

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
12 October 2006 (12.10.2006)

PCT

(10) International Publication Number
WO 2006/107624 A3

(51) International Patent Classification:
G10L 19/00 (2006.01)

(21) International Application Number:
PCT/US2006/010892

(22) International Filing Date: 23 March 2006 (23.03.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/664,518 23 March 2005 (23.03.2005) US
11/387,034 22 March 2006 (22.03.2006) US

(71) Applicant and

(72) Inventor: **SIERACKI, Jeffrey, M.** [US/US]; 13506
Collingwood Terrace, Silver Spring, Maryland 20904
(US).

(74) Agents: **WILLIAMS, Frederick, C.** et al.; BURNS &
LEVINSON LLP, 1030 Fifteenth Street, N.W., Suite 300,
Washington, District Of Columbia 20005-1501 (US).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, 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, 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

(88) Date of publication of the international search report:
13 November 2008



WO 2006/107624 A3

(54) Title: SYSTEM AND METHOD FOR ACOUSTIC SIGNATURE EXTRACTION, DETECTION, DISCRIMINATION, AND LOCALIZATION

(57) Abstract: A system and method whereby acoustic signals can be classified and identified as to nature and location of the original signal. The system and method determine from an arbitrary set of signals a signature or other characterizing feature and distinguish signals associated with a plurality of conditions by means of dictionaries comprising atoms of signals.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US06/10892

A. CLASSIFICATION OF SUBJECT MATTER
 IPC: **G10L 19/00(2006.01)**

USPC: 704/E19.001
 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)
 U.S. : 704/E19.001

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)
 Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| X | MALLET, S.G. Matching pursuits with time-frequency dictionaries, IEEE Transactions on Signal Processing. December 1999, vol. 41, pages 3397-3415, see page 3397. | 1-15 and 17 |
| Y | BULTAN, A. A Four-Parametric Atomic Decomposition of Chirplets, IEEE Transactions on Signal Processing. March 1999, vol. 47, pages 731-745, see page 731. | 16 and 19 |
| Y | SANDLER, B. Optimal and wavelet-based shock wave decomposition and estimation. J. Accoustic Soc. Am. August 1998, vol. 104, pages 955-963, see page 955. | 19 |

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 |
| "E" earlier application or patent published on or after the international filing date | "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art |
| "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "&" document member of the same patent family |
| "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 | |

| | |
|---|---|
| Date of the actual completion of the international search 01 August 2008 (01.08.2008) | Date of mailing of the international search report 14 AUG 2008 |
| Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201 | Authorized officer /Lori A. Clow/ for Anna Skibinsky Telephone No. (571) 272-4373 |

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US06/10892

Continuation of B. FIELDS SEARCHED Item 3:
DIALOG, EAST
terms searched: signal, signature, "structure book", "sparse approximation"