

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
14 February 2008 (14.02.2008)

PCT

(10) International Publication Number
WO 2008/019231 A3

- (51) International Patent Classification:
G10K 11/34 (2006.01) **H04R 1/40** (2006.01)
- (21) International Application Number:
PCT/US2007/074618
- (22) International Filing Date: 27 July 2007 (27.07.2007)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
11/462,496 4 August 2006 (04.08.2006) US
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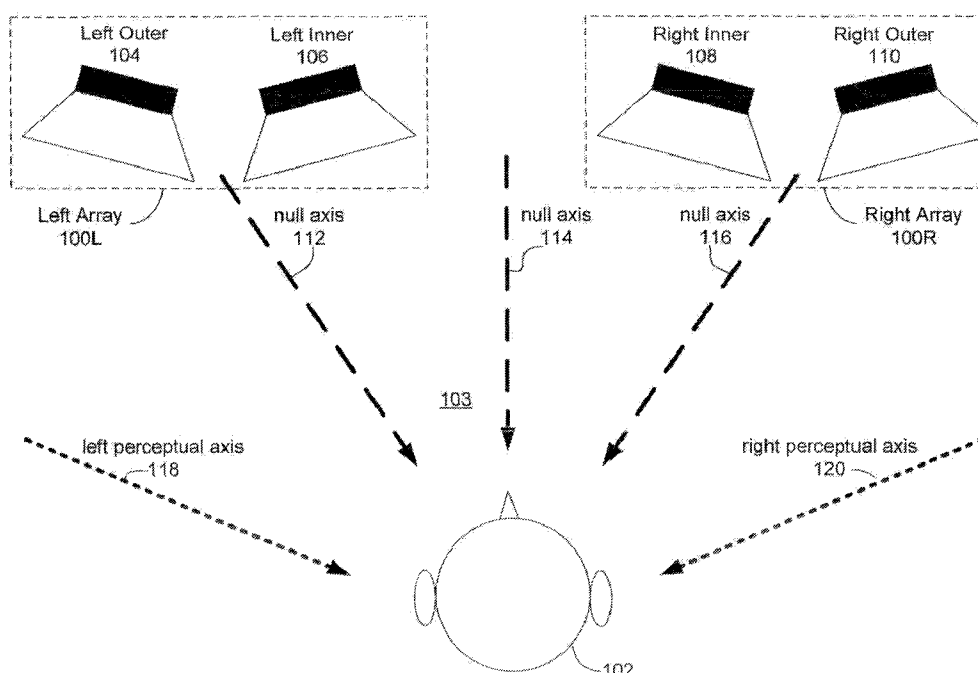
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

- (88) Date of publication of the international search report:
20 March 2008

(54) Title: ACOUSTIC TRANSDUCER ARRAY SIGNAL PROCESSING



(57) Abstract: A set of filters is configured to distribute input signals representing a single perceptual axis to first and second physically separate arrays (100L, 100R) of loudspeakers comprising at least first and second transducers (104, 106, 108, 110), such that the arrays of loudspeakers will create an array pattern corresponding to the input signals when the input signals are between a first frequency and a second frequency.

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2007/074618

A. CLASSIFICATION OF SUBJECT MATTER
INV. G10K11/34 H04R1/40

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)
H04R G10K

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 practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2005/086526 A (1 LTD [GB]; HOOLEY ANTHONY [GB]; GOUDIE ANGUS GAVIN [GB]) 15 September 2005 (2005-09-15) page 3, line 4 - line 15 page 4, line 9 - line 15 page 9, line 8 - line 21 page 11, line 17 - line 33 figures 2a, 2b, 4a, 4b	1-43
A	US 4 991 687 A (OYABA TAKASHI [JP] ET AL) 12 February 1991 (1991-02-12) column 1, line 63 - column 2, line 5 column 2, line 45 - line 66 column 4, line 45 - line 56 figures 1, 2	1-43
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☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Date of the actual completion of the international search

18 January 2008

Date of mailing of the international search report

29/01/2008

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2007/074618

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 670 282 A (YAMAHA CORP [JP]) 14 June 2006 (2006-06-14) paragraphs [0009] - [0012], [0027] - [0029]; figures 1,3 -----	1-43
A	US 2005/063555 A1 (BERARDI WILLIAM [US] ET AL) 24 March 2005 (2005-03-24) paragraphs [0026], [0027], [0031]; figure 1 -----	1-43
A	WO 99/08479 A (NEW TRANSDUCERS LTD [GB]; BANK GRAHAM [GB]; AZIMA HENRY [GB]; COLLOMS) 18 February 1999 (1999-02-18) page 6, line 26 - line 36 page 15, line 29 - page 16, line 19 -----	1-43

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2007/074618

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005086526 A	15-09-2005	GB 2426902 A	06-12-2006
US 4991687 A	12-02-1991	JP 2239795 A	21-09-1990
		JP 2528178 B2	28-08-1996
EP 1670282 A	14-06-2006	CN 1857027 A	01-11-2006
		JP 2005101902 A	14-04-2005
		WO 2005032207 A1	07-04-2005
		US 2007019816 A1	25-01-2007
US 2005063555 A1	24-03-2005	CN 1599510 A	23-03-2005
		EP 1517580 A2	23-03-2005
		JP 2005094777 A	07-04-2005
WO 9908479 A	18-02-1999	AU 741154 B2	22-11-2001
		AU 8551998 A	01-03-1999
		BG 104072 A	31-08-2000
		BR 9811836 A	15-08-2000
		CA 2295724 A1	18-02-1999
		CN 1266604 A	13-09-2000
		EA 2176 B1	28-02-2002
		EP 1002445 A1	24-05-2000
		HU 0101998 A2	28-09-2001
		ID 24975 A	31-08-2000
		JP 2001513619 T	04-09-2001
		MX PA00001277 A	05-04-2004
		NO 20000588 A	04-02-2000
		NZ 501959 A	24-11-2000
		PL 338378 A1	23-10-2000
		SK 1632000 A3	12-09-2000
		TR 200000351 T2	22-05-2000
		TW 392415 B	01-06-2000
		ZA 9806927 A	08-02-1999