Title: COMBINED RECOVERY OF HYDROGEN AND HYDROCARBON LIQUIDS FROM HYDROGEN-CONTAINING GASES

Abstract: A pressure differential of a feed gas (110) between a compressor (120) and expander (160) is employed to cool the feed gas to condense and remove at least a portion of one component to produce a partially depleted feed gas from which another component may then be removed. In especially preferred aspects, the feed gas comprises C₂-C₃ hydrocarbons and hydrogen, wherein the hydrocarbons are condensed in the cooler and hydrogen is removed using a pressure swing adsorption unit (180).
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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.

(88) Date of publication of the international search report:
30 October 2003
INTERNATIONAL SEARCH REPORT

International application No. PCT/US02/40412

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : F25 J 1/02, 3/00
US CL : 62/607,912,931,932
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)
U.S. : 62/607,912,931,932

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>E, Y</td>
<td>US 6,560,989 B1 (ROBERTS et al) 13 May 2003 (13.05.2003), see entire patent.</td>
<td>1-17</td>
</tr>
<tr>
<td>Y</td>
<td>US 6,023,942 A (THOMAS et al) 15 February 2000 (19.02.2000), see entire patent.</td>
<td>1-17</td>
</tr>
<tr>
<td>Y</td>
<td>US 4,654,047 A (HOPKINS et al) 31 March 1987 (31.03.1987), see entire patent.</td>
<td>1-17</td>
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☐ Further documents are listed in the continuation of Box C.  ☐ See patent family annex.

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Date of the actual completion of the international search 26 July 2003 (26.07.2003)

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