



(51) International Patent Classification:

C10C 3/04 (2006.01) **B01F 13/10** (2006.01)
B01F 3/04 (2006.01) **B01J 19/18** (2006.01)
B01F 7/00 (2006.01)

(21) International Application Number:

PCT/EP2010/070859

(22) International Filing Date:

29 December 2010 (29.12.2010)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

PCT/IN2009/000759

31 December 2009 (31.12.2009)

IN

(71) Applicant (for all designated States except US): **SHELL INTERNATIONAL RESEARCH MAATSCHAPPIJ B.V.** [NL/NL]; Carel van Bylandtlaan 30, NL-2596 HR The Hague (NL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BRAN, Roberto** [AU/AU]; 385 Eagle Farm Road, Pinkenba, Brisbane, QLD 4008 (AU). **KUMAR, Cheluva** [IN/IN]; RMZ Centennial Campus B#8B, Kundanahalli Main Road, Bangalore 560048 (IN). **RAJ, Sachin** [MY/MY]; Level 19, Tower 2, Petronas Twin Tower, Kuala Lumpur (MY). **SCOTT, Daryl** [AU/AU]; 385 Eagle Farm Road, Pinkenba, Brisbane, QLD 4008 (AU).

(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, RS, 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:

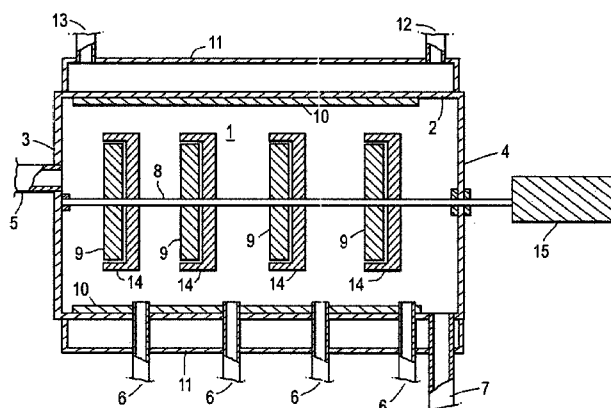
— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

Published:

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

(54) Title: MULTI-PURPOSE REACTOR AND PROCESS FOR THE PREPARATION OF MODIFIED BITUMEN

Fig.1



(57) Abstract: A reactor is provided for the preparation of modified bitumen, which reactor comprises a horizontal housing comprising a cylindrical wall and two side walls, wherein a bitumen inlet has been provided at or near one of the side walls of the housing and a bitumen product outlet has been provided at or near the opposite side wall of the housing, wherein a plurality of inlets for the provision of oxygen-containing gas has been provided in the cylindrical wall of the housing between the bitumen inlet and the bitumen product outlet, which multi-purpose reactor is further provided with a mixer arranged inside the housing comprising at least one rotor rotating within at least one stator having a plurality of openings. Also there is provided a process for the preparation of modified bitumen, which comprises contacting bitumen at elevated temperature and pressure with a modifier in a reactor as herein described.

