

Title (en)

A METHOD AND A DEVICE TO PRODUCE LOW-TAR- AND LOW-DUST PRODUCT GAS

Title (de)

VERFAHREN UND VORRICHTUNG ZUR HERSTELLUNG EINES TEER- UND STAUBARMEN PRODUKTGASES

Title (fr)

PROCÉDÉ ET DISPOSITIF DE FABRICATION D'UN PRODUIT DE GAZ À FAIBLE TENEUR EN GOUDRON ET EN POUSSIÈRES

Publication

**EP 4151706 A1 20230322 (EN)**

Application

**EP 21196854 A 20210915**

Priority

EP 21196854 A 20210915

Abstract (en)

Method to produce a product gas with low tar and dust contents from solid biomass, biogenic residues and/or organic waste fractions with a gas production device (100), the gas production device (100) comprising: a fuel conversion reactor (1a, 1b), which is an updraft gasification reactor (1a) or a pyrolysis reactor (1b); and a gas treatment reactor (2) located downstream the fuel conversion reactor (1a, 1b); wherein the fuel conversion reactor (1a, 1b) is close-coupled with the gas treatment reactor (2); wherein the fuel conversion reactor (1a, 1b) comprises a space to contain a fuel bed (3) above a grate (4); wherein the gas treatment reactor (2) comprises the following: a POX zone (12), and at least one POX nozzle (22) for supplying an oxidiser into the POX zone (12); and a gas heating zone (10) fluidic located between the space to contain the fuel bed (3) and the POX zone (12); wherein the method comprises the following steps: Creating an initial product gas (VI) in the fuel conversion reactor (1a, 1b); Heating the initial product gas, which is created in the fuel conversion reactor (1a, 1b), in the gas heating zone (10); Combusting the heated initial product gas in the gas treatment reactor (2) partially in the POX zone (12) of the gas treatment reactor (2) by injecting or supplying an oxidiser through the POX nozzles (22) into the POX zone (12).

IPC 8 full level

**C10K 3/00** (2006.01); **C10B 47/04** (2006.01); **C10B 49/02** (2006.01); **C10J 3/34** (2006.01)

CPC (source: EP)

**C10B 47/04** (2013.01); **C10B 53/02** (2013.01); **C10B 57/18** (2013.01); **C10J 3/06** (2013.01); **C10J 3/84** (2013.01); **C10K 3/005** (2013.01); **C10B 49/02** (2013.01); **C10J 3/34** (2013.01); **C10J 2300/0916** (2013.01); **C10J 2300/0956** (2013.01); **C10J 2300/1846** (2013.01)

Citation (applicant)

- CZ 295171 B6 20050615 - SYKORA FRANTISEK ING [CZ]
- WO 2017102945 A1 20170622 - SHELL INT RESEARCH [NL], et al
- WO 2010022741 A2 20100304 - DALL ENERGY HOLDING APS [DK], et al
- FI 100033 B 19970829 - LAATUKATTILA OY [FI]
- WO 2008004070 A1 20080110 - BABCOCK & WILCOX VOLUND APS [DK], et al
- DE 60033782 T2 20071031 - VALTION TEKNILLINEN [FI], et al
- CA 2521982 A1 20060517 - COGAS LLC [US]
- CN 102911739 A 20130206 - UNIV EAST CHINA SCIENCE & TECH
- DD 238162 A3 19860813 - KOSSATZ KLAUS [DD], et al
- DE 2953663 A1 19860528 - LAMBIOTTE USINES [FR]
- US 2020270528 A1 20200827 - SCHIRNHOFER LEO [AT], et al
- DE 102005045166 B4 20070726 - FACHHOCHSCHULE BINGEN [DE]
- "Bridgwater A.V. (eds) Advances in Thermochemical Biomass Conversion", SPRINGER SCIENCE, article "The Heuristic Envirocycler, a Solid Waste Disposal Energy Recovery Device for the 1990's, Lefcort M.D."
- HAUBEN, M. P: "Analysis of tar removal in a partial oxidation burner", PHD THESIS, 2004
- MORF P.O: "Secondary reactions of Tar during Thermochemical Biomass Conversion", PHD THESIS, 2001
- KALTSCHMITT, M.HARTMANN H.HOFBAUER H.: "Energie aus Biomasse", 2009, SPRINGER-VERLAG
- FJELLERUP, JAHRENFELDT, J.HENRIKSEN, U.GOBEL, B.: "Formation, Decomposition and Cracking of Biomass Tars in Gasification", KGS.LYNGBY: TECHNICAL UNIVERSITY OF DENMARK. DEPARTMENT OF MECHANICAL ENGINEERING, 2005

Citation (search report)

- [XAI] EP 1129154 A1 20010905 - VALTION TEKNILLINEN [FI], et al
- [XAI] WO 2018210393 A1 20181122 - DALL ENERGY HOLDING APS [DK]
- [XA] CN 109679695 A 20190426 - XINDI ENERGY ENGINEERING TECH

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)

BA ME

Designated validation state (EPC)

KH MA MD TN

DOCDB simple family (publication)

**EP 4151706 A1 20230322**

DOCDB simple family (application)

**EP 21196854 A 20210915**