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- **Maeno, Masashi**
1, Aza Takamichi, Iwatsuka-cho, Nakamura-ku Nagoya Aichi 453-8515 (JP)
- **Isozumi, Shinichi**
3-1, Asahi, Nishibiwajima-cho Kiyosu Aichi 452-8561 (JP)
- **Mitoma, Keisuke**
3-1, Asahi, Nishibiwajima-cho Kiyosu Aichi 452-8561 (JP)

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(71) Applicant: **MITSUBISHI HEAVY INDUSTRIES, LTD. Tokyo 108-8215 (JP)**

(74) Representative: **Bongiovanni, Simone et al STUDIO TORTA Via Viotti 9 10121 Torino (IT)**

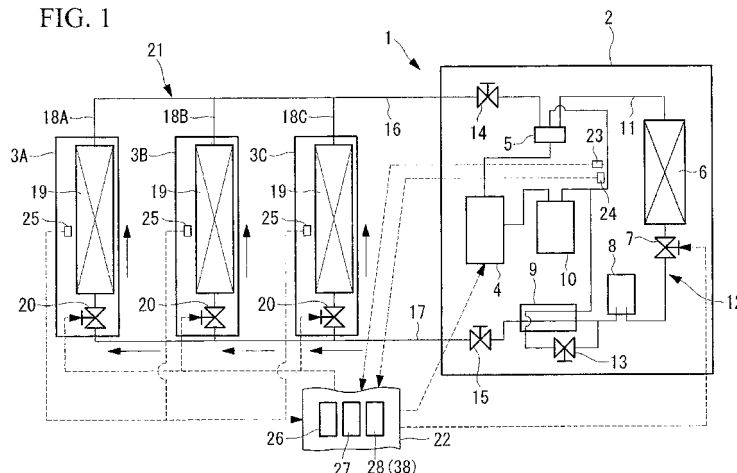
(72) Inventors:
• **Watanabe, Satoshi**
1, Aza Takamichi, Iwatsuka-cho, Nakamura-ku Nagoya Aichi 453-8515 (JP)

(54) **Air-conditioning apparatus**

(57) An air-conditioning apparatus (1) capable of reliably recovering lubricant accumulated in indoor units (3A,3B,3C) and their refrigerant circuit, regardless of the refrigerant-pipe length differences of the indoor units connected to each other, has been desired, and includes an operating unit (22) configured to carry out liquid return at each indoor unit, to carry out an oil-recovery operation for recovering lubricant accumulated in the refrigerant

circuit, and to complete the oil-recovery operation when liquid return is detected at the outdoor unit (2). The operating unit includes a detecting unit configured to detect the refrigerant pipe length of each of the indoor units, a storing unit configured to store the refrigerant pipe lengths detected by the detecting unit, and a control unit configured to change the operation time during the oil-recovery operation on the basis of the refrigerant pipe length of each of the indoor units stored in the storing unit.

FIG. 1





EUROPEAN SEARCH REPORT

Application Number
EP 07 11 8087

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	JP 10 288410 A (DAIKIN IND LTD) 27 October 1998 (1998-10-27) * the whole document *	1,6	INV. F25B31/00 F25B49/02
A,D	JP 2006 183979 A (MITSUBISHI HEAVY IND LTD) 13 July 2006 (2006-07-13) * the whole document *	1,6	ADD. F25B13/00
A	GB 2 223 330 A (TOSHIBA KK [JP]; TOSHIBA AUDIO VIDEO ENG [JP]) 4 April 1990 (1990-04-04) * page 6, line 25 - page 11, line 9; figures 1-7 *	1,6	
A	EP 0 848 214 A2 (SANYO ELECTRIC CO [JP]) 17 June 1998 (1998-06-17) * page 3, line 30 - page 7, line 26; figures 1-4 *	1,6	
			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 3 May 2011	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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**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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03-05-2011

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 10288410	A	27-10-1998	NONE	
JP 2006183979	A	13-07-2006	NONE	
GB 2223330	A	04-04-1990	JP 2013760 A	18-01-1990
			US 4932215 A	12-06-1990
EP 0848214	A2	17-06-1998	DE 69720662 D1	15-05-2003
			DE 69720662 T2	01-04-2004
			ID 19160 A	18-06-1998
			JP 3732907 B2	11-01-2006
			JP 10170108 A	26-06-1998
			US 5966947 A	19-10-1999