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(54) Title: OBJECT-BASED AUDIO SYSTEM USING VECTOR BASE AMPLITUDE PANNING

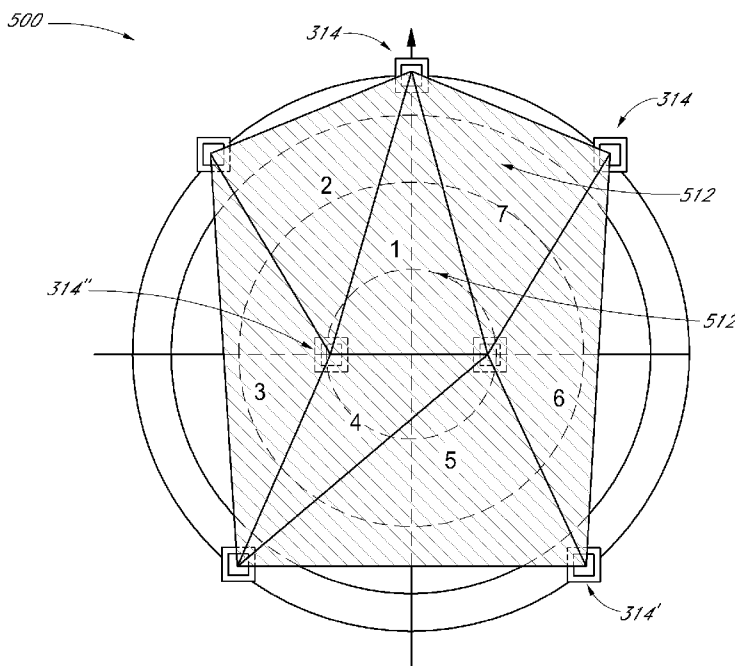


FIG. 5

(57) Abstract: Methods and systems of reproducing object-based audio are disclosed. In some embodiments, vector base amplitude panning (VBAP) is used for playing back an object's audio. Using the positioning of sound reproduction devices and object's location information, rendering can determine which sound reproduction devices are used for playing back the object's audio. For example, a triangle in which the object is positioned at a given time can be identified. The triangle can have sound reproduction devices as vertices, and the object's audio can be rendered on the sound reproduction devices corresponding to the vertices of the triangle. In some embodiments, ambiguities associated with VBAP-based rendering are identified and resolved.





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A. CLASSIFICATION OF SUBJECT MATTER
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B. FIELDS SEARCHED
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 H04S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Kenneth Faller Ii ET AL: "Acoustic Performance of an Installed Real-Time Three-Dimensional Audio System", Proceedings of Meetings on Acoustics 60th Meeting Acoustical Society of America Session 5pAA, 15 September 2010 (2010-09-15), pages 1-13, XP055115822, Cancun, Mexico DOI: 10.1121/1.3580300] Retrieved from the Internet: URL:http://scitation.aip.org/docserver/ful ltext/asa/journal/poma/11/1/1.3580300.pdf? expires=1398775978&id=id&acname=guest&che cksum=1513A223ADCCE9C7A18F34931CE00927 [retrieved on 2014-04-29] pages 1,2,4; figures 5-6 ----- -/--	1-25

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Will, Robert
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INTERNATIONAL SEARCH REPORT

International application No PCT/US2013/043150

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>Akio Ando ET AL: "Audio Engineering Society Convention Paper Sound intensity based three-dimensional panning", 10 May 2009 (2009-05-10), XP055114864, Retrieved from the Internet: URL:http://www.aes.org/tmpFiles/elib/20140422/14871.pdf [retrieved on 2014-04-23]</p>	1,2,5,6, 13,14, 17,18
A	<p>pages 1-2,6 - page 8; figures 3,4; tables 1,2</p>	7,19
A	<p>----- Ville Pulkki ET AL: "Creating Auditory Displays with Multiple Loudspeakers Using VBAP: A Case Study with DIVA Project", 1 January 1998 (1998-01-01), XP055114989, Retrieved from the Internet: URL:http://icad.org/websiteV2.0/Conferences/ICAD98/papers/PULKKI.PDF [retrieved on 2014-04-23] page 2 - page 3; figures 1-3</p>	1,7,13, 19
A	<p>----- PULKKI V: "Virtual Sound Source Positioning Using Vector Base Amplitude Panning", JOURNAL OF THE AUDIO ENGINEERING SOCIETY, AUDIO ENGINEERING SOCIETY, NEW YORK, NY, US, vol. 45, no. 6, 1 June 1997 (1997-06-01), pages 456-466, XP002719359, ISSN: 0004-7554 cited in the application Chapters 2.2 - 3, 6.2</p>	1