(54) Title: HYBRID COMBUSTOR FOR FUEL PROCESSING APPLICATIONS

(57) Abstract: The present invention discloses a hybrid combustor, such as an anode tailgas oxidizer (ATO), for fuel processing applications which combines both flame and catalytic type burners. The hybrid combustor of the present invention combines the advantages of both flame and catalytic type burners. The flame burner component of the hybrid combustor is used during start-up for the preheating of the catalytic burner component. As soon as the catalytic burner bed is preheated or lit off, the flame burner will be shut off. Optionally, the hybrid combustor may also include an integrated heat recovery unit located downstream of the catalytic burner for steam generation and for the preheating of the feed for a reformer, such as an autothermal reformer.
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International application No.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC: F23D 3/40( 2006.01)

USPC: 43 1/7

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 43 1/7

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>Y</td>
<td>US 2004/0255588 A1 (Lundberg et al) 23 DEC 2004 paragraphs 0015, 0035-0039, 0054-0058</td>
<td>1-2, 8-9, 14, 16-20</td>
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<td>Y</td>
<td>US 2005/01 58678 A1 (Wang et al) 21 July 2005, paragraphs 0035, 0068, 0121</td>
<td>1, 16</td>
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<tr>
<td>Y</td>
<td>US 5,375,999 (Aizawa et al) 27 DEC 1994, column 1, lines 66-68; column 2, lines 30-68; column 3, lines 1-68; column 4, lines 1-10</td>
<td>1, 8-9, 12, 16, 19, 21</td>
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<tr>
<td>Y</td>
<td>US 4,702,891 (Li et al) 27 OCT 1987, column 3, lines 35-57, column 5, lines 13-44</td>
<td>10</td>
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Further documents are listed in the continuation of Box C.

See patent family annex.

Date of the actual completion of the international search
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