Filed on behalf of: Meta Platforms, Inc.

Entered: November 6, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

META PLATFORMS, INC.,
Petitioner,

v.

EIGHT KHZ, LLC,
Patent Owner.

Case IPR2023-01019
Patent 10,368,179 B1

PETITIONERS' UPDATED EXHIBIT LIST

Pursuant to 37 C.F.R. § 42.63(e), Petitioners Meta Platforms, Inc., Meta Platforms Technologies, LLC, and Twisted Pixel Games, LLC respectfully submit the following corrected exhibit list:

Exhibit	Description
1001	U.S. Patent No. 10,368,179 ("the '179 patent")
1002	File History for U.S. Patent No. 10,368,179 ("'179 FH")
1003	Declaration of Dr. Agnieszka Roginska ("Roginska")
1004	*Curriculum Vitae* of Dr. Agnieszka Roginska
1005	U.S. Patent No. 9,690,374 ("Clement")
1006	U.S. Patent No. 9,037,468 ("Osman")
1007	U.S. Patent No. 7,876,903 ("Sauk")
1008	U.S. Patent Application Publication No. 2017/0188168 ("Lyren")
1009	U.S. Patent Application Publication No. 2018/0373412 ("Reif")
1010	U.S. Patent Application Publication No. 2011/0206209 ("Ojala")
1011	U.S. Patent No. 1,624,486 ("Fletcher")
1012	U.S. Patent No. 1,855,149 ("Jones")
1013	U.S. Patent No. 7,330,197 ("Kobayashi")
1014	U.S. Patent No. 7,710,654 ("Ashkenazi")
1015	U.S. Patent No. 8,520,872 ("Jang")
1016	U.S. Patent No. 8,520,873 ("Mahabub")
1017	U.S. Patent No. 9,041,622 ("McCulloch")
1018	U.S. Patent No. 9,367,811 ("Ramachandran")
1019	U.S. Patent No. 9,544,706 ("Hirst")
1020	U.S. Patent No. 9,578,440 ("Otto")
1021	U.S. Patent No. 9,674,507 ("Pirchheim")
1022	RESERVED
1023	U.S. Patent No. 9,767,618 ("Najaf-Zadeh")

Exhibit	Description
1024	RESERVED
1025	U.S. Patent No. 10,070,239 ("Romigh")
1026	RESERVED
1027	U.S. Patent No. 10,095,031 ("Katz")
1028	File History for U.S. Patent Application 16/106,140
1029	U.S. Patent No. 10,509,466 ("Miller")
1030	U.S. Patent Application Publication No. 2012/0183161 ("Agevik")
1031	U.S. Patent Application Publication No. 2016/0124502 ("Sawyer")
1032	U.S. Patent Application Publication No. 2016/0292924 ("Balachandreswaran")
1033	U.S. Patent Application Publication No. 2017/0105083 ("Nair")
1034	U.S. Patent Application Publication No. 2017/0115488 ("Ambrus")
1035	Korean Patent Application Publication No. KR 10-2011-0022252, including English Translation and Certification ("Moon")
1036	Christoph Anthes et al., *State of the Art of Virtual Reality Technology*, 2016 IEEE Aerospace Conf. 1-19 (Mar. 2016) ("Anthes")
1037	*Average Cost of RAM per Gigabyte Chart*, HumanProgress ("HumanProgress")
1038	Durand R. Begault, *3-D Sound for Virtual Reality and Multimedia* (NASA/TM-2000-209606) (Aug. 2000) ("Begault")
1039	Tom Emrich, *Virtual Reality North: A Look at the Major VR Players in Canada*, betakit.com (July 15, 2015), betakit.com/virtual-reality-north-a-look-at-the-major-vr-players-in-canada/ ("Emrich")

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1040	Braxton Boren, *History of 3D Sound* (Am. Univ., Wash. D.C. 2018), https://dra.american.edu/islandora/object/auislandora%3A77787/datastream/PDF/view ("Boren")
1041	Douglas S. Brungart et al., *The Interaction Between Head-Tracker Latency, Source Duration, and Response Time in the Localization of Virtual Sound Sources*, Proc. ICAD 04- 10th Meeting Int'l Conf. Auditory Display 1-7 (July 6-9, 2004) ("Brungart 2004")
1042	Douglas S. Brungart et al, *The Detectability of Headtracker Latency in Virtual Audio Displays*, Proc. ICAD 05-11th Meeting Int'l Conf. Auditory Display 37-42 (July 6-9, 2005) ("Brungart 2005")
1043	E. Colin Cherry, *Some Experiments on the Recognition of Speech, with One and with Two Ears*, 25 J. ACOUSTICAL SOC'Y AM. 975 (1953) ("Cherry")
1044	Christof Faller, *Coding of Spatial Audio Compatible with Different Playback Formats*, AES 117th Convention 1-12 (Oct. 28-31, 2004) ("Faller")
1045	Mohammad Dashti et al., *Traffic Management: A Holistic Approach to Memory Placement on NUMA Systems*, ASPLOS 1-13 (Mar. 16-20, 2013) ("Dashti")
1046	S.S. Fisher et al., *Virtual Interface Environment Workstations*, 32 Proc. Hum. Factors Soc'y 32nd Ann. Meeting–1988 91-95 (Feb. 1988) ("Fisher")
1047	Wolfgang Fohl et al., *A System-On-Chip Platform for HRTF-Based Realtime Spatial Audio Rendering With an Improved Realtime Filter Interpolation*, 4 INT'L J. ADVANCES INTELLIGENT SYS. 309 (2011) ("Fohl")
1048	Mats Liljedahl, *Sound for Fantasy and Freedom* in GAME SOUND TECHNOLOGY AND PLAYER INTERACTION: CONCEPTS AND DEVELOPMENTS 22 (Mark Grimshaw ed., 2011) ("Grimshaw")

Exhibit	Description
1049	Eric Growney & Agnieszka Roginska, *Effect of Spatial Audio Processing on Attention Redirection and Speech Intelligibility in Multi-Talker Communication*, AES 152nd Convention 1-10 (May 2022) ("Growney")
1050	Maxim Liadov, *A New Generation of Xtreme Fidelity Processors and Sound Cards*, iXBT Labs (Aug. 22, 2005) ("Liadov")
1051	JESSE SCHELL, THE ART OF GAME DESIGN: A BOOK OF LENSES (2008) ("Schell")
1052	Christoph Lameter, *Local and Remote Memory: Memory in a Linux/NUMA System*, SGI (June 20, 2006) ("Lameter 2006")
1053	Christoph Lameter, *NUMA (Non-Uniform Memory Access): An Overview*, ACMqueue 1-12 (2013) ("Lameter 2013")
1054	Matteo Marucci et al., *The Impact of Multisensory Integration and Perceptual Load in Virtual Reality Settings on Performance, Workload and Presence*, 11 NATURE SCI. REPS. 1 (2021) ("Marucci")
1055	Joel D. Miller et al., *Latency Measurements of a Real-Time Virtual Acoustic Environment Rendering System*, Proc. 2003 Int'l Conf. Auditory Display 111-114 (July 6-9, 2003) ("Miller")
1056	Francisco Cheng, *Mobile Processors 101: Why Smartphones are Smarter with an All-In-One Processor*, QUALCOMM ONQ BLOG (June 12, 2013) ("Cheng")
1057	Masayuki Morimoto & Yoichi Ando, *On the Simulation of Sound Localization*, (E) 1 J. ACOUSTIC SOC'Y JAPAN 167 (1980) ("Morimoto")
1058	RESERVED
1059	Stephan Paul, *Binaural Recording Technology: A Historical Review and Possible Future Developments*, 95 ACTA ACUSTICA UNITED WITH ACUSTICA 767 (2009) ("Paul")
1060	Ben Kuchera, *Google Cardboard Adds 'Inexpensive' Spatial Audio to its SDK*, POLYGON (Jan. 13 2016, 12:00pm PST) ("Kuchera")

Exhibit	Description
1061	Paul Sauk & Duane Satorius, *Creating a Multi-Dimensional Communication Space to Improve the Effectiveness of 3-D Audio*, IEEE Military Comm'cns Conf. 1-7 (Oct. 29-31, 2007) ("Sauk 2007")
1062	Mel Slater & Martin Usoh, *Presence in Immersive Virtual Environments*, IEEE Virtual Reality Ann. Int'l Symp. 90-96 (Sept. 18-22, 1993) ("Slater")
1063	Jaka Sodnik & Sašo Tomažič, *Spatial Auditory Human-Computer Interfaces*, SPRINGER BRIEFS COMPUT. SCI. (2015) ("Sodnik")
1064	Paul James, *Sulon Cortex 'Augmented Virtual Reality' Headset, Interview with Don Henderson*, ROAD TO VR (Feb. 5, 2015) ("James")
1065	Mona Lalwani, *Surrounded by Sound: How 3D Audio Hacks Your Brain*, THE VERGE (Feb. 12, 2015, 10:30am)https://www.theverge.com/2015/2/12/8021733/3d-audio-3dio-binaural-immersive-vr-sound-times-square-new-york ("Lalwani")
1066	Dave Smith, *Three-Dimensional Audio Makes Virtual Reality So Much Better It's Crazy*, BUS. INSIDER (Apr. 3, 2015, 1:06 PM), https://www.businessinsider.com/virtual-reality-the-importance-of-3d-positional-audio-2015-4 ("Smith")
1067	JASON JERALD, THE VR BOOK: PERCEPTION AND INTERACTION DESIGN FOR VIRTUAL REALITY (2015) ("VR Book")
1068	Elizabeth M. Wenzel et al., *Development of a Three-Dimensional Auditory Display System*, 20 SIGCHI BULL. 52 (Oct. 1988) ("Wenzel 1988a")
1069	Elizabeth M. Wenzel et al., *A Virtual Display System for Conveying Three-Dimensional Acoustic Information*, Proc. Hum. Factors Soc'y 32nd Ann. Meeting 86-90 (1988) ("Wenzel 1988b")
1070	RESERVED

Exhibit	Description
1071	Elizabeth M. Wenzel et al., *Localization with Non-Individualized Virtual Acoustic Display Cues*, Proc. SIGCHI Conf. Hum. Factors Comput. Sys. 351-59 (Apr. 1991) ("Wenzel 1991")
1072	Elizabeth M. Wenzel, *Localization in Virtual Acoustic Displays*, 1 PRESENCE TELEOPERATORS VIRTUAL ENV'TS 80 (Feb. 1992) ("Wenzel 1992")
1073	Qualcomm, *What's So Special About the Digital Signal Processor?*, QUALCOMM ONQ BLOG (Dec. 5, 2013) ("OnQ")
1074	Frederic L. Wightman & Doris J. Kistler, *Headphone Simulation of Free-Field Listening. II: Psychophysical Validation*, 85 J. ACOUSTIC SOC'Y AM. 868 (1989) ("Wightman")
1075	Jiann-Rong Wu et al., *Head Motion and Latency Compensation on Localization of 3D Sound in Virtual Reality*, Proc. ACM Symp. Virtual Reality Software Tech. 15-20 (Sept. 1997) ("Wu")
1076	Dmitry N. Zotkin et al., *Customizable Auditory Displays*, PROC. 2002 Int'l Conf. Auditory Display 1-10 (July 2-5, 2002) ("Zotkin")
1077	Gr. Brit. Provisional Patent Specification No. 394,325 ("Blumlein")
1078	Linley Gwennap, *Qualcomm Extends Hexagon DSP*, MICROPROCESSOR REP. 1-4 (Aug. 26, 2013) ("Gwennap")
1079	Stanley P. Lipshitz, *Stereo Microphone Techniques……Are the Purists Wrong?* 34 J. AUDIO ENG'G SOC'Y 716 (1986) ("Lipshitz")
1080	U.S. Patent No. 9,851,786 ("Pedrotti")
1081	U.S. Patent No. 9,787,846 ("Srinivasan")
1082	U.S. Patent Application Publication No. 2015/0094142 ("Stafford")
1083	U.S. Patent Application Publication No. 2019/0043259 ("Wang")
1084	Plaintiff's Second Supplemental Infringement Contentions, Exhibit 22, *Eight kHz, LLC v. Meta Platforms, Inc.*, No. 6:22-cv-00575 (W.D. Tex. Mar. 3, 2023)

Exhibit	Description
1085	Oculus Connect 5 Spatial Audio for Oculus Quest and Beyond video clips (May 12, 2023)
1086	Oculus Connect 5 Spatial Audio for Oculus Quest and Beyond video clip transcriptions (May 12, 2023)
1087	Oculus Connect 5 Keynote Day 01 video clips (May 16, 2023)
1088	Oculus Connect 5 Keynote Day 01 video clip transcriptions (May 16, 2023)
1089	Defendants' Opening Claim Construction Brief, *Eight kHz, LLC v. Meta Platforms, Inc*., No. 6:22-cv-00575 (W.D. Tex. Apr. 12, 2023), ECF No. 83
1090	Plaintiff's Claim Construction Reply Brief, *Eight kHz, LLC v. Meta Platforms, Inc*., No. 6:22-cv-00575 (May 3, 2023), ECF No. 92
1091	Declaration of Durand R. Begault, Ph.D. in Support of Plaintiff's Reply Claim Construction Brief, *Eight kHz, LLC v. Meta Platforms, Inc*., No. 6:22-cv-00575 (W.D. Tex. May 3, 2023), ECF No. 92-7
1092	Plaintiff's Second Supplemental Infringement Contentions, Exhibit 23, *Eight kHz, LLC v. Meta Platforms, Inc*., No. 6:22-cv-00575 (W.D. Tex. Mar. 3, 2023)
1093	U.S. Patent No. 5,173,944 ("Begault '944")
1094	U.S. Patent No. 5,438,623 ("Begault '623")
1095	Deposition transcript of Durand Begault, Ph.D., *Eight kHz, LLC v. Meta Platforms, Inc*., No. 6:22-cv-00575 (W.D. Tex. May 22, 2023) ("Begault Dep.")
1096-1140	RESERVED
1141	Defendants' Stipulation Regarding Invalidity Challenges, *Eight kHz, LLC v. Meta Platforms, Inc*., No. 6:22-cv-00575 (W.D. Tex. Oct. 17, 2023), ECF No. 149
1142	Order Resetting Markman Hearing Via Zoom, *Eight kHz, LLC v. Meta Platforms, Inc*., No. 6:22-cv-00575 (W.D. Tex. Sept. 11, 2023), ECF No. 142

Exhibit	Description
1143	Order Granting Joint Motion to Amend Scheduling Order, *Eight kHz, LLC v. Meta Platforms, Inc*., No. 6:22-cv-00575 (W.D. Tex. Aug. 30, 2023), ECF No. 140
1144	Email from Board to Counsel Authorizing Petitioners' Request to Reply to Patent Owner's Preliminary Response in IPR2023-01019, -01020, and -01024 (Oct. 12, 2023)

Respectfully submitted,

Dated: November 6, 2023

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), I certify that on this 6th day of November, 2023, a true and correct copy of the foregoing **Petitioners' Updated Exhibit List and Exhibit 1144** were served by electronic mail on Patent Owner's lead and backup counsel at the following email addresses:

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