

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 June 2005 (23.06.2005)

PCT

(10) International Publication Number
WO 2005/056725 A3

(51) International Patent Classification:
C10G 67/08 (2006.01)

(21) International Application Number:
PCT/US2004/040090

(22) International Filing Date:
1 December 2004 (01.12.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/527,255 5 December 2003 (05.12.2003) US

(71) Applicant (for all designated States except US): **EXXON-MOBIL RESEARCH AND ENGINEERING COMPANY** [US/US]; 1545 Route 22 East, P.O. Box 900, Annandale, NJ 08801-0900 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **JACOBS, Peter, W.** [US/US]; 755 Jennifer Jean Drive, Baton Rouge, LA 70808 (US). **GREANEY, Mark, A.** [US/US]; 1265 River Road, Upper Black Eddy, PA 18972 (US). **BEGASSE, John, N.** [US/US]; 30 Amelia Avenue, Livingston, NJ 07039 (US).

(74) Agents: **HUGHES, Gerard, J.** et al.; ExxonMobil Research and Engineering Company, 1545 Route 22 East, P.O. Box 900, Annandale, NJ 08801-0900 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, 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, HU, IE, IS, IT, LT, LU, MC, NL, 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
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
19 October 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SUPERIOR EXTRACTION PERFORMANCE USING SULFURIC ACID

(57) Abstract: The instant invention relates to a method for producing low-sulfur, lownitrogen distillate boiling range products involving contacting a distillate boiling range feedstream with an acidic solution to selectively remove heterocyclic nitrogen-containing compounds before hydrotreating.



WO 2005/056725 A3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US2004/040090

A. CLASSIFICATION OF SUBJECT MATTER INV. C10G67/08				
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) C10G				
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, WPI Data, PAJ				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	US 3 487 012 A (MARK A. PLUMMER ET AL) 30 December 1969 (1969-12-30) column 2, line 53 - line 57 column 3, line 6 - line 9 column 3, line 21 - line 31; claims 1,5; examples 1,7,8	1-29		
X	US 3 681 233 A (IVOR W. MILLS ET AL) 1 August 1972 (1972-08-01) column 4, line 36 - line 43 column 5, line 36 - line 46 column 6, line 31 - line 55; claims 1,4 ----- -/--	1-29		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.				
<input checked="" type="checkbox"/> Patent family members are listed in annex.				
° Special categories of cited documents :				
<table border="0"> <tr> <td style="vertical-align: top;"> *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 </td> <td style="vertical-align: top;"> *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 </td> </tr> </table>			*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
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 29 August 2006		Date of mailing of the international search report 05/09/2006		
Name and mailing address of the ISA European Patent Office, P.B. 5318 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer Deurinck, P		

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US2004/040090

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 984 617 A (CHELLIS ITALO V. DE ET AL) 16 May 1961 (1961-05-16) column 2, line 17 - line 29 column 3, line 33 - line 45 column 3, line 61 - line 66; claim 1; figure 1 -----	1-29
X	US 2 944 015 A (RAUSCH MAURICE K ET AL) 5 July 1960 (1960-07-05) column 2, line 23 - line 46 column 3, line 10 - line 11; claim 1 -----	1-29
X	US 2 636 843 A (ARNOLD ROBERT C ET AL) 28 April 1953 (1953-04-28) column 2, line 1 - line 55 claims 1,5; figure 1 -----	1-29

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US2004/040090

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3487012	A	30-12-1969	NONE	
US 3681233	A	01-08-1972	NONE	
US 2984617	A	16-05-1961	NONE	
US 2944015	A	05-07-1960	NONE	
US 2636843	A	28-04-1953	NONE	