Title: METHOD OF THERMAL NOX REDUCTION IN CATALYTIC COMBUSTION SYSTEMS

Abstract: Method and apparatus for control of Zeldovich (thermal) NOx production in catalytic combustion systems during combustion of liquid or gaseous fuels in the post catalytic sections (14) of gas-turbine combustors by reducing combustion residence time in the Homogeneous Combustion (HC) zone through control of the HC Wave position, principally by adjusting the catalyst (13) inlet temperature. As the fuelair mixture inlet temperature to the catalyst is reduced, the HC Wave moves downstream, extends the ignition delay, shortens the residence time at high temperature, thereby reducing the thermal NOx production. The countervailing increase in CO production by longer ignition delay can be limited by actively positioning the HC Wave so that thermal NOx is reduced while power output and low CO is maintained. NOx is reduced to on the order of <3ppm, and preferably <2ppm, while CO is maintained <100ppm, typically <50ppm, and preferably <5-10ppm.
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(7)**: F23D 3/40
- **US CL**: 60/723,777; 431/7

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.**: 60/723,777; 431/7

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>A</td>
<td>US 5,263,998 A (MACKRODT et al.) 23 November 1993 (23.11.1993), column 1, ll. 28-57</td>
<td></td>
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<tr>
<td>A</td>
<td>US 6,059,793 A (GREEN) 01 August 2000 (01.08.2000), col 20, ll. 35-38.</td>
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<tr>
<td>A</td>
<td>US 4,966,001 A (BEEBE) 30 October 1990 (30.10.1990), the entire document.</td>
<td></td>
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</tbody>
</table>

- Further documents are listed in the continuation of Box C.

- See patent family annex.

*Special categories of cited documents:
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- "&" document member of the same patent family

**Date of the actual completion of the international search**

06 August 2002 (06.08.2002)

**Date of mailing of the international search report**

12 SEP 2002

**Name and mailing address of the ISA/US**

Commissioner of Patents and Trademarks

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