

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner

v.

SONOS, INC.,
Patent Owner

IPR2026-00131
U.S. Patent No. 10,966,025

DECLARATION OF DR. JULES WHITE

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I, Jules White, hereby declare as follows:

I. BACKGROUND AND QUALIFICATIONS

1. I am currently the Senior Advisor to the Chancellor for Generative AI in Education and Enterprise Solutions and a Professor of Computer Science and Computer Engineering at Vanderbilt University.

2. I have over 20 years of experience in computer science and computer engineering. I received a bachelor's degree in computer science from Brown University, and a Master of Science and Ph.D. in Computer Science from Vanderbilt University. I am currently a Professor of Computer Science in the Department of Computer Science at Vanderbilt University, Director of the Vanderbilt Amplify Generative AI Innovation Center, and Senior Advisor to the Chancellor on Generative AI in Enterprise and Education. I was also previously an Assistant Professor in Computer Engineering at Virginia Tech.

3. I teach online courses on software engineering, cybersecurity, mobile computing, artificial intelligence, and other topics on Coursera. These courses have over 1,200,000 people enrolled, primarily working professionals. In 2024, I received the Coursera Innovation Award for my online courses.

4. The publications that I have authored or co-authored throughout my

career have been cited 14,568 times.¹ My work has an H-index, or Hirsch index, score of 46 (meaning that I have published 46 papers that have each been cited at least 46 times)² and an i-10 index of 121 (showing that 117 of my publications have been cited at least 10 times).³

5. My experience extends beyond academia. I have held a variety of positions within industry and in affiliation with federally supported research labs. From 2014-2020, I was President of Ziiio, Inc., a company that I co-founded. In this role, I led the technical direction of the company, including algorithmic development, cloud architecture, and mobile computing design. From 2012-2015, I was Chief Technology Officer of Optio Labs, Inc., a company that I co-founded. In this role, I was in charge of architecting the cloud and mobile security solutions for the product offerings and overseeing the technical direction of the company. From

¹ See *Jules White*, GOOGLE SCHOLAR (last accessed Feb. 15, 2026), <https://scholar.google.com/citations?user=10HSX90AAAAJ&hl=e>.

² *Id.* The H-index is a standard metric widely used to quantify the cumulative performance and impact of a scholar's publications. According to J.E. Hirsch, who invented the index in 2005, an H-index of 20 after 20 years of scientific activity indicates a successful scientist; an H-index of 40 after 20 years of scientific activity indicates an outstanding scientist, "likely to be found only at the top universities or major research laboratories"; and an H-index of 60 after 20 years "characterizes truly unique individuals." J.E. Hirsch, "An index to quantify an individual's scientific research output," 102(46) PNAS 16569, 16571 (Nov. 7, 2005). The H-index is generally considered to be "among the very best measures available of a scientist's impact." Robert J. Sternberg, "Evaluating merit among scientists," 7(2) J. APPL. RES. MEM. COGN. 209, 211 (2018).

³ See *Jules White*, GOOGLE SCHOLAR (last accessed Feb. 15, 2026), <https://scholar.google.com/citations?user=10HSX90AAAAJ&hl=en>.

2012-2016, I was the Chief Scientist of Cloudpoint Labs, a company that I co-founded. In this role, I worked on cloud-based computer vision systems and at-scale processing of cloud computer vision transactions from mobile clients. In 2025, I co-founded CR8.io, a company commercializing AI software systems produced in my research center at Vanderbilt. From 2011-2012, I was a Visiting Research Scientist at the Carnegie Mellon Software Engineering Institute, a federally funded research and development center. In this role, I worked on real-time systems, such as the real-time systems in flight avionics. From 2001-2002, I worked as a software engineer at IBM focused on a range of enterprise systems.

6. I have published over 180 papers on topics ranging from mobile computing to cyber-security to cloud computing. My contributions to the field have also been recognized by the National Science Foundation (NSF). I received a National Science Foundation (NSF) CAREER Award, which is one of the NSF's "most prestigious awards in support of early-career faculty who have the potential to serve as academic role models in research and education and to lead advances in the mission of their department or organization." I have also received several Best Paper Awards for research work in domains ranging from Software Product-lines to Civil Engineering, from conferences, such as the International Conference on Software Product-lines.

7. As a faculty member at Vanderbilt University, I run the Amplify

Generative AI Innovation Center. I am also the Senior Advisor to the Chancellor on Generative AI in Enterprise and Education and lead the university-wide creation of software infrastructure to support generative AI in the university. As a Principal Investigator or Co-Principal Investigator, I have received over \$17,000,000 in grant support, both from Federal entities, such as the NSF, Defense Advanced Research Projects Agency (DARPA), Air Force Research Labs (AFRL), and Office of Naval Research (ONR), and private entities, such as Varian Medical Systems and NOAH Basketball. My research focuses on generative AI and securing, optimizing, and leveraging data from mobile cyber-physical systems.

8. My research work has been recognized in the industry and adopted by industry leaders. My work on securing mobile devices was licensed into Optio Labs, a company that I co-founded. Optio Labs received over \$10,000,000 in venture capital backing. My work on mobile augmented reality was licensed into PAR Works / Cloudpoint Labs, a company that I co-founded. The company received \$1,000,000 in venture backing and won awards, such as being an Innovation Award Honoree at CES and a finalist for Technical Achievement Award at SXSW. I am an inventor on multiple patents.

9. My complete qualifications and professional experiences are described in my curriculum vitae, provided as **Exhibit 2002**.

II. SCOPE OF ASSIGNMENT

10. I have been asked by Patent Owner Sonos, Inc. (“Sonos”) to provide my opinions regarding the validity of U.S. Patent No. 10,966,025 (the “’025 Patent”). Specifically, I have been asked to provide my opinions as to the validity of claims 1-4, 7-10, and 12-23 of the ’025 Patent (the “Challenged Claims”) in view of the following four grounds asserted by Petitioner Google LLC (“Google”):

Ground	Challenged Claim(s)	35 U.S.C.	Reference(s)
1	1, 3-4, 7-10, 12-14, 16, 18, 21	§ 103	Litbak and Seydoux
2	2, 17, 19-20, 22-23	§ 103	Litbak, Seydoux, and Palmer
3	12	§ 103	Litbak, Seydoux, and Holm
4	15	§ 103	Litbak, Seydoux, and Lee

11. I am being compensated at an hourly rate of \$550 per hour for the time spent conducting my analysis and rendering the opinions set forth in my Declaration. But my compensation is in no way dependent upon the nature of my opinions or outcome of this IPR or any other proceeding.

12. In forming my opinions, I have reviewed and considered the following materials.

Exhibit	Description
Ex. 1001	U.S. Patent No. 10,966,025 (the “’025 Patent”)
Ex. 1003	Declaration of Dr. David Anderson (“Anderson Decl.”)
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. 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)

III. LEGAL STANDARDS

13. I am not an attorney, but I have been informed by counsel about legal standards relevant to my opinions.

14. I understand that a patent claim is presumed valid and that the validity of each patent claim is considered separately.

15. I understand that the burden of proving unpatentability in an IPR is different than in the district courts. Specifically, I understand that the petitioner must prove unpatentability by a “preponderance of the evidence” in an IPR, whereas a party challenging a patent’s validity in a district court must prove invalidity by “clear and convincing evidence.”

16. I understand that bare assertion through implication that a reference discloses a claim limitation, without more, is not enough to meet the “preponderance of the evidence” standard in an IPR.

17. I understand that a dependent claim includes all of the requirements of its independent claim, plus additional requirements of its own. As a consequence, if

the requirements of its independent claim are not met by a prior art reference, then the requirements of the dependent claim are also not met.

18. I understand that the '025 Patent is governed by pre-AIA 35 U.S.C. §§ 102-103 since the '025 Patent claims priority to a patent application that was filed before March 16, 2013.

A. Claim Construction

19. I understand that claim construction begins with the language of the claims. Claim terms are generally given their ordinary and customary meaning as understood by a person of ordinary skill in the art (“POSITA”) when viewing the claim terms in the context of the entire patent.

20. I understand that, in some cases, the plain and ordinary meaning of a claim term may be readily apparent and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.

21. I understand that, in other cases, a claim term may have a specialized meaning in which case it is often necessary to look to the intrinsic evidence—which I understand to include the claims, the specification, and the prosecution history of the patent at issue—to construe the claim term. Indeed, I understand that the context in which a term is used in a claim can be highly instructive. I also understand that the specification is highly relevant to claim construction and can be the single best

guide in determining the meaning of a claim term. In this respect, I understand that a claim construction that stays true to the claim language and most naturally aligns with the specification will be the correct construction.

22. I understand that an inventor is typically entitled to the full scope of the claimed invention. In this respect, I understand that it is improper to limit the scope of the claims to a preferred embodiment described in the specification or add limitations into the claims that are not required by the intrinsic evidence. I also understand that claims are interpreted with an eye toward giving effect to all terms in the claims and thus, claims should be interpreted so that no claim term becomes meaningless, nonsensical, or superfluous.

23. Moreover, I understand that extrinsic evidence, such as dictionaries, treatises, and the like, can also be used to assist with claim construction. However, I understand that intrinsic evidence is often more reliable than the extrinsic evidence.

B. Obviousness (35 U.S.C. § 103)

24. I understand that a patent claim is “obvious” and therefore invalid under 35 U.S.C. § 103 only if the differences between the claimed subject matter and the prior art are such that the subject matter as a whole would have been obvious to a POSITA at the time the invention was made.

25. I understand that a patent retains its statutory presumption of validity and the party asserting invalidity must prove both the facts underlying the issue of

obviousness and the ultimate issue of obviousness by a preponderance of the evidence in an IPR.

26. In making an obviousness determination, I understand that there are several factors to consider: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art at the time the invention was made; (3) the differences between the claimed invention and the prior art, (4) whether there is a motivation to combine prior art references, and (5) objective evidence of non-obviousness (which is often referred to as “secondary considerations”), such as any commercial success, copying, prior failure by others, licenses, longstanding need, and unexpected results.

27. I understand that prior art used to show that a claimed invention is obvious must be “analogous art.” Prior art is analogous art to the claimed invention if (1) it is from the same field of endeavor as the claimed invention or (2) it is reasonably pertinent to the problem faced by the inventor.

28. I understand that a patent claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was independently known in the prior art, whether those references were set forth in a single reference or in a combination of references. Instead, it must have been obvious to combine those elements in the same way as the claimed invention does.

29. I understand that a single reference may be the basis for finding that a claim is obvious. When the obviousness determination relies on the combination of

two or more references, however, the patent challenger must show that there is a reason, suggestion, or motivation that would lead a POSITA to combine prior art references.

30. I understand that, when relying on a combination of prior art references, the party asserting invalidity must submit objective evidence as to how and why the prior art references would have been combined to produce the claimed invention. This typically includes evidence that a POSITA would have had an apparent reason or motivation to combine or modify the prior art in a manner that yields the claimed invention (e.g., a teaching or suggestion in the prior art), as well as evidence that a POSITA would have had a reasonable expectation that the combination would have succeeded.

31. I also understand that obviousness concerns whether a POSITA not only “could” have made but “would” have been motivated to make a combination or modification of prior art to arrive at the claimed invention.

32. I understand that when prior art teaches away from the claimed invention, that prior art ordinarily cannot be used to render the claimed invention obvious. In this regard, I understand that prior art teaches away from the claimed invention when a POSITA would be discouraged from following the path leading to the invention because of the prior art.

33. I understand that when separate prior art references teach away from

one another or present conflicting teachings, these separate prior art references ordinarily cannot be combined to render the claimed invention obvious. In this respect, I understand that separate prior art references teach away from one another when their combination would negate the original intent of the prior art or would produce a seemingly inoperative device.

34. Relatedly, I understand that a POSITA with common sense at the time of the invention would not have reasonably looked to another reference to solve a problem that was already solved by a first reference.

35. I understand that it is improper to rely on hindsight when assessing obviousness. Many true inventions might seem obvious with the benefit of hindsight. I understand that the obviousness inquiry must be conducted from the standpoint of a POSITA at the time the claimed invention was made. In this regard, I understand that defining a problem in terms of its solution reveals improper hindsight in the selection of the prior art relevant to obviousness. What is known today, and what is learned from the teachings and disclosures of the patent itself containing the claim under analysis, should not be considered. Nor should one use the patent claim as a roadmap to pick out elements of the prior art for combination.

36. I understand that if a claim element is not obvious, then the claims that depend from it are also not obvious.

IV. SUMMARY OF OPINIONS

37. Based on my analysis, it is my opinion that Google and Dr. Anderson have not shown, by a preponderance of the evidence, that any of the Challenged Claims of the '025 Patent would have been obvious at the time of the invention in view of the Grounds presented in the Petition.

V. PRIORITY DATE

38. The '025 Patent was filed on October 31, 2019 as U.S. Patent App. No. 16/670,109, and issued on March 30, 2021. Ex. 1001, p. 1.

39. For purposes of my Declaration, I have been instructed to assume that **January 25, 2011** is the effective priority date and invention date of the Challenged Claims of the '025 Patent for purposes of evaluating how a POSITA would have understood the plain and ordinary meaning of the claim terms at the time of the invention. I understand that Dr. Anderson has likewise been instructed to assume the same date. Anderson Decl., ¶30.

VI. LEVEL OF ORDINARY SKILL IN THE ART

40. Google proposed the following level of ordinary skill in the art in its Petition:

A person of ordinary skill in the art (“POSITA”) at the time of the purported invention would have had the equivalent of a four-year degree from an accredited institution in computer science, computer engineering, electrical engineering, or an equivalent thereof, and

approximately four years of professional experience in the fields of networking and network-based systems or applications, such as consumer audio systems, or an equivalent level of skill, knowledge, and experience.

Pet., p. 5 (citing Anderson Decl., ¶58-60).

41. For purposes of my Declaration, I have applied Google's proposed level of ordinary skill in the art. Based on my education and professional experience, I possess at least the level of ordinary skill in the art reflected in Google's proposed definition. I am also familiar with the knowledge and abilities that a POSITA would have possessed at the time of the invention of the '025 Patent, which is no later than **January 25, 2011**.

VII. OVERVIEW OF THE '025 PATENT

42. As explained in the '025 Patent, many legacy audio systems 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. The functionality of individual speakers of legacy audio systems was thus generally limited by installation-specific wiring and centralized control logic, rather than by the speakers themselves. From an engineering perspective, those legacy 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.

43. 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., Id.*, 1:52-58, 2:35-37. One significant technical challenge at the time of the claimed invention was enabling multiple smart speakers to operate together in a coordinated manner while allowing each smart speaker to assume a distinct playback role. 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.

44. The multi-channel pairing technology disclosed in the '025 Patent addressed limitations associated with both early smart speakers and legacy audio systems by enabling smart speakers to determine their pairing configuration and process and output audio content accordingly. In this regard, the '025 Patent generally discloses multi-channel pairing technology that “enable[s] two or more playback devices to be paired, such that multi-channel audio is achieved or enhanced.” *Id.*, 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.

45. 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.

46. 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.

47. 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.*

48. 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.

See, e.g.:

- 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.” *Id.*, 8:33-45;⁴
- “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

⁴ 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.

VIII. CLAIM CONSTRUCTION

49. I have been informed that Sonos and Google have agreed to constructions for the following terms found in the Challenged Claims of the '025 Patent:

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” / “pairing” / “paired”</i>	“configuration involving two or more playback devices that have different playback roles”

50. For purposes of my Declaration, I have applied the foregoing agreed-upon constructions.

51. For claim terms for which Sonos and Google have not agreed upon a construction, I have applied the plain and ordinary meaning that a POSITA would have understood for those terms in the context of the '025 Patent at the time of the invention, which is no later than **January 25, 2011**.

52. Dr. Anderson likewise states that he applied the plain and ordinary meaning to claim terms for which Sonos and Google have not agreed upon a construction. Anderson Decl. ¶57. Based on my review of his declaration, however, it is my opinion that Dr. Anderson relied on an interpretation of at least one claim term that is inconsistent with the plain and ordinary meaning that a POSITA would

have understood in the context of the '025 Patent at the time of the invention.

53. Specifically, Dr. Anderson appears to apply an interpretation of the term “*processing of the audio data*,” as recited in the independent claims (e.g., limitations [1d] and [1e]), that departs from its plain and ordinary meaning. I have addressed the proper interpretation of this claim term below in connection with my opinions regarding Google’s invalidity grounds. *See* Section X.A.1.b.

54. In addition, as set forth above, the term “data network” is used in constructions of two claim terms—namely, (1) “*playback device*” and (2) “*network interface*.” With respect to this “data network” term, I have applied the meaning that a POSITA would have understood in the context of the '025 Patent at the time of the invention.

55. Specifically, it is my opinion that a POSITA would have understood a “data network” to be a medium that interconnects devices, enabling them to send data to and receive data from each other.

56. My understanding of the term “data network” is supported by the specification, which I understand is intrinsic evidence. For instance, the specification discloses the following:

The zone player 200 includes a network interface 202, a processor 204, a memory 206, an audio processing circuit 210, a module 212, optionally, an audio amplifier 214 that may be internal or external, and optionally, a speaker unit 218 connected to the audio amplifier 214.

The network interface 202 *facilitates a data flow between a data network* (i.e., the data network 108 of FIG. 1) *and the zone player 200* and typically executes a special set of rules (i.e., a protocol) to send data back and forth. [...] In general, a network interface manages the assembling of an audio source or file into smaller packets that are *transmitted over the data network or reassembles received packets* into the original source or file.”

Ex. 1001, 7:40-54 (emphasis added); *see also, e.g., id.*, FIG. 1.

57. Notably, I see nothing in the intrinsic evidence suggesting the inventors intended to deviate from this plain and ordinary meaning of “data network” reflected in the above-quoted passage.

58. Thus, a POSITA would have understood a “data network” to be a medium that interconnects devices, enabling them to send data to and receive data from each other.

IX. OVERVIEW OF THE RELIED-UPON REFERENCES

59. Dr. Anderson relies on the following references in support of his opinions regarding the Challenged Claims of the '025 Patent:

- U.S. Patent App. Pub. No. 2007/0055399 (“Litbak”; Ex. 1005);
- U.S. Patent App. Pub. No. 2007/0160225 (“Seydoux”; Ex. 1008);
- U.S. Patent No. 5,581,626 (“Palmer”; Ex. 1018);
- U.S. Patent App. Pub. No. 2007/0087686 (“Holm”; Ex. 1020);
- U.S. Patent App. Pub. No. 2008/0076389 (“Lee”; Ex. 1016).

Google relies exclusively on Litbak and Seydoux for its obviousness challenges to

independent claims 1, 16, and 18. Thus my analysis below focuses mainly on those two references.

60. Further, although Dr. Anderson identifies additional references that he considers “relevant” (Anderson Decl. ¶61), Google’s asserted invalidity grounds rely only on the five references identified above. Thus, except to the extent Dr. Anderson expressly relies on any additional reference in support of a particular invalidity theory, I do not consider such references relevant to my analyses and opinions.

A. Overview of Litbak

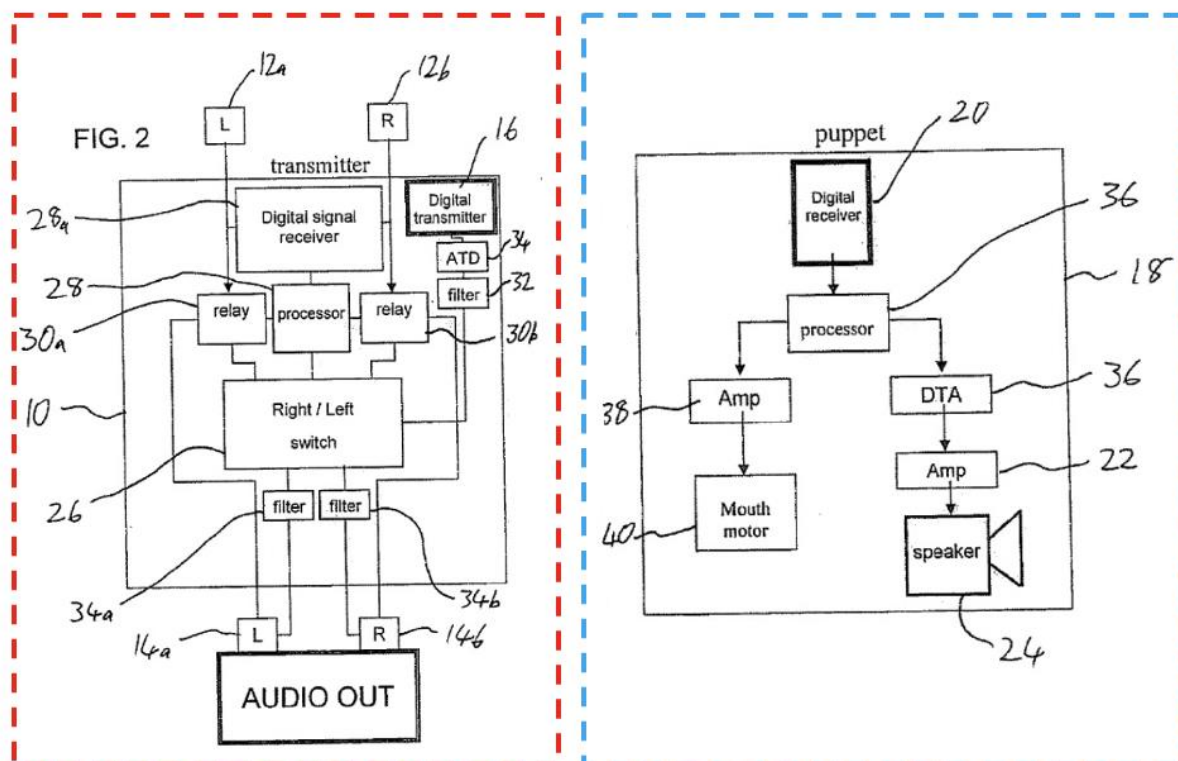
61. Google relies on Litbak as the primary reference for each of its four invalidity grounds (Grounds 1-4). Litbak was filed on June 1, 2006, and published on March 8, 2007 as U.S. Patent App. Pub. No. 2007/0055399. Ex. 1005, 1.

62. Litbak is directed to “interactive puppet” technology. *Id.*, ¶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, there were no known solutions for 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.

63. To address this 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.

64. FIG. 2 of Litbak illustrates the “audio switching arrangement” comprising a “transmitter” (annotated in red) 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.

65. As shown in FIG. 2, 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.” A POSITA would have understood that, once deployed, the “transmitter” and “puppet” are intended to operate together as part of the disclosed “audio switching arrangement” and remain in that fixed arrangement. Indeed, Litbak describes operation of the “audio switching arrangement” in terms of the interaction between the “transmitter” and the “puppet.” Ex. 1005, ¶13, 23, 26, 47, 54-61. I see nothing in Litbak suggesting that the “transmitter” and “puppet” are initially separate devices that later become paired or otherwise reconfigured together. Rather, a POSITA would understand that Litbak’s intended design assumes the “transmitter” and “puppet” are already part of the same “audio switching arrangement.” *See, e.g.*, Ex. 1005, ¶13, cl. 1, Abstract.

66. According to Litbak, the “audio switching arrangement” operates in two different states: (1) a “straight-through state,” and (2) a “diverted state.” *See,*

e.g., id., 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.

67. More specifically, Litbak explains that the “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.

68. 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,

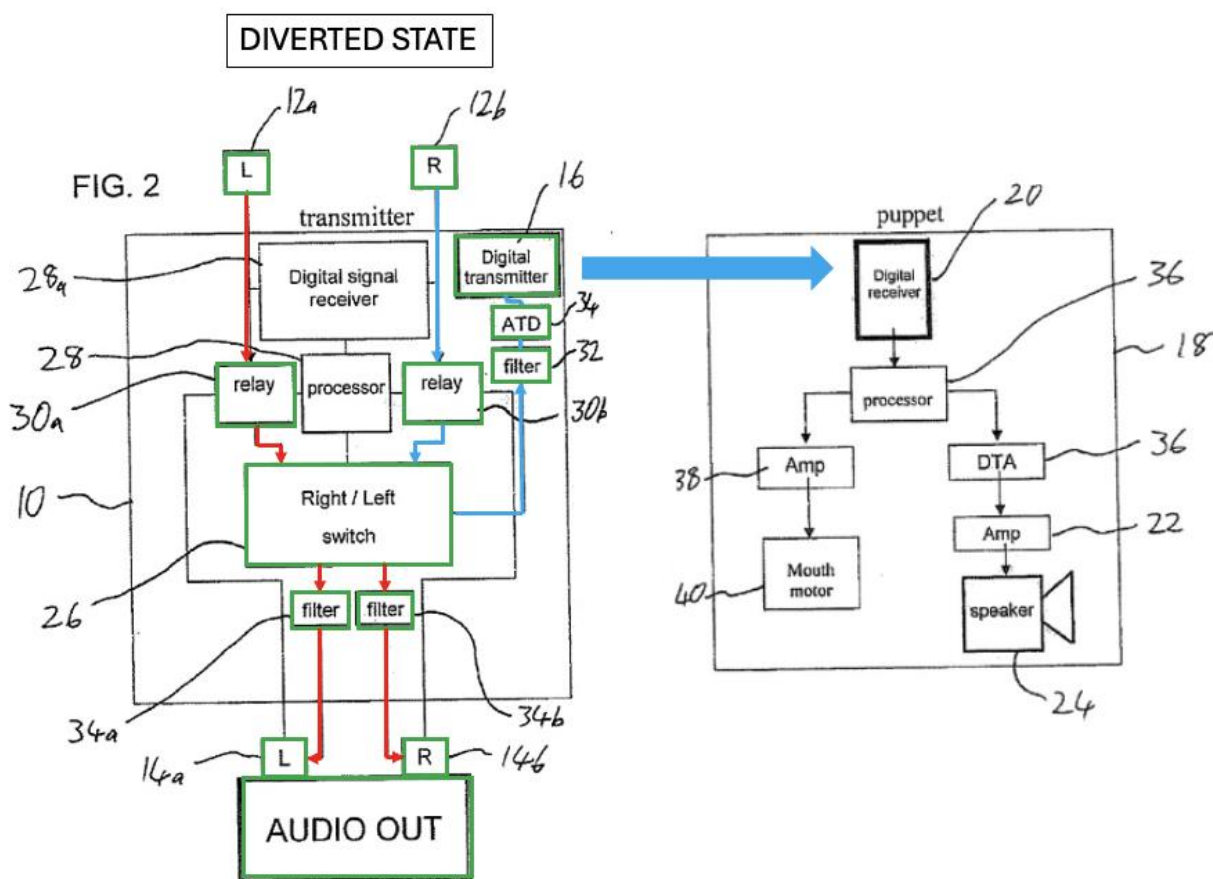
the diverted state of electronic switch 26 and to the second code to switch to, or maintain, the straight-through state of electronic switch 26.” *Id.*, ¶52-53.

69. In this way, Litbak explains that the “audio switching arrangement” first monitors for a “predefined actuation signal” and 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.”

70. Litbak further explains that “[r]elays 30a and 30b are actuated by signal processor 28” to place the “audio switching arrangement” in the “diverted state.” *Id.*, ¶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 a transmitter (e.g., “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.

71. 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:

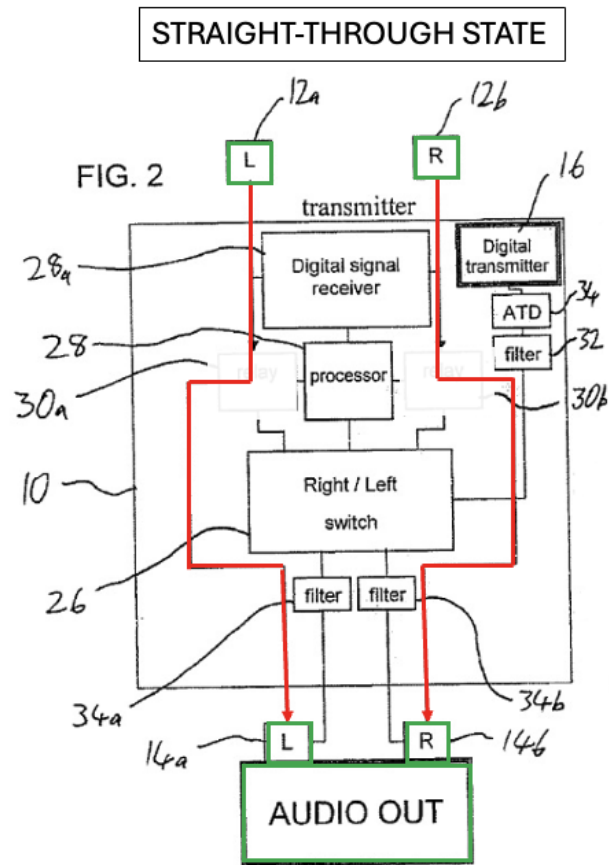


72. In contrast, when the “audio switching arrangement” is in the “straight-through state,” Litbak explains that the “relays 30a and 30b” are “de-energized” and the “electronic switch 26” is bypassed, such that the “audio inputs 12a, 12b” are routed directly to the “audio outputs 14a, 14b.” *See, e.g., id.*, ¶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.

73. 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. 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.” *Id.*

74. 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:



75. Litbak describes its “audio switching arrangement” as providing “a number of significant advantages over the existing interactive puppet technologies.” *Id.*, ¶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.*

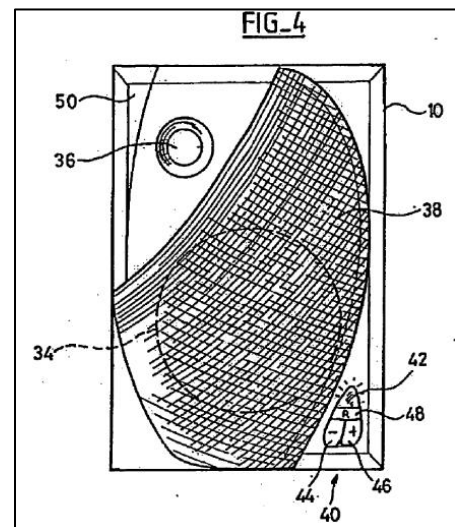
B. Overview of Seydoux

76. Google relies on Seydoux as a secondary reference for each of its four

invalidity grounds (Grounds 1-4). Seydoux was filed on December 28, 2006, and published on July 12, 2007 as U.S. Patent App. Pub. No. 2007/0160225. Ex. 1008, 1.

77. 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.” *Id.*, ¶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.

78. 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.



79. 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.*

X. VALIDITY OF THE CHALLENGED CLAIMS

80. As noted above, Dr. Anderson opines that the following grounds allegedly render obvious the Challenged Claims of the '025 Patent.

Ground	Challenged Claim(s)	35 U.S.C.	Reference(s)
1	1, 3-4, 7-10, 12-14, 16, 18, 21	§ 103	Litbak and Seydoux
2	2, 17, 19-20, 22-23	§ 103	Litbak, Seydoux, and Palmer
3	12	§ 103	Litbak, Seydoux, and Holm
4	15	§ 103	Litbak, Seydoux, and Lee

81. As explained below, it is my opinion that Dr. Anderson’s analyses of these asserted grounds are flawed and do not establish that the Challenged Claims would have been obvious to a POSITA at the time of the invention. Thus, in my opinion, Google has not demonstrated, by a preponderance of the evidence, that any of the Challenged Claims of the '025 Patent are obvious.

A. The Combination of Litbak and Seydoux Does Not Render Obvious Claims 1, 3-4, 7-10, 12-14, 16, 18, and 21 (Ground 1)

82. Dr. Anderson opines that independent claims 1, 16, and 18 as well as dependent claims 3-4, 7-10, 12-14, and 21 of the '025 Patent are allegedly rendered

obvious by a combination of Litbak and Seydoux. Anderson Decl., ¶75-198. I disagree.

83. In my opinion, none of the foregoing claims are rendered obvious by the combination of Litbak and Seydoux because that combination fails to disclose or suggest several limitations that are required by the independent claims. And those deficiencies extend to the dependent claims that depend from them.

84. For instance, as explained below, Dr. Anderson's obviousness theories suffer from at least *three* clear defects. It is my opinion that each defect, standing alone, provides a sufficient basis for concluding that the foregoing claims would not have been obvious to a POSITA in view of the combination of Litbak and Seydoux.

1. Independent Claims 1, 16, 18

a. The combination of Litbak and Seydoux fails to disclose or suggest "*one or more speaker drivers*"

85. Independent claims 1, 16, and 18 recite a "*playback device*" that includes, among other things, "*one or more speaker drivers*" and associated functionality. Claim 1 is representative⁵ and reproduced below:

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

⁵ I agree with Dr. Anderson's opinion that "[c]laims 16 and 18 only differ with respect to their preambles" and are "substantively identical to claim 1." Anderson Decl., ¶150. Thus, my analysis of independent claim 1 applies equally to independent claims 16 and 18.

[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.*

86. With respect to limitation 1[aii], Dr. Anderson opines that “*one or more speaker drivers*” would have been obvious in view of Litbak and Seydoux based on the following rationale:

In my opinion, element [1aii] would have been obvious over Litbak and Seydoux because Litbak’s “arrangement” includes an “**Audio Out**” which “output[s]” an “audio signal” “through a **speaker**” “to generate desired audio content” (configured to output audio based on the audio data). Litbak, [0029], [0033], [0037] (“speaker of the entertainment system”), [0040], [0047], FIGs. 1A-1B, 2. Seydoux provides implementation details of “**base/medium**” and “**tweeter**” **speaker drivers** which would have been obvious to include in Litbak’s arrangement. Seydoux, [0151].

Anderson Decl., ¶94 (annotations in original).

87. As I understand it, Dr. Anderson’s theory proceeds in three steps. First, he treats **only** Litbak’s “transmitter” component of the disclosed “audio switching arrangement” as the alleged “*playback device*,” while excluding Litbak’s “puppet.” *Id.*, ¶95. Second, under his characterization of Litbak, he appears to equate the audio outputs (“Audio Out”) of Litbak’s “transmitter” with the claimed “*one or more speaker drivers*,” or alternatively, appears to assume that Litbak’s “transmitter” includes a “speaker.” Third, Dr. Anderson relies on secondary reference Seydoux’s discussion of “base/medium” and “tweeter” drivers for “implementation details” to argue that the assumed speaker allegedly disclosed in Litbak’s “transmitter” would

amount to “*one or more speaker drivers.*”

88. In my opinion, Dr. Anderson’s theory is flawed for at least three reasons:

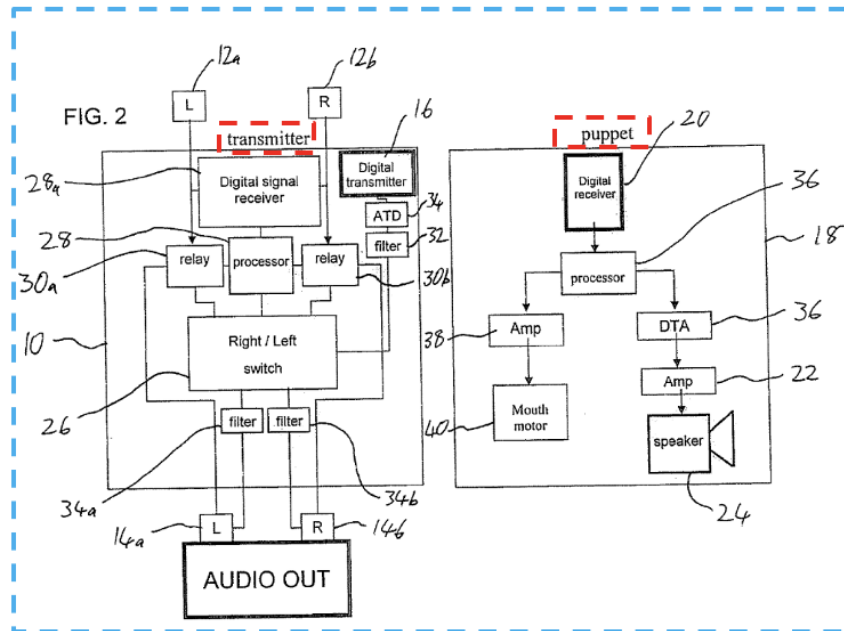
- (1) Dr. Anderson redraws the boundaries of Litbak’s “disclosed audio switching arrangement” to map only the “transmitter” to the claimed “*playback device*” and the “puppet” to “*one or more other playback devices*”;
- (2) Even under Dr. Anderson’s redrawing, Litbak’s “transmitter” (i.e., the alleged “*playback device*”) does not include a speaker and the audio output terminals (e.g., “audio outputs 14a, 14b”) of Litbak’s “transmitter” do not amount to “*one or more speaker drivers*”; and
- (3) because Litbak’s “transmitter” does not include “*one or more speaker drivers,*” Seydoux’s “implementation details” for “*one or more speaker drivers*” do not remedy Litbak’s deficiency.

I address each point below.

89. **First**, Dr. Anderson redraws the boundaries of Litbak’s “disclosed audio switching arrangement” such that Litbak’s “transmitter” alone is the entire “audio switching arrangement” that corresponds to the alleged “*playback device.*” But it is my opinion that Litbak does not define the “audio switching arrangement” that way.

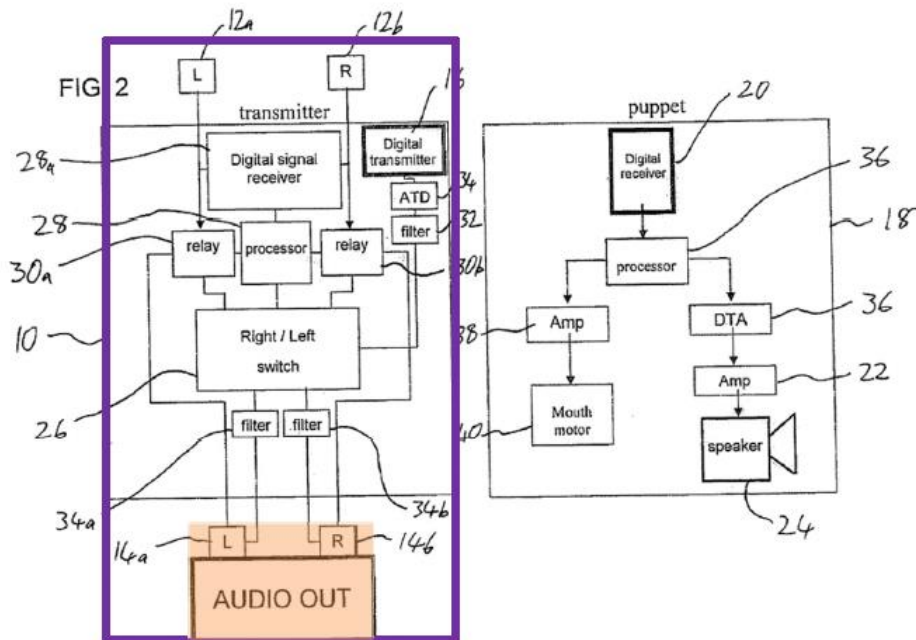
90. In fact, Litbak expressly discloses that its “audio switching arrangement” includes both the “transmitter” **and** “puppet.” See, e.g., Ex. 1005, Abstract, ¶13, cl. 1, FIG. 2.

91. This is illustrated 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 (annotations added).

92. Dr. Anderson’s theory, however, depend on redrawing the boundaries of Litbak’s disclosed “audio switching arrangement” and isolating the “transmitter” from the “puppet,” as reproduced below from his declaration:



Id., FIG. 2.

See, e.g., Anderson Decl., ¶¶95.

93. Dr. Anderson appears to do this because the Challenged Claims require “the playback device to become paired with one or more other playback devices” and he needs the “puppet” to be the “one or more other playback devices.” Ex. 1001, cl. 1; Pet., 39-40.

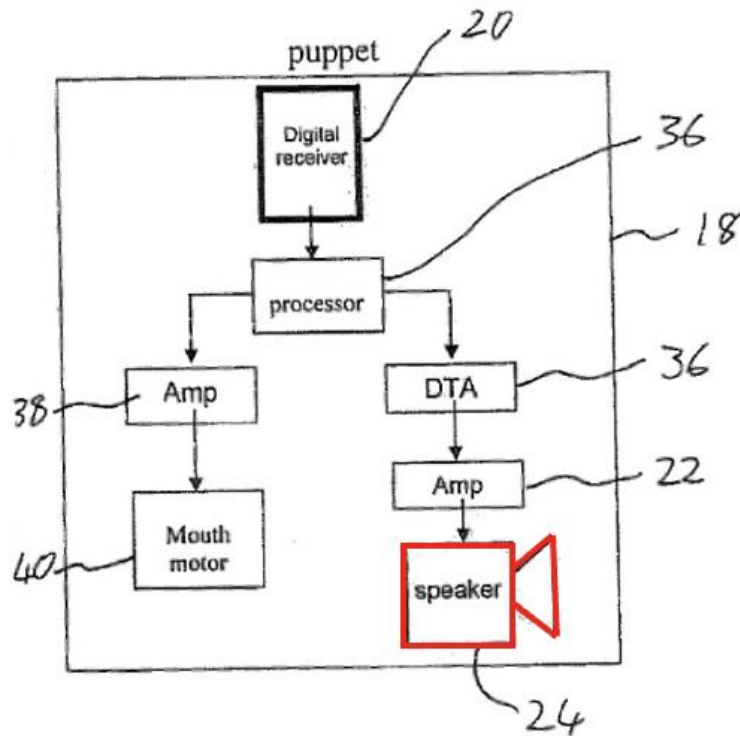
94. However, in my opinion, if Litbak’s disclosed “audio switching arrangement” is properly treated as including both the “transmitter” and the “puppet,” then the “puppet” cannot simultaneously be part of the alleged “playback device” and the alleged “one or more other playback devices.” And as discussed in my overview, it is my opinion that Litbak does not provide a basis for separating the “transmitter” and the “puppet” in that manner. See Section IX.A.

95. Thus, it is my opinion that Dr. Anderson is relying on an unsupported reconstruction of Litbak's disclosed "audio switching arrangement."

96. **Second**, even if I were to accept Dr. Anderson's characterization of Litbak's "audio switching arrangement," it is my opinion that his theory still falls short because Litbak's "transmitter" itself does not include "*one or more speaker drivers*." This is apparent from Litbak's figures and accompanying disclosure.

97. Specifically, Litbak's "transmitter," illustrated in FIG. 2 above, includes audio inputs, audio outputs, a signal processor, relays, filters, and an electronic switch. But I see nothing in Litbak indicating that the "transmitter" itself includes a "speaker," or any other transducer that converts electrical signals into audible sound waves. *See* Ex. 1005, FIG. 2; *see also id.*, FIGs. 1A-1B (depicting no speaker).

98. In contrast, in the same FIG. 2 (reproduced below to show only the "puppet"), Litbak illustrates and labels a "speaker" within the puppet—identified as "speaker 24":



See *id.*, FIG. 2 (cropped and annotated).

99. In my opinion, the fact that Litbak expressly depicts and labels a “speaker” within the remote puppet, while omitting any speaker from the “transmitter,” reinforces my conclusion that a speaker is not included in Litbak’s “transmitter.”

100. Indeed, aside from the remote puppet’s “speaker” (e.g., “speaker 24”), Litbak refers to a “speaker” only in passing and not as a component of the “audio switching arrangement” itself. Specifically, one reference to a “speaker” appears in Litbak’s discussion of “*conventional* wireless speakers.” *Id.*, ¶35. The only other reference not expressly involving the remote puppet’s “speaker 24” appears in Litbak’s definition of an “audio signal,” which Litbak defines as “a signal which can

be amplified and output through a speaker to generate desired audio content.” *Id.*, ¶40. It is my opinion that neither passage discloses or suggests, nor would a POSITA have understood either passage to disclose or suggest, that the “transmitter” itself includes a speaker. At most, a POSITA would have understood those passages to teach that an audio signal routed through the “transmitter” may ultimately be amplified and/or output through a speaker located in the “puppet” or a speaker located downstream of the “audio switching arrangement.”

101. My understanding is consistent with Litbak’s disclosed architecture. Litbak expressly states that “the typical positioning of the switching arrangement of the present invention is *between* the audio source (e.g., decoder, receiver, player) and the playback/output device (e.g., television, amplifier etc.).” *Id.*, ¶39. A POSITA would have understood that the “transmitter” to function as an intermediary audio signal-routing component positioned upstream of a device responsible for audio playback rather than a playback device that includes “*one or more speaker drivers*” for outputting audio in the form of sound waves. In my opinion, because the downstream “playback/output device” is already responsible for outputting audio in the form of sound waves, a POSITA would have understood there to be no reason for the upstream “transmitter” itself to include a speaker.

102. Thus, to the extent Dr. Anderson suggests that Litbak’s “transmitter” includes a speaker, it is my opinion that such a suggestion is unsupported by Litbak’s

disclosure and contrary to how a POSITA would have understood Litbak's teachings.

103. Moreover, it is my opinion that a POSITA would have understood that the audio outputs of Litbak's "transmitter" (e.g., "audio outputs 14a, 14b") do not amount to "*one or more speaker drivers*." Such "Audio Out" terminals merely provide electrical signals to another device. They do not themselves output audio in the form of sound waves.

104. In this regard, a POSITA would have understood a "*speaker driver*" to be a transducer that converts electrical signals into sound waves. Dr. Anderson appears to adopt the same understanding. *See* Anderson Decl., ¶97 (quoting Ex. 1010, p. 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")). Under that well understood definition, a POSITA would **not** have understood Litbak's "Audio Out" terminals to constitute "*one or more speaker drivers*" because those "Audio Out" terminals merely output electrical signals, whereas a "*speaker driver*" converts electrical signals into sound waves. *See, e.g.,* Ex. 1005, ¶33, 40 (defining "electrical signal" to include an "audio signal"), 47, FIG. 2. Dr. Anderson likewise 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.” Anderson Decl., ¶95. This further confirms my understanding that the “Audio Out” terminals themselves do not amount to “*one or more speaker drivers*.”

105. **Third**, it is my opinion that Dr. Anderson’s reliance on Seydoux’s disclosure of a “base/medium” and “tweeter” as purported “implementation details” of a speaker (Anderson Decl., ¶94) is misplaced. Significantly, Dr. Anderson does not explain why a POSITA would have modified Litbak’s “transmitter” to add a speaker in the first place. Instead, his analysis assumes that Litbak’s “transmitter” already includes a speaker and then cites Seydoux as disclosing specific examples of “*one or more speaker drivers*” that could purportedly provide implementation details for that assumed speaker. But, in my opinion, even if Seydoux discloses examples of “*one or more speaker drivers*,” that does not provide a basis for concluding that Litbak’s “transmitter” includes (or would have been modified to include) “*one or more speaker drivers*.” Thus, in my opinion, Seydoux does not address the absence of “*one or more speaker drivers*” in Litbak’s “transmitter.”

106. Moreover, it is my opinion that, even if Dr. Anderson had expressly proposed modifying Litbak’s “transmitter” to add a speaker (which he did not), such a modification would be inconsistent with Litbak’s design and objectives. In this regard, 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. It is my opinion that a POSITA therefore would have had no reason to complicate Litbak’s “simple and robust” implementation by adding a speaker to the “transmitter.”

107. In my opinion, such a modification would also be inconsistent with Litbak’s intended placement of the “audio switching arrangement.” As noted above, Litbak teaches positioning the “audio switching arrangement” between “the audio source (e.g., decoder, receiver, player) and the playback/output device (e.g., television, amplifier etc.).” *Id.*, ¶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.”). In my opinion, 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” of the “audio switching arrangement.”

108. For these reasons, it is my opinion that Dr. Anderson has not shown that the combination of Litbak and Seydoux discloses or suggests the claimed “*one or more speaker drivers*” required by the independent claims. *See* limitations [1aii], [1d], and [1e].

- b. **The combination of Litbak and Seydoux fails to disclose or suggest 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*”**

109. Representative independent claim 1 further recites that the “*playback device*” functions 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.*” Limitation [1b].

110. Dr. Anderson opines that Litbak’s “actuation signal” in combination with Seydoux’s Bluetooth remote control “implementation details” satisfies this limitation. See Anderson Decl., ¶111. According to Dr. Anderson, 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).” *Id.*, ¶118. He 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.*, ¶120-125. In my opinion, Dr. Anderson’s analysis is flawed for two main reasons.

111. **First**, Dr. Anderson fails to show 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 in my overview, Litbak’s “audio switching arrangement” includes both the “transmitter” and the “puppet.” See Section IX.A. Once deployed, those components operate together as part of the same disclosed “audio switching arrangement.” *Id.* Dr. Anderson’s analysis is inconsistent with Litbak’s disclosure.

112. In this regard, limitation [1b] requires “*for the playback device to become paired with one or more other playback devices.*” But, in my opinion, Litbak’s “transmitter” and “puppet” do not “***become paired***” based on receipt of any instruction, much less from a “*controller over [a] network.*” Instead, the “transmitter” and “puppet” already make up the disclosed “audio switching arrangement” before any “actuation signal” is received. See, e.g., Ex. 1005, Abstract, ¶13 (“the switching arrangement comprising: (a) a transmitter ... ; (b) a puppet”), ¶30, cl. 1, FIG. 2.

113. Indeed, based on Litbak’s disclosure, a POSITA would have understood that the “actuation signal” is received by the “transmitter” sometime ***after*** the “transmitter” and “puppet” have already been deployed as part of the disclosed “audio switching arrangement.” See, e.g., *id.*, ¶48, 52-53, 61. Thus, it is my opinion that Litbak’s “actuation signal” does not 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. In my opinion, a POSITA would not have understood a signal received after the “transmitter” and “puppet” are already operating together as part of the same disclosed arrangement to be the signal that causes those components to become paired.

114. At most, Litbak teaches that the “actuation signal” informs the “transmitter” how audio signals should be routed through the “audio switching arrangement.” *See, e.g.,* Ex. 1005, ¶¶55, 61. 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.*, ¶¶48, 52-53, 61. But, in my opinion, 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.*” Rather, the “actuation signal” is more akin to an indication governing how audio signals should be routed.

115. My understanding is reflected in the claims of the ’025 Patent. For instance, independent claim 1 recites a “*playback device*” configured to “*receive a signal... [that] comprises an instruction for the playback device to become paired with one or more other playback devices,*” whereas dependent claim 9 additionally

recites that “*the signal further comprises an instruction for the playback device to play back a particular channel of the audio data.*” Ex. 1001, cls. 1, 9. A POSITA would have understood those as distinct types of instructions. Thus, in my opinion, the fact that Litbak's “actuation signal” affects how audio signals are routed does not mean that it constitutes the claimed “*instruction for the playback device to become paired with one or more other playback devices.*”

116. **Second**, in my opinion, Dr. Anderson's analysis relies on hindsight reconstruction of Litbak with Seydoux rather than what a POSITA would have understood from the disclosures of Litbak and Seydoux.

117. In this regard, it is my opinion that a POSITA would not have been motivated to apply the claimed “*instruction for the playback device to become paired*” to Litbak's fundamentally different architecture and objectives. 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. See Section VII.

118. To reach limitation [1b], Dr. Anderson first separates the “transmitter” and “puppet” in Litbak’s disclosed “audio switching arrangement” into the alleged “*playback device*” (i.e., “transmitter”) and “*one or more other playback devices*” (i.e., “puppet”) 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. But, in my opinion, Litbak provides no reason to restructure its disclosed “audio switching arrangement,” and Dr. Anderson does not offer one.

119. Moreover, even assuming the “actuation signal” amounted to the claimed “*instruction for the playback device to become paired*” (which it does not), it is my opinion that 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.” 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. *See, e.g.*, Ex. 1005, ¶¶47-53. Litbak explains that this approach is simple and low cost. *See, e.g., id.*, ¶¶10, 11, 34, 36, 48.

120. In contrast, a POSITA would have understood that modifying Litbak to utilize Seydoux’s “implementation details” would increase complexity which, in my opinion, is inconsistent with the stated goals and advantages Litbak identifies as

important. *See, e.g.,* Ex. 1005, ¶11.

121. Thus, it is my opinion that a POSITA would not have been motivated to undertake such modifications.

- c. **The combination of Litbak and Seydoux fails to disclose or suggest 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*”**

122. Representative independent claim 1 further recites that the “*playback device*” functions to configure itself 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].

123. Thus, limitation [1d] requires (1) “*a first processing of the audio data,*” (2) that the “*first processing*” be performed “*so as to output two-channel audio based on the audio data from the one or more speaker drivers,*” and (3) that the “*first processing*” be performed “*after the playback device has determined it is not paired with the one or more other playback devices.*”

124. Dr. Anderson opines that Litbak discloses this limitation based on the following rationale:

Litbak’s “straight-through state” discloses the claimed first processing because “in the absence of the predefined actuation signal an audio

signal from each of the stereo inputs” (two-channel stereo audio) “is transferred to a corresponding stereo output.” Litbak, [0023]-[0026], [0029], [0033], [0047], [0061].

Litbak discloses processing the “audio programming” (audio data) at least because Litbak discloses selectively routing the channels to output “stereo” (two-channel audio), and matches ’025 Patent claim 1, which recites “a first processing of the audio data so as to output two-channel audio.” Litbak, [0023]-[0026], [0033], [0039], [0047], [0061]; EX-1001, claim 1.

Litbak further discloses processing of the “audio programming” (audio data) as explained for [1pre]. Supra Ground 1, [1pre]; Litbak, [0039]. And in my opinion, it would have been obvious to implement Litbak’s steps using Seydoux’s software modules to achieve the first audio processing, as explained for [1pre] and [1aiv]. Supra Ground 1, [1pre], [1aiv].

Anderson Decl, ¶138, 140-41.

125. As I understand it, Dr. Anderson’s “*first processing*” theory has three parts. First, he identifies Litbak’s “straight-through state” as the claimed “*first processing of the audio data*” because, in that state, audio signals are routed from the audio inputs of Litbak’s “transmitter” to its audio outputs. Second, Dr. Anderson relies on Litbak’s separate disclosure of “monitor[ing] for the predefined actuation signal” and applying “filtering techniques” discussed elsewhere in his analysis (*see*

id., ¶84) to suggest that Litbak’s “audio switching arrangement” is generally capable of “*processing*” audio data. Third, Dr. Anderson opines that it would have been obvious to a POSITA to implement Litbak’s “straight-through state” functionality using Seydoux’s software modules.

126. In my opinion, Dr. Anderson’s “*first processing*” theory is flawed for at least three reasons:

- (1) Litbak’s “straight-through state” does not disclose or suggest the claimed “*first processing of the audio data*” because no “*processing of the audio data*” occurs in that state;
- (2) the “monitoring” function identified by Dr. Anderson 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,*” and the “filtering” function identified by Dr. Anderson neither occurs as part of Litbak’s “straight-through state” (i.e., the alleged “*first processing*”) nor is performed “*so as to output two-channel audio based on the audio data*”; and
- (3) Seydoux does not remedy this deficiency because Dr. Anderson merely proposes implementing Litbak’s “straight-through state” using Seydoux’s software modules without explaining how that implementation would cause Litbak’s “straight-through state” to perform any “*processing of the audio data.*”

I address each point below.

127. **First**, it is my opinion that a POSITA would have understood that Litbak does not disclose or suggest the claimed “*first processing of the audio data.*”

To the contrary, Litbak repeatedly explains that, in the “straight-through state,” audio signals are passed directly from the audio inputs to the audio outputs of the “audio switching arrangement” without any processing of the audio signals. In my opinion, a POSITA would have understood that this is precisely why Litbak refers to this state as the “*straight-through* state.”

128. Nevertheless, Dr. Anderson opines that Litbak’s “straight-through state” discloses “*first processing of the audio data*” because Litbak discloses “selectively routing” audio signals from the audio inputs to the audio outputs of the “audio switching arrangement.” *Id.*, ¶140. In my opinion, however, 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*.”

129. Rather, in this context, a POSITA would have understood “*processing of the audio data*” to require one or more operations on the audio data itself. Examples of such operations include decryption, decoding, digital-to-analog conversion, mixing, filtering, equalization, or other operations that act upon the audio data itself.

130. My understanding is consistent with both the intrinsic and extrinsic evidence.

131. For example, the specification of the ’025 Patent describes several examples in which a playback device may process audio data, all of which involve

one or more operations performed on the audio data itself. *See, e.g.*, 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.”).

132. Dependent claims 2, 17, and 19 of the '025 Patent reinforce my understanding. Each of those claims recites 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.***” These dependent claims therefore confirm my understanding that “*processing of the audio data*” involves one or more operations on the audio data itself rather than merely routing audio signals from one location to another.

133. I have reviewed extrinsic evidence that is consistent with my understanding as well. For instance, several dictionaries define “data processing” to require one or more operations “on” the data itself. *See, e.g.*:

- Ex. 2003 [McGraw Hill Dictionary of Computer and Electrical Engineering, 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.”);

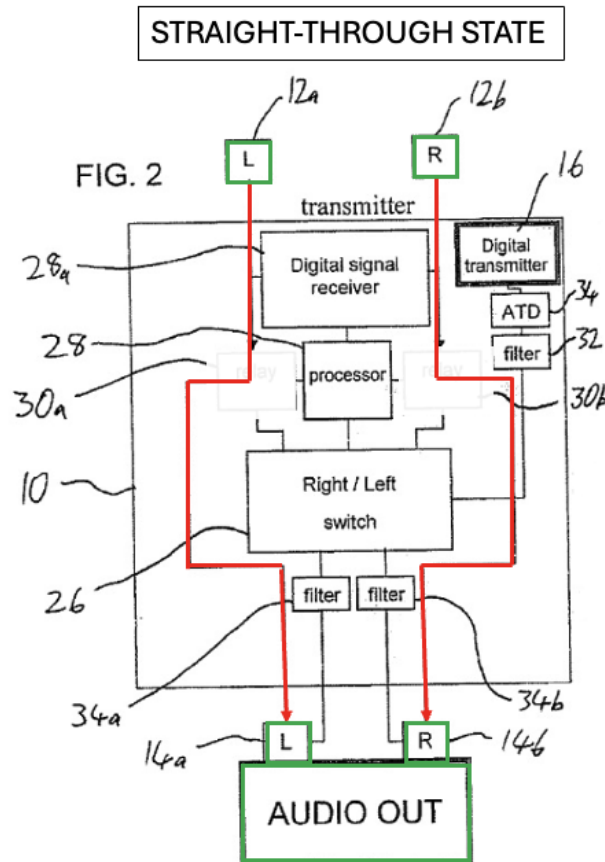
- Ex. 2004 [Collins English Dictionary (June 2012)] (defining “data processing” as “a sequence of operations performed *on* data, esp by a computer, in order to extract information, reorder files, etc”);
- Ex. 2005 [Oxford Learners Dictionary] (defining “data processing” as “a series of actions that a computer performs *on* data to produce an output (= results)”).

134. In contrast, it is my opinion that a POSITA would have understood that merely routing an audio signal from one location to another does not constitute “*processing of the audio data*” because no operation is performed on the audio signal itself. Instead, the audio signal is simply passed from one point to another. A POSITA would have understood that this is precisely what occurs in Litbak’s “straight-through state.”

135. Specifically, Litbak explains that when the “audio switching arrangement” is in the “straight-through state,” the “processor 28” leaves “relays 30a and 30b” “de-energized,” thereby bypassing the “electronic switch 26” and directly connecting the “audio inputs 12a, 12b” 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.

136. The resulting audio signal path is annotated in red below.



See id., FIG. 2 (modified from original).

137. As shown, “relays 30a and 30b” remain de-energized and the audio signals pass directly from the audio inputs to the corresponding audio outputs. The “audio switching arrangement” therefore acts as a conduit through which the audio signals pass without any operation performed on the audio signals themselves.

138. Litbak expressly explains that this straight-through configuration 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.” *Id.*, ¶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.”). In my opinion, a POSITA would have understood this teaching to mean that Litbak intentionally avoids performing any “*processing of the audio data*” while operating in the “straight-through state.”

139. Thus, contrary to Dr. Anderson’s opinion, it is my opinion that Litbak’s “straight-through state” does not disclose or suggest the claimed “*first processing of the audio data*.” Rather, Litbak intentionally avoids “*processing of the audio data*” by providing a direct “straight-through” audio signal path from the audio inputs to the audio outputs of the “audio switching arrangement.”

140. **Second**, it is my opinion that Dr. Anderson’s “*first processing*” theory is also flawed because he relies on (1) a “monitoring” function that 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,*” and (2) a “filtering” function that neither occurs as part of Litbak’s “straight-through state” (i.e., the alleged “*first processing of the audio data*”) nor is

performed “*so as to output two-channel audio based on the audio data.*”

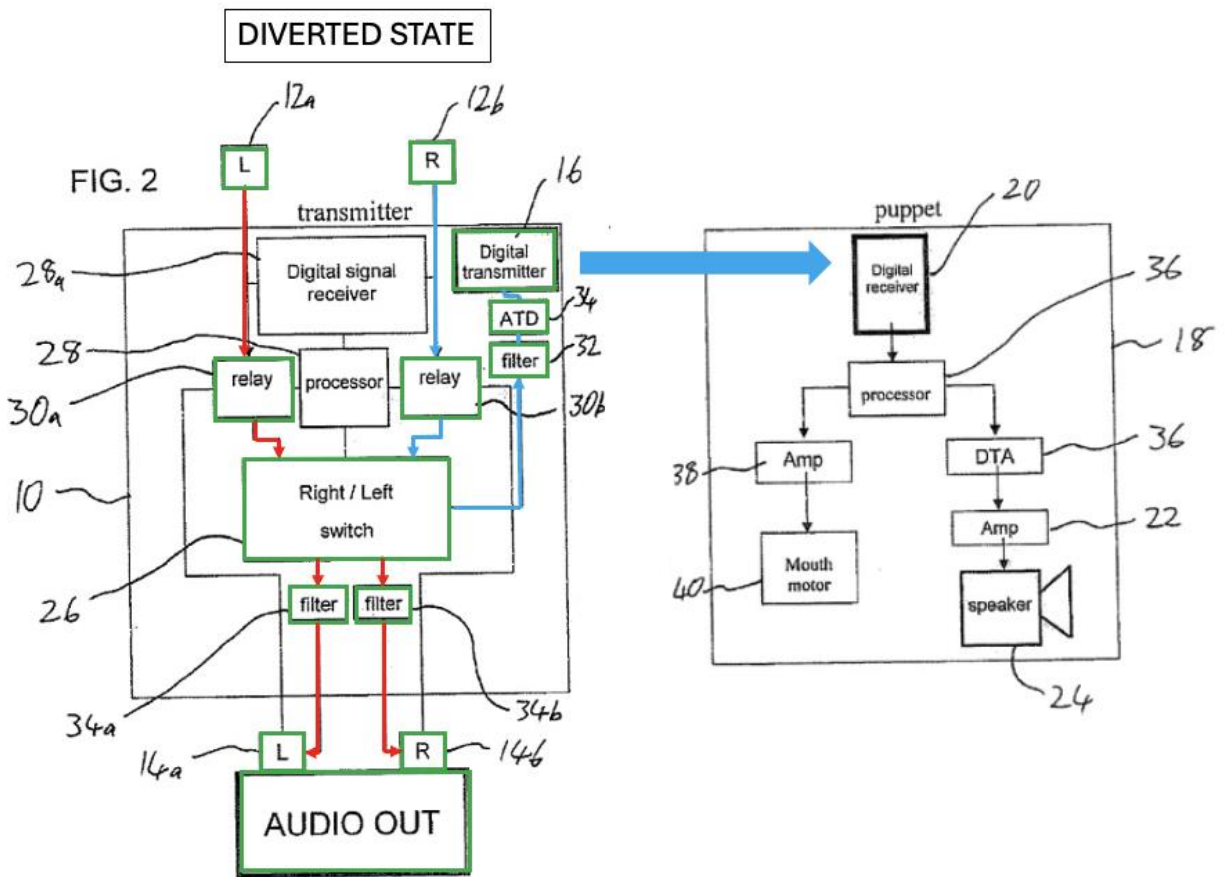
141. Specifically, in addressing whether Litbak’s “audio switching arrangement” amounts to a “*playback device*” (i.e., a “data network device configured to process and output audio”) in connection with the preamble of claim 1, Dr. Anderson opines that Litbak’s “audio switching arrangement” is configured “process” 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.” Anderson Decl., ¶84. However, it is my opinion that Dr. Anderson’s reliance on these monitoring and filtering functions for limitation [1d] is misplaced.

142. 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.” *Id.*, ¶47-53. A POSITA would therefore understand that the monitoring function is directed to determining which operational state should be selected. Thus, it is my opinion that the monitoring function would not amount to the claimed “*first processing of the audio data*” because it 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 is performed to determine whether the “audio switching arrangement” should operate in the “straight-through state” or the “diverted state,” and therefore precedes operation in either state.

143. With respect to the filtering function, Litbak makes clear that the filtering function does *not* occur in the “straight-through state,” where audio signals are directly routed from the audio inputs to the audio outputs as discussed above. Nor is the filtering function performed “*so as to output two-channel audio based on the audio data.*” Rather, a POSITA would have understood that the filtering components whose purpose is to filter out an actuation signal (i.e., “output filters 34a, 34b” and “filter 32”) are used only when the “audio switching arrangement” operates in the “diverted state.” *See, e.g., id.*, ¶23, ¶57, ¶61.

144. Indeed, as shown below, unlike the “straight-through state” discussed above, Litbak’s “diverted state” routes audio signals through output filters 34a and 34b and filter 32, among other components annotated in green.



See *id.*, FIG. 2 (modified from original).

145. Thus, it is my opinion that the monitoring and filtering functions identified by Dr. Anderson do not amount to 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.*”

146. **Third**, it is my opinion that Dr. Anderson’s reliance on Seydoux’s software modules does not remedy the foregoing deficiency in Litbak. In this regard, because no “*first processing of the audio data*” occurs in Litbak’s “straight-through

state,” it is my opinion that Dr. Anderson’s proposal to “implement *Litbak’s* steps using Seydoux’s software modules to achieve the first audio processing” (Anderson Decl., ¶141) does not explain how any “*first processing of the audio data*” would occur in the “straight-through state.” Significantly, Dr. Anderson does not opine that a POSITA would have been motivated to modify Litbak’s “straight-through state” to perform any “*first processing of the audio data*.” Thus, even if a POSITA were to implement Litbak’s “straight-through state” using Seydoux’s software modules, there still would be no “*processing of the audio data*” in that state because audio signals would continue to pass directly from the audio inputs to the audio outputs without any operation being performed on the audio signals themselves.

147. Further, even if Dr. Anderson had proposed modifying Litbak’s “straight-through state” to perform “*processing of the audio data*” (which he did not), a POSITA would have understood such a modification to be contrary to Litbak’s design objectives. 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”). It is my opinion that a POSITA therefore would not have been motivated to add audio data processing functionality to Litbak’s “straight-through state,” and notably, Dr. Anderson does not propose doing so.

148. For these reasons, it is my opinion that Dr. Anderson has not shown that Litbak, alone or in combination with Seydoux, discloses or suggests the claimed “*first processing of the audio data*” recited in the independent claims.

2. Dependent Claims 3-4, 7-10, 12-14, 21

149. It is my opinion that Dr. Anderson has not shown that Litbak, alone or in combination with 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.

a. Dependent Claim 8

150. Dependent claim 8 further recites the following limitation:

*wherein the one or more speaker drivers comprises a **plurality of speaker drivers**, and wherein the instructions, when executed by the one or more processors, further cause the playback device to: output audio from the **plurality of speaker drivers**.*

151. Dr. Anderson opines that “claim 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.” Anderson Decl., ¶161. I disagree.

152. In my opinion, the same reasoning I discuss above with respect to the independent claims applies to claim 8 because Litbak's "transmitter" does not include a single speaker, much less a "***plurality***" of speakers. See Section X.A.1.a. Thus, Seydoux's implementation of "base/medium" and "tweeter" drivers does not provide a basis for concluding that Litbak's "audio switching arrangement" includes a "*plurality of speaker drivers*" recited in claim 8.

153. Moreover, as discussed above with respect to the independent claims, Dr. Anderson does not explain why a POSITA would have modified Litbak's "transmitter" to add "*one or more speaker drivers*," much less a "*plurality of speaker drivers*." And even if such a modification had been proposed by Dr. Anderson (which it was not), it is my opinion that a POSITA would have understood it to be inconsistent with Litbak's design objectives and intended placement within Litbak's system architecture. See Section X.A.1.a.

154. For these reasons, it is my opinion that Dr. Anderson has not shown that the combination of Litbak and Seydoux discloses or suggests the claimed "*one or more speaker drivers*" recited in the independent claims, much less a "*plurality of speaker drivers*" recited in dependent claim 8.

B. The Combination of Litbak, Seydoux, and Palmer Does Not Render Obvious Claims 2, 17, 19-20, and 22-23 (Ground 2)

155. It is my opinion that Dr. Anderson has not shown that Litbak, alone or in combination with 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

156. Dependent claims 2, 17, and 19 further recite the following limitations:

[2a/17a/19a] wherein 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,

[2b/17b/19b] wherein performing the second processing further comprises utilizing at least a second one or more pass-filter parameters such that the playback device becomes configured to output at least a second range of audio frequencies based on the audio data from the one or more speaker drivers, and

[2c/17c/19c] wherein the first range of audio frequencies and the second range of audio frequencies are different.

157. With respect to these dependent claims, Dr. Anderson opines that “it would have been obvious for the ‘arrangement’ in the Litbak-Seydoux system to implement Palmer’s filter switching when it pairs with a ‘‘surround’ audio system’ including a subwoofer” and that “[w]hen unpaired, the arrangement would have performed a first processing that outputs full range frequencies, and after pairing, the arrangement would have performed a second processing leaving low frequency signals for the surround sound system’s subwoofer to output.” Anderson Decl.,

¶205.

158. As I understand it, Dr. Anderson proposes modifying Litbak's "audio switching arrangement" by adding Palmer's "filtering" through Seydoux's software modules. Under his theory, Litbak's "straight-through state" would allegedly perform a "*first processing of the audio data*" that "outputs full range frequencies" by utilizing Palmer's "filtering" implemented as a software module. *See id.*, ¶210-11.

159. As an initial matter, Dr. Anderson does not explain where or how Palmer's "filtering" functionality would be implemented within Litbak's "audio switching arrangement." Nor does he explain how the proposed combination would operate while preserving the direct-routing functionality discussed above that Litbak intended for its "straight-through state."

160. More fundamentally, it is my opinion that a POSITA would not have been motivated to make Dr. Anderson's proposed modification. As discussed above, a POSITA would have understood that no "*first processing of the audio data*" occurs in Litbak's "straight-through state," and that is by design. Litbak intentionally avoids "*processing of the audio data*" in the "straight-through state" by providing a direct signal path between the audio inputs and audio outputs of the "audio switching arrangement." Indeed, Litbak *repeatedly* explains that, in the "straight-through state," the audio signals are directly routed from the audio inputs to the audio outputs

while bypassing the components used in the “diverted state,” including “output filters 34a and 34b.” *See* Section X.A.1.b. It is my opinion that a POSITA therefore would have understood that Litbak deliberately avoids performing operations on the audio signals themselves while operating in the “straight-through state.”

161. As discussed above, 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”).

162. In contrast, Dr. Anderson proposes adding Palmer’s “filtering” functionality 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*.” In my opinion, that proposal is difficult to reconcile with Litbak’s objective of providing a direct signal path that bypasses processing and avoids even slight signal degradation. Because the introduction of “filtering” would not align with the

design objective of Litbak's "audio switching arrangement" and operation in the "straight-through state," it is my opinion that a POSITA would not have been motivated to modify Litbak to incorporate Palmer's "filtering" functionality.

163. For these reasons, it is my opinion that Dr. Anderson has not shown that a POSITA would have been motivated to combine Litbak, Seydoux, and Palmer in the manner proposed with respect to limitations 2a/17a/19a. Accordingly, it is my opinion that Dr. Anderson has not shown that Litbak, alone or in combination with Seydoux and Palmer, discloses or suggests dependent claims 2, 17, and 19.

C. The Combination of Litbak, Seydoux, and Holm Does Not Render Obvious Claim 12 (Ground 3)

164. It is my opinion that Dr. Anderson has not shown that Litbak, alone or in combination with Seydoux and Holm, discloses or suggests dependent claim 12 for at least the reasons discussed above with respect to the independent claims.

D. The Combination of Litbak, Seydoux, and Lee Does Not Render Obvious Claim 15 (Ground 4)

165. It is my opinion that Dr. Anderson has not shown that Litbak, alone or in combination with Seydoux and Lee, discloses or suggests dependent claim 15 for at least the reasons discussed above with respect to the independent claims.

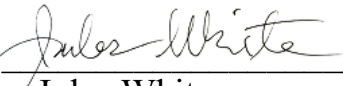
XI. CONCLUSION

166. For the reasons set forth above, it is my opinion that Google and Dr. Anderson have not established, by a preponderance of the evidence, that any of the

Challenged Claims of the '025 Patent would have been obvious at the time of the invention in view of combinations of references asserted in Grounds 1-4 of the Petition.

167. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willfully false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: August 7, 2026

By: 
Jules White