

(43) International Publication Date
9 October 2014 (09.10.2014)

(51) International Patent Classification:

F22B 15/00 (2006.01) F22B 1/08 (2006.01)
F22B 37/26 (2006.01)

(21) International Application Number:

PCT/US2014/024680

(22) International Filing Date:

12 March 2014 (12.03.2014)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/779,493 13 March 2013 (13.03.2013) US

(71) Applicant: CHEVRON U.S.A. INC. [US/US]; 6001 Bollinger Canyon Road, San Ramon, California 94583 (US).

(72) Inventor: PENTON, John David; 6001 Bollinger Canyon Road, San Ramon, California 94583 (US).

(74) Agents: NORTHCUTT, Christopher D. et al.; Chevron Services Company, Post Office Box 6006, San Ramon, California 94583-0806 (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, BN, 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, IR, IS, JP, KE, KG, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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, KM, 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))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

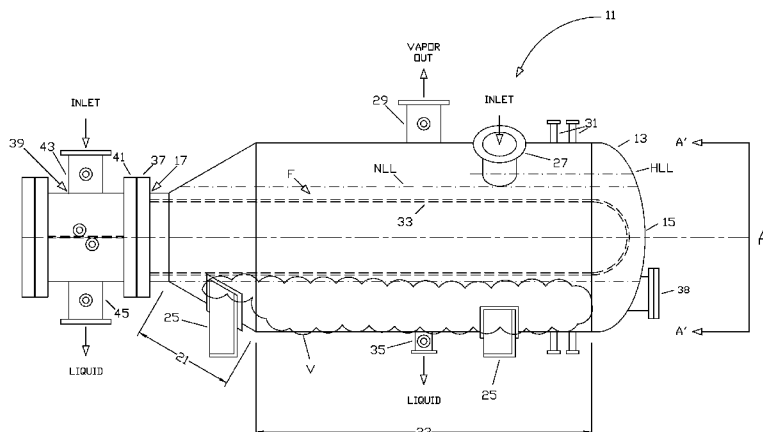
- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

7 May 2015

(54) Title: STEAM GENERATION ASSEMBLY FOR FOUL FLUIDS OR FLUIDS HAVING IMPURITIES AND METHOD FOR GENERATING STEAM WITH SUCH AN ASSEMBLY

FIG. 1



(57) Abstract: A steam generation assembly (11) is provided for producing steam with foul or unclean fluids for use in operations. The heat is transferred to the foul fluid from a clean steam flowing through a tube bundle (33) and is circulated through a closed loop steam generation system. The tube bundle extends within an outer shell (13) that collects the foul fluid for heat transfer. Outer shell includes a larger volume (V) below the tube bundle than convention heat exchangers so that any particulates and emulsions can gather below the tube bundle rather than attaching or forming on its surface.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2014/024680

A. CLASSIFICATION OF SUBJECT MATTER
INV. F22B15/00 F22B37/26 F22B1/08
ADD.

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)

F22B F28F F28G F28D

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

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

EP0-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/288418 A1 (FUJITA ISSAKU [JP] ET AL) 26 November 2009 (2009-11-26)	3-8, 10-14
Y	paragraphs [0096] - [0119], [0173] - [0186]; figures 2,4,12	9
X	GB 931 925 A (STORK KONINKLIJKE MASCHF) 24 July 1963 (1963-07-24)	1-7,10, 12-14
A	page 1, line 56 - page 2, line 12; figures	11
X	FR 2 339 132 A1 (STEIN INDUSTRIE [FR]) 19 August 1977 (1977-08-19)	1,3-8, 10,12-14
X	US 3 518 830 A (VISOVICH PAUL W ET AL) 7 July 1970 (1970-07-07)	1,3-8, 10-14
A	column 3, line 9 - column 5, line 75; figures	2
	----- -/--	

☒ 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 another 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

9 March 2015

Date of mailing of the international search report

23/03/2015

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Henkes, Roeland

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2014/024680

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 931 235 A (WESTINGHOUSE ELECTRIC CORP) 17 July 1963 (1963-07-17) page 2, line 36 - page 3, line 76; figures -----	1,3-8, 10,12-14
Y	EP 2 365 269 A1 (ALSTOM TECHNOLOGY LTD [CH]) 14 September 2011 (2011-09-14)	9
A	paragraphs [0026] - [0042]; figures -----	1-8, 12-14
A	WO 99/32837 A1 (EXXON PRODUCTION RESEARCH CO [US]) 1 July 1999 (1999-07-01) page 32, lines 12-18; figure 3 -----	1,13

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2014/024680

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009288418 A1	26-11-2009	CN 101495805 A JP 4796146 B2 US 2009288418 A1 WO 2008026325 A1	29-07-2009 19-10-2011 26-11-2009 06-03-2008
GB 931925 A	24-07-1963	BE 622764 A CH 385889 A DE 1167360 B GB 931925 A NL 109733 C NL 258246 A	09-03-2015 31-12-1964 09-04-1964 24-07-1963 09-03-2015 09-03-2015
FR 2339132 A1	19-08-1977	NONE	
US 3518830 A	07-07-1970	ES 371933 A1 US 3518830 A	16-03-1972 07-07-1970
GB 931235 A	17-07-1963	NONE	
EP 2365269 A1	14-09-2011	EP 2365269 A1 TW 201144736 A WO 2011107841 A1	14-09-2011 16-12-2011 09-09-2011
WO 9932837 A1	01-07-1999	AR 013111 A1 AT 411107 B AU 739776 B2 AU 8152098 A BG 104621 A BR 9813700 A CA 2315015 A1 CH 694136 A5 CN 1301335 A CO 5040207 A1 CZ 20002142 A3 DE 19882878 T1 DK 200000939 A DZ 2527 A1 EG 22215 A EP 1040305 A1 ES 2188347 A1 FI 20001439 A GB 2350121 A GC 0000004 A GE P20033122 B HR P980343 A2 HU 0102573 A2 ID 25453 A JP 2001527200 A KR 100381322 B1 MY 115404 A NO 20003172 A NZ 505337 A OA 11525 A PE 89399 A1 PL 343849 A1 RU 2200920 C2 SI 20290 A SK 8702000 A3	13-12-2000 25-09-2003 18-10-2001 12-07-1999 28-02-2001 10-10-2000 01-07-1999 30-07-2004 27-06-2001 29-05-2001 12-12-2001 12-07-2001 16-06-2000 01-02-2003 31-10-2002 04-10-2000 16-06-2003 16-06-2000 22-11-2000 30-10-2002 12-05-2003 31-08-1999 28-11-2001 05-10-2000 25-12-2001 26-04-2003 31-05-2003 21-08-2000 29-08-2003 09-02-2004 05-10-1999 10-09-2001 20-03-2003 31-12-2000 12-02-2001

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2014/024680

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		TN SN98097 A1	13-06-2000
		TR 200001801 T2	20-04-2001
		TW 436597 B	28-05-2001
		UA 71558 C2	15-12-2004
		US 6212891 B1	10-04-2001
		WO 9932837 A1	01-07-1999
		ZA 9805316 A	20-12-1999
