

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

META PLATFORMS, INC.,
Petitioner,

v.

EIGHT KHZ, LLC,
Patent Owner.

IPR2023-01003
Patent 9,226,090 B1

Record of Oral Hearing
Held: October 29, 2024

Before JUSTIN T. ARBES, LYNNE H. BROWNE, and
SCOTT RAEVSKY, *Administrative Patent Judges*.

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The above-entitled matter came on for hearing on Tuesday, October 29, 2024, commencing at 1:00 p.m., via video teleconference.

P R O C E E D I N G S

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JUDGE ARBES: Good afternoon, everyone. This is Judge Arbес and also appearing today are Judge Browne and Judge Raevsky. This is the oral hearing in Case IPR2023-01003 involving Patent 9,226,090. Can counsel please state your names for the record? Counsel for Petitioner?

MS. NGUYEN: Good afternoon, Your Honors. My name is Lisa Nguyen on behalf of Petitioner, Meta Platforms, Inc. I'm joined today by Dr. Jeremy Rashid, who will be presenting oral argument as a LEAP practitioner. Also on the public line, I have my colleague, Grace Wang, as well as in-house counsel Katie Brockway for Meta.

JUDGE ARBES: Thank you. Counsel for Patent Owner?

MR. ROBINSON: Thank you, Your Honor. My name is Erick Robinson for Patent Owner. With me is Homayoon Rafatijo, who is a LEAP practitioner. And also with me is my partner, Jayne Piana, and of counsel, Pat Dunn.

JUDGE ARBES: Great. Thank you. Per the Trial Hearing Order in this case, the parties were to have 60 minutes of time to present arguments, but both parties submitted requests for LEAP practitioners to participate, which were granted. So, each party will have 75 minutes of total time. The order of presentation will be first, Petitioner will present its case regarding the challenged claims and may reserve time for rebuttal. Patent Owner then will respond to Petitioner's presentation and may reserve time for sur-rebuttal. Petitioner then may use any remaining time to respond to Patent Owner's presentation. And finally, Patent Owner may use any of its remaining time for a brief sur-rebuttal, responding to Petitioner's rebuttal

1 arguments only.

2 A few issues before we begin. We've received the parties'
3 demonstrative exhibits and objections to the other's demonstratives. The
4 Trial Hearing Order set forth a procedure for demonstratives stating that the
5 parties shall meet and confer in good faith to resolve any objections to the
6 demonstratives. And in the unlikely event that an issue could not be
7 resolved after doing so, the parties could file a one sentence statement for
8 each objection. The Order expressly stated, no argument or further
9 explanation is permitted. Both parties failed to comply with that Order.
10 Collectively, the parties filed 17 pages of objections, objecting to 52
11 individual slides and did include substantive argument. Rather than going
12 through each slide today, many of which may end up not even being used
13 given the amount, we're going to deny both sets of objections in total.

14 So, the parties may refer to their demonstratives as filed.
15 However, as we stated in the Trial Hearing Order, demonstratives are not
16 evidence. They may not be used as evidence. They may not be used to
17 make new arguments. Rather, they're merely visual aids to a party's oral
18 presentation regarding arguments and evidence previously presented and
19 discussed in the papers. If either party believes that the other party is
20 presenting an improper new argument today, I would ask you to please raise
21 that during your own presentation, rather than objecting at the time and
22 interrupting the other side. We will review the transcript after the hearing
23 and take any further action, as appropriate.

24 Finally, given that this hearing is by video, please keep your
25 microphones muted when you're not speaking. When it's your turn to argue,
26 please speak slowly, and if you hear another voice, please stop so that we
27 don't end up talking over each other. Are there any questions from the

1 parties before we begin?

2 All right. Counsel for Petitioner, you may proceed, and would you
3 like to reserve time for rebuttal?

4 MS. NGUYEN: Yes, Your Honor, 25 minutes. Thank you, Your
5 Honor. And I would like to start by noting that I will be first presenting on
6 the parties' disputes with respect to the Bedingfield grounds, Grounds 1
7 through 4. Then my colleague, Dr. Rashid, will be addressing the Li
8 grounds, Grounds 5 through 8, as well as Petitioner's arguments with respect
9 to motions to strike and motions to exclude.

10 Let's start with the Bedingfield discussion by identifying the
11 primary dispute between the parties, whether the independent claims require
12 HRTFs. They do not. How do we know that? Because Patent Owner has
13 failed to identify any specific term in the claims, in the independent claims,
14 that would require HRTFs. Let's actually pause for a moment and think
15 about how unusual that is. Normally, when the parties dispute the scope of a
16 claim, they identify a claim limitation and provide constructions for that
17 claim limitation, and then go through claim analysis, claim construction
18 analysis, where you look at the intrinsic evidence and then the extrinsic
19 evidence. Here, Patent Owner has failed to identify any specific term
20 because it relies almost exclusively on extrinsic evidence to argue that the
21 independent claims require HRTFs. If you actually look at the intrinsic
22 evidence, the claims, the specification, the specification actually expressly
23 says that the methods disclosed are not limited to HRTFs.

24 So, let's actually look at the patent and let's go to slide 4 of
25 Petitioner's demonstratives. The '090 patent is about providing face-to-face
26 communication simulated during a call. How does the '090 patent do that?
27 Let's go to slide 5 of Petitioner's demonstratives. The '090 patent focuses on

1 having a listener and a sound localization point where you place the speaker.
2 So, for example, if I'm having a call with my mom, I can place a sound
3 localization point next to me so that it simulates my mom having a face-to-
4 face conversation with me across the table. As you see in Figure 23 on slide
5 5, I can be the user 2362, and my mom can be the user 2380 right next to
6 me. And the sound will be different from the left ear to the right ear. And
7 how does that happen? By adjusting the sound. And specifically, the '090
8 patent is very clear that it is not limited to HRTFs.

9 Let's go to slide 6. In slide 6, in column 35, lines 49 through 55 of
10 the '090 patent, the '090 patent explains that adjustments are made to the
11 sound for each of these users since they are located at a different location
12 around the table with respect to sound localization points. These
13 adjustments include, but are not limited to, calculations for and changes to
14 ITD, interaural time differences, ILD, interaural level differences, HRTFs,
15 attenuations, reverberations, and other aspects of sound. The '090 patent
16 makes clear that localization can occur by adjusting aspects of sound.

17 Let's look at Figures 13A to D on slide 6. The '090 patent used
18 different known methods in order to adjust the sound. For example, in
19 Figures 13A through 13D, the patent recognizes that one aspect of sound is
20 ITD, interaural time difference. So, if my mom is supposed to sound like
21 she's coming from my left, the sound will arrive at my left ear faster than it
22 would to my right ear. And so, you have a difference in time arrivals.
23 Similarly, for ILD, interaural level differences, if my mom is supposed to be
24 next to me on my left, the sound will sound louder at my left ear than in my
25 right ear.

26 Now, let's actually look at the claims and what they say. And
27 actually, let's skip to slide 8 and start with Claim 15. There is not a whole

1 lot of language to tie HRTFs to. The limitations that the parties have been
2 disputing are captures a binaural voice and a sound localization point that is
3 away from and proximate to. And specifically adjusting binaural sound so
4 that it's positioned at a sound localization point that is away from and
5 proximate to the listener. Now, we know from Patent Owner's sur-reply at
6 page 2, Patent Owner is not saying away from and proximate to requires
7 HRTFs. What about sound localization point? Does that require HRTFs?

8 Let's go to slide 27. Slide 27 shows other passages from the patent
9 that again confirm that creating a sound localization point does not require
10 HRTFs. In column 3, lines 59 through 67, the patent says a location of
11 sound and/or a direction to the sound can be altered or created -- created --
12 using one or more of HRTFs accounting for the differences in arrival time
13 between the ears, interaural time differences, differences in amplitude or
14 level of the sound between the ears, interaural level differences,
15 asymmetrical spectral reflections, phase delays, group delays, a ratio of
16 direct signal to reverberate signal. Now, ILD is particularly important here
17 because Bedingfield discloses differences of the level of sound between the
18 ears. It discloses differences in volume between the ears and this is what the
19 '090 patent is disclosing.

20 Let's go back to slide 8 and look at Claim 15 again. Again, there
21 really is nothing to tie HRTFs to in this claim. You capture the binaural
22 voice, then you adjust that binaural voice so it is positioned at the sound
23 localization point. That's it. There's nothing to tie the HRTFs to.

24 Let's look at Claim 1, which is on slide 7.

25 JUDGE ARBES: Counsel, can I ask a question before you do?
26 Just for clarity in the terminology that we use today, the parties do appear to
27 use a bit different terms to refer to this. Do you agree that the phrasing

1 binaural synthesis is limited to this processing using HRTFs, processing
2 non-binaural content with left and right HRTFs of the desired placement
3 angle and position? That that's binaural synthesis, and we're really talking
4 about the same thing?

5 MS. NGUYEN: So no, I don't think we are talking about the same
6 thing, in part because again both Claims 1 and Claims 8 talk about capturing
7 binaural sound and adjusting that binaural sound. Second, binaural synthesis
8 can have different meanings, in particular when you're saying, okay let's
9 adjust the sound. The parties have not actually really defined whether or not
10 binaural synthesis covers adjustment of sound but in particular binaural
11 sound. So, if you say that binaural synthesis can also cover taking binaural
12 sound and adjusting it, is that binaural synthesis? I think some people would
13 say that is in fact binaural synthesis, other people would say no that's not
14 binaural synthesis because it's not creating the actual binaural sound, it's just
15 adjusting it. But ultimately it does not matter and I'm probably going to say
16 that a lot during this presentation, that it does not matter because we need to
17 look at the claim language and the claim language says capturing binaural
18 sound and adjusting that binaural sound.

19 JUDGE ARBES: So, Counsel, the reason that I ask is, I want to
20 make sure we're not talking past each other today and it appears to be a little
21 bit of that in the briefing. The language that I pulled that from was from Dr.
22 Kyriakakis's initial declaration at paragraph 55 that talks about the second
23 way to create binaural sound. That appears to be -- we can clarify that with
24 Patent Owner, that appears to be what they're referring to, but you're saying
25 that -- that the claims do not require that way of creating binaural sound with
26 HRTFs. Is that the argument you're making?

27 MS. NGUYEN: That is the argument we're making, and with

1 respect to Dr. Kyriakakis's description in paragraph 55 of his declaration, it's
2 talking about creating binaural sound. Again, we have binaural capture here.
3 So, you're capturing the binaural sound and then you're adjusting that
4 binaural sound. And when he did specifically talk about you can also
5 synthesize the sound, he didn't actually use the word synthesis, but that's
6 beside the point. It goes back to these are different ways to create binaural
7 sound, but the claims describe how you create it. You capture the sound
8 first and then you adjust it. And that's what the combination of Bedingfield
9 and Andrea does.

10 JUDGE ARBES: Okay. Can I ask, in your view, that initial step
11 of capturing binaural sound, is there any way to do that other than the
12 mechanism by which Andrea does it with two microphones based on either
13 side of the head? How else would you capture binaural sound?

14 MS. NGUYEN: How else would you capture binaural sound
15 besides having headphones -- and with microphones with the headphones?

16 JUDGE ARBES: Yes, can you give some other examples of ways
17 that that step could be satisfied?

18 MS. NGUYEN: Sure. So, you could, besides capturing it with the
19 two microphones on the earphones, you could capture binaural sound with
20 having audio capture in two different ways, right, like the patent talks about
21 having two microphones in different locations as well, so, not necessarily at
22 the earphones. If the question is whether or not you can do it with other I
23 guess equipment besides microphones, I'm not actually sure about that.

24 JUDGE ARBES: Okay. The reason I ask, and we can get into the
25 different steps of the claim, but the claims, at least Claim 1, does recite
26 capturing binaural sound and then it's adjusting that binaural sound. So, the
27 sound that's being captured is already binaural and we're making an

1 adjustment to it. Am I reading that right?

2 MS. NGUYEN: You are reading that right, and if you call with
3 respect to Andrea, Andrea talks about really capturing binaural sound in
4 order to amplify the voice, the speech component of the sound, right? So,
5 when you have the microphones, you're going to capture both voice, speech,
6 and other sounds. And so, when it captures the binaural sound, it will
7 amplify, as we mentioned, one of the motivations to combine is to amplify
8 that voice. But Andrea also, because it has the microphones at each ear, it
9 actually knows where the placement of that binaural voice is, that binaural
10 sound is. And so, when you're adjusting that sound, let's say the way that
11 Bedingfield teaches it, right? Let's say you have, you know, the volume of
12 the sound that you receive from Andrea is 50, 50, left, right. You're going to
13 adjust it if I want the person, my mom, to the left. So, the volume is at level
14 67 and level 33. And so, you can adjust Andrea's binaural sound also. And
15 so, in doing so, whether or not you want to call that binaural synthesis or
16 not, you are adjusting the binaural sound that's captured. And so, you don't
17 need to actually determine whether or not you want to call it binaural
18 synthesis or something else. It just comes down to you are adjusting the
19 binaural sound that's captured by Andrea.

20 If there's no further questions with respect to that, again we're
21 looking at Claim 1 and Claim 1 is very similar to Claim 15, except that it
22 says capturing binaural sound as opposed to capturing binaural voice, and it
23 also separates the steps so that you are designating a sound localization point
24 and then you are providing the sound in the earphones so that it sounds like
25 the binaural sound is coming from an origin next to the listening person. So,
26 away from and proximate to the listening person.

27 If we go to slide 9, now we're talking about Claim 8. An important

1 thing to note about Claim 8 is that it doesn't actually require binaural. There
2 is no binaural limitation in Claim 8. It says designate a sound localization
3 point that simulates a location at the space where an origin of the voice of
4 the second individual occurs and then it executes the call so that it appears
5 that the voice is coming from that sound localization point. Claim 8
6 additionally requires altering an interaural time difference of the voice that
7 the listener hears in response to moving the head orientation. And ITD and
8 moving -- providing that in response to the head orientation, it's going to
9 come into play with respect to the Ballas arguments.

10 But let's actually look at what the disputes are between the parties.
11 So, let's go to slide 40. And actually, let's start with slide 39. These are the
12 grounds that have been instituted. Grounds 1 through 3 really address
13 Claims 1 and 15, the capturing binaural voice and capturing binaural sound,
14 and then adjusting that binaural sound. Ground 4 is Claim 8, where we,
15 again, no longer have a binaural limitation and simply requires a sound
16 localization point that it is away from and proximate to, and as well the
17 interaural time difference limitation in response to movement of head
18 orientation.

19 So, let's look at the disputes on slide 40. For Grounds 1 through 4,
20 Patent Owner again synthesizes this binaural synthesis. But again, synthesis
21 is not required. Synthesis is a bit vague in this context, so it's really not
22 helpful to be talking about binaural synthesis. The question really is does
23 Bedingfield disclose the limitations of the claim? And any time that we're
24 thinking about what the Patent Owner is arguing, we need to tie it back to
25 the claim limitation, and most of the time, with the majority of the time,
26 Patent Owner fails to tie its arguments to an actual claim limitation.

27 And that's, in fact, the second argument. Bedingfield creates

1 perception of externalization, not externalized noise. And this argument
2 again is not tied to any claim term. Externalization is not a claim term.

3 With respect to perception, again, if we actually look at the claim
4 terms if we go back to slide 8, it talks about positioning the sound
5 localization point where it is representing a origin of the sound. So, I'm
6 going to highlight that language. So, it says you're -- in order to position --
7 let's see if this highlighter is working -- in order to position a sound
8 localization point it represents an origin of the binaural voice. We're not
9 talking about actually not providing the sound from the sound localization
10 point. It represents an origin of the binaural voice. And if we look at slide 7
11 and Claim 1, again, it says simulates an origin of the binaural sound. It
12 doesn't say it's actually coming from that point. It's simulating it. And if we
13 go to slide 9 with Claim 8, this -- Claim 8 makes it even clearer because it
14 says appears to the first individual to originate from the SLP. It doesn't have
15 to be, it appears. And again, you're simulating the SLP, that the origin of the
16 sound is coming from the SLP. It does not -- the sound does not actually
17 need to come from the SLP.

18 So, let's go to back to slide 40 and first address this first argument
19 about Bedingfield does not teach binaural synthesis and Bedingfield is not a
20 binaural reference.

21 Let's go to slide 41. Again, Bedingfield is very similar to the '090
22 patent where I'm trying to figure out, okay, I want to create -- simulate face-
23 to-face conversation with my mom. Here, we have listener 102A or 102,
24 and you're putting that listener at 102A in a circular configuration. My mom
25 is participant 104A, 104, and I can hear her coming from my left side.

26 Let's go to slide 42. Just like the '090 patent recognizes that you
27 can localize sound by taking advantage of the natural acoustic differences

1 between the left ear and the right ear, Bedingfield teaches that if you have
2 your speaker, 1404, to your left, you can make the sound in your left channel
3 louder than the sound coming from your right channel in order to simulate
4 that my mom is coming from the left.

5 If we go to slide 43, again, '090 patent talks about adjustments to
6 aspects of sound, and Bedingfield discloses that you can create the sound
7 field by processing sound in order to make it appear that your mom or
8 whoever you're listening to is coming from a specific location in that sound
9 field. Bedingfield discloses that you can use a number of different audio
10 techniques, including increasing or decreasing volume, changing delay,
11 changing echo, changing attenuation, changing frequencies. These are all
12 disclosed ways in Bedingfield to adjust parameters. So, you have the
13 sensation that one participant is located at a particular location in reference
14 to the listener.

15 JUDGE ARBES: Counsel, the heading of your slide there says
16 that Bedingfield discloses adjusting by binaural sound. But I understood
17 you to be arguing in the petition that with respect to the first step, on page 22
18 of the petition, that Bedingfield does not expressly teach capturing a binaural
19 sound. And that's why you needed the Andrea reference. So, are we really
20 talking about the combination here? I mean, the sound that you've captured
21 in your proposed combination is based on that combination with Andrea,
22 right? So, it's that sound that's being adjusted. That's what we're talking
23 about now.

24 MS. NGUYEN: That's correct, Your Honor. So, it should be the
25 binaural sound captured. So, it's using the Bedingfield techniques to adjust
26 the binaural sound captured, but the binaural sound captured is still the
27 sound that's captured by Andrea. So, Andrea discloses the captured binaural

1 sound and how you capture it. Then Bedingfield discloses taking that
2 captured binaural sound and adjusting it.

3 So, let's actually look at what Patent Owner is trying to argue here.
4 And in particular, if we go to slide 44, Patent Owner is actually saying that
5 Bedingfield is a stereo reference instead of a binaural reference. And when
6 we look at how Bedingfield uses the word stereo, Bedingfield is not using
7 the word stereo in the commonly known in the industry way of talking about
8 stereo. As Dr. Kyriakakis had said in his opening declarations at paragraphs
9 43 to 47, he says that normally, stereo is describing loudspeaker sound. And
10 here, clearly, Bedingfield is talking about earphones. And so, when
11 Bedingfield is using the word stereo, as Dr. Kyriakakis said in his deposition
12 at Exhibit 2016, pages 160 to 161, Bedingfield is actually using stereo in a
13 colloquial way to mean two channels. And just like a square can be a
14 rectangle, binaural sound can be stereo if you're talking about just two
15 channels. It doesn't mean that, you know, binaural sound is stereo or a
16 square, anything -- a square, that a rectangle is a square, always a square.
17 But it does mean that binaural sound is a type of sound that has two
18 channels.

19 And when you actually look at, let's go to slide 45, the disclosure
20 that's actually provided by Bedingfield, it's clear that Bedingfield is talking
21 about binaural sound. Sound that is a representation that would be received
22 by each ear, left and right, which the listener can localize. Here we see at
23 column 3, lines 35 to column 4, line 12, that Bedingfield describes the
24 hearing mechanism, including ears, nerves, brain processing, subsequently
25 referred to as the ear, detects placement of a speaker or a sound source by
26 detecting differences perceived by the listener's two ears. The listener may
27 hear a second speaker located at the 3:00 position relative to the listener in

1 stereo sound with an increased volume level in the right audio channel and a
2 decreased volume in the left audio channel as compared to the right and left
3 volume levels received from the first speaker. This is exactly describing
4 binaural sounds, and Patent Owner never really explains why Bedingfield's
5 disclosure here is not binaural, other than to say, well, Bedingfield says
6 stereo. So, let's ignore the rest of Bedingfield's disclosure and just focus on
7 the fact that Bedingfield uses the word stereo. If a person --

8 JUDGE ARBES: I'm sorry, Counsel. This point appears to be
9 very similar to an argument that was made in one of the companion cases,
10 but is it -- the fact that two different sounds are being played at two different
11 volumes, does that really make it binaural sound that you are providing? Or
12 did it -- both parties' experts appear to agree that there's two ways to create
13 binaural sound. Don't you have to have created the sound in one of those
14 two ways in order to be able to call it binaural sound?

15 MS. NGUYEN: Again, the claims themselves don't say create the
16 binaural sound, it says capture the binaural sound and adjust the binaural
17 sound. And that is what the combination of Bedingfield and Andrea are
18 doing. And with respect to, I guess, the dispute as to stereo and what the
19 meaning of binaural is, on page 16, footnote 6 of Patent Owner's sur-reply,
20 they say, well, let's just accept the definition of binaural in the District Court
21 litigation, which is representation of sound waves as they would have been
22 received by each of the left ear and the right ears of the listener, which a
23 listener can localize. And they emphasize that part, the last part of that
24 definition, which the listener can localize.

25 And that's exactly what Bedingfield is describing in paragraph --
26 I'm sorry, column 3, lines 35 onward. Bedingfield is saying, I want to put
27 the speaker at the 3:00 position. How do I do that? I take natural acoustic

1 differences and apply that to the sound, so that now I have increased, you
2 know, right audio channel and a decreased left audio channel. And it also
3 goes back to what the patent itself says, the '090 patent itself says. The '090
4 patent doesn't exclusively say you can only adjust sound, you can only
5 create sound using binaural synthesis, using HRTFs. The '090 patent, again,
6 if we go to slide 27, it's very clear that you can create these natural acoustic
7 differences without HRTFs. And if we are saying that binaural synthesis
8 requires HRTFs, '090 patent makes it very clear that HRTFs alone are not
9 the only way to create a sound localization point, or to localize sound, to
10 create that binaural sound.

11 So again, on slide 27, we have passages at column 3, lines 59
12 through 67 of the '090 patent talking about creating that sound. At column
13 35, lines 49 through 55, we're talking about adjusting that sound.

14 Let's go to slide 28, where we have even more disclosures. In
15 column 4, lines 20 through 39, the patent talks about, again, adjustments to
16 sound are made so the sound emanates or originates from the sound
17 localization point. The sound is processed -- so the sound localization
18 occurs for the listener to emanate from or originate at the sound localization
19 point. The sound is processed to alter, add, or generate HRTFs, ITDs,
20 and/or ILD. So, it goes back to what is critical here is what the '090 patent is
21 saying is required for capturing and adjusting. The '090 patent did not use
22 the words binaural synthesis. It did not use the word, you know, creating
23 binaural sound. It's just saying capture binaural sound and adjust that
24 binaural sound. And that disclosure in the '090 patent, and specifically about
25 ILD, being able to create the natural acoustic differences between the left
26 and right ear, that's exactly what is disclosed in Bedingfield.

27 Patent Owner has not identified any differences in the disclosure in

1 the '090 patent and Bedingfield. It goes back to Patent Owner relies
2 exclusively on extrinsic evidence to make their arguments. Patent Owner
3 wants you to ignore the patent, the '090 patent, ignore Bedingfield, instead
4 use terms that are not used in either the prior art or the patent in order to say
5 this is not disclosed. But you really have to see, okay, what does the '090
6 patent disclose? What does Bedingfield disclose? Does that match up?
7 And they do.

8 So, let's go back to the part -- to Patent Owner's arguments on slide
9 40. So, besides the, you know, Bedingfield is not binaural argument, Patent
10 Owner also makes this argument that Bedingfield creates the perception of
11 externalization, not externalized noise. And what is this argument really?
12 We go to slide 46. Patent Owner is saying that Bedingfield is teaching that
13 the listener should use his or her imagination instead of manipulation of
14 auditory cues. But that really doesn't make any sense, particularly given the
15 description and disclosures in Bedingfield.

16 If we go to slide 48, again, in order to really make this argument,
17 Patent Owner has to modify the teachings of Bedingfield and say, oh,
18 Bedingfield is actually teaching not, you know, sound localization points
19 away from and proximate to the listener. It's all in the listener's head. But
20 when you actually look at how Figures 14, Figures 15 are described by
21 Bedingfield, specifically if you go to slide 47 of Petitioner's demonstratives,
22 Bedingfield says, as shown in Figure 15, after the listener of 1402 changes
23 the focus, the sound field may correspondingly change to reflect the new
24 sound field orientation, thus providing more balanced left and right sound
25 volume. So again, Bedingfield is teaching -- and even the title of
26 Bedingfield is Synthetic Audio Placement. It's about manipulating audio.
27 It's not about encouraging imagination through other cues, like visual cues or

1 anything like that. Bedingfield is specifically talking about manipulating
2 audio cues. Here we --

3 JUDGE ARBES: I understand your arguments about Bedingfield's
4 disclosure. Can you respond a bit to Patent Owner's arguments, which I
5 think were more directed to how Andrea accomplishes the capture of
6 binaural sound, and that binaural recording that captures both voice from
7 either side with the microphone and then environmental sounds? Can you
8 respond to that a bit and how, if I capture the voice that way, am I able to
9 adjust it in the way that Bedingfield describes?

10 MS. NGUYEN: Sure. So, if you go to slide 32. And again, it's
11 hard to place where Patent Owner's arguments are again, because Patent
12 Owner doesn't actually tie it to any specific claim language. And in their
13 sur-reply they also say, well, we're not trying to construe captured binaural
14 sound. So, I'm actually not sure where this argument comes into play,
15 whether or not it's capturing or adjusting. But if you think about the
16 combination and what Andrea teaches, Andrea teaches that you have two
17 microphones on your left ear and your right ear, and it captures that sound.
18 So, if the -- because your mouth is equidistant from these microphones, the
19 sound should be the same. So, if you want to clean up the voice aspect of
20 that binaural sound, then you can basically say, well, any other sound that
21 you capture, that's just going to be noise. For example, if I hear a bird to my
22 right, that bird is going to be louder in the sound captured on my right than
23 my left. And so, you can take the two audio channels and clean up the
24 signal. And so, when Andrea talks about cleaning up that signal, it's again,
25 still in that -- it's still binaural. Like you still have a left audio and right
26 audio. You just have removed the noise aspects of it. Andrea talks about
27 basically noise cancellation and filtering out the noise. And this is actually

1 very similar to how the patent, the '090 patent describes it.

2 So, if you go to slide 36, the '090 patent describes filtering out
3 ambient noise, that the vocal sound captured from the third microphone is
4 used to enhance the sound captured by the fourth microphone and cancel out
5 these non-vocal components. And Andrea is basically saying the exact same
6 thing. You have your two microphones, and you're going to filter out and
7 minimize the unwanted sound perceived by the users. And so, it really
8 parallels the '090 patent quite well in terms of how it works. So, you take
9 the binaural captured sound. Again, the '090 talks about capturing binaural
10 sound and then adjusting it. That is what this Bedingfield-Andrea
11 accommodation does. It captures binaural sound. It cleans it up. And then
12 it adjusts it so that you can place and position a sound localization plain. It
13 parallels the '090 patent and how the '090 patent actually supports the claims
14 in saying that, okay, you capture binaural sound, now you want to adjust that
15 binaural sound so that you place it at an SLP. That only makes sense if you
16 are canceling out the non-vocal components. Otherwise, you're going to be
17 stuck with a situation where you captured binaural sound and you have a
18 bunch of different sounds. Let's say a bird on your right and a door closing
19 on your left. If you were to adjust that sound so that the sound is emanating
20 from the same SLP, you have the bird, you have the door, and you have the
21 voice coming from the same SLP. And that is not what the '090 patent
22 intended. And so, when we're talking about the combination of Andrea and
23 Bedingfield, it actually does parallel the disclosure in the '090 patent.

24 So, with respect to imagination, I actually think what they're trying
25 to say is that the sound actually needs to come from the sound localization
26 point. And this is made very clear by the sur-reply on page 19 where Patent
27 Owner says, this highlights a key point. The voices are perceived to

1 originate there, not actually originating there. Yet the claims require the
2 sound originate from the SLP. The claims do not require again that the
3 sound originate from the SLP. It must appear to come from the SLP or
4 simulate that it's coming from the SLP. The sound does not actually come
5 from the SLP itself.

6 Now, if we go back to slide 40 and talk about PO's arguments,
7 these are the arguments with respect to Grounds 1 through 4. And again,
8 these arguments are not tied to any specific claim language. And rather, we
9 need to focus on the fact of how the '090 patent describes capturing binaural
10 sound and adjusting that binaural sound and the fact that Bedingfield
11 actually does it in the same way as '090 patent. It captures binaural sound
12 and then adjusts that binaural sound.

13 Now, let's --

14 JUDGE ARBES: Counsel, perhaps in the interest of time, we may
15 want to move on to Claim 8, and specifically the ITD issue with respect to
16 Bedingfield.

17 MS. NGUYEN: So, let's talk about the ITD issue, and let's go to
18 slide 50. So, as Patent Owner has also highlighted, there are three
19 disclosures or times in Bedingfield that the word delay is used. So, here we
20 see the first two on slide 50. And the last one we acknowledge is not
21 actually talking about ITD. In fact, that just shows that a person of ordinary
22 skill in the art reading the disclosures of Bedingfield will look at context,
23 will try to understand the context of what is being used here for the delay.
24 And so, in these two disclosures, Bedingfield is talking about how do I place
25 a sound source within my sound field. And I can do that by, again, adjusting
26 volume, adjusting echo, adjusting delay. That's what's in the first disclosure
27 in column 3. Similarly, in column 5, again, Bedingfield, you have to read it

1 in context. And Bedingfield says, in other embodiments, the participants
2 may be placed in other configurations within the sound field, such as in a
3 rectangular configuration or along a linear axis using various audio
4 techniques, such as volume, balance, parametric equalization, delay, echo,
5 and the like. And Patent Owner has not been able to identify what else delay
6 might mean in these contexts. When you're talking about placing --

7 JUDGE ARBES: But Counsel, I have a number of questions about
8 both of the first two examples. But first of all, why is it Patent Owner's
9 responsibility to find out other ways? You are saying that this portion of
10 Bedingfield teaches the adjustment of ITD. So, what we're trying to figure
11 out is whether a person of ordinary skill in the art, understanding this
12 language in the reference, would they understand it to disclose that? I mean,
13 that's your burden to show, correct?

14 MS. NGUYEN: That's correct, that's absolutely true. And we
15 believe that we -- it does. Particularly Dr. Kyriakakis's declaration, when he
16 originally described this in paragraph 147, he does talk about how when you
17 look at it in context, what does delay mean? It's absolutely our burden, but
18 Patent Owner completely ignores that Dr. Kyriakakis does look at it in
19 context and does say when you are in a virtual environment and the prior art,
20 the reference is teaching -- saying and saying that you can use delay in order
21 to move sound within the sound field. That to a person of ordinary skill in
22 the art, as Dr. Kyriakakis said in paragraph 147, does mean delayed as in
23 delay between the left ear and the right ear. So, ILD, I'm sorry, ITD.

24 JUDGE RAEVSKY: Counsel, this is Judge Raevsky. When I
25 look at paragraph 147, I see where your expert says that, but then I don't see
26 a because after it. I don't see a reason why. What is the reason that you're
27 relying on for that statement?

1 MS. NGUYEN: He says in the context of the sound field. It's
2 because when you read it with respect to the sound field it has to mean
3 delay, it has to mean ITD because, for example if you're looking at the delay
4 in the last disclosure where it talks about digital delays, it's not talking about
5 the sound field, and in that context it's not talking about ITD because when
6 you're thinking about that context the digital delays, it's clear from the fact
7 that they're talking about other possibilities with respect to the digital delay
8 that it's not talking about ITD.

9 Dr. Kyriakakis says because we're talking about a sound field and
10 we're talking about placing sound in a way so that the sound is coming from
11 a particular location in the sound field, these various audio techniques such
12 as volume, balance, delay, that means to a person of ordinary skill in the art,
13 ITD. When you're talking about various audio techniques to create a sound
14 field and you're talking about delay in those audio techniques, we're talking
15 about ITD.

16 JUDGE ARBES: Counsel, can you respond to -- Patent Owner
17 cited some testimony from Dr. Begault about the first example there where
18 it's talking about movement from the front to behind the listener, and that the
19 ITD would actually be the same in those cases, so you couldn't actually
20 determine if the person was in front or behind you. So, that use of the word
21 delay in column 3 of Bedingfield is not really talking about ITD.

22 MS. NGUYEN: Right. So, that's actually not quite accurate with
23 respect to what Dr. Begault said. When you're moving a sound, let's say
24 from front to back, it only sounds potentially the same if they're exactly the
25 same distance away from front to back. But when you're adjusting the
26 delay, and let's say you're moving from two feet in front of you to three feet
27 in front of you, that actually does mean that the sound impacts how you're

1 hearing it and your ability to localize it. And so, you can tell the difference
2 if the distance is different. The only time you can't tell the difference is if it
3 is the same distance from front to back.

4 JUDGE ARBES: Okay. I understand your position on raw
5 distance there, but column 3 about line 56, what it's talking about in this
6 paragraph is giving the listener the impression that a sound source has
7 moved behind the listener. That raw distance that you're talking about really
8 doesn't encompass that concept, right? I mean I can't tell front to back. All I
9 can tell is distance away from me, right, with ITD?

10 MS. NGUYEN: With ITD, you -- no, you could tell. So, for
11 example, as I just mentioned, the only time you can't tell if somebody's
12 moved from front to back is if it's the distance between my head to the front
13 and my head to the back is the same. But let's say again, if I have somebody
14 who moves from two feet in front of me to one foot behind me, that actually
15 does tell me that person is now located behind me. So, there's only like a
16 rare instance where that change in ITD doesn't actually -- or a delay, doesn't
17 tell you whether or not the person has moved from front to back. And
18 generally, it goes back to at the very start of this paragraph in column 3, it's
19 talking about placement of the speaker generally. And it's talking about, for
20 example, 3:00 position to located it behind you. You can certainly tell if
21 somebody's moved from your 3:00 position to a location behind you, if the
22 ITD has changed.

23 JUDGE ARBES: Maybe I'm not understanding ITD fully then. Is
24 the ITD different then with a point one foot in front of me and one foot
25 behind me, or is it the same?

26 MS. NGUYEN: It is the -- so, the -- is the ITD different from --
27 it's going to be different from, yes, when you're in one foot in front of you,

1 and let's say two feet behind you.

2 JUDGE ARBES: I'm talking about -- let's say the exact same
3 distance, the exact same distance in front of me, the exact same distance
4 behind me. If I think about my head as a point in space, the ITD should be
5 exactly the same between those, right?

6 MS. NGUYEN: Correct. So, if that's the case, that is exactly the
7 same. So that, again, is that one instance where it doesn't tell you a
8 difference, right? But it just (INDISCERNIBLE) --

9 JUDGE ARBES: Okay.

10 MS. NGUYEN: But otherwise, when you're talking about locating
11 another participant behind you, it can tell you the difference, particularly if
12 they're offset by a little bit.

13 JUDGE RAEVSKY: Is it the case that the column 5 disclosure is
14 more helpful to you because the paragraph where the delay is mentioned
15 talks about locating participants on the left and right side of the sound field?

16 MS. NGUYEN: We believe that both disclosures help us, but as
17 you mentioned, I think column 5 is more clear with respect to you have a
18 rectangular configuration or circular configuration, and you're placing your
19 participants in that circular or rectangular configuration and using delay as
20 part of that. Yes.

21 JUDGE RAEVSKY: I guess doesn't it make more sense, or
22 wouldn't it make more sense to the skilled artisan that if someone's on the
23 left side then the delay would be different, the interaural time delay, and
24 therefore the word delay in that paragraph is more likely to be referring to
25 ITD than if it's directly in front or behind you?

26 MS. NGUYEN: Yes, definitely agree that it's easier if something's
27 offset to the left or right. And so, because it's a rectangular or circular

1 configuration it's talking about the different in arrival times between the left
2 and the right ear. So, that delay, yes.

3 So, I want to make sure actually that our LEAP participant has
4 time to argue as well. And so, I think there was some discussion with
5 respect to whether or not Ballas is binaural or not. But we, as mentioned in,
6 you know, let's go to slide 52. I'm sorry. Fifty-two, Ballas really does
7 disclose binaural techniques as well. And if anything, it's a transaural
8 reference, which means it's providing binaural sound over speakers.

9 So, unless there are any further questions, I will pass this along to
10 Dr. Rashid to talk about the Li references.

11 DR. RASHID: All right. Thank you, Your Honor. My name is
12 Jeremy Rashid, LEAP practitioner on behalf of Petitioner Meta. I appreciate
13 the opportunity to speak today. I'm going to be discussing Petitioner's
14 Grounds 5 to 8, and then I'll move on to Petitioner's two motions, the motion
15 to exclude and motion to strike.

16 Let's go to slide 55. Grounds 5 to 8 are based on the primary
17 reference Li. The main issues here are one, does Li disclose a telephone
18 call? And two, did Petitioner address all limitations in the claims? The
19 answer to both these questions is yes. I'll explain why.

20 Let's go to slide 57. First, Li discloses the telephone call because
21 the entire configurable 3D sound system 900 in Li is explicitly applied to a
22 conference call, not just a two line embodiment in Li, but the entire
23 description in Li provides for creating a sound field in different situations,
24 including a conference call. Why does Li say that about system 900? There
25 are a lot of figures in Li that build on system 900, and it is that same system
26 900 that applies to a conference call. Therefore, all of Li's teachings of its
27 concert embodiment apply to its conference call embodiment.

1 What is a conference call? There should be no dispute about this.
2 Going back to the claims, what is required? At least a talking person talking
3 and a listening person listening to that person talking on a telephone call.
4 Patent Owner should not be able to dispute that a conference call covers
5 these three things. Not only does Li discuss a conference call, but it also
6 discloses the sound sources on that conference call, such as speaking users
7 and a person's voice. Li distinguishes between these sound sources because
8 they are listed separately. Patent Owner's interpretation of Li is that every
9 single sound source must be pre-recorded and cannot be live. This is
10 incorrect.

11 Li's conference call that mimics a real conference room
12 environment does not involve a pre-recording. It is a live recording. Li
13 distinguishes between recordings and pre-recordings. For example, Your
14 Honors, right now on this call, my mic is recording my voice. This is a live
15 conference call, just like Li teaches. The mic is not pre-recording my voice
16 and transmitting it to you. My voice is not a pre-recording that is played
17 back to you, but it is a live recording.

18 Let's go to slide 58. This teaching in Li is exactly the same as
19 what is taught in the '090 patent, which uses the word recording to refer to
20 live real-time transmissions during transmission calls, telephone calls. This
21 is confirmed by the snippets on the slide. Patent Owner's own expert
22 confirms that record in the '090 patent is the same as real-time interaction,
23 same as live. This is the same thing in Li. You can only mimic a real
24 conference room environment if you have real-time interaction. So, there
25 should be no dispute that Li's recording includes at least a live recording.
26 Patent Owner's argument that Li's recording is different from the '090 patent
27 should therefore be disregarded.

1 Let's go to slide 59. To my second point, the Petitioner did not
2 miss any of the claim limitations in its briefing. The claim repeats the same
3 words over and over and over again. For example, the blue boxes, this
4 highlighting the term during a telephone call is repeated four times and the
5 term involving the SLP is repeated three times. Because of these lengthy
6 terms, it is appropriate for Petitioner to refer back to prior limitations
7 because we mapped it once. It makes sense to refer back to the original
8 mapping. So, we did not ignore limitations. We mapped everything, just
9 referred back. This is on slides 60 to 62. In fact, it is Patent Owner who
10 failed to identify any claim limitation that is not met by the combination.
11 And they had every opportunity to do so in their papers. To date, they have
12 not identified anything that is missing from the combination. And this is
13 because we showed every limitation is met. So, those are the only issues
14 relating to Li. Unless there are have questions, I'll move on to the two
15 motions.

16 JUDGE ARBES: No, Counsel, but just to let you know on time,
17 you have 20 minutes remaining total.

18 DR. RASHID: Thank you, Your Honor. All right, moving to slide
19 63. The motion to exclude and the motion to strike. The motion to exclude
20 is in relation to Exhibits 2029 and 2030. And the motion to strike concerns
21 arguments relating to these exhibits in Patent Owner's sur-reply.

22 The Board should exclude these exhibits and Patent Owner's
23 arguments should be stricken from the sur-reply. The issues here are simple.
24 There are three independent reasons why, and they apply equally to both
25 motions. One, relevance. Two, untimeliness. And three, hearsay. I'll talk
26 about these reasons now.

27 Let's go to slide 64. To my first point, relevance. Exhibits 2029

1 and 2030 are deposition transcripts of the testimony of Dr. Welch and Dr.
2 Roginska from unrelated proceedings. These are unrelated because they are
3 from different proceedings that challenge different patents, '509 and '179,
4 and patents '509 and '179, not in the same family as the '090 patent. In order
5 to be related, patents '509 and '179 would have to be continuations or similar
6 of the '090 patent. Because these patents are from different proceedings,
7 Petitioner had no opportunity to give more context to the testimony of
8 Welch and Roginska. Petitioner did not present these experts for their
9 testimony on the '090 patent, and Patent Owner did not cross-examine these
10 experts on the '090 patent. Now Patent Owner is relying on these exhibits as
11 if these experts did indeed testify on the '090 patent.

12 Let's go to slide 66. For my second point, untimeliness, Patent
13 Owner's new theories were not included in the prior briefing. These new
14 theories include contradictory and disagreeing opinions, expert agreement
15 and acknowledgement on sound, externalization and binaural synthesis, and
16 experts acknowledging facts about stereo sound and associated conclusions.
17 Patent Owner had the opportunity to present these new theories earlier, but
18 waited until the sur-reply. This clearly prejudices Petitioner. So, today
19 Petitioner has to reply to them. Not only are the arguments new, they're also
20 not supported by the exhibits at issue.

21 Let's go to slide -- let's jump back to slide 65. To my third point,
22 the exhibits are hearsay and not been an exception. By introducing the
23 transcripts and comparing expert opinions, Patent Owner is relying on Dr.
24 Kyriakakis's testimony for the truth of the matter, so that otherwise it would
25 make no sense for them to even reference these exhibits. The provision in
26 Federal Rules of Evidence 801(d)(2)(C) does not permit any testimony on
27 any matter to be entered, rather it has to be on the subject. Experts Welch

1 and Roginska did not testify on anything related to the '090 patent, so this
2 exception provided for in 801(d)(2)(C) does not apply here. Essentially, this
3 is the backdoor way for Patent Owner to get these deposition transcripts into
4 the record. Patent Owner clearly knew that this is the later part when that's
5 why it relied on the sur-reply. Petitioner was not provided the opportunity to
6 fully respond to the arguments, and this is an egregious disregard for the
7 rules in the Trial Practice Guide. This is an exceptional case of trying to
8 enter evidence. The Trial Practice Guide provides striking as the
9 exceptional remedy in lieu of prejudice to the Petitioner. So, this warrants
10 exclusion of the exhibits and striking at and in the statements for the record.

11 Now that we have talked about these reasons, we ask Your Honors
12 to exclude the exhibits and strikes the arguments. Unless there are
13 questions, I thank you for your time, otherwise I'll save the rest of my time
14 for rebuttal.

15 JUDGE ARBES: Thank you, Counsel. Counsel for Patent Owner,
16 you may proceed, and would you like to reserve time?

17 MR. RAFATIJO: Thank you, Your Honor. Yes, I would reserve
18 12 minutes for rebuttal. So, good afternoon, Your Honors, and may it please
19 the Board.

20 So, I heard a lot from the counsel on the other side that we have
21 not presented any of -- we have not tried the concept of HRTF to any of the
22 claimed terms. Now, Your Honor, in our sur-reply at page 7 and 8, we
23 clearly said that a sound localization point located at a position away from
24 and proximate to the user, that would indicate HRTF processing. So, we did
25 so, Your Honors.

26 And then I heard repeatedly from the other side that the patent
27 specification talks about multiple ways to adjust the sound, but they ignore

1 that we are talking about creation of an SLP or sound position point in the
2 first place. There is no dispute that all of the independent claims requires
3 creation of a sound localization point. Essentially, you need to have a sound
4 localization point from where the origin of the voice occurs.

5 So, I would like to go to slide 27 of the Petitioner. They show this
6 snippet on the top at column 3, lines 59 through 65 of our patent. And they
7 use this snippet to tell you, Your Honors, that we have multiple ways of
8 creating sound localization point.

9 Now, Your Honors, to me, in plain English, this says that you have
10 to use HRTF. And this is grammar 101, and I can say that as a non-native
11 speaker. And I would like to read this sentence for the record. It says,
12 sound localization, essentially sound localization point, can be -- code can be
13 altered or created using one or more of its related transfer functions, comma,
14 accounting for ITE, ILD, and a bunch of other factors, end quote. So, what's
15 followed after the comma, accounting for, this is an adjective clause, Your
16 Honors, modifying HRTFs. Essentially, these are the factors their expert
17 testified in his declaration that are accounted for in the concept of HRTF.
18 So, in plain English, Your Honors, this language says, this -- a snippet that
19 they rely on says, creation or alteration of sound localization point, meaning
20 if you would like to change the position of sound localization from point A
21 to point B, you would need to use HRTFs.

22 Now, the second snippet on this slide, this is slide 27 of Petitioner,
23 talks about adjusting, but the sound localization point, Your Honors, are
24 already there. We do not dispute that if -- when the sound localization point
25 is created, then you can adjust the voice, volume, for example, you can turn
26 the volume up or down. We do not dispute that. What we dispute, and that's
27 what we argued in our sur-reply, and you are -- that creation -- that having

1 the sound localization point away from and proximate to a user, requires
2 HRTF processing. Further, Your Honors, moving the sound localization
3 point from point A to point B also requires HRTF. So, I wanted to make
4 that very clear in the outset, but Your Honors, I would like to go to slide 3
5 now.

6 JUDGE ARBES: Counsel, before you do, can I just ask one
7 question about that? So, I think I understand your point about the
8 adjustments and the second box on slide 27. So, if we assume that that ties
9 to the adjusting step of Claim 1, where exactly does the requirement to use
10 HRTFs come in before the adjusting step? So, we have steps -- steps A and
11 B of Claim 1, where exactly does the HRTFs come in if it's before that?

12 MR. RAFATIJO: Sure. Sure, Your Honor. Most of these claims
13 talks about, especially Claim 15 and Claim 8, designating a sound
14 localization point. It talks about creating, designating a sound localization
15 point away from and proximate to the user. For example, Claim 8,
16 limitation B, talks about designating a sound localization point. And
17 furthermore, Your Honor, in Claim 1, when it talks about adjusting the
18 sound localization point, it clearly says adjusting the sound localization point
19 to place it in a new sound localization point, according to our interpretation,
20 which I'm going to explain. So, and this first snippet on slide 27 says, for
21 creation or alteration. An alteration essentially means, Your Honor, if you
22 move the sound from point A to point B, for both of them, you need to have
23 HRTF.

24 JUDGE ARBES: But as I understand Step B of Claim 1, that's the
25 language I'm talking about, designating a sound localization point in empty
26 space that is away from and proximate to the listening person. How do you
27 read HRTFs into that? That appears to be just designating a point in three-

1 dimensional space.

2 MR. RAFATIJO: Well, Your Honor, this is a sound localization
3 point, and our patent makes it very clear, a POSITA would understand the
4 same, that in order to create the sound localization point, in order to have
5 that sound localization point, away from and proximate to the user, you
6 would need to use code one or more of HRTFs, because these HRTFs, Your
7 Honor, account for all of the spatial information required for designating that
8 SLP. You know, you're saying this is a point in the space, but it's a specific
9 point in the space. It's a point from which the sound can originate, so it is a
10 sound localization. We're talking about the concept of a sound localization
11 outside the head of the user, away from and proximate to the user. And to
12 have that point with those features, you need to have HRTF. Again, I'm
13 borrowing from the evidence they presented to you on a slide 27. The patent
14 is clear, and the POSITA reading is, as Dr. Begault explained, would
15 understand that HRTF is inherent in all of this claims, because we are
16 designating SLP.

17 JUDGE ARBES: And just one more point before we move on.
18 Can you respond to Petitioner's argument that there are some claims that
19 expressly recite HRTFs in dependent claims? So, if that was a concept that
20 is implicit or inherent in all of the -- in Claims 1 and 15, for instance, why
21 was it not recited there then?

22 MR. RAFATIJO: Sure, Your Honor. If I can go to my slide
23 number would be -- that would be slide -- that I'm talking about Claim 10.
24 So, okay, I go off of the memory. So, we have Claim 8 versus Claim 10, for
25 example. Claim 10 talks about to adjust the HRTF of the voice in order to
26 accurately simulate, accurately simulate, yeah, it's a slide 89. If you can go
27 to slide 89, please. Okay. So, we need to understand what Claim 8 says.

1 Claim 8 starts with a sound localization point. So now you have created,
2 designated a sound localization point using HRTF. This sound localization
3 point has two features, away from and proximate to, and from where the
4 origin of the voice occurs. Then you execute the phone call. When you
5 execute the phone call, Your Honor, this voice, presented to the user for the
6 listener for the first time, from the SLP that was created in Step B or
7 designated in Step B. Then limitation D talks about, okay, now the listener
8 has the voice, listener moves freely in the room. So, now we are going to
9 adjust only ITD of the voice that is already presented to the user at the SLP.

10 Claim 10 talks about, well, instead of adjusting the ITD, we're
11 going to adjust the HRTF to more accurately simulate HRTFs of the first
12 individual in response to that first individual moving. So again, Claims 8
13 and 10, and these arguments are rebutted, Your Honors. We made this
14 argument in our POR and they did not address that. So, the difference
15 between Claim 8 and 10 is about accuracy. Both claims simulate HRTF.
16 The difference is when I move around in my room as a listener, I have two
17 options, either to adjust the ITD of the voice that is already presented to me
18 at an SLP, or with each step I have to adjust my HRTF. Because as we
19 know, Your Honors, HRTF accounts for all different factors, room
20 reverberation, room refraction, reflection, all of this stuff.

21 So, you can adjust that, but as Dr. Begault testified in this
22 testimony, and by the way, Your Honor, I would like to point out that the
23 simulation part of simulating head-related signals is one way of creating
24 binaural sound. And this is testimony from Dr. Kyriakakis. He said
25 binaural sound or sounds that either capture binaural recording or simulate,
26 if I can go to slide 90 please, or simulate head-related signals. So, and this
27 simulation is essentially binaural synthesis, Your Honor.

1 If we can go to slide 91. The POSITA reading this, the two
2 HRTFs, they said like, okay, the difference between the two claims is all
3 about accuracy. And correctly so, Your Honor, because if you have to
4 adjust HRTF in every step that the listener moves in the room, it's very
5 computationally expensive, the process of adjusting HRTF. So, you may
6 assume to adjust ITD, but again, Your Honor, that's the limitation D. Before
7 we get to the limitation D, you have to designate a sound localization point,
8 a date from an approximate for which you need HRTF.

9 So, for this --

10 JUDGE ARBES: And Counsel, if you can go back, go back two
11 slides, perhaps. I believe it was slide 89. Okay. So, the claim language
12 there, is it the claim language in yellow on slide 89, that that's where the
13 HRTFs come in, because it has to be before the adjustment or the alteration,
14 right?

15 MR. RAFATIJO: That is correct, Your Honor. The language in
16 yellow and light blue together, limitation D, it says, a sound localization
17 point, a location in empty space, from which the origin of the voice occurs,
18 and this sound localization point is located away from and proximate to the
19 listener. That is where the HRTF is coming from.

20 JUDGE ARBES: Okay. I think some of the confusion, perhaps, in
21 this case then, I mean, the normal situation would be we have claim
22 language, the yellow and blue, and we would do a claim construction
23 analysis of that. We would analyze the claim language itself. We would
24 look to the specification to determine what that language means. But you're
25 saying that the language in yellow and light blue, that means that HRTFs are
26 used. Am I understanding your argument, right?

27 MR. RAFATIJO: That is correct. HRTF is inherent in the

1 language in yellow and light blue. And we have argued that in our sur-reply,
2 for example, page 7 and 8, and also in our POR which I don't have the
3 citation top of my head. But if I can, Your Honor, I would like to go to slide
4 5.

5 JUDGE ARBES: Counsel, before you do that, I just wanted to
6 clarify why the language in yellow and blue couldn't be considered, say,
7 representing an ITD? Because would an ITD also localize sound?

8 MR. RAFATIJO: Your Honor, an ITD, if we can go to -- let me
9 take you to one of the slides here. Okay. If I can go to the slide 98, please.
10 Well, actually, 95. So, Petitioner's expert, Your Honor, I have to set this
11 background in order to answer your questions. Why this HRTF and nothing
12 else? Petitioner's expert said -- refers to the paper by no more -- no -- she's
13 the famous audio engineer of the 20th century, Doris Kistler. She said, to
14 simulate external sound source at an SLP in the MTS, which is essentially
15 using headphones. This is the language we use in all of our claims. The
16 researchers have investigated it. And the very next sentence, he talks about
17 binaural sound because it's the binaural sound that simulate head-related
18 signals necessarily for that externalization.

19 Let's go to the paper. This is their evidence, Your Honor. It's slide
20 96. It said, the first step for externalization is to measure the transfer
21 functions, HRTF. Why? Because the transfer functions contain all the
22 information needed to simulate the localization of sound sources. So, when
23 I heard from the counselors on the other side, as she talked about that claim
24 language talks about simulation. Well, of course we do not deny that, but
25 simulation of a sound localization point, you would need HRTF, and this is
26 their evidence, Your Honor.

27 Now, why ITD cannot be used. This is again another evidence

1 they introduced in this proceeding, Your Honor. This evidence, as we
2 discussed in our sur-reply, it goes over ITD and ion-based simulation and
3 then discusses HRTF. It says with HRTF, you're going to have a preset that
4 is externalized, meaning a background approximate to the user, a sound will
5 appear outside the listener. This effect stands in contrast to the within the
6 head, lateralized precept. And this is where this reference, which is their
7 exhibit, contrasts HRTF with ITD and ILD-based simulations. With ITD
8 alone and ILD, Your Honors, you get a lateralized precept, which is within
9 the head. Now, Your Honor, Dr. Begault testimony about ITD that you kept
10 hearing the term ITD. They never gave you a definition for ITD. Dr.
11 Begault said, Your Honor, ITD only positions the auditory events laterally,
12 creates a lateral precept. And that is the lateralized precept. Their evidence
13 discussed as inside the head localization and contrasted to HRTF processing.
14 So, you cannot use ITD. You can adjust the ITD after you use HRTF to
15 create a sound localization point. But by and of itself, ITD and ILD cannot
16 externalize the sound evidenced by their own testimony -- their own
17 evidence.

18 So, I hope that addresses your question, Your Honor.

19 JUDGE ARBES: Counsel, I guess maybe if you can explain that a
20 little bit further, why would ITD not externalize the sound? If I -- all it
21 might tell me is a distance away, some sound from a point that is 10 feet
22 away is going to have a different ITD than a sound at five -- five feet away,
23 but it's still external, right?

24 MR. RAFATIJO: Your Honor, if you can go to slide 97, I just
25 realized that this is the evidence I was talking about that contrasts HRTF
26 processing with ITD-based simulations that cause within the head lateralized
27 percept over the headphones. Remember, Your Honors, our patent is talking

1 about over the headphones. What you are referring to, Your Honors, is if
2 you have just loudspeakers around, and yes, the sound that hits my left ear
3 sooner than my right ear, but I'm not going to be able to detect where exactly
4 the sound source is located. How I hear the sound is inside the head.
5 There's nothing from those speakers can be heard externalized to me. But
6 when we have headphones, and you just adjust the ITD, you could create
7 what this reference describes as within the head, lateralized percept, and if
8 you can go to slide 98, please.

9 JUDGE RAEVSKY: Are the claims limited to using headphones,
10 Counsel?

11 MR. RAFATIJO: Your Honors, it talks about electronic earphones
12 or wearable electronic devices, and Dr. Begault in, I think in paragraph 59 of
13 his declaration, he went over all, every one of the examples that the
14 specifications used as wearable electronic devices, and he said these are all
15 required headphones. There's headsets, earphones, headphones, all of those
16 requires wearable electronic devices over headphones. That's why we are
17 talking about HRTF because, and Your Honors, in their slide 29, Petitioner's
18 slide 29, they should receive from Dr. Begault's testimony.

19 JUDGE RAEVSKY: I'm sorry, can I just ask a follow-up question
20 about that? So, I think the claims, as I understand them, and I might be
21 missing something, but I think they're talking about the earphones located at
22 the head of the talking person with the audio is captured, but Claim 1, for
23 instance, when it's talking about providing, okay, it said, provided at the
24 electronic earphone. So, that's your point where it has to be, I'll put to
25 earphones rather than speaker, okay, I missed that.

26 MR. RAFATIJO: Correct, Your Honor. And Dr. Begault's in the
27 testimony that they did post on the slide 29, they showed you a portion of it,

1 he clearly said, over the headphone, 100 percent you need to use HRTF.
2 Please look at your slide 29 and read the entire snippet toward the end, Dr.
3 Begault says, you know, I'm not talking -- we are not talking about loudest
4 speaker in these claims. Here we have headphones, and over the
5 headphones, 100 percent you need to have HRTF. So, HRT -- the concept
6 of HRTF is implicit in the current, in all of these claims, and they have failed
7 to recognize that.

8 And, Your Honor, I would like to go to slide 5, please. Okay.
9 Why they think that Bedingfield is a binaural sound reference. And they
10 said it over and over today, because Bedingfield teaches providing two
11 different sounds to each ear. Their position has not changed from what it
12 was in the 104 IPR. But, Your Honor, as the counsel corrected in the record,
13 what we agreed upon in the District Court, both parties was the
14 representation of vocal sounds is received by both ears, which a listener can
15 localize. So, this localization is a critical concept in understanding the
16 difference between binaural voice and non-binaural voice. And can you
17 please go to slide 6? And that's where I'm talking about, which a listener can
18 localize.

19 And if now we can go to slide 7. If you take their
20 (INDISCERNIBLE) scoring which I heard the other -- the counsel said,
21 Bedingfield, despite disclosing the stereo, which is a very norm term of art,
22 by the way, it's still binaural sound because it provides two signals to both
23 ears. Their experts said, well, all sounds can be heard by two ears. Does
24 that make them binaural? No. We have a stereo sound, we have natural
25 sound, we have mono sound. They're not binaural. The difference between,
26 if you can go to slide 8, sorry slide 9, the difference between, Your Honors,
27 stereo and binaural and other kinds of sounds is this externalization away

1 from and proximate to. Binaural sounds, the only way you can localize the
2 sound at a sound localization point, away from and proximate to. And this
3 testimony, Your Honor, is unrebutted. This is unrebutted. They're not
4 telling us what other way you can use to localize the sound away from and
5 proximate to the user.

6 So, Your Honor, if you can go to slide 11. This is a definition by
7 Petitioner to expert for binaural sound. That it captures, simulated, head-
8 related signals contain natural acoustic differences between the two ears.

9 If you can go to slide 12. Your Honor, this is an ocean of concept
10 that I have to dissect for Your Honors. Every term is important. And I'm
11 going to get to it, I'm going to dissect this because we need to understand the
12 technology. That's something Petitioner does not discuss. If you understand
13 the technology, how a POSITA would read this claim, I believe you will side
14 with us.

15 So first, at slide 13, it's talking about head-related signals. What
16 are these head-related signals? Your Honor, this is a HRT. Their expert
17 testified humans are able to localize sounds because of certain factors,
18 including reverberation, reflection, refraction, attenuation, shape of the ears
19 and stuff like that, right? The very next slide 14, the very next paragraph
20 says these factors are captures in the concept of HRTFs. And he goes on to
21 say, spatial information is thus encoded onto the signals received by the ear.
22 So, Petitioner's experts showed this understanding is his declaration that in
23 order to have this spatiality, counsel says, it's found localization for away
24 from and proximate to the listener you need to have HRTFs because all of
25 those factors are encoded, are captured in the concept of HRTF.

26 And now again I would refer Your Honors to slide 27 of Petitioner.
27 They showed you up this snippet from our patent where it says sound

1 localization point can be created or altered using one or more of HRTFs
2 comma accounting for all the factors Petitioner's expert listed in paragraph
3 52 of his declaration. So, you have to use HRTF to create sound localization
4 point, Your Honors, because it is the sound -- it is the HRTF that accounts
5 for all this. It doesn't say you can use either HRTF or ITD or ILD as the
6 other side represented to you. That's patently false and a mischaracterization
7 of our patent.

8 So, Your Honor, let's go to slide 15 please. Then we have
9 containing natural opposite differences between the two ears. So, HRTF
10 contains these two. What are these? ITD and ILD, Your Honors. You
11 heard about these terms today. So, I'm not going to stay there, but just want
12 to point out something in slide 16. Your Honors, if a reference discloses
13 only ILD or ITD, that reference doesn't mean -- that doesn't mean the
14 reference also discloses HRTF. Because ITD and ILD are contained in
15 HRTF, not the other way around. And slide 17, please. And we asked this
16 question from Petitioner's experts. Do you agree with this statement? He
17 said, yes. He said, if you have ILD and ITD, you cannot reconstruct HRTF,
18 meaning you don't have a HRTF. And you don't have a HRTF, therefore
19 you cannot have sound localization point away from and proximate to user.

20 And slide 18, please. And, Your Honors correctly sided with us in
21 104 decision. You said, you quoted us actually, disclosing some of the
22 sound characteristic, i.e., ITD and ILD, modified by the use of HRTF does
23 not necessarily mean that HRTF are used to modify them. They think
24 Bedingfield is a binaural reference and discloses HRTF because Bedingfield
25 discloses ILD. That is scientifically incorrect, against the record, and
26 against the decision you have made already in a parallel IPR, Your Honor.
27 So, Bedingfield --

1 JUDGE ARBES: So, Counsel, let's -- maybe, if we can assume for
2 the sake of argument that we agree with you on that point, Petitioner does
3 have the Andrea reference in this case, which has to do with the capture of
4 binaural sounds. So, maybe can we talk about that a bit?

5 MR. RAFATIJO: Sure, Your Honors. That's actually the second
6 point I wanted to make. Your Honors, Andrea talks about capturing binaural
7 sound. It doesn't talk about processing the binaural sound that is captured
8 with HR here. And their expert agreed with us. If I can point you to our
9 slide 29 I believe. Sorry, slide 29 -- or 30. Excuse me, slide 30. Okay. We
10 asked their expert, does this claim involve binaural synthesis? He said, yes.
11 And he said, if you just capture the voice of the talker with two microphones
12 in the head of the talker, that voice and provide that voice to the listener, the
13 listener will be heard that -- will be hearing that voice as originating in the
14 middle of the rep. Essentially two microphones in the head of a talker, all
15 you can capture is the SLP of the talker, which is inside the head. In order to
16 move that SLP, alter that SLP, quoting the language in our patent, alter the
17 SLP from point A to point B, you need to have processing detection.

18 If you can go to slide 31. When we ask him, okay, so Claim 15,
19 does it have binaural synthesis in it? He said, yes, the last limitation has
20 binaural synthesis. So, Your Honors, capturing binaural voice with two
21 microphones in the head of the talker, it doesn't provide the SLP away from
22 and proximate to the listener. The listener will hear that voice in the head
23 and they agreed with us, their expert agreed with us.

24 JUDGE ARBES: Counsel, okay, I understand your point if the
25 sound has not changed at all, but let's say that I changed the volume on one
26 side. And so, this is two channel, right? So, I change the volume on the
27 right side. I'm not changing HRTFs, I'm just changing the volume on the

1 one side, am I not changing that and I will no longer hear it at the exact same
2 point that I would have if I didn't process it altogether?

3 MR. RAFATIJO: Your Honor, ITD cannot alter the sound or
4 position point. So, when you're saying that if I change the ITD, does that
5 mean that I can hear it, hear the sounds coming from another point in the
6 space? That statement is not correct. And if I can show this at slide 33,
7 please. When we deposed their expert over 18 pages, he gave many
8 examples, including examples that start with binaural sound as input. And
9 we said, look, you have a binaural sound rendering at point A, you want to
10 change the sound localization point to go to point B. What do you have to
11 do? He said, you need to use code, magic HRTF box. So, and it says, so
12 you have a binaural sound, you are processing it through a different set up
13 HRTF correspond to a slight difference in angle. At no point do their
14 experts offer any example that you are changing the location of sound
15 localization point, or you are creating a sound localization point using
16 anything but HRTF.

17 JUDGE ARBES: But Counsel, isn't that what the last step of
18 Claim 8 is doing? The last step of Claim 8 is only altering the ITD and that
19 would change the perceived location right?

20 MR. RAFATIJO: Your Honor, that is not changing the perceived
21 location.

22 JUDGE ARBES: It's not, okay.

23 MR. RAFATIJO: No, not at all. It's a change of ITD in response
24 to the movement of the listener.

25 JUDGE ARBES: The movement of the head, the user's head
26 orientation, right?

27 MR. RAFATIJO: Yes, yes. The SLP is fixed. At no point -- the

1 SLP is created and it speaks in the space because of limitation 8b. At no
2 point in petition he talks about moving the SLP somewhere else.

3 So, Your Honor, if I can go back, because this technology needs to
4 be understood before we get engaged in any arguments. So, I'd love to go
5 back to slide 19. So, they said binaural sounds can be created in two ways,
6 and this is consistent with the testimony from their expert, and the definition
7 he gave for binaural sound. He says capture or simulate. So, let's go slide
8 20. We have capture, binaural recording, Your Honor. With binaural
9 recording, you are capturing again head-related signals, which are HRTF.
10 Slide 21. And simulation, which the other side kept talking about patent, the
11 claim talks about simulation. You are simulating a sound authorization
12 point for which you need HRTF. That's called binaural synthesis, Your
13 Honor. And if we can go to slide 23, and I showed this to you earlier, Your
14 Honor. Even if you start with a new HRTF -- sorry, with a binaural sound,
15 and you would like to move the sound authorization point of that binaural
16 sound to another point in the space, you still need to use HRTF, which is
17 consistent with the excerpt they showed us. They showed us in their slide
18 27, Petitioner's slide 27, that creation or alteration of sound localization
19 point need HRTF.

20 So, Your Honor, with that understanding, I would like to go to
21 slide 25. Okay, here's our Claim 15. Talks about wearable electronic device
22 that captures binaural voice, and then talks about adjusting the binaural
23 voice to position a sound localization point, essentially to position in the
24 sound localization point. So, you are changing the SLP of the binaurals.
25 And, Your Honors, if you go to slide 28, please, without binaural synthesis,
26 Your Honors, the SLP of the captured voice is inside the head or in front of
27 the mouth of the listener. In order to move it to a sound localization point,

1 and away from and proximate to the listener, you have to use HRTF, or
2 binaural synthesis.

3 Your Honor, if you can go to slide 30, I showed this earlier to you,
4 but they agreed with us. We asked their expert to do the two microphones
5 captured your perspective of how you hear your voice. He said yes, and
6 without any other processing, the listener over headphones would hear it
7 somewhere in the middle of or front of their face. But our patent requires
8 this voice be transmitted to a point away from and proximate to the listener.
9 How would you get there? Only with binaural synthesis, Your Honor,
10 which requires the (INDISCERNIBLE). Again, slide 31. And their experts
11 agree with us.

12 So, Your Honor, I don't have to go even further here. But I'd like
13 to discuss if you can go to slide 38. So, if you look at the ground it
14 presented to you in the petition, Your Honors, they never talked about
15 binaural synthesis. All they talked about was binaural recording. Andrea
16 discloses binaural recording, and modifying Bedingfield is as simple as
17 adding one microphone to Bedingfield. But in their view afterward, at
18 petition stage, you have binaural recording and transmit that binaural
19 recording to the listener. But their experts said, if you do that, you would
20 not provide the sound at the sound of a position point that is away from and
21 proximate to the listener. So, you need to do binaural synthesis. So, and
22 you are aware, Your Honors, Federal Circuit has repeatedly said, the first
23 step for any obvious analysis is to start with the meaning and scope of the
24 claim. They did not understand that claim right. They did not understand
25 that the claim refers to binaural synthesis.

26 So, Your Honor, if we can go to slide 44, please. Now, at reply,
27 Your Honor, they advanced a new theory. They said, well, Andrea teaches a

1 software module to process binaural sound. So, they realized that they did
2 not address this in the petition. But, Your Honor, there are two problems
3 with their argument. One procedurally and one from substance perspective.
4 Procedurally, Federal Circuit has repeatedly said the Board is not permitted
5 to entertain new arguments injected by a Petitioner or its petition. Nowhere
6 did they ever discuss this in their petition.

7 Second, Your Honor, if you can go to slide 45, their argument is
8 not right either. They do not start to Andrea, where Andrea discloses a
9 module for processing binaural sound with HRTF. It doesn't. It cites a
10 conclusory statement from Dr. Kyriakakis. And I tell you, Your Honor, I
11 have reviewed Andrea a few times and I could not find anywhere that
12 Andrea talks about a program, an algorithm, or a module. So, it's just a
13 baseless shift of theory, but it shows to you something, Your Honor. They
14 are trying to get the process of binaural sounds from Andrea, not
15 Bedingfield, because they know Bedingfield is not a binaural reference.

16 So --

17 JUDGE ARBES: Well, Counsel, it's my understanding that they're
18 using Andrea for the very first step of the capture. You actually get the
19 binaural sound and then the processing later comes with -- with Bedingfield,
20 where it does have software to create the overall sound field, right? There is
21 a computer system that does that.

22 MR. RAFATIJO: Well, but Your Honor, this sentence in plain
23 English says, Andrea, you know, you have to modify the Bedingfield with a
24 software module to process the binaural sound as taught by Andrea. So,
25 they are -- if you review Dr. Kyriakakis paragraph 125 you find
26 (INDISCERNIBLE). So, they know there is something off with
27 Bedingfield. Bedingfield is not a binaural reference. So, that's why you're

1 trying to get it under Andrea. And this argument is deficient either, because
2 it was not raised earlier and it has, again, there's no start to Andrea, Andrea
3 does not disclose any modular software module for processing sound.

4 And Your Honor, if we can go to -- and Your Honor, if we can go
5 to slide 43, please. Their expert agreed with us that Andrea does not teach
6 binaural synthesis using HRTF. So, they are advancing conflicting
7 arguments. Their expert one day says it doesn't teach binaural synthesis,
8 another day says, oh, it has a software module to process sound. But -- and
9 that's why we believe you have to, you know, that's a battle of credibility of
10 the experts in this case.

11 So, if we can go please to slide 46, actually I want to go to slide
12 49. So, Your Honors, not once but twice, you rejected their argument that
13 we agree with Patent Owner that Bedingfield does not teach either method
14 of creating or creating binaural sound. And Your Honor correctly pointed
15 this out in '104 IPR. And later on, again, you said, Petitioner had not shown
16 that Bedingfield teaches either of the two ways for creating binaural sound
17 described by Dr. Kyriakakis. And their argument has not changed Your
18 Honor. They are advancing the same argument that Bedingfield is binaural.
19 It is not, Your Honor. It is a stereo. As Dr. Begault testified over like five,
20 six paragraphs and examined Bedingfield in great detail, it says Bedingfield
21 is a stereo reference. It's not binaural.

22 If we can go to slide 50 please. There are bases for Bedingfield to
23 be a binaural reference. It's just because Bedingfield could provide for
24 different sounds to each ear. That's it. Again, they're not engaging in the
25 concept of HRTF. They're not consent -- engaging any of the requirements
26 that their expert testified you need to create binaural sound.

27 So, Your Honor, if we can go to slide 53. Okay. Here's, again,

1 they're saying that Bedingfield discloses providing sounds to the left and
2 right ears of the listener to simulate your position of the participant in the
3 sound field. And they're citing Bedingfield column 3, line 62, and column 4,
4 line 12. If you can go to the next slide, slide 54. But the same passage they
5 show you clearly says the sounds provided to the listener is in stereo. It's not
6 binaural. And now counsel argues that, you know, Bedingfield uses a stereo
7 in a colloquial. And by the way, that snippet from Dr. Kyriakakis's
8 deposition testimony has never been cited by any party in this proceeding.
9 It's the first time I saw it actually. But it's a stereo.

10 If you can go to slide 55, whereas their expert, Your Honor, this is
11 their expert's word, testified, binaural processing produces a virtual auditory
12 space with a two channel synthetic binaural signal. It doesn't say stereo
13 signal. So, if you have binaural processing, you have binaural signal. And
14 if you have a stereo system, you have a stereo signal, it's that simple. That's
15 why they call it stereo and binaural two different terms. Now, the counsel
16 wants you to believe that while Bedingfield clearly says stereo, it means
17 binaural.

18 So, Your Honor, if you can go to slide 56, and here's another
19 example. And Your Honor said, if you, assuming you agree with us, so they
20 are using ILD disclosure, the volume difference disclosure in Bedingfield
21 and say like, although it is not disclosed in HRTF, it is disclosed because of
22 ILD. But, Your Honor, if you can go to slide 57 -- sorry, 58. But just
23 because it's discloses ILD doesn't mean it disclosed as HRTF, not at all. The
24 two are different. And slide 59, I showed this earlier. You agreed with us
25 on this one. So, the only thing that they have to say about Bedingfield, it has
26 volume differences, ILD, which you can get -- by the way, Bedingfield
27 describes it as a stereo effect. Bedingfield describes this volume changes as

1 a stereo effect. And they think Bedingfield is a binary sound reference. It is
2 not, Your Honor.

3 So, okay, I would like to go to Claim 8. If you can go to the
4 slide --

5 JUDGE ARBES: Counsel, just one question. I'd like to finish this
6 thought before we move on. The difference that I see between perhaps this
7 and the 1004 case is the reliance on Andrea for that initial step of the capture
8 of the binaural sound. As I understand it, Andrea performs the binaural
9 recording, but it does not use HRTFs, just does the binaural recording. And
10 as I understand your argument that if you capture binaural sound that way, it
11 is impossible to do the later processing steps without using HRTFs. Is that
12 correct?

13 MR. RAFATIJO: That is correct, Your Honor.

14 JUDGE ARBES: Okay. Well, one question I wanted to make sure
15 that I asked, in page 15 of Petitioner's reply in footnote 6, Petitioner
16 argues -- appears to argue that that's factually incorrect, and citing Dr.
17 Begault's testimony and Dr. Kyriakakis's. Can you respond to that
18 specifically, Petitioner's assertion that that is factually wrong?

19 MR. RAFATIJO: Let me go there. So, Your Honor, actually, they
20 misunderstood that position. Dr. Begault said you can have a system using
21 both binaural recording and binaural synthesis. And actually, they are
22 saying the same thing we are saying. We are saying Claim 15 is first
23 binaural recording using two microphones, and then you have to use
24 processing. I'm going to read it for the record. They said, to the extent that
25 PO suggests that a system cannot use both binaural recording and binaural
26 synthesis, PO is incorrect. We are not saying that. Your Honor, we are
27 saying you'll record the two microphones and then process it with synthesis.

1 So, they agreed with us that you can have a system that have both binaural
2 synthesis and binaural recording. As a matter of fact, Dr. Begault referred to
3 that system as a binaural mixing console. And I can show you my slide.
4 Let's see. Slide 22, please. Okay. It says ability to combine binaural
5 recording and binaural synthesis signals to overlay the captured sound in
6 binaural synthesis. And we cited this, Your Honors, in our POR page 32,
7 POR page 40. It's not our fault they misunderstood that position, Your
8 Honor. We clearly said you can have binaural synthesis and binaural
9 recording, and as this Claim 1 is directed at both, Claim 15 is only binaural
10 synthesis, but if we go with their expert claim of viewing the board, it's both.
11 They did not address the binaural synthesis part, Your Honor, in any of our
12 claims.

13 JUDGE ARBES: I think I understand then. So, you are
14 acknowledging that it would be possible to combine a system like Andrea
15 for capturing binaural sound that way with the two microphones, but you
16 would need a disclosure of processing using HRTFs, which Bedingfield does
17 not -- Bedingfield and Andrea do not have in your view?

18 MR. RAFATIJO: That is correct, Your Honor.

19 JUDGE ARBES: Okay. So, the question then becomes whether
20 the claims require that type of processing with HRTFs?

21 MR. RAFATIJO: Yes. And if we can go to page -- to slide 87.
22 And in all of our claims, Your Honors, you have this language, a sound
23 localization point, away from and proximate to the listener, from where the
24 origin of the voice of the talker occurs. And this, Your Honor, is
25 externalization. They said we randomly throw out terms like externalization
26 and stuff. This is externalization, Your Honor. Away from and proximate
27 to the user. As a matter of fact, their expert agreed with us that this is

1 external to the user. This is externalization.

2 If we can go to slide, please 93. Well, we asked their expert, is this
3 sound in this claim external? They said, based on the definition I'm using
4 my report, yes. And then he goes on to say, Your Honor, there is no actual
5 sound. It is in -- there is nothing in that room. The sound is synthesized.
6 But their expert's reading is on fly. Said the sound is synthesized and it's
7 external to the user. How would you get there without external sound? If
8 you can go to slide 94, read out binaural sound. This is unrebutted, Your
9 Honor. You need binaural sound, you need external processing for your
10 processing to externalize the sound. So, if this is external and it is
11 synthesized, how would you get there without binaural sound in the
12 (INDISCERNIBLE) processing? They don't explain it. They don't.

13 So, Your Honor, if I can go to, I guess I talked about why ITD
14 cannot be the case here using their own references. If I can go to slide 102.
15 Okay. Again, we asked the expert, do you agree that this is external? He
16 said, yes. We said, can it be binaural? He said, oh, binaural sound is one
17 way to achieve it. Slide 103. Then we said, can it be a stereo? And we
18 asked this question four times, Your Honor. Four times. Each four times he
19 didn't show all of that because they didn't want the slide to look ugly by
20 already adding all of the slides that he can say, but he said, no, it could not
21 be stereo. Four times he said it could not be stereo, it could not be stereo, it
22 could not be stereo.

23 And if we can go to slide 104. And he's right. As Dr. Begault
24 cited one of the famous article in the field, a major difference is that
25 headphone listening with such a stereo signal is limited to in-head
26 localization. So, you cannot use a stereo when you have headphone because
27 to create binaural -- to create externalization.

1 If we go to page -- or slide 105. Okay. We asked him, okay, you
2 said it could be binaural and it could be other things. What other things? He
3 couldn't name anything. He couldn't. We asked him several questions. Sir,
4 I know they exist, I don't have a name for it. And we can go to slide 106.
5 Then he -- he was shocked when we saw his supplemental declaration. He
6 gave us a reference. Asahi it's a patent, it's a long patent in 1979, has almost
7 40, 50 columns, without a (INDISCERNIBLE). And as a former professor
8 of chemistry, Your Honors, who published several peer-reviewed papers in
9 his career before becoming a lawyer, I do not expect my fellow
10 academicians to be this imprecise.

11 So, but that's not the point. The point is, he says, Asahi, discuss
12 out of the head externalization using a stereo sound. So, if we go to slide
13 107. So, which one we should believe, Your Honor? One day he says, it is
14 not the stereo sound. It cannot -- a stereo cannot produce externalization.
15 The other day, when we asked what other, okay, what's -- other than binaural
16 name one thing that could create externalization, he said, oh, a reference that
17 has a stereo sound in it. So, which is it, Your Honor? But you have to
18 resolve all this inconsistency against petition, Your Honor.

19 If we can go to slide 108. Dr. Begault, by contrast, Your Honor,
20 and let me back up and tell you who this man is. This man is the goddess of
21 audio engineering. Their expert in the District Court named him as a
22 seminal reference. Quote, unquote, seminal reference. Dr. Kyriakakis said,
23 he has high opinion of Dr. Begault. His work has high quality, and we start
24 with this. The other IPR experts they have retained, they all said the same
25 thing, including one of them actually got her Ph.D., Dr. Roginska, under Dr.
26 Begault. So, we're talking about this first-class scientist who said
27 repeatedly, if you cannot have sound externalization without HRTF

1 processing, which over a headphone that is absolutely true, he said it in the
2 slide 29 of Petitioner. I ask -- I encourage you to review slide 29 of
3 Petitioner. So, we have headphones in our claim, we have externalization
4 according to their own expert, away from and proximate to. So, how did
5 you create that effect? Only with HRTF processing.

6 So, if we can go to slide 114. So, Your Honor, they relied
7 exclusively on Bedingfield for this limitation. And as I said earlier,
8 Bedingfield does not disclose HRTF for anything related to HRTF.

9 You heard from the counsel, they talked about perception of
10 standard. And I would like to address that a little because this is very
11 important. If we can go to page -- slide 124. Okay. Petitioner has
12 repeatedly said, Bedingfield -- a Bedingfield listener would perceive a sound
13 as externalized. This is very important, perception. Again, they said the
14 listener's perception of the call. But, we think perception is different from
15 externalization. Let me first show you slide 125. Their -- so Bedingfield on
16 the lefthand side, you see figure 19a and 19b from Bedingfield. Bedingfield
17 has this default configurations from where there are speakers and a user
18 would perceive the sound that's coming from these seats around the table.
19 The same system was described -- a system similar to this was described in
20 the Petitioner's expert's declaration. They said you have MTC and the image
21 of the listeners are there on these MTCs. And during the call, voices of
22 remote participant are produced such that they appear to originate from the
23 projected images. So, this is a perception. The sound itself is not localized.
24 For that, we need to use HRTF.

25 And let me go to slide 127. This is critical, Your Honor. When we
26 asked their expert in this court a question about sound perception, he said
27 that's a different field. We deal with creation of audio in the '090 patent.

1 And then he says because this is an audio perception question, not an audio
2 signal processing question. And she went on to say, sound perception is a
3 subjective experience. Meaning, even if I externalize the voice for you, even
4 if I manipulate the audio using signal processing, that voice is actually
5 externalized to you. You may perceive it differently. That's subjective
6 experience.

7 If we can go to page 129. Dr. Kyriakakis said there are three
8 fields, acoustics, psychoacoustics, and that's one word. Dr. Kyriakakis made
9 sure that it is one word, you think, otherwise it means bad psychoacoustic.
10 So, and audio signal processing. So, and he said, psychoacoustics deals with
11 how listeners perceived sound. If we can go back to slide 128, this is how
12 they define the level of the skills in the art. A person of ordinary skills
13 should know audio signal processing, not psychoacoustic. That's a different
14 thing. That has nothing to do with our patent. And now they come forward
15 with a prior art that talks about perception of externalization and try to --
16 that's a direct attempt to change the level of skill in the art. And you should
17 reject that, Your Honor.

18 And we asked him, okay, you know, do you think '090 patents
19 concern, if we can go to slide 129, do you think '090 patent concern
20 psychoacoustics? He said, yes. And when we said, okay, which part? He
21 said, the part that talks about sound localization. And, Your Honor, they
22 defined the level of skill in the art to the exclusion of psychoacoustics, and
23 now they're trying to say it is psychoacoustics patent.

24 If we can go to slide 131. And we pressed him. We said, okay,
25 you think it's psychoacoustics. What limitation? He pointed out the
26 limitation that talks about providing the listening person to binaural sound.
27 That patent talks about provision, the binaural -- the sound -- the binaural

1 sound is created and provided. It's not perception of the listener.

2 So, Your Honors, finally, I would like to discuss ITD. If we can
3 go to slide 135. This is the only paragraph that they rely on in order to get
4 ITD from Bedingfield. That's conclusive paragraph, as Your Honors pointed
5 out. If we can go to slide 136. We asked him, do you believe -- do you
6 agree that delay can mean a lot of different concepts? And he said, yes. So,
7 he tested this. Why did he not engage in the context of Bedingfield? Why
8 did he have to rely on the Board and the Patent Owner to go and find
9 whether the delay is ITD or not?

10 So, if we go to slide 138. Your Honors in the '104 IPR recognized
11 that some of his testimony, Dr. Kyriakakis's testimony, is inconclusive and
12 unsupportive. And this ITD testimony here is another example of it. So,
13 now by contrast, if we go to slide 139, Dr. Begault testified over four pages,
14 four pages, and examined the three reference to ITD to delay in Bedingfield.
15 It's not ITD.

16 Slide 140.

17 JUDGE RAEVSKY: Counselor, I'm going to ask you the same
18 question I asked Petitioner, more or less. I'm in column 5 of Bedingfield in
19 the paragraph that delay is listed in, one of the examples, at least. The
20 context includes hearing a participant located on the left side of the sound
21 field and another participant located on the right side of the sound field. So,
22 why is that not enough to say that that context means the delay there is an
23 interaural time delay?

24 MR. RAFATIJO: Sure, Your Honor. I get to slide 144. Okay.
25 This is what you're referring to. It says, using various audio techniques such
26 as volume, balance, the stop, and delay to produce the effects described
27 evoke in reference to Figure 1. Slide 145. We need to understand what

1 Figure 1 talks about, Your Honor. First, it talks about the sound field. So,
2 Figure 1 talks about a sound field that represent a perception. Again, the
3 word perception matters here, Your Honor. This is not audio processing.
4 This is a perception reference. Perception that the resulting -- the sound
5 comes from -- that essentially the user receive audio from the participant as
6 if the listener is present between all participants. This talks about a user
7 being among the participant. That's all, a perception. 146.

8 Whereas, ITD, Your Honor, as Dr. Begault testified, is used to
9 adjust binaural sound, the context of binaural sound. Binaural sound has a
10 function of listener's head orientation. And that's exactly how limitation D.
11 You have to adjust ITD based on listener's head orientation. Maybe if it
12 doesn't disclose that, maybe if it doesn't talk about, oh, listener's orientation
13 change so we have to adjust ITD, doesn't talk about that. So, they can't get
14 ITD as a function of head orientation from that disclosure. Because that's a
15 stereo reference. That has nothing to do with head orientation of the listener
16 and position of ITD.

17 If we can go to slide 147. Again, Dr. Begault says, ITD is used to
18 position the auditory event laterally. And therefore, this delay, which
19 creates perception, not real processing, is not ITD.

20 And finally, Your Honor, 140, it's slide number 48, which I'm
21 happy at least to hear from the learned friend on the other side that they
22 considered that this delay is not ITD. And this is a special effect to simulate
23 the room, to simulate the room effect. But none of the disclosures in
24 (INDISCERNIBLE), you know, as you pointed out, it shouldn't be algorithm
25 to prove this stuff, Your Honors. They haven't proved it. They haven't
26 proved that delay is with clear and convincing evidence is ITD.

27 So finally, I would like to go to slide 153, and 50 for a few minutes

1 address the Li grounds. Okay. Dr. Begault says, one of the -- and this
2 testimony is unrebutted, one of the novelty of these claims is that it create
3 the SLP and adjust and all that stuff during a telephone call. So, the
4 telephone call goes at the heart of this case, because slide 154, they define in
5 their -- they adopted that position apparently, that telephone call is a voice
6 communication between two parties. And their expert says, the telephone
7 call in our patents or electronic on our patents, it's a live voice exchange
8 during a telephone call. It's a live voice exchange, it should be live.

9 If we can go slide 155. And their entire case on this is based on a
10 board (INDISCERNIBLE) for conference call. You heard from the counsel
11 on the other side. Li discloses a conference call, but therefore conference
12 call is a telephone call that has live voices. They never engage in the context
13 of Li's disclosure.

14 So, 156, please. Your Honor has pointed out, not once, but twice,
15 that the conference call is used -- is configured to record soundtracks for
16 playback. But that is not necessarily -- that does not disclose how a voice
17 exchange would occur during a conference call when modified to use a
18 (INDISCERNIBLE), across the voice of the speaker. So, Your Honors said
19 there's no voice exchange here.

20 At slide 157, they tried -- they -- at last, second argument, oh, Li
21 says recorded versus pre-recorded and they're different. Your Honors
22 rejected that and cited a lot of our examples that show Li used recorded and
23 pre-recorded for a sound that is recorded first, stored for playback or
24 reconstruction. And, Your Honor, if we can go to slide 158, we asked her,
25 you know, I'm going to leave slide 158 and afterward to Your Honor, I'm
26 going to add just two more slides and that's it. But their experts, to create
27 this distinction, arbitrary distinctions, their experts change position at least

1 five times. And every time we thought that he arrives at the position about
2 recorded versus pre-recorded, he again offered a testimony that was
3 inconsistent with what he said earlier. So, I'm going to leave that to Your
4 Honor.

5 I just want to go to slide 164. Dr. Begault said, yes, there is a
6 distinction between recorded and pre-recorded in Li, but that is not the
7 distinction they are saying. The distinction is, Your Honors, Li also
8 discloses a microphone array system, a bunch of microphones that points to
9 different points in the states to capture voice. Li used the term recorded for
10 the voice that is recorded using its microphone system and pre-recorded for
11 voice that is recorded, sound that is recorded with other means. But in both
12 of those occasions, Your Honor, Dr. Begault testified in 10 paragraphs, over
13 10 paragraphs examining every single example in Li that the recorded is
14 what is recorded using Li's microphone.

15 And if we can go to slide 156. Sorry, 165. Sorry, 165. Okay.
16 Instead, and finally concluded, when Li gives numerous examples of which
17 recorded and pre-recorded sounds are not live, the conference call example
18 in Li cannot mean to a POSITA to involve live voice exchange to be with
19 the users. And 166. And there is a use for a non-live conference call, as Dr.
20 Begault said. It's simply like you have a lecture, you want to view the
21 lecture, you want to simulate, you know, how the -- you missed the lecture,
22 you miss the class, you have the recording, I mean, you want to hear about
23 it. You hear the lecture. So, that's what Li is about. You have a recorded
24 and pre-recorded thing, either using Li's microphone, which is recorded, or
25 using some other means that is pre-recorded, but you're going to play it back
26 for the user. That is to mimic a conference call. It's about mimicking the
27 conference call environment. It's not live, Your Honor.

1 So finally, Your Honor, 167. They say, Dr. Begault testified about
2 '090 patent that the word record means real-time interaction. Your Honors,
3 they are using Dr. Begault's testimony about the '090 patent to say the record
4 in Li also means real-time interaction. Your Honor, if this is not hindsight,
5 what it is? You cannot use our patent to capture the prior art. If they
6 clearly, Dr. Begault says, in this patent, Li uses recorded and pre-recorded
7 for playback consistently, whereas in the '090 patent, it talks about real-time
8 interaction.

9 And finally, Your Honor, they showed you a snippet, I think under
10 slide 57, if I'm right, that -- not our slide, Petitioner's slide 57, where we
11 have a voice that is transmitted somehow that the sound sources in Li could
12 be a person's voice and other sounds that originates and is transmitted. First
13 of all, that disclosure is 30 pages away from -- apart from the conference call
14 disclosure. And Your Honors correctly pointed out in your '104 decision
15 that marrying the two together just doesn't make sense. But at the top, aside
16 from that, Your Honor, they just show you one sentence from that
17 paragraph. The sentence in -- the preceding sentence in that paragraph says
18 that Li has a microphone array, and if I want to be very accurate about this,
19 okay, the preceding sentence says, okay, that you have a microphone arrays
20 that each microphone is pointed to a point in that space, I think, and that
21 basically records, a, quote, multiple acoustic beam from different sound
22 sources. So, essentially you have 10 microphones. Each microphone is
23 directed at one sound source. And there it says the sound source could be a
24 person's voice and a lot of other stuff. But it refuses to create a recording
25 using Li's microphone. And as I said repeatedly today, Li's use this
26 recording for playback, not for live voice exchange. Therefore, Your
27 Honors, they have not met their burden on the Li grounds and stuff.

1 So, with that, I think I rest and reserve the rest of my time.

2 JUDGE ARBES: Thank you, Counsel. Counsel for Petitioner,
3 you may reply and you have 17 minutes.

4 MS. NGUYEN: Thank you, Your Honor. This goes back to claim
5 construction and whether or not HRTFs, binaural synthesis, externalization
6 are required by the claims. And again, Patent Owner relies exclusively on
7 extrinsic evidence and the intrinsic evidence confirms that HRTFs are not
8 required.

9 So, let's actually step through what we would normally do in a
10 claim construction analysis. And let's actually start with the claims. And so,
11 let's go to slide 26. On slide 26, I can share my screen. Actually, I'll just
12 refer to it actually. For slide 26, we have Claims 2, 5, and 17. And Claim
13 17 is dependent on Claim 15. And if you recall, that is the claim that simply
14 positions the SLP of the binaural voice to the location that is away and
15 proximate to the first person. So, here we're not talking about creating or
16 adjusting the sound or moving in SLP from one point to another. We are
17 literally positioning the SLP at a certain location. And in Claim 17, it says
18 to change an ITD, an ILD, and a head-related transfer function, HRTF, in
19 order to position the sound localization point. Again, it can use any of these
20 methods or all of these methods.

21 If we go to back to slide 9, one of the things that Your Honor noted
22 for Claim 8 is that you first execute the electronic call such that the origin of
23 the voice appears to be at an SLP. And then you maintain that as the listener
24 moves around, changes head orientation. And Your Honor properly noted
25 that it says alter an ITD. And when asked whether or not you need an HRTF
26 to alter an SLP, Patent Owner said, yes, you do. But that is inconsistent with
27 the last limitation of Claim 8, because the last limitation of Claim 8, though

1 the SLP is fixed, it is not fixed with respect to the orientation in relation to
2 the head. And so, when you are, as the listener, moving your head
3 orientation, the SLP may be fixed, but it's not fixed as to your head. And
4 therefore, the voice may now appear to be behind you in front of you,
5 depending on where your head orientation is. And so, Claim 8 expressly
6 says you can simply alter an ITD in order to count for that adjustment. So,
7 you can move an SLP in relation to your head, the listener's head, using an
8 ITD. That's explicitly stated in the claims.

9 Let's actually --

10 JUDGE ARBES: But Counsel, I thought that Patent Owner's point
11 was more to do with the earlier language of the claim in 8b about simulating
12 a location in empty space from where an origin of the voice occurs. Empty
13 space that is located away from and proximate to the first individual. That is
14 the language, the yellow and blue language we talked about earlier, and that
15 language is what requires the use of HRTFs. Can you respond to that?

16 MS. NGUYEN: Sure. So, if we go to slide 27 of Petitioner's
17 demonstratives, again a location of sound and/or a direction of sound can be
18 altered or created. And this is where Patent Owner said, when I read this
19 grammar-wise this just says HRTFs. Patent Owner completely ignored the
20 language using one or more of HRTFs, accounting for differences in arrival
21 times between the ears, differences in amplitude. It says, one or more of. If
22 it simply said you can create an alter using HRTFs you would not need the
23 language in column 3, line 59 that says using one or more of. Again, it's
24 saying you can use HRTFs or something else. It is not limited to HRTFs.
25 This then emphasizes that every single citation that we noted with respect to
26 creating the sound localization point never limits it to HRTFs. There is
27 nothing in the specification that limits the creation of a sound localization

1 point to HRTFs. Again, if you go to --

2 JUDGE ARBES: Counsel, just to make sure I understand, you are
3 reading that sentence very differently from Patent Owner then, that that
4 language -- using one or more of -- is followed by a list of about seven or
5 eight individual items, and that's what it's referring to.

6 MS. NGUYEN: Correct.

7 JUDGE ARBES: Okay.

8 MS. NGUYEN: If you just said created using HRTFs, you can just
9 say created using HRTFs. You wouldn't need to say one or more of a list.

10 And if we go to slide 28, again, we're talking about block 120,
11 which if we go back to slide 7, you capture the sound in block 100, you
12 designate a sound localization point at block 110, and then you adjust the
13 sound at 120. And if you go back to slide 27 -- I'm sorry, 28, block 120
14 states adjust the sound so that the sound originates from the sound
15 localization point at the location in empty space. Adjustments to the sound
16 are made so the sound emanates or originates from the sound localization
17 point. Again, we are just following the claim language. You capture the
18 binaural sound, then you designate a SLP, then you adjust it. And in the
19 adjustment, again, it says the sound is processed to alter, add, or generate
20 HRTFs, ITDs, and/or ILDs. Again, ILD being the disclosure in Bedingfield.
21 And so --

22 JUDGE ARBES: But Counsel, I think -- I think Patent Owner
23 might say, and maybe they can respond to this, but the portions you're citing
24 on slide 28 have to do with the adjustments that happen later, and that the
25 language that appears before that, the language in yellow and blue, that's
26 what requires the use of HRTFs, and then this concept of making
27 adjustments that can be done in various ways, for example, changing the

1 HRTFs, changing ITD, things like that, that's distinct from that earlier claim
2 language, which really requires it.

3 MS. NGUYEN: Understood, and it would require, though, that
4 you actually narrow the understanding of what SLP is. This is not the plain
5 and ordinary meaning of sound localization point. The intrinsic evidence
6 never says when you designate an SLP, you only use HRTFs. It goes back
7 to Patent Owner has failed to point to anything in the intrinsic evidence that
8 would actually require designating or adjusting or any other term to actually
9 require HRTFs. There's nothing in the specification tying the SLP language
10 to HRTFs alone. All the language in the specification make it very clear that
11 it's HRTFs, ILDs, ITDs, or other aspects of sound. And so, it goes back to
12 your typical, ordinary claim construction language. If we are construing
13 sound localization point, where is Patent Owner's evidence in the claims?
14 Where is Patent Owner's evidence in the specification that says SLP is tied
15 only to HRTFs? It's not there.

16 Let's actually go to Patent Owner's slide 89, where they have
17 Claim 10. This claim really emphasizes why HRTFs are not required. It
18 really shows that you can more accurately simulate real HRTFs of the first
19 individual in response to movements of the head. Ultimately, what Patent
20 Owner and Patent Owner's extrinsic evidence is all about is providing more
21 accurate localization as opposed to what the patent actually talks about. If
22 we actually go to Patent Owner's slide 110, this is testimony by Dr. Begault.
23 So, I think this was a typo on this because this is actually Exhibit 211,
24 paragraph 79. On Patent Owner's slide 110, Dr. Begault says, I've already
25 established that the means of externalization for a listener requires both
26 binaural sounds with HRTFs and 6DOF tracking. Dr. Begault had
27 repeatedly stated in his declaration that externalization actually requires both

1 HRTFs and 6DOF. And that's because he wants to make it as accurate as
2 possible as the expert that he is. But this goes back to 6DOF is clearly not
3 required, and it appears that Patent Owner has dropped that argument. They
4 have not made any mention of 6DOF in their presentation. And then it goes
5 back to, are HRTFs required then? Dr. Begault says, actually both is
6 required for externalization, but that's only because he wants it to be
7 accurate, but it goes back to what is actually disclosed in the '090 patent.
8 And when we go back into the '090 patent on slide 6, the '090 patent says,
9 okay, you can adjust sound including just interaural time difference or
10 interaural level difference. The sound source is to the left in Figures 13A to
11 13D show that the '090 patent, when it says localization, it is in fact talking
12 about an adjustment as simple as ITD, or an adjustment as simple as ILD,
13 that you are localizing the sound to your left or to your right. So, all this
14 argument with respect to externalization in the head, binaural synthesis, it
15 ignores the disclosure in the '090 patent that says, I can simply localize if I
16 take the natural acoustics between the left ear and the right ear and adjust
17 that somehow.

18 So, let's go to Patent Owner's slide 15 because Patent Owner
19 makes a lot of arguments in relation to Dr. Kyriakakis's description of
20 binaural sound. So, if we go to slide 15, he says, it was well-known that
21 binaural sound and binaural audio was commonly used to refer to systems or
22 techniques that capture or simulate head-related signals containing natural
23 acoustic differences between the ears. He says, head-related signals, he does
24 not say head-related transfer functions, because head-related signals does in
25 fact encompass ITD and ILD containing natural differences between the two
26 ears. And so, again, Patent Owner tries to make it seem like Dr. Kyriakakis
27 said that, hey, HRTFs are always required. He did not, in fact, say that. He

1 said, binaural sound can be simulated by capturing head-related signals, not
2 head-related transfer functions, but head-related signals.

3 Let's go to slide 6 of Patent Owner's demonstratives. And slide 6
4 is this construction that Patent Owner says should be the construction of
5 binaural sound. And we're fine with that. It goes back to Patent Owner does
6 not identify why Bedingfield does not disclose this definition of binaural
7 voice or binaural sound, particularly in relation to providing that binaural
8 sound as stated in the claims, because the definition says sound waves,
9 including representations of same, as they would be received by each of the
10 left and right ears of a listener, which a listener can localize. And as we
11 have repeatedly pointed out with respect to Bedingfield, Bedingfield,
12 particularly at slide 45 of Petitioner's demonstratives talks about positioning
13 the second speaker located at the 3:00 position relative to the listener with an
14 increased volume on the right audio and a decreased volume on the left
15 audio. Isn't that localization? Patent Owner never explains why that is not
16 localization. Why putting that speaker at the 3:00 position is not
17 localization. And if it is localization, then why isn't Bedingfield a binaural
18 reference?

19 Patent Owner talks a lot about binaural synthesis and
20 externalization. And in particular, Patent Owner talks about how, well,
21 Bedingfield can only be in the head because it is stereo. But if you go to
22 slide 48 of Petitioner's demonstratives, again, you would have to ignore the
23 teachings of Bedingfield. You would have to rewrite it, modify it as you see
24 on the left on slide 48 of Petitioner's exhibit. In order to argue that
25 Bedingfield teaches in the head, Patent Owner literally modified the Figures
26 14 and 15 in Bedingfield, but Bedingfield expressly teaches in Figures 14
27 and 15 on slide 48 of Petitioner's demonstratives, and slide 47 of Petitioner's

1 demonstratives that you are localizing sound by providing sound in each ear
2 that would allow the person to localize the sound behind you, in front of
3 you, to the right of you, to the left of you, that is binaural sound. And that is
4 what Bedingfield is teaching.

5 With respect to Patent Owner's argument on imagination, and my
6 understanding is that they're now referring to that as perception, it goes back
7 to the claims only provide that you simulate or you make it appear as the
8 sound is coming from the sound localization point. If we go to Patent
9 Owner's slide 126, this really crystallizes their argument here. This
10 highlights a key point. The voices are perceived to originate there, not
11 actually originating there, yet the claims require the sound originates from
12 SLP. That is not what the claims require. The claims do not require that
13 you somehow actually put the sound so that originates from the SLP. It's
14 simulation, it's appearing, it's positioning, it is not actually originating from
15 the SLP, or else this really wouldn't make any sense. This whole patent
16 wouldn't make any sense because you are providing the sound to the listener
17 over headphones.

18 Let's talk about --

19 JUDGE ARBES: Counsel, you have one minute remaining.

20 MS. NGUYEN: I'm sorry. Unless there are any other questions,
21 I'm actually going to pass it along to our LEAP practitioner, Dr. Rashid.

22 DR. RASHID: Hi, Your Honors. Just to turn to Patent Owner's
23 slide 156, where he points to the previous decision in IPR2023-1004, I will
24 say that that relates to a different patent, in fact, it's the '196 patent with
25 different claim terms. And so, it's a different record entirely.

26 In relation to Patent Owner's slide 159 to 63, that Dr. Kyriakakis
27 was inconsistent, our response is that Dr. Kyriakakis was not inconsistent,

1 he's always (INDISCERNIBLE) recorded, encompassing both live and pre-
2 recorded. There's various portions in his deposition transcripts, such as page
3 55, where that can be confirmed.

4 That's all I have for you.

5 JUDGE ARBES: Thank you, Counsel. Counsel for Patent Owner,
6 we gave an extra minute there, so if you'd like, you have 11 minutes then.

7 MR. RAFATIJO: Thank you, Your Honors. I'd like to start with
8 what the counsel said. We are not tying anything to the language in the
9 claims. You pointed out, Your Honors, for your time --

10 JUDGE ARBES: I'm sorry, Counsel, could you speak up a bit?
11 We're having trouble hearing you.

12 MR. RAFATIJO: Sure. Is that better, Your Honor?

13 JUDGE ARBES: Yes, it is.

14 MR. RAFATIJO: Great. So, with respect to what Petitioner's
15 counsel said, that they're not tying these externalization or concept of HRTF
16 to any language, as you pointed out, we are tying it to, for example,
17 limitation 8b, and any limitation that talks about sound localization point.
18 And, you know, at some point, I think I heard the counsel was confused
19 because she said the SLP is fixed, but also it is not fixed because the location
20 of the listener's head moves around in response to -- in relation to Claim 8.
21 Well, Your Honor, the sound localization point is fixed. That's -- that's
22 undisputable. And they haven't disputed it.

23 Your Honors, I need to go back to their slide 27 because, you
24 know, that is, I'm average -- the language is very straightforward. It says,
25 the sign localization point can be created or altered using one or more of
26 HRTFs, comma, accounting for a lot of factors, which Petitioner's experts
27 included in the concept of HRTF, listed as to be included in the concept of

1 HRTFs. Now, about one or more of HRTFs, Your Honors, the S in the
2 HRTF stands for plural. You have many head-related transfer functions.
3 So, of course, if you want to create a sign localization point, you can use
4 either one of the functions or two or three or four of the functions. So, that
5 doesn't mean that we have to rewrite the specifications or meet accounting
6 for, and then read it as one or more of HRTFs, ITD, ILD. I mean, the
7 accounting for clause modifies HRTFs. One or more HRTFs modify
8 HRTFs. So, it talks about HRTF needing HRTF for creation or alteration of
9 sound localization points. And counsel---

10 JUDGE ARBES: Counsel, is it the understanding of a person of
11 ordinary skill in the art, thinking about HRTFs, is it their understanding that
12 everything that appears after the words accounting for is included in that
13 concept? For instance, phase delays, group delays, ratio of the direct signal
14 to the reverberated signal, all of those are included in the concept of HRTFs?

15 MR. RAFATIJO: That is correct, Your Honors. Well --

16 JUDGE ARBES: What is your best support for that? Is there any
17 expert testimony you can point us to?

18 MR. RAFATIJO: Yes. I'm going to point you to slide -- if we can
19 pull up our slides, please. I would like to point you to slide 14. Their expert
20 says, these factors, and I'm going to show you all those factors, are captured
21 in the concept of head-related transfer functions. Because spatial
22 information is encoded onto the signals, so the counsel says it says head-
23 related signal. It doesn't say head-related transfer functions. But you are
24 creating these head-related signals by using HRTF. And then if you can go
25 to slide 13, I'm going to show you all these factors. These factors include,
26 Your Honor, such factors include reverberation, reflection, refraction,
27 attenuation, shape of the listener's ear, head, shoulders, and torso. So, that's

1 exactly the factors you see in that paragraph and from our patent.

2 I would also like to point you to slide 95, and 96 please. This is
3 their evidence, Your Honor. It says the transfer functions, meaning head-
4 related transfer functions, contain all the information, all the information,
5 needed to simulate the localization of sound sources. But they're talking
6 about, oh, our patent talks about simulation. Yes, it talks about simulation of
7 an SLP, is that simulation of sound localization, but to do so you need a
8 (INDISCERNIBLE) here. Why? Because HRTF contains all the
9 information needed and this information are all those factors listed by their
10 expert. And ITD and ILD also included in the concept of HRTF. If you can
11 go to slide 17. Okay. It says, if you were just given ILD and ITD
12 information you would not be able to reconstruct the HRTF because you
13 don't have the spectral modifications. However, if you have the HRTFs, the
14 middle part of the right speaker, that means you have ITD, ILD and spectral
15 modifications. So, because they're all part of HRTF.

16 So, you know, they said we didn't rely on any intrinsic evidence.
17 So, our patents clearly talks about -- you need to have HRTF to create some
18 localization point, and they kept saying that we have not shown any
19 language from the patent, any language from the claim. That is actually not
20 correct as it just -- as I just explained to Your Honors.

21 Now, they show -- if you can go to slide 89 please. Okay. Your
22 Honor, here again, they said it's about accuracy. Well, that's our argument.
23 Both Claim 8 -- and by the way, their explanation, Your Honor, that you just
24 heard, they had an opportunity to raise these argument in their briefs,
25 because we presented this argument in our POR and they did not address it
26 in their reply. But the point here is, Your Honor, both Claim 8 and 10 talks
27 about HRTF-based simulations. And both of them, up until the point the

1 voice is presented to the user, and if we can go please to slide -- because I
2 want to make this very clear -- 89, sorry, 90 -- sorry, 88, 88. We asked their
3 expert where exactly, at what point in Claim 8, the listener first hears the
4 voice of the speaker. He said at the execution limitation, when it says
5 execute the electronic call.

6 So, first you have to create the SLP, designate the SLP with HRTF,
7 then you need to provide the voice, and this is their expert's testimony,
8 provides the voice at that SLP. And then limitation B and Claim 10 talks
9 about what happens when a listener moves. We never disputed that you
10 have to use ITD for limitation 8D, so they keep talking about limitation 8D
11 just so it does not engage with our argument because we never dispute that.
12 Limitation 8D does not have HRTF in it. I mean, I heard counsel put words
13 in my mouth. If I misspoke, which I believe I did not, but limitation 8D
14 does not have HRTF in it. We get HRTF from limitation 8B and Claim 10
15 modifies limitation 8B. So, essentially you have to change the HRTF to
16 have accurate simulation. And remember, Your Honor, HRTF is a
17 multivariable function. It has reverberation, it has all these factors that they
18 listed. So, if you change the ITD, only ITD, you are essentially changing
19 HRTF because it's a multivariable function. When you use HRTF in the first
20 place, and then you use ITD, you are changing HRTF. But in order to
21 accurately simulate the HRTF, you have to change all those variables based
22 on the movement of the listener. So, you need to have HRTF to create this
23 SLP in the first place. And then based on the movement of the listener, you
24 can adjust different parameters all accounted for in the HRTF.

25 Finally, Your Honor, they said the claim does not talk about
26 origination of the voice. Claim clearly talks about the origin of the voice.
27 The origin of the voice occurs at SLP. So, what does that mean, Your

1 Honor? If you provide the sound such that the origin of sounds comes from
2 an SLP, does that not move to a POSITA that the sound originates from an
3 SLP? So, it's not perception, it's origination, Your Honor.

4 And finally, they said Bedingfield discloses differences in
5 volumes, and again, recited the 3:00 disclosure from Bedingfield. But that
6 disclosure clearly talks about a stereo sound, as I discussed earlier. And it
7 talks about the stereo effect. We never disputed that you can have ILD, but
8 they are trying to stick to ILD to get to HRTF, and we said all over again,
9 no, that's not correct. If you have HRTF and then modify ILD, yes. But if
10 you just have ILD, you cannot reconstruct HRTF, and that's their expert's
11 testimony.

12 And finally, Your Honor, if you can go to slide 160, please. They
13 say, Your Honor, their expert's inconsistent, and record always means live.
14 Well, okay, always means live. We gave him, the expert, this part of Li, that
15 talks about sound recording, and then sound can be saved and played or
16 recorded audio as 3D binaural sound. This is from Li. We said, okay, does
17 record means live here? It says, no, of course it's not live. So, we cheated,
18 Your Honor. One day they just said, according to their experts, record
19 always mean live. This is an example, record is not live. And again, if you
20 go -- I didn't want to go over this -- these slides because we discussed this,
21 but because, I mean, now I have to.

22 If we can go to slide 161, it talks about a stereo recording is played
23 back. And he says, well, you know, so it's not live two-way communication.
24 It talks about recording and it says it's not live. Their expert testifies, it's not
25 live. If we can go to slide 162, it says live. Li is talking about recorded and
26 pre-recorded voice. And first he said, every time Li says recorded, it's live.
27 Pre-recorded means recording in advance and playback. Despite showing all

1 those examples to him, and he admits that, well, yes, here it is not live. Then
2 he modified his opinion. He shifted his opinion. He said, it is not live if, as
3 in couple of the example you showed me, it says it is the store. But if I have
4 a binaural microphone around me and record it and transmit it to you, that's
5 live.

6 Slide 163, please. And we show him this point from Li. Users to
7 record and reproduce 3D sounds for playback. You just see on the left side.
8 He said, if it is stored for playback, it's not live. That's the first system. And
9 then he presented by column 7, line 33 to 37, he said, well, it doesn't say. It
10 can be live. Clearly there it says for playback. And he says, it can be live.
11 So, now, Your Honors, you have two experts. One expert who initially gave
12 opinions consistent with Dr. Begault's testimony and all other experts that
13 the Petitioner hired.

14 JUDGE ARBES: Counsel, your time has expired if you'd like to
15 finish this thought.

16 MR. RAFATIJO: Sure, Your Honor. I just want to end on this
17 point. This is not about battle of experts, it's about an expert who changes
18 his opinion when it suits him.

19 And with that, Your Honor, I will rest, and I thank you for the
20 opportunity, given to me as a LEAP practitioner.

21 JUDGE ARBES: Thank you. We thank both parties today and
22 particularly thank the parties for giving the opportunity to the LEAP
23 practitioners to present arguments today. We will take the case under
24 advisement, and that concludes the hearing for today. Thank you.

25 (Whereupon the above-entitled matter went off the record at
26 3:40 p.m.)

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