



(51) International Patent Classification:
C01B 3/36 (2006.01) *B01J 19/08* (2006.01)
B01J 19/24 (2006.01)

(21) International Application Number:
PCT/US2011/024776

(22) International Filing Date:
14 February 2011 (14.02.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/304,403 13 February 2010 (13.02.2010) US

(72) Inventor; and

(71) Applicant : MCALISTER, Roy, Edward [US/US];
2350 W Shangri La, Phoenix, AZ 85029 (US).

(74) Agents: WECHKIN, John, M. et al.; Perkins Coie LLP,
P.O. Box 1247, Seattle, WA 98111-1247 (US).

(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).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:
29 December 2011

(54) Title: REACTOR VESSELS WITH TRANSMISSIVE SURFACES FOR PRODUCING HYDROGEN-BASED FUELS AND STRUCTURAL ELEMENTS, AND ASSOCIATED SYSTEMS AND METHODS

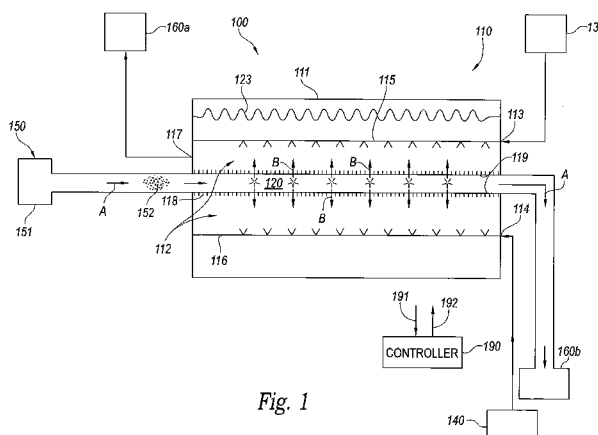


Fig. 1

(57) Abstract: Reactor vessels with transmissive surfaces for producing hydrogen-based fuels and structural elements, and associated systems and methods. A chemical reactor in accordance with a particular embodiment includes a reactor vessel having a reaction zone, a hydrogen donor source coupled in fluid communication with the reaction zone, and a steam source coupled in fluid communication with the reaction zone. The reactor further includes a transmissive surface at the reaction zone, with the transmissive surface being transmissive to a reactant entering the reaction zone and/or radiant energy entering the reaction zone.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/024776**A. CLASSIFICATION OF SUBJECT MATTER*****C01B 3/36(2006.01)i, B01J 19/24(2006.01)i, B01J 19/08(2006.01)i***

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

C01B 3/36; F02B 43/08; C25B 1/02; C01B 13/00; B01J 8/00; B01J 19/08

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: reactor, hydrocarbon, steam, hydrogen-based fuel, transmissive surface, radiant energy

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2005-0029120 A1 (BAR-GADDA RONNY) 10 February 2005 See abstract, paragraphs [0042]-[0048], claim 14	1-36
A	US 6585785 B1 (DAVID W. WARREN et al.) 01 July 2003 See abstract, claims 1-2, 8	1-36
A	US 7449158 B2 (PHILIPP HAUETER et al.) 11 November 2008 See abstract, claims 1, 18	1-36
A	US 04053576 A (EDWARD A. FLETCHER) 11 October 1977 See abstract, claims 1-2, 8	1-36
A	US 06155212 A (ROY E. MCALISTER) 05 December 2000 See abstract, claims 1-2	1-36

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

24 OCTOBER 2011 (24.10.2011)

Date of mailing of the international search report

24 OCTOBER 2011 (24.10.2011)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 189 Cheongsu-ro,
Seo-gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

LEE, Young Wan

Telephone No. 82-42-481-5560



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/024776

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005-0029120 A1	10.02.2005	CA 2572434 A1 EP 1765745 A2 US 2004-0265137 A1 US 7384619 B2 WO 2005-005009 A2 WO 2005-005009 A3	20.01.2005 28.03.2007 30.12.2004 10.06.2008 20.01.2005 20.01.2005
US 6585785 B1	01.07.2003	CA 2424760 A1 CA 2424760 C WO 02-062463 A1	04.10.2004 11.09.2007 15.08.2002
US 7449158 B2	11.11.2008	EP 1520901 A1 EP 1520901 B1 US 2005-0192362 A1 US 2007-0098602 A1 US 7176246 B2	06.04.2005 23.06.2010 01.09.2005 03.05.2007 13.02.2007
US 04053576 A	11.10.1977	None	
US 06155212 A	05.12.2000	US 05343699 A US 05394852 A US 2003-0012985 A1 US 2011-0125391 A1 US 6446597 B1 US 6756140 B1	06.09.1994 07.03.1995 16.01.2003 26.05.2011 10.09.2002 29.06.2004