

Title (en)
INTEGRATED GAS GENERATOR AND ELECTRICAL ENERGY STORE

Title (de)
INTEGRIERTER GASERZEUGER UND STROMSPEICHER

Title (fr)
GÉNÉRATEUR DE GAZ ET ACCUMULATEUR DE COURANT

Publication
EP 4229229 A1 20230823 (DE)

Application
EP 21794101 A 20211006

Priority
• DE 102020006326 A 20201015
• EP 2021077520 W 20211006

Abstract (en)
[origin: WO2022078834A1] A modular reactor configuration for generating hydrogen (H₂) by means of electrolysis in the single-stage configuration thereof and methane (CH₄) in the two-stage configuration thereof, with optional gas storage and gas utilization in fuel cells, wherein the single-stage configuration, composed of the electrolyzer (1), the fuel cell (2), the gas stores (3a) and (4a) for separately storing H₂ and oxygen (O₂), the associated lines (3) and (4), the condenser (5), the H₂O vessel (6), the heat stores (7) and (8) and the evaporator (9), is based on the principles of a reversible product cycle for H₂ according to figure 1 and can serve both as an electrical energy store and for generating H₂ as combustion gas, and the two-stage configuration of which, by way of example according to figure 5 with the additional components of the methanation reactor (11), the lines (12) and (13), the heat exchangers (16) and (17) and the CH₄ discharge line (14) in the H₂O condenser (15), is based on the extended reversible ideal cycles that describe the possible methanation reactions in said second reactor stage with the reaction equations (6), (7), (8), (9) and (10), which may also take place in parallel, and is thermodynamically equivalent to the reverse reaction in relation to the oxidation of CH₄ and thus indicates the best possible structures for further technical implementation.

IPC 8 full level
C25B 1/04 (2021.01); **C25B 3/26** (2021.01); **C25B 15/08** (2006.01); **H01M 8/04089** (2016.01); **H01M 8/0612** (2016.01); **H01M 8/0668** (2016.01); **H01M 8/18** (2006.01)

CPC (source: EP US)
C07C 1/041 (2013.01 - US); **C07C 1/12** (2013.01 - US); **C25B 1/042** (2021.01 - EP US); **C25B 1/23** (2021.01 - EP); **C25B 15/021** (2021.01 - US); **C25B 15/08** (2013.01 - EP); **C25B 15/081** (2021.01 - EP); **H01M 8/0656** (2013.01 - EP); **H01M 8/0668** (2013.01 - EP); **H01M 16/003** (2013.01 - US); **Y02E 60/36** (2013.01 - EP); **Y02E 60/50** (2013.01 - EP); **Y02P 20/129** (2015.11 - EP)

Citation (search report)
See references of WO 2022078834A1

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

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DOCDB simple family (application)
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