Exhibit E-10: Invalidity Based on the Playstation VR System ("Sony PSVR System")

U.S. Patent No. 10,368,179

Claim 14 (the "Asserted Claim") of the '179 Patent is anticipated under 35 U.S.C. § 102 and/or obvious under 35 U.S.C. § 103 in view of the Playstation VR system ("Sony PSVR System"), as embodied in the Playstation VR products themselves and other prior art references that describe them.[1] To the extent Plaintiff argues that the Sony PSVR System does not disclose any limitation, either expressly, implicitly, and/or by inherency, a person of ordinary skill in the art would have determined that the limitation would have been obvious in light of the Sony PSVR System alone or in combination with applicant admitted prior art, the knowledge of one of ordinary skill in the art, or any one or more of the references identified in Defendants' invalidity contentions for at least the reasons stated in the cover pleading for Defendants' invalidity contentions and/or in the accompanying claim charts.

As discovery is ongoing, the contentions provided below are preliminary only. The contentions provided below address the Asserted Claim, which was identified in Plaintiff's Infringement Contentions. Defendants reserve the right to supplement or modify these contentions in accordance with the orders of the Court, Local Rules, or other applicable rules.

The following disclosures are for prior art purposes only. The following chart may include positions in the alternative and does not constitute any concession by Defendants for purposes of infringement. Defendants' contentions herein are not, and should in no way be seen as, admissions or adoptions regarding any particular claim scope or construction or alleged infringement, either literally or under the doctrine of equivalents. Defendants do not agree with Plaintiff's application of the claim, or that the claim satisfies other statutory requirements, e.g., 35 U.S.C. § 112. Furthermore, to the extent that any limitations in the Asserted Claim is subject to 35 U.S.C. § 112(6), Defendants' invalidity contentions are in no way an admission that the '179 Patent specification sufficiently discloses or describes corresponding structure for performing the claimed function. Defendants' contentions also are based, at least in part, on Plaintiff's Infringement Contentions to date and Plaintiff's apparent interpretation and application of the Asserted Claim. Given the

[1] On information and belief, functionalities included in the Sony PSVR System are described by PS VR Set Up (Nov 7, 2017), https://www.youtube.com/watch?v=U5LBzaYkZ2A; GDC 2014 Review (Mar 20, 2014), https://www.roadtovr.com/sony-project-morpheus-ps4-vr-headset-hands-on-gdc-2014/; Phillips (April 30, 2015), https://www.gamedeveloper.com/audio/the-virtual-reality-game-music-composer; Environmental Audio and Processing for VR (2015), https://www.gdcvault.com/browse/gdc-15/play/1021958; PS VR Wareable Review (Oct. 13, 2016), https://www.wareable.com/vr/sony-project-morpheus-release-date-price-games; Want a PlayStation VR headset? (Dec 5, 2015), https://www.youtube.com/watch?v=1MomFyfFXGs; Playstation VR Features (Nov. 4, 2015), https://www.youtube.com/watch?v=LMq8gQkljMw. On information and belief, the Sony PSVR System operated as described before the earliest possible priority date of the '179 patent.

ambiguities in Plaintiff's Infringement Contentions and Plaintiff's overly broad interpretation of the Asserted Claim, Defendants' contentions herein necessarily account for a variety of possible claim constructions and do not necessarily represent Defendants' agreement or view as to the meaning, patentability, definiteness, written description support for, or enablement of any limitations of the Asserted Claim.

The citations to portions of any reference in this chart are exemplary only and are not exhaustive of the disclosures of the limitations in the art. Furthermore, citations to any figure, table, chart, component, or embodiment are meant to encompass the language describing the respective figure, table, chart, component, or embodiment and vice versa. Defendants will rely on the entirety of the references cited in this chart to show that the Asserted Claim is invalid. Defendants reserve the right to rely on additional citations or sources of evidence that also may be applicable, or that may become applicable in light of claim construction, amendments, if allowed, to Plaintiff's Infringement Contentions, and/or information obtained during discovery as this case progresses.

Claim	The Sony PSVR System's Exemplary Disclosures
CLAIM 14	
14 [pre]. A method executed by one or more electronic devices, the method comprising:	To the extent the preamble is limiting, the Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, a "method executed by one or more electronic devices" as embodied in the product itself and as reflected in other prior art references that describe it. For example:

Eight khz, LLC
Exhibit 2008
IPR2023-01020
Page 2

Claim	The Sony PSVR System's Exemplary Disclosures

Claim	The Sony PSVR System's Exemplary Disclosures

Claim	The Sony PSVR System's Exemplary Disclosures

Claim	The Sony PSVR System's Exemplary Disclosures
	See PS VR Set Up (Nov 7, 2017).[2] *See* GDC 2014 Review (Mar 20, 2014).[3]

[2] https://www.youtube.com/watch?v=U5LBzaYkZ2A.

[3] https://www.roadtovr.com/sony-project-morpheus-ps4-vr-headset-hands-on-gdc-2014/.

Eight khz, LLC
Exhibit 2008
IPR2023-01020
Page 6

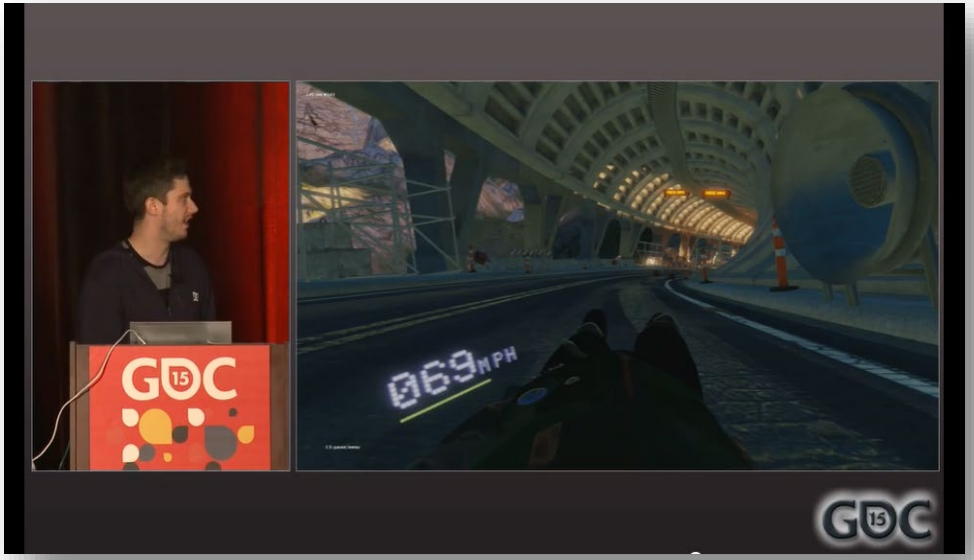
Claim	The Sony PSVR System's Exemplary Disclosures
	 See GDC 2014 Review (Mar 20, 2014).
14[a]. storing head-related transfer functions (HRTFs) in memory;	The Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, "storing head-related transfer functions (HRTFs) in memory" as embodied in the product itself and as reflected in other prior art references that describe it. For example: At GDC 2015, a presentation entitled "Environmental Audio and Processing for VR" laid out the technology of audio design and implementation for Sony's Project Morpheus system.

Eight khz, LLC
Exhibit 2008
IPR2023-01020
Page 7

Claim	The Sony PSVR System's Exemplary Disclosures
	While the talk concentrated mainly on sound design concerns, speaker Nicholas Ward-Foxton (audio programmer for Sony Computer Entertainment) touched upon voice-over and music issues as well. Let's explore his excellent discussion of audio implementation for a virtual space, and ponder how music fits into this brave new virtual world. … According to Sony, Project Morpheus creates its 3D sound by virtue of binaural recording techniques (in which two microphones are positioned to mimic natural ear spacing), implemented into the virtual environment with a proprietary audio technology developed by Sony. *See* Phillips (April 30, 2015).[4] According to Nicholas Ward-Foxton's GDC talk, to make the three-dimensional audio more powerful in a virtual space, the VR systems need to keep track of the player's head movements and adjust the audio positioning accordingly. With this kind of head tracking, sounds swing around the player when turning or looking about. This effect helps to offset an issue of concern in regards to the differences in head size and ear placement between individuals. In short, people have differently sized noggins, and their perception of audio (including the 3D positioning of sounds) will differ as a result. This dependance on the unique anatomical details of the individual listener is known as Head-Related Transfer Function. There's an excellent article explaining Head-Related Transfer Function on the "How Stuff Works" site. Head-Related Transfer Function can complicate things when trying to create a convincing three-dimensional soundscape. When listening to identical binaural audio content, one person may not interpret aural signals the same way another would, and might estimate that sounds are positioned differently. Fortunately, head tracking comes to the rescue here. As Ward-Foxton explained during his talk, when we move our heads about and then listen to

[4] https://www.gamedeveloper.com/audio/the-virtual-reality-game-music-composer

Claim	The Sony PSVR System's Exemplary Disclosures
	the way that the sounds shift in relation to our movements, our brains are able to adjust to any differences in the way that sounds are reaching us, and our estimation of the spatial origination of individual sounds becomes much more reliable. So the personal agency of the gaming experience is a critical element in completing the immersive aural world. *See* Phillips (April 30, 2015). Environmental audio requires differing approaches in virtual reality to standard surround and television-based game design. This talk will center on these differences to try and show people how to alter their usual approaches to get the best VR experience and help achieve "presence" in the virtual world. It will focus on audio processing and cover topics such as obstruction/occlusion, reverberation, distance modelling, ***binaural processing***, ambiance and the human auditory system. Examples will be shown for each, and techniques used will be explained to help guide others down this new pathway in interactive audio design.

Claim	The Sony PSVR System's Exemplary Disclosures
	 *See* Environmental Audio and Processing for VR (2015).[5] PlayStation VR: Audio When using PS VR you plug in your headphones directly to the headset ***to make use of the binaural 3D audio***. This 3D audio makes it seem like noise is hitting your ears from different directions (including above and below you) and distances, making everything all the more real.

[5] https://www.gdcvault.com/browse/gdc-15/play/1021958.

Claim	The Sony PSVR System's Exemplary Disclosures
	For example, if you hear a creak behind you and to your right in an FPS, you better turn and shoot. *See* PS VR Wareable Review (Oct. 13, 2016).[6] *See* Want a PlayStation VR headset? (Dec 5, 2015).[7] ("Audio is really immersive too … you can definitely tell there are some thrusters behind me to propel this ship.")

[6] https://www.wareable.com/vr/sony-project-morpheus-release-date-price-games.

[7] https://www.youtube.com/watch?v=1MomFyfFXGs

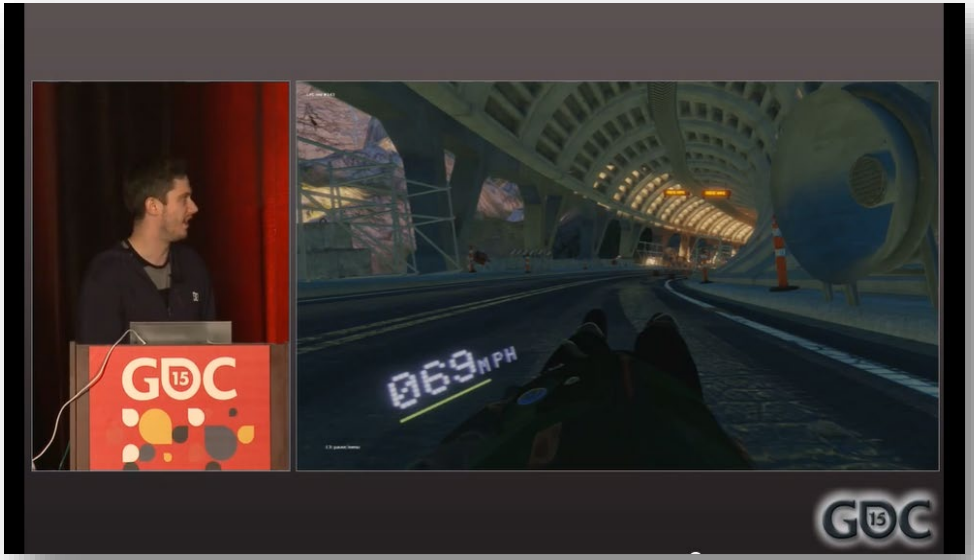
Claim	The Sony PSVR System's Exemplary Disclosures
	To the extent Plaintiff argues that the Sony PSVR System does not disclose this limitation, either expressly, implicitly, and/or by inherency, a person of ordinary skill in the art would have determined that the limitation would have been obvious in light of the Sony PSVR System alone or in combination with any applicant admitted prior art, the knowledge of one of ordinary skill in the art, or any one or more of the references identified in Meta's Invalidity Contentions under Sections IV.J.6 for at least the reasons stated in Meta's Invalidity Contentions cover pleading.
14[b]. displaying, with a wearable electronic device (WED) worn on a head of a user, a virtual image in an environment;	The Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, "displaying, with a wearable electronic device (WED) worn on a head of a user, a virtual image in an environment" as embodied in the product itself and as reflected in other prior art references that describe it. For example: > Two demo experiences were shown today. The first, called The Deep, puts you underwater in a shark cage, which is similar to the Game of Thrones experience put on recently at SXSW in Austin in that they both take place in confined spaces, so they don't have to account for player movement. As an experience, it was ok. ***The game itself was well done, and the shark looked amazing, but I think I was just looking for a different kind of experience…*** which I definitely got in the second demo, the unreleased-but-already-famous Eve: Valkyrie. I won't review the game here, but it's a terrific game in its own right right, and a great showcase of Morpheus' strengths. Eve offers the same advantage as The Deep in that you're sitting in a cockpit, a confined space. *See* GDC 2014 Review (Mar 20, 2014).
14[c]. processing, by a digital signal processor (DSP), sound with the HRTFs to generate binaural sound that externally localizes in empty	The Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, "processing, by a digital signal processor (DSP), sound with the HRTFs to generate binaural sound that externally localizes in empty space from the virtual image in the environment" as

Eight khz, LLC
Exhibit 2008
IPR2023-01020
Page 12

Claim	The Sony PSVR System's Exemplary Disclosures
space from the virtual image in the environment;	embodied in the product itself and as reflected in other prior art references that describe it. For example: > At GDC 2015, a presentation entitled "Environmental Audio and Processing for VR" laid out the technology of audio design and implementation for Sony's Project Morpheus system. While the talk concentrated mainly on sound design concerns, speaker Nicholas Ward-Foxton (audio programmer for Sony Computer Entertainment) touched upon voice-over and music issues as well. Let's explore his excellent discussion of audio implementation for a virtual space, and ponder how music fits into this brave new virtual world. > … > According to Sony, Project Morpheus creates its 3D sound by virtue of binaural recording techniques (in which two microphones are positioned to mimic natural ear spacing), implemented into the virtual environment with a proprietary audio technology developed by Sony. *See* Phillips (April 30, 2015). > According to Nicholas Ward-Foxton's GDC talk, to make the three-dimensional audio more powerful in a virtual space, the VR systems need to keep track of the player's head movements and adjust the audio positioning accordingly. With this kind of head tracking, sounds swing around the player when turning or looking about. This effect helps to offset an issue of concern in regards to the differences in head size and ear placement between individuals. In short, people have differently sized noggins, and their perception of audio (including the 3D positioning of sounds) will differ as a result. This dependance on the unique anatomical details of the individual listener is known as Head-Related Transfer

Eight khz, LLC
Exhibit 2008
IPR2023-01020
Page 13

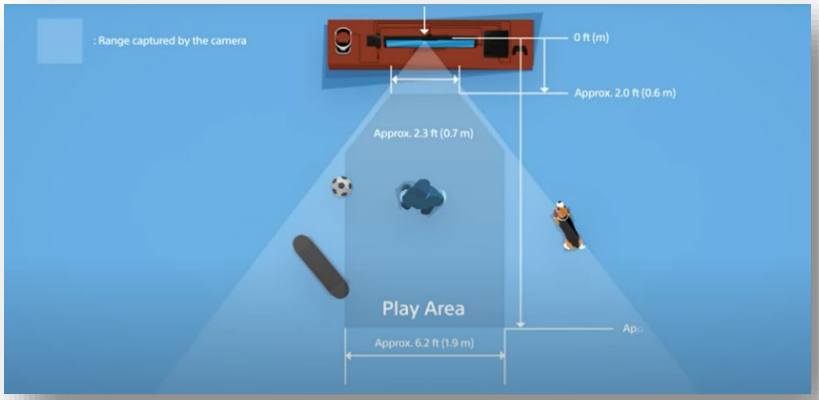
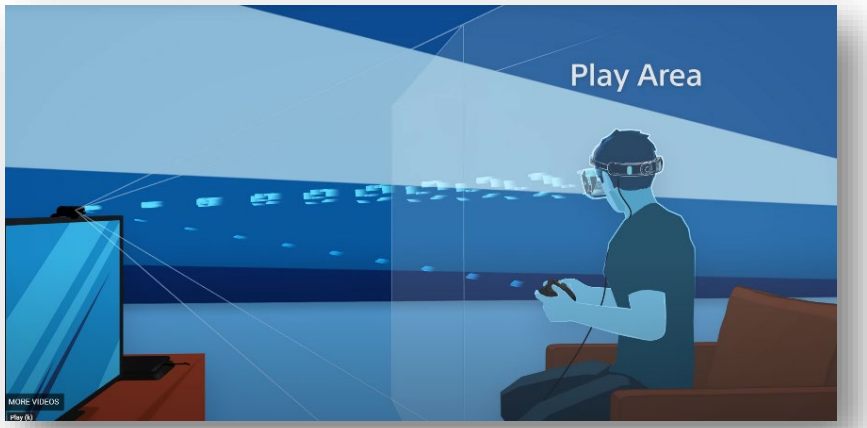
Claim	The Sony PSVR System's Exemplary Disclosures
	Function. There's an excellent article explaining Head-Related Transfer Function on the "How Stuff Works" site. Head-Related Transfer Function can complicate things when trying to create a convincing three-dimensional soundscape. When listening to identical binaural audio content, one person may not interpret aural signals the same way another would, and might estimate that sounds are positioned differently. Fortunately, head tracking comes to the rescue here. As Ward-Foxton explained during his talk, when we move our heads about and then listen to the way that the sounds shift in relation to our movements, our brains are able to adjust to any differences in the way that sounds are reaching us, and our estimation of the spatial origination of individual sounds becomes much more reliable. So the personal agency of the gaming experience is a critical element in completing the immersive aural world. *See* Phillips (April 30, 2015). Environmental audio requires differing approaches in virtual reality to standard surround and television-based game design. This talk will center on these differences to try and show people how to alter their usual approaches to get the best VR experience and help achieve "presence" in the virtual world. It will focus on audio processing and cover topics such as obstruction/occlusion, reverberation, distance modelling, ***binaural processing***, ambiance and the human auditory system. Examples will be shown for each, and techniques used will be explained to help guide others down this new pathway in interactive audio design.

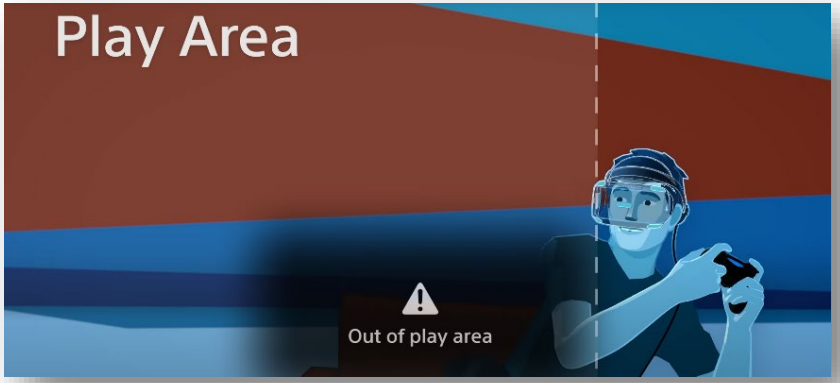
Claim	The Sony PSVR System's Exemplary Disclosures
	 *See* Environmental Audio and Processing for VR (2015). PlayStation VR: Audio When using PS VR you plug in your headphones directly to the headset ***to make use of the binaural 3D audio***. This 3D audio makes it seem like noise is hitting your ears from different directions (including above and below you) and distances, making everything all the more real.

Claim	The Sony PSVR System's Exemplary Disclosures
	For example, if you hear a creak behind you and to your right in an FPS, you better turn and shoot. *See* PS VR Wareable Review (Oct. 13, 2016). *See* Want a PlayStation VR headset? (Dec 5, 2015). ("Audio is really immersive too … you can definitely tell there are some thrusters behind me to propel this ship.") To the extent Plaintiff argues that the Sony PSVR System does not disclose this limitation, either expressly, implicitly, and/or by inherency, a person of ordinary skill in the art would have

Claim	The Sony PSVR System's Exemplary Disclosures
	determined that the limitation would have been obvious in light of the Sony PSVR System alone or in combination with any applicant admitted prior art, the knowledge of one of ordinary skill in the art, or any one or more of the references identified in Meta's Invalidity Contentions under Section IV.J.6 for at least the reasons stated in Meta's Invalidity Contentions cover pleading.
14[d]. determining, with the WED, when the user is leaving the environment; and	The Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, "determining, with the WED, when the user is leaving the environment" as embodied in the product itself and as reflected in other prior art references that describe it. For example: *See* Playstation VR Features (Nov. 4, 2015).[8]

[8] https://www.youtube.com/watch?v=LMq8gQkljMw.

Claim	The Sony PSVR System's Exemplary Disclosures
	 

Claim	The Sony PSVR System's Exemplary Disclosures
	

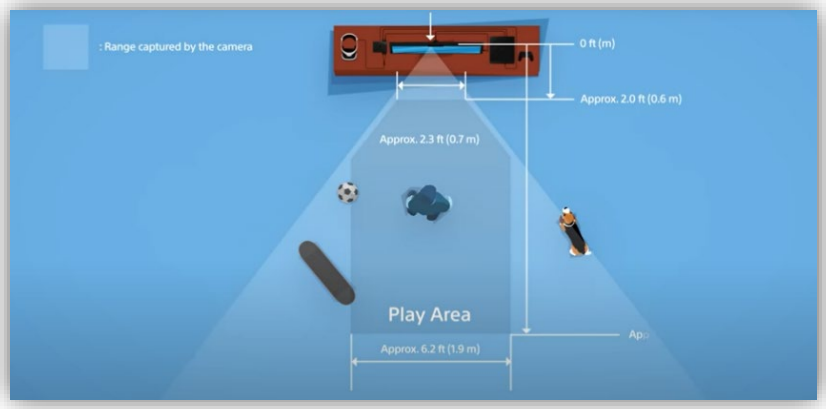
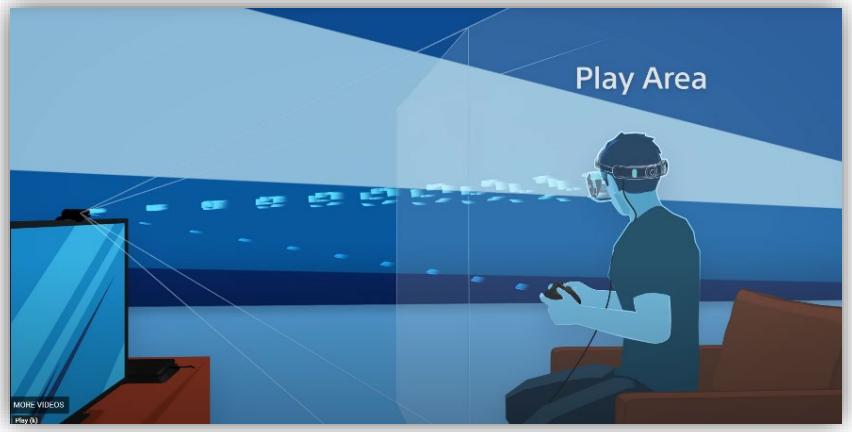
Claim	The Sony PSVR System's Exemplary Disclosures

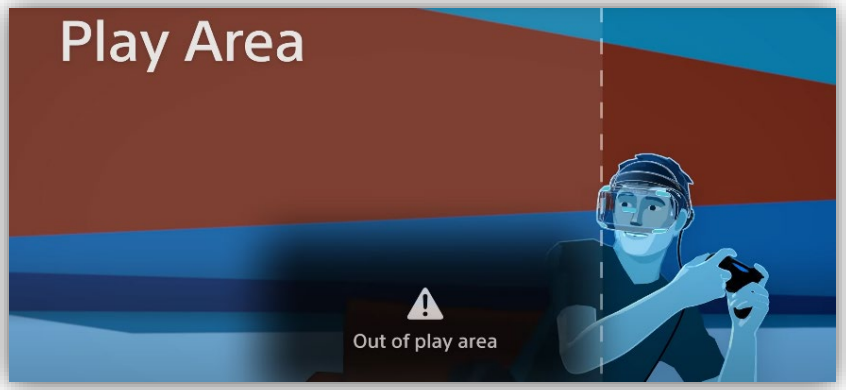
Claim	The Sony PSVR System's Exemplary Disclosures

Claim	The Sony PSVR System's Exemplary Disclosures
	  See PS VR Set Up (Nov 7, 2017). > Positional tracking didn't work at the beginning of my demo of The Deep, but the rep made some adjustments and it started. After that, I was able to look down and see my knees, and when I bent down in real life, I could see my avatar's knees bend and I crouched closer to the bottom of the cage. I was also able to pitch forward and my torso would move closer to the edge of the cage. In Eve, I was able to lean forward to look more closely at the cockpit, and, hilariously, was able to detach my head from my torso from leaning way back. *See* GDC 2014 Review (Mar 20, 2014). To the extent Plaintiff argues that the Sony PSVR System does not disclose this limitation, either expressly, implicitly, and/or by inherency, a person of ordinary skill in the art would have determined that the limitation would have been obvious in light of the Sony PSVR System alone or

Claim	The Sony PSVR System's Exemplary Disclosures
	in combination with any applicant admitted prior art, the knowledge of one of ordinary skill in the art, or any one or more of the references identified in Meta's Invalidity Contentions under Sections IV.J.4, 5 for at least the reasons stated in Meta's Invalidity Contentions cover pleading.
14[e]. alerting the user that the user is leaving the environment by reducing a volume of the binaural sound that localizes from the virtual image and that is being provided to the user.	The Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, "alerting the user that the user is leaving the environment by reducing a volume of the binaural sound that localizes from the virtual image and that is being provided to the user" as embodied in the product itself and as reflected in other prior art references that describe it. For example: *See* Playstation VR Features (Nov. 4, 2015).[9]

[9] https://www.youtube.com/watch?v=LMq8gQkljMw.

Claim	The Sony PSVR System's Exemplary Disclosures
	 

Claim	The Sony PSVR System's Exemplary Disclosures
	

Claim	The Sony PSVR System's Exemplary Disclosures

Claim	The Sony PSVR System's Exemplary Disclosures

Claim	The Sony PSVR System's Exemplary Disclosures
	  See PS VR Set Up (Nov 7, 2017). > Positional tracking didn't work at the beginning of my demo of The Deep, but the rep made some adjustments and it started. After that, I was able to look down and see my knees, and when I bent down in real life, I could see my avatar's knees bend and I crouched closer to the bottom of the cage. I was also able to pitch forward and my torso would move closer to the edge of the cage. In Eve, I was able to lean forward to look more closely at the cockpit, and, hilariously, was able to detach my head from my torso from leaning way back. *See* GDC 2014 Review (Mar 20, 2014). To the extent Plaintiff argues that the Sony PSVR System does not disclose this limitation, either expressly, implicitly, and/or by inherency, a person of ordinary skill in the art would have determined that the limitation would have been obvious in light of the Sony PSVR System alone or

Claim	The Sony PSVR System's Exemplary Disclosures
	in combination with any applicant admitted prior art, the knowledge of one of ordinary skill in the art, or any one or more of the references identified in Meta's Invalidity Contentions under Sections IV.J.5, 7, 8 for at least the reasons stated in Meta's Invalidity Contentions cover pleading.

Eight khz, LLC
Exhibit 2008
IPR2023-01020
Page 29