

(51) International Patent Classification:

B01J 6/00 (2006.01) *B01J 8/42* (2006.01)
B01J 8/08 (2006.01) *B01J 8/00* (2006.01)
B01J 8/12 (2006.01) *B01J 8/02* (2006.01)

(21) International Application Number:

PCT/EP2024/084032

(22) International Filing Date:

29 November 2024 (29.11.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

23213621.8 01 December 2023 (01.12.2023) EP
24212694.4 13 November 2024 (13.11.2024) EP

(71) Applicants: **BASF SE** [DE/DE]; Carl-Bosch-Strasse 38, 67056 Ludwigshafen am Rhein (DE). **HELMHOLTZ-ZENTRUM DRESDEN-ROSSENDORF E. V.** [DE/DE]; Bautzner Landstraße 400, 01328 Dresden (DE).

(72) Inventors: **EHRHARDT, Kai Rainer**; Carl-Bosch-Straße 38, 67056 Ludwigshafen am Rhein (DE). **HAFNER-OPITZ, Selina Gabriele**; Carl-Bosch-Straße 38, 67056 Ludwigshafen am Rhein (DE). **BODE, Johannes**; Carl-Bosch-Straße 38, 67056 Ludwigshafen am Rhein

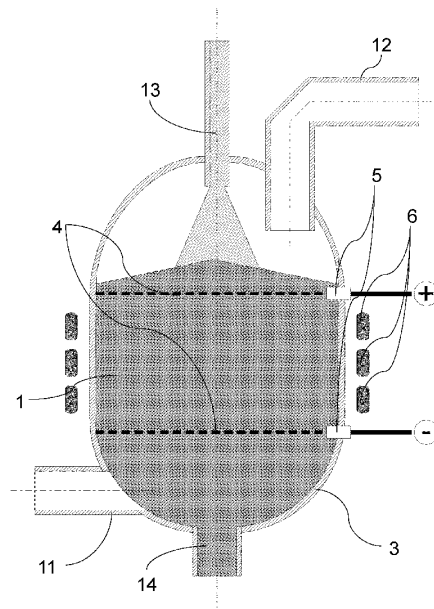
(DE). **SCHEIFF, Frederik**; Im Hohen Acker 4, 67146 Deidesheim (DE). **HURTADO RIVERA, Andrea Cristina**; Carl-Bosch-Straße 38, 67056 Ludwigshafen am Rhein (DE). **ZOELS, Bernd**; Carl-Bosch-Straße 38, 67056 Ludwigshafen am Rhein (DE). **SCHLERETH, David**; Scheldelaan 600, 2040 Antwerpen (BE). **KOLIOS, Grigorios**; Carl-Bosch-Straße 38, 67056 Ludwigshafen am Rhein (DE). **PASIN E MATOS, Laila Raquel**; Carl-Bosch-Straße 38, 67056 Ludwigshafen am Rhein (DE). **WON-DRAK, Thomas**; Bautzner Landstr. 400, 01328 Dresden (DE). **ECKERT, Sven**; Bautzner Landstraße 400, 01328 Dresden (DE).

(74) Agent: **MEISSNER BOLTE PARTNERSCHAFT MBB**; Patentanwälte Rechtsanwälte, P.O. Box 86 06 24, 81633 Munich (DE).

(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,

(54) Title: METHOD FOR EVALUATING AND/OR CONTROLLING A PROCESS IN A VESSEL FOR UNIT OPERATIONS

Fig. 5



(57) Abstract: A method for evaluating and/or controlling a process in a vessel for unit operations involving an electrically conductive bed comprises a) applying a voltage across at least a portion of the bed through a plurality of electrodes that are in an electrically conductive relationship with the bed to induce an electric current flowing through the bed; and b) measuring a magnetic field and/or measuring changes in a magnetic field induced by the electric current by magnetic sensors at a plurality of locations outside the bed to generate magnetic field data. The method allows for contactless evaluating and/or controlling of processes in such a vessel for unit operations.

TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS,
ZA, ZM, ZW.

(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))
- in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE