

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
7 December 2006 (07.12.2006)

PCT

(10) International Publication Number
WO 2006/130184 A3(51) International Patent Classification:
C07C 5/13 (2006.01)(21) International Application Number:
PCT/US2006/003179

(22) International Filing Date: 30 January 2006 (30.01.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/149,504 31 May 2005 (31.05.2005) US(71) Applicant (for all designated States except US):
CATALYTIC DISTILLATION TECHNOLOGIES
[US/US]; 10100 Bay Area Blvd., Pasadena, TX 77505 (US).(72) Inventors: **BOYER, Christopher, C.**; 10100 Bay Area Blvd., Pasadena, TX 77507 (US). **LOESCHER, Mitchell, E.**; 10100 Bay Area Blvd., Pasadena, TX 77507 (US). **XU, Jinsuo**; 10100 Bay Area Blvd., Pasadena, TX 77507 (US). **DAUTZENBERT, Frits, M.**; 10100 Bay Area Blvd., Pasadena, TX 77507 (US).(74) Agent: **JOHNSON, Kenneth, H.**; P.O. Box 630708, Houston, TX 77263 (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, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

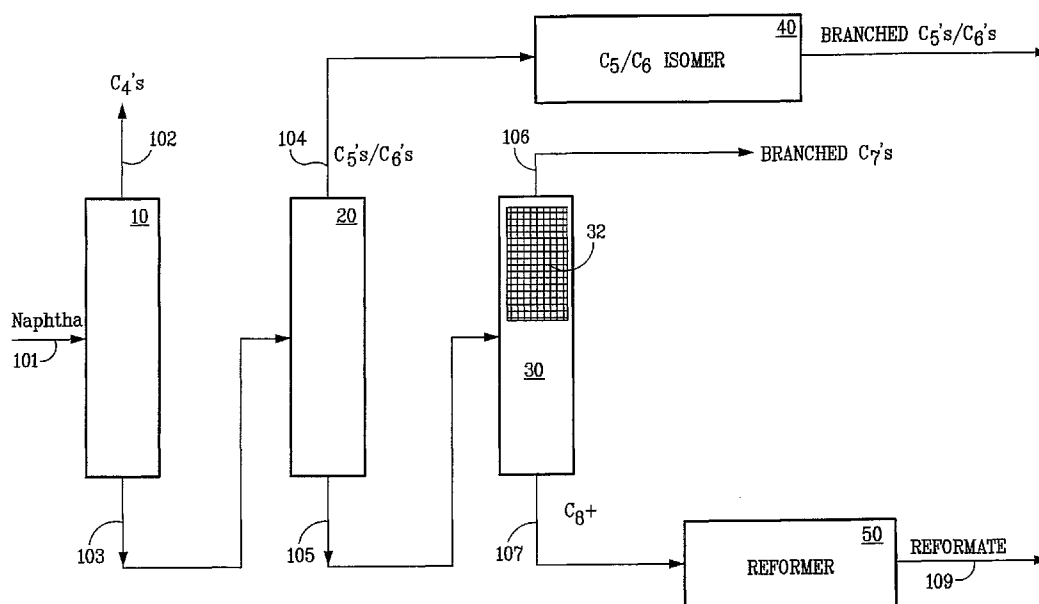
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, 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

[Continued on next page]

(54) Title: NORMAL HEPTANE ISOMERIZATION



(57) Abstract: A process for the isomerization of heptane preferably contained within a naphtha stream is disclosed wherein the naphtha is stripped of the butanes and the pentanes and hexanes are removed for isomerization. The heptanes and heavier are fed to a distillation column reactor containing an isomerization catalyst where the normal heptane is isomerized to mono and di branched heptane and removed as overheads. The cyclic heptanes and heavier are removed as bottoms and for feed to a catalytic reforming process.

WO 2006/130184 A3



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

15 November 2007

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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 06/03179

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - C07C 5/13 (2007.01)

USPC - 585/741

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)

USPC - 585/741 (see search terms below)

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)

USPTO-WEST - PGPB,USPT,USOC,EPAB,JPAB keywords: naphtha, reactor, distillation, separation, alkane isomerization, n-heptane isomerization, catalyst, process, debutanizer, isomerization, heptane, conversion, mono-branched alkane, di-branched alkane.
INTERNET search - Google - same search terms as for USPTO-WEST.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,855,857 B2 Boesveld et al., 15 February 2005 (15.02.2005), col 1, ln 29-37; col 3, ln 14-25, 50-67; col 4, ln 1; col 7, ln 35-67; col 8, ln 1-13.	1-2, 4
Y		3, 5-10, 12, 18, 20-21
X	US 6,818,589 B1 Gillespie, 16 November 2004 (16.11.2004), col 7, ln 21-65; col 8, ln 26-37.	11, 14-15
Y		12-13, 16-20
Y	US 6,069,289 A Dandekar et al., 30 May 2000 (30.05.2000), col 3, ln 47-54; col 5, ln 55-67; col 6, ln 1-21.	3, 13, 20-21
Y	US 5,397,457 A Harandi et al., 14 March 1995 (14.03.1995), col 2, ln 25-28, 58-63; col 3, ln 20-38.	5-6, 16-18, 20
Y	US 6,767,859 B2 Ying et al., 27 July 2004 (27.07.2004), Abstract; col 2, ln 30-61.	7-10
Y	US 6,759,563 B1 Hibbs, 06 July 2004 (06.07.2004), Abstract; col 13, ln 65-67; col 14, ln 1-4.	19

☐

Further documents are listed in the continuation of Box C.

☐

* 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

17 June 2007 (17.06.2007)

Date of mailing of the international search report

24 SEP 2007

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450

Facsimile No. 571-273-3201

Authorized officer:

Lee W. Young

PCT Helpdesk: 571-272-4300

PCT OSP: 571-272-7774