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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
4 November 2010 (04.11.2010)

PCT

(10) International Publication Number
WO 2010/124737 A1

(51) International Patent Classification:
H04R 25/00 (2006.01) *H03M 3/02* (2006.01)

(21) International Application Number:
PCT/EP2009/055279

(22) International Filing Date:
30 April 2009 (30.04.2009)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant *(for all designated States except US)*: **WIDEX A/S** [DK/DK]; Nymoellevej 6, DK-3540 Lynge (DK).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **KNUDSEN, Niels Ole** [DK/DK]; Ejlersvej 6, DK- 3050 Humlebak (DK).

(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, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (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, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

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

WO 2010/124737 A1

(54) Title: INPUT CONVERTER FOR A HEARING AID AND SIGNAL CONVERSION METHOD

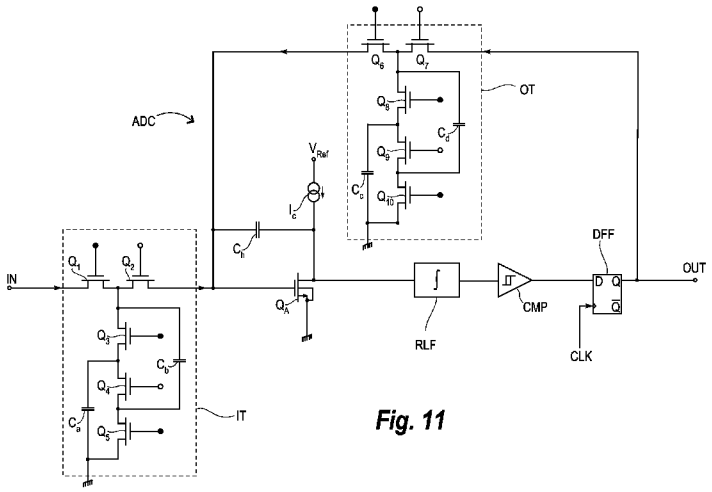


Fig. 11

(57) Abstract: In order to minimize noise and current consumption in a hearing aid, an input converter comprising a first voltage transformer and an analog-to-digital converter of the delta- sigma type for a hearing aid is devised. The analog-to-digital converter of the input converter has an input stage, an output stage, and a feedback loop, and the input stage comprises an amplifier (Q_A) and an integrator (RLF). The first voltage transformer (IT) has a transformation ratio such that it provides an output voltage larger than the input voltage and is placed in the input converter upstream of the input stage. A second voltage transformer (OT) having a transformation ratio such that it provides an output voltage larger than the input voltage, is optionally placed in the feedback loop of the converter. The voltage transformers (IT, OT) are switched-capacitor voltage transformers, each transformer (IT, OT) having at least two capacitors (C_a, C_b, C_c, C_d). The invention further provides a method of converting an analog signal.