(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
10 June 2004 (10.06.2004)

PCT

(10) International Publication Number
WO 2004/049117 A2

(51) International Patent Classification[7]: G06F

(21) International Application Number:
PCT/US2003/037170

(22) International Filing Date:
19 November 2003 (19.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/302,309 22 November 2002 (22.11.2002) US

(71) Applicant: **ARBITRON INC.** [US/US]; 9705 Patuxent Woods Drive, Columbia, MD 21046 (US).

(72) Inventors: **JENSEN, James, M.**; 10702 Faulkner Ridge Circle, Columbia, MD 21044 (US). **NEUHAUSER, Alan, R.**; 1512 Flora Court, Silver Spring, MD 20910 (US).

(74) Agents: **FLANAGAN III, Eugene, L.** et al.; St. Onge Steward Johnston & Reens LLC., 986 Bedford Street, Stamford, CT 06905-5619 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, 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, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW.

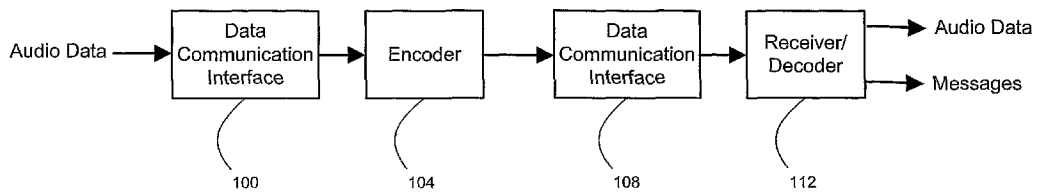
(84) Designated States *(regional)*: ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**
— *without international search report and to be republished upon receipt of that report*

*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.*

WO 2004/049117 A2

(54) Title: ENCODING MULTIPLE MESSAGES IN AUDIO DATA AND DETECTING SAME




(57) Abstract: Systems and methods are provided for encoding and decoding multiple messages in audio data. The messages each comprise a sequence of message symbols each comprising a combination of substantially single-frequency components. At least some of the message symbols in one of the messages coexist with at least some of the symbols of another one of the messages along a time base of the audio data.