Exhibit F-09: Invalidity Based on the PlayStation VR system ("Sony PSVR System")

U.S. Patent No. 10,917,737

Claims 1, 14, 15, and 16 (the "Asserted Claims") of the '737 Patent are anticipated under 35 U.S.C. § 102 and/or obvious under 35 U.S.C. § 103 in view of the Playstation VR system[1] ("Sony PSVR System"), also known as Sony Project Morpheus, as embodied in the PlayStation VR products themselves and other prior art references that describe them.[2] To the extent Plaintiff argues that 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 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 Claims, which were identified in Plaintiff's September 2, 2022 Infringement Contentions ("Plaintiff's Infringement Contentions"). Defendants reserves 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 claims, or that the claims satisfy other statutory requirements, e.g., under 35 U.S.C. § 112. Furthermore, to the extent any Asserted Claim is subject to 35 U.S.C. § 112(6), Defendants' invalidity contentions are in no way an admission that the '737 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 Claims. Given the ambiguities in Plaintiff's Infringement Contentions and Plaintiff's overly broad interpretation of the Asserted Claims, 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 claim contained therein.

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 Claims are invalid. Defendants reserve the right to rely on additional citations or sources of evidence that also may be applicable, or that may become

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[1] The PlayStation VR system, as referred to herein, includes, but is not limited to, the various physical prototypes, commercial products, and systems created and publicly presented by Sony Corp. and Sony Interactive Entertainment under the name of "PlayStation VR" or "Project Morpheus" prior to the earliest possible priority date of the '737 patent.

[2] On information and belief, functionalities included in the PSVR System are described by U.S. Patent No. 9,037,468 ("Osman") as shown in Exhibit F-01. The exemplary citations and disclosures in Exhibit F-01 are incorporated by reference herein as if set forth below.

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 1	
1[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, an "electronic system" 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).[3]

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

Claim	The Sony PSVR System's Exemplary Disclosures
	  See GDC 2014 Review (Mar 20, 2014) (showing one or more electronic devices). "The version of the game that I was shown was on the HTC Vive, but the developers say they are targeting the Oculus Rift with the Touch controllers and ***Sony Morpheus with its Move controllers*** as well adding they would like to also make the game available on AR platforms like Microsoft's Hololens and the Magic Leap device." *See* Holodance VR Review (Aug. 08, 2015).[4] "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

[4] https://uploadvr.com/holodance-vr/

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	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." *See* Environmental Audio and Processing for VR (2015).[5]

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

Claim	The Sony PSVR System's Exemplary Disclosures

Claim	The Sony PSVR System's Exemplary Disclosures
	See Playstation VR Features (Nov. 4, 2015).[6]
1[a] tracking, with a wearable electronic device (WED) worn on a head of a user, movement of a handheld portable electronic device (HPED) held in a hand of the user such that the movement of the HPED defines a size and a shape of a three-dimensional (3D) zone that extends from a physical floor and around the user;	The Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, "tracking, with a wearable electronic device (WED) worn on a head of a user, movement of a handheld portable electronic device (HPED) held in a hand of the user such that the movement of the HPED defines a size and a shape of a three-dimensional (3D) zone that extends from a physical floor and around the user" as embodied in the product itself and as reflected in other prior art references that describe it. For example:

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

Claim	The Sony PSVR System's Exemplary Disclosures
	See GDC 2014 Review (Mar 20, 2014) (showing a handheld portable electronic device (HPED) and wearable electronic device (WED) worn on the head of a user). "***The controller tracking was also very good*** in the The Deep demo. The controller only rotated the hand; the arm's position wasn't tracked. It was kind of cool that the crouching made the avatar crouch." *See* GDC 2014 Review (Mar 20, 2014). "Launching this week on IndieGoGo, Holodance is a virtual reality dancing game developed by Narayana Games that has you rhythmically ***hitting balls that are coming at you in random locations in 3D space***, somewhat like a mix between Dance Dance Revolution and Guitar Hero with your hands as the controls. I recently had a chance to play through an early pre-alpha build of the game and despite bugs here and there the game was pretty darn fun… both for me and those watching." *See* Holodance VR Review (Aug. 08, 2015). *See* Playstation VR Features (Nov. 4, 2015).

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	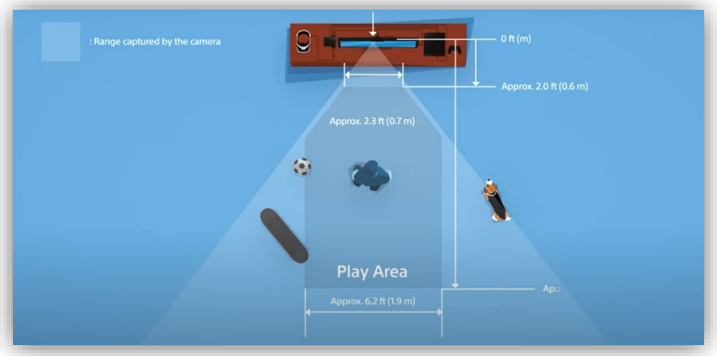 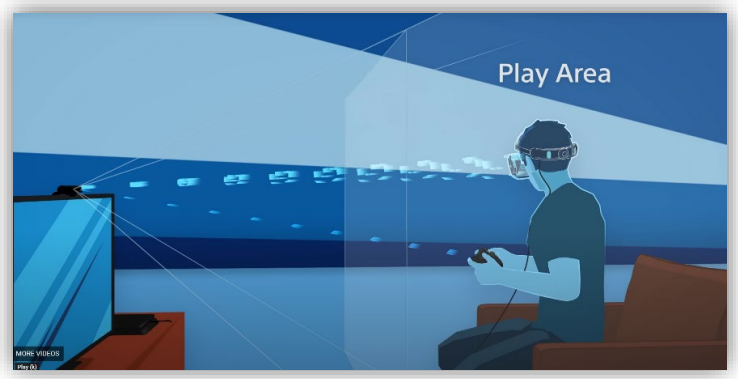

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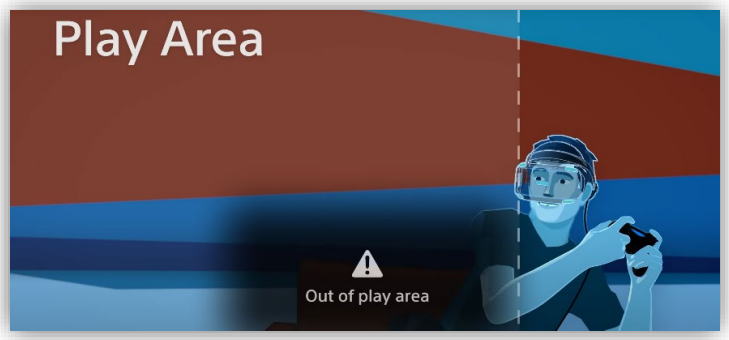
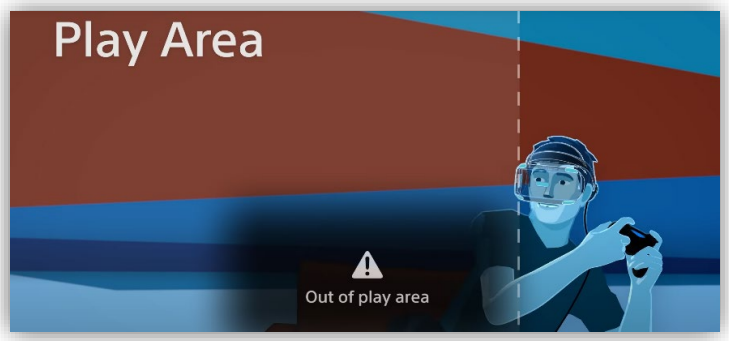
	

Claim	The Sony PSVR System's Exemplary Disclosures

Claim	The Sony PSVR System's Exemplary Disclosures

Claim	The Sony PSVR System's Exemplary Disclosures
	See PS VR Set Up (Nov 7, 2017).[7] *See* GDC 2014 Review (Mar 20, 2014) (showing a wearable electronic device (WED) worn on a head of the user). "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

[7] On information and belief, the Sony PSVR System operated as described in the PS VR Set Up video before the earliest possible priority date of the '737 patent. *See* https://www.youtube.com/watch?v=U5LBzaYkZ2A; *see also* https://www.youtube.com/watch?v=Ymo8sdhSQ94 (Oct 10, 2016).

Claim	The Sony PSVR System's Exemplary Disclosures
	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).  *See* PS VR Set Up (Nov 7, 2017). "The version of the game that I was shown was on the HTC Vive, but the developers say they are targeting the Oculus Rift with the Touch controllers and ***Sony Morpheus with its***

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	Move controllers as well adding they would like to also make the game available on AR platforms like Microsoft's Hololens and the Magic Leap device." *See* Holodance VR Review (Aug. 08, 2015). To the extent Plaintiff argues that 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 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 Defendants' Invalidity Contentions under Sections IV.J.3-5 for at least the reasons stated in Defendants' Invalidity Contentions cover pleading.
1[b] designating, with the HPED held in the hand of the user, a sound localization point (SLP) in empty space in the zone above the physical floor from where binaural sound originates to the user;	The Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, "designating, with the HPED held in the hand of the user, a sound localization point (SLP) in empty space in the zone above the physical floor from where binaural sound originates to the user" as embodied in the product itself and as reflected in other prior art references that describe it. For example: "Launching this week on IndieGoGo, Holodance is a virtual reality dancing game developed by Narayana Games that has you rhythmically ***hitting balls that are coming at you in random locations in 3D space***, somewhat like a mix between Dance Dance Revolution and Guitar Hero with your hands as the controls. I recently had a chance to play through an early pre-alpha build of the game and despite bugs here and there the game was pretty darn fun… both for me and those watching." *See* Holodance VR Review (Aug. 08, 2015). "The version of the game that I was shown was on the HTC Vive, but the developers say they are targeting the Oculus Rift with the Touch controllers and ***Sony Morpheus with its Move controllers*** as well adding they would like to also make the game available on AR platforms like Microsoft's Hololens and the Magic Leap device." *See* Holodance VR Review (Aug. 08, 2015).

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Claim	The Sony PSVR System's Exemplary Disclosures
	See Want a PlayStation VR headset? (Dec 5, 2015) [8] (showing determining when the PED is pointed at one of the SLPs while the user is located in the zone).
1[c] tracking, with the WED worn on the head of the user, the HPED held in the hand of the user such that the HPED provides a location to the WED of the SLP in empty space in the zone above the physical floor from where the binaural sound originates to the user;	The Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, "tracking, with the WED worn on the head of the user, the HPED held in the hand of the user such that the HPED provides a location to the WED of the SLP in empty space in the zone above the physical floor from where the binaural sound originates to the user" as embodied in the product itself and as reflected in other prior art references that describe it. For example:

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

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	See GDC 2014 Review (Mar 20, 2014) (showing a handheld portable electronic device (HPED) and wearable electronic device (WED) worn on the head of a user tracking the HPED). "***The controller tracking was also very good*** in the The Deep demo. The controller only rotated the hand; the arm's position wasn't tracked. It was kind of cool that the crouching made the avatar crouch." *See* GDC 2014 Review (Mar 20, 2014). "Launching this week on IndieGoGo, Holodance is a virtual reality dancing game developed by Narayana Games that has you rhythmically ***hitting balls that are coming at you in random locations in 3D space***, somewhat like a mix between Dance Dance Revolution and Guitar Hero with your hands as the controls. I recently had a chance to play through an early pre-alpha build of the game and despite bugs here and there the game was pretty darn fun… both for me and those watching." *See* Holodance VR Review (Aug. 08, 2015). "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."

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	See Phillips (April 30, 2015).[9] "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 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."

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

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	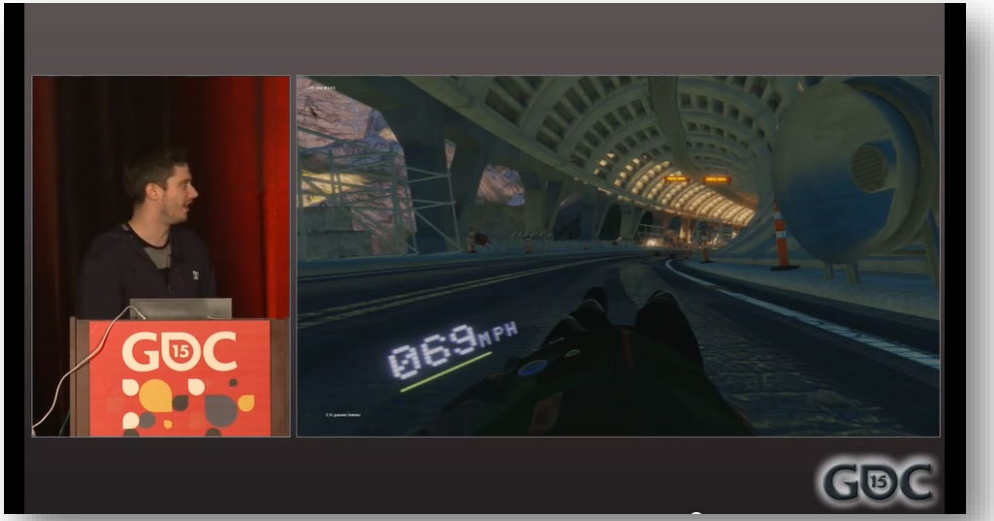

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	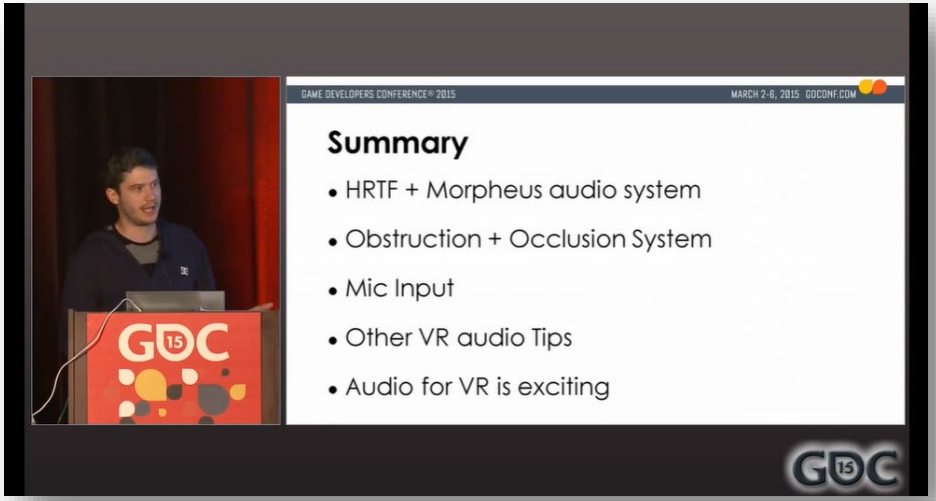 *See* Environmental Audio and Processing for VR (2015). "PlayStation VR: Audio" "When using PS VR you plug in your headphones directly to the headset ***to make use of the binaural 3D audio***. This 3D audio makes it seem like noise is hitting your ears from different directions (including above and below you) and distances, making everything all the more real." "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).[10]

[10] On information and belief, the Sony PSVR System operated as described in the PS VR Wareable review before the earliest possible priority date of the '737 patent. *See* https://www.wareable.com/vr/sony-project-morpheus-release-date-price-games.

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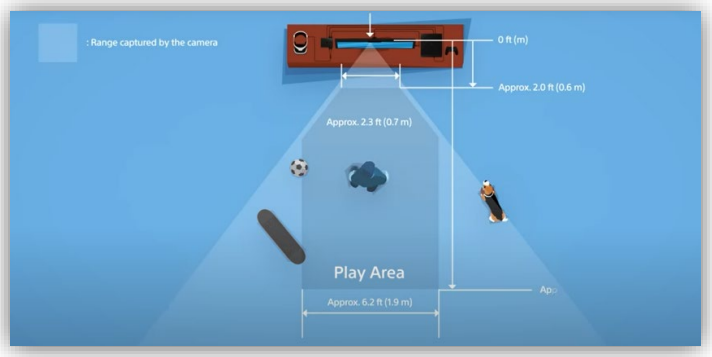
	 See Playstation VR Features (Nov. 4, 2015). 

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	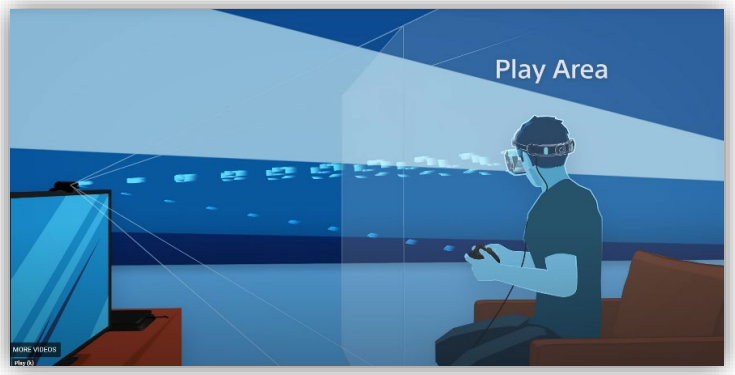 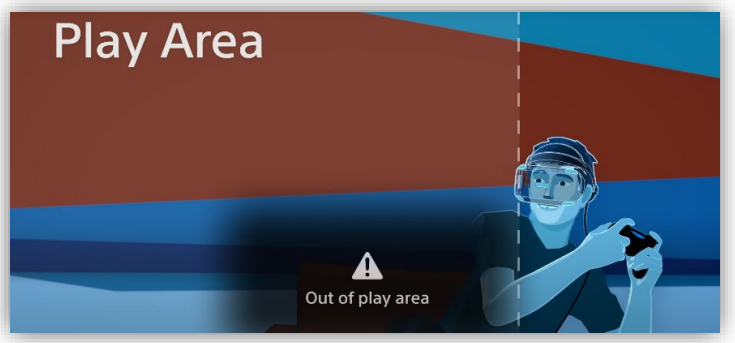

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Claim	The Sony PSVR System's Exemplary Disclosures
	 See PS VR Set Up (Nov 7, 2017).[11]

[11] On information and belief, the Sony PSVR System operated as described in the PS VR Set Up video before the earliest possible priority date of the '737 patent. *See* https://www.youtube.com/watch?v=U5LBzaYkZ2A; *see also* https://www.youtube.com/watch?v=Ymo8sdhSQ94 (Oct 10, 2016).

Claim	The Sony PSVR System's Exemplary Disclosures
	  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.")

Claim	The Sony PSVR System's Exemplary Disclosures
	  See GDC 2014 Review (Mar 20, 2014) (showing a wearable electronic device (WED) worn on a head of the user) "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) "The version of the game that I was shown was on the HTC Vive, but the developers say they are targeting the Oculus Rift with the Touch controllers and ***Sony Morpheus with its***

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	Move controllers as well adding they would like to also make the game available on AR platforms like Microsoft's Hololens and the Magic Leap device." *See* Holodance VR Review (Aug. 08, 2015).

Claim	The Sony PSVR System's Exemplary Disclosures
	  See Want a PlayStation VR headset? (Dec 5, 2015) (showing tracking, with the WED worn on the head of the user, the HPED held in the hand of the user such that the HPED provides a location to the WED of the SLP). To the extent Plaintiff argues that 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 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 Defendants' Invalidity Contentions under Sections IV.J.3-5 for at least the reasons stated in Defendants' Invalidity Contentions cover pleading.
1[d] processing, by a processor, sound with head-related transfer functions (HRTFs) to generate the binaural sound that externally localizes to the user at the	The Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, "processing, by a processor, sound with head-related transfer functions (HRTFs) to generate the binaural sound that externally localizes to the user at the location of the SLP in empty space in the zone above the physical floor" as embodied in the product itself and as reflected in other prior art references that describe it. For example:

Claim	The Sony PSVR System's Exemplary Disclosures
location of the SLP in empty space in the zone above the physical floor; and	"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 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

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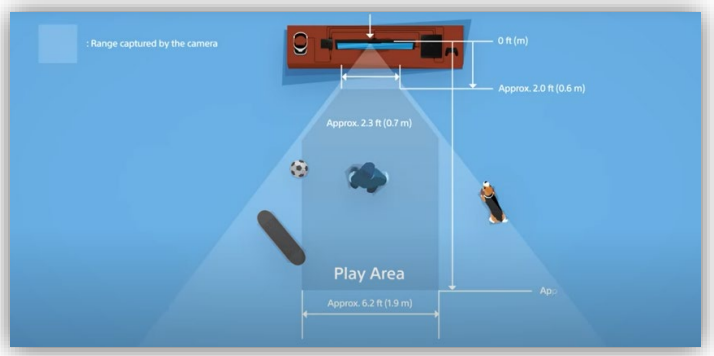
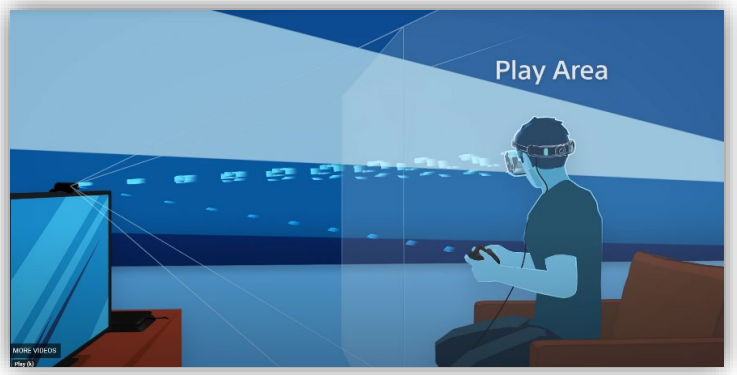
	origination of individual sounds becomes much more reliable. So the personal agency of the gaming experience is a critical element in completing the immersive aural world." *See* Phillips (April 30, 2015).
1[e] displaying, with the WED worn on the head of the user, a virtual image at the location of the SLP in empty space in the zone above the physical floor from where the binaural sound originates to the user.	The Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, "displaying, with the WED worn on the head of the user, a virtual image at the location of the SLP in empty space in the zone above the physical floor from where the binaural sound originates to the user" 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).

Claim	The Sony PSVR System's Exemplary Disclosures
	   See Playstation VR Features (Nov. 4, 2015).

Claim	The Sony PSVR System's Exemplary Disclosures
	 

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	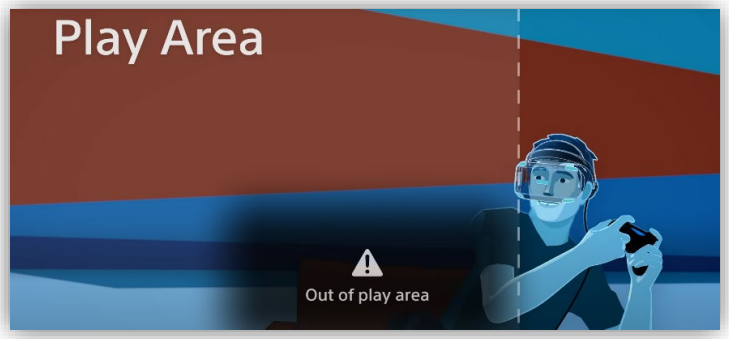

Claim	The Sony PSVR System's Exemplary Disclosures

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	  See PS VR Set Up (Nov 7, 2017). "Launching this week on IndieGoGo, Holodance is a virtual reality dancing game developed by Narayana Games that has you rhythmically ***hitting balls that are coming at you in random locations in 3D space***, somewhat like a mix between Dance Dance Revolution and Guitar Hero with your hands as the controls. I recently had a chance to play through an early pre-alpha build of the game and despite bugs here and there the game was pretty darn fun… both for me and those watching." *See* Holodance VR Review (Aug. 08, 2015). "The version of the game that I was shown was on the HTC Vive, but the developers say they are targeting the Oculus Rift with the Touch controllers and ***Sony Morpheus with its Move controllers*** as well adding they would like to also make the game available on AR platforms like Microsoft's Hololens and the Magic Leap device." *See* Holodance VR Review (Aug. 08, 2015).

Claim	The Sony PSVR System's Exemplary Disclosures
	   See Want a PlayStation VR headset? (Dec 5, 2015) (showing a virtual image at the location of the SLP). To the extent Plaintiff argues that 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 Sony PSVR System alone or in

Claim	The Sony PSVR System's Exemplary Disclosures
	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 Defendants' Invalidity Contentions under Sections IV.J.3-5 for at least the reasons stated in Defendants' Invalidity Contentions cover pleading.
CLAIM 14	
14[pre] An electronic system, 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, an "electronic system" 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).

Claim	The Sony PSVR System's Exemplary Disclosures
	  See GDC 2014 Review (Mar 20, 2014) (showing one or more electronic devices). "The version of the game that I was shown was on the HTC Vive, but the developers say they are targeting the Oculus Rift with the Touch controllers and ***Sony Morpheus with its Move controllers*** as well adding they would like to also make the game available on AR platforms like Microsoft's Hololens and the Magic Leap device." *See* Holodance VR Review (Aug. 08, 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

Claim	The Sony PSVR System's Exemplary Disclosures
	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." *See* Environmental Audio and Processing for VR (2015).
14[a] a portable electronic device (PED) that moves to define a boundary of a three-dimensional (3D) zone extending from a physical floor on which a user holding the PED stands and around the user and that designates a sound localization point (SLP) in empty space inside the 3D zone; and	The Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, "a portable electronic device (PED) that moves to define a boundary of a three-dimensional (3D) zone extending from a physical floor on which a user holding the PED stands and around the user and that designates a sound localization point (SLP) in empty space inside the 3D zone" as embodied in the product itself and as reflected in other prior art references that describe it. For example:

Claim	The Sony PSVR System's Exemplary Disclosures
	   See GDC 2014 Review (Mar 20, 2014) (showing a portable electronic device (PED)). "***The controller tracking was also very good*** in the The Deep demo. The controller only rotated the hand; the arm's position wasn't tracked. It was kind of cool that the crouching made the avatar crouch." *See* GDC 2014 Review (Mar 20, 2014). "Launching this week on IndieGoGo, Holodance is a virtual reality dancing game developed by Narayana Games that has you rhythmically ***hitting balls that are coming at you in random locations in 3D space***, somewhat like a mix between Dance Dance Revolution and Guitar Hero with your hands as the controls. I recently had a chance to play through an early

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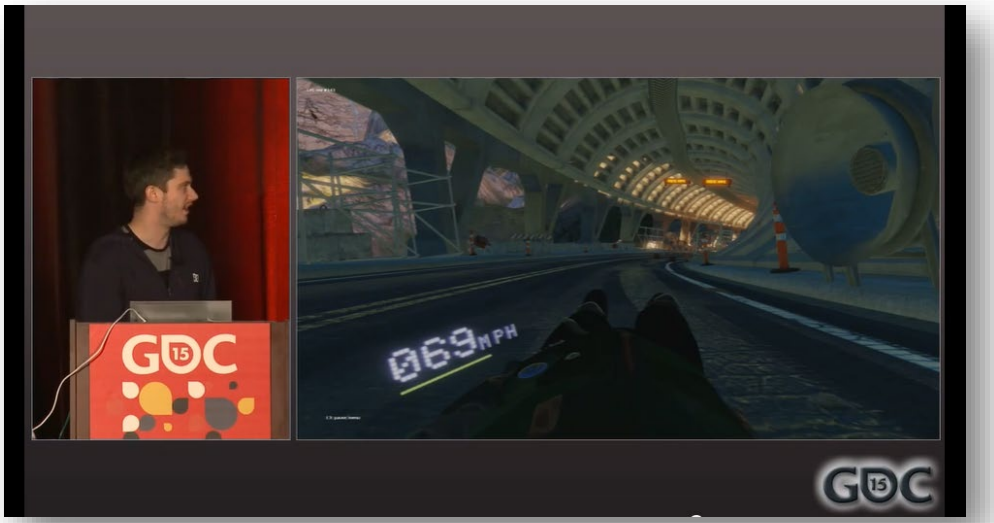
	pre-alpha build of the game and despite bugs here and there the game was pretty darn fun… both for me and those watching." *See* Holodance VR Review (Aug. 08, 2015). "At GDC 2015, a presentation entitled "Environmental Audio and Processing for VR" laid out the technology of audio design and implementation 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 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

Claim	The Sony PSVR System's Exemplary Disclosures
	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." 

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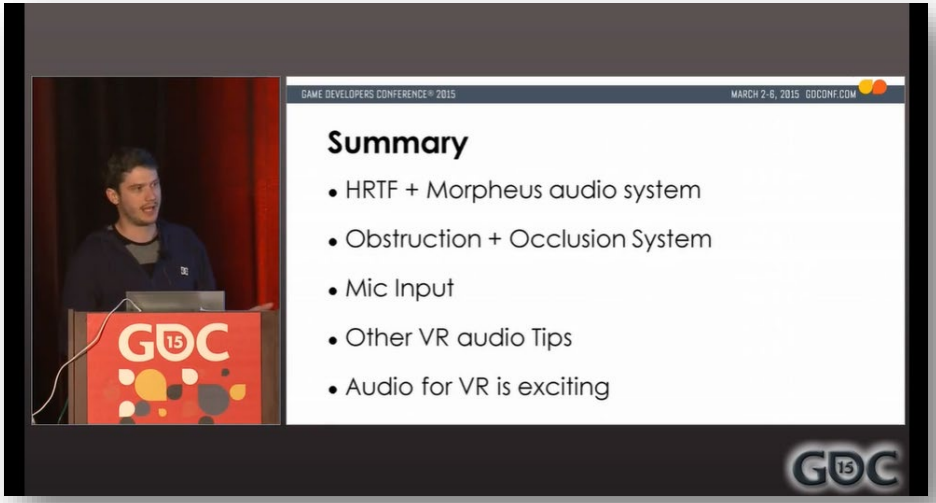 *See* Environmental Audio and Processing for VR (2015). "PlayStation VR: Audio When using PS VR you plug in your headphones directly to the headset ***to make use of the binaural 3D audio***. This 3D audio makes it seem like noise is hitting your ears from different directions (including above and below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

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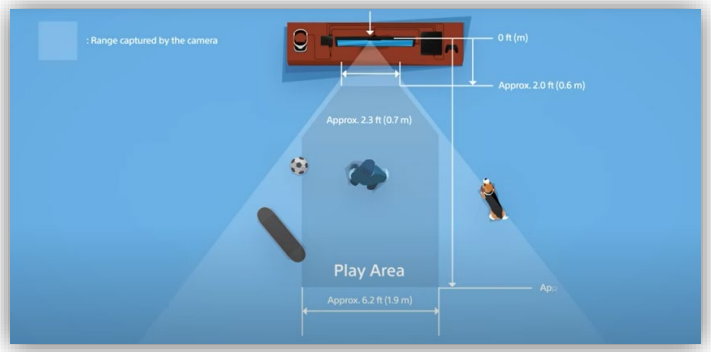
	 See Playstation VR Features (Nov. 4, 2015). 

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	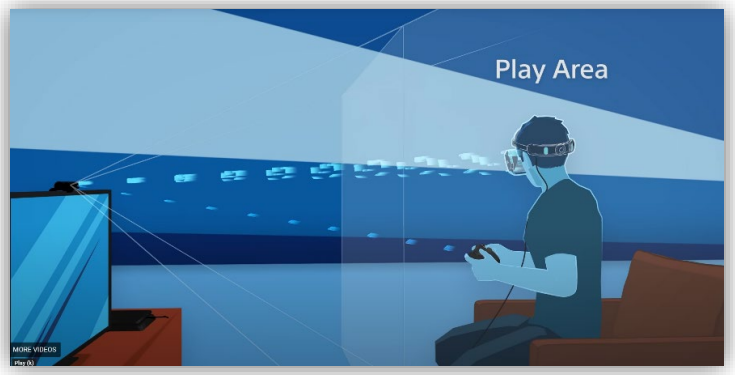 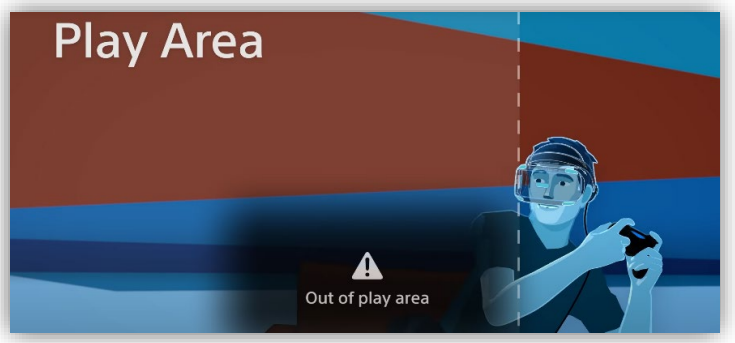

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Claim	The Sony PSVR System's Exemplary Disclosures
	 See PS VR Set Up (Nov 7, 2017).

Claim	The Sony PSVR System's Exemplary Disclosures
	See GDC 2014 Review (Mar 20, 2014) (showing a wearable electronic device (WED) worn on a head of the user). "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). "The version of the game that I was shown was on the HTC Vive, but the developers say they are targeting the Oculus Rift with the Touch controllers and ***Sony Morpheus with its Move controllers*** as well adding they would like to also make the game available on AR platforms like Microsoft's Hololens and the Magic Leap device." *See* Holodance VR Review (Aug. 08, 2015).

Claim	The Sony PSVR System's Exemplary Disclosures
	   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.") > "The version of the game that I was shown was on the HTC Vive, but the developers say they are targeting the Oculus Rift with the Touch controllers and ***Sony Morpheus with its Move controllers*** as well adding they would like to also make the game available on AR platforms like Microsoft's Hololens and the Magic Leap device." *See* Holodance VR Review (Aug. 08, 2015).

Claim	The Sony PSVR System's Exemplary Disclosures
	   See Want a PlayStation VR headset? (Dec 5, 2015) (showing PED designating an SLP). To the extent Plaintiff argues that 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 Sony PSVR System alone or in combination with any applicant admitted prior art, the knowledge of one of ordinary skill in the art,

Claim	The Sony PSVR System's Exemplary Disclosures
	or any one or more of the references identified in Defendants' Invalidity Contentions under Sections IV.J.3-5 for at least the reasons stated in Defendants' Invalidity Contentions cover pleading.
14[b] a wearable electronic device (WED) that is worn on a head of the user, tracks movement of the PED to determine the boundary of the 3D zone that extends from the physical floor and around the user, includes a processor that processes sound with head-related transfer functions (HRTFs) so sound externally localizes as binaural sound to the user at the SLP in empty space inside the 3D zone defined by movement of the PED, and displays a virtual image at the SLP in empty space inside the 3D zone, and displays a 3D virtual image that shows the boundary of the 3D zone that extends from the physical floor and around the user.	The Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, "a wearable electronic device (WED) that is worn on a head of the user, tracks movement of the PED to determine the boundary of the 3D zone that extends from the physical floor and around the user, includes a processor that processes sound with head-related transfer functions (HRTFs) so sound externally localizes as binaural sound to the user at the SLP in empty space inside the 3D zone defined by movement of the PED, and displays a virtual image at the SLP in empty space inside the 3D zone, and displays a 3D virtual image that shows the boundary of the 3D zone that extends from the physical floor and around the user" as embodied in the product itself and as reflected in other prior art references that describe it. For example:

Claim	The Sony PSVR System's Exemplary Disclosures
	See GDC 2014 Review (Mar 20, 2014) (showing a wearable electronic device (WED) worn on a head of the user). *See* GDC 2014 Review (Mar 20, 2014) (showing a wearable electronic device (WED) worn on a head of the user that tracks the PED). "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.

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	… 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 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

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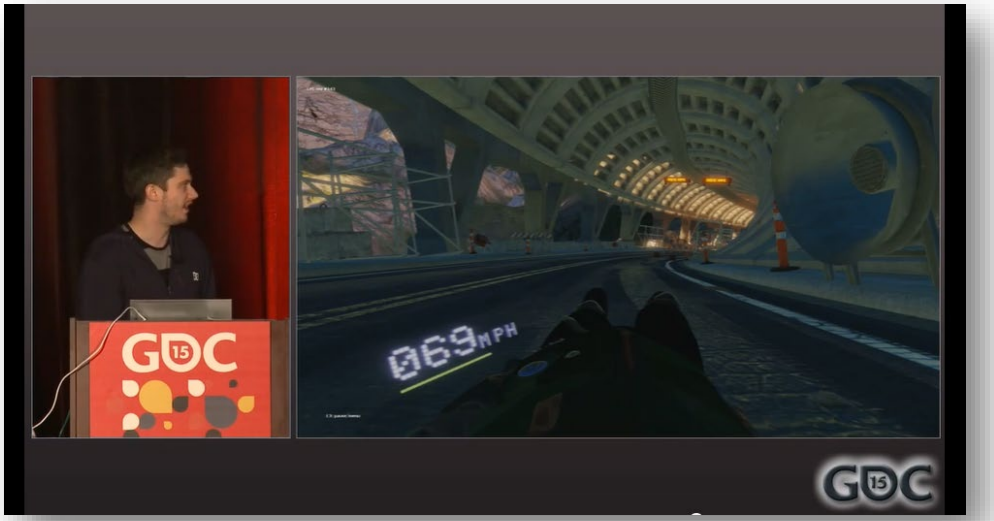
	"presence" in the virtual world. It will focus on audio processing and cover topics such as obstruction/occlusion, reverberation, distance modelling, ***binaural processing***, ambiance and the human auditory system. Examples will be shown for each, and techniques used will be explained to help guide others down this new pathway in interactive audio design." 

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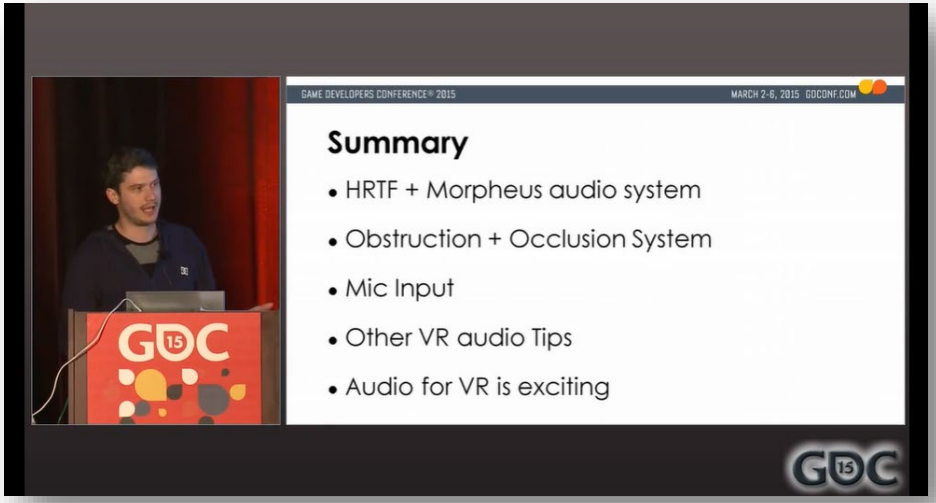 *See* Environmental Audio and Processing for VR (2015). "PlayStation VR: Audio When using PS VR you plug in your headphones directly to the headset ***to make use of the binaural 3D audio***. This 3D audio makes it seem like noise is hitting your ears from different directions (including above and below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

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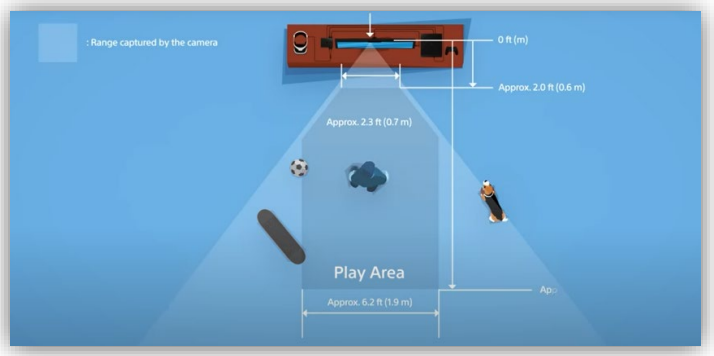
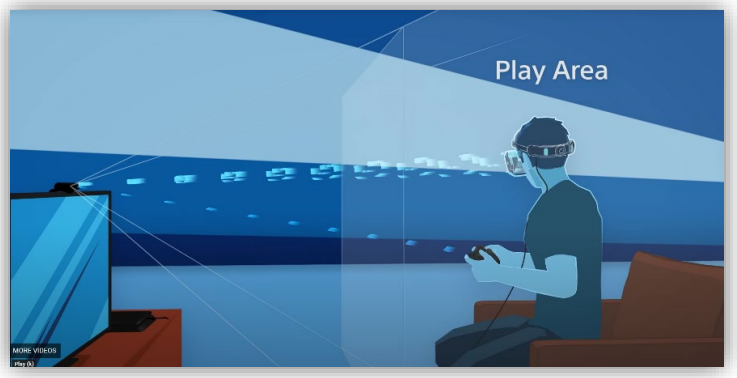
	the bottom of the cage. I was also able to pitch forward and my torso would move closer to the edge of the cage. In Eve, I was able to lean forward to look more closely at the cockpit, and, hilariously, was able to detach my head from my torso from leaning way back." *See* GDC 2014 Review (Mar 20, 2014)  

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	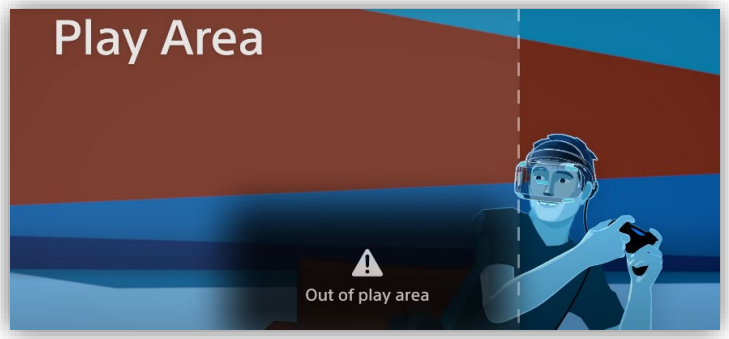

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	  See PS VR Set Up (Nov 7, 2017). "Two demo experiences were shown today. The first, called The Deep, puts you underwater in a shark cage, which is similar to the Game of Thrones experience put on recently at SXSW in Austin in that they both take 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).

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	   See Playstation VR Features (Nov. 4, 2015).

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	"Launching this week on IndieGoGo, Holodance is a virtual reality dancing game developed by Narayana Games that has you rhythmically ***hitting balls that are coming at you in random locations in 3D space***, somewhat like a mix between Dance Dance Revolution and Guitar Hero with your hands as the controls. I recently had a chance to play through an early pre-alpha build of the game and despite bugs here and there the game was pretty darn fun… both for me and those watching." *See* Holodance VR Review (Aug. 08, 2015). "The version of the game that I was shown was on the HTC Vive, but the developers say they are targeting the Oculus Rift with the Touch controllers and ***Sony Morpheus with its Move controllers*** as well adding they would like to also make the game available on AR platforms like Microsoft's Hololens and the Magic Leap device." *See* Holodance VR Review (Aug. 08, 2015).

Claim	The Sony PSVR System's Exemplary Disclosures
	  See Want a PlayStation VR headset? (Dec 5, 2015) (displays a virtual image at the SLP). To the extent Plaintiff argues that 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 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 Defendants' Invalidity Contentions under Sections IV.J.3-5 for at least the reasons stated in Defendants' Invalidity Contentions cover pleading.
CLAIM 15	
15 wherein the 3D zone has a customized size and shape defined by movement of the PED while held in a hand of the user.	The Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, "wherein the 3D zone has a customized size and shape defined by movement of the PED while held in a hand of the user" as embodied in the product itself and as reflected in other prior art references that describe it. *See* claim 14. For example:

Claim	The Sony PSVR System's Exemplary Disclosures
	   See GDC 2014 Review (Mar 20, 2014) (showing a portable electronic device (PED) held in a hand of a user) "***The controller tracking was also very good*** in the The Deep demo. The controller only rotated the hand; the arm's position wasn't tracked. It was kind of cool that the crouching made the avatar crouch." *See* GDC 2014 Review (Mar 20, 2014). "Launching this week on IndieGoGo, Holodance is a virtual reality dancing game developed by Narayana Games that has you rhythmically ***hitting balls that are coming at you in random locations in 3D space***, somewhat like a mix between Dance Dance Revolution and Guitar Hero with your hands as the controls. I recently had a chance to play through an early

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	pre-alpha build of the game and despite bugs here and there the game was pretty darn fun… both for me and those watching." *See* Holodance VR Review (Aug. 08, 2015). *See* Playstation VR Features (Nov. 4, 2015).

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	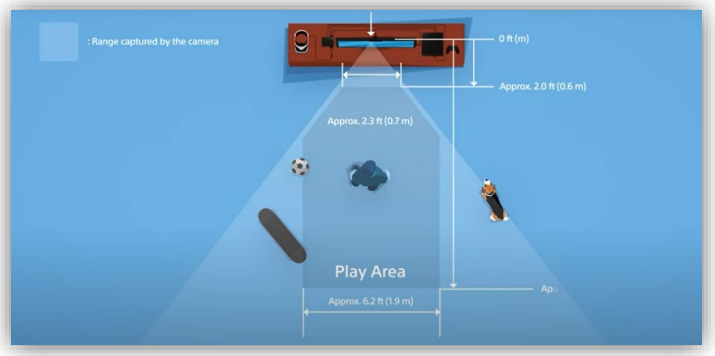 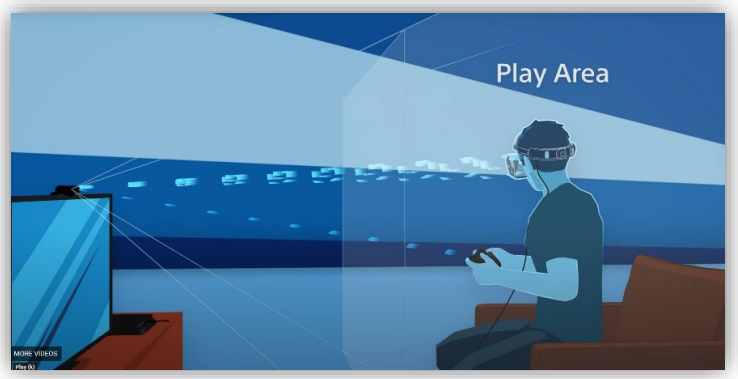

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	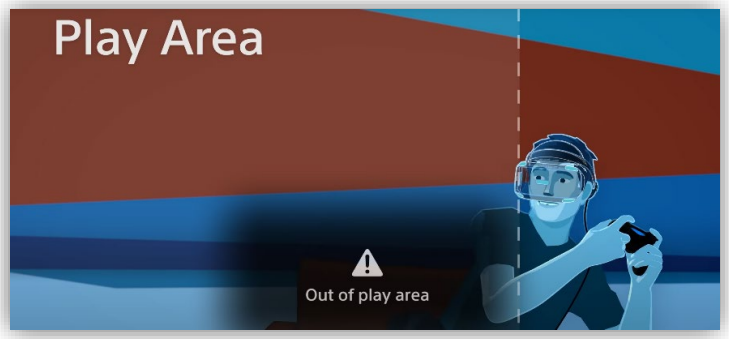

Claim	The Sony PSVR System's Exemplary Disclosures

Claim	The Sony PSVR System's Exemplary Disclosures
	   See PS VR Set Up (Nov 7, 2017).

Claim	The Sony PSVR System's Exemplary Disclosures
	   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 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 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 Defendants' Invalidity Contentions under Sections IV.J.3-5 for at least the reasons stated in Defendants' Invalidity Contentions cover pleading.
CLAIM 16	
16 wherein the WED tracks the PED to determine when the PED is at the boundary of the 3D zone, and the WED automatically displays the 3D	The Sony PSVR System discloses and/or renders obvious, alone or in combination with other prior art, "wherein the WED tracks the PED to determine when the PED is at the boundary of the 3D zone, and the WED automatically displays the 3D virtual image that shows the boundary of the 3D

Claim	The Sony PSVR System's Exemplary Disclosures
virtual image that shows the boundary of the 3D zone to alert the user that the PED is at the boundary of the 3D zone.	zone to alert the user that the PED is at the boundary of the 3D zone" as embodied in the product itself and as reflected in other prior art references that describe it. *See* claim 14. For example: *See* GDC 2014 Review (Mar 20, 2014) (showing a wearable electronic device (WED) worn on a head of the user)

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	   See GDC 2014 Review (Mar 20, 2014) (showing a wearable electronic device (WED) worn on a head of the user tracking PED) "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)

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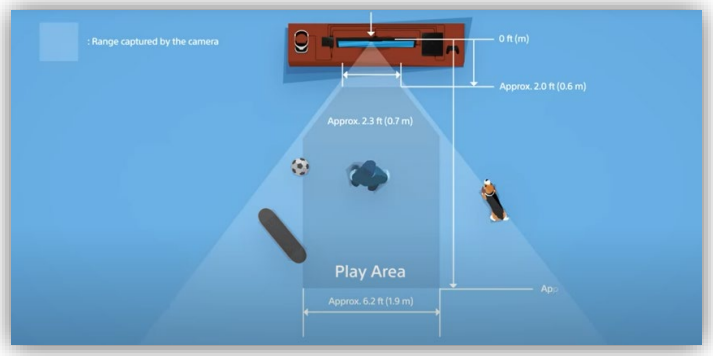
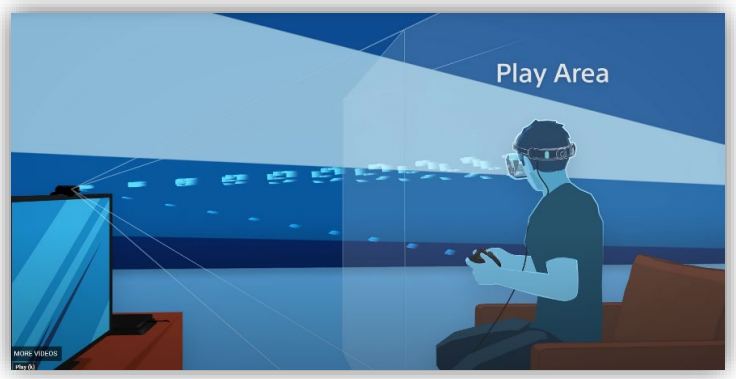
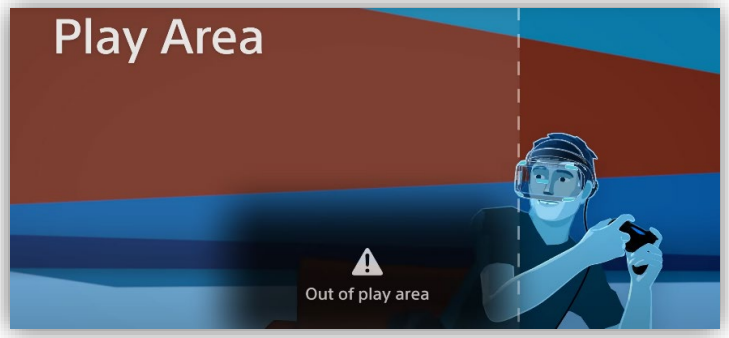
	 

Claim	The Sony PSVR System's Exemplary Disclosures
	

Claim	The Sony PSVR System's Exemplary Disclosures

Claim	The Sony PSVR System's Exemplary Disclosures
	  See PS VR Set Up (Nov 7, 2017). "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).

Claim	The Sony PSVR System's Exemplary Disclosures
	   See Playstation VR Features (Nov. 4, 2015).

Claim	The Sony PSVR System's Exemplary Disclosures
	To the extent Plaintiff argues that 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 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 Defendants' Invalidity Contentions under Sections IV.J.3-5 for at least the reasons stated in Defendants' Invalidity Contentions cover pleading.