

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner

v.

SONOS, INC.,
Patent Owner

U.S. Patent No. 10,966,025

Inter Partes Review Case No.: IPR2026-00131

**PATENT OWNER RESPONSE TO
PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 10,966,025**

Pursuant to 37 CFR § 42.120(a), Patent Owner submits the following Patent Owner Response to the petition.

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Exhibit	Description
Ex. 1001	U.S. Patent No. 10,966,025 (the “’025 Patent”)
Ex. 1003	Declaration of Dr. David Anderson
Ex. 1005	U.S. Patent App. Pub. No. 2007/0055399 (“Litbak”)
Ex. 1008	U.S. Patent App. Pub. No. 2007/0160225 (“Seydoux”)
Ex. 1010	Excerpts of Steven M. Kaplan, Wiley Electrical and Electronics Engineering Dictionary (2004)
Ex. 2001	Declaration of Dr. Jules White
Ex. 2002	Curriculum Vitae of Dr. Jules White
Ex. 2003	Excerpts of McGraw Hill Dictionary of Computer and Electrical Engineering (2003)
Ex. 2004	Excerpts of Collins English Dictionary (June 2012)
Ex. 2005	Excerpts of Oxford Learners Dictionary (Sept. 2022)
Ex. 2006	<i>Personalized Media Communications, L.L.C. v. Zynga, Inc.</i> , 12-cv-00068, Dkt. No. 150 (E.D. Tex. Aug. 18, 2013)

I. INTRODUCTION

Petitioner Google LLC (“Google”) challenges claims 1-4, 7-10, and 12-23 (the “Challenged Claims”) of U.S. Patent No. 10,966,025 (the “’025 Patent”) on four obviousness grounds. Pet., 1. Google’s challenge fails because it never establishes three claim limitations that appear in every independent claim. Instead, Google’s challenge begins by reconstructing Litbak’s disclosed “audio switching arrangement” to somehow fit the Challenged Claims.

Specifically, Google redraws the boundaries of Litbak’s disclosed “audio switching arrangement” by treating only the “transmitter” component as the alleged claimed “*playback device*,” while excluding the “puppet,” despite Litbak’s disclosure that both components form part of the same “audio switching arrangement.” Google then layers additional assumptions onto that reconstructed arrangement and turns to Seydoux for purported “implementation details” to fill the resulting gaps. Even then, Google’s hindsight-driven arrangement is still defective.

First, Google fails to show that Litbak discloses or suggests the claimed “*first processing of the audio data*.” In this regard, Google’s theory hinges on Litbak’s “straight-through state,” but Litbak repeatedly explains that, in that state, audio signals pass directly from the audio inputs to the audio outputs of the “audio switching arrangement” through a pass-through path designed to avoid signal degradation. As discussed below, a person of ordinary skill in the art (“POSITA”)

would not have understood such direct signal routing to constitute “*processing of the audio data.*”

Unable to identify any actual “*processing of the audio data*” in Litbak’s “straight-through state,” Google points to isolated “monitoring” and “filtering” functions elsewhere in Litbak and to Seydoux’s software modules. *See* Pet., 56. But those functions either occur before (or as part of) the “audio switching arrangement” determines to operate in the “straight-through state” (i.e., monitoring function) or occur in a different operational state altogether (i.e., filtering function). And Google does not rely on Seydoux to modify Litbak’s “straight-through state” to perform the claimed “*first processing of the audio data.*” Instead, Google assumes that missing functionality already exists in Litbak’s “straight-through state” and then cites Seydoux for implementing the assumed functionality in software. *Id.*

Second, Google fails to show that Litbak discloses or suggests the claimed “*playback device*” having “*one or more speaker drivers.*” To map to the Challenged Claims, Google treats only Litbak’s “transmitter” as the alleged “*playback device*” while excluding the “puppet.” Pet., 27-32. But Google’s theory fails even under its own characterization of Litbak because the “transmitter” itself does not include the claimed “*one or more speaker drivers.*” Google also never proposes modifying Litbak’s “transmitter” to add “*one or more speaker drivers*” or explain why a POSITA would have modified the “transmitter” to add one.

Third, Google fails to show that Litbak discloses or suggests the claimed “*signal from a controller*” comprising an “*instruction for the playback device to become paired.*” Google contends that Litbak’s “actuation signal” constitutes the claimed “*instruction for the playback device to become paired*” and that Litbak’s “transmitter” becomes paired with the “puppet” when the “actuation signal” is received. But, as discussed below, Litbak’s “transmitter” and “puppet” already operate together as part of the same disclosed “audio switching arrangement” before any “actuation signal” is ever received. Thus, Litbak’s “actuation signal” does not constitute the “*instruction for the playback device to become paired.*”

Ultimately, Google’s obviousness theories are driven not by what Litbak actually teaches, but by what Google, with the benefit of hindsight, needs Litbak to teach to satisfy the Challenged Claims. The Petition therefore fails to carry Google’s burden of proving unpatentability, and the Board should confirm the patentability of all Challenged Claims.

II. OVERVIEW OF THE ’025 PATENT

As the ’025 Patent explains, prior audio systems generally relied on centralized control architectures and hard-wired speaker connections to “group, consolidate, and pair” “individual, discrete speakers” into different “desired configurations.” *See, e.g., Ex. 1001, 7:13-19.* In those systems, speaker functionality was largely dictated by installation-specific wiring and centralized

control logic rather than by the speakers themselves. Ex. 2001, ¶42. As a result, such prior audio systems imposed practical limitations on scalability, installation, maintenance, and reconfiguration because changes to speaker configurations often required modifications to physical wiring, centralized control logic, or both. *Id.*

With the advancement of audio technology and the emergence of smart speakers driven by Sonos, the '025 Patent explains that there was a growing demand at the time of the claimed invention (i.e., early 2011) to “enhance a multi-channel listening environment.” *See, e.g.*, Ex. 1001, 1:52-58, 2:35-37. One significant technical challenge at the time was enabling multiple smart speakers to operate together in a coordinated manner while allowing each smart speaker to assume a distinct playback role. Ex. 2001, ¶43. Absent such functionality, a smart speaker could play back audio on its own but could not participate in a coordinated multi-channel playback configuration, such as a stereo pair. *Id.*

The '025 Patent addresses the foregoing challenges through multi-channel pairing technology that “enable[s] two or more playback devices to be paired, such that multi-channel audio is achieved or enhanced.” Ex. 1001, 2:9-10. The '025 Patent further explains that this technology is “particularly useful” to “create or enhance multi-channel audio reproduction, like stereo, surround sound, or some other multi-channel environment.” *Id.*, 3:30-35.

To illustrate, the '025 Patent discloses a “controller” that may be configured

to “pair two or more playback devices to establish a multi-channel audio environment.” *Id.*, 4:62-64. That is, “through the controller, a user can select which playback devices to pair,” and “once programmed,” a smart speaker (referred to in the specification and the claims as a “*playback device*”) may operate in a “paired” configuration “until disengaged.” *Id.*, 4:64-67.

The '025 Patent emphasizes that “pairing” is “preferably performed through a control interface and not by physically connecting and re-connecting speaker wire,” thereby providing “a more flexible and dynamic platform through which sound reproduction can be offered to the end-user.” *Id.*, 7:15-22. The '025 Patent further explains that “pairing enhances a multi-channel listening environment by increasing the separation between devices.” *Id.*, 9:46-49.

According to the '025 Patent, the disclosed “playback device” can determine its pairing configuration and process audio data accordingly. *See, e.g., id.*, 3:39-54, 4:4-14, 14:58-64. When a first playback device is ***not paired*** with a second playback device, it may be configured to perform a first processing of audio data received at its network interface so as to output “two-channel” audio (e.g., “play both right and left channel audio”). *Id.*, 3:45-49. When the first playback device is ***paired*** with a second playback device, the first playback device may be configured to perform a second processing of the audio data so as to output one-channel audio (e.g., “right channel audio and not left channel audio”), while the second playback device may

be configured to perform processing of audio data so as to output a different channel (e.g., “left channel audio and not right channel audio”). *Id.*

The '025 Patent provides several examples of how a playback device may process audio data so as to output either multi-channel or one-channel audio. Ex. 2001, ¶48 (citing the following disclosure):

- In certain embodiments, the audio processing circuit 210 resembles the circuitry in an audio playback device and includes one or more ***digital-to-analog converters (DAC)***, an audio preprocessing part, an audio enhancement part or a ***digital signal processor*** and others. In operation, when an audio source is retrieved via the network interface 202, the audio source is ***processed*** in the audio processing circuit 210 ***to produce analog audio signals. The processed analog audio signals are then provided to the audio amplifier 214 for playback on speakers.*** In addition, the audio processing circuit 210 may include necessary circuitry to ***process analog signals as inputs to produce digital signals*** for sharing with other devices on a network.” Ex. 1001, 8:33-45;¹
- “In an alternative embodiment, both playback devices (e.g., players 702 and 704) may receive and ***process the data*** of the audio item and each playback device may ***output only the audio content designated*** for the respective player. For example, player 702 might receive both left and right channel audio, but only play

¹ All emphasis added unless otherwise indicated.

the left channel, whereas player 704 might also receive both left and right channel audio, but only play the right channel.” *Id.*, 15:41-48;

- “In yet another embodiment, each player might receive and *process the data* and *play only the channel or channels that are designated for that player.*” *Id.*, 18:18-20;
- “In another embodiment, one of the paired playback devices (e.g., player 702 or player 704) *processes the data* of the audio item, *essentially separating the data into channels*, each of the channels representing a single-sound track, for example, and being played back in one of the playback devices, thus creating or enhancing a multi-channel listening environment.” *Id.*, 15:35-41;
- “*Changing the equalization* of the playback device might include any of: turning on or off (or effectively muting) one or more specific speaker drivers, *changing the channel output* of one or more speaker drivers, *changing the frequency response* of one or more specific speaker drivers, changing the amplifier gain of any particular speaker driver, changing the amplifier gain of the playback device as a whole.” *Id.*, 17:2-9;
- “[C]hanging the equalization of a playback device (e.g., changing the equalization of one or more speaker drivers of the playback device) may affect frequency dependent parameters. Examples might include the adjustment of the strength of frequencies within the audio data, a phase adjustment, and time-delay adjustment.” *Id.*, 17:10-15.

III. OVERVIEW OF ALLEGED PRIOR ART

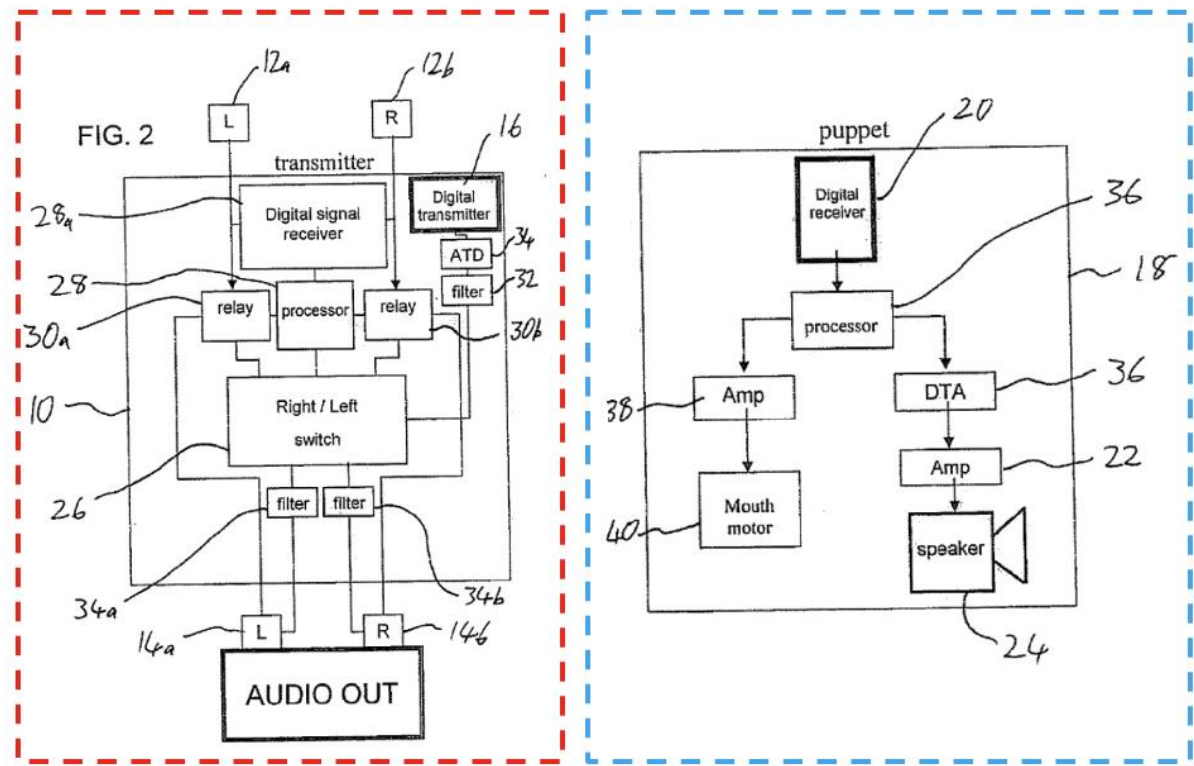
A. Litbak

Litbak is directed to “interactive puppet” technology. Ex. 1005, ¶35. Litbak explains that prior “interactive puppets” were “highly complex and require[d] sophisticated processing of the audio track content to recover the puppet audio data.” *Id.*, ¶10. According to Litbak, no existing solution provided a “simple switching arrangement in which one audio channel of a stereo soundtrack is selectively switched between regular connection to a television and transmission to a puppet.” *Id.* Litbak therefore identified “a need for an audio switching system which would provide a simple and low-cost solution for selective transmission of part of an audio track to a remote puppet, and which would allow normal operation of the audio system while the puppet is not in use without degrading the quality of the audio.” *Id.*, ¶11.

To address that need, Litbak discloses an “audio switching arrangement” for “providing an audio signal selectively to at least one audio output and to a remote puppet.” *Id.*, ¶12. Litbak explains that the intended placement of the “audio switching arrangement” is between an “audio source (e.g., decoder, receiver, player)” and a “playback/output device (e.g., television, amplifier etc.).” *Id.*, ¶39.

FIG. 2 of Litbak, reproduced below, illustrates the disclosed “audio switching arrangement” comprising a “transmitter” (annotated in red) and a “remote puppet”

(annotated in blue):



Id., FIG. 2 (annotations added). Google’s Petition labels Litbak’s “transmitter” as the “audio switching arrangement” (*see, e.g., Pet.*, 6-7), but Litbak is clear that the “audio switching arrangement” comprises **both** the “transmitter” and the “puppet.” *See, e.g., Ex. 1005, Abstract*, ¶13 (“the switching arrangement comprising: (a) a transmitter ... ; (b) a puppet”), ¶30, cl. 1, FIG. 2.

As shown above, Litbak’s “audio switching arrangement” is defined by a “transmitter” and a “puppet.” *See, e.g., id.* Litbak’s “transmitter” includes “audio inputs 12a, 12b,” “audio outputs 14a, 14b,” “electronic switch 26,” “signal processor 28,” “digital signal receiver 28a,” “relays 30a and 30b,” and “output filters 34a and

34b.” Once deployed, the “transmitter” and “puppet” operate together as part of the disclosed “audio switching arrangement” and remain in that arrangement. Ex. 2001, ¶65.

Litbak explains that the “audio switching arrangement” operates in one of two states: (1) a “straight-through state,” or (2) a “diverted state.” *See, e.g.*, Ex. 1005, Abstract, ¶13, 26, 33, 38, 39, 47, 55, 56, 61. In general, Litbak explains that, when the “audio switching arrangement” receives “[audio] programming intended for the interactive puppet,” the “audio switching arrangement” operates in the “diverted state,” and when the “audio switching arrangement” receives “other [audio] programming not intended for use with the puppet,” the “audio switching arrangement” operates in the “straight-through state.” *See, e.g., id.*, ¶3, 54, 55.

More specifically, according to Litbak, “signal processor 28” determines which state to invoke based on a “predefined actuation signal” “superimposed on the audio signal as part of the electrical signal from the audio input 12a or 12b.” *Id.*, ¶47-53. In this respect, Litbak explains that the “digital signal receiver 28 monitors for the predefined actuation signal,” which could be analogue or digital. *Id.*, ¶61. When the predefined actuation signal is an “analogue signal,” Litbak discloses that “signal processor 28 is configured to be responsive to the presence of [*sic*] tone at the predefined frequency” (i.e., “15 kHz and about 20 kHz”) and then “switches electronic switch 26 between the straight-through state and the diverted state in a

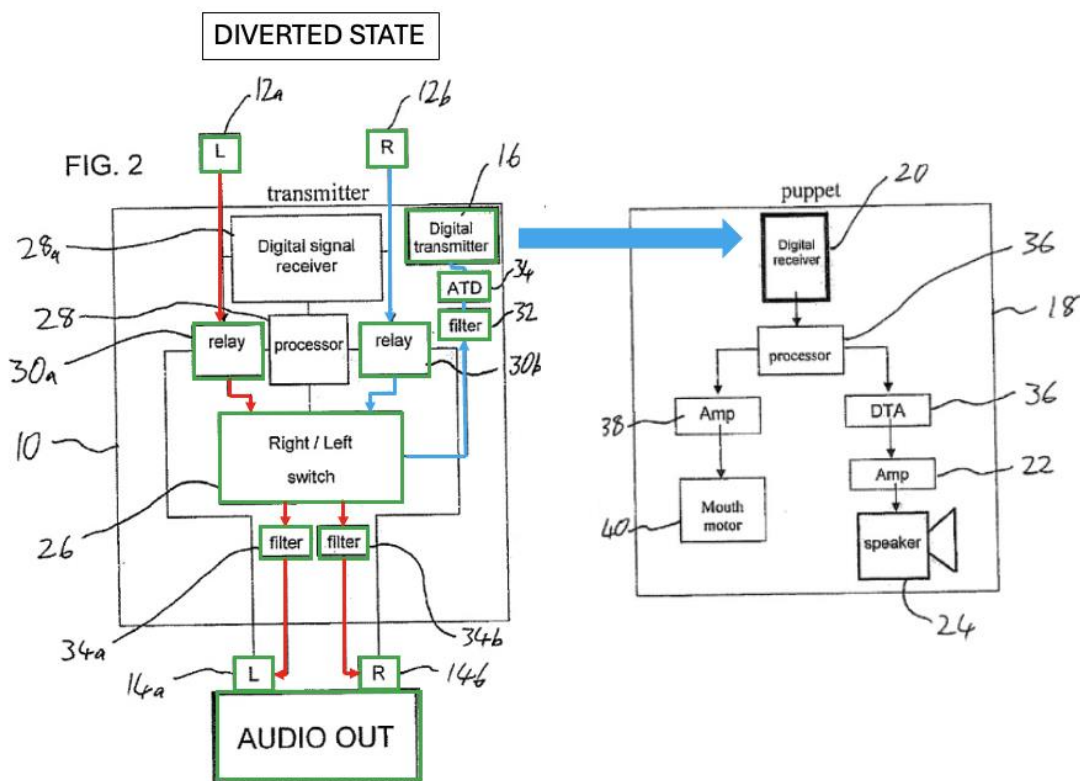
first direction at an onset of the tone and in an opposite direction on termination of the tone.” *Id.*, ¶48. When the predefined actuation signal is “digital,” Litbak discloses that the “signal processor 28” identifies a “first code” or a “second code” and is “configured to be responsive to the first code to switch to, or maintain, the diverted state of electronic switch 26 and to the second code to switch to, or maintain, the straight-through state of electronic switch 26.” *Id.*, ¶52-53.

In this way, Litbak explains that the “audio switching arrangement” first monitors for a “predefined actuation signal” and then uses the presence, absence, or content of that signal to determine whether the “audio switching arrangement” should operate in either the “straight-through state” or the “diverted state.” Ex. 2001, ¶69.

Litbak further explains that “[r]elay 30a and 30b are actuated by signal processor 28” to place the “audio switching arrangement” in the “diverted state.” Ex. 1005, ¶55. In that “diverted state,” the “audio inputs 12a, 12b” are routed through the “electronic switch 26.” *Id.* As a result, one audio input channel is transmitted via “transmitter 16” to the remote puppet, which then outputs corresponding audio content through its “speaker,” and the other audio input channel is routed to both “audio outputs 14a, 14b” of the “audio switching arrangement” through the “electronic switch 26” and “output filters 34a and 34b.” *See, e.g., id.*, ¶23 (“[I]n the diverted state, the audio signal from a first of the audio inputs is

transferred to the transmitter for transmitting to the puppet while the audio signal from a second of the audio inputs is transferred to both of the audio outputs.”), ¶61 (“When an actuation signal is detected ... Processor 28 then actuates relays 30 *a* and 30 *b* so as to connect the inputs to the electronic switch 26 ... If a second predefined code is received, the corresponding channel is diverted to filter 32, ATD 34 and then transmitted via transmitter 16 to receiver 20 [of puppet 18] for playing via DTA 36, amplifier 22 and speaker 24.”); *see also, e.g., id.*, Abstract, ¶13, 47.

Litbak’s “diverted state” is illustrated below, with the signal path to the remote puppet annotated in **blue**, the signal path to the transmitter’s audio outputs annotated in **red**, and the components involved highlighted in **green**:



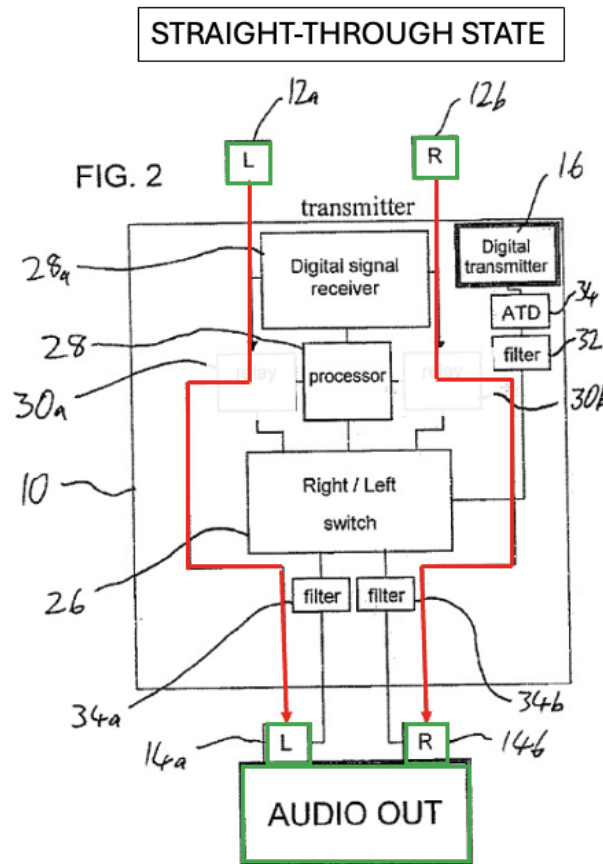
Ex. 2001, ¶71.

In contrast, when the “audio switching arrangement” is in the “straight-through state,” Litbak explains that the “relays 30a and 30b” are “de-energized” and the “electronic switch 26” is bypassed, such that the “audio inputs 12a, 12b” are routed directly to the “audio outputs 14a, 14b.” *See, e.g.*, Ex. 1005, ¶61 (“When no actuation signal is detected, processor 28 leaves relays 30 a and 30 b de-energized so that inputs 12 a, 12 b are directly connected to audio outputs 14 a, 14 b as if the switching arrangement was not present.”), ¶20 (describing “bypassing the electronic switch to connect the audio input directly to the audio output”), ¶21 (same), ¶55 (same), ¶56 (same); *see also, e.g., id.*, Abstract, ¶13, 23, 26, 33, 38, 39, 47.

In fact, Litbak explains that the “straight-through state” involves “providing a ***direct electrical conductor*** connection between audio inputs 12a, 12b and audio outputs 14a, 14b.” *Id.*, ¶55. In other words, an electrical short is provided between audio input 12a and audio output 14a and an electrical short is provided between audio input 12b and audio output 14b, such that audio signals pass directly from the audio inputs to the corresponding audio outputs. Ex. 2001, ¶73. Litbak describes the advantages of this state as follows: “bypass[ing] all electronic components and ***giv[ing] a wired connection*** between inputs and outputs ensures that even any slight degradation introduced by the electronic components is avoided.” Ex. 1005, ¶55.

Litbak’s “straight-through state” is illustrated below, with the direct audio

signal path annotated in red and the components involved (i.e., the audio inputs and outputs) annotated in green:



Ex. 2001, ¶74.

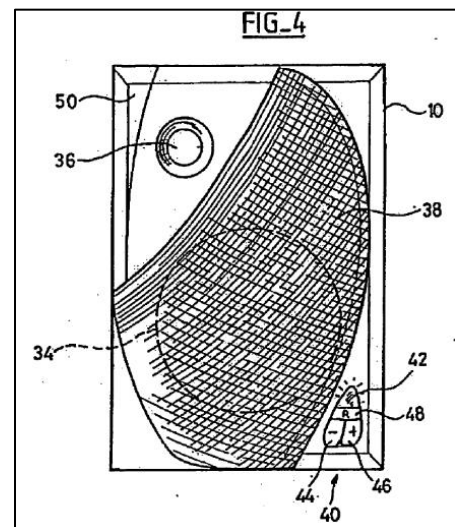
Litbak describes its “audio switching arrangement” as providing “a number of significant advantages over the existing interactive puppet technologies.” Ex. 1005, ¶35. In particular, Litbak emphasizes that “[t]he implementation is simple and robust, avoiding the need for any complex processing of the audio channel content,” and that “[e]ssentially all that is required is circuitry for sensing the actuation signal to activate switching, a suitable switch, and standard short-range wireless

transmission technology similar to that used in conventional wireless speakers.” *Id.*

B. Seydoux

Seydoux is directed to a “system for distributing audio signals between a plurality of active loudspeakers, enabling said signals to be played back by the various respective loudspeakers.” Ex. 1008, ¶1. Seydoux explains that each “loudspeaker” includes “acoustic transducer means, associated amplifier means, wireless interface means, and means for applying an audio channel signal to the amplifier means for playback by the transducer means” *Id.*, ¶25.

FIG. 4 illustrates an example “loudspeaker 10” that includes “a base/medium range loudspeaker 34 and a tweeter 36,” among other components. *Id.*, ¶151, FIG. 4. FIG. 5 illustrates a corresponding block diagram showing “various hardware members of the loudspeaker 10,” including a “master central processor unit (MCU) 56,” “memory 58,” “Bluetooth module 60,” “amplifiers 72, 74,” “loudspeaker 34,” and “tweeter 36.” *Id.*, ¶152-56, FIG. 5.



Seydoux also discloses that its system is “suitable for being coupled to various peripherals,” including “control peripherals, e.g. a remote control 20 sending control signals to the system using an AVRCP profile.” *Id.*, ¶149. Seydoux explains that

such peripherals are “capable of sending both audio signals and control signals,” such as “a Bluetooth-enabled combined mobile telephone and digital music player” configured to control system functions, including “select sources, volume, balance, ...” *Id.*

IV. LEVEL OF ORDINARY SKILL IN THE ART

For purposes of this IPR, Sonos does not dispute Google’s proposed level of a person of ordinary skill in the art. *See* Pet., 5.

V. CLAIM CONSTRUCTION

In the parallel district court litigation, the parties agreed to the following constructions for terms recited in the Challenged Claims:

Term	Agreed-Upon Constructions
“ <i>playback device</i> ”	“data network device configured to process and output audio”
“ <i>network interface</i> ”	“physical component of a device that provides an interconnection with a data network”
“ <i>pair</i> ” / “ <i>pairing</i> ” / “ <i>paired</i> ”	“configuration involving two or more playback devices that have different playback roles”

A. Proper Construction of “*processing of the audio data*”

Although Google’s expert, Dr. Anderson, asserts that he applies the plain and ordinary meaning to claim terms for which the parties have not agreed upon a construction (Ex. 1003, ¶57), Google’s obviousness theories reveal that Google is applying an impermissibly overbroad interpretation of the term “*processing of the audio data*.”

Specifically, Google’s challenge depends on treating the mere routing of audio signals as “*processing of the audio data.*” See, e.g., Pet., 54-56. A POSITA, however, would not have understood the term so broadly in the context of the ’025 Patent. Ex. 2001, ¶128. Rather, a POSITA would have understood “*processing of the audio data*” to require “one or more operations on the audio data itself.” *Id.*, ¶129. Examples of such operations include decryption, decoding, digital-to-analog conversion, mixing, filtering, equalization, or other operations that act upon the audio data itself. *Id.*

The intrinsic evidence confirms that understanding. *Id.*, ¶130-32. For instance, the ’025 Patent consistently describes an example playback device processing audio data by performing one or more operations on the audio data itself. See, e.g., *id.*, ¶131; Ex. 1001, 8:33-45 (describing digital-to-analog and analog-to-digital conversion), 17:2-15 (describing changing the equalization, including “adjustment of the strength of frequencies within the audio data”), 18:18-20 (“[E]ach player might receive and process the data and play only the channel or channels that are designated for that player.”).

The claims of the ’025 Patent further reinforce that understanding. Ex. 2001, ¶132. For instance, dependent claims 2, 17, and 19 recite that the claimed “*first processing*” further includes “*utilizing at least a first one or more pass-filter parameters ... to output at least a first range of audio frequencies*” A POSITA

would have understood such “*processing*” to involve one or more operations on the audio data itself, not the mere routing of audio signals from one location to another.

Id.

That understanding is further confirmed by the extrinsic evidence. *Id.*, ¶133. Consistent with how a POSITA would have understood the term at the time of the claimed invention (i.e., 2011), dictionaries published before, around, and after that timeframe define “data processing” as requiring one or more operations performed “on” the data itself. *See, e.g.*, Ex. 2003 (defining “data processing” as “[a]ny operation or combination of operations **on** data, including everything that happens to data from the time they are observed or collected to the time they are destroyed.”); Ex. 2004 (defining “data processing” as “a sequence of operations performed **on** data, esp by a computer, in order to extract information, reorder files, etc”); Ex. 2005 (defining “data processing” as “a series of actions that a computer performs **on** data to produce an output (= results)”).

Likewise, at least one district court has construed “processing” as “performing operations **on** data or a signal.” Ex. 2006 [*Personalized Media Communications, L.L.C. v. Zynga, Inc.*, 12-cv-00068, Dkt. No. 150 (E.D. Tex. Aug. 18, 2013)].

Consistent with the foregoing evidence, a POSITA would **not** have understood the mere routing of an audio signal from one location to another, without any operation on the audio signal itself, to constitute “*processing of the audio data.*”

Ex. 2001, ¶134.

Thus, the term “*processing of the audio data*” requires one or more operations performed on the audio data itself. It does not encompass the mere routing of an audio signal without any operation on the audio signal itself. *Id.*, ¶128-34. This distinction is dispositive here because Google’s Petition relies exclusively on Litbak’s “straight-through state,” in which audio signals are directly routed from the audio inputs to the audio outputs of the “transmitter” without performing any operation on the audio signal itself. *See infra* §VI.A.2.

VI. GOOGLE FAILS TO DEMONSTRATE THAT THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Independent Claims 1, 16, and 18 (Grounds I-IV)

Google relies exclusively on Litbak and Seydoux for the independent claims. Pet., 1. As explained below, however, Google’s obviousness theories suffer from at least three independent defects—each of which is fatal to the Petition.

1. **Google fails to demonstrate that the combination of Litbak and Seydoux discloses or suggests a “*playback device*” configured to “*perform a first processing of the audio data so as to output two-channel audio based on the audio data from the one or more speaker drivers after the playback device has determined it is not paired with the one or more other playback devices*”**

Limitation [1d] of representative independent claim 1² requires “*a first processing of the audio data*” that is performed (1) “*so as to output two-channel audio based on the audio data from the one or more speaker drivers,*” and (2) “*after the playback device has determined it is not paired with the one or more other playback devices.*” Ex. 1001, cl. 1.

Google contends that Litbak’s “audio switching arrangement” operating in the “straight-through state” performs the claimed “*first processing of the audio data*” because, “in the absence of the predefined actuation signal[,] an audio signal from each of the stereo inputs” is “selectively rout[ed]” to “a corresponding stereo output.” Pet., 54-56. Google also relies on Litbak’s “monitoring” and “filtering” functions and further contends that “it would have been obvious to implement Litbak’s steps using Seydoux’s software modules to achieve” the claimed “*first processing of the audio data.*” *Id.*, 56. Google’s theory fails for multiple reasons.

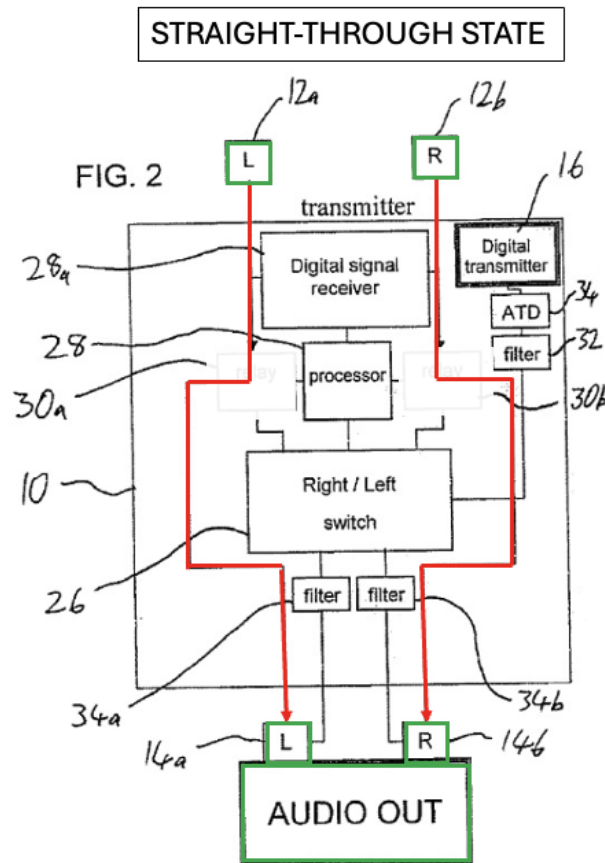
First, Litbak does not disclose or suggest the claimed “*first processing of the audio data.*” Ex. 2001, ¶127. To the contrary, Litbak ***repeatedly*** explains that, in the “straight-through state,” audio signals pass directly from the audio inputs to the

² For purposes of this IPR, Sonos agrees with Google that “[c]laims 16 and 18 only differ with respect to their preambles” and are “substantively identical to claim 1.” Pet., 59.

audio outputs of the “transmitter” without any “*processing*” of the audio signals. *See, e.g.*, Ex. 1005, Abstract, ¶13, 20, 21, 23, 26, 33, 38-39, 47, 55-56, 61. Indeed, that direct pass-through functionality is precisely why Litbak refers to this state as the “*straight-through* state.” Ex. 2001, ¶127.

Unable to identify any actual “*processing*,” Google contends that Litbak’s “straight-through state” amounts to the claimed “*first processing of the audio data*” because Litbak discloses “selectively routing” audio signals from the audio inputs to the audio outputs of the “transmitter.” Pet., 55-56. But that contention relies on an impermissibly overbroad interpretation of “*processing of the audio data*” as discussed above. *Supra* §V.A. A POSITA would not have understood the mere routing of an audio signal, without performing any operation on the audio signal itself, to constitute “*processing of the audio data*.” *Id.*

Under the proper construction, Google’s theory fails. In Litbak’s “straight-through state,” an audio signal is merely passed from the inputs to the outputs of the “transmitter” without any operation being performed on the audio signal itself. Ex. 2001, ¶134-39. In fact, Litbak repeatedly and unequivocally confirms that, in the “straight-through state,” the “audio switching arrangement” bypasses any processing components and simply routes audio signals directly from the inputs to the outputs. Ex. 2001, ¶135; *see also, e.g.*, Ex. 1005, Abstract, ¶13, 20, 21, 23, 26, 33, 38, 39, 47, 55, 56, 61. The resulting audio signal path is annotated in red below.



Ex. 2001, ¶136; *see also* Ex. 1005, FIG. 2 (modified from original).

As shown, “relays 30a and 30b” remain “de-energized,” such that the audio signals pass directly from the audio inputs to the corresponding audio outputs. *See, e.g., id.*, ¶61. The “audio switching arrangement” therefore functions merely as a conduit for the audio signal; it does not perform any operation on the audio signal itself. Ex. 2001, ¶137.

Moreover, Litbak makes clear that avoiding “*processing*” of audio signals in the “straight-through state” is by design. *Id.*, ¶138. In this regard, Litbak explains that the “straight-through state” is desirable because “bypass[ing] all electronic

components and giv[ing] a wired connection between inputs and outputs ensures that even any slight degradation introduced by the electronic components is avoided.” Ex. 1005, ¶55. Litbak further identifies “a need for an audio switching system ... which would allow normal operation of the audio system while the puppet is not in use without degrading the quality of the audio.” *Id.*, ¶11. A POSITA therefore would have understood that Litbak deliberately avoids performing any “*processing of the audio data*” in the “straight-through state.” Ex. 2001, ¶138.

Second, because Litbak discloses only a direct pass-through functionality in the “straight-through state,” without any “*processing of the audio data*,” Google scavenges isolated functions from elsewhere in Litbak in an attempt to manufacture the required “*processing of the audio data*.” See Pet., 56. Specifically, in addressing the parties’ agreed-upon construction of “*playback device*” (i.e., a “data network device configured to process and output audio”) in connection with the preamble of independent claim 1, Google contends that Litbak’s “audio switching arrangement” processes audio by “monitor[ing] for the predefined actuation signal” and applying “filtering techniques” to “remove the actuation signals from the output from electronic switch 26 to audio outputs 14a and 14b.” *Id.*, 20-21. Google then cites back to that same discussion, including Litbak’s monitoring and filtering functions, when addressing the claimed “*first processing of the audio data*.” *Id.*, 56.

But Google’s reliance on those functions is misplaced. The “monitoring”

function is ***not*** performed “*so as to output two-channel audio based on the audio data,*” much less “***after** the playback device has determined it is not paired with the one or more other playback devices.*” Ex. 2001, ¶142. And the “filtering” function does not even occur in Litbak’s “straight-through state,” much less is performed “*so as to output two-channel audio based on the audio data.*” *Id.*, ¶143.

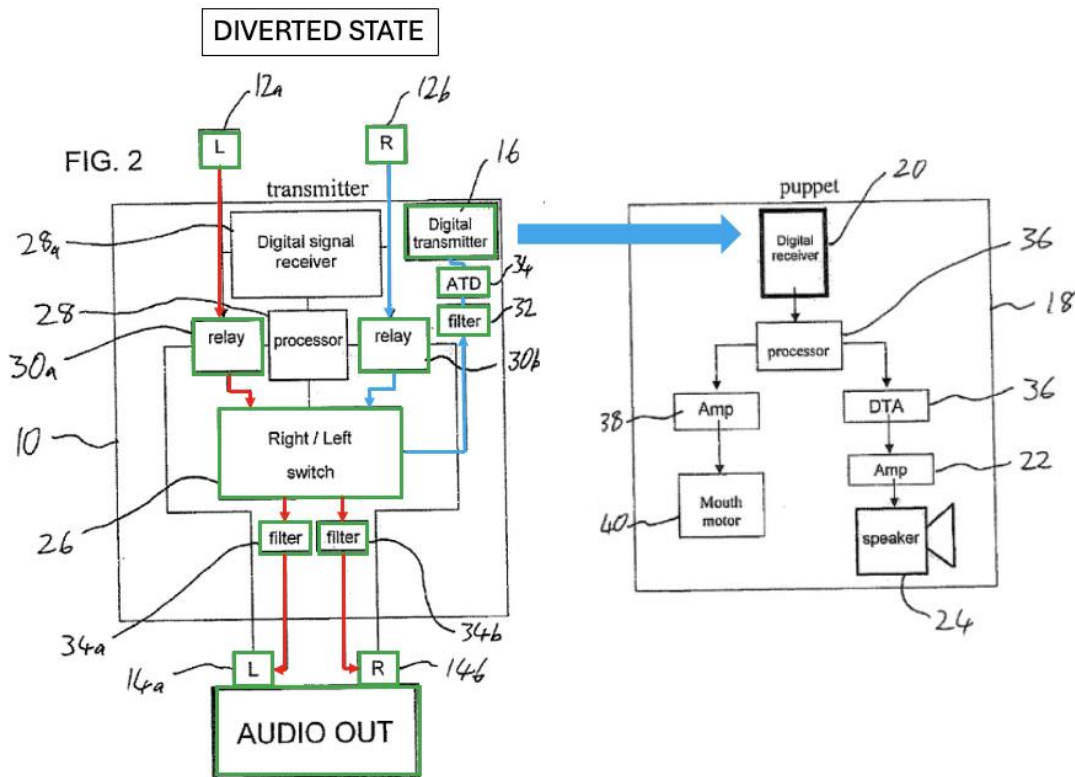
With respect to the monitoring function, Litbak explains that the “digital signal receiver 28 monitors for the predefined actuation signal” (Ex. 1005, ¶61) and that “signal processor 28” uses that predefined actuation signal to determine whether the “audio switching arrangement” should operate in the “straight-through state” or the “diverted state.” Ex. 1005, ¶47-53. A POSITA would therefore understand that the monitoring function is directed to determining which operational state should be selected. Ex. 2001, ¶142. The monitoring function is not performed “*so as to output two-channel audio based on the audio data,*” much less “***after** the playback device has determined it is not paired with the one or more other playback devices.*” Rather, a POSITA would have understood that the monitoring function precedes or is part of the determination of whether to operate in either the “straight-through state” or the “diverted state.” *Id.*

Google’s reliance on the filtering function fares no better. Litbak makes clear that the filtering function does ***not*** even occur in the “straight-through state,” where audio signals are directly routed from the audio inputs to the audio outputs as

discussed above. *Id.*, ¶143. Nor is the filtering function performed “*so as to output two-channel audio based on the audio data.*” *Id.*

In fact, Litbak explains that the “audio switching arrangement” operates in the “straight-through state” when no actuation signal is detected. *See, e.g.*, Ex. 1005, ¶20, 25-26. Because no actuation signal is present when in the “straight-through state,” a POSITA would have understood that the filtering components whose purpose is to filter out the actuation signal (i.e., “output filters 34a, 34b” and “filter 32”) are not used in that state. Ex. 2001, ¶143; Ex. 1005, ¶57. Rather, a POSITA would have understood that those components are used only when the “audio switching arrangement” operates in the “diverted state.” Ex. 2001, ¶128; Ex. 1005, ¶23, ¶61.

To illustrate, as shown below, unlike the “straight-through state,” Litbak’s “diverted state” involves routing audio signals through output filters 34a and 34b and filter 32, among other components annotated in green.



Ex. 2001, ¶144; Ex. 1005, FIG. 2 (modified from original).

Thus, Google's theory fails because it depends on functions that either occur before the "audio switching arrangement" determines to operate in the "straight-through state" (i.e., monitoring function) or occur in a different operational state altogether (i.e., filtering function). Ex. 2001, ¶145. Neither function constitutes the claimed "*first processing of the audio data*" that must be performed "*so as to output two-channel audio based on the audio data*" and "*after the playback device has determined it is not paired with the one or more other playback devices.*" *Id.*

Third, Google's reliance on Seydoux's software modules does not remedy Litbak's failure to disclose the claimed "*first processing of the audio data.*" *Id.*,

¶146-47. Critically, Google does not rely on Seydoux to modify Litbak’s “straight-through state” so that it performs the claimed “*first processing of the audio data*.” See Pet., 56. Nor does Google contend that a POSITA would have made such a modification. *Id.*

Instead, Google *assumes* that Litbak’s existing “straight-through state” already satisfies the claimed “*first processing of the audio data*” and then cites Seydoux’s software modules merely as purported implementation details. See *id.* (proposing to “implement **Litbak’s** steps using Seydoux’s software modules”). But those implementation details are irrelevant unless Google first establishes that Litbak’s “audio switching arrangement” operating in the “straight-through state” performs the claimed “*first processing of the audio data*,” or explains why a POSITA would have modified Litbak to add such functionality. Google does neither. As a result, Seydoux does not fill the critical gap in Google’s theory. That gap is fatal. Simply put, Google’s proposal to implement Litbak’s existing direct pass-through functionality in the “straight-through state” using software modules does not transform that functionality into “*processing of the audio data*.” Ex. 2001, ¶146.

Moreover, even if Google had proposed modifying Litbak’s “straight-through state” to perform “*processing of the audio data*” (which Google did not), a POSITA would have understood such a modification to be contrary to Litbak’s design and core objectives. *Id.*, ¶147. Litbak explains that “bypass[ing] all electronic

components and giv[ing] a wired connection between inputs and outputs ensures that even any slight degradation introduced by the electronic components is avoided.” Ex. 1005, ¶55; *see also id.*, ¶10. Litbak further emphasizes that its configuration is “simple and robust,” while “avoiding the need for any complex processing of the audio channel content.” *Id.*, ¶35; *see also id.*, ¶10 (explaining that prior systems were “highly complex and require[d] sophisticated processing of the audio track content”). A POSITA therefore would not have been motivated to add audio data processing functionality to Litbak’s “straight-through state,” and notably Google never proposes doing so. Ex. 2001, ¶147.

Thus, Seydoux’s software modules do not remedy Litbak’s failure to disclose the claimed “*first processing of the audio data.*” Google identifies no “*processing of the audio data*” in Litbak’s “straight-through state,” proposes no modification that would introduce such “*processing,*” and offers no rationale why a POSITA would have made such a modification. Such an obviousness theory is insufficient to establish Google’s burden of proving obviousness. *See, e.g., In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (“The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.”).

2. Google fails to demonstrate that the combination of Litbak and Seydoux discloses or suggests a “*playback device*” comprising “*one or more speaker drivers*”

Independent claims 1, 16, and 18 each require a “*playback device*” that includes “*one or more speaker drivers*” and associated functionality. Claim 1 is representative and reproduced below:

[1ai] *a network interface configured to receive audio data over a network;*

[1aii] *one or more speaker drivers configured to output audio based on the audio data;*

[1aiii] *one or more processors; and*

[1aiv] *tangible, non-transitory, computer readable memory comprising instructions encoded therein, wherein the instructions, when executed by the one or more processors, cause the playback device to:*

[1b] *receive a signal from a controller over the network, wherein the signal comprises an instruction for the playback device to become paired with one or more other playback devices such that, after pairing, the playback device and the one or more other playback devices have different playback roles; and*

[1c] *(i) determine that either (a) the playback device is not paired with the one or more other playback devices or (b) that the playback device is paired with the one or more other playback devices such that the playback device and the one or more other playback devices have the different playback roles,*

[1d] *(ii) configure the playback device to perform a first processing of the audio data so as to output two-channel audio based on the audio*

*data from the **one or more speaker drivers** after the playback device has determined it is not paired with the one or more other playback devices, and*

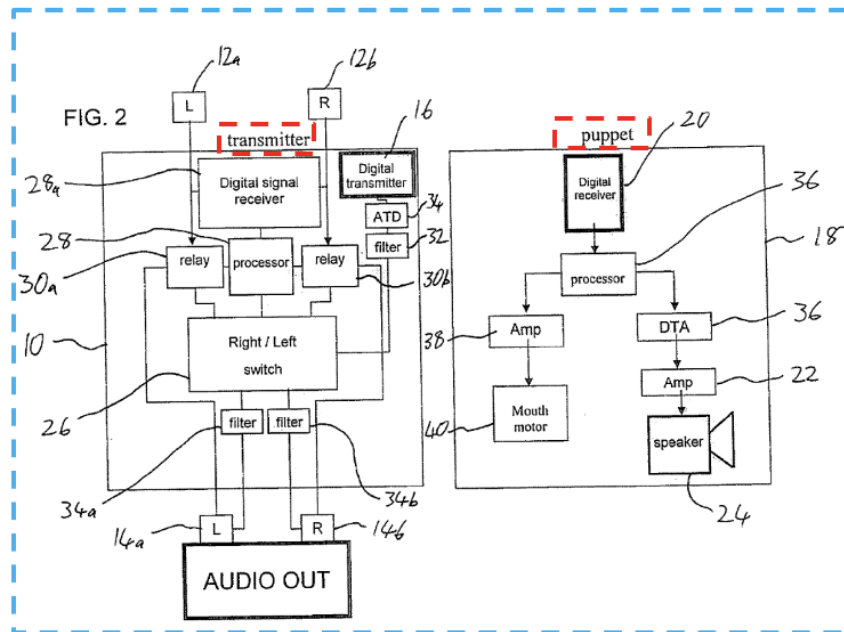
[1e] *(iii) change the configuration of the playback device by configuring the playback device to perform a second processing of the audio data so as to output one-channel audio based on the audio data from the **one or more speaker drivers** after the playback device has determined it is paired with the one or more other playback devices.*

Google contends that the claimed “*one or more speaker drivers*” would have been obvious based on Litbak and Seydoux. Pet., 27-32. But that contention depends on an erroneous characterization of Litbak’s “audio switching arrangement.” Specifically, Google treats **only** Litbak’s “transmitter” component of the disclosed “audio switching arrangement” as the alleged “*playback device*,” while excluding Litbak’s “puppet.” See, e.g., Pet., 6-7, 17-20. That characterization is contrary to Litbak’s disclosure and is necessary only because Google cannot otherwise map Litbak to the claimed “*one or more other playback devices*.” Ex. 2001, ¶89-94. Google’s obviousness theory accordingly fails for multiple reasons.

First, Google’s theory rests on the flawed premise that Litbak’s “transmitter” alone is the entire “audio switching arrangement” that corresponds to the claimed “*playback device*.” See, e.g., Pet., 6-7, 17-18, 38-44. But Litbak does not define the “audio switching arrangement” that way. Ex. 2001, ¶89.

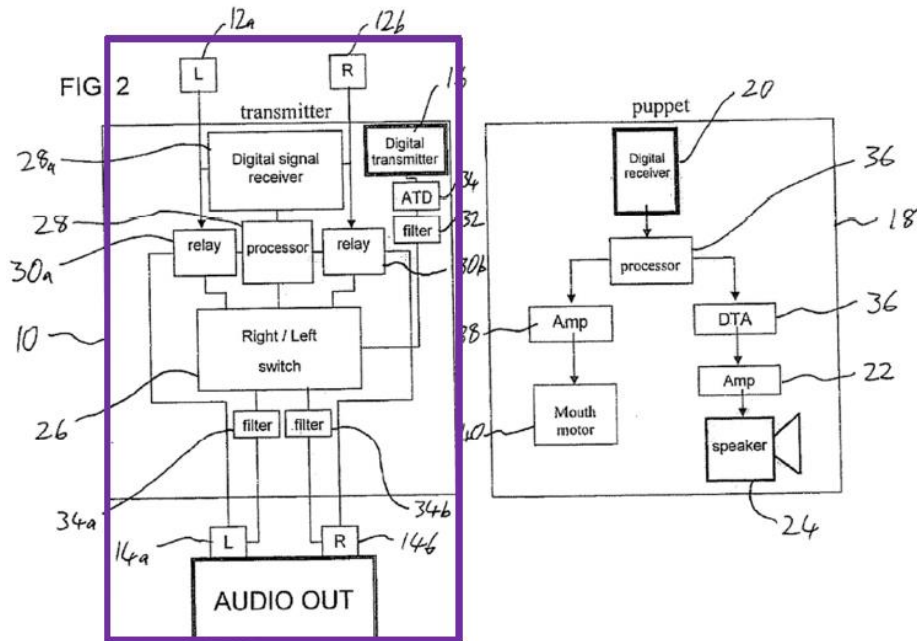
Rather, Litbak expressly discloses that its “audio switching arrangement”

includes both the “transmitter” *and* “puppet.” See, e.g., Ex. 1005, Abstract, ¶13, cl. 1, FIG. 2. This is clearly depicted in FIG. 2 reproduced below, where the “audio switching arrangement” is defined by the blue box and includes the “transmitter” and “puppet,” each annotated in red:



Id., FIG. 2; Ex. 2001, ¶91.

Google, however, reaches its obviousness theory only by redrawing the boundaries of Litbak’s disclosed “audio switching arrangement” and isolating the “transmitter” from the “puppet,” as reproduced below from its Petition:



See, e.g., Pet., 20; see also *id.*, 6-7.

Google needs to do this because the Challenged Claims require “*the playback device to become paired with one or more other playback devices*” and Google needs the “puppet” to be the “*one or more other playback devices.*” Ex. 1001, cl. 1; Pet., 39-40. If Litbak’s disclosed “audio switching arrangement” is properly treated as including both the “transmitter” and the “puppet,” then the “puppet” cannot simultaneously be part of the alleged “*playback device*” and the alleged “*one or more other playback devices.*” Ex. 2001, ¶94. But Litbak provides no basis for separating those components in that manner. *Id.*

Thus, Google’s theory depends on an impermissible reconstruction of Litbak’s “audio switching arrangement.”

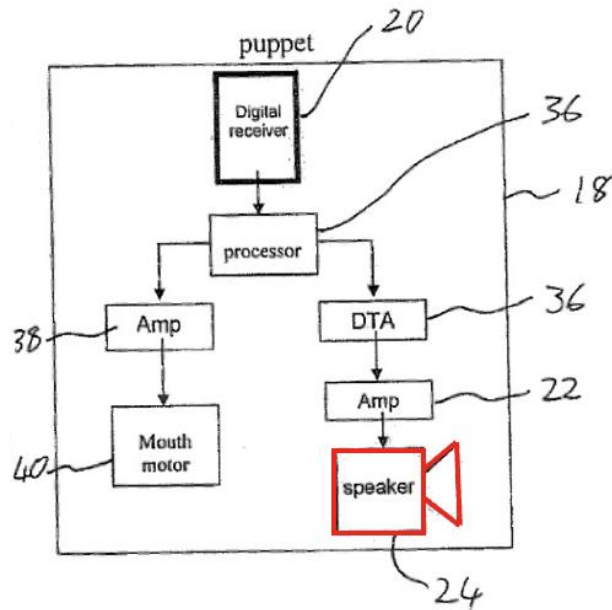
Second, even if Google’s own characterization of Litbak’s “audio switching

arrangement” were accepted, Google’s theory still fails because Litbak’s “transmitter” itself does not include the claimed “*one or more speaker drivers.*” *Id.*, ¶96. Simply put, Litbak discloses no “speaker” within the “transmitter,” and the “Audio Out” terminals of the “transmitter” do not amount to “*one or more speaker drivers.*” *Id.* Put another way, Google cannot have it both ways. If the “puppet” is included within the “audio switching arrangement” as Litbak discloses, then Google loses the claimed “*one or more other playback devices.*” If the “puppet” is excluded so that it can serve as the alleged “*one or more other playback devices*” as Google proposes, then the resulting “audio switching arrangement” that only includes the “transmitter” lacks the claimed “*one or more speaker drivers.*” Either way, Google’s theory fails to satisfy the Challenged Claims.

In fact, the absence of “*one or more speaker drivers*” within the “transmitter” is apparent from Litbak’s figures and accompanying disclosure. *Id.*, ¶96. Specifically, FIG. 2 of Litbak (reproduced above) identifies components of the “transmitter,” including audio inputs, audio outputs, a signal processor, relays, filters, and an electronic switch. But no “speaker” is shown or described as part of Litbak’s “transmitter.” *Id.*, ¶97. The same is true of FIGs. 1A and 1B. Ex. 1005, FIGs. 1A-1B; Ex. 2001, ¶97.

In contrast, when Litbak intends to disclose a speaker, it does so expressly. *Id.*, ¶98. In the same FIG. 2 (reproduced below to show only the “puppet”), Litbak

depicts and labels a “speaker” within the “puppet.”



Id.; Ex. 1005, FIG. 2 (cropped and annotated).

The omission of any speaker from the “transmitter,” coupled with the express disclosure of a “speaker” in the “puppet,” confirms that the “transmitter” itself does *not* include a speaker. *See id.*; Ex. 2001, ¶¶99-100.

That conclusion is reinforced by Litbak’s disclosed architecture. *Id.*, ¶101. Litbak places the “audio switching arrangement” “*between* the audio source (e.g., decoder, receiver, player) and the playback/output device (e.g., television, amplifier etc.).” Ex. 1005, ¶39. A POSITA would have understood the “transmitter” to function as an intermediary signal-routing component positioned upstream of a device responsible for audio playback. Ex. 2001, ¶101. Because the downstream “playback/output device” is already responsible for audio playback, a POSITA

would have understood there to be no reason for the upstream “transmitter” itself to include a speaker. *Id.*

Moreover, the “Audio Out” terminals of Litbak’s “transmitter” (i.e., “audio outputs 14a, 14b”) do ***not*** amount to the claimed “*one or more speaker drivers.*” *Id.*, ¶103. In fact, both experts agree that a POSITA would have understood a “*speaker driver*” to be a transducer that converts electrical energy into sound waves. *Id.*, ¶104; Ex. 1003, ¶97 (quoting Ex. 1010, 7 (defining “driver” as “[a] transducer which converts electrical energy into sound energy, which is then radiated outward to the surround medium,” which is “[a]lso called [a] speaker”)). Litbak’s “Audio Out” terminals perform no such conversion. Ex. 2001, ¶104. Instead, the “Audio Out” terminals merely output electrical signals to another device (i.e., a downstream “playback/output device”) without converting them into sound waves. *Id.*; Ex. 1005, ¶33, 40, 47, FIG. 2.

Google’s own analysis confirms as much. Specifically, Google acknowledges that Litbak’s “Audio Out” terminals (i.e., “outputs 14a, 14b”) function to “output ‘***audio signals***’ which [in turn] ‘can be amplified and output through a speaker to generate desired audio content.’” Pet., 28. Litbak expressly defines an “electrical signal” to include such an “audio signal.” *See* Ex. 1005, ¶40. Thus, even under Google’s theory, Litbak’s “Audio Out” terminals merely output electrical signals that may later be converted into sound waves by a downstream “playback/output

device.” Ex. 2001, ¶103-104. The “Audio Out” terminals do **not** themselves convert electrical energy into sound waves and, therefore, do not satisfy the claimed “*one or more speaker drivers*.” *Id.*, ¶104.

Third, Google’s reliance on Seydoux (Pet., 27-32) does not cure Litbak’s failure to disclose or suggest the claimed “*one or more speaker drivers*.” Critically, Google does **not** rely on Seydoux to modify Litbak’s “transmitter” to include a speaker. *See id.* Nor does Google contend that a POSITA would have made such a modification. *See id.*

Instead, Google simply **assumes** that a speaker is already present in Litbak’s “transmitter” and then cites Seydoux **only** for purported “implementation details” that supposedly tie that assumed speaker to the claimed “*one or more speaker drivers*.” *See id.* But those “implementation details” are irrelevant unless Google first establishes that Litbak’s “transmitter” includes a speaker or explains why a POSITA would have modified Litbak’s “transmitter” to add one. Google does neither. Thus, Seydoux does not fill the critical gap in Google’s theory.

Google’s failure even to propose adding a speaker to Litbak’s “transmitter” is unsurprising because such a modification would have been contrary to Litbak’s design and core objectives. *See* Ex. 2001, ¶106. For instance, Litbak emphasizes that its “audio switching arrangement” provides “significant advantages” over “existing interactive puppet technologies” because its implementation is “simple and

robust” where “[e]ssentially all that is required is circuitry for sensing the actuation signal to activate switching, a suitable switch, and standard short-range wireless transmission technology” to communicate with a remote puppet. Ex. 1005, ¶35-36. A POSITA would have understood that adding a speaker to Litbak’s “transmitter” would increase complexity and detract from the “simple and robust” implementation that Litbak identifies as advantageous. Ex. 2001, ¶106. That understanding strongly weighs against the modification that would be required to salvage Google’s theory. *See, e.g., Willis Elec. Co. v. Polygroup Ltd. (Macao Com. Offshore)*, 166 F.4th 1363, 1370 (Fed. Cir. 2026) (affirming finding of nonobviousness where the proposed modification would have “completely gone away from the [reference’s] teachings.”).

Moreover, the required modification would conflict with Litbak’s intended placement of the “audio switching arrangement”—i.e., between “the audio source (e.g., decoder, receiver, player) and the playback/output device (e.g., television, amplifier etc.).” Ex. 1005, ¶39; *see also id.*, ¶10 (noting the absence of known solutions providing a “simple switching arrangement in which one audio channel of a stereo soundtrack is selectively switched between regular connection *to a television* and transmission to a puppet.”). Because the downstream “playback/output device” (e.g., “television”) is responsible for outputting audio in the form of sound waves, a POSITA would have had no reason to add a speaker to

the upstream “transmitter.” Ex. 2001, ¶107.

Thus, Google’s hindsight-driven obviousness theory is legally insufficient and fails to demonstrate that the combination of Litbak and Seydoux discloses or suggests the claimed “*one or more speaker drivers.*” See, e.g., *Pers. Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993 (Fed. Cir. 2017) (vacating obviousness finding where Board failed to adequately explain and support conclusion that the prior art disclosed the claimed limitations and a POSITA would have been motivated to combine references in the manner required by the claims).

3. Google fails to demonstrate that the combination of Litbak and Seydoux discloses or suggests a “*playback device*” configured to “*receive a signal from a controller over the network, wherein the signal comprises an instruction for the playback device to become paired with one or more other playback devices*”

Limitation [1b] of representative independent claim 1 requires the claimed “*playback device*” to be configured to “*receive a signal from a controller over the network, wherein the signal comprises an instruction for the playback device to become paired with one or more other playback devices such that, after pairing, the playback device and the one or more other playback devices have different playback roles.*” Ex. 1001, cl. 1.

Google contends that Litbak’s embedded “actuation signal” in combination with Seydoux’s Bluetooth remote control “implementation details” satisfies this limitation. See Pet., 38-48. According to Google, Litbak’s ““actuation signal”

discloses a ‘signal’ comprising an instruction for the ‘arrangement’ to enter the ‘diverted state’ (become paired) with the ‘puppet’ (another playback device).” Pet., 44-45. Google then relies on Seydoux’s remote control (i.e., a “control peripheral”) that sends “control signals” via Bluetooth as purported “implementation details” showing how the “*signal*” may be received “*from a controller over the network.*” *Id.*, Pet., 39, 45-48. Google’s theory for limitation [1b] fails for multiple reasons.

First, Google fails to demonstrate that Litbak’s “actuation signal” constitutes “*an instruction for the playback device to become paired with one or more other playback devices,*” as required by limitation [1b]. As discussed above, Litbak’s “audio switching arrangement” includes both the “transmitter” and the “puppet.” *Supra* §III.A; Ex. 2001, ¶111. Once deployed, those components operate together as part of the same disclosed “audio switching arrangement.” *Id.* That disclosure is fundamentally inconsistent with Google’s theory.

In this regard, limitation [1b] requires “*for the playback device to become paired with one or more other playback devices.*” But Litbak’s “transmitter” and “puppet” do not “***become paired***” based on receipt of any instruction, much less from a “*controller over [a] network.*” *Id.*, ¶112. Rather, the “transmitter” and “puppet” already make up the disclosed “audio switching arrangement” before any “actuation signal” is received. *Id.*

Indeed, the “actuation signal,” which Google relies on for the claimed

“*signal*” comprising the claimed “*instruction*,” is received by the “transmitter” sometime *after* the “transmitter” and “puppet” have already been deployed as part of the disclosed “audio switching arrangement.” *Id.* ¶113. Thus, a POSITA would not have understood Litbak’s “actuation signal” to constitute “*an instruction for [the transmitter] to become paired*” with the “puppet” because the two are already operating together as part of the same “audio switching arrangement” before the “actuation signal” is ever received. *Id.* It would defy logic for a signal received after the alleged “*pairing*” already exists to be the claimed “*signal*” that causes the “*pairing*” to occur. *Id.*

At most, Litbak teaches that the “actuation signal” informs the “transmitter” how audio signals should be routed through the “audio switching arrangement.” *Supra* §III.A; Ex. 2001, ¶114. In this respect, the presence, absence, or content of the “actuation signal” is used by the “transmitter” to determine whether the “audio switching arrangement” should operate in either the “straight-through state” or the “diverted state.” *Id.* But such a signal that informs the “transmitter” how audio signals should be routed through the “audio switching arrangement” is not the same thing as “*an instruction for the playback device to become paired with one or more other playback devices.*” *Cf.*, compare ’025 Patent, cl. 1 (“*receive a signal... [that] comprises an instruction for the playback device to become paired with one or more other playback devices*”) with cl. 9 (“*wherein the signal further comprises an*

instruction for the playback device to play back a particular channel of the audio data.”); Ex. 2001, ¶114-15.³

Second, Google’s theory for limitation [1b] is premised on impermissible hindsight bias. *Id.*, ¶116.

In this respect, a POSITA would not have been motivated to graft the claimed “*instruction for the playback device to become paired*” onto Litbak’s fundamentally different architecture and core objectives. *Id.*, ¶117. Litbak’s “audio switching arrangement” is a fixed arrangement comprising the “transmitter” and the “puppet,” and the purpose of this fixed arrangement is to automatically handle audio programming that is intended for use with or without the “puppet.” *See, e.g.*, Ex. 1005, ¶13, 54-55. In contrast, the claimed “*playback device*” can dynamically operate alone or as part of a “*pair*” with another “*playback device*” depending on a user’s preference, as reflected by the “*instruction for the playback device to become paired*” transmitted by the “*controller*” that the user operates. Ex. 2001, ¶117.

To reach limitation [1b], Google first breaks apart the “transmitter” and “puppet” in Litbak’s disclosed “audio switching arrangement” into the alleged

³ Google does not rely on Seydoux to supply the missing “*instruction for the playback device to become paired*.” Thus, Seydoux does not fill the gap in Google’s theory.

“*playback device*” and “*one or more other playback devices*” and then relies on the claimed “*instruction for the playback device to become paired with one or more other playback devices*” to bring those two components back together. *Id.*, ¶118. Litbak provides no reason to fundamentally restructure its disclosed “audio switching arrangement,” and Google offers none. *Id.*

Moreover, even assuming the “actuation signal” amounted to the claimed “*instruction for the playback device to become paired*” (it does not), a POSITA would not have been motivated to modify Litbak so that an external “controller” allegedly taught by Seydoux would send the “actuation signal” to Litbak’s “transmitter.” *Id.*, ¶119. This is because Litbak’s principles of operation rely on Litbak’s “transmitter” to detect the “actuation signal” superimposed on the audio signal itself to determine which route the audio signals should take. *Supra* §III.A. Litbak explains that this approach is simple and low cost. *See, e.g.*, Ex. 1005, ¶10, 11, 34, 36, 48. In contrast, a POSITA would have understood that modifying Litbak to utilize Seydoux’s “implementation details” would increase complexity in direct tension with the stated goals and advantages Litbak identifies as important. *See, e.g.*, Ex. 1005, ¶11; Ex. 2001, ¶120. Accordingly, a POSITA would not have been motivated to undertake such modifications.

Thus, Google’s hindsight-driven obviousness theory is legally insufficient and fails to demonstrate that the combination of Litbak and Seydoux discloses or

suggests limitation [1b]. *See, e.g., Pers. Web Techs.*, 848 F.3d at 993.

B. Dependent Claims 3-4, 7-10, 12-14, 21 (Ground 1)

Google fails to establish that the combination of Litbak and Seydoux discloses or suggests dependent claims 3-4, 7-10, 12-14, and 21 for at least the reasons discussed above with respect to the independent claims.

1. Google fails to demonstrate that the combination of Litbak and Seydoux discloses or suggests “a plurality of speaker drivers” required by dependent claim 8

Dependent claim 8 further recites that “*the one or more speaker drivers comprises a plurality of speaker drivers*” and the claimed “*playback device*” is further configured to cause itself to “*output audio from the plurality of speaker drivers.*” Ex. 1001, cl. 8. Google contends that “[c]laim 8 would have been obvious over Litbak and Seydoux for the *same* reasons explained above for Ground 1, [1aii] because Seydoux’s ‘base/medium range loudspeaker 34 and a tweeter [3]6’ are each speaker drivers.” Pet., 66.

That argument fails for the same reasons discussed above with respect to the independent claims. *See supra* §VI.A.2. If anything, the deficiency is even more pronounced for claim 8. Under Google’s characterization of Litbak, the “transmitter” (i.e., what Google refers to as the “audio switching arrangement”) does not include a single speaker, much less a “*plurality*” of speakers. Ex. 2001, ¶152. Thus, Seydoux’s purported “implementation details” do not establish that Litbak’s

“audio switching arrangement” includes, or would have been modified to include, a “*plurality of speaker drivers*” recited in claim 8. *Id.*

Moreover, even if Google had proposed a modification that would add a “*plurality of speaker drivers*” to Litbak’s “transmitter” (which it did not), a POSITA would have understood it to be inconsistent with Litbak’s architecture, design objectives, and intended placement of the “audio switching arrangement.” *See supra* §VI.A.2. A POSITA therefore would not have been motivated to modify Litbak’s “transmitter” to include a “*plurality of speaker drivers.*” Ex. 2001, ¶153.

For these reasons, Google has failed to show that the combination of Litbak and Seydoux discloses or suggests a “*plurality of speaker drivers*” recited in dependent claim 8. Having failed to establish the lesser requirement of “*one or more speaker drivers*” recited in the independent claims, Google necessarily fails to establish the additional requirement of a “*plurality of speaker drivers*” recited in dependent claim 8.

C. Dependent Claims 2, 17, 19-20, and 22-23 (Ground 2)

Google fails to establish that the combination of Litbak, Seydoux, and Palmer discloses or suggests dependent claims 2, 17, 19-20, and 22-23 for at least the reasons discussed above with respect to the independent claims.

1. No Motivation to Combine Litbak with Seydoux and Palmer for Dependent Claims 2, 17, 19

Dependent claims 2, 17, and 19 further recite, *inter alia*, that “*performing the*

first processing further comprises utilizing at least a first one or more pass-filter parameters such that the playback device becomes configured to output at least a first range of audio frequencies based on the audio data from the one or more speaker drivers.” Ex. 1001, cl. 2, 17, 19.

To satisfy these dependent claims, Google proposes modifying Litbak’s “transmitter” by adding Palmer’s “filtering” functionality implemented through Seydoux’s software modules. Pet., 86-89. Under Google’s theory, Litbak’s “straight-through state” would allegedly perform a “*first processing of the audio data*” by utilizing Palmer’s “filtering” to “output[] full range frequencies.” *Id.*

As an initial matter, Google never explains where and how Palmer’s “filtering” functionality would be incorporated into Litbak’s “transmitter.” Nor does Google explain how its proposed combination would operate while preserving the direct pass-through functionality that Litbak expressly identifies as its defining feature of its “straight-through state.” Having failed to explain how the proposed combination would actually be implemented and function, Google has not established obviousness. *See, e.g., Metalcraft of Mayville, Inc. v. The Toro Co.*, 848 F.3d 1358, 1367 (Fed. Cir. 2017) (“Without any explanation as to how [] the references would be combined to arrive at the claimed invention, we are left with only hindsight bias that *KSR* warns against.”).

More fundamentally, a POSITA would not have been motivated to make

Google’s proposed modification. Ex. 2001, ¶160. As discussed above, no “*first processing of the audio data*” occurs in Litbak’s “straight-through state.” See *supra* §VI.A.1. Rather, Litbak intentionally provides a direct audio signal path between the audio inputs and audio outputs of the “audio switching arrangement” without performing any operation on an audio signal itself. *Id.*

As previously discussed, Litbak further explains that “bypass[ing] all electronic components and giv[ing] a wired connection between inputs and outputs ensures that even any slight degradation introduced by the electronic components is avoided.” Ex. 1005, ¶55; see also *id.*, ¶11 (identifying “a need for an audio switching system ... which would allow normal operation of the audio system while the puppet is not in use without degrading the quality of the audio.”). Litbak also emphasizes that its configuration is “simple and robust,” while “avoiding the need for any complex processing of the audio channel content.” *Id.*, ¶35; see also *id.*, ¶10 (explaining that prior systems were “highly complex and require[d] sophisticated processing of the audio track content”).

Google’s proposed modification runs directly contrary to those teachings. Ex. 2001, ¶162. Under Google’s theory, Palmer’s “filtering” functionality would be introduced into a state of operation whose very purpose is to pass audio signals directly from the audio inputs to the audio outputs without “*processing of the audio data*.” Because the introduction of Palmer’s “filtering” functionality would not align

with the design objective of Litbak’s “audio switching arrangement” and operation in the “straight-through state,” a POSITA would not have been motivated to modify Litbak to incorporate that functionality. *Id.*

For these reasons, Google has failed to show that a POSITA would have been motivated to combine Litbak, Seydoux, and Palmer in the manner proposed for dependent claims 2, 17, and 19. Thus, Google has not established that the proposed combination of Litbak, Seydoux, and Palmer discloses or suggests the additional limitations recited in dependent claims 2, 17, and 19. *Id.*, ¶141.

D. Dependent Claim 12 (Ground 3) and Dependent Claim 15 (Ground 4)

Google fails to establish that the combination of Litbak, Seydoux, and Holm discloses or suggests dependent claim 12 for at least the reasons discussed above with respect to the independent claims.

Likewise, Google fails to establish that the combination of Litbak, Seydoux, and Lee discloses or suggests dependent claim 15 for at least the reasons discussed above with respect to the independent claims.

VII. CONCLUSION

For the foregoing reasons, Sonos requests that the Board issue a Final Written Decision affirming the patentability of all of the Challenged Claims.

Respectfully submitted,

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Dated: August 7, 2026

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CERTIFICATION OF WORD COUNT

The undersigned certifies that the foregoing Patent Owner's Response complies with the type-volume limits in 37 C.F.R. § 42.24(b)(1). According to the utilized word-processing system's word count, this paper—excluding the caption, table of contents, table of authorities, table of exhibits, certification of word count, and certificate of service—contains 9,607 words.

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CERTIFICATE OF SERVICE

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