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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
19 January 2012 (19.01.2012)

PCT

(10) International Publication Number
WO 2012/007909 A3

(51) International Patent Classification:
G01N 29/11 (2006.01) *G01N 29/44* (2006.01)

(21) International Application Number:
PCT/IB2011/053115

(22) International Filing Date:
12 July 2011 (12.07.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/363,305 12 July 2010 (12.07.2010) US

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(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, 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, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,

[Continued on next page]

(54) Title: ANALYZING ULTRASONIC SIGNALS USING A DYNAMIC SIGNAL PROCESSING WINDOW FOR AN EARLY DETECTION OF SCALING IN WATER PROCESSING EQUIPMENT

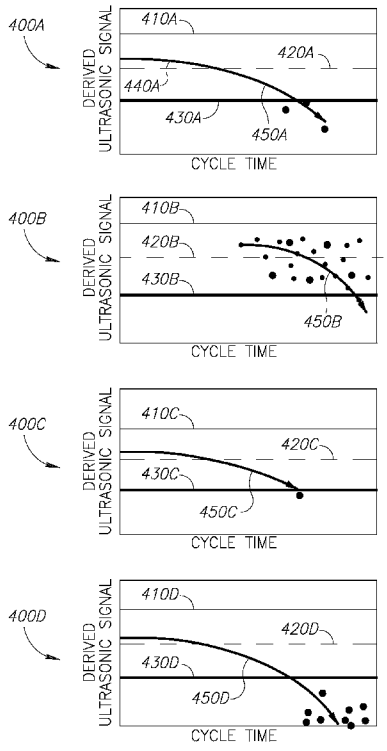


Figure 4

(57) Abstract: A method of early detection of scaling on internal surfaces of conduits of water processing equipment, is provided herein. The method includes: transmitting ultrasonic signals through the wall of the conduits; deriving data samples from received ultrasonic signals or reflections thereof; calculating a moving average of the scatter of the ultrasonic signals, over time, based on the data samples; applying a statistical operand to the moving average, to yield a statistical distribution metric; determining a dynamic window defined by: (i) an upper boundary being the moving average plus at least a fraction of the statistical distribution metric and (ii) a lower boundary being the moving average minus the at least a fraction of the statistical distribution metric; generating a trend line being a smooth fitting of the derived samples; and monitoring the trend line within the window to detect a crossover of the trend line at either of the boundaries.

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ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, 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, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, 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, 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))*

(88) **Date of publication of the international search report**:
22 March 2012