

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
30 November 2000 (30.11.2000)

PCT

(10) International Publication Number
WO 00/72567 A1

(51) International Patent Classification⁷: **H04M 9/08**

Engineering, Colchester, CO4 3SQ (GB). **HAWKSFORD, Malcolm, John** [GB/GB]; University of Essex, 40 Broome Grove, Wivenhoe, Colchester, Essex CO7 9QU (GB).

(21) International Application Number: **PCT/GB00/01904**

(22) International Filing Date: **18 May 2000 (18.05.2000)**

(74) Agent: **LIDBETTER, Timothy, Guy, Edwin**; BT Group Legal Services, Intellectual Property Dept., Holborn Centre, 8th floor, 120 Holborn, London EC1N 2TE (GB).

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data:
99304040.1 25 May 1999 (25.05.1999) EP

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, 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.

(71) Applicant (*for all designated States except US*): **BRITISH TELECOMMUNICATIONS PUBLIC LIMITED COMPANY** [GB/GB]; 81 Newgate Street, London EC1A 7AJ (GB).

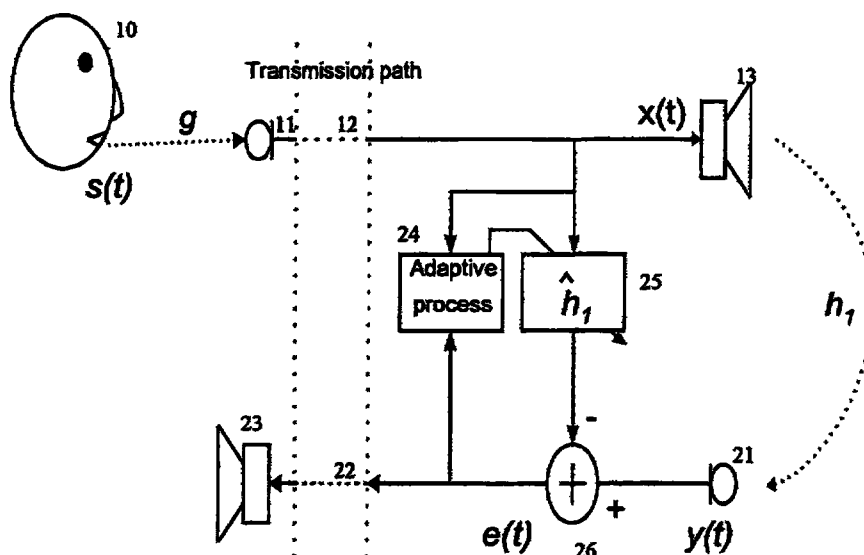
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR,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

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **REED, Martin** [GB/GB]; University of Essex, Dept. Electronic Systems

[Continued on next page]

(54) Title: **ACOUSTIC ECHO CANCELLATION**



(57) Abstract: A multiple channel steered spatialised signal is generated from a signal input (12) modified according to respective spatialisation gain functions (g_1, g_2) to generate a plurality of audio channels ($x_1(t), x_2(t)$). An echo cancellation signal $e(t)$ is applied to a return path (22) using a combined spatialisation and echo path estimate ($\hat{h}_1, \hat{h}_2$). The estimate is derived from the gain functions applied to the respective channels 14L, 14R. When the gain functions applied in the respective channels are changed, for instance to represent a different apparent position of the sound source (10), a new estimate ($\hat{h}_1, \hat{h}_2$) of the echo paths ($\hat{h}_1, \hat{h}_2$) is generated, based on a previous estimate of the echo path and on the new gain functions (g_1, g_2).



Published:

— With international search 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.