



(51) International Patent Classification:

G01N 29/02 (2006.01) G01N 29/036 (2006.01)
G01K 7/32 (2006.01) G01B 7/06 (2006.01)

(21) International Application Number:

PCT/US2022/027978

(22) International Filing Date:

06 May 2022 (06.05.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/184,830 06 May 2021 (06.05.2021) US

(71) Applicant: **INFICON, INC.** [US/US]; Two Technology
Place, East Syracuse, NY 13057 (US).

(72) Inventors; and

(71) Applicants: **SONG, Chunhua**; 4598 Providence Road,
Jamesville, NY 13078 (US). **RINZAN, Mohamed**; 104
Fallen Oaks Lane, Manlius, NY 13104 (US). **LAKEMAN,
Steve**; 305 Eagle Ridge Street, Newbury Park, CA 91320
(US). **BAUMGARTEL, Lukas**; 2860 SW Montgomery
Drive, Portland, OR 97201 (US). **LAPIDOT, Matan**; Ke-
far-Menahem (IL). **O'NEILL, Brian**; 3339 Woodstone
Drive, Lewis Center, OH 43035 (US).

(74) Agent: **SULLIVAN, Denis, J.**; 125 East Jefferson Street,
Syracuse, NY 13202 (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, DJ, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH,

(54) Title: SYSTEM AND METHOD FOR DECONVOLUTION OF REAL-TIME MASS FROM THE INFLUENCE OF TEMPERATURE AND PRESSURE ON CRYSTAL MICROBALANCE

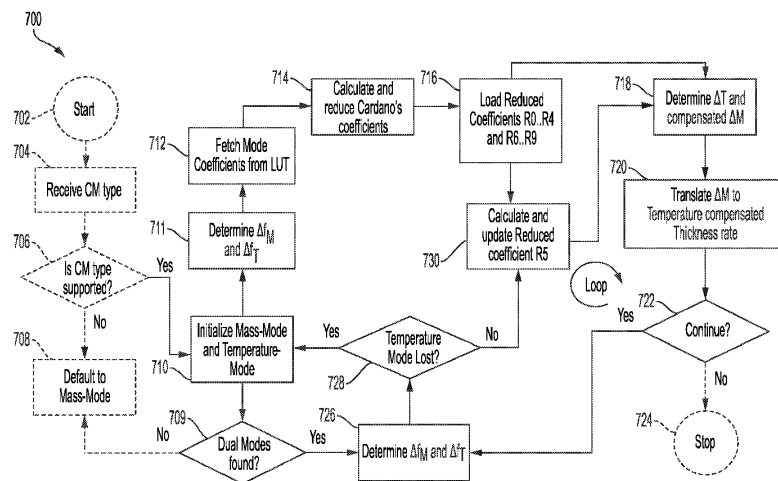


FIG. 7

(57) Abstract: A system and method for determining the changes in resonance frequency in crystal microbalance (CM) sensors and the resulting changes in the determination of incremental mass on the CM sensors caused by temperature. Dual mode resonances and coefficients are used in a deconvolution process to determine and extract the frequency shift caused by temperature to provide the temperature compensated incremental mass (ΔM). In one embodiment, dual mode analysis is provided using a mass mode (e.g., the c-mode fundamental frequency (f^c_{100})) and a temperature mode (e.g., the anharmonic frequency (f^c_{102})) and associated coefficients. In other embodiments that are more sensitive to temperature changes, dual mode analysis is provided using the b-mode fundamental frequency (f^b_{100}) as the temperature -mode and associated coefficients.

[Continued on next page]

KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, 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, ST, SV, SY, TH, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, 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, ST, 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))