HEAT GENERATING EXPANDER FOR HEAT PUMP SYSTEMS

An expander controls the expansion and flow of refrigerant between high and low pressure within a vapor compression system. The expander drives a shaft that in turn drives a friction disk within a friction heat generator. Frictional contact between the friction disk and the plate generates heat. The friction heat generator transfers heat to the water circuit to elevate the temperature of water.
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) : F25D 25/00
US CL. : 62/115
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.: 62/115, 324.1, 324.5, 498, 500

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)
East –heat pump, expander, shaft

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>
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<tbody>
<tr>
<td>X</td>
<td>US 6,606,860 B2 (MCFARLAND) 19 AUGUST 2003 (19.08.2003), SEE ENTIRE DOCUMENT.</td>
<td>1-6, 11</td>
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<td>Y</td>
<td>US 5,216,899 A (FABRIS) 08 JUNE 1993 (08.06.1993), SEE ENTIRE DOCUMENT.</td>
<td>12-16</td>
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<td>A</td>
<td>US 4,197,715 A (FAWCETT ET AL) 15 APRIL 1980 (15.04.1980), SEE ENTIRE DOCUMENT.</td>
<td>1-21</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of Box C.

Date of the actual completion of the international search

Authorized officer
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