the Petition relies on conclusory assertions rather than a technically coherent integration, it fails to establish both a motivation to combine and a reasonable expectation of success. The proposed combination is therefore unsupported as a matter of law and engineering, and the Petition does not demonstrate a reasonable likelihood of prevailing. Institution should be denied.

E. Claims 6 and 15 Are Not Taught Because the Asserted Prior Art Does Not Disclose a Predetermined Threshold Corresponding to a Frequency Posing a Risk to Hearing

1. Claims 6 and 15 Recite a Frequency-Based Hearing-Risk Determination

Claims 6 and 15 of the '736 patent expressly recites that the “predetermined threshold equates to a frequency determined to pose a risk of harm to a user’s hearing capabilities.” EX1001, cl. 6

The claim thus ties the threshold to a determination of hearing risk associated with frequency, not merely audibility, user preference, or general sound level attenuation. Petitioner contends that the DiCenso641-Smith combination satisfies this limitation by identifying frequencies outside the audible range (e.g., greater than 20 kHz) and asserting, through expert testimony, that such frequencies

were known in the art to pose a risk of hearing harm. Pet., 30. But that theory conflates background knowledge about frequencies with what the prior-art systems determine and use operationally.

2. The Applied References Do Not Disclose Frequency-Based Hearing-Risk Thresholds

None of the references relied upon in the asserted grounds disclosed a system that determines a harmful frequency and uses that determination as a threshold.

DiCenso641 **does not disclose determining or applying a frequency-based threshold for control purposes.** DiCenso641 merely distinguishes between audible and inaudible frequencies for signal-processing purposes, such as detecting sounds outside the human audible range and down-converting those sounds so they may be perceived by the user. Nothing in DiCenso641 identifies any frequency as posing a condition that the system itself evaluates and uses as a threshold for control logic. To the contrary, DiCenso641 is concerned with personalization of an auditory environment based on received user preferences, allowing a user to select subjective levels such as “low,” “real,” or “loud” for different sound categories. EX1005, ¶¶0019, 0049. The subjective level of audibility is not disclosed as a threshold defining hearing risk, and DiCenso641 never equates the two within the operation of its disclosed system. EX2003, ¶¶85-87.

Nor does DiCenso641's down-conversion of ultrasonic content reflect threshold-based control determination. If frequencies above 20 kHz were treated by the system as hearing hazards, a system concerned with frequency-based control thresholds would be expected to attenuate, suppress, or block those frequencies, not preserve the content and convert it into the audible range for delivery to the user. DiCenso641's behavior thus confirms that its sound check is directed to perceptibility, not threshold-driven control based on system-determine criteria. EX2003, ¶88.

Smith does not cure this deficiency because it relies on monitoring signal amplitude, whereas Claim 1 recites determining if a sound includes a frequency outside of a predetermined threshold. Smith describes attenuating excessive sound levels to provide output deemed "safe or at least less harmful," but it does so by reference to sound pressure level, amplitude, and decibel-based limits, not by determining that any particular frequency satisfies a frequency-based threshold used for control. EX1006, ¶0003. Throughout the disclosure, Smith frames hearing damage in terms of excessive amplitude and teaches reducing gain or compressing signals when amplitudes exceed defined thresholds. For example, Smith teaches that when signal amplitude reaches a defined threshold or "knee," the system reduces gain "to prevent damaging amplitudes from reaching the user's ear drum." EX1006, ¶0094. Smith likewise discusses attenuating sounds above specified

decibel levels, such as attenuating “undesirable sounds above 100 dB,” and limiting total output power so that the maximum sound level remains within a “comfortable or safe level.” EX1006, ¶¶0078, 0125. As the Petition acknowledges, Smith operates by identifying “inaudible sounds...due to their...amplitude” or by attenuating noises based on decibel levels. Pet., 9, 25, 64. However, an amplitude outside of a predetermined threshold is technically distinct from and does not satisfy the specific claim limitation of a “frequency outside of a predetermined threshold.” By conflating loudness (amplitude) with frequency, the Petition fails to demonstrate that Smith teaches the specific frequency-dependent determination logic recited by the claims.

Although Smith discusses frequency bands in certain contexts, those discussions relate to improving audibility or selectively attenuating noise sources for clarity, not to the system determining and using frequencies that themselves trigger threshold-based control. Smith therefore does not disclose a frequency-based threshold selected and applied by the system or using such a determination as a threshold for sound alteration. EX2003, ¶¶89-91.

In short, Petitioner’s theory improperly equates an audible-range boundary with a system-level frequency threshold and relies on expert assertion rather than disclosure to bridge that gap. Because neither DiCenso641 nor Smith discloses a system that itself determines and applies a frequency-based threshold as part of its

control logic, the applied references fail to disclose the claimed frequency-based hearing-risk threshold, recited by claims 6 and 15. EX2003, ¶¶89-91.

3. The Petition Improperly Patches the Holes with Outside Evidence

Unable to identify in the applied references any disclosure of a system that itself determines and applies a frequency-based threshold, the Petition improperly turns to Wiernicki (EX1013), a reference not asserted in any Ground, to attempt to fill that gap. Pet., 30-31. The Petition invokes Wiernicki solely to “demonstrate a POSITA’s knowledge” and to assert, in the abstract, that certain frequencies (e.g., above 20 kHz) were known in the art to be associated with hearing effects. That approach is improper and cannot support institution.

Under 37 C.F.R. § 42.104(b)(4), a petition must identify, with particularity, where each element of a challenged claim is found in the prior art relied upon in the asserted grounds. The Petition may not rely on an extraneous reference outside the Grounds to supply a missing claim limitation, nor may it use such a reference to reconstruct a theory of operation that the applied references themselves do not disclose. The Director has recently made this requirement explicit. In a July 31, 2025 memorandum, the USPTO clarified that the Office will enforce and no longer waive Rule 104(b)(4), and that a petitioner may not use non-ground materials—such as expert testimony, general knowledge, or other references not relied upon in the grounds, to supply a missing claim limitation. USPTO Memorandum,

Enforcement and Non-Waiver of 37 C.F.R. § 42.104(b)(4) and Permissible Uses of General Knowledge in Inter Partes Reviews (July 31, 2025). The memorandum further explains that institution is not appropriate where a petitioner attempts to cure a failure of proof as to a claim element by relying on materials outside the asserted grounds.

That is precisely what occurs here. Unable to identify the claimed limitation in the applied references themselves, the Petition turns to Wiernicki, a reference not relied upon in the asserted Grounds, to supply the missing disclosure and to reconstruct a theory of operation absent from DiCenso641 and Smith. The Petition asserts that Wiernicki thus does the substantive work required to meet the claim limitation, standing in for a disclosure that the applied references do not provide. Rule 104(b)(4) does not permit that approach, and the Director has made clear that such a defect precludes institution.

To the extent the Petition implicitly suggests that a frequency-based threshold determination is inherent because certain frequencies were allegedly known in the art to be associated with hearing effects, that argument fails as well. Inherency requires that the missing limitation be necessarily present in the prior-art system, not merely that it could be inferred after the fact based on general knowledge. *PAR Pharm., Inc. v. TWI Pharm., Inc.*, 773 F.3d 1186, 1194–96 (Fed. Cir. 2014) The Petition does not contend, and the applied references do not

disclose, that the systems necessarily determine and apply a frequency-based threshold as part of their operation. At most, the Petition asserts that a POSITA could characterize certain frequencies as risky based on extraneous knowledge, which is insufficient to establish inherency. Because the Petition relies on a non-grounds reference to supply a missing limitation, improperly equates audibility with threshold determination, and fails to show that the claimed functionality is necessarily present in the applied references, it does not establish that Claims 6 and 15 are taught by the prior art. Institution should therefore be denied. EX2003, ¶92.

F. Claims 7 and 16 Are Not Taught Because the Prior Art Does Not Notify the User of a Frequency Outside a Threshold

Petitioner contends that DiCenso641 in combination with Smith teaches the “notifying a user” limitation in claims 7 and 16 because Smith discloses that inaudible sounds may be “replaced with other sounds, such as a warning,” and because DiCenso641 allows users to customize auditory experiences by adding, inserting, or replacing sounds. Pet., 31-33. That theory fails for multiple independent reasons. EX2003, ¶93.

First, neither Smith nor DiCenso641 discloses notifying a user that a detected sound includes a frequency outside a predetermined threshold, as recited in the claim. Smith describes substituting inaudible sounds with other sounds, not generating a notification responsive to detection of a threshold-exceeding frequency. EX1006, ¶0027. DiCenso641, in turn, discloses user-configured sound

modification, such as amplification, cancellation, or replacement, based on sound *type* and user preference, not alerting a user to the *presence* of an out-of-range frequency. EX1005, ¶¶[0028], [0033]. The Petition never identifies any disclosure in either reference that performs the claimed notification function. EX2003, ¶94.

Unable to point to such a disclosure, Petitioner repeatedly asserts that a POSITA would have found it obvious to *further modify* the DiCenso641-Smith combination to provide an alert when an inaudible sound is detected. Pet., 31-33. That assertion improperly attempts to supply a missing claim element through expert testimony rather than identifying it in the applied references, in direct violation of 37 C.F.R. § 42.104(b)(4). An obviousness theory cannot rest on expert ipse dixit that a system *could be further modified* to perform the claimed function when the cited art does not disclose that function.

The defect is compounded by Petitioner's reliance on the '736 patent itself to explain what the alleged alert would be and how it would operate. EX1002, ¶136; Pet., 32. A challenged patent cannot be used to supply, illustrate, or rationalize missing teachings in the prior art. Doing so reflects impermissible hindsight reconstruction, not a disclosure of the DiCenso641-Smith combination. EX2003, ¶95.

In short, the Petition's theory depends not on what DiCenso641 and Smith teach, but on a post hoc reconstruction in which expert testimony and the

challenged patent are used to bridge an admitted disclosure gap. That approach cannot satisfy Petitioner's burden at institution.

G. Claim 9 Is Not Taught Because the Petition Fails to Identify Any Disclosure of Signal-Energy-Based Auto-Adjustment Sensed Within a Cluster or Surrounding Clusters

1. Claim 9 Recites Autonomous Output Adjustment Based on Sensed Signal Energy at the Cluster Level

Claim 9 of the '736 patent recites an in-ear device in which audio output "auto-adjusts based on signal energy sensed within a cluster or surrounding clusters." EX1001, cl. 9. The '736 patent specification explains that this functionality arises from a sensing architecture in which devices "having the ability to sense the frequency and magnitude of audio signals" provide data that is evaluated by the system to adjust connected output devices. EX1001, 8:22-25.

The adjustment contemplated by Claim 9 is autonomous and sensed signal energy. The claimed system monitors audio signal energy sensed by devices within a cluster or surrounding clusters and adjusts the output of in-ear monitors based on that sensed energy to maintain "high quality/fidelity output." EX1001, 8:48-53; 13:13-17. Claim 9 thus ties auto-adjustment to measured signal energy at the cluster level, not to subjective user input or preference selection. EX2003, ¶96.

2. The Petition Does Not Identify Auto-Adjustment Based on Signal Energy

The Petition does not identify any disclosure in the prior art that teaches autonomous adjustment based on sensed signal energy. Instead, it relies on manual user preferences to satisfy the “auto-adjust” limitation.

To map Claim 9, the Petition quotes DiCenso641, asserting that “microprocessor 326 receives user preferences 322 corresponding to each of the plurality of types of sounds and modifies the signal for each type of sound in the ambient auditory environment based on the corresponding user preference.” Pet., 37 (quoting EX1005, ¶0042). However, that disclosure does not involve signal energy sensing. DiCenso641 repeatedly characterizes its system as being “personalized or customized in response to user preferences,” with users interacting through an interface that includes “slider bars 510, 520, 530, and 540” to select levels such as “‘off,’ ‘low,’ ‘real,’ or ‘loud.’” EX1005, ¶¶0019, 0049. Those adjustments are driven by user selection, not by measured signal energy, and therefore cannot satisfy Claim 9’s recitation that output auto-adjusts based on sensed signal energy. EX2003, ¶97.

The Petition itself acknowledges that the ’736 patent teaches autonomous behavior, stating that “the output of such an in-ear monitor can be autonomously adjusted after sensing audio output.” Pet., 36-39. But rather than identify any disclosure in the prior art where output is adjusted based on sensed signal energy,

the Petition simply assumes that DiCenso641's user-driven preference modification is equivalent. That assumption is unsupported and incorrect. Manual preference selection is not signal-energy-based auto-adjustment.

3. The Petition Also Fails to Teach Sensing Within a Cluster or Surrounding Clusters

The Petition further fails to identify any disclosure of cluster-level or surrounding-cluster sensing as recited in Claim 9.

In DiCenso641, the earpieces capture sound from the user's immediate vicinity and process it locally. *Id.*, ¶0022. There is no disclosure of sensing signal energy across multiple devices operating as clusters, much less sensing energy from surrounding clusters and using that information to drive output adjustment. EX2003, ¶98.

Although the Petition treats DiCenso641's "pair of earpieces 134" as a "cluster," it identifies no mechanism by which an in-ear device adjusts its output based on energy data aggregated from other, distinct sensing nodes, as taught in the '906 patent. Pet., 14; EX1001, 12:26-30. DiCenso641 does not disclose sensing signal energy across clusters or coordinating output adjustments based on the sensed signal energy. Smith does not cure this deficiency. EX2003, ¶99.

Smith focuses on processing signals to compensate for hearing loss or to attenuate noise according to an "environmental noise signature." EX1006, ¶0005. Smith does not disclose auto-adjusting an in-ear device based on signal energy

sensed within a cluster or surrounding clusters, nor does it disclose a cluster-based sensing architecture. EX2003, ¶100.

In sum, the Petition fails to identify any disclosure in the asserted prior art of an in-ear device whose output auto-adjusts based on signal energy sensed within a cluster or surrounding clusters, as recited by Claim 9. Instead, the Petition relies on user-selected preferences and manual controls to stand in for autonomous, signal-energy-based adjustment, and it offers no teaching of cluster-level or surrounding-cluster sensing at all. Because the Petition does not disclose, either expressly or inherently, the signal-energy-based auto-adjustment recited by Claim 9, it fails to establish unpatentability of that claim. Institution should therefore be denied as to Claim 9.

H. The Petition Advances Internally Inconsistent Theories of “Automatic” Operation and User-Driven Control (Claims 10, 20)

The Petition fails because it advances mutually inconsistent theories regarding how sound alteration is performed in the asserted prior art. In one portion of its analysis, Petitioner contends that sound alteration is carried out automatically by a processor without user involvement. Elsewhere, however, Petitioner relies on manual, user-driven controls to supply the same alteration steps. The Petition never reconciles these positions, and the resulting contradiction undermines its mapping for Claims 10 and 20.

1. Petitioner Argues Sound Alteration Is “Automatic” Because No User Intervention Is Required, but DiCenso641 does not Disclose Such Automation

To satisfy the recitations in Claims 10 and 20 that sound alteration is “performed automatically,” the Petition argues that the prior art operates without human involvement at the time of execution. According to Petitioner, a POSITA would understand the operation to be automatic “inasmuch as the microprocessor would execute relevant code without requiring further human intervention.” Pet., 38 (citing EX1002, ¶156). Under this theory, once a triggering condition is met, the alteration proceeds autonomously and independently of user choice or control. But the Petition never identifies any system-determined decision making. Instead, the alleged automation consists of a processor executing previously selected user preferences. DiCenso641 repeatedly explains that sound modification is based on user choice. The user selects sound categories and specifies how those sounds should be treated, and the system thereafter applies those preferences. EX1005, ¶¶0019, 0023, 0049. Thus, the processor is not autonomously determining when or how sounds should be altered; it is implementing settings chosen by the user.

Indeed, DiCenso641 discloses sound modification mechanisms that rely exclusively on user-generated controls rather than autonomous system logic. DiCenso641 explicitly teaches that sound modification is effectuated through manual user inputs, specifically slider bars 510, 520, 530, and 540 that require a

user to actively adjust sound levels. EX1005, ¶0049. Similarly, the reference discloses relying on touch-based gestures, such as drawing a “V” for voices or swiping to raise or lower sound categories, to effect sound modification. *Id.* ¶0056. These mechanisms depend on the user selecting sound categories, specifying preference levels “on the fly,” and manually dictating how sounds are altered, *id.* ¶0048, rather than the system automatically altering sounds to ensure a frequency does not fall outside a predetermined threshold.

2. The Petition’s Positions Are Logically and Technically Irreconcilable

An alteration that is “performed automatically” occurs without user decision at the time of execution. By contrast, alteration achieved through sliders, gestures, and user-specified preferences is dictated by user choice, not autonomous system logic. EX2003, ¶101-103. The Petition thus simultaneously asserts that sound alteration requires no user involvement and that sound alteration occurs precisely because the user controls the outcome through interface interactions. That contradiction goes to the core of the Petition’s mapping and explains why it fails.

The challenged claims tie alteration to operation based on predetermined technical conditions, such as maintaining sound output within a frequency range that avoids risk to hearing. EX1001, cls. 10, 20. DiCenso641, by contrast, repeatedly characterizes its system as being “personalized or customized in response to user preferences,” with adjustments made through explicit user

interaction. EX1005, ¶¶0019, 0023, 0049. A system whose behavior is dictated by subjective user selections is fundamentally different from one that autonomously alters sound based on system-determined conditions.

Because the Petition relies on inconsistent and unreconciled theories to satisfy the same alteration limitations, it fails to carry its burden. The Board cannot credit a mapping that depends on user control to establish alteration while simultaneously asserting that no user involvement is required. Accordingly, the Petition fails to establish unpatentability of Claims 10 and 20, and institution should be denied. EX2003, ¶¶101-103.

I. Claim 17 Is Not Taught Because the Petition Improperly Equates Filtering with Panning

1. Claim 17 Recites Panning of the Sensed Noise

Claims 17 recites that the processor performs “panning the sensed noise.” EX1001, cl. 8. As the Petition itself acknowledges, the ’736 patent describes panning as an operation involving separation and spatial handling of frequencies within the sensed noise signal. Pet., 35. This is confirmed by the ’736 patent. The ’736 patent states that “panning” is the process of “separating like frequencies.” EX1001, 9:2-4. This understanding is reinforced by the disclosed signal-processing implementation, the ’736 patent stating: “At step 335, the audio is panned. That is, like frequencies in the sensed audio are separated.” *Id.*, 16:12-14, Fig. 5. Read in

context, Claim 17's panning limitation therefore includes frequency-domain separation of sensed noise. EX2003, ¶104.

2. DiCenso641 Does Not Disclose Panning of Sensed Noise

DiCenso641 does not pan the sensed noise signal. Instead, it categorizes sounds into types (e.g., voices, traffic, music) and reconstructs an auditory scene by spatially placing isolated sound types based on user preference. For example, DiCenso641 explains that sounds are generated “based on a corresponding desired spatial position for the type of sound within the auditory environment of the user” so that voices appear in the “correct spatial position.” EX1005, ¶¶0007, 0026, 0044. That disclosure concerns spatial reconstruction of separated sound types, not panning of the raw sensed noise itself. EX2003, ¶105-106. While DiCenso641 discusses placing sounds in a “stereo panorama,” this operation is performed on separated component signals (e.g., placing a specific voice in a specific location), not on the raw “sensed noise” itself. EX1005, ¶0007; EX2003, ¶105-106.

3. Filtering Is Not Panning

The Petition attempts to satisfy Claim 17 by arguing that DiCenso641's use of filters constitutes panning because filtering involves frequency separation. Pet., 35. That argument collapses distinct concepts. Filtering separates or attenuates frequencies; panning concerns spatial manipulation of sound. EX1001, 8:66-67; EX2003, ¶107. What DiCenso641 discloses is filtering and spatial placement of

reconstructed sound types based on user preference, not automated panning of the sensed noise signal. EX2003, ¶107.

Because the Petition identifies no disclosure of panning the sensed noise as recited by Claim 8, that claim is not taught.

**V. GROUND 1B: DEFECTIVE MAPPING OF THE CLAIMED
“INTERFACING MECHANISM” (CLAIMS 2 AND 12)**

The Petition fails to establish unpatentability of Claims 2 and 12 because the Petition never identifies a prior-art disclosure corresponding to the claimed “interfacing mechanism.” Instead the Petition improperly equates any user interface to the claimed mechanism, disregarding the specific structural and functional features recited in the dependent claims.

**A. The Claims Recite a Specific Interfacing Mechanism With
Structural and Functional Features**

Claims 2 and 12 do not merely recite the presence of a user interface. They recite an *interfacing mechanism* that includes defined hardware and defined functionality.

Specifically, the interfacing mechanism includes a network adapter capable of both wired and wireless communication, and an input mechanism configured to (i) manipulate the interfacing mechanism and (ii) vary the output of an output device. Claim 12 further recites that these components be provided *in a computing device*.

B. The Petition Improperly Collapses the Claimed Interfacing Mechanism Into “Any UI”

Rather than identifying a disclosure that satisfies these recitations, the Petition reduces the claimed “interfacing mechanism” to a generic user interface. Petitioner maps DiCenso641’s mobile device user interface (UI 324) to the claimed interfacing mechanism. Pet., 45-49 To supply additional functionality, the Petition then invokes Smith for user selection of noise types and Holland for delivery of content over a network. *Id.* This mapping reads the term “interfacing mechanism” to mean “any UI,” untethered from the claim language reciting a network adapter and an input mechanism that manipulates that adapter to vary output. The Petition never explains how a software UI, standing alone, satisfies these hardware-centric limitations. EX2003, ¶¶108-109.

C. Even if the Cited References Disclosed the Interfacing Mechanism, Which They Do Not, the Board cannot cure the Petition Deficiencies

Even if taught, which it is not, the Board cannot cure the deficiency in the Petition’s mapping. *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380-81 (Fed. Cir. 2016)

DiCenso641 discloses that user preferences may be communicated using “wired or wireless technology,” such as Wi-Fi or Bluetooth, EX1005, ¶¶0019, 0023. But DiCenso641 does not disclose a network adapter as a specific component of an interfacing mechanism, nor does it disclose a single interface

capable of both wired and wireless communication. More importantly, DiCenso641 does not disclose an input mechanism that manipulates the interfacing mechanism itself to vary the output of a separate output device. Its disclosures are expressly directed to software-level preference selection, where “the user interface gives the user the ability to set auditory preferences on the fly,” such as by using “slider bars 510, 520, 530, and 540 for controlling user preferences.” *Id.*, ¶¶0048-0049. Those disclosures describe user interaction with software controls, not manipulation of an interface mechanism that includes a network adapter. EX2003, ¶109.

Smith fares no better. Smith describes systems in which a user may select types of noise to attenuate and the level of attenuation, for example by selecting to “attenuate gunshot noise by 12 dB.” EX1006, ¶0082. Smith also notes that such selections may be made via an application running on a cellular telephone. *Id.*, ¶0088. But Smith contains no disclosure of a network adapter, and no disclosure of an input mechanism that manipulates an interfacing mechanism to vary output. Smith’s discussion of user selection is entirely abstracted from any disclosure of interface hardware or network-adapter manipulation. EX2003, ¶110.

Holland, which the Petition invokes to supply the network adapter, likewise does not bridge the gap. Holland describes a network adapter only as a means to couple an electronic system to a network. EX1007, ¶0162. Holland does not

disclose any input mechanism that manipulates an interfacing mechanism with an adapter, nor does it disclose varying the output of an output device by manipulating interface mechanism. To the contrary, Holland is directed to downloading and displaying companion content, explaining that a “companion content device... downloads content associated with a media presentation playing on a media player and displays the downloaded content.” *Id.*, ¶0010. Holland teaches content delivery, not control of an interface mechanism through an input mechanism. EX2003, ¶111.

The Petition attempts to paper over these gaps by equating a generic software user interface to the claimed “interfacing mechanism.” Pet., 44-45. But while the Petition relies on Holland to supply a physical “network adapter,” the Petition never identifies any disclosure explaining how DiCenso641’s software sliders or Smith’s user selections manipulate that interfacing mechanism with an adapter to vary output, as recited in Claims 2 and 12. This role-splitting across references highlights, rather than cures, the absence of any disclosure corresponding to the claimed interfacing mechanism. EX2003, ¶112.

D. The Petition’s Theory Ignores the Dependent-Claim Structure

By equating the interfacing mechanism to a generic UI and then distributing the remaining claimed features across unrelated references, the Petition ignores the structural limitations imposed by Claims 2 and 12.

In particular, the Petition never identify where the claimed input mechanism manipulates the interfacing mechanism itself, as recited by Claims 2[d] and 12[d]. Mapping the interface to DiCenso’s software UI while relying on Holland for physical adapter hardware leaves a critical gap: there is no disclosure showing that user input operates on the interfacing mechanism with the network adapter to vary output.

This is not a matter of semantics—it is a failure of proof. The Petition’s theory depends on collapsing a multi-component interfacing mechanism into “any UI,” thereby reading out the dependent-claim limitations that recite specific hardware and specific manipulative relationships among components. Because the Petition never identifies a disclosure corresponding to the claimed interfacing mechanism as recited, it fails to meet its burden for Claims 2 and 12. The Board cannot supply missing structural elements or ignore dependent-claim limitations to salvage an obviousness theory.

Accordingly, the Petition’s defective mapping of the “interfacing mechanism” independently requires denial of institution as to Claims 2 and 12.

VI. GROUNDS 1C-1D

Ground 1C-1D are expressly premised on the same unpatentability theory and the same asserted disclosures relied upon in Ground 1A, with the addition of further claim limitations. Because Petitioner has failed to establish that the applied

prior art teaches or renders obvious the limitations of the independent claims challenged in Ground 1A, Petitioner necessarily fails to establish the unpatentability of the dependent claims challenged in Ground 1C. The Petition does not cure the deficiencies identified in Ground 1A, nor does it identify any additional teachings that would independently satisfy the limitations incorporated from the independent claims. Accordingly, Ground 1C rises or falls with Ground 1A and must fail for the same reasons.

VII. GROUND 1E: FAILS FOR ALL THE SAME REASONS AS GROUND 1A

Independent Claim 32 recites substantively the same system architecture and operations that were discussed and found deficient in the Petition's Ground 1A mapping for independent claims 1 and 11, including the requirements for a "data source," a "cluster" of at least one computing device, an "electronic bus," and a processor configured to "identify," "isolate," and "determine" frequency thresholds. Pet., 120-121 (Claims 32[a]–32[f]). The Petition expressly relies on the same analysis presented for Ground 1A to satisfy these limitations in Ground 1E. Pet., 61-64 (citing §VIII.A.1.a-c for elements 32[pre]-32[c]); Pet., 62 (citing §VIII.A.1.d(ii) for the "electronic bus" of 32[c][ii]); Pet., 63 (stating element 32[e][i] is "substantially identical to element 1[e][i]"). Because the Petition relies on the identical, defective mappings of DiCenso641 and Smith challenged in Ground 1A, Ground 1E necessarily fails for the same reasons.

Furthermore, the addition of Goldstein873 in Ground 1E does not cure these deficiencies. The Petition relies on Goldstein873 solely to satisfy the limitation of “transmitting an alert to another computing device” regarding the frequency threshold (Claim 32[3][iv]). Pet., 64-65. Goldstein873 is not cited to remedy the Petition’s failure to resolve the mutually exclusive processing states required by the Petition’s mapping of the base system components, show a “cluster,” or show the “electronic bus.” Because Goldstein873 addresses only the added “alert” feature and does not supply the missing teachings discussed in Ground 1A and also recited in Claim 32, the combination of DiCenso641, Smith, and Goldstein873 fails to render the claim obvious. Therefore, Petitioner has not demonstrated a reasonable likelihood of prevailing on Ground 1E.

VIII. GROUNDS 2A-2E

All of Ground 2 (Grounds 2A-2E) fares no better. Petitioner introduces Goldstein873 only as a contingent fallback “to the extent” the Board finds that DiCenso641 does not disclose earpieces including a wireless transceiver. Pet., 68; EX1002, ¶¶280-290. But Petitioner does not rely on Goldstein873 to remedy any of the substantive deficiencies that defeat Ground 1A, nor does Goldstein873 address them. Because Goldstein873 neither supplies the missing claim elements nor resolves the architectural and processing conflicts identified above, Ground 2A

fails for the same reasons as Ground 1A and does not establish a reasonable likelihood of prevailing.

IX. *CHEVRON* AND *DEEPER* FAVOR DENYING INSTITUTION.

When “a petition meets the standards for institution in relation to fewer than all the challenges presented, or where deficiencies in the petition ... affect only a portion of the challenges presented, the [Board] will evaluate all the challenges and determine whether, in the interests of efficient administration of the Office and integrity of the patent system, the entire petition should be denied.” Trial Practice Guide, § II.D.3 (citing 35 U.S.C. §§ 316(b), 326(b); *accord Chevron Oronite Co., LLC v. Infineum USA L.P.*, IPR2018-00923, Paper 9 (PTAB Nov. 7, 2018) (informative); *Deeper, UAB v. Vexilar, Inc.*, IPR2018-01310, Paper 7 (PTAB Jan. 24, 2019) (informative). Here, the Petition suffers from numerous fatal deficiencies such that institution should be denied even if some claims/Grounds meet the standard for institution as it would be inefficient use of the Board’s resources. Interim Processes Memo, 3; 35 U.S.C. § 316(b).

X. CONCLUSION

For at least the foregoing reasons, Petitioner has failed to show a reasonable likelihood of prevailing with respect to any challenged claim. Therefore, the Board should deny institution.

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CERTIFICATE OF WORD COUNT (37 C.F.R. § 42.24(d))

1. This Patent Owner Preliminary Response complies with the type-volume limitation of 14,000 words, comprising 13,985 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

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

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CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e))

I certify that the above-captioned **PATENT OWNER PRELIMINARY RESPONSE UNDER 37 C.F.R. § 42.107(a)** and associated Exhibits 2003-2005 were served in their entirety on February 17, 2026, upon the following parties via electronic mail:

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