

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD., SAMSUNG ELECTRONICS,
AMERICA, INC., HARMAN INTERNATIONAL INDUSTRIES, INC.,

Petitioners

v.

STATON TECHIYA, LLC,

Patent Owner

IPR2024-00559
U.S. Patent No. 11,610,587

PATENT OWNER'S RESPONSE

Under 37 C.F.R. § 42.120

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Exhibit	Description
2001	Declaration of Dr Eric Tarr

I. INTRODUCTION

The challenged claims of the '587 patent require that both “a portion of the microphone signal” be sent to an audio buffer, and that “a modified microphone signal” be sent to a data buffer. Petitioner argues that in Fiedler, its primary reference, that the audio buffer disclosed in the '587 patent corresponds to the “original acquisition buffer” in Fiedler; that the '587 patent’s “microphone signal” corresponds to the “samples” received by the input buffer in Fiedler, and that sending those samples to the first acquisition buffer constitute “sending a portion of the microphone signal to the audio buffer.” Petitioner also characterizes the data buffer of the '587 patent as corresponding to the “second acquisition buffer” in Fiedler; that the “modified microphone signal” of the '587 patent corresponds to Fiedler’s “signal” in which information has been interspersed with silence nodes; and that sending that “signal” from the first acquisition buffer to the second acquisition buffer constitutes “sending a modified microphone signal to the data buffer...”. However, such a characterization is inconsistent with the plain language of Fiedler, the requirements of the challenged claims, or Petitioner’s arguments regarding the other claim limitations of the challenged claims.

First, the claims of the '587 patent require that only “*a portion* of the microphone signal” is sent to the audio buffer. When read in the context of the '587 patent’s specification and Fiedler’s description of how the microphone signal is processed in its invention, it is clear that Fiedler sends each and every of its microphone signal “samples” to the first acquisition buffer. This does not meet the “sending a portion of the microphone signal to the audio buffer” limitation of the '587 patent. In fact,

Petitioner's arguments for the '587 patent's limitation "sending a modified microphone signal to the data buffer" concede exactly this point, clearly stating that "*after each sample of audio data is initially written to the acquisition buffer...*the recording cursor goes back to the beginning of the sequence of amplitude values in the acquisition buffers corresponding to this interval and writes a silence node there." Nor can Petitioner argue that Fiedler's microphone signal interspersed with silence nodes is the "portion of the microphone signal" of the challenged claims. Petitioner identifies this exact "signal" as the "modified microphone signal" of the challenged claims. However, the specification of the '587 patent, as well as Federal Circuit law, dictate that the exact same signal cannot meet both the "sending a portion of the microphone signal to the audio buffer" and "sending a modified microphone signal to the data buffer."

Second the signal in Fiedler which Petitioner alleges is a "modified microphone signal" is not modified as one of ordinary skill in the art would understand what is disclosed in the '587 patent. Rather, for each "sample" signal that Petitioner identifies, Fiedler provides only two options: it is passed through in its entirety, or it is completely destroyed and unrecoverable. This is far from what is disclosed in the '587 patent, where the "modified microphone signal" is reduced, amplified or changed from the original microphone signal, but never destroyed.

Accordingly, the Board should find that Petitioner has failed to show by a preponderance of the evidence that the challenged claims of the '587 patent are unpatentable.

II. BACKGROUND

A. The '587 Patent

1. Technical Overview

The '587 patent is entitled “Personalized Sound Management System and Method,” and was issued on March 21, 2023 with a priority date of September 15, 2009. The specification states that the invention “relates in general to methods and systems for implementing a suite of personalized sound applications for modifying a user’s acoustic environment...and providing user selection and control over the management of sound.” The patent teaches systems for what the '587 patent refers to as “personalized sound management” in which an individual can “modify what is received from the acoustic space [] thereby tailoring or personalizing the received acoustic information to meet the needs of [the] person [].” The individual “selects the applications and control devices [] to modify acoustic space [] to meet their personal needs and wants.” EX2001, ¶ 22; EX1001 at 1:43-50, 3:41-47, 53-55.

The '587 patent discloses a personalized sound management system 206, for which several embodiments are disclosed. Systems implementing these applications may each include a microphone configured to measure ambient sound and generate a microphone signal, a speaker configured to emit an audio signal, a memory configured to store instructions, an audio buffer configured to store at least a portion of the

microphone signal, a data buffer; and a processor operatively coupled to the memory , the audio buffer, and the data buffer. The processor is configured to execute the instructions to receive the microphone signal, send a portion of the microphone signal to the audio buffer, analyze the audio buffer in order to detect a sonic signature, notify a user when a sonic signature is detected, send a modified microphone signal to the data buffer that replaces or adds to previous data stored in the data buffer, and sends a portion of the data in the buffer, spanning a time period, to the speaker in response to a user request. EX2001, ¶ 25; EX1001, 24:48-25:10.

The patent discloses several non-limiting embodiments. For example, in one embodiment, the Earguard system, when the sound pressure level begins metabolically exhausting the ear, the Earguard system modifies the incoming sound by reducing its level to a point where the ear is no longer metabolically exhausted. EX2001, ¶ 27; EX1001, 5:59-6:5. In another embodiment, a signal containing the user's voice is modified so as to be more natural sounding and easily recognizable to another hearing the voice. EX2001, ¶ 28; *Id.*, 6:47-58. As another example, in the Earbliss system, a personalized sound management application is provided to acoustically isolate someone who snores from another's acoustic environment, while allowing sounds other than snoring to be heard normally. EX2001, ¶ 29. *Id.*, 7:48-51, 8:16-31. In yet another embodiment, the Hear and Tell system, among the operations the device can perform are "passing the detected signal through to the user, boosting the sound such that the user is made aware of the detected sound, rejecting the sound so that the user does not hear the

detected sound, attenuating the detected sound, and replacing the detected sound with an alternate sound to name. EX2001, ¶ 30; *Id.*, 9:21-27.

2. Benefits Over the Prior Art

The '587 patent explains that “[i]n general, humans are continuously inundated with a diversity of sounds. Many of the sounds are not critical to our lives but our brain processes these sounds and tries to distinguish between them.” 1:33-36. This diversity of sound “can cause an auditory overload that can impact both the health and safety of an individual.” EX2001, ¶ 23; EX1001, 1:38-39; *see also* 3:62-67. To protect against this, the inventions of the '587 patent allow the user to “modify a user’s acoustic environment” and provid[e] user selection and control over the management of sound.” EX2001, ¶ 24; *Id.* at 1:45, 49-50. The '587 patent provides in one embodiment a system for managing the internal acoustic environment of an automobile compared to the external acoustic environment outside of the automobile. The embodiment modifies the user’s acoustic environment by listening for specific sounds (e.g., the siren of an emergency vehicle) in the external acoustic environment and providing a response in the internal acoustic environment. EX2001, ¶ 26; EX1001, 5:19-38. In another embodiment, a system is disclosed in which the external acoustic environment is monitored using a sound pressure level (SPL) dose management system, and allows for modification of the internal acoustic environment of the user either automatically or manually when the SPL dose reaches a level that could damage the ear. EX2001, ¶ 27; *Id.*, 5:63-6:9, 6:20-21. In yet another embodiment, the user can modify their acoustic environment to be able to clearly hear both their own voice and the voices of others on,

e.g., a telephone call by eliminating or minimizing background noise in a noisy external environment. EX2001, ¶ 28; *Id.*, 6:59-7:1, 7:8-17. In yet another embodiment, the invention processes all sounds coming from the external acoustic environment and searches for specific sonic signatures (e.g., snoring or a baby crying) which are then suppressed or enhanced in the internal acoustic environment of the ear canal as necessary. EX2001, ¶ 29; *Id.*, 7:65-8:31.

3. Challenged Claims

Claims 1-12 are challenged in this proceeding. Claim 1, the sole independent claim, recites:

1. A system, comprising:

a user interface; and

an audio device comprising:

a microphone configured to measure ambient sound and generate a microphone signal;

a speaker configured to emit an audio signal;

a memory configured to store instructions;

an audio buffer configured to store at least a portion of the microphone signal;

a data buffer;

a processor operatively coupled to the memory, the processor operatively coupled to the audio buffer, the processor operatively coupled to the data buffer, wherein the processor is configured to execute the instructions to perform operations comprising:

receiving the microphone signal;

sending a portion of the microphone signal to the audio buffer;

analyzing the audio buffer for detecting a sonic signature;

notifying a user when a sonic signature is detected;

sending a modified microphone signal to the data buffer replacing or adding to previous data stored in the data buffer; and

sending a portion of the data stored in the data buffer, spanning a time period, to the speaker in response to a user request, wherein the user request is one of the sonic signature that is a voice command or a manual input from the user interface.

Claims 2-12 recite:

2. The system according to claim 1, wherein the sonic signature is a voice command, and where the voice command is to replay audio.
3. The system according to claim 1, in which the time period is less than 30 minutes.
4. The system according to claim 1, in which the time period is less than 15 minutes.
5. The system according to claim 1, wherein the audio device is wirelessly connected to an earpiece.
6. The system according to claim 5, wherein the earpiece includes: an ambient microphone; and an ear canal receiver.
7. The system according to claim 6, wherein the earpiece further includes: an ear canal microphone.
8. The system according to claim 7, wherein the operation of notifying the user sends a notification signal to the ear canal receiver.
9. The system according to claim 5 wherein the earpiece receiver further includes: a sealing section.
10. The system according to claim 1, wherein the sonic signature detected is one of a siren or an alarm.

11. The system according to claim 10 wherein the user interface is a button.

12. The system according to claim 1, wherein the time period is less than 1 minute.

B. Person of Ordinary Skill in the Art

Petitioner argues that a person of ordinary skill in the art at the time of the invention would have had a Bachelor of Science degree or equivalent in electrical engineering, computer science or a similar field and two years of experience in the design of digital audio systems and associated signal processing such as voice or speech processing and/or acoustic pattern recognition. Pet. at 10. Additional experience in practical design may replace formal education in a person of skill in the art, or vice versa. *Id.* Patent Owner does not dispute this characterization of a person of skill in the art.

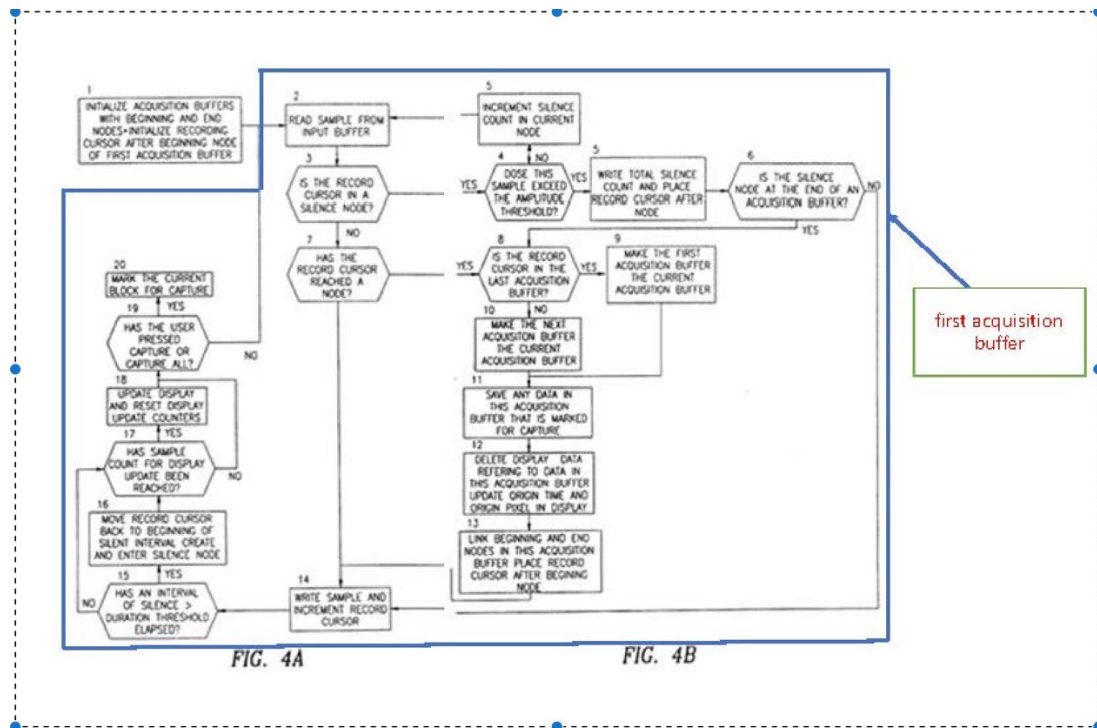
III. OVERVIEW OF CITED PRIOR ART

A. *Fiedler*

U.S. Patent No. 6,804,638 to Fiedler is entitled “Device and Method For Selective Recall and Preservation of Events Prior To Decision To Record The Events.” Fiedler discloses that its invention “enables users effectively to record words that have already been spoken...by the user.” EX1007, 2:35-44. In Fiedler, a signal from “an analog input transducer such as a microphone” is fed to “an analog-digital converter, which in turn passes a train of digital sample values to a set of input buffers.”

EX2001, ¶ 31; EX1007, FIG. 1, 3:67-4:4.

The microphone signal is then sent from the input buffer to a “first acquisition buffer.” *See* FIG. 2; 5:10-17; 5:24-36. FIG. 4 (reproduced below) illustrates the process:



EX2001, ¶ 32; EX1007, FIGS. 4A-4B, 3:52-53. “As audio data are transferred from the input buffers to the acquisition buffers, the successive amplitude values in the audio stream are measured against the amplitude and duration thresholds (FIG. 4, block 15), and the stream is accordingly stored in the acquisition buffers as segments of sound data interspersed with silence nodes.” “[A]fter each sample of audio data is initially written to the acquisition buffer...the recording cursor goes back to the beginning of the sequence of amplitude values in the acquisition buffers corresponding to this interval and writes a silence node there.”

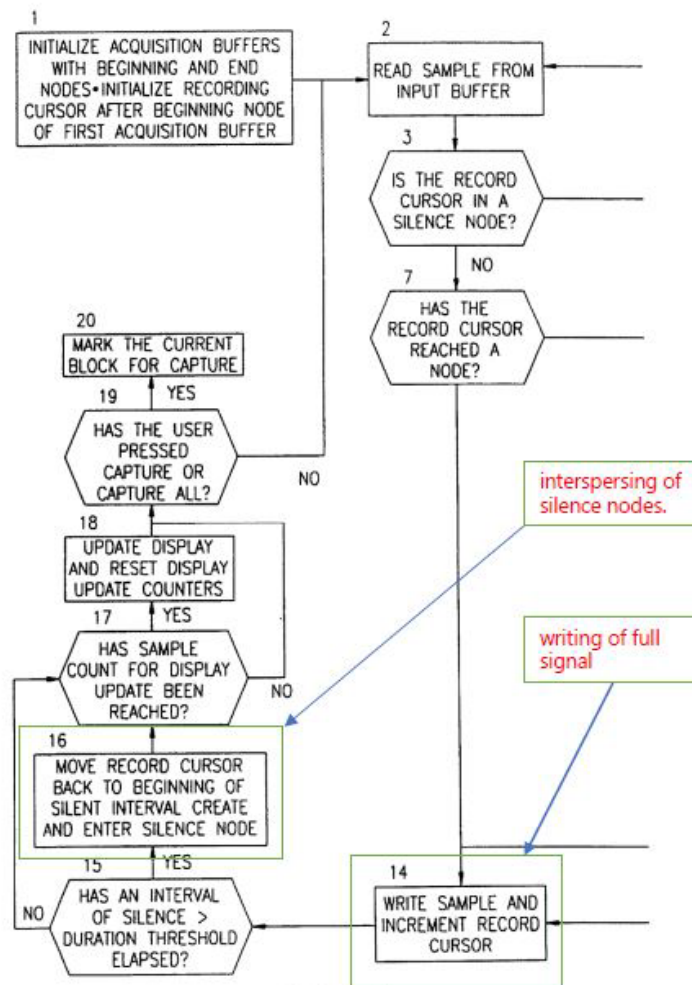


FIG. 4A

EX2001, ¶ 33, EX1007, FIG. 4A, 5:54-59, 6:1-10.

In addition to the primary embodiment, Fielder proposes an alternative embodiment which can be used for “event-activated recording,” which is effected “on detection of a suitable triggering event.” EX2001, ¶ 33; EX1007, 6:33-35. In this alternative embodiment, “the portion of the acquisition buffer contents leading up to the triggering even may be transferred to a second acquisition buffer, which will be used in place of the original acquisition buffer for all purposes described below, including the presentation of data to the user for selection for recall and/or preservation.” EX2001, ¶ 34; Pet. at 34; EX1002 at 59 (citing EX1007, 6:42-47).

In Fiedler’s alternative embodiment, the information in the first acquisition buffer is transferred to a second acquisition buffer from a time “just prior to the triggering event, and advantageously forms a continuous record with the triggering event and the events following it.” EX2001, ¶ 35; EX1007, 6:50-52. Fiedler discloses that this is effected by: (1) continuing to record in the acquisition buffer the triggering event and the events following the triggering event, (2) concurrently with this continuous recording, copying the appropriate portions of the acquisition buffer contents to [the second acquisition buffer], preserving the record of events prior to, including, and following the triggering event, and (3) recording events directly to [the] second acquisition buffer] when the copying process has caught up with the direct recording process by reaching the present moment.” EX2001, ¶ 36; *Id.*, 6:56-67.

Petitioner and their expert acknowledge that their purported combination of Fiedler with the remaining secondary references is based on the second, alternative embodiment of Fiedler, in which Fiedler distinguishes between an “original acquisition buffer” which performs as disclosed in the primary embodiment, and a “second acquisition buffer” which uses an “event-related trigger.” EX2001, ¶ 37; Pet. at 16, 34, 36-38. According to the Petition, the “original acquisition buffer” of Fiedler corresponds to the “audio buffer” of the ‘587 patent, while the “second acquisition buffer” of the alternative embodiment corresponds to the “data buffer” of the ’587 patent. *Id.*

B. *Broussard*

United States Patent Application Pub. No. 2006/0195322 to Broussard (EX1008) is entitled “System and Method for Detecting and Storing Important Information.” The publication discloses “an improved method for recording audio notes for easier later retrieval.” Abstract. “FIG. 2 is a block diagram of major components of the processing and storage unit 12.” EX1008, [0015]. The unit system would either have to receive the analog signal in digital form or have an analog to Digital (A to D) converter 32 which makes the data available to a data processor 34...”. *Id.* “After having been converted to a digital audio signal as previously described, the audio signal 60 enters a buffer memory 62. A trigger detection subsystems 64 uses the data in the buffer 62 to look for triggers in the data that indicate that the incoming signal contains information which should be recorded in a separate extended audio segment.” *Id.*, [0019]; EX2001, ¶ 38.

C. *Victorian*

European Patent Application No. EP 1519625 A2 to Victorian et al. (EX1009) is entitled, “External ear canal voice detection,” and discloses an “ear-level full duplex audio communication systems” which “include one or two ear attachment devices...that wirelessly communicates to a remote device such as a computer, a personal digital assistant (PDA), a cellular phone, a walkie talkie or a language translator.” (EX1009, Abstract); EX2001, ¶ 39. Victorian discloses that “[i]n one embodiment of the invention, a system includes an earmold configured for use as an [in-the-ear] device,” which includes a microphone that receives an “occluded sound” (i.e., the user’s voice) from about the ear canal, processes the sound, and transmits it, while receiving an incoming wireless signal representing a remote sound and converting it into the remote

sound. *Id.*, [0009]-[0011]. Victorian does not disclose receipt of any wireless signal other than one representing a remote sound. EX2001, ¶¶ 40-41.

D. *Andreasson*

U.S. Application No. 2007/0281744 A1 to Andreasson (EX1010) is titled, “Audio Output Device Selection For A Portable Electronic Device,” and discloses “detect[ing] whether an output unit of an accessory is connected to the body of a user and determines audio output units to which its application will transmit audio signal [sic].” (EX1010, Abstract). Andreasson discloses embodiments including an in-the-ear and/or behind-the-ear module. EX2001, ¶¶ 42-43.

E. *Couper*

U.S. Application No. 2008/0162133 A1 to Couper et al. (EX1011) is entitled “Audio Detection Using Distributed Mobile Computing,” and discloses “a method of identifying incidents using mobile devices.” EX1011, [0004]. Such incidents are identified by sound signatures 120, such as “gunshots, explosions, sirens...” *Id.*, [0026]. Upon determining that a sound 150 received by a mobile matches a sound signature 120, “the mobile device [] can send a communication to the event processor 125. In one embodiment, the communication can be a Short Message Service (SMS) message 155.” *Id.*, [0034]. The mobile device can also send a recording of the detected sound over the voice channel of the network. *Id.*, [0044]. EX2001, ¶¶ 44-45.

F. *Bulthuis*

U.S. Application No. 2003/0032447 A1 to Bulthuis (EX1012) is entitled “Conversation Rewind,” and discloses “a consumer electronics device...designed to

record all real time communications occurring on it.” EX1012, Abstract. “Recording is started when a communication is initiated, either by the user making or accepting a call.” *Id.* Petitioner does not allege that Bulhuis discloses the use of any form of an audio buffer or data buffer. EX2001, ¶¶ 46-47.

IV. PETITIONER HAS NOT PROVEN BY A PREPONDERANCE OF THE EVIDENCE THAT THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Legal Principles

To make a *prima facie* showing of obviousness under 35 U.S.C. § 103, the Petition must fulfill the requirements set forth in *Graham v. John Deere Co.*, 383 U.S. 1 (1966), including demonstrating that the cited references teach each element of a challenged claim. *In re Magnum Oil Tools Int’l.*, 829 F.3d 1364, 1376 (Fed. Cir. 2016).

But “[o]bviousness requires more than a mere showing that the prior art includes separate references covering each separate limitation in a claim under examination.” *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011) (internal citation omitted). Rather, Petitioner also has the burden to show there would have been some motivation to modify or combine the asserted prior art, and that the proposed modifications or combinations would render the patented claims obvious. *In re Magnum Oil Tools Int’l.*, 829 F.3d at 1376. It does not suffice that an element is simply known in a prior art reference; “a reason for combining must exist.” *Virtek Vision Int’l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882 (Fed. Cir. 2024).

It is insufficient that “a skilled artisan, once presented with the two references, would have understood that they could be combined,” because “it does not imply a

motivation to pick out those two references and combine them to arrive at the claimed invention.” *PersonalWeb Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993–94 (Fed. Cir. 2017) (internal citations omitted). Nor is it enough to show that the references are in the same field of invention or are compatible. *Johns Manville v. Knauf Insulation*, IPR2018-00827, Paper 9 at 17–20 (PTAB Oct. 16, 2018) (informative).

A reference can “teach away” from combining prior art references when a POSITA, “upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *Ricoh Co., Ltd. v. Quanta Computer Inc.*, 550 F.3d 1325, 1332 (Fed. Cir. 2008) (quoting *In re Kahn*, 441 F.3d 977, 990 (Fed. Cir. 2006)).

Motivation and expectation of success are generally not present where the proposed modification or combination contradicts a reference’s basic teachings or is inoperable. *AstraZeneca AB v. Mylan Pharms. Inc.*, 19 F.4th 1325, 1337 (Fed. Cir. 2021); *In re Urbanski*, 809 F.3d 1237, 1244 (Fed. Cir. 2016) (same).

Hindsight analysis is inappropriate. *Cheese Sys., Inc. v. Tetra Pak Cheese & Powder Sys.*, 725 F.3d 1341, 1352 (Fed. Cir. 2013). A petition must demonstrate a rationale to modify or combine prior art references without relying on the patent disclosure itself. *Apple Inc. v. Contentguard*, Paper 9 at 15, 17; *see also P&G v. Teva Pharms. USA, Inc.*, 566 F.3d 989, 995 (Fed. Cir. 2009); *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012). In other words, the Petitioner must not use the patent as a roadmap. *In re NTP, Inc.*, 654 F.3d 1279, 1299

(Fed. Cir. 2011) (internal citation omitted); *see also KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007).

V. PETITIONER HAS FAILED TO SHOW THE CHALLENGED CLAIMS ARE OBVIOUS

In its Petition, Petitioner alleges that the combination of Fiedler and Broussard renders claims 1, 3, 4 and 12. Each of these arguments is incorrect. First, Fiedler does not disclose the “sending a portion of the microphone signal to the audio buffer.” Rather, the entire microphone signal is sent to the analog/digital converter, which is then sent unaltered to the audio buffer.

A. Ground 1A: Petitioner Has Failed to Show that *Fiedler* in View of *Broussard* Renders Claims 1, 3, 4 and 12 Obvious Under 35 U.S.C. § 103

1. Claim 1 Is Not Obvious Over *Fiedler* In View of *Broussard*

Claim 1 of the '587 Patent recites a system comprising:

a user interface; and

an audio device comprising:

a microphone configured to measure ambient sound and generate a microphone signal:

a speaker configured to emit an audio signal;

a memory configured to store instructions;

an audio buffer configured to store at least a portion of the microphone signal;

a data buffer;

a processor operatively coupled to the memory, the processor operatively coupled to the audio buffer, the processor operatively coupled to the data buffer, wherein the processor is configured to execute the instructions to

perform operations comprising:

receiving the microphone signal;

sending a portion of the microphone signal to the audio buffer;

analyzing the audio buffer for detecting a sonic signature;

notifying a user when a sonic signature is detected;

sending a modified microphone signal to the data buffer replacing or adding to previous data stored in the data buffer; and

sending a portion of the data stored in the data buffer, spanning a time period, to the speaker in response to a user request, wherein the user request is one of the sonic signature that is a voice command or a manual input from the user interface.

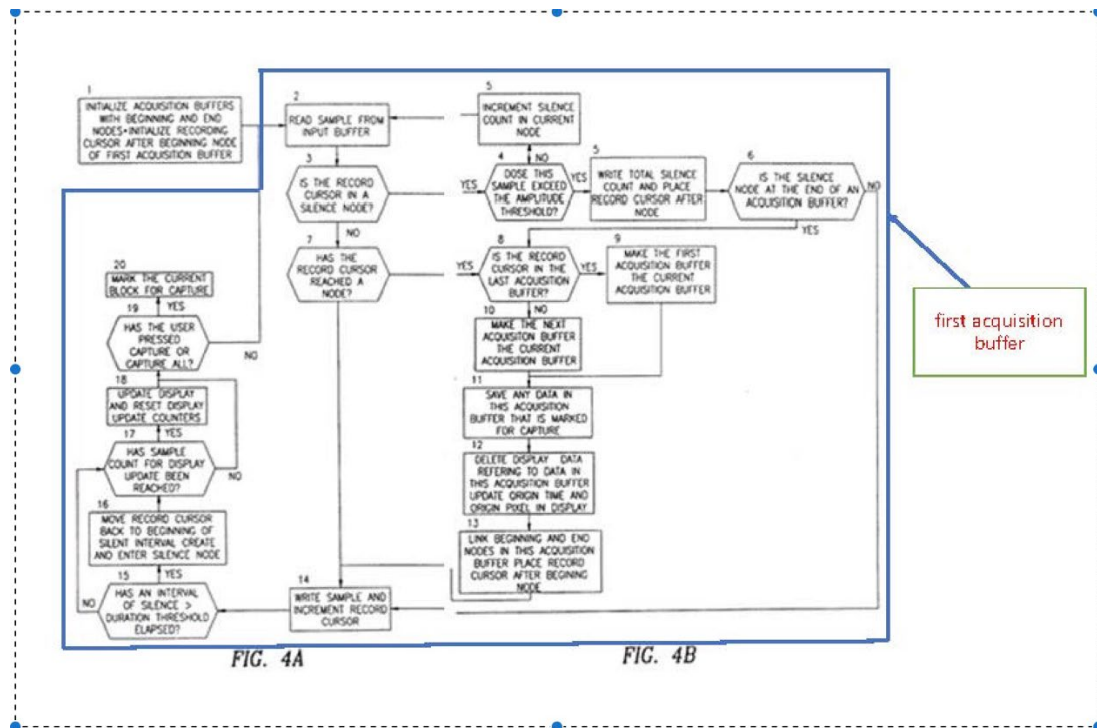
(EX1001 at 24:48-25:10.) Petitioner has failed to show by a preponderance of evidence that it would have been obvious in view of Fiedler and Broussard to configure a processor of an audio device to perform the claimed operations of “sending a portion of the microphone signal to the audio buffer” [1.10] and “sending a modified microphone signal to the data buffer replacing or adding to previous data stored in the data buffer” [1.13].

a. *Fiedler* Does Not Teach “Sending A Portion of the Microphone Signal to the Audio Buffer” [1.10]

Petitioner’s limitation [1.10] of the ’587 patent recites “sending a portion of the microphone signal to the audio buffer,” and Petitioner relies entirely on the Fiedler reference for its argument that this limitation is shown in the prior art. Pet. at 26-28. In Petitioner’s argument, Fiedler’s first acquisition buffer corresponds to the “audio buffer configured to store at least a portion of the microphone signal” in limitation [1.6] of the

'587 patent. Pet. at 18 (citing EX1002, ¶¶ 128-129). The digital samples received by the input buffer of Fiedler from the analog-digital converter are equated by Petitioner to “the microphone signal” of the '587 patent. Pet. at 26 (citing EX1002, ¶¶ 157-158) (“the digital sample values are ‘the microphone signal’ because they were generated from the microphone.”), 28 (“Accordingly, a POSITA would have understood the Fiedler-Broussard combination to disclose or suggest the processor executing instructions to read the digitized audio samples out of the input buffers (“receiving the microphone signal”)...”). Finally, Petitioner equates each of the “samples” in Fiedler to the '587 patent's claimed “a portion of the microphone signal.” Pet. at 27-28 (“Each ‘sample’ is a ‘portion’ of the microphone signal.”) (citing EX1007, Figs. 4A-4B; EX1002, ¶ 160). From this, Petitioner argues that “transfer of the samples into the original acquisition buffer” meets the limitation “sending a portion of the microphone signal to the audio buffer.” Pet. at 28 (citing EX1002, ¶ 161). EX2001, ¶ 50.

This analysis is inconsistent with the disclosures of both Fiedler and the '587 patent. Fiedler is clear that in both its primary and its alternative embodiment, every “sample” received by Fiedler's input buffer (i.e., the entire microphone signal according to Petitioner) is sent to Fiedler's “first acquisition buffer.” EX2001, ¶ 51; *see also* FIG. 2; 5:10-17; 5:24-36. FIG. 4 illustrates this process by which Fiedler's samples are sent to the acquisition buffer:



EX2001, ¶ 52; EX1007, FIGS. 4A-4B, 3:52-53; *see also* 5:54-59 (“As audio data are transferred from the input buffers to the acquisition buffers, the successive amplitude values in the audio stream are measured against the amplitude and duration thresholds (FIG. 4, block 15), and the stream is accordingly stored in the acquisition buffers as segments of sound data interspersed with silence nodes.”)

However, claim 1 of the ’587 patent requires that only “a *portion* of the microphone signal,” not all of the microphone signal, be sent to the audio buffer, and the plain language of claim 1 precludes Petitioner’s argument that sending all of the digital samples to the audio buffer nonetheless constitutes sending “a portion.” Limitation [1.6] of claim 1 requires that the “audio buffer” (which, as explained above, Petitioner maps to the first acquisition buffer of Fiedler) be “configured to store *at least a portion* of the microphone signal.” EX1001, 24:55-56. In other words, the audio buffer must be configured to store more than zero of the microphone signal, but could store the entirety

of the microphone signal. If Petitioner reads “sending a portion of the microphone signal to the audio buffer” as claiming sending the entirety of the microphone signal to the audio buffer, as it must under its analysis, this would construe “at least a portion of the microphone signal” in limitation [1.6], and “a portion of the microphone signal” in limitation [1.10] identically, which would read the term “at least” out of the claim.

EX2001, ¶¶ 53-54. This is improper. *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1382 (Fed. Cir. 2006) (“[W]e decline to construe the term “partially hidden from view” to have the same meaning as ... “at least partially hidden from view”); *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111 (Fed. Cir. 2004); *Bicon, Inc. v. The Straumann Co.*, 441 F.3d 945 (Fed. Cir. 2006).

Should Petitioner attempt to argue in its Reply that the “signal” interspersed with silence nodes that is (eventually) written to the first acquisition buffer of Fiedler is the “portion of the microphone signal” in limitation [1.10], Petitioner runs into a separate problem – it has already identified this signal as the “modified microphone signal” that is sent to the data buffer, not the audio buffer, in limitation [1.13]. Pet. at 36 (“Fiedler’s silence node scheme ‘modifies’ the captured data (i.e., the microphone signal) because it replaces parts of the captured data with a silence node.”) (citing EX1002, ¶ 192); EX2001, ¶ 55. As explained above, Petitioner relies on Fiedler’s second, alternative embodiment for its argument that the challenged claims are obvious. In that alternative embodiment, Fiedler is clear that after a triggering event, the information that is written to the second acquisition buffer (which Petitioner claims corresponds to the ‘587 patent’s data buffer) is identical to the information contained in the first acquisition

buffer (which Petitioner claims corresponds to the audio buffer). 6:48-63. In other words, Petitioner would be taking the position that the same signal is both “a portion of the microphone signal” and “a modified microphone signal.” EX2001, ¶ 56. This is inconsistent with Federal Circuit law. *PPC Broadband, Inc. v. Corning Optical Comm’ns RF, LLC*, 815 F.3d 747, 752-753 (Fed. Cir. 2016); *Applied Med. Res. Corp. v. U.S. Surgical Corp.*, 448 F.3d 1324, 1333 fn.3 (Fed. Cir. 2006).

Further, the specification of the ‘587 patent makes clear that the “portion of the microphone signal” and the “modified microphone signal” are two separate signals, used for two separate purposes. While the portion of the microphone signal is used for sonic signature detection, consistent with the language of the claims, the modified microphone signal is used to manage and/or personalize the user’s acoustic environment. For example, in one embodiment of the ‘587 patent, the signal that is examined for sonic signature detection (the car exterior environment) is different than the signal that is ultimately presented to the user (either the siren, or a statement that an emergency vehicle is coming from a different direction). EX1001, 5:19-38. Other embodiments of the ‘587 patent make the same clear distinction. See, e.g., EX1001, 5:59-6:9, 6:52-7:17, 7:62-8:31, 9:11-27. EX2001, ¶¶ 57-61. Accordingly, Petitioner has failed to show by a preponderance of the evidence that the references in Ground 1 teach “sending a portion of a microphone signal to the audio buffer,” and therefore has not shown that claim 1 of the ‘587 patent is unpatentable.

b. Fiedler Does Not Teach “Sending A Modified Microphone Signal To The Data Buffer...” [1.13]

Petitioner's limitation [1.13] recites "sending a modified microphone signal to the data buffer replacing or adding to previous data stored in the data buffer," and Petitioner relies entirely on the Fiedler reference for its argument that this limitation is shown in the prior art. Pet. at 34-38. Petitioner argues that the "modified microphone signal" of the '587 patent is disclosed by Fiedler's deletion of audio data below a certain amplitude threshold prior to capture, and its replacement with a silence node. *Id.* at 36 (citing EX1002, ¶ 192). However, this, as a person of ordinary skill in the art would understand, the noise gating disclosed in Fiedler does not create a "modified microphone signal." Rather, the system of Fiedler either destroys the "samples" (if the amplitude of the sample is below the defined threshold) or does not change them in any way (if the amplitude is above the threshold). EX2001, ¶ 64-65; EX1007, 5:42-47. In contrast, the embodiments disclosed in the '587 patent all perform some operation on the microphone signal. For example, the '587 patent discloses that modifications of the signal can include "boosting the sound such that the user is made aware of the detected sound, ... attenuating the detected sound, and replacing the detected sound with an alternative sound to name." EX2001, ¶ 66; EX1001, 9:21-27. Other embodiments similarly disclose amplifying the detected signal so as to make the wearer of the earpieces aware of the signal's detection and "eliminate what does not need to be heard while allowing the user to be aware of other sounds in a normal context," 8:24-31, amplifying a signal that is exterior to an automobile (*id.*, 5:19-38), and modifying the voice of a user for clarity and recognizability (6:52-7:17). Note that in the '587 patent, eliminating what does not need to be heard does not delete the signal but rather deletes

the part of the signal (e.g., noise related to drilling as in a dentist office 14:32-33) that is embedded in the signal leaving a part of the original signal modified but not deleted.

EX2001, ¶¶ 67-69.

Accordingly, Petitioner has failed to show by a preponderance of the evidence that the references in Ground 1 teach “sending a modified microphone signal to a data buffer...,” and therefore that claim 1 of the ’587 patent is unpatentable.

2. Claims 3, 4 and 12

Claims 3, 4 and 12 each depend from claim 1. For each of these claims, Petitioner relies on the same teachings of Fielder for its argument that the limitations “sending a portion of the microphone signal to the audio buffer” and “sending a modified microphone signal to the data buffer replacing or adding to previous data stored in the buffer” are shown in the prior art. Pet. at 42. Accordingly, Petitioner has failed to show by a preponderance of the evidence that claim 3, 4 and 12 of the ’587 patent are unpatentable as well. EX2001, ¶ 71.

B. Ground 1B: Petitioner Has Failed to Show that Fiedler, Broussard and Victorian Render Claims 5-9 Obvious Under 35 U.S.C. § 103

Ground 1B alleges that the combination of Fiedler, Broussard and Victorian renders claims 5-9 obvious. However, Ground 1B relies on the same arguments as Ground 1A for the terms “sending a portion of the microphone signal to the audio buffer” and “sending a modified microphone signal to the data buffer...” That is, Petitioner does not rely on Victorian to supply these missing limitations. Pet. at 43-52. Therefore, for the reasons explained in Section VI.A.1., Petitioner has failed to show

that the references cited in Ground 1B render claims 5-9 of the '587 patent unpatentable. EX2001, ¶ 72.

C. Ground 1C: Petitioner Has Failed to Show that Fiedler, Broussard, Victorian and Andreasson Render Claim 8 Obvious Under 35 U.S.C. .§ 103

Claim 8 depends from claim 1 via claims 5, 6, and 7. Ground 1C alleges that the combination of Fiedler, Broussard, Victorian and Andreasson renders claim 8 obvious. However, Ground 1C relies on the same arguments as Ground 1A for the term “sending a portion of the microphone signal to the audio buffer” and “sending a modified microphone signal to the data buffer....” That is, Petitioner does not rely on Victorian or Andreasson to supply these missing limitations. Pet. at 52. Therefore, for the reasons explained in Section VI.A., Petitioner has failed to show that the references cited in Ground 1C render claim 8 of the '587 patent unpatentable. EX2001, ¶ 73.

D. Ground 1D: Petitioner Has Failed to Show that Fiedler, Broussard and Couper Render Claims 10 and 11 Obvious Under 35 U.S.C. .§ 103

Ground 1D alleges that the combination of Fiedler, Broussard and Couper renders claims 10 and 11 obvious. However, Ground 1D relies on the same arguments as Ground 1A for the terms “sending a portion of the microphone signal to the audio buffer” and “sending a modified microphone signal to the data buffer....” That is, Petitioner does not rely on Victorian or Andreasson to supply these missing limitations. Pet. at 57-60. Therefore, for the reasons explained in Section VI.A.1., Petitioner has failed to show that the references cited in Ground 1D render claims 10 and 11 of the '587 patent unpatentable. EX2001, ¶ 74.

E. Ground 2: Petitioner Has Failed to Show that Fiedler, Broussard and Bulthuis Render Claims 1 and 2 Obvious Under 35 U.S.C. .§ 103

Ground 2 alleges that the combination of Fiedler, Broussard and Bulthuis render claims 1 and 2 obvious. However, Ground 2 relies on the same arguments as Ground 1A for the terms “sending a portion of the microphone signal to the audio buffer” and “sending a modified microphone signal to the data buffer....” Pet. at 60, 66. That is, Petitioner does not rely on Bulthuis to supply these missing limitations. Therefore, for the reasons explained in Section V.A.1. above, Petitioner has failed to show that the references cited in Ground 2 render claims 1 and 2 of the ’587 patent unpatentable. EX2001, ¶ 75.

VI. CONCLUSION

For the reasons stated above, Patent Owner requests that the Board find Petitioner has failed to meet its burden to show by a preponderance of the evidence that the challenged claims are unpatentable.

Dated: December 6, 2024

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(b) and (d), the undersigned hereby certifies that this Patent Owner Response complies with the type-volume limitation of 37 C.F.R. § 42.24(b)(1) because, exclusive of the exempted portions, it contains 6,057 words as counted by the word-processing system used to prepare the paper.

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CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing document was served electronically via electronic mail on December 6, 2024 on the following counsel of record for

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