Title: EXTERNAL SECOND STAGE CYCLONES IN OLEFIN PRODUCTION PROCESS

Abstract: The present invention comprises a process and apparatus for producing olefins from oxygenates in a reactor (2). This process comprises these oxygenates with a catalyst to produce a gaseous mixture comprising light olefins and by-products, sending the mixture to a single stage cyclone (14) within said reactor to separate said catalyst from said gaseous mixture and then sending said the to a second stage cyclone (18). The second stage cyclone is located outside of said reactor and it functions to remove the catalyst from the mixture. Then the catalyst can be returned to the reactor (2) after having been treated in a regeneration zone (22) to remove carbonaceous deposits from the catalyst.
(88) Date of publication of the international search report:
7 December 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.
INTernational search report

A. CLASSIFICATION OF SUBJECT MATTER
   IPC: C07C 1/00 (2006.01); F27B 15/08 (2006.01)
   USPC: 585/640,921; 422/147
   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.: 585/640, 921; 422/147
   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)
   Please see continuation sheet

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>Y</td>
<td>US 6,166,282 A (MILLER) 26 December 2000 (26.12.2000), figure, column 8, line 54 to column 11, line 23.</td>
<td>1-8</td>
</tr>
<tr>
<td>A</td>
<td>GB 1,538,874 A (BRITISHPETROLEUMCOMPANYLIMITED) 24 January 1979 (24.01.1979), entire document.</td>
<td>6-8</td>
</tr>
</tbody>
</table>

- Further documents are listed in the continuation of box C.
- See patent family annex.

Date of the actual completion of the international search: 23 June 2006 (23.06.2006)
Date of mailing of the international search report: 11 August 2006

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