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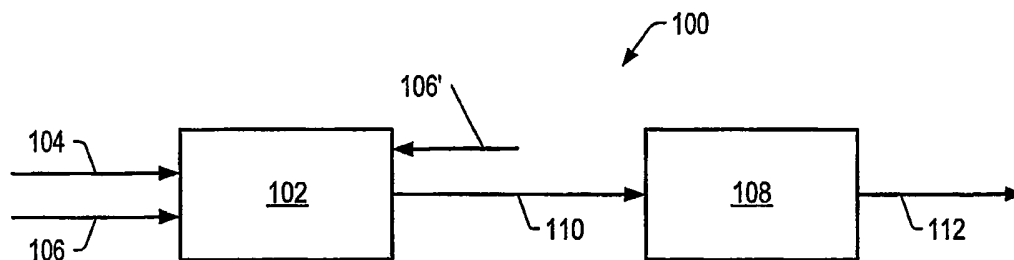
- with international search report
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(88) Date of publication of the international search report:

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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: SYSTEMS, METHODS, AND CATALYSTS FOR PRODUCING A CRUDE PRODUCT



(57) Abstract: Contact of a crude feed with one or more catalysts produces a total product that include a crude product. The crude product is a liquid mixture at 25 °C and 0.101 Mpa. One or more other properties of the crude product may be changed by at least 10 % relative to the respective properties of the crude feed.

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2004/042430

## A. CLASSIFICATION OF SUBJECT MATTER

C10G29/04 C10G29/06 C10G45/00

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

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 063 266 A (GRANDE ET AL) 16 May 2000 (2000-05-16) cited in the application column 3, line 3 - line 10; claims 1,6,16; example 1 column 2, line 10 - line 29; table 1	1-5, 10-27
X	US 5 928 501 A (SUDHAKAR ET AL) 27 July 1999 (1999-07-27) claims 1-4; figure 1; table 1	1-5, 10-27
X	US 5 871 636 A (TRACHTE ET AL) 16 February 1999 (1999-02-16) cited in the application column 2, line 15 - line 43; claims 1,3; figure 1; example 1; table 1	1-5, 14-27
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in 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

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Date of the actual completion of the international search

17 January 2006

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25. 01. 2006

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US2004/042430

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 3 712 861 A (ROSINSKI E,US ET AL) 23 January 1973 (1973-01-23) column 1, line 48 - line 70 column 3, line 45 - line 72; claim 1; example 1; table 1 -----	6-27
X	US 4 830 736 A (HUNG ET AL) 16 May 1989 (1989-05-16) column 1, line 29 - line 44 column 4, line 31 - line 59 column 5, line 51 - column 6, line 18; claim 1; table 1 -----	6-9, 14-27
X	US 6 309 537 B1 (HARLE VIRGINIE ET AL) 30 October 2001 (2001-10-30) column 3, line 3 - line 48 column 10, line 60 - line 67 column 15, line 63 - column 16, line 2; claims 1,8,9,16 -----	6-9, 14-27
X	US 4 613 425 A (HIGASHI ET AL) 23 September 1986 (1986-09-23) column 1, line 14 - line 35 column 3, line 62 - column 4, line 16; claim 1 -----	6-9, 14-27
X	EP 0 225 686 A (MOBIL OIL CORPORATION) 16 June 1987 (1987-06-16) page 2, line 2 - line 19 page 5 - page 6; claim 15; table 2 -----	6-9, 14-27
X	US 4 729 826 A (LINDSAY ET AL) 8 March 1988 (1988-03-08) column 7, line 44 - line 47; claims 1-3,5 -----	6-9, 14-27
X	US 6 554 994 B1 (REYNOLDS BRUCE E ET AL) 29 April 2003 (2003-04-29) column 1, line 20 - line 40 column 5, line 15 - line 33; claim 1 -----	6-9, 14-27
X	US 4 456 699 A (HENSLEY, JR. ET AL) 26 June 1984 (1984-06-26) column 1, line 9 - line 29 column 8, line 18 - line 48 column 14, line 7 - line 16 column 16, line 13 - line 21; claims 1,12; table 2 -----	6-9, 14-27

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2004/042430

### Box 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 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 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.
- ☒ 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: 1-5, 14-27 (relating to claims 1-5)

a method for producing a crude product with reduced TAN and a specific catalyst  
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2. claims: 6-9, 14-27 (relating to claims 6-9)

a method for producing a crude product with reduced alkali metal salt of organic acids and a specific catalyst  
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3. claims: 10-13, 14-27 (relating to claims 10-13)

a method for producing a crude product with reduced TAN and reduced Ni/V/Fe and a specific catalyst  
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/042430

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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