



(51) International Patent Classification:

C10G 1/04 (2006.01) *B01D 11/02* (2006.01)
C10C 3/08 (2006.01)

(21) International Application Number:

PCT/IB2009/052326

(22) International Filing Date:

2 June 2009 (02.06.2009)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/057,915 2 June 2008 (02.06.2008) US

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(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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, 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, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, 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:

- 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:

8 April 2010

(54) Title: SYSTEM FOR SEPARATING BITUMEN FROM OIL SANDS

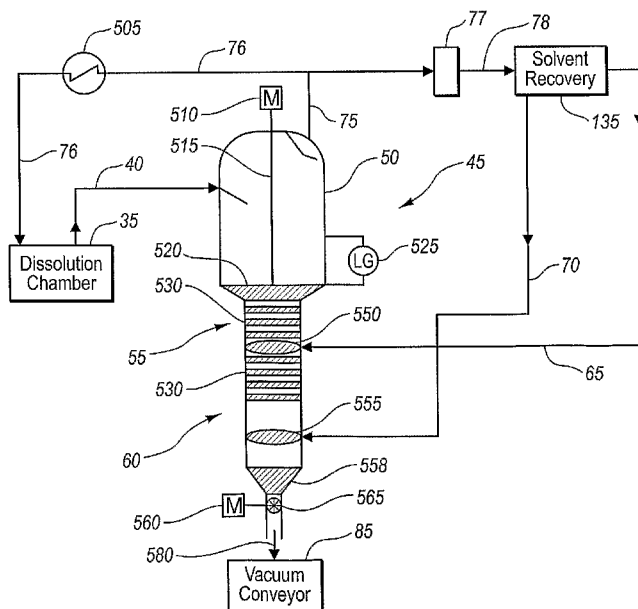


FIG. 5

(57) Abstract: Disclosed is a system for processing oil sands to remove bitumen, the viscous petroleum product adhered to the sands, from the sands itself. The processing system is designed to be substantially air tight, preventing outside air from entering and volatile chemicals from escaping from the system. Mined oil sands are delivered to the system, which creates a slurry of oil sands and solvent in a slurry chamber. The slurry is transported to a dissolution chamber which conditions the slurry before the slurry is sent to an extraction chamber. A plurality of trays and scrapers further conditions the slurry to remove bitumen. The use of heavy, aromatic solvents and light, paraffinic solvents in sequence improves bitumen recovery while allowing environmentally safe processing of the sands to occur in a later step. The sands are dried and the solvent recovered for recycling and reuse in the system. Clean, dry sands are returned to the source of mined oil sands for reclamation.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2009/052326**A. CLASSIFICATION OF SUBJECT MATTER*****C10G 1/04(2006.01)i, C10C 3/08(2006.01)i, B01D 11/02(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)

C10G, B01D 11, C10C

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: bitumen* <and> sand* <and> slurr* <and> extract*

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2008-0060978 A1 (WEGNER) 13 March 2008 See abstract and [0035]-[0072]	1-38,39
A	US 4994175 A1 (HARGREAVES et al.) 19 February 1991 See abstract and column 8, line 64 - column 9, line 12	1-38
A	US 4347118 A1 (FUNK et al.) 31 August 1982 See the whole document	1-38,39
A	US 4139450 A1 (HANSON) 13 February 1979 See the whole document	1-38,39
A	US 4422901 A1 (KARNOFSKY) 27 December 1983 See figures and claims	1-38,39
A	US 2006-0043005 A1 (CLEMINSON et al.) 02 March 2006 See figure 1 and claims	39
A	US 2007-0090025 A1 (STRAND) 26 April 2007 See figures and [0132] - [0149]	1-38

☒ 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

11 FEBRUARY 2010 (11.02.2010)

Date of mailing of the international search report

17 FEBRUARY 2010 (17.02.2010)

Name and mailing address of the ISA/KR

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Facsimile No. 82-42-472-7140

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB2009/052326**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. Claims 1-12 and 27-28 and 30, 13-19, 20-26 relate to an extraction chamber configured for separating bitumen, and claims 29 and 31-38 relate to a method of removing bitumen.
2. Claim 39 relates to a slurry handling system configured for creating a slurry of bitumen.

The inventions listed as 1 and 2, do not relate to a single general inventive concept under PCT Rule 13.1, because, under PCT Rule 13.2 they do not share the same or corresponding technical features.

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB2009/052326

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3954415 A1 (DAVITT) 04 May 1976 See figures and column 4, line 51 - column 5, line 3	1-38

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/IB2009/052326

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008-0060978 A1	13.03.2008	WO 2007-146992 A2 WO 2007-146992 A3	21.12.2007 14.02.2008
US 4994175 A1	19.02.1991	None	
US 4347118 A1	31.08.1982	None	
US 4139450 A1	13.02.1979	None	
US 4422901 A1	27.12.1983	None	
US 2006-0043005 A1	02.03.2006	US 2009-008297 A1 US 7431830 B2	08.01.2009 07.10.2008
US 2007-0090025 A1	26.04.2007	None	
US 3954415 A1	04.05.1976	None	