Title: METHOD AND APPARATUS FOR MAINTAINING EMISSION CAPABILITIES OF HOT CATHODES IN HARSH ENVIRONMENTS

Abstract: A method and apparatus for operating a multi-hot-cathode ionization gauge is provided to increase the operational lifetime of the ionization gauge in gaseous process environments. In example embodiments, the life of a spare cathode is extended by heating the spare cathode to a temperature that is insufficient to emit electrons but that is sufficient to decrease the amount of material that deposits on its surface or is optimized to decrease the chemical interaction between a process gas and a material of the at least one spare cathode. The spare cathode may be constantly or periodically heated. In other embodiments, after a process pressure passes a given pressure threshold, plural cathodes may be heated to a non-emitting temperature, plural cathodes may be heated to a lower emitting temperature, or an emitting cathode may be heated to a temperature that decreases the electron emission current.
Published:
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report: 9 October 2008

(15) Information about Correction:

Previous Correction:
see Notice of 27 March 2008
## B. FIELD SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document with indication where appropriate of the relevant passages</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>US 3 353 048 A (HAGENLOCHER ARNO K ET AL) 14 November 1967 (1967-11-14) the whole document</td>
</tr>
<tr>
<td>A</td>
<td>US 3 327 931 A (HALL CHARLES L) 27 June 1967 (1967-06-27) the whole document</td>
</tr>
<tr>
<td>A</td>
<td>US 4 866 640 A (MORRISON JR CHARLES F [US]) 12 September 1989 (1989-09-12) the whole document</td>
</tr>
<tr>
<td>A</td>
<td>JP 2005 259606 A (ANELVA CORP) 22 September 2005 (2005-09-22) figures 1,2</td>
</tr>
</tbody>
</table>

### Further documents are listed in the continuation of Box C

### X See patent family annex

* 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 document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure use exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed
- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

### Date of the actual completion of the international search

15 August 2008

### Date of mailing of the international search report

25/08/2008

### Name and mailing address of the ISA

European Patent Office, P B 5818 Patentlaan 2 NL-2280 HV Rijswijk
Tel (+31-70) 340-2040 Tx 31 651 epo nl
Fax (+31-70) 340-3016

Lachaud, Stephane
<table>
<thead>
<tr>
<th>Patent document cited in search report</th>
<th>Publication date</th>
<th>Patent family member(s)</th>
<th>Publication date</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 3353048</td>
<td>14-11-1967</td>
<td>NONE</td>
<td></td>
</tr>
<tr>
<td>US 4866640</td>
<td>12-09-1989</td>
<td>NONE</td>
<td></td>
</tr>
<tr>
<td>JP 2005259606</td>
<td>22-09-2005</td>
<td>NONE</td>
<td></td>
</tr>
</tbody>
</table>