



(51) International Patent Classification:

C02F 1/26 (2006.01) *C02F 103/36* (2006.01)
C02F 103/08 (2006.01)

(21) International Application Number:

PCT/US2010/057448

(22) International Filing Date:

19 November 2010 (19.11.2010)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/264,270 25 November 2009 (25.11.2009) US

(71) Applicant (for all designated States except US): **MAS-SACHUSETTS INSTITUTE OF TECHNOLOGY** [US/US]; 77 Massachusetts Avenue, Cambridge, MA 02139 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BAJPAYEE, Anurag** [IN/US]; Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139 (US). **KRAEMER, Daniel** [DE/US]; Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139 (US). **MUTO, Andrew** [US/US]; Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139 (US). **CHEN, Gang** [US/US]; Mas-

sachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139 (US). **LIENHARD, John** [US/US]; Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139 (US). **MIKIC, Borivoje** [US/US]; Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139 (US).

(74) Agent: **SAYRE, Robert**; Modern Times Legal, 1 Broadway, 14th Floor, Cambridge, MA 02142 (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, 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,

[Continued on next page]

(54) Title: WATER DESALINATION USING DIRECTIONAL SOLVENT EXTRACTION

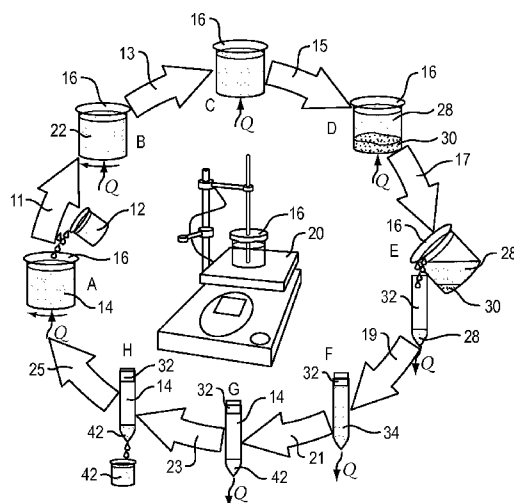


FIG. 1

(57) Abstract: Substantially pure water is produced via desalination using a directional solvent that directionally dissolves water but does not dissolve salt. The directional solvent is heated to dissolve water from the salt solution into the directional solvent. The remaining highly concentrated salt water is removed, and the solution of directional solvent and water is cooled to precipitate substantially pure water out of the solution.



LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, **Published:**

SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, — *with international search report (Art. 21(3))*
GW, ML, MR, NE, SN, TD, TG).