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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
31 July 2008 (31.07.2008)

PCT

(10) International Publication Number
WO 2008/092058 A3

(51) International Patent Classification:
*B01D 3/10* (2006.01)

(21) International Application Number:
PCT/US2008/052005

(22) International Filing Date: 25 January 2008 (25.01.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/627,216 25 January 2007 (25.01.2007) US

(71) Applicants and
(72) Inventors: **THOMPSON, Christopher, E.** [US/US]; 342 Loire Valley Drive, Simi Valley, CA 93065 (US). **THOMPSON, Owen, E.** [US/US]; 342 Loire Valley Drive, Simi Valley, CA 93065 (US).

(74) Agents: **BURTON, Ralph, M.** et al.; Brooks Kushman, 1000 Town Center, Twenty-second Floor, Southfield, MI 48075 (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, 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, 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, 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).

**Declaration under Rule 4.17:**
— *of inventorship (Rule 4.17(iv))*

**Published:**
— *with international search report*

(88) Date of publication of the international search report:
30 October 2008

(54) Title: METHOD AND APPARATUS FOR HARVESTING WATER AND LATENT ENERGY FROM A GASEOUS MIXTURE

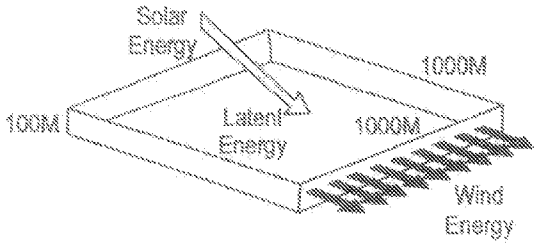



FIG. 1

(57) Abstract: An apparatus harvests latent energy and water by adiabatically decompressing a controlled volume of atmospheric air to lower its pressure and temperature below the saturation point of included water vapor, thus causing the water vapor to change state to nonvaporous water and release to the decompressed air thermal energy associated with the change of state. The apparatus then extracts the nonvaporous water, leaving the released thermal energy in the decompressed air. The apparatus then recompresses the decompressed air, which will have a resulting temperature, and thus a thermal energy, greater than those of the initially ingested air, and harvests the recompressed air and its increased thermal energy. The apparatus can also humidify and warm atmospheric air before it is ingested to increase appreciably the amount of harvested thermal energy.

WO 2008/092058 A3