



(43) International Publication Date
2 August 2012 (02.08.2012)

(10) International Publication Number
WO 2012/103485 A3

- (51) **International Patent Classification:**
G06F 17/40 (2006.01) *G01R 19/25* (2006.01)
- (21) **International Application Number:**
PCT/US2012/022983
- (22) **International Filing Date:**
27 January 2012 (27.01.2012)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
61/437,454 28 January 2011 (28.01.2011) US
- (71) **Applicant (for all designated States except US):** **THE BOARD OF REGENTS OF THE NEVADA SYSTEM OF HIGHER EDUCATION ON BEHALF OF THE DESERT RESEARCH INSTITUTE** [US/US]; UNR-DRI Technology Transfer Office/321, The University of Nevada, Reno, Reno, NV 89557 (US).
- (72) **Inventors; and**
- (75) **Inventors/Applicants (for US only):** **KUHNS, Hampden** [US/US]; 770 Singing Wood Drive, Reno, NV 89509 (US). **ROBERTS, Morien** [GB/US]; 960 S. University Park Loop, Reno, NV 89512 (US).
- (74) **Agent:** **LAUER, Deakin, T.**; Klarquist Sparkman, LLP, One World Trade Center, Suite 1600, 121 SW Salmon Street, Portland, OR 97204 (US).

- (81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, 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, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

— with international search report (Art. 21(3))

(88) **Date of publication of the international search report:**

4 October 2012

(54) **Title:** SIGNAL IDENTIFICATION METHODS AND SYSTEMS

(57) **Abstract:** Disclosed herein are signal identification methods and systems. In some examples, the method and/or system allows appliances to be associated with their electrical usage. In one example, a method for determining whether a load is in a steady state or in transition includes analyzing a time series of electric power or current measurements on at least one circuit, at least one load coupled to the at least one circuit; and determining whether the load is in a steady state or a transition. Also disclosed is an appliance identification method. Further disclosed is a method of mapping unlabeled appliances which utilizes a STEC Table which summarizes linkages between transitions and steady state clusters.



WO 2012/103485 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 2012/022983

A. CLASSIFICATION OF SUBJECT MATTER		G06F 17/40 (2006.01) G01R 19/25 (2006.01)	
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)			
G06F 17/00, H02J 3/00, H04M 11/00, H04Q 9/00, G08B 21/00, G09F 9/00, G09G 3/00-3/32, H01L 51/00-51/50, H05B 33/00-33/14, A61B 9/00, G01R 19/00-19/30			
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)			
PatSearch (RUPTO internal), Esp@cenet, PAJ, USPTO			
C. DOCUMENTS CONSIDERED TO BE RELEVANT			
Category*	Citation of document, with indication, where appropriate, of the relevant passages		Relevant to claim No.
X	EP 1729223 A2 (SANYO ELECTRIC CO., LTD.) 06.12.2006, abstract, [0014]-[0016], [0103]-[0104], [0115], [0120]-[0130], [0153]-[0167], [0171]-[0175], [0241]-[0246], [0277], fig. 1, 4-6, 11-12		1-5, 7-11, 14-21
Y			22-28
A			6, 12-13
Y	TW 201034629 A (UNIV SOUTHERN TAIWAN) 01.10.2010, abstract		22-25
Y	US 2005/0237211 A1 (TOHOKU PIONEER CORPORATION) 27.10.2005, abstract		26-27
Y	JP 9055810 A (YAZAKI CORP) 25.02.1997, abstract		28
☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.			
* Special categories of cited documents:		"1" 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 "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 "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 "&" document member of the same patent family	
"A"	document defining the general state of the art which is not considered to be of particular relevance		
"E"	earlier document but published on or after the international filing date		
"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)		
"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		Date of mailing of the international search report	
04 July 2012 (04.07.2012)		12 July 2012 (12.07.2012)	
Name and mailing address of the ISA/ FIPS Russia, 123995, Moscow, G-59, GSP-5, Berezhkovskaya nab., 30-1		Authorized officer A. Korsunsky	
Facsimile No. +7 (499) 243-33-37		Telephone No. 499-240-25-91	