

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

META PLATFORMS, INC.,

Petitioner

v.

JAWBONE INNOVATIONS, LLC,

Patent Owner.

IPR 2023-01127
Patent 8,019,091 B2

Record of Oral Hearing
Held: September 20, 2024

Before GEORGIANNA W. BRADEN, NORMAN H. BEAMER,
JASON M. REPKO, and *Administrative Patent Judges*.

IPR 2023-01127
Patent 8,019,091 B2

APPEARANCES:

ON BEHALF OF THE PETITIONER:

LISA NGUYEN, ESQUIRE
DAVID TENNANT, ESQUIRE
GRACE WANG, ESQUIRE
Paul Hastings LLP
1117 S. California Avenue
Palo Alto, California 94304-1106

ON BEHALF OF THE PATENT OWNER:

RICHARD COWELL, ESQUIRE
Fabricant LLP
411 Theodore Fremd Avenue
Suite 206 South
Rye, New York, 10580

The above-entitled matter came on for hearing on Friday,
September 20, 2024, commencing at 1:00 p.m., at the U.S. Patent and
Trademark Office, 600 Dulany Street, Alexandria, Virginia.

1 time unless there's some special circumstance. Petitioner's Counsel
2 will begin, followed by Patent Owner's. We ask that the parties hold
3 any objections to the party's arguments until it's your time at the
4 podium.

5 So, with that, I'm going to invite Petitioner's Counsel to begin.
6 And I need to know how much time you wish to reserve for rebuttal?

7 MS. WANG: Thank you, Your Honor. I'll reserve 10 minutes
8 for rebuttal.

9 JUDGE REPKO: Okay. Give me a moment while I set the
10 timer. You may begin.

11 MS. WANG: Thank you, Your Honor. I actually have
12 demonstrative slides if you want them in person. If you want the hard
13 copy.

14 JUDGE REPKO: We don't need a hard copy. Thank you.

15 MS. WANG: Thank you. Good afternoon again, Your Honors.
16 Grace Wang of Paul Hastings for Petitioner Meta. With me today are
17 Silvia Medina, in house counsel at Meta. And dialing in remotely are
18 Lisa Nguyen and David Tennant, both of Paul Hastings.

19 Turning to slide 2 of Petitioner's demonstratives. This is
20 Exhibit 1022. The primary dispute between the parties for today is
21 whether there is motivation to combine Ikeda with Puthuff in ground
22 1 or to combine Ikeda with Alcivar in ground 2. Under ground 1,
23 Petitioner relies on two different combinations of Ikeda with Puthuff.
24 There's no disputed limitations for the first combination, and there's
25 two disputed limitations for the second combination. As we're going
26 to get into later, all of -- or, Patent Owner's arguments on motivation

1 to combine. And these two disputed limitations are based on their
2 misunderstanding of the petition, their misreading of the
3 combinations, and their misunderstanding of the technology.

4 Turning to slide 5, the subject matter of the '091 Patent is to
5 perform noise removal. So, what we're showing on this slide is figure
6 2 of the '091 Patent. There's three inputs into the noise removal
7 system. There's two microphones shown in green. The top
8 microphone is a main microphone one, and the bottom microphone is
9 a reference microphone two. The third input to the noise removal
10 system is what's called a VAD, a VAD or V-A-D, voice activity
11 detector. That is providing voice information into the noise removal
12 system.

13 Now, you can imagine in a perfect world, the top main
14 microphone is receiving pure speech, no noise. And the bottom
15 reference microphone is receiving pure noise, no speech. That's in a
16 perfect world. Of course, the real world is not perfect. And what
17 happens in the real world is crosstalk. So, you can see what's
18 happening in the figure is we have noise entering and corrupting the
19 top main microphone, and you have speech signal entering, corrupting
20 the bottom reference microphone. So, what this means is both
21 microphones are going to have a combination of signal and noise.

22 Now, according to the patent, what you can do is use this voice
23 signal, use the VAD signal to tell you whether the person is speaking
24 or not. If they're not speaking, this greatly simplifies the problem.
25 When there's no speech, you know that the microphones are receiving
26 pure noise. And in that case, you can use these time periods of pure

1 noise to calculate these transfer functions, H1 and H2. And then when
2 speech does occur, you can apply these transfer functions to remove
3 the noise from that speech. The result at the output of figure 2 is a
4 cleaned up speech signal.

5 For the most part, Patent Owner does not dispute that the
6 proposed combinations in the petition solve this exact same problem
7 in the exact same way as what I just described. Their only argument
8 boils down to whether there is motivation to combine the proposed
9 combinations, and the evidence shows that there is. So, I'll turn
10 quickly to slide 9.

11 The petition has five different grounds. Only grounds 1 and 2
12 are at issue between the parties. Patent Owner raises no argument
13 with respect to grounds 3, 4, and 5, which build on top of grounds 1
14 and 2.

15 So, we're going to spend some time talking about the Ikeda
16 reference because this is really the main dispute between the parties.
17 What Ikeda has, sorry, this is slide 10, is two different teachings. One
18 teaching is a conventional noise canceller, and the other teaching is an
19 inventive noise canceller that builds on top of the conventional noise
20 canceller. The petition relies on both teachings throughout. The main
21 dispute between the parties is what is this conventional teaching in
22 Ikeda? And does it actually teach away from the combinations in the
23 petition?

24 Turning to slide 11, these figures on the slide are showing
25 Ikeda's conventional noise canceller. The top figure is going to look
26 very familiar. It has signal and noise sources on the left, two green

1 microphones, 1 and 2, a main microphone on top and a reference
2 microphone on the bottom. This is illustrating the same problem as
3 the '091 Patent. You have cross talk. Noise is corrupting the top main
4 microphone. Speech is corrupting the bottom reference microphone.

5 The way that Ikeda addresses this problem is also the same as
6 in the '091 Patent. This is the text on the left-hand side of the slide.
7 Ikeda at Exhibit 1003, column 3, line 32 to 54. Ikeda's conventional
8 noise canceller has something that Ikeda calls the outside, and that
9 outside has to perform two functions. The first function is that the
10 outside has to tell us when the desired speech is absent. This means
11 there's only noise. So, what Ikeda tells us to do is let's update or adapt
12 the blue filter 3 to get a good noise estimate. And this way, when the
13 system does the subtraction at block 4 in Ikeda, that's going to remove
14 the noise that corrupts the top main microphone. The result also still
15 same as the '091 Patent, a cleaned up speech signal.

16 The outside has to do an additional thing. The second thing that
17 the outside has to do is detect when noise is absent. This means that
18 there's only speech on the microphones. And in those instances, Ikeda
19 tells us adapt or update the yellow filter 6, so that when we do the
20 subtraction at block 7, we will remove the speech that's corrupting the
21 bottom reference microphone. We're going to revisit this later, but
22 this is going to be important, this requirement that Ikeda has to do
23 both functions of detecting absence of speech as well as absence of
24 noise.

1 Turning to slide 13, Ikeda's second teaching. This is their,
2 Ikeda's, inventive noise canceller. It has the same setup as the
3 conventional noise canceller. You have the same --

4 JUDGE BRADEN: In terms of -- please confirm that this
5 Ikeda's invention teaching is what Patent Owner is referring to as the
6 second combination. Is that correct? Or is this?

7 MS. WANG: That's a good question, Your Honor. So, these
8 are two separate teachings in Ikeda. What Patent Owner and what I
9 will refer to today as the second combination is a specific way of
10 combining the Puthuff reference in ground 1 with the Ikeda reference.
11 And that is, it is, there is a first combination, which is another way of
12 replace -- of combining the two references.

13 JUDGE BRADEN: Okay. And are those specific to either the
14 conventional teaching or the invention teaching?

15 MS. WANG: So, both combinations are modifying the
16 inventive teaching. Yes.

17 JUDGE BRADEN: Thank you.

18 MS. WANG: Thank you. Okay, so the inventive teaching.
19 What the inventive teaching in Ikeda adds to the conventional noise
20 canceller is this purple block on slide 13, which is a VAD. It's a
21 VAD, a voice activity detector because of the signal-to-noise power
22 ratio estimator block or the SNR block. The SNR block tells you how
23 much voice there is relative to noise, and that's why it's a VAD. The
24 VAD also has this corresponding step size output circuit 11 that
25 determines how and when to adjust the adaptive filters. But it's really
26 the same principles that apply for this inventive noise canceler as for

1 the conventional one. Depending on how high the SNR is, you're
2 going to either adjust the blue filter more or adjust the yellow filter
3 more.

4 Turning to slide 14, let's take a look at what Ikeda describes as
5 the outside in the context of the inventive noise canceller. This is the
6 main point of contention between the parties. What Ikeda says, this is
7 the top left quote on slide 14 is, let's use this purple circuit, quote,
8 even when adequate learning sections cannot be indicated from the
9 outside. Patent Owner makes a lot out of this statement and other
10 similar statements in Ikeda. They rely on this to argue that this is
11 teaching away, that this, you would never replace, you would never
12 touch, you would never modify the purple VAD with anything,
13 especially with an outside sensor, and this teaches away from the
14 combinations.

15 But the evidence shows that Patent Owner is wrong for two
16 reasons. One is the way Ikeda describes the outside, that is not used
17 or required in the combination. Therefore, it's not teaching away
18 because it's describing something different. And the second
19 independent reason is, even if they were the same, even if Ikeda's
20 outside was the same as the combination, this statement, and nowhere
21 else in Ikeda does it state, that the outside should not be used together
22 with the purple VAD.

23 We're going to jump to slide 16, where we are showing the
24 three different combinations at issue for the independent claims.
25 Again, two combinations in ground one, one combination -- a third
26 combination for ground 2. In each case, we are relying on a voice or

1 VAD sensor from the secondary reference, Puthuff or I to add to
2 Ikeda's circuit. Now, we're going to start with the second combination
3 in ground 1. In the second combination, we're keeping Ikeda's purple
4 VAD intact, and we're just adding to it. We're enhancing it with
5 Puthuff sensor and its related teachings. Now, if Your Honors find
6 that the second combination is good and meets the claims, we don't
7 have to consider the first or the third combinations.

8 Turning to slide 17, we're going to take a quick look at what
9 Puthuff actually describes. Puthuff is a vibration sensor or an
10 accelerometer that detects bone conduction on the speaker's skin on
11 their skull. According to Puthuff, this bone conduction signal is
12 especially useful because when there's high acoustic noise, the
13 vibration sensor is going to pick up the vibration on the skull of the
14 speaker or the skin on the skull of the speaker, and that's going to
15 enhance and improve the quality of the signal. Now, in Puthuff, that
16 vibration signal is processed as an audio signal. It's combined with
17 the microphone signal, and the result is a cleaner signal. We know
18 that the vibration signal is audio because the teaching in Puthuff, this
19 is the bottom right quote on slide 17, Puthuff, Exhibit 1004, page 10,
20 lines 10 to 11, is of a, quote, bone conduction component of the audio
21 signal, end quote. So, it's an audio signal that is being added to
22 Ikeda's audio system.

23 JUDGE REPKO: Before you go on, I just had a quick question
24 about that. So, in your combination, Puthuff sensor essentially
25 determines that the vibrations are speech. That's what you mean when
26 you say audio signal?

1 MS. WANG: The Puthuff sensor determines that there's
2 vibrations in speech, and it processes those vibrations as an auditory
3 signal. Yes.

4 JUDGE REPKO: So, that means somebody's talking, right?

5 MS. WANG: Correct.

6 JUDGE REPKO: Someone's talking. And that is, in your
7 proposed combination, that's going to indicate speech?

8 MS. WANG: Yes.

9 JUDGE REPKO: In combination with Ikeda, Ikeda is going to
10 interpret that signal as someone's talking at that point. Is that correct?

11 MS. WANG: Right. Right.

12 JUDGE REPKO: Thank you.

13 MS. WANG: Okay, so I'm going to jump down to slide 31.
14 These are Patent Owner's motivation to combine arguments. Patent
15 Owner is presenting five main arguments. They're all wrong for
16 different reasons. If Your Honors have any specific issue you'd like to
17 discuss, I'm happy to address that first. Otherwise, I could just take
18 each of these in turn.

19 The first issue, the first argument is on slide 32, Patent Owner
20 in their POR at 17, their argument shows that they're really addressing
21 the wrong combination. They're relying on bodily incorporation,
22 which we know is not the correct test. What they focus on is that
23 we're taking Puthuff sensor by itself, that it's Puthuff sensor alone in
24 isolation. This is also in the POR at 28, 29, and 30.

25 Turning to slide 33. As we've just discussed, discussed when
26 we looked at Puthuff, that is not the combination. The petition clearly

1 points to Puthuff's disclosure of the bone conduction component of
2 the audio signal, not the vibration sensor by itself in isolation. This is
3 in the petition at 31 and 35. Patent Owner argues that because we're
4 taking the vibration sensor, the combination system now all of a
5 sudden becomes mixed modality; because there's vibration and there's
6 audio, and that's two different modalities to have in the system. And
7 they say that this distorts the signals. This is in their POR at 30.

8 But again here, there's no mixed modalities because we're
9 taking the audio portion or the bone conduction component of an
10 audio signal, which is an audio signal, and we're combining that with
11 Ikeda's audio system. A lot of Patent Owner's remaining arguments
12 actually stem from this misreading of the combination.

13 Turning to slide 35, second argument. Patent Owner argues at
14 POR 26, the combination does not denoise properly. They further
15 explain this argument at POR 29 by -- basically saying that, well, now
16 you have two signals that have different amounts of noise. You have
17 one cleaned up signal from the vibration of your -- of Puthuff, and you
18 have another acoustic signal that's still very noisy. And what Patent
19 Owner concludes is that the system, this is the bottom quote on page
20 on slide 35, what they conclude is that the combination system is
21 going to, quote, subtract out of full acoustic noise, $N(z)$, as received at
22 the reference microphone and as part of $XB(z)$. This subtraction
23 would distort the desired signal in $XA(z)$. But this is based on their
24 own misunderstanding of how the combination works and how
25 adaptive filters operate.

1 Turning to slide 37, Dr. Stern testified. This is paragraph 20 of
2 his reply declaration Exhibit 1021. Patent Owner, quote,
3 misunderstands the general principles behind the operation of adaptive
4 filters, end quote. And, quote, completely omits the operation of the
5 adaptive filter in its analysis, end quote. So, by omitting them, Patent
6 Owner's basically arguing that the adaptive filters have to do nothing.

7 Turning to slide 38, but of course they don't do nothing. They
8 have to do something. And the thing that they do is identify, quote,
9 the portion of noise in the reference channel that correlates with the
10 noise in the primary channel. by identifying the correlated noise that
11 is common to both the cleaned up microphone and the noisy reference
12 microphone, this combination is now only going to subtract not the
13 full noise at Patent Owner alleges, but only the correlated noise. In
14 other words, this is on slide 39, due to the presence of the adaptive
15 filters and their operation, the system necessarily removes only the
16 noise that appears that actually is there in the main channel, not more
17 than that. And because of that, there's no added distortion and the
18 combination performs proper denoising.

19 Third argument, slide 40. The petition describes several
20 benefits to the combination. One of these benefits is explicitly stated
21 in Puthuff. This is the quote on the left of slide 40. Puthuff says,
22 quote, but the bone conduction expedient improves system immunity
23 to false triggering due to noisy environments. So, what is false
24 triggering? Dr. Stern explains to in the quote on the right of slide 40,
25 false triggering is what happens when the system falsely identifies
26 background noise as speech. So, if we do a very quick example, let's

1 say I'm the main speaker. While I'm talking, there's someone else in
2 the room, in the background, who's talking at the same time. In
3 Ikeda's system, both of Ikeda's microphones might pick up that
4 background noise, not realize that it's noise. They might mislabel it or
5 mischaracterize it as coming from me. And so, when they do that,
6 they falsely identify that, the background, as part of the desired signal.
7 And when that happens, that background speech is not subtracted, it's
8 not cleaned up from the main microphone signal.

9 Now, in the combination, what we're adding is Puthuff's
10 vibration sensor. It's attached to my skin on my skull. And so, it's
11 detecting my vibrations when I'm speaking. And it's only sensitive to
12 my vibrations. It's not sensitive or it's not picking up anything to do
13 with the background speaker. And what that means is that it's not
14 going to falsely identify that background speech as desired signal.
15 And this is the reason why there's less false triggers, because now
16 we've enhanced Ikeda by adding Puthuff to more accurately label the
17 times when speech from me, the main speaker actually occurs. So,
18 this is the benefit in the combination of reduced false trigger.

19 JUDGE REPKO: So, going back to that section where Patent
20 Owner alleges Ikeda teaches away. It says the correction
21 characteristics are not achievable unless the adequate learning sections
22 are indicated to the, each adaptive filter. So, I guess in your
23 combination, if you just clarify, it's the Puthuff sensor, it's using that
24 bone conduction to determine how to drive the adaptive filters or how
25 to indicate these sections of the adaptive filters. Is that correct? And
26 can you kind of discuss that a little bit more?

1 MS. WANG: Yeah. Thank you, Your Honor, for that question.
2 So, in the combination, we're combining the -- in this second
3 combination in ground 1, what we're doing is combining Ikeda's SNR
4 block with the information that we have from Puthuff. So, the SNR
5 might be, might not be very certain that there's actually signal
6 occurring. Right. So, it might be like a 50/50 percent likelihood or
7 something. And what, by adding, by introducing the vibration sensor
8 from Puthuff, we can, we're basically saying we can improve that
9 certainty that there's actually speech coming from your target main
10 person up to, I don't know, like 95/100 percent. Right. Because the
11 person is actually vibrating. Does that answer your question?

12 JUDGE REPKO: Yes. Thank you.

13 MS. WANG: Okay, so turning to slide 41, fourth argument.
14 This gets to their teaching away argument. So, Patent Owner's
15 arguing Ikeda really discourages using outside sensors, therefore
16 discourages the combination. But the evidence shows that Ikeda's
17 outside is actually different from Puthuff sensor. Remember that
18 Ikeda's sensor, or Ikeda's outside has to do two things. This is the
19 quote on the left on slide 41 that we just went through. It has to detect
20 the absence of the desired signal. Yes, that is what a voice sensor,
21 what a VAD sensor will do.

22 But the second thing that the outside has to do in Ikeda is detect
23 absence of noise. That is not what a voice sensor, what a VAD sensor
24 does. That is not what Puthuff sensor does. And Dr. Sayeed, in the
25 quote on the right, Jawbone's expert, on the right of slide 41,
26 Jawbone's expert, Dr. Sayeed, admitted during his deposition

1 testimony, no, VAD is not detecting when noise is absent. Puthuff
2 sensor, it's a normal vibration sensor. It's used as a VAD. It doesn't
3 detect absence of noise. So, it really should be undisputed that Ikeda's
4 outside is not the same as Puthuff's sensor. And what this means is
5 that all of Patent Owner's arguments that the proposed combinations
6 are not obvious because of language that Ikeda uses to describe the
7 outside, that is not relevant and should be rejected.

8 Fifth argument, slide 42. Even if it was the same, even if
9 Ikeda's outside is the same as Puthuff's sensor, there's still no teaching
10 away. Patent Owner is going to point Your Honors to this part of
11 Ikeda shown on slide 42, as well as other parts of Ikeda that it argues
12 support a teaching away from the outside. But if we actually take a
13 minute and stop and read these portions of Ikeda , it's not actually
14 saying, let's totally avoid using anything in the outside.

15 What Ikeda does say is there are certain situations where using
16 the outside is going to, it's going to be difficult and you want to have a
17 system that can compensate for even when the outside makes that
18 adaptation difficult, but it really just depends on the situation.
19 Statements like this, these are not deficiencies with Ikeda's outside.
20 These are nothing problems that the outside is introducing into Ikeda's
21 system. Ikeda never states that the outside and the VAD are mutually
22 exclusive. It doesn't advocate for abandoning outside sensors
23 wholesale. It never states that its purpose is to avoid having an
24 outside sensor. And this is what distinguishes our facts from the Tri-
25 Vascular (phonetic) facts that Patent Owner cites in its papers.

1 Patent Owner, sort of, admits that there's no explicit
2 disparagement. They rely on implicit disparagement in the POR at
3 21. Even when we asked Dr. Sayeed, Patent Owner's expert, to
4 describe a situation in which using Ikeda's outside would have been
5 difficult, he said, no, I don't know. This is in his transcript, Exhibit
6 1020, page 50, line 6 to 10, and it's cited in our reply at 11. Dr. Stern
7 testified that adding a sensor, adding this voice sensor from Puthuff,
8 that's only going to improve the VAD and therefore the noise
9 cancellation. This is in his Exhibit or, sorry, his first declaration,
10 Exhibit 1002, paragraphs 91, 97, and 98. And that makes sense,
11 right? More information is always going to be better. More
12 information will help you improve performance. And if given the
13 opportunity to clean up the main microphone signal, why wouldn't
14 you want to take that opportunity?

15 JUDGE REPKO: So, in the record, are there specific examples
16 of the situation in which this would be difficult?

17 MS. WANG: There are none, Your Honor. Ikeda's pretty, I
18 guess, high level or not very specific about what those situations are.
19 And Dr. Sayeed was unable to explain or point to any examples in
20 which those situations would occur.

21 JUDGE REPKO: Thank you.

22 MS. WANG: Okay. So, I'm going to turn to the disputed
23 limitations for the second combination. Unless there's other questions
24 on motivation to combine.

25 JUDGE REPKO: I have no other questions. Do my
26 colleagues? No. There are no questions.

1 MS. WANG: Okay. Thank you, Your Honors. So, turning to
2 slide 46, the first limitation in dispute is generating transfer functions
3 in response to a determination that voicing activity is at absent or
4 present from the acoustic signals.

5 Slide 47 Patent Owner makes a first argument, but we can see
6 pretty quickly that it's based entirely on its incorrect premise on the
7 mixed modality issue. They conclude that, this is the quote from POR
8 30 on the left hand side of slide 47, they conclude that the Ikeda
9 circuit will act unpredictably. But again, this is kind of -- this is
10 entirely based on their assumption that the adaptive filters have to do
11 nothing when what they actually do is remove the correlated noise in
12 both channels. And as discussed on slides 36 through 39, the
13 evidence establishes that the combination circuit does denoise and
14 behave properly, so there's no added distortion and there's no
15 unpredictability in the combination circuit.

16 Slide 48. Patent Owner's making a second argument for this
17 disputed limitation. This is in their sur-reply at 20, where they argue
18 even if the transfer functions are generated properly, they're saying it's
19 not generated based on whether voicing activity is present in the
20 acoustic signals. But the petition at 26 already describes how the
21 transfer functions are calculated, quote, when signal component $S(z)$
22 is present, end quote. That presence of $S(z)$ that's in the acoustic
23 signal.

24 Patent Owner might be arguing that, you know, the
25 combination is introducing this vibration sensor. If the vibration
26 sensor is picking up the speech, then the same speech cannot also be

1 present in the acoustic signals. But that should be plainly rejected.
2 Speech is obviously going to appear in both signals. When I'm
3 speaking, the vibration sensor on my skull, it's picking up the
4 vibrations from my skin and my tissue. So, certainly the speech is
5 picked up by the vibration sensor. But at the same time, when I'm
6 speaking, my speech is producing a sound, which is how it's reaching
7 the microphone in this room and your ears. And so, my voice is also
8 present in the acoustic signals. So, just because voice is present in the
9 vibrations signal doesn't mean that it's no longer present in the
10 acoustic signal.

11 Turning to the second disputed limitation, slide 49. Generating
12 -- this is for claim 1. Generating a VAD signal using the voice
13 activity signal. On slide 50, Patent Owner argues at page 31 of the
14 POR that Petitioner makes no argument that the second combination
15 teaches this limitation, but they seem to just have overlooked our
16 argument on page 42 of the petition where we clearly refer to the
17 combination where Puthuff's signal is being used as an input into
18 Ikeda's purple VAD. That's a clear reference to the second
19 combination. And this is also in our reply at 18.

20 JUDGE REPKO: So, I want to make sure you have time to talk
21 about the Alcivar reference.

22 MS. WANG: Okay.

23 JUDGE REPKO: And I have a specific question about that. If
24 we could kind of move on to that.

25 MS. WANG: Yes.

1 JUDGE REPKO: And my question is about Ikeda's use of
2 microphone 2 for the noise input. And specifically, like, where does
3 Ikeda's reference signal, microphone 2, work in your combination?
4 That's the noise input 1. If you could speak a little bit about that in the
5 Alcivar combination.

6 MS. WANG: Yeah, yeah. Thank you, Your Honor. So, it
7 works in a similar way as with the Puthuff sensor. So, the Alcivar
8 sensor, it's a tissue conduction microphone that's touching the user's
9 throat, and you have a reference noise, noisy microphone that's
10 picking up the acoustic signal. So, in that combination, when the
11 presence of Alcivar's tissue conduction microphone, it provides the
12 same information as in Puthuff's voicing sensor. Right. It tells you
13 when the speaker is vibrating and therefore producing speech. And
14 that helps to inform when speech is occurring or not for removing
15 speech from the noisy reference channel.

16 JUDGE REPKO: Okay. And I guess in Alcivar, I know you
17 didn't talk about this a lot, but they talk about, like, breathing noises,
18 and they have this diver's mask and all of this.

19 MS. WANG: Yeah.

20 JUDGE REPKO: And so, you have, Ikeda's microphone 2.
21 That picks up noise input.

22 MS. WANG: Mm-hmm.

23 JUDGE REPKO: In terms of how this combination would be
24 used or how you envision it to be used, I mean, is it incorporating the
25 diving mask? Are all these applications involved where you're trying
26 to filter out these breathing noises?

1 MS. WANG: Thank you, Your Honor.

2 JUDGE REPKO: And can you talk a little bit about that and
3 how that works in combination with that microphone 2 in Ikeda,
4 which does receive the noise input?

5 MS. WANG: Yes. Thank you, Your Honor. So, the
6 combination with Alcivar is just taking the tissue conduction
7 microphone itself. Patent Owner makes a lot, a big deal about the fact
8 that it's an underwater system. It's a mask. It's divers. There's
9 insulation around the microphone. The combination that's articulated
10 in the petition is only taking the microphone itself. So, we're not
11 bodily incorporating, like all of Alcivar, the mask, the environment
12 that it's in. We're only relying on the microphone.

13 But even if we were doing bodily incorporation and taking all
14 of Alcivar mask and kind of pushing it up or using it together with
15 Ikeda's system, there's still nothing in this combination or in the
16 claims that limits anything to a specific type of noise. They make a
17 lot of arguments about near-field noise, far-field noise, and how it's all
18 different and how, therefore, it's like the combination is incompatible.
19 But really, when you look at the claims, when you look at the
20 combination, there's no requirement in anything that there has to be
21 near-field noise, that it has to address far-field noise, or that it has to
22 address some other type of noise. It's just noise.

23 And Dr. Sayeed, this is our last slide. Slide 57. During his
24 testimony, his deposition, he agreed that both far-field noise and both
25 near-field noise are both undesired. So, in the combination system, as
26 long as those two noises are correlated, which could be two near-field

1 noises, two far-field noises, or one of each, as long as they're
2 correlated, they're going to be removed.

3 JUDGE REPKO: Okay. Thank you.

4 MS. WANG: And with that, I see I'm out of time, or almost out
5 of time, but I'll just end by wrapping up and saying that the main
6 takeaways are that this is a case that comes down to motivation to
7 combine. And we don't think there's any evidence supporting Patent
8 Owner's teaching away arguments. Thank you.

9 JUDGE REPKO: Okay. Thank you. You've got 10 minutes
10 for rebuttal. Patent Owner, you can take the podium and let me know
11 how much time you wish to reserve for rebuttal.

12 MR. COWELL: Thank you, Your Honor, I would like to
13 reserve 10 minutes for sur-rebuttal.

14 JUDGE REPKO: All right. You may begin.

15 MR. COWELL: Sorry. Just one moment. I'm not in
16 presentation mode. I'm sorry.

17 JUDGE REPKO: I'll reset the timer.

18 MR. COWELL: Thank you. I appreciate that. So, good
19 afternoon, Your Honors. Richard Cowell of Fabricant, LLP for Patent
20 Owner Jawbone. And I agree with Ms. Wang that a lot of this dispute
21 is focused on motivation to combine and whether a POSITA reading
22 Ikeda in Puthuff or Ikeda and Alcivar would be motivated to combine
23 them, as the Petitioner suggests.

24 Now moving. I'm on slide 4. And what Petitioner has, two
25 Ikeda plus Puthuff combinations. One where you use the vibration
26 sensor in place of, or in addition to Ikeda's VAD. I'm sorry. One is

1 where they're in place of, two is in addition to Ikeda's VAD, and they
2 call Ikeda signal to noise power ratio estimator and step-size output
3 circuit, Ikeda's VAD, and that's the purple highlighting that Ms. Wang
4 showed us earlier.

5 Now, Ikeda is clear as to what its invention is. Its invention is
6 to avoid needing to use a command input from the outside. And Ms.
7 Wang said many things about what outside was, but she also, in her
8 petition, told us exactly what outside is, and that's in the bottom left-
9 hand here on slide 5, which is outside, is using a sensor other than the
10 physical microphones, or at least that's one example of it to be the e.g.

11 JUDGE REPKO: So, do you agree with that?

12 MR. COWELL: I agree that when Ikeda's -- when Ikeda refers
13 to outside, it means using a sensor other than the physical
14 microphones.

15 JUDGE REPKO: Okay.

16 MR. COWELL: I agree. And so, Ikeda explains how it avoids
17 that need. And that's by its -- I'm on slide 6 now. That's Ikeda's
18 unique configuration, where it compares the relation size between the
19 desired signal and the noise signal. So, it determines an estimated
20 signal to noise power ratio of the main signal, and an estimated signal
21 to noise power ratio of the reference signal. Basically, just flips them
22 and then it puts them into the step size circuit. And that step size
23 circuit, it can operate in multiple ways, but it either -- it controls how
24 the adaptive filters adjust. And as Dr. Stern put it, that's the invention.

25 Now, Ms. Wang spent a lot of time saying that we
26 misunderstood their combination and that we analyzed the wrong

1 combination. But that's not true. According to their own expert. And
2 we asked their expert, we said, what are you taking from Puthuff?
3 What are the teachings of Puthuff you're taking and putting it to
4 Ikeda? And he tells me, he tells me, I asked him, are you taking
5 accelerometer number 30 and put that in places of boxes 10 and 11 of
6 Ikeda? And then I wanted to make sure. So, I asked him, do you
7 need to make any more alterations? And he said, no additional
8 modifications, just a straight up replacement.

9 So, we have the invention. We all understand the combination.
10 The combination is taking -- I'm on slide 8 now. It's taking Puthuff's
11 accelerometer and putting it in place of boxes 10 and 11 of Ikeda.
12 And that's what we have. This is the first combination, of course.
13 And we're on slide 9 now, is removing, and this just demonstrates a
14 visual, removing those two boxes and replacing them with the
15 accelerometer from Puthuff. And there's, we cited to multiple case
16 law on this. A person of ordinary skill in the art would not be
17 motivated to take what is the actual inventive aspect of a prior art
18 reference, remove that and put something from the prior art in. In this
19 case, it's the outside sensor that Ikeda talks about. But even if Ikeda is
20 talking about some different outside sensor, you're not going to read
21 Ikeda, say, okay, this is a Ikeda's unique configuration, it solves the
22 problem that Mr. Ikeda was trying to solve. I'm not going to rip that
23 out and just put in something old. It doesn't make any sense.

24 Now, it also doesn't work. Ikeda wants to perform learning in
25 accordance with the level of the desired signal and that of the noise
26 signal. But when you put in the Puthuff sensor, you have the

1 accelerometer controlling it, controlling the adaptation. It doesn't
2 know the noise signal. There's no dispute about that. The
3 accelerometer has no idea what the noise signal is. So, now you still
4 have the two air pressure acoustic signals coming in on the
5 microphones, but now you have the adaptation controlled by the
6 accelerometer. And what happens is, if I'm talking, the accelerometer
7 will register that I'm talking. It'll say, okay, adapt it as if, you know,
8 I'm getting mostly or all signal. But that's not necessarily the case.
9 It's very likely that in a situation with a lot of noise, the acoustic
10 microphones will have -- be overwhelmed with noise. But now you're
11 adapting it as if you have nice, clear signal, and what's going to
12 happen is you're going to distort your eventual output.

13 And one other thing I did want to raise, and this is important,
14 this isn't only a teaching away case. This is a motivation to combine
15 issue, and those are two separate inquiries. Ms. Wang keeps telling
16 that we're saying teaching away. And there is teaching away, but
17 there's also no motivation to combine here. You don't need a specific
18 disparagement or a specific leading away to deviate (phonetic) a
19 motivation to combine. If what you're doing is you're ripping out the
20 inventive aspects of the prior art and replacing them with the thing it
21 removed. And that's, we cited our Tri-Vascular case, with the Asustek
22 case from the Board as well. But Ikeda --

23 JUDGE REPKO: Looking at that statement about, I guess, the
24 basis is that one statement about it being difficult in certain situations.
25 I mean, is there anything--and I asked this question to Petitioner too--
26 is there any specific situations in the record that you could point to

1 that Ikeda is referring to, kind of, illuminate what they mean by
2 certain situations?

3 MR. COWELL: There's nothing -- we don't know what Ikeda
4 was thinking, of course. It's not in Ikeda. I agree with Ms. Wang. It's
5 not in there. The situations that we raised regarding the problems
6 with the combination, where they do indeed put an outside sensor in,
7 those situations are still cases that the Ikeda outside sensor wouldn't
8 work, and that's very high noise on both microphones --

9 JUDGE REPKO: Mm-hmm?

10 MR. COWELL: -- overwhelming the signal. But then the
11 accelerometer vibration sensor telling you that, yes, you have a signal.
12 You have a clear signal.

13 JUDGE REPKO: Does Ikeda talk anything about outside
14 sensors specifically, just apart from that teaching away part? I mean,
15 do they discuss the outside sensors and raise some of these issues that
16 you're raising here? Is there anything you can point to in Ikeda itself
17 within the four corners?

18 MR. COWELL: No, Ikeda does not tell us what about the
19 outside sensors he doesn't like.

20 JUDGE REPKO: Mm-hmm?

21 MR. COWELL: He just says, I don't want to use outside
22 sensors and I'm going to -- excuse me. And I'm going to -- I'm sorry,
23 my computer decided to give me a problem. So, I don't want to use
24 outside sensors, so I'm going to design the circuit that I don't need to
25 use outside sensors for.

26 JUDGE REPKO: Right.

1 MR. COWELL: And there's no place for an outside sensor in
2 these circuits.

3 JUDGE REPKO: Yeah, but I mean, it does say just to,
4 specifically, it says it's difficult --

5 MR. COWELL: Sure.

6 JUDGE REPKO: -- straight form learning. Right?

7 MR. COWELL: Yeah.

8 JUDGE REPKO: And it says depending on the situation.
9 That's pretty qualified though, right? Just says, it's situational and it's
10 difficult, not impossible. Is there anything else in Ikeda that you
11 could point to that would make it seem like it's impossible or
12 disparaging specific sensors in particular?

13 MR. COWELL: I think what we need to think about is what
14 Ikeda is talking about there, he's talking about the prior art. He's not
15 talking about his invention.

16 JUDGE REPKO: Right.

17 MR. COWELL: He's saying so in the prior art, yeah, there's
18 cases where outside sensors don't work. Maybe he's thinking what I
19 talked about. Maybe he's got something else in mind. No way to
20 know that. So, what he does is he says, I'm going to remove any need
21 for outside sensors completely. And he does that. And that's his
22 invention. And that's what a person of skill in the art reading this
23 would see. They'd say, okay, this is the invention. And Dr. Stern
24 agreed with us, that's the invention.

25 JUDGE REPKO: Yeah.

1 MR. COWELL: And you wouldn't remove that invention to
2 put in the exact prior art.

3 JUDGE REPKO: I mean, is that teaching away? It sounds
4 more like you're talking about some sort of principle of operation, line
5 of case law, not teaching away. We're looking for some criticism,
6 some disparagement, but you can't really point to anything in Ikeda
7 that's even discussing outside sensors.

8 MR. COWELL: Right. And if we're talking about teaching
9 away, it's all implicit. I agree with that. But before you get to
10 teaching away, you have to analyze motivation to combine alone.
11 You don't need to raise the level of a teaching away. We cited to an
12 Apple-Samsung case in our briefing about this. It's still very relevant
13 and important to how a POSITA would read the reference.

14 JUDGE REPKO: Yeah. And Ikeda saying this is one way to
15 do it because there are certain situations in which you want to do it
16 this way. I mean, maybe there's certain situations that you'd want to
17 not use Ikeda system and kind of do a modification. Is that a fair
18 reading of that statement in Ikeda? Like, it's difficult in some
19 situations, maybe not others?

20 MR. COWELL: That's a reading --

21 JUDGE REPKO: Maybe cross-reasons or something. Right?

22 MR. COWELL: I'm sorry. That's a reading of how Ikeda
23 describes the prior art, yes.

24 JUDGE REPKO: Yeah.

1 MR. COWELL: They're difficult in some situations, and that's
2 why. And it's important to know the combinations, and Ms. Wang
3 told us that they're not using what Ikeda calls the conventional system.

4 JUDGE REPKO: Right.

5 MR. COWELL: They're using Ikeda's inventive system, where
6 he's dispensed with any need for an outside sensor. Now, I'm back on
7 slide 8 right now, which is just discussing the first Ikeda-Puthuff
8 combination. And Ms. Wang spent a lot of time talking about Aaliyah
9 (phonetic) Corporation, but that's really a dodge here. As I said, we
10 asked Dr. Stern, exactly what teachings are you taking from Ikeda,
11 from Puthuff, putting into Ikeda? And he told us and he said, nothing
12 else. And I don't think we misunderstood the combination. Ms.
13 Wang didn't tell us how the combination differs based on the
14 supposed misunderstanding, where we went wrong with it. So, I think
15 that's really just dodging the question.

16 JUDGE REPKO: Would you characterize it as a mixed
17 modality? That's how they kind of phrase it in the reply. I mean, do
18 you agree with that characterization --

19 MR. COWELL: Sure.

20 JUDGE REPKO: -- of the arguments?

21 MR. COWELL: Let me slide --

22 JUDGE REPKO: Mixed modality?

23 MR. COWELL: Yeah.

24 JUDGE REPKO: So, the mixed modality is really important
25 for the second combination. It's not the -- there's a second
26 combination where we use it side by side with --

1 MR. COWELL: Yeah.

2 JUDGE REPKO: -- Ikeda's existing system. Puthuff has this
3 sort of transition function. Right?

4 MR. COWELL: Right.

5 JUDGE REPKO: And so, in that circumstance, do you agree
6 with their characterization of your arguments as being mixed modality
7 and the way you see it in that respect?

8 MR. COWELL: It is. And let me, I'm putting up slide 18,
9 which just shows the second combination, and it shows the signal 40
10 coming out of the Puthuff circuit going into basically where the signal
11 microphone is indicated. Just so we're all on the same page.

12 JUDGE REPKO: Okay.

13 MR. COWELL: And so, when we talk about the mixed
14 modalities, we look at figure 2 of Puthuff. Now, I'm on slide 19. And
15 what put says is you have these two sources of sound. You have air
16 pressure microphone, and you have an accelerometer, and you mix
17 them together there's a mixing circuit included in Puthuff. Mix them
18 together, and you vary it based on the ambient noise. And as it goes
19 up, as the ambient noise goes up, you use more and more of the
20 accelerometer signal until at a certain point, and this is direct quote
21 from Puthuff, the accelerometer signal dominates.

22 So, that's the mixed modalities there. It's, at some levels, it's a
23 mix of the two signals. And at high levels, it's just the accelerometer.
24 And the point there. What is important about that is that you now
25 have a signal that does not bear the same resemblance to the noise
26 microphone signal. You have a mixed modality, or just the

1 accelerometer signal, if you want. That doesn't have the same
2 characteristics, the air pressure microphone signal you're using as the
3 reference. And when you go to remove the noise, it's not going to --
4 you're not subtracting from the same sum as you would be otherwise.

5 JUDGE REPKO: So, you think that when they're removing,
6 they're just simply subtracting one signal from another, and that's how
7 they're proposing to use this Puthuff?

8 MR. COWELL: Well, let's see what the subtractor does. But,
9 yes, there is the adaptive filter part of it as well. But even if
10 everything Ms. Wang says is right, you know, it's adapting, and it's
11 going to remove the correlated noise between the two. There's not
12 going to be any correlated noise because you now have a signal that
13 doesn't correlate with the noise microphone signal. Puthuff explains
14 that the accelerometer's different frequency characteristics is different.
15 It's just basically, it's a very different signal. That's why he switches
16 to it only at high levels of noise, because it sounds different. So, now
17 there's no correlation between the noise in the air pressure microphone
18 and in the accelerometer signal. So, you wouldn't make this
19 combination because it wouldn't do anything, at best. At worst, you
20 may have some false correlations, and it would distort the signal.

21 JUDGE REPKO: Okay. But there is more than simply
22 subtracting the signals, in your view, right? Under their proposed
23 combination, when they add Puthuff.

24 MR. COWELL: Yeah.

25 JUDGE REPKO: You think they're doing more than just.

1 MR. COWELL: Yeah. The signals come in. They are run
2 through the adaptive filters, and the output of that is what's subtracted.
3 I don't disagree with that.

4 JUDGE REPKO: Yeah.

5 MR. COWELL: So, moving. Unless there's anything else you
6 want to talk about, the first Puthuff combination. I'll just talk about
7 continue talking about the second one.

8 JUDGE REPKO: I don't have further questions. My
9 colleagues have any questions? It doesn't look like it. No. Thank
10 you.

11 MR. COWELL: So. Right, so as I explained, what we now
12 have coming out, coming into Ikeda as if it's coming straight from the
13 air pressure microphone, but not is you have this signal, it has noise
14 from the accelerometer, maybe electronic noise, maybe somebody's
15 chewing whatever, some kind of noise from the accelerometer. It has
16 a signal from the accelerometer. It may or may not, depending where
17 you are in the ambient noise level, have signal and noise from the air
18 pressure microphone. And there's nothing in there to correlate to the
19 noise air pressure microphone, which is specifically and only hearing
20 what the air pressure gives it. So, it can't cancel. It can't cancel noise
21 correctly. It's going to act unpredictably.

22 JUDGE REPKO: So, when I asked Petitioner about that and
23 about whether the sensor determines whether the vibrations are speech
24 or not, they're saying that the vibrations are speech. And you're
25 saying you kind of disagree with that. You feel like there could be

1 chewing, that this bone conduction microphone is going to pick up
2 other things. Can you talk a little bit more about that?

3 MR. COWELL: Yeah, I mean, it's just a matter of common
4 sense. It's a bone conduction microphone. So, it's usually right about
5 here, I think, pointing to my temple, and it picks up the vibrations of
6 bones. If you're like me, you grind your teeth a lot when you don't
7 want to. That's going to come through there. If you're chewing or
8 something, that would also come through there.

9 JUDGE REPKO: So, you're saying it's going to make it
10 difficult to determine the vibration speech that's going to degrade this
11 noise removal aspect of it?

12 MR. COWELL: It would, yeah. But even moving past that,
13 even if it was a pure signal coming through, that's still, the same
14 argument still holds because it's not going to correlate with the
15 ambient noise.

16 JUDGE REPKO: I mean, is it going to be impossible to do it,
17 or is it just maybe a degraded quality? These things that, you know,
18 chewing. And like you said, the correlation issue, is it just a matter of
19 poor quality or is it just inoperability?

20 MR. COWELL: Well, to -- you will get some sort of signal
21 out, certainly. So, it's not inoperable in that way.

22 JUDGE REPKO: Okay.

23 MR. COWELL: But I don't think you can get a predictable
24 noise remove signal out.

25 JUDGE REPKO: So, not useful for the purposes that it's
26 intended to be used for?

1 MR. COWELL: Exactly. Exactly.

2 JUDGE REPKO: Okay.

3 MR. COWELL: And I did want to run through the offered
4 motivations to combine. First one. They say Ikeda and Puthuff
5 address the same problem. I'm on slide 13 now. But they're not the
6 same problem. Ikeda is a noise canceling system. Puthuff is a voice
7 pickup system. Ikeda takes a signal with noise and removes the noise.
8 Puthuff simply replaces an air pressure microphone signal with an
9 accelerometer signal. It's not the same problem.

10 JUDGE REPKO: But a component of Ikeda addresses that
11 problem though, right? I mean, you need that input, and if Puthuff is
12 doing that, then you're maybe substituting one component that's
13 functionally capable of performing that function in Ikeda. Looking at
14 Ikeda's overall system is the way you kind of characterize Ikeda, but
15 specifically, there's a component within Ikeda that could be useful.
16 Puthuff confused in that part. Right?

17 MR. COWELL: I may have misunderstood your question.

18 JUDGE REPKO: So, you're saying, well, they're not the same
19 problem. Well, generally, Ikeda is addressing, the way you
20 characterize it, a specific problem. But within Ikeda, there's a
21 subsystem that perhaps Puthuff can be used in. Correct? I mean,
22 detecting --

23 MR. COWELL: Yeah, I mean --

24 JUDGE REPKO: -- noise, discerning speech. Right? So, in
25 that sense, why wouldn't that be the same problem then?

1 MR. COWELL: To me, that's not the same problem. Ikeda's
2 problem isn't receiving a signal, and that's what they're proposing to
3 replace in Ikeda with Puthuff. They're proposing you replace the PD
4 microphone with the Puthuff circuit. So, I don't think that's
5 addressing the same problem. It is replacing a component --

6 JUDGE REPKO: That performs that --

7 MR. COWELL: Performs that specific function. Yeah.

8 JUDGE REPKO: Yes. Okay.

9 MR. COWELL: That voice pickup function or sound pickup
10 function.

11 JUDGE REPKO: And that kind of follows from the rest of
12 these things, too, right? These 2, 3, 4, and 5 that you've identified
13 here on the slide. I mean, the false triggering, use of the
14 accelerometer to detect voice activity, these are all things that would
15 benefit Ikeda's system, would it not?

16 MR. COWELL: No, they don't benefit Ikeda's system. First of
17 all, false triggering. False triggering Puthuff tells us what false
18 triggering it is. What false triggering is. Excuse me. It's when you
19 have something like a voice activated application that hears something
20 in the noise that says, oh, that sounds like voice, I'm going to go now.

21 JUDGE REPKO: Yeah

22 MR. COWELL: Ikeda itself already accounts for that issue. It
23 has the two adaptive filters, and it controls the adaptation of them.
24 Now, that adaptation is controlled by the signal to noise ratio between
25 those two signals. And if there's something in the background that
26 sounds like something in the foreground, the adaptation between the

1 filters will adapt to filter that out over time. That's how they work.
2 Now, Ms. Wang had an example where, and I'm just going to have to
3 scroll ahead to my other slide if I wrote it down. Ms. Wang had an
4 example which was not in any of their papers, where there's a noise in
5 both microphones and you're in the second Ikeda-Puthuff
6 combination. So, there's a lot of noise in the surrounding area coming
7 into both microphones. And Ikeda, she says, would say, well, it's just
8 noise, so I'm not going to, I don't need to adapt anything; or I have to
9 adapt them at a same level, or. And she says, well, now we have
10 Puthuff there. So, Puthuff gives us a nice clean signal into, so Ikeda's
11 says, I have a nice clean signal, I can go there.

12 But, you know, we still have that problem. It has a clean signal,
13 but there's tons of noise in the background. That noise isn't being
14 adapted away. The filter isn't adapting in response to that noise. It's
15 adapting to an accelerometer signal. And now we have that
16 correlation that doesn't work anymore. There's no correlation
17 anymore between the two signals.

18 So, the remainder of these. So, put, I'm back on slide 12.
19 Puthuff discloses the use of accelerometer to detect voice activity. I
20 mean, I don't -- Puthuff really doesn't do that. Puthuff uses an
21 accelerometer to retrieve voice, but it doesn't use any, doesn't do any
22 sort of detection there. And accelerometers were known. That's
23 certainly not in dispute. But being known is not enough. And in their
24 papers, I don't think Ms. Wang said it today, but in their papers, they
25 say, well, an accelerometer is a cheaper alternative to the Ikeda

1 circuitry. But there's no evidence in the record whatsoever that
2 accelerometers are cheaper than Ikeda circuits.

3 And finally, the dual microphone thing. So, what Puthuff says.
4 I'm on slide 15. The invention finds utility in numerous voice pickup
5 applications included but not limited to, dot, dot, dot, dual microphone
6 directional pickup systems. That's not a motivation, that is a bare
7 statement. It doesn't explain what would make it useful. And Dr.
8 Stern at least referenced, referencing this paragraph doesn't explain
9 what would make it useful. To the extent the use is the reduction in
10 false triggering or using the cleaner signal as an input, I've already
11 explained why I don't think those apply. So, now --

12 JUDGE REPKO: The main thing, you keep going back to the
13 correlation. And the correlation, just want to make clear, because I
14 think we kind of touched on this before, is like you're acknowledging
15 that we're not just subtracting the signals in the proposed combination.
16 Is this correlation, does that require changes in the way Ikeda's
17 adaptive filter would work? And is that beyond the skill of one of
18 ordinary skill in the art? Is that kind of what your general argument
19 is, that this correlation is just going to be beyond one of ordinary skill,
20 is going to really change the adaptive filters in order to work with this
21 correlation?

22 MR. COWELL: Yeah, I think that is true. There's no evidence
23 in the record because a Petitioner never addressed this argument that
24 it's receiving the accelerometer signal and that that has different
25 characteristics than an air pressure microphone signal. But one of
26 skill in the art, I believe in this case is three years of, is a bachelor's

1 degree and I think two years of experience, are they going to know
2 how to make those adaptations? Can that adaptation even be done on
3 the fly? There's no evidence whatsoever of that in this record. And I
4 can't refute what they don't present to me, but it does not seem to me
5 that that's something a person of ordinary skill in the art could do as a
6 matter of course.

7 JUDGE REPKO: Okay. So, you're acknowledging they do
8 more than just subtract, but the person who's working on this would
9 not be able to change the system around in a way that would account
10 for this issue that you've identified between the correlation
11 and suppression?

12 MR. COWELL: Yes, I believe that is correct.

13 JUDGE REPKO: Is that generally? Okay, thank you.

14 MR. COWELL: Sure.

15 JUDGE REPKO: Thank you for clarifying that for me.

16 MR. COWELL: Just jumping ahead now to slide 21. And this
17 is the specific limitations of claim 11. In this case, it is on, limitations
18 are spelled out on slide 20. But essentially, it's the transfer functions
19 being generated in response to a determination that voicing activity is
20 present or absent from the acoustic signals from a period of time. And
21 we can see here in claim 11, the acoustic signals are received using at
22 least two different acoustic microphones, of the at least two acoustic
23 microphones. That's directly above the highlighted part in the claim.
24 And what we have here is we have a signal that's not an acoustic
25 signal anymore. Or at least, it's not the acoustic signals that are
26 received by those microphones. It is this mixed microphone

1 accelerometer signal. And I have here, on slide 21 on the bottom, the
2 quote from Puthuff saying, yet another advantage in the invention
3 derives from the use of the two modalities of sound transfer. And
4 when we talk about mixed modalities, it comes right out of Puthuff,
5 between those two modalities, you're not removing it from the
6 acoustic signals as received by the two microphones.

7 Now, I'm running out of time. I'd like to jump ahead to the
8 Alcivar combination. And again, Ms. Wang throws up the bodily
9 incorporation argument. But again, here on slide 24 we can say
10 specifically asked Dr. Stern, what are you substituting into Ikeda from
11 Alcivar? And he told me, it was 54, 56, 58, 60, 62, 68, and maybe 72
12 or 74. So, it's not the whole Alcivar circuit. We never said it was, but
13 it is these highlighted portions. And what we have, 56 is the
14 insulation that goes around the microphone.

15 JUDGE REPKO: But for purposes of obviousness, generally,
16 when we're thinking about whether they've made their case, do they
17 need all of this detail that you seem to be requiring here, how
18 specifically this works with this component? Wouldn't this be part of
19 the ordinary creativity of one of ordinary skill in the art to be able to
20 get this to work without having to explain in detail how these specific
21 components need to work together? Just focusing on Petitioner's
22 burden for a moment.

23 MR. COWELL: I understand what you're saying and so I have
24 two responses to that. The first one is I need to know what teaching
25 he's taking from Alcivar. And I asked him what he's taking from
26 Alcivar. If he just said I'm taking the idea of a skin surface

1 microphone, then okay, then we deal with that. But he told me in
2 great detail what he was taking. He pointed out the boxes and he was
3 very clear that that's what he was taking. As to, you know, so I think
4 I'm entitled to rely on their experts sworn testimony as to what he's
5 taking. And it's not just a, it's not a bodily incorporation, it's not well
6 will these circuits work or not. It's what are the teachings you're
7 using? And he tells me what the teachings are and that's what I have
8 to work with. I can't assume that they're going to take -- that he's
9 going to tell me what they take but then later remove it or change it
10 somehow to make it work without explaining how. That leaves me in
11 a bind where I can't even respond to it.

12 But in essence, the part that even matters here for Ikeda and
13 Alcivar is that he's taking the microphone and the insulation and the
14 rest of the circuitry he uses. And so, what we see on 25 again, they're
15 taking the core inventive features of Ikeda and putting in prior art.
16 This I think is from the '70s, if I remember right, for Alcivar. And
17 they're sticking that in, in place of Ikeda's own unique configuration.
18 And a person would not be motivated to do that, regardless of whether
19 it's explicitly teaching a way or not. You would not be motivated to
20 take what's in the -- what's the inventive functionality of the prior art
21 and destroy that, put in something that you disparate, that even if you
22 don't disparage, that you're trying to replace. And that's the exact
23 thing that Ikeda's trying to replace, is the outside sensor.

24 Now, so what we have is we have a device, and there's no
25 dispute as to what this device looks like now. It's a microphone, it's
26 glued to your throat, it's connected by a wire to a headset somewhere,

1 and it's got some insulating material over it. And you're going to walk
2 around and you're going to use this in a crowded room or in a
3 restaurant or an airport. And if that isn't an indication of hindsight, I
4 don't know what is, because this is not a device anybody would have
5 made at the time. Nobody was going to take a 40-year-old skin
6 surface mic, stick it to your throat with the insulation, attach it by wire
7 to this headset and walk around. And we talk about the creativity and
8 understanding of a person of skill in the art. And we do, and we have
9 to think about, they're also a reasonable person. They're not looking
10 at the claims of the '091 Patent and going back and saying, oh, this
11 will fit, this will fit. They're saying, what's a device I can make? And
12 I have the whole world of prior art in front of me. How would it help
13 me? And now when we have this combination, as attested to by
14 Petitioner's own expert, it just does not make any sense. And a person
15 of ordinary skill in the art would not therefore make it.

16 And unless Your Honors have any further questions, that's the
17 end of my presentation so far.

18 JUDGE REPKO: I have no further questions. Do my
19 colleagues have any questions? Doesn't look like it. Thank you.
20 About 12 minutes for sur-rebuttal. Petitioner, you may take the
21 podium. About 10 minutes for your rebuttal. Let me know when
22 you're ready to go.

23 MS. WANG: Thank you, Your Honors. So, Mr. Cowell spoke
24 a lot about motivation to combine. The motivation to combine here
25 for all three combinations is we are enhancing Ikeda by using a voice
26 sensor in the first and third combinations. This is the first

1 combination in ground 1 and the Alcivar combination in ground 2.
2 We're enhancing Ikeda because Ikeda doesn't say with any specifics
3 what is the outside or how to use it. It's quite vague. And so, these
4 combinations introduce a voice sensor to perform part of the function
5 of what Ikeda says is done by the outside determining the presence or
6 absence of voice activity. This is in our petition at page 32. And by
7 identifying the main speech properly, we are reducing false triggers,
8 as I discussed earlier today.

9 The second combination also enhances Ikeda. Here we are
10 adding to Ikeda's VAD with additional information. Ikeda's VAD is
11 based on the acoustic information from the microphones. We are
12 introducing information from a bone conduction component of an
13 audio signal. And that is different information from the microphones.
14 And that will improve the accuracy of Ikeda's SNR estimate.

15 Mr. Cowell made -- or discussed the correlation, the correlated
16 noise. They say there's no correlation because the Puthuff sensor is an
17 accelerometer and that's a pure accelerometer signal. That is false.
18 Puthuff discloses the bone conduction of an audio component of an
19 audio signal. So, it's an audio signal. And also, we saw on his slides
20 that he was referring to figure 2 of Puthuff. What that figure shows is
21 that both of the incoming signals, the acoustic signal and the
22 accelerometer signal, they're being weighted. So, for low noise one,
23 the microphone signal is going to dominate, but the vibration signal is
24 still there. And for high noise, the accelerometer signal dominates,
25 but the microphone signal is still there. So, for him to say that there's
26 no correlation between that signal and the reference noise

1 microphone, when there's high acoustic noise, that doesn't make any
2 sense because there's still always the microphone signal that's present
3 in the combined composite signal.

4 JUDGE REPKO: He's saying that also that the bone
5 conduction microphone is going to pick up some other noise, you
6 know, from teeth grinding or something like that. Can you speak to
7 that?

8 MS. WANG: For teeth grinding, for chewing, for movement,
9 these are types of things that may be picked up for the vibration
10 sensor. But he doesn't point to anything in Puthuff or Alcivar that
11 describes them as, those sensors, as being able to pick up these types
12 of sounds or vibrations. What both of those sensors are targeted at
13 doing, what both Puthuff and Alcivar describe those sensors as
14 targeting to do is detecting voice vibrations. And this isn't in the
15 record, but, you know, teeth grinding, movement, all of those are at
16 much lower frequencies than acoustic sound, which is what you're
17 interested in when you're trying to produce speech, so those types of
18 sounds would be easily filtered out. Puthuff itself describes itself as a
19 voice pickup system. And so, both of systems, both sensors in
20 Puthuff and Alcivar are aimed at doing voice activity detection. So,
21 they're not going to be as sensitive to other types of vibrations or
22 noise.

23 Mr. Cowell also mentioned a lot about Dr. Stern's testimony on
24 bodily incorporation. As we know, bodily incorporation is not the
25 test. This is in our slide 34. The cases that are cited in our reply at
26 page 15, the in re: Mouttet case and the in re: Keller case, they clearly

1 state that bodily incorporation is not the proper test to apply. The
2 combinations are more fully described in his declarations and also in
3 the petition. What he was agreeing to during his deposition testimony
4 was that these concepts could be combined and connected in certain
5 ways, not that they would literally be bodily incorporated and then
6 suddenly be expected to operate as is.

7 Regarding what Mr. Cowell said about Dr. Stern's testimony
8 about that's the invention. That statement is really taken out of
9 context. This is on, in Exhibit 2004, starting at page 26, line 17
10 through page 27 through 13. At the top of page 27 he states that's the
11 invention. But he could --

12 JUDGE BRADEN: Sorry, Counselor.

13 MS. WANG: Oh.

14 JUDGE BRADEN: I'm sorry, Counselor, can you give that
15 citation again? What page?

16 MS. WANG: Sorry. Exhibit 2004, page 26, 11 to page 27, line
17 13.

18 JUDGE BRADEN: Thank you.

19 MS. WANG: So, starting at the top of page, it's really this
20 whole section, but I'm just going to emphasize one portion of it. The
21 quote where he says, that's the invention. That's page 27, lines 2 to 3.
22 But he goes on to say, there's no assertion that that's the solution that
23 you would always want to adopt under all circumstances, and it's
24 appropriate for some things and not others. So, as we know from
25 Ikeda, there are some situations in which you are able to use the

1 outside sensor, and there may be others where you are not able to use
2 the outside sensor. That's what he's getting at there.

3 Mr. Cowell mentioned the Tri-Vascular case, and I wanted to
4 spend just a little bit on that. Our facts here are very different from
5 the Tri-Vascular case. In the Tri-Vascular case, there's two prior art
6 references that the patent challenger was trying to combine. One
7 reference wanted to penetrate the blood vessel wall. The other
8 reference needed to avoid penetrating the blood vessel wall. So, by
9 definition, those references in the Tri-Vascular case are mutually
10 exclusive. You cannot both penetrate and not penetrate the blood
11 vessel. The same is not true here. They're trying to apply these, the
12 Tri-Vascular case, to having an outside sensor and having Ikeda is
13 bad, but there's nothing in Ikeda or anywhere in the record that says
14 that those two things are mutually exclusive. Our case, our facts are
15 more similar to the Muresan (phonetic) v. Google case. This is in our
16 reply at pages 9 to 12. So, in Muresan, just like in Ikeda, the prior art
17 had a conventional teaching of text and an inventive teaching of
18 graphical previews. And the Fed Circuit there affirmed the PTAB's
19 finding that there was no teaching away of a combination of text and
20 graphics. So, similarly here, there's no teaching away of Ikeda's
21 outside with a VAD sensor.

22 Mr. Cowell mentioned the cost as he rebutted our statement in
23 the petition that the combinations are a low cost way. Their argument
24 is that oh, why would you introduce additional componentry,
25 additional hardware? The reason for that is the improved
26 performance. The reduced false triggering by introducing a cheap

1 hardware component is definitely reason for someone to want to make
2 the combination in all three cases.

3 And unless there's other questions, I think I'll wrap it up here.
4 Thank you so much.

5 JUDGE REPKO: I have no further questions. Do my
6 colleagues? Don't hear anything.

7 MS. WANG: Thank you.

8 JUDGE REPKO: Thank you. Okay, Counselor for Patent
9 Owner, you have 12 and a half minutes.

10 MR. COWELL: So, I have a few things I want to address that
11 Ms. Wang just said. She keeps saying bodily incorporation is not the
12 standard in obviousness. And of course it's not. No one's saying it is.
13 And the problems that we've raised here and we've identified with
14 their combination isn't a result of signal voltages, mismatching, or
15 some little timing errors. These are conceptual differences where the
16 two references just work completely differently and they're not
17 compatible with each other. And then you explain how that works.

18 Earlier, Ms. Wang said more information is better. But more
19 information is only better if the system knows what to do with that
20 information or if the system can use that information. And what we
21 showed and what we talked about earlier, earlier is Ikeda doesn't want
22 that information. It doesn't want the vibration information because it
23 doesn't have a use for it. Ikeda already has dealt with the problem of
24 not, excuse me -- Ikeda has already decided to avoid the outside
25 sensor and in this inventive system avoids the need for it completely

1 and therefore it has no use for it. Now what Ms. Wang says is, well,
2 we're just enhancing a Ikeda sensor, but there's no enhancement.

3 We went through. They have five motivations to combine.
4 Most of them are just that, accelerometers or vibration centers, sensors
5 existed in the past, or, you know, that they're analogous areas of
6 problem solving. None of them, none of those are actual benefits.
7 The only benefit they ever talk about is the false triggering benefit that
8 Ms. Wang has talked about a lot earlier. I think there's just a
9 disagreement there. But there's no evidence that, in the record, that
10 including Puthuff or Alcivar would reduce false triggering. And if
11 you look at Dr. Stern's first declaration, that's 1002 and paragraphs
12 148 to 153, that's his motivation to combine section. And he doesn't
13 explain how introducing these vibration sensors reduces false
14 triggering.

15 JUDGE REPKO: It appears to apply to acoustic noise, and
16 they're saying that the Puthuff sensor is going to give you a cleaner
17 signal during those times.

18 MR. COWELL: Right. And as we spoke about earlier, that not
19 helpful when you plug it into Ikeda's system. That's the second
20 combination, the second Puthuff-Ikeda combination. The first one,
21 you don't use that signal or you use it as a VAD. For that second
22 combination, and you and I spoke about this earlier today. We don't
23 believe that does show any improvement because what you have is
24 now you have the uncorrelated noise between the two different
25 sources of noise.

1 JUDGE REPKO: And they're pointing us to that figure that
2 shows two signals and they're at least correlated in time.

3 MR. COWELL: Right.

4 JUDGE REPKO: There's a threshold there and then they're still
5 tracked, just like they're swapping one out. So, how do you respond
6 to that argument?

7 MR. COWELL: Well, first I'll say they didn't address that in
8 their papers. But what happens in there, you have the accelerometer
9 signal. There's not two signals that are parallel with each other.
10 They're mixed together and there's still not the same correlation.

11 JUDGE REPKO: They're weighted. They're saying they're
12 weighted. One's weighted. The weightings change depending on the
13 threshold.

14 MR. COWELL: Right. They are weighted, but there's
15 components of the accelerometer signal and the acoustic signal at
16 everything except basically the extremes, I believe.

17 And just to jump back to my false triggering point in Dr. Stern's
18 second declaration, paragraph 17, I think you just brought this up
19 yourself. But it does not cite to any evidence. It's purely ipse dixit
20 that it would reduce false triggering.

21 And something that strikes me as you read this, when he cites to
22 Ikeda in his motivation to combine paragraphs, he's always citing to
23 Ikeda's description of the prior art. He never explains an improvement
24 to Ikeda's actual inventive functionality that would be caused by these
25 extra sensors. And that's because there is no such improvement. And
26 they didn't choose to map Ikeda's conventional system to the claims.

1 They relied solely on the inventive system for their combinations.
2 And the vibration sensor provides no benefit to the inventive system.
3 And therefore, a person of skill in the art would not be motivated to
4 make it. And unless there's further questions, that's it for me.

5 JUDGE REPKO: I don't have further questions. Do you have
6 colleagues at this point? No. Thank you.

7 MR. COWELL: Okay. Thank you.

8 JUDGE REPKO: So, that concludes our hearing. Thank you.
9 And please stay and answer any questions that a court reporter may
10 have. Thank you.

11 (Whereupon, the proceedings at 2:28 p.m. were concluded.)

PETITIONER:

Lisa Nguyen
David Tennant
Alan Billharz
Grace Wang
PAUL HASTINGS LLP
lisanguyen@paulhastings.com
davidtennant@paulhastings.com
alanbillharz@paulhastings.com
gracewang@paulhastings.com

Colby Davis
ALLEN & OVERY, LLP
colby.davis@allenovery.com

Gregory Gewirtz
Russell Faegenburg
Orville Cockings
James Vezeris
LERNER DAVID LLP
ggewirtz.ipr@ldlkm.com
rfaegenburg@lernerdavid.com
ocockings@lernerdavid.com
jvezeris@lernerdavid.com

Indranil Mukerji
John Moulder
WILLKIE FARR & GALLAGHER LLP
imukerji@willkie.com
jmoulder@willkie.co

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Patent 8,019,091 B2

PATENT OWNER:

Peter Lambrianakos
Vincent Rubino
Enrique Iturralde
Richard Cowell
FABRICANT LLP
plambrianakos@fabricantllp.com
vrubino@fabricantllp.com
eiturralde@fabricantllp.com
rcowell@fabricantllp.com