Abstract: A cracking furnace construction includes a firebox (12) defining a chamber (20) having a high emissivity thermal protective layer (18) disposed on at least part of the refractory walls (17) and/or on process tubes (14) disposed within the chamber (20). The coating contains an inorganic adhesive for metal/alloy tubes or colloidal silica and/or colloidal alumina for refractory walls (17) or ceramic tubes, a filler, and one or more emissivity agents. A method of coating the firebox chamber (20) includes preparing the surface of the tubes/refractory walls (17), preparing the coating, and applying the coating to the surface.
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

- **IPC(8) - F27B 5/08 (2009.01)**
- **USPC - 428/630; 428/631; 432/253; 432/264**

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)
- IPC(8) -- F27B 5/08 (2009.01) and USPC -- 428/630; 428/631; 432/253; 432/264

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
- IPC(8) -- C10C55/00; C10G9/00; C07C4/00 and USPC -- 428/630; 428/631; 432/253; 432/264

Electronic database consulted during the international search (name of database and, where practical, search terms used)
- PubWest (PGPB, USPTO, USOC, EPAB); USPTO; Espacenet; Google Patents; Google Scholar; Google -- COATING COKE COOKING CRACKING ETHANE ETHYLENE FURNACE LAYER METAL METALLIC PROTECTIVE REFORMER REFRactories THERMAL TUBE TUBING

**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>X</td>
<td>US 2005/0051057 A1 (Evans et al.) 10 March 2005 (10.03.2005) para [0003]; [0009]; [0010]; [0019]; [0021]; [0023]; [0035]; [0039]; [0041]; [0042]; [0047]</td>
<td>9, 11, 12</td>
</tr>
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<td>Y</td>
<td>US 2007/0210747 B1 (Trotter) 03 April 2001 (03.04.2001) Figs 2 and 3; Table I; col 2, ln 6-22</td>
<td>2, 10, 13-18, 20, 21</td>
</tr>
<tr>
<td>Y</td>
<td>US 3,807,125 A (Kydd) 21 September 1971 (21.09.1971) Fig 2; Abstract; col 2, ln 47-69</td>
<td>8</td>
</tr>
</tbody>
</table>

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
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  - "Z" document member of the same patent family

**Date of the actual completion of the international search**
04 May 2009 (04.05.2009)

**Date of mailing of the international search report**
12 May 2009

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