

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 August 2001 (23.08.2001)

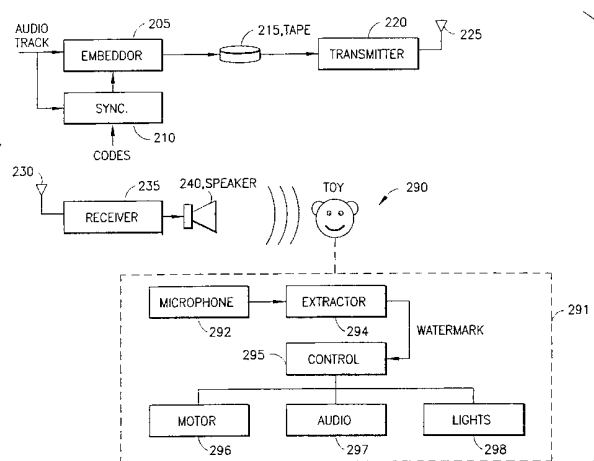
PCT

(10) International Publication Number
WO 01/61987 A3

- (51) International Patent Classification⁷: **G08B 5/22**
- (21) International Application Number: PCT/US01/40013
- (22) International Filing Date: 1 February 2001 (01.02.2001)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
09/505,080 16 February 2000 (16.02.2000) US
- (71) Applicant (for all designated States except US): **VERANCE CORPORATION** [US/US]; Suite 200, 10145 Pacific Heights Boulevard, San Diego, CA 92121 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **PETROVIC, Rade** [US/US]; 11416 Cypress Woods Drive, San Diego, CA 92131 (US). **WINOGRAD, Joseph, M.** [US/US]; 49 Church Hill Avenue, Cambridge, MA 02140 (US).
- (74) Agent: **LIPSITZ, Barry, R.**; Law offices of Barry R. Lipsitz, 755 Main Street, Building No. 8, Monroe, CT 06468 (US).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report
- (88) Date of publication of the international search report:
24 January 2002

[Continued on next page]

(54) Title: REMOTE CONTROL SIGNALING USING AUDIO WATERMARKS



(57) Abstract: A system for using a watermark embedded in an audio signal to remotely control a device (290). Various devices such as toys, computers, and appliances, equipped with an appropriate detector (292), detect the hidden signals, which can trigger an action, or change a state of the device. The watermarks can be used with a "time gate" device, where detection of the watermark opens a time interval within which a user is allowed to perform an action, such as pressing a button, typing in an answer, turning a key in a lock, etc. To prevent fraudulent activation of a time gate, the time gate device can be configured to react only to watermarks coming from live broadcasts, and not from replays from tapes or other storage devices. In another feature, robustness of the watermark is improved, e.g., for acoustic propagation channels, by shifting the detection time of the watermark based on a measured bit error count of the watermark. Furthermore, the watermark may be inserted before the desired action along with corresponding offset information if the audio signal is not suitable at the time of the action.



WO 01/61987 A3



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/40013

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G08B 5/22

US CL : 340/5.2

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. : 340/5.2, 5.23, 5.28, 5.63, 5.84, 7.34, 7.38, 7.49; 463/1; 380/28, 30, 253; 446/175; 84/645

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)
EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,940,135 A (PETROVIC et al) 17 August 1999, see whole document	40-51
Y	US 5,905,800 A (MOSKOWITZ et al) 18 May 1999, see whole document	1-51
Y	US 5,752,880 A (GABAI et al) 19 May 1998, see whole document	1-51
Y	US 5,319,735 A (PREUSS et al) 07 June 1994, see whole document	1-51
Y	US 5,270,480 A (HIKAWA) 14 December 1993, see whole document	1-39
Y	US 5,113,437 A (BEST et al) 12 May 1992, see whole document	1-51
Y	US 4,840,602 A (ROSE) 20 January 1989, see whole document	1-39

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent 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

"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

"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

Date of the actual completion of the international search

02 July 2001 (02.07.2001)

Date of mailing of the international search report

Name and mailing address of the ISA/US

Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703)305-3230

Authorized officer

Michael Horabik

Telephone No. 703-305-4700