

(51) International Patent Classification:
C02F 3/30 (2006.01)(21) International Application Number:
PCT/US2010/041317(22) International Filing Date:
8 July 2010 (08.07.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/224,011 8 July 2009 (08.07.2009) US(71) Applicants (for all designated States except US): **SAUDI ARABIAN OIL COMPANY** [SA/SA]; P.O. Box 5000, Dhahran, 31311 (SA). **SIEMENS WATER TECHNOLOGIES CORP.** [US/US]; 18 Thorn Hill Road, Warrendale, PA 15086 (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, 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, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

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

(54) Title: LOW CONCENTRATION WASTEWATER TREATMENT SYSTEM AND PROCESS

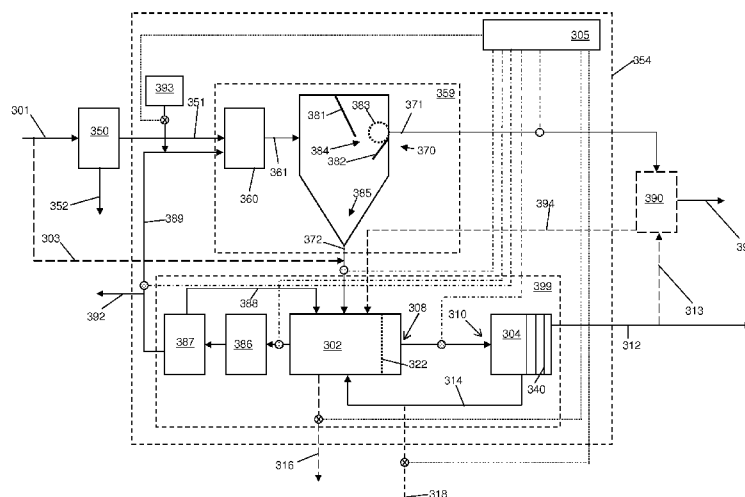


FIG. 3

(57) Abstract: A low concentration wastewater treatment system is provided that includes a high flux adsorbent material treatment system integrated with a low flux adsorbent material biological regeneration reactor. The high flux adsorbent material treatment system includes one or more unit operations for mixing low concentration wastewater with adsorbent material that is fresh, recycled, or a combination of both, and for decanting a liquid effluent having a reduced level of contaminants. The adsorbent material with adsorbed contaminants is regenerated in a low flux adsorbent material biological regeneration reactor in which a biological reaction occurs, such as biological oxidation, wherein organic contaminants in the wastewater are metabolized generally into carbon dioxide and water. Excess biomass is removed from the adsorbent material, and the thus-regenerated adsorbent material is recycled to the high flux adsorbent material treatment system.