



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 553 293 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
08.03.2006 Bulletin 2006/10

(51) Int Cl.:
F04B 27/10 (2006.01) **F04B 53/08** (2006.01)
F04B 53/16 (2006.01)

(43) Date of publication A2:
13.07.2005 Bulletin 2005/28

(21) Application number: **04030278.8**

(22) Date of filing: **21.12.2004**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR**
Designated Extension States:
AL BA HR LV MK YU

- **Ota, Masaki**
Kariya-shi
Aichi-ken (JP)
- **Fukanuma, Tetsuhiko**
Kariya-shi
Aichi-ken (JP)
- **Murase, Masakazu**
Kariya-shi
Aichi-ken (JP)

(30) Priority: **25.12.2003 JP 2003431650**

(71) Applicant: **KABUSHIKI KAISHA TOYOTA**
JIDOSHOKKI
Kariya-shi,
Aichi-ken (JP)

(74) Representative: **HOFFMANN EITLE**
Patent- und Rechtsanwälte
Arabellastrasse 4
81925 München (DE)

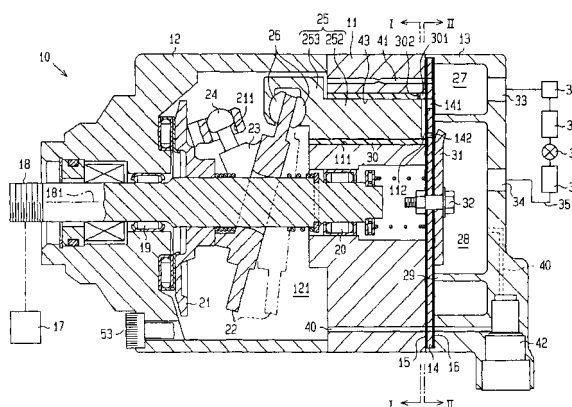
(72) Inventors:
• **Enokijima, Fuminobu**
Kariya-shi
Aichi-ken (JP)

(54) Heat insulating structure in piston type compressor

(57) A heat insulating structure in a piston type compressor includes a heat insulating member. The piston type compressor includes a cylinder block and a cover housing connected to the cylinder block, a piston is accommodated in a cylinder bore defined in the cylinder block to define a compression chamber. A suction pressure region and a discharge pressure region are defined in the cover housing. The piston is reciprocated in the

cylinder bore in accordance with rotation of a rotary shaft so that refrigerant gas is drawn from the suction pressure region to the compression chamber and discharged from the compression chamber to the discharge pressure region. The heat insulating member has a predetermined shape and is located in the cylinder block. The heat insulating member has an inner peripheral surface that defines the cylinder bore.

FIG. 1



EP 1 553 293 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 03 0278

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 2002/056364 A1 (SCHWARZKOPF, OTFRIED) 16 May 2002 (2002-05-16) * paragraph [0001] *	1-3,6,12	F04B27/10 F04B53/08 F04B53/16
Y	* paragraph [0010] - paragraph [0011] * * figures 1-3 *	5,8	
Y	----- US 4 370 104 A (WHITE CONSOLIDATED INDUSTRIES, INC.) 25 January 1983 (1983-01-25) * column 3, line 1 - line 56 * * figure 2 *	5	
Y	----- WO 02/35093 A (FISHER & PAYKEL APPLIANCES LIMITED; SEAGAR, NEVILLE, DAVID; MCGILL, IA) 2 May 2002 (2002-05-02) * abstract * * page 10, line 8 - line 16 *	8	
X	----- US 2003/175129 A1 (IIZUKA JIRO ET AL) 18 September 2003 (2003-09-18) * paragraph [0030] * * paragraph [0036] * * claim 1 * * figures 1,2 *	1-3,6	TECHNICAL FIELDS SEARCHED (IPC) F04B
X	----- DE 102 31 212 A1 (VOLKSWAGEN AG) 6 February 2003 (2003-02-06) * the whole document *	1,12	
A	----- US 2003/221549 A1 (DANFOSS A/S; HANSEN, OVE THORBOL ET AL.) 4 December 2003 (2003-12-04) * paragraph [0028] * * figure 1 *	1,8	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 17 January 2006	Examiner Gnächtel, F
<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>			

3
EPO FORM 1503 03.82 (P04C01)

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

EP 04 03 0278

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

17-01-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002056364 A1	16-05-2002	DE 10051420 A1	25-04-2002
		JP 2002180954 A	26-06-2002

US 4370104 A	25-01-1983	AU 540530 B2	22-11-1984
		AU 7255281 A	28-01-1982
		CA 1151553 A1	09-08-1983
		NZ 197600 A	24-08-1984

WO 0235093 A	02-05-2002	AU 7974100 A	06-05-2002
		BR 0017357 A	10-02-2004
		CA 2426385 A1	02-05-2002
		EP 1328727 A1	23-07-2003
		JP 2004512460 T	22-04-2004
		MX PA03003375 A	07-08-2003
		TW 504546 B	01-10-2002

US 2003175129 A1	18-09-2003	DE 10307555 A1	11-09-2003
		JP 2003247487 A	05-09-2003

DE 10231212 A1	06-02-2003	NONE	

US 2003221549 A1	04-12-2003	DE 10223844 A1	18-12-2003
		GB 2391271 A	04-02-2004
		JP 2004003487 A	08-01-2004
