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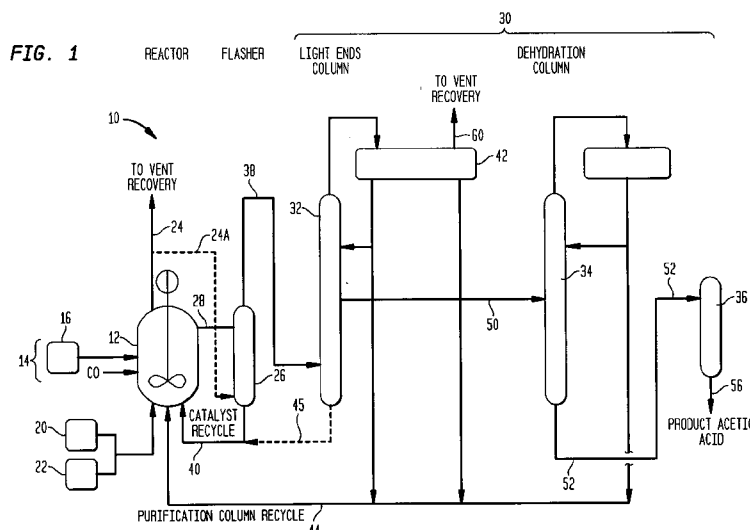
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- Published:

 - 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: METHANOL CARBONYLATION SYSTEM HAVING ABSORBER WITH MULTIPLE SOLVENT OPTIONS



(57) Abstract: A methanol carbonylation system (10) includes an absorber tower (75) adapted for receiving a vent gas stream and removing methyl iodide therefrom with a scrubber solvent, the absorber tower being coupled to first and second scrubber solvent sources (16, 56) which are capable of supplying different first and second scrubber solvents. A switching system including valves (90, 92, 94, 96, 98) alternatively provides first or second scrubber solvents to the absorber tower and returns the used solvent and sorbed material to the carbonylation system to accommodate different operating modes.

WO 2009/134332 A3

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/002505

A. CLASSIFICATION OF SUBJECT MATTER
INV. B01J8/00 C07C51/12 B01D53/14 B01D53/18 C07C53/08

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)
B01J C07C B01D

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 practical, search terms used)

EPO-Internal, CHEM ABS Data, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 567 331 A2 (CHIYODA CHEM ENG CONSTRUCT CO [JP]) 27 October 1993 (1993-10-27) examples page 5, line 10 - line 19 page 5, line 59 - page 6, line 8 page 6, line 26 - line 29	21-25
Y	US 5 281 359 A (SCATES MARK O [US] ET AL) 25 January 1994 (1994-01-25) column 2, line 1 - line 8 column 5, line 50 - column 6, line 26 column 8, line 59 - column 10, line 30 claims; examples ----- -/--	21-25

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 document 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

17 December 2009

Date of mailing of the international search report

12/02/2010

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/002505

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 241 219 A (WAN CHEE-GEN [US]) 23 December 1980 (1980-12-23) cited in the application	21-25
A	column 2, line 48 - column 4, line 51 -----	1-20
Y	US 5 416 237 A (AUBIGNE SIMON D [FR] ET AL) 16 May 1995 (1995-05-16) cited in the application	21-25
A	column 9, line 31 - line 42 examples -----	1-20
X,P	US 2008/293967 A1 (SCATES MARK O [US] ET AL) 27 November 2008 (2008-11-27) paragraph [0029] - paragraph [0031] paragraph [0080] - paragraph [0081] paragraph [0092] -----	21
A	DATABASE CA [Online] CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; 10 August 2005 (2005-08-10), CHEN, DASHENG ET AL: "Process for preparation of acetic acid and acetic anhydride" XP002549216 retrieved from STN Database accession no. 144:467817 cited in the application abstract & CN 1 651 388 A (SHANGHAI WUJING CHEMICAL INDUSTRY CO., LTD., PEOP. REP. CHINA) 10 August 2005 (2005-08-10) -----	1-25
A	EP 0 013 804 A1 (MONSANTO CO [US]) 6 August 1980 (1980-08-06) the whole document -----	1-25

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/002505

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:

see additional sheet

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 fees, this Authority did not invite payment of additional fees.
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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-20

Apparatus for producing acetic acid comprising an absorber tower coupled to first and second scrubber solvent sources and methods for operating an absorber tower, wherein a first and , after removal of that solvent, a second scrubber solvent is supplied to the absorber tower.

2. claims: 21-25

A method of operating an apparatus for making acetic acid comprising supplying a scrubber solvent to an absorber tower.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2009/002505

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0567331	A2	27-10-1993	DE 69313506 D1 09-10-1997
			DE 69313506 T2 26-03-1998
			US 5334755 A 02-08-1994

US 5281359	A	25-01-1994	AU 663666 B2 12-10-1995
			AU 5091093 A 29-03-1994
			BR 9306934 A 12-01-1999
			CA 2141944 A1 17-03-1994
			CN 1086741 A 18-05-1994
			DE 69301828 D1 18-04-1996
			DE 69301828 T2 19-09-1996
			EP 0656811 A1 14-06-1995
			ES 2085170 T3 16-05-1996
			JP 8501017 T 06-02-1996
			JP 3320728 B2 03-09-2002
			MX 9305274 A1 28-02-1994
			NO 950735 A 27-02-1995
			RU 2103064 C1 27-01-1998
			SG 48904 A1 18-05-1998
			TR 27222 A 20-12-1994
			TW 429162 B 11-04-2001
			WO 9405423 A1 17-03-1994
			US 5466874 A 14-11-1995
			ZA 9306316 A 27-02-1995

US 4241219	A	23-12-1980	BE 884537 A1 29-01-1981
			DE 3028934 A1 19-02-1981
			FR 2462413 A1 13-02-1981
			GB 2055830 A 11-03-1981
			IT 1128546 B 28-05-1986
			JP 56022746 A 03-03-1981
			MX 155402 A 29-02-1988
			NL 8004207 A 03-02-1981

US 5416237	A	16-05-1995	NONE

US 2008293967	A1	27-11-2008	NONE

CN 1651388	A	10-08-2005	NONE

EP 0013804	A1	06-08-1980	AR 218566 A1 13-06-1980
			AU 5293979 A 29-05-1980
			BR 7907480 A 05-08-1980
			CA 1110273 A1 06-10-1981
			DE 2963564 D1 14-10-1982
			ES 486011 A1 01-09-1980

EP 0013804	A1		JP 55092339 A 12-07-1980
			JP 57047170 B 07-10-1982
			MX 151401 A 14-11-1984
			US 4255591 A 10-03-1981
			YU 283579 A1 31-08-1984
