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(54) **Capacity modulated compressor**

(57) A heat pump system may include first and second heat exchangers, a compressor, and a fluid conduit. The compressor may include a capacity modulation system providing first, second, and third capacities of the compressor. The second capacity may be less than the first capacity and greater than the third capacity. The fluid conduit may provide fluid communication between the first and second heat exchangers and the compressor. The fluid conduit may define a first flow path from the

compressor to the first heat exchanger and from the first heat exchanger to the second heat exchanger during a cooling mode and a second flow path from the compressor to the second heat exchanger and from the second heat exchanger to the first heat exchanger during a heating mode. The compressor may operate at the first capacity during the heating mode and at the second capacity during the cooling mode.

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EUROPEAN SEARCH REPORT

Application Number
EP 08 25 1177

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 6 123 517 A (BROOKE RICHARD D [US] ET AL) 26 September 2000 (2000-09-26) * figure 18 * * column 9, line 43 - column 10, line 45 * * claims 1,29,30 * -----	1-14, 20-26	INV. F04C18/02 F04C28/14 F25B1/04 F25B13/00
X	US 2005/019177 A1 (SHIN DONG KOO [KR] ET AL) 27 January 2005 (2005-01-27) * figures 8-11 * * paragraphs [0008], [0017], [0107] - [0126] * -----	1-12, 20-26	
X	US 4 383 805 A (TEEGARDEN ARLO F ET AL) 17 May 1983 (1983-05-17) * figures 1-6 * * column 2, line 38 - column 3, line 18 * * column 4, line 30 - line 34 * * column 7, line 7 - column 8, line 66 * -----	1-12, 20-26	
X	GB 2 403 271 A (SCROLL TECH [US]) 29 December 2004 (2004-12-29) * figures 2-4 * * page 1, line 13 - line 29 * * page 3, line 25 - page 4, line 26 * -----	1-5,11, 12,20-26	TECHNICAL FIELDS SEARCHED (IPC) F04C F25B
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X	US 5 577 897 A (INAGAKI MITSUO [JP] ET AL) 26 November 1996 (1996-11-26) * figures 1-8,14-18 * * claim 1 * * column 15, line 38 - line 40 * ----- -/--	1-12, 20-26	
3 The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 22 October 2008	Examiner Lequeux, Frédéric
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 08 25 1177

DOCUMENTS CONSIDERED TO BE RELEVANT			
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		22 October 2008	Lequeux, Frédéric
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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Application Number

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-14,20-26

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-14,20-26

Compressor with three operating capacities

2. claims: 15-19

Heat pump with reversible flow

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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22-10-2008

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