

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
12 September 2024 (12.09.2024)



(10) International Publication Number
WO 2024/186807 A1

(51) International Patent Classification:

H01M 10/44 (2006.01) H01M 10/54 (2006.01)
H01M 6/52 (2006.01)

(21) International Application Number:

PCT/US2024/018502

(22) International Filing Date:

05 March 2024 (05.03.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/450,560 07 March 2023 (07.03.2023) US

(71) Applicant: **AGR LITHIUM INC.** [US/US]; 2700 Post Oak Blvd, Suite # 2100, Houston, Texas 77056 (US).

(72) Inventors: **CHAUDHARI, Vijay**; c/o Ace Green Recycling, Inc., 2700 Post Oak Blvd, Suite # 2100, Houston, Texas 77056 (US). **NAIK, Amol**; c/o Ace Green Recycling, Inc., 2700 Post Oak Blvd, Suite # 2100, Houston, Texas 77056 (US). **TYAGI, Vipin**; c/o Ace Green Recycling, Inc.,

2700 Post Oak Blvd, Suite # 2100, Houston, Texas 77056 (US). **CHADHA, Nishchay**; c/o Ace Green Recycling, Inc., 2700 Post Oak Blvd, Suite # 2100, Houston, Texas 77056 (US).

(74) Agent: **UPADHYE, Kalpesh V.** et al.; c/o Morgan, Lewis & Bockius LLP, 1111 Pennsylvania Ave NW, Washington, District of Columbia 20004 (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, CV, 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, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, 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.

(54) Title: METHOD AND SYSTEM FOR DISCHARGING SPENT LITHIUM ION BATTERIES

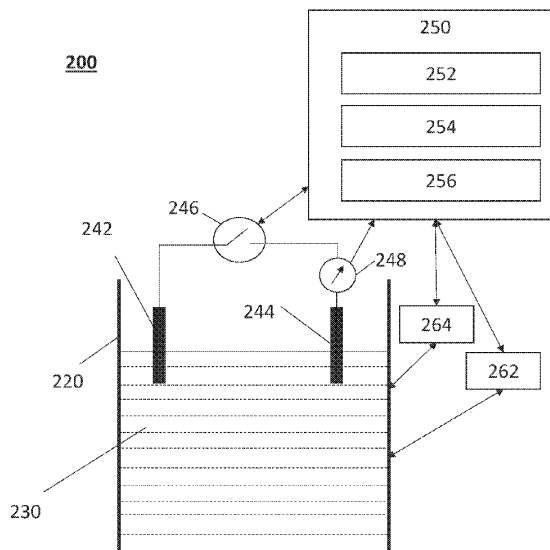


FIG. 2

(57) Abstract: A method of discharging a spent lithium-ion (Li-ion) battery may include contacting external electrodes of the spent Li-ion battery to a discharging solution. The discharging solution including an aqueous solution of salts having a same anion and a redox couple as cations. The redox couple includes a first cation of a metal having a first oxidation state and a second cation of the same metal having a second oxidation state different from the first oxidation state.

[Continued on next page]

WO 2024/186807 A1

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, 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, ME, 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))