

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
26 May 2005 (26.05.2005)

PCT

(10) International Publication Number
WO 2005/047435 A2

(51) International Patent Classification⁷: **C10J**

(21) International Application Number:
PCT/GB2004/004651

(22) International Filing Date:
3 November 2004 (03.11.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0325668.2 4 November 2003 (04.11.2003) GB

(71) Applicants and

(72) Inventors: **DOGRU, Murat** [GB/GB]; 24 Netherby Drive, Newcastle Upon Tyne NE5 2RS (GB). **AKAY, Galip** [GB/GB]; Rockshaw, Moorcourt Close, Sidmouth EX10 8SU (GB).

(74) Agent: **NOVAGRAAF PATENTS LIMITED**; The Crescent, 54 Blossom Street, York YO24 1AP (GB).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, 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, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: GASIFICATION

(57) **Abstract:** A gasifier (1) for the gasification of biomass and waste to produce combustible effluent, comprising: a fuel valve (22) for loading solid fuel (1 1) into a first oxidation zone (8); a first throat (2) defining the lower edge of the first oxidation zone (8); a second throat (4) defining the lower edge of a second oxidation zone (14); a reduction zone (5) linking the first oxidation zone (8) to the second oxidation zone (14) and; two oppositely located (at the reduction zone) vortex discharge pipes (18) for the combustible effluent wherein in the first oxidation zone the gas flow is in the same direction as fuel flow and in the second oxidation zone the gas flow is in the opposite direction to the fuel flow; a method for the gasification of biomass and waste to produce a combustible effluent using the gasifier, comprising the steps of: partially oxidising a biomass fuel in the first oxidation zone (8) to produce char; reducing the char in the reduction zone (5) to form ash; further oxidising any char residue in the ash in the second oxidation zone (14); extracting the combustible effluent produced in the above steps, by the discharge pipe (18) wherein in the first oxidation zone the gas flow is in the same direction as fuel flow and in the second oxidation zone the gas flow is in the opposite direction to the fuel flow, a novel gasification system and method incorporating the gasifier, a novel filter and method for filtration for use in the system, a novel polymer for use in the filter; and the use thereof in combusting solid fuel such as biomass, fossil fuel, waste, or combinations thereof in producing combustible gases for energy generation.



WO 2005/047435 A2