



(43) International Publication Date
24 December 2014 (24.12.2014)

(51) International Patent Classification:
H04R 3/02 (2006.01)

(21) International Application Number:
PCT/US2014/043297

(22) International Filing Date:
19 June 2014 (19.06.2014)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/837,155 19 June 2013 (19.06.2013) US

(71) Applicant: **CREATIVE TECHNOLOGY LTD** [SG/SG];
31 International Business Park, #03-01 Creative Resource,
Singapore 609921 (SG).

(72) Inventor; and

(71) Applicant (for US only): **VERITY, Steve** [US/US]; 623
Los Padres Blvd., Santa Clara, California 95050 (US).

(72) Inventors: **YUAN, River**; 1252 Spaich Drive, San Jose,
California 95117 (US). **MINETT, Ian**; 1180 Muriel Ct.,
San Jose, California 95121 (US). **RIDDER, Robert**; 2339
Muriel Drive, Santa Cruz, California 95050 (US).

(74) Agent: **SWERDON, Russell**; Creative Labs, Inc., (Legal
Department), 1901 McCarthy Boulevard, Milpitas, Califor-
nia 95035 (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, BN, 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, IR, IS, JP, KE, KG, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA,
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, 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,
KM, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments (Rule 48.2(h))

(54) Title: ACOUSTIC FEEDBACK CANCELLER

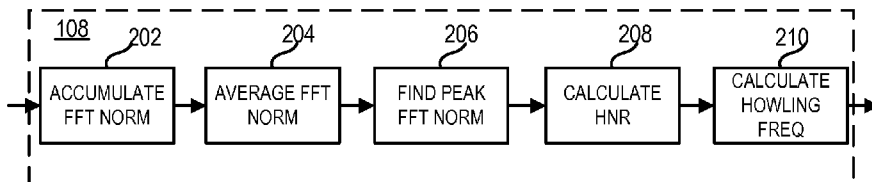


Fig. 2

(57) Abstract: In embodiments of this invention howling sounds are removed without disturbing speech and music. Microphone signals are converted to the frequency domain where howling frequencies are detected and estimated using howling to noise ratios. A notch filter adaptively designed for the howling frequency is applied to remove the howling.