Title: IMPROVED REFRIGERATION DEVICE WITH IMPROVED DC MOTOR

Abstract: A miniature cooling device (100) includes numerous improvements capable of increasing the reliability and useful lifetime of the device, as well as improving electrical power to cooling power conversion efficiency. The improvements include a unitary DC motor shaft design (102) that incorporates a unitary mass flywheel (314) into the shaft element (300) and provides a solid shaft cross-section (302) for increasing magnetic flux density in the DC motor. Additional improvements include a bend resistant flexible vane (114) in the DC motor to compression piston drive coupler (806), reduced dead space volume within the compression cylinder (818), improved heat dissipation by a cylinder head cover (1300) and an athermalized compressor design that provides uniformly efficient operation over a wide range of operating temperatures. Further improvements include fabrication and coating improvements that increase the life of compression piston and compression cylinder wear surfaces.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
   IPC(7) : F25B 9/00; H02K 31/00
   US CL : 62/6; 310/178, 67R
   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. : 62/6; 310/178, 67R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
   None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
   None

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,P</td>
<td>US 2005/0002123 A1 (CAMERON) 06 January 2005 (06.01.2005), see entire document.</td>
<td>1-25</td>
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<tr>
<td>A</td>
<td>US 5,865,091 A (DOMANSKI et al) 02 February 1999 (02.02.1999), see entire document.</td>
<td>1-25</td>
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<td>A</td>
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<tr>
<td>A</td>
<td>US 6,076,358 A (BIN-NUN) 20 June 2000 (20.06.2000), see entire document.</td>
<td>1-25</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
   09 November 2005 (09.11.2005)

Date of mailing of the international search report
   13 JAN 2006

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