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 IPR2026-00083
U.S. Patent No. 10,656,906

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

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PATENT OWNER'S UPDATED EXHIBIT LIST

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2002	Invalidity Contentions, *Zophonos Inc. v. Samsung Elecs. Co., Ltd.*, Case No. 2:25-cv-00752 (E.D. Tex. Jan. 19, 2026)
2003	Declaration of Dr. Justin Mathew in Support of Patent Owner Preliminary Response
2004	*Curriculum Vitae* of Dr. Justin Mathew
2005	Am. Speech-Language-Hearing Ass'n, Audiogram, https://www.asha.org/public/hearing/Audiogram/

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I. INTRODUCTION

U.S. Patent No. 10,656,906 ("the '906 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. More specifically, the '906 patent discloses systems and methods for multi-frequency sensing and autonomous environmental control using clusters of computing devices. The '906 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 an audio control source to identify and isolate sounds, determine whether frequencies exceed predetermined thresholds, and alter audio outputs in response. *See* EX1001, 1:55-63; 2:39-48; cl. 1.

Ground 1A fails for multiple, independent reasons that span the independent claims and cascade through the dependent claims. Rather than presenting a coherent theory grounded in what the applied references actually disclose, the Petition repeatedly substitutes speculation, role reassignment, and user-driven functionality for the architecture recited in the claims. The result is not a close case

on obviousness, but a collection of mismatched theories that cannot be reconciled with the claim language or with the disclosures of DiCenso641 and Smith.

The unifying defect in Ground 1A is internal inconsistency with Petitioner's mappings and theories. At every critical step, the Petition attempts to satisfy claim limitations by recharacterizing components, reassigning functions, or layering incompatible processing models onto one another, without identifying any disclosure in the prior art that supports those moves. These defects manifest repeatedly. For the independent claims, the Petition fails to identify any component in DiCenso641 that satisfies the claimed "audio control source," instead distributing claimed control functions across multiple devices in a manner untethered to the reference. It likewise fails to disclose the recited "cluster of at least one computing device," resorting to post hoc role reassignment among DiCenso641's identical wearable components. When attempting to combine DiCenso641 with Smith, the Petition never reconciles their fundamentally incompatible sound-processing approaches and operations, offering only conclusory assertions in place of a motivated and technically coherent integration.

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-1C 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-2C) 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 2A: 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 '906 PATENT

A. The '906 patent provides novel techniques for multi-frequency sensing and adaptive control using mobile-based clusters.

U.S. Patent No. 10,656,906 ("the '906 patent") is directed to systems and 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 large and acoustically complex environments such as stadiums, theaters, transportation hubs, vehicles, and other shared venues, where individual listener experiences vary significantly. *Id.*, 2:3-23.

At a high level, the ’906 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.*, 10:39-42. 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.*, 11:56-58, 8:5-10. Through this sensing, the system develops localized “sound ‘fingerprints’” that visualize environmental conditions across the venue. *Id.*

The sensed data is communicated to an audio control source, which is structurally and functionally distinct from both the sensing devices and the output devices. The audio control source includes “a memory, containing computer-executable instructions” and “a processor, for executing the computer-executable instructions,” and is in electronic communication with the clusters. *Id.*, cl. 1. Based on data received from one or more clusters, the audio control source executes instructions for “identifying one or more sounds within the noise,” “isolating the one or more sounds,” determining whether a sound includes “a frequency determined to pose a risk of harm,” and automatically altering those sounds before varying the output of one or more output devices. *Id.*, 5:9-26, 6:25-67, cls. 1[a],

[e], [g]. 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.*, 11:59-62

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.*, 12:54-55. 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.*, 12:55-60. Those peer devices then "conduct the same audio measurements to confirm the threshold breach," thereby "provid[ing] more robust data sets." *Id.*, 12:61-62. Only after this breach-confirmation step does the system escalate the data to the audio control source for corrective action. *Id.*, 12:66-13:6. 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 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.*, 13:64-14:6, 15:46-48. 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.*, 15:53-54. The workflow further includes controlling the dynamic range through (described as "compressed or limiting"), "panning" like frequencies, applying "equalization," and adding "effects that add depth and texture." *Id.*, 9:1-6, 15:55-67. 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 '906 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.*, 14:15-21. 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 '906 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.*, 2:11-14.

Thus, the ’906 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, an audio control source, and autonomous output control, the ’906 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 ’906 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). Patent Owner asserts that no term requires express construction beyond its plain and ordinary meaning as understood by a POSITA at the time of the invention in light of the specification and the patent's prosecution history.

III. OVERVIEW OF THE CITED ART

A. DiCenso641 Describes a User-Centric Wearable System for Personalized Audio Processing (For both)

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, ¶¶0001,0022.

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 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, ¶34-41.

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 DiCenso641. EX2003, ¶42-48. 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." *Id.*, ¶¶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, ¶42-48.

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, ¶42-48.

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, ¶42-48.

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.

First, the Petition fails to establish that DiCenso641 discloses the claimed "audio control source." Independent claims 1 and 11 recite an audio control source that itself includes memory and a processor and that executes instructions to connect to clusters, identify and isolate sounds, determine whether frequencies breach predetermined thresholds, automatically alter those sounds, and vary the output of one or more output devices. The Petition labels DiCenso641's smartphone as the audio control source but never explains how it performs these claimed functions. To the contrary, DiCenso641 assigns many of its operations (which Patent Owner does not concede are analogous to the claimed functions) to the wearable's internal DSP, while the smartphone serves only as a user interface and preference conduit.

Second, the Petition also fails to establish that DiCenso641 discloses the claimed "cluster of at least one computing device." The independent claims recite an architecture in which an audio control source communicates with a cluster that is distinct from an output device. The Petition identifies no disclosure in DiCenso641 describing how such a cluster is formed, operates as a unit, or is distinguished from other components. Instead, it relies on shifting characterizations of the same wearable hardware, at times treating a pair of earpieces collectively as

a "cluster," and elsewhere reassigning those same earpieces as separate "cluster" and "output device" components.

Third, even if somehow the Board can decipher how the Petition intended to show the element is taught, the Petition's mapping being internally inconsistent further underscores its failure of proof. In different portions of the analysis, the Petition alternately treats the same earbuds as a "cluster," as an "output device," or as both, without any supporting disclosure in DiCenso641 nor any explanation of how such role-switching would occur. These contradictions confirm that the Petition is not describing DiCenso641's disclosed architecture but rather stitching together incompatible characterizations to satisfy different claim limitations.

Fourth, the Petition fails to establish a motivated and technically coherent combination of DiCenso641 and Smith. To satisfy the limitation of "isolating the one or more sounds," the Petitioner relies on DiCenso641's alleged technique of separating an audio signal into distinct component signals (e.g., separating voices from traffic). *See* Pet., 31 (citing EX1005, ¶0044). However, to teach the step of "determining if one or more of the one or more sounds includes a frequency outside of a predetermined threshold," the Petitioner pivots to Smith, relying on that reference's broad environmental analysis to detect specific high-frequency events like ultrasonic waves. See Pet., 33-36 (citing EX1006, ¶0026). But even following Petitioner's mapping and logic (which Patent Owner does not concede is

correct), the Petition never explains how Smith's evaluation of the overall sound environment—used to identify hazardous frequencies across the full range of sound—could be integrated into DiCenso641's architecture, in which individual sounds are allegedly extracted and separated before such analysis occurs, without undermining the operation of one reference or the other. As explained below, these architectures are fundamentally incompatible, and the Petition offers only conclusory assertions, not a viable integration theory, to bridge that gap. Accordingly, the Petition fails to establish a motivation to combine or a reasonable expectation of success.

The same defects that defeat Petitioner's challenge to independent claims 1 and 11 apply with equal force to the dependent claims. Claims 6 and 15 adds the recitation that the system automatically alter one or more sounds when a threshold is exceeded, but Petitioner never identifies any disclosure in which a single audio control source performs that automatic alteration, instead relying on manual user-preference adjustments and DSP-level processing within the wearable device. Claims 7 and 16 further recite notifying a user when a threshold is breached, yet the Petition again relies on wearable-centric behavior without establishing that such notification is generated by the claimed control source as part of the asserted architecture. Claim 17 adds panning of the sensed noise, and claim 9 further adds automatic adjustment of an in-ear device's audio output based on sensed signal

energy within a cluster or surrounding clusters, but Petitioner merely points to isolated signal-processing techniques in the prior art without explaining how those operations would be executed within the same coherent processing pipeline that already fails under the independent claims. For claims 10 and 20, the Petition fails because it advances mutually inconsistent theories of sound alteration, arguing that the prior art operates autonomously without user intervention to satisfy "automatic" operation, while elsewhere relying on user-driven sliders, gestures, and preference selections to supply the same alteration steps. Because the Petition never explains how a single disclosed system can coherently operate in both autonomous and user-directed modes, it fails to establish a reasonable likelihood of prevailing for Claims 10 and 20.

Because Petitioner does not remedy the foundational architectural defects in its mapping of the independent claims, the additional limitations of claims 6-7, 9-10, 15-17 and 20 do not salvage the Petition.

For these independent reasons, the Petition does not demonstrate that DiCenso alone or in combination with Smith teaches the claimed system architecture, nor does it show how the mapped elements operate together in a manner consistent with the claims. Institution should therefore be denied.

A. The Petition Fails to Show That DiCenso641 Discloses the Claimed "Audio Control Source" and Therefore Does Not Establish Obviousness of the Independent Claims.

Each of independent claims 1 and 11 recites, "an audio control source." EX1001, 19:24-26, 20:33-35. The Petition's "audio control source" theory fails for three independent and dispositive reasons. Petitioner's attempt to map the claimed "audio control source" to DiCenso641's smartphone fails because DiCenso641 assigns the claimed sound-processing functions to the wearable device's DSP, not to the smartphone. Second, the Petition impermissibly distributes the functions of the claimed "audio control source" across multiple components in DiCenso641, without explaining why such a redistribution would be appropriate or identifying any disclosure in DiCenso641 that supports it. Because the Petition never identifies any single component in DiCenso641 that performs the recited control functions of the claimed "audio control source," Petitioner has not shown a reasonable likelihood of prevailing, and institution should be denied.

1. The Claims Recite an Audio Control Source That Performs Signal-Processing Functions

Claims 1 and 11 of the '906 patent recite an "audio control source" that is not merely a communication intermediary, but a processing-capable controller that performs the signal-management functions of the system. As recited, the audio control source includes "a memory, containing computer-executable instructions" and "a processor, for executing the computer-executable instructions." EX1001,

cls. 1, 11. Those instructions are stored and executed by the audio control source itself and include instructions for "connecting to the at least one cluster" and for "varying an output of the at least one output device." *Id.*, cls. 1[a], 11.

Critically, the claims specify that the audio control source performs active signal-processing functions, not passive routing. The stored instructions recite "identifying one or more sounds within the noise," "isolating the one or more sounds," and "determining if one or more of the one or more sounds includes a frequency outside of a predetermined threshold." EX1001, cl. 1[e], 19:39-59; *Id.*, cl. 11, 20:48-65. The claims further recite that the audio control source "alter[s] the one or more of the one or more sounds so that the frequency does not fall outside of the predetermined threshold." *Id.*, cls. 1[g][iv], 11[g][iv]. The predetermined threshold is itself a technical constraint, such as "a frequency determined to pose a risk of harm to a user's hearing capabilities." *Id.*, cl. 6, 20:11-13; EX2003, ¶¶51-52.

As the claim language makes clear, the audio control source is the entity responsible for a claimed set of operations: connecting to a cluster, identifying and isolating specific sounds from noise, determining whether those sounds breach a predetermined threshold\, automatically altering those sounds, and varying the output of a particular output device based on that determination. EX1001, cls. 1, 11. These functions are performed by the audio control source itself, consistent

with the claim language and structure, and are not satisfied by distributing those operations across separate components. With those claim recitations in view, the Petition must identify a component in DiCenso641 that satisfies the structural and functional limitations of the claimed audio control source. It does not. DiCenso641 does not disclose any component that performs the audio control source signal-processing functions recited in claims 1 and 11. EX2003, ¶¶51-52.

2. Petitioner's Theory Relies on an Impermissible Post-Hoc Reassignment of Functionality to DiCenso641's Smartphone That Contradicts DiCenso641's Explicit Assignment of Logic to the Wearable DSP

The Petition expressly identifies DiCenso641's smartphone (mobile device 320) as the claimed "audio control source." Pet. 11-13 ("Accordingly, DiCenso641 teaches a mobile device 320 configured to implement a user interface via which a user may control the processing of input signals to create auditory output signals ('an audio control source')"). The claims, however, recite that the audio control source itself include a memory and processor configured to execute instructions for "identifying one or more sounds," "isolating the one or more sounds," and altering those sounds. EX1001, cl. 1[e]-[g], 11. The Petition therefore must identify disclosures showing those recited operations being performed by DiCenso641's smartphone. It does not. Instead, the Petition asserts that the "functionality of DSP 310 … may instead be performed by microprocessor 326 of mobile device 320." Pet. at 26, 28, 30 n.8. But that statement is not drawn from any disclosure in

DiCenso641. Rather than identifying passages describing the smartphone performing the recited operations, the Petition relies on disclosures associated with DSP 310 in the wearable device and attributes those operations to the smartphone.

DiCenso641 explains that its system includes a "wearable device 130 that includes… a microprocessor-based digital signal processor (DSP)," and that the wearable device may be implemented as "headphones or ear buds 134." EX1005, ¶0022. Within that wearable hardware, "DSP 310 processes the signal using a microprocessor to identify at least one of a plurality of types of sounds" and "modifies the signal for each type of sound… based on the corresponding user preference." *Id.*, ¶0042. DiCenso641 further teaches that "DSP 310 may separate sounds or divide signals associated with particular sounds." *Id.*, ¶0044.

The portions of DiCenso641 cited by the Petition do not attribute those operations to the smartphone (mobile device 320). DiCenso641 describes the smartphone as providing a user interface and, in some circumstances, performing additional processing, stating that it may "provide additional processing power to augment the capabilities of the main system microprocessor and/or DSP." *Id.*, ¶¶0027, 0039. DiCenso641 further explains 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." *Id.*, ¶0039. The Petition does not identify any disclosure in which the smartphone itself performs the claimed identifying,

isolating, thresholding, or altering operations attributed to the claimed audio control source. Instead, the cited passages describe data being sent to and returned from the mobile device without attributing those recited functions to that device. EX2003, ¶53.

Consistent with this architecture, the disclosures cited by the Petition discuss autonomous signal analysis and manipulation in connection with the wearable DSP, while the smartphone is used to capture and relay user preferences, such as manual selections to "cancel noise" or "cancel alerts," via sliders or checkboxes. *Id.*, ¶¶0039-0042, 0049-0054. Unlike the '906 patent, in which the audio control source performs an autonomous threshold determination, DiCenso641 does not disclose the smartphone performing any such analysis. DiCenso641 therefore provides no disclosure in which the smartphone itself performs the identifying, isolating, thresholding, or altering functions performed by the claimed audio control source.

Petitioner's own mapping confirms that it does not identify a single disclosed component corresponding to the claimed "audio control source." On the one hand, the Petition expressly identifies DiCenso641's smartphone (mobile device 320) as the component satisfying the "audio control source" limitation of claim 1[a]. *See* Pet., 13 ("Accordingly, DiCenso641 teaches **a mobile device 320** configured to implement a user interface via which a user may control the

processing of input signals to create auditory output signals ('an audio control source')") (emphasis added). On the other hand, when addressing the functional recited in claims 1[e]-[g], the Petition relies on DiCenso641's disclosure of DSP 310 located in the wearable device to satisfy the claimed sound-processing steps, including identifying, isolating, and modifying sounds. *See* Pet., 31-32 (citing DiCenso641 for the proposition that "DSP 310 may separate sounds or divide signals associated with particular sounds… [and] [e]ach sound type or group may be modified or manipulated"). Indeed, the Petition goes further than merely interpreting DiCenso641, it rewrites it. The Petition repeatedly and misleadingly asserts that the DSP's operations may be performed "instead" by the smartphone and, in its mapping, replaces DiCenso641's express reference to "DSP 310" with "[microprocessor 326]" under the guise of "clarity," even though the reference itself attributes those functions to the wearable device. Pet. at 26, 28, 30 n.8. This bracketed substitution reveals the premise underlying Petitioner's theory: not what DiCenso641 discloses, but an expert-supplied assumption that the wearable DSP's signal-analysis functions can be reassigned to the mobile device. EX2003, ¶¶54-55

The Petition ultimately acknowledges the architectural gap in its theory, asserting that "a POSITA would have thus understood DiCenso641 to disclose that the functionality of DSP 310 … described as being performed in wearable device 130, may instead be performed by microprocessor 326 of mobile device 320." Pet.,

26. That assertion, however, highlights, rather than cures, the fatal defect in Petitioner's mapping. DiCenso641 contains no disclosure that the smartphone performs the claimed identification, isolation, thresholding, or automatic alteration functions. Petitioner's theory therefore depends on a wholesale reassignment of processing logic from the wearable to the smartphone, an architecture that appears nowhere in the reference.

Petitioner's reliance on 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" fares no better. *See* Pet., 26. Taken as written, that disclosure confirms that DSP 310 remains the locus of audio control. The mobile device is described only as receiving an unprocessed stream, performing some form of additional processing, and returning the result to DSP 310, where DiCenso641 assigns the identification, separation/division, and audio-modification operations. Nothing in this bidirectional processing loop suggests that the smartphone assumes responsibility for the claimed audio source control functions. To the contrary, the return of the processed stream to DSP 310 underscores that DSP 310 retains control over how audio is ultimately analyzed and altered. EX2003, ¶55. Accepting Petitioner's interpretation would require the Board to read DiCenso641's limited off-device processing disclosure as a

wholesale reassignment of the wearable DSP's disclosed logic to the smartphone. DiCenso641 contains no disclosure supporting such a reading. EX2003, ¶¶56-57.

Rather than identifying any technical disclosure in DiCenso641 that would support this reassignment, Petitioner relies entirely on speculation. The Petition cites no design rationale, architectural teaching, or technical explanation suggesting that the wearable DSP's disclosed functions could be stripped from the wearable and performed instead by the smartphone. The sole support offered is a citation to Petitioner's expert declaration, which merely repeats the Petition's assertion verbatim without providing any independent technical reasoning or evidentiary foundation. *See, e.g.*, EX1002, ¶110 (mirroring Pet., 26). An expert declaration that simply echoes counsel's argument cannot supply a disclosure that the reference itself lacks. *See* 37 C.F.R. § 42.65(a).

Accordingly, Petitioner's theory does not identify what DiCenso641 actually discloses but instead rests on an unsupported assumption that processing functionality ***could*** be reassigned from the wearable DSP to the smartphone. Because that assumption contradicts the reference's express architectural and functional allocation and is unsupported by reasoned expert analysis, it cannot satisfy the claim language that the audio control source itself perform the recited functions.

Claims 1 and 11 of the ’906 patent recite that the audio control source itself include “a memory” and “a processor” configured to execute instructions for “identifying one or more sounds,” “isolating the one or more sounds,” and altering those sounds. EX1001, cl. 1[e]-[g]. If, as the Petition’s own mapping reflects, those functions are performed by the wearable DSP 310 rather than the smartphone, then the smartphone cannot be the claimed “audio control source.” The claims do not permit the recited processing to be performed by a different component and then imputed to the audio control source.”

B. The Petition Fails Because It Relies on Internally Inconsistent Architectural Theories Untethered to the Prior Art

The Petition’s challenge to claim 1 of the ’906 patent fails for a second fundamental and dispositive reason: Petitioner relies on shifting and internally inconsistent architectural theories to satisfy different claim limitations, without any corresponding disclosure in the prior art explaining or supporting those shifts.

Independent claim 1 recites a specific system topology in which an audio control source is in electronic communication with two structurally and functionally distinct components: (i) “at least one cluster of at least one computing device” and (ii) “at least one output device.” EX1001, cl. 1[b], 1[d], 1[e]. The cluster comprises at least one computing device with a sound-sensing mechanisms and a wireless transceiver, while the output device comprises a power source, speaker, and communication mechanism. *Id.* The claim further recites that the

audio control source is in electronic communication with *both* the cluster and the output device.. *Id.*, 8:5-13. A coherent prior-art mapping must therefore identify a system architecture that consistently assigns and maintains these distinct roles.

The Petition does not perform this mapping.

For claim element 1[b], the Petition advances a collective theory, treating DiCenso641's pair of earpieces 134 as a single unit constituting the claimed "cluster." Pet., 13-14 ("Accordingly, DiCenso641 teaches a pair of earpieces 134 ('at least one cluster') including a first earpiece having a DSP ('of at least one computing device')"). Under this theory, the earpieces operate symmetrically as a unified computing structure.

But when addressing claim element 1[e], which recites that the audio control source is in electronic communication with *both* the cluster and the output device, the Petition (without explanation) abandons that collective theory and instead asserts a segmented communication model. Pet., 24. There, Petitioner contends that the mobile device is in communication with "a first earpiece of earpieces 134 ('the at least one cluster') and the second earpiece ('and the at least one output device')." *Id.*, 24-25. In other words, under Petitioner's theory, the same pair of earpieces is alternately treated as a single collective component and then as two distinct system components with different roles depending on what the claims recite, rather than what the reference teaches.

However, the Petition offers no technical explanation and cites no disclosure in DiCenso641 for how the system transitions from a symmetric, collective architecture to a role-segmented architecture, or for how distinct roles are assigned to otherwise identical hardware. That omission is fatal.

DiCenso641 describes a symmetric wearable architecture, not a hierarchical or role-segmented one, as alleged by Petitioner. DiCenso641 explains that wearable device 130 may be implemented as earpieces 134 that "each contain an associated speaker and one or more microphones or transducers," and that the user wears "two in-ear or intra-aural devices 134 (one in each ear)" that operate together to reproduce the desired auditory scene. EX1005, ¶¶0022, 0024. Identification, separation, and modification of sounds are performed by DSP 310, which "processes the signal… to identify at least one of a plurality of types of sounds" and "modifies the signal for each type of sound." *Id.*, ¶¶0042, 0044. DiCenso641 contains no disclosure assigning differentiated architectural roles to the earpieces, such as designating one earpiece as a sensing or computing cluster and another as a standalone output device, nor does it disclose any hierarchy or control relationship between them.

Critically, Petitioner's problem is not that a single product cannot satisfy multiple claim limitations. Rather, the problem is that Petitioner's fictitious mapping depends on reassigning functions among system components in a manner

the reference never discloses or suggests. Where a claim recites distinct functional components performing specified roles, the prior art must disclose, or at least suggest, a system architecture in which those roles are implemented as mapped. Obviousness cannot be established through post hoc role reassignment untethered to the reference itself. As the Federal Circuit explained, a finding of obviousness requires an explanation of why a skilled artisan would combine or modify references in the manner claimed, not hindsight assembly of pieces. *See In re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000)."

Because the Petition alternates between incompatible architectural theories to satisfy different elements of claim 1, without any supporting disclosure in DiCenso641, its Ground 1 is wholly deficient.

C. DiCenso641 Does Not Disclose the Claimed "Cluster of at Least One Computing Device"

The independent claims of the '906 patent recite a system architecture in which an audio control source is 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." EX1001, cls. 1[b], 1[d], 1[e]. The claims further recite that the audio control source store instructions for "connecting to the at least one cluster" and for "varying an output of the at least one output device." *Id.*, cl. 1[a], 1[e]. Thus, Petitioner must identify, in the prior art, a component or grouping of components that is reasonably disclosed as a *cluster* with which the audio control

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, ¶¶58-59.

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., 14 EX1005, ¶0025). However, to satisfy the separate claimed "output device" (Element 1[d]), the Petition recycles the exact same hardware, asserting that the "pair of earpiece[s] 134 including a second earpiece" constitutes the output device. Pet, 17-18. 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. *See* 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, ¶¶58-59.

The artificiality of the Petitioner's theory is exposed by the communication limitation (Element 1[e]). The Petition asserts that the mobile device is in

communication with *both* the "cluster" (first earpiece) and the "output device" (second earpiece). Pet., 24. Yet, the Petitioner relies on the same wireless link (Link 360) described in DiCenso641 for both connections. *See 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 distributed 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, ¶60.

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 independent claims 1 and 11, 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, evaluating frequency thresholds, and altering the sound prior to output. *See* EX1001, cls. 1[e]-[g], 11; Pet., 24-39. 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, ¶61.

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, ¶62.

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. *Id.*, ¶¶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, ¶63.

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, ¶¶62-63.

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, ¶¶64.

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 sound types 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; *see also id.*, cl. 23; EX2003, ¶¶64-65.

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, ¶66.

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. *Id.*, ¶0007; *see also id.*, 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, ¶67.

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; *see also id.*, 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, ¶68

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, ¶69. 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 . . ." ; see also id. ¶0029 (reiterating the contrast with systems that "attempt to reduce any/all noise")). EX2003, ¶70.

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. *See* Pet., 31-33. 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, ¶75.

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, 73-74. 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 sound types before performing the further processing taught by Smith. Pet., 29-38. 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 detection 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, ¶71-72,

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. *See 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 ’906 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., 33-35. 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 disclose 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, ¶77-79.

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, ¶80.

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 levels. For example, Smith teaches that when signal amplitude reaches a defined level 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., 36, 48. However, an amplitude outside of a predetermined level is technically distinct from and does not satisfy the specific claim limitation of a "frequency outside of a predetermined threshold." EX2003, ¶81-83. 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, ¶81-83.

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, ¶81-83.

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., 42-43. 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. *See* 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. *See 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, ¶84.

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. EX1002, ¶¶154-61. That theory fails for multiple independent reasons. EX2003, ¶85

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, ¶86.

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. EX1002, ¶¶157-60. 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 '906 patent itself to explain what the alleged alert would be and how it would operate. EX1002, ¶157 (citing EX1001, 15:48-53). 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, ¶87

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 '906 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 '906 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, 8:18-21.

The adjustment contemplated by Claim 9 is autonomous and based on 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." *Id.*, 8:48-53; 12:35-39. Claim 9 thus ties auto-adjustment to measured signal energy at the cluster level, not to subjective user input or preference selection. EX2003, ¶88

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., 50 (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 the output auto-adjusts based on sensed signal energy. EX2003, ¶89.

The Petition itself acknowledges that the '906 patent teaches autonomous behavior, stating that "the output of such an in-ear monitor can be autonomously adjusted after sensing audio output." Pet., 49-50. 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. EX1005, ¶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, ¶90.

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., 13; *see* EX1001, 12:26-30. DiCenso641 does not disclose sensing signal energy across clusters or coordinating output adjustments based on such sensed energy. Smith does not cure this deficiency. EX2003, ¶91.

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, ¶92.

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 and 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., 51-52 (citing EX1002, ¶¶177-78). 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. DiCenso641 ¶¶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, ¶¶93-95. 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. *See* 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, ¶¶93-95.

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. 17. As the Petition itself acknowledges, the '906 patent describes panning as an operation involving separation and spatial handling of frequencies within the sensed noise signal. Pet., 49. This is confirmed by the '906 patent. The '906 patent states that "panning" is the process of "separating like frequencies." EX1001, 8:66-9:1. This understanding is reinforced by the disclosed signal-processing implementation, the '906 patent stating: "At step 335, the audio is panned. That is, like frequencies in the sensed audio are separated." *Id*., 15:63-64, Fig. 5. Read in context, Claim 17's panning limitation therefore includes frequency-domain separation of sensed noise. EX2003, ¶96.

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, ¶¶97-98. 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, 97-98

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., 46-47. That argument collapses distinct concepts. Filtering separates or attenuates frequencies; panning concerns spatial manipulation of sound. EX1001, 8:66-67; EX2003, ¶99. 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, ¶99.

Because the Petition identifies no disclosure of panning the sensed noise as recited by Claim 17, 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. *See* Pet., 58. 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., ¶¶100-101

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, ¶101.

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, ¶102.

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 an 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, ¶103.

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, ¶104.e

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 identifies 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. GROUND 1C

Ground 1X is 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

xpertclaims. Accordingly, Ground 1C rises or falls with Ground 1A and must fail for the same reasons.

VII. GROUND 2

All of Ground 2 (Grounds 2A-2C) A 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, ¶¶247-53. 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.

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

The merits consideration phase of an IPR includes determining whether the petition presents a sufficient number of Grounds/challenges that meet the reasonable likelihood standard. 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).

As discussed throughout this Preliminary Response, the Petition suffers from numerous fatal deficiencies. Given these defects, institution of trial should be denied even if some of the claims or Grounds meet the standard for institution (which they do not). It would not be an efficient use of the Board's valuable time and resources to institute review when resolution of this proceeding would be costly and time-consuming to address challenges that are flawed from the outset. *See* Interim Processes Memo, 3; 35 U.S.C. § 316(b).

IX. 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.

Respectfully submitted,

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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 13,780 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 entireties on February 17, 2026, upon the following parties via electronic mail:

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