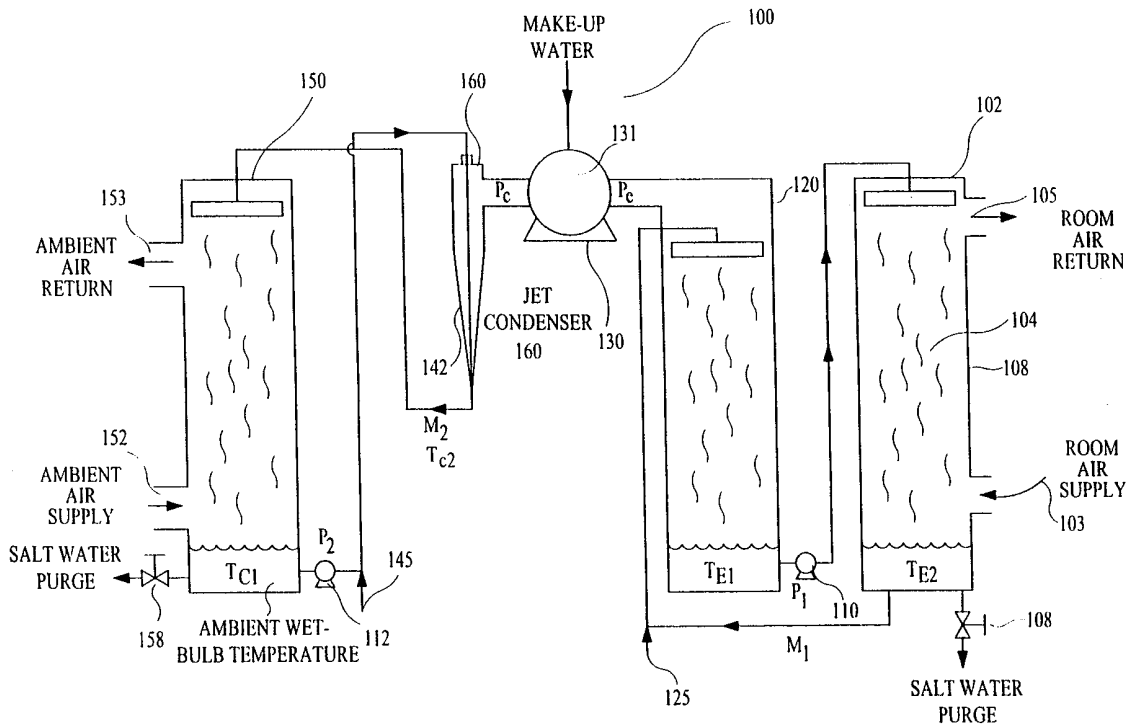




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification <sup>7</sup> : <b>F24F 5/00, F25B 29/00, F04C 18/10, 18/02,</b> (Continued on the following page)</p>	<p><b>A3</b></p>	<p>(11) International Publication Number: <b>WO 00/06955</b> (43) International Publication Date: 10 February 2000 (10.02.00)</p>
<p>(21) International Application Number: PCT/US99/16882 (22) International Filing Date: 27 July 1999 (27.07.99) (30) Priority Data: 09/126,325 31 July 1998 (31.07.98) US (71) Applicant: THE TEXAS A &amp; M UNIVERSITY SYSTEM [US/US]; 310 Wisenbaker, College Station, TX 77843-3122 (US). (72) Inventors: HOLTZAPPLE, Mark, T.; 1805 Southwood Drive, College Station, TX 77840 (US). DAVISON, Richard; 303 Crescent, Bryan, TX 77801 (US). RABROKER, G., Andrew; 213 Bucknell, College Station, TX 77840 (US). (74) Agents: REMENICK, James et al.; Baker &amp; Botts, L.L.P., The Warner, 1299 Pennsylvania Avenue, N.W., Washington, DC 20004 (US).</p>	<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b> With international search report.</p> <p>(88) Date of publication of the international search report: 8 September 2000 (08.09.00)</p>	

(54) Title: VAPOR-COMPRESSION EVAPORATIVE AIR CONDITIONING SYSTEM



(57) Abstract

Novel vapor compression evaporative cooling systems which use water as a refrigerant are provided, as are methods for using same. Also provided are novel compressors, compressor components, and means for removing noncondensibles useful in such cooling systems.

(Continued)

F04C 18/344, F04B 37/14, 7/00, 39/00, F16M 11/14, F16C 11/06, 33/74, B01D 53/26

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# INTERNATIONAL SEARCH REPORT

Intern. Application No  
PCT/US 99/16882

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>					
IPC 7	F24F5/00	F25B29/00	F04C18/10	F04C18/02	F04C18/344
	F04B37/14	F04B7/00	F04B39/00	F16M11/14	F16C11/06
	F16C33/74	B01D53/26			
According to International Patent Classification (IPC) or to both national classification and IPC					

<b>B. FIELDS SEARCHED</b>					
Minimum documentation searched (classification system followed by classification symbols)					
IPC 7	F24F	F25B	F04C	F04B	B01D F16M F16C

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 practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DIRK VAN ORSHOVEN: "The use of water as a refrigerant" THERMAL STORAGE APPLICATIONS RESEARCH CENTER, XP002121470 University of Wisconsin cited in the application the whole document ---	1,49,57
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-/--		

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search

24 January 2000

Date of mailing of the international search report

**25. 04. 2000**

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/16882

**C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 035 590 A (STEFFENS RALF) 30 July 1991 (1991-07-30) abstract; figures ----	60
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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 99/16882

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-59

Air-conditioning system and method

2. Claims: 60-90

A positive displacement compressor

3. Claims: 91-95

A vacuum pump

4. Claims: 96-97

A gerotor vacuum pump

5. Claim : 98

A pivotable mounting apparatus

6. Claim : 99

Rotary shaft seal

7. Claim : 100

A method for removing water vapor

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/16882

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Information on patent family members

International Application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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