



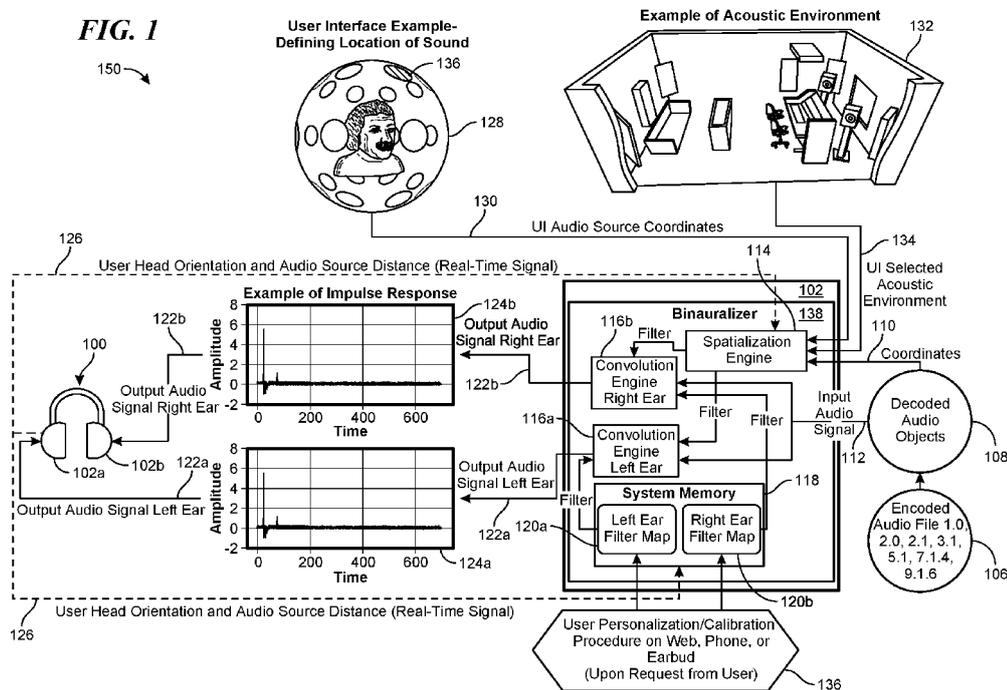
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(54) Title: VIRTUAL AUDITORY DISPLAY FILTERS AND ASSOCIATED SYSTEMS, METHODS, AND NON-TRANSITORY COMPUTER-READABLE MEDIA



(57) Abstract: An example method includes receiving audio signals associated with virtual auditory space locations. Digital filters are selected based on the virtual auditory space locations. The digital filters include one or more notch filters including one or more center frequencies that are based on generally sigmoidal distributions of center frequencies as a function of virtual auditory space location. The notch filters are configured to produce one or more notches in frequency spectrums of audio signals when applied to the audio signals. The digital filters are applied to the audio signals to obtain processed audio signals. Output audio signals are generated based on the processed audio signals. The output audio signals are provided to devices for producing virtual auditory display sound.



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A. CLASSIFICATION OF SUBJECT MATTER

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CPC - INV. H04S 3/008; H04R 5/02

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 See Search History document

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

Electronic database consulted during the international search (name of database and, where practicable, search terms used)
 See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2019/0020963 A1 (3D SPACE SOUND SOLUTIONS LTD) 17 January 2019; the entire document	1-30
A	US 2017/0245082 A1 (GOOGLE, INC.) 24 August 2017; the entire document	1-30
A	US 2019/0116444 A1 (STAGES LLC) 18 April 2019; the entire document	1-30

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

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

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