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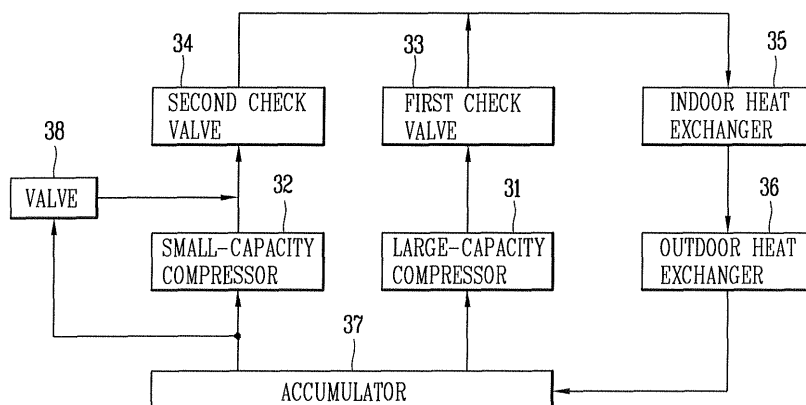
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(54) **Air-conditioner and operation control method thereof**

(57) An air-conditioner includes a small-capacity compressor and a large-capacity compressor for compressing a refrigerant to a high temperature high pressure gaseous refrigerant; a valve for connecting a suction

opening of a refrigerant channel of the large-capacity compressor and a discharge passage of a refrigerant channel of the large-capacity compressor; and a controller for controlling the small-capacity compressor, the large-capacity compressor and the valve.

FIG. 3





EUROPEAN SEARCH REPORT

Application Number
EP 05 10 1673

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	GB 2 209 851 A (TOSHIBA KK [JP]) 24 May 1989 (1989-05-24) * page 4, line 26 - page 12, line 10; figures 1-7 *	1	INV. F25B49/02
X	US 2002/073721 A1 (SEO HYEONG-JOON [KR] ET AL) 20 June 2002 (2002-06-20) * paragraph [0025] - paragraph [0046]; figures 1-5 *	1,2,4,9	
Y	EP 1 598 616 A2 (SAMSUNG ELECTRONICS CO LTD [KR]) 23 November 2005 (2005-11-23) * paragraph [0014] - paragraph [0063]; figures 1-7 *	3	
E	JP 10 205895 A (MATSUSHITA REFRIGERATION) 4 August 1998 (1998-08-04) * the whole document *	1,2,9	
A	US 2004/098994 A1 (LEE WON HEE [KR]) 27 May 2004 (2004-05-27) * paragraph [0035] - paragraph [0075]; figures 2,3 *	4	
Y	US 2004/118135 A1 (LEE WON HEE [KR] ET AL) 24 June 2004 (2004-06-24) * paragraph [0024] - paragraph [0060]; figures 2,3 *	3,10	
			TECHNICAL FIELDS SEARCHED (IPC)
			F25B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 16 April 2012	Examiner Szilagyi, Barnabas
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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EPO FORM 1503 03.82 (P04C01)



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:

☐ 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

EP 05 10 1673

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, 2, 4, 9

An air-conditioner comprising a small-capacity and a large-capacity compressor a valve and a controller for controlling the compressors and the valve
Air-conditioner and method wherein while the small-capacitor compressor is being operated, the controller operates the valve for a certain time before actuating the large-capacity compressor, and then, the controller operates the large-capacity compressor.

2. claims: 1, 3, 5-8, 10-16

Air-conditioner and method wherein the controller performs a controlling operation by the following steps comprising:
a first step in which, in case of a cooling operation, a small-capacity compressor and a large-capacity compressor are actuated, and then, when a value of a room temperature varied by the actuated small-capacity compressor and large-capacity compressor is smaller than a value obtained by subtracting a pre-set first temperature from a desired temperature set by a user, the small-capacity compressor and the large-capacity compressor are stopped;
a second step in which in a state than the small-capacity compressor and the large-capacity compressor are stopped, when the value of the room temperature is greater than a value obtained by adding a pre-set second temperature to the desired temperature, it goes back to the first step;
a third step in which the first and second steps are repeatedly performed as many as the pre-set number of times;
a fourth step in which only the small-capacity compressor is controlled to satisfy a relation of (desired temperature - pre-set first temperature room temperature (desired temperature - pre-set second temperature));
a fifth step in which when the value of the room temperature is greater than a value obtained by adding a pre-set third temperature to the desired temperature, a valve is operated for a certain time and then stopped; and
a sixth step in which the large-capacity compressor is actuated.

**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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16-04-2012

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