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(54) **Tone synthesis apparatus and method**

(57) Tone synthesis apparatus synthesizes a tone of a wind instrument generated in response to vibration of a reed contacting a lip during a performance of the wind instrument. First arithmetic operation section solves a motion equation (A1) representative of behavior of the reed in an equilibrium state with external force acting on the lip and a second motion equation (A2) representative of behavior of the lip in the equilibrium state, to thereby calculate displacement yb(x), y0(x) of the lip and reed in the equilibrium state. Second arithmetic operation section solves a motion equation of coupled vibration of the lip and reed with calculation results of the first arithmetic operation section used as initial values of the displacement yb(x), y0(x) of the lip and reed, to thereby calculate the displacement y(x, t) of the reed. Tone is synthesized on the basis of the displacement y(x, t) calculated by the second arithmetic operation section.

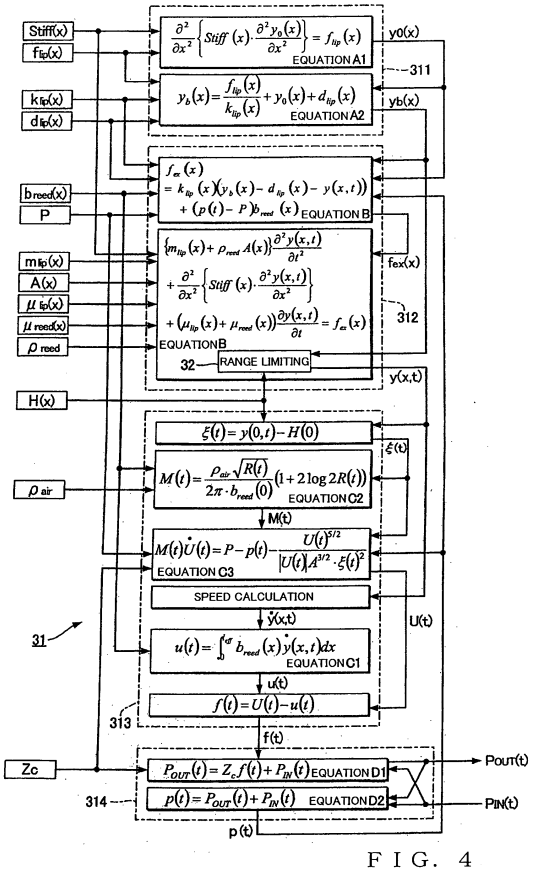

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	Federico Avanzini: "Chapter 3 Single reed models", COMPUTATIONAL ISSUES IN PHYSICALLY-BASED SOUND MODELS (PhD), 1 January 2002 (2002-01-01), XP055152524, Universita degli Studi di Padova Retrieved from the Internet: URL:http://www.dei.unipd.it/~avanzini/phdthesis/downloads/ch3.pdf [retrieved on 2014-11-12]	1,2,4,5, 8,9	INV. G10H5/00
A	* pages 47,48 * * Section 3.3 * * Section 3.4 *	3,6,7	
A	Vasileios Chatziioannou ET AL: "ISMA 2007 REED VIBRATION MODELLING FOR WOODWIND INSTRUMENTS USING A TWO-DIMENSIONAL FINITE DIFFERENCE METHOD APPROACH", , 12 September 2007 (2007-09-12), XP055153003, Barcelona, Spain Retrieved from the Internet: URL:http://www.socasites.qub.ac.uk/mvanwalstijn/pubs/papers/isma07.pdf [retrieved on 2014-11-13] * pages 2-6 *	1-9	TECHNICAL FIELDS SEARCHED (IPC) G10H

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	17 November 2014	Lecointe, Michael

CATEGORY OF CITED DOCUMENTS

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T	Andre Almeida ET AL: "The clarinet: how blowing pressure, lip force, lip position and reed "hardness" affect pitch, sound level, and spectrum", The Journal of the Acoustical Society of America, 1 September 2013 (2013-09-01), pages 2247-2255, XP055152521, United States DOI: 10.1121/1.4816538 Retrieved from the Internet: URL:http://www.ncbi.nlm.nih.gov/pubmed/23967954 [retrieved on 2014-11-12] * Section II * -----		

TECHNICAL FIELDS SEARCHED (IPC)

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