



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 028 253 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
03.01.2001 Bulletin 2001/01

(51) Int. Cl.⁷: **F04B 27/18**

(43) Date of publication A2:
16.08.2000 Bulletin 2000/33

(21) Application number: **00102697.0**

(22) Date of filing: **09.02.2000**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **10.02.1999 JP 3289399**

(71) Applicant:
**Kabushiki Kaisha
Toyoda Jidoshokki Seisakusho
Aichi-ken (JP)**

(72) Inventors:
• **Ota, Masaki,
c/o K.K. Toyoda Jidoshokki Seisakusho
Kariya-shi, Aichi-ken (JP)**

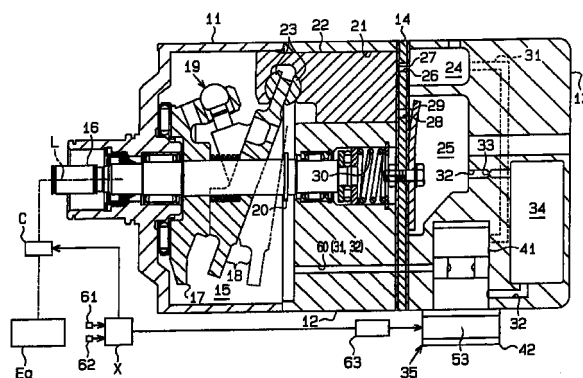
• **Suitou, Ken,
c/o K.K. Toyoda Jidoshokki Seisakusho
Kariya-shi, Aichi-ken (JP)**
• **Nishimura, Kenta,
c/o K. K. Toyoda Jidoshokki
Kariya-shi, Aichi-ken (JP)**
• **Kurakake, Hirotaka,
c/o K. K. Toyoda Jidoshokki
Kariya-shi, Aichi-ken (JP)**

(74) Representative:
**Pellmann, Hans-Bernd, Dipl.-Ing. et al
Patentanwaltsbüro
Tiedtke-Bühling-Kinne & Partner
Bavariaring 4-6
80336 München (DE)**

(54) **Displacement control structure of variable displacement type compressor**

(57) A variable displacement compressor includes a bleed passage (31) for connecting a crank chamber (15) to a suction chamber (24) and a supply passage (32) for connecting the crank chamber (15) to a discharge chamber (25). The supply passage (32) includes a fixed restriction (33). A buffer chamber (34) is located in the supply passage (32) between the fixed restriction (33) and the crank chamber (15). A first valve element (44) selectively opens and closes the supply passage (32) between the buffer chamber (34) and the crank chamber (15). A solenoid (42) actuates the first valve element (44) in response to a current. A second valve element (48) opens and closes the bleed passage (31). When the first valve element (44) closes the supply passage (32), the second valve element (48) opens the bleed passage (31). When the first valve element (44) is open, the second valve element (48) operates in accordance with the difference between the pressure in the crank chamber (15) and the pressure in the suction chamber. In this compressor, the displacement can be changed rapidly, the efficiency of the compressor is relatively high, and the pressure in the crank chamber (15) is limited.

Fig.1



EP 1 028 253 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 10 2697

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 332 365 A (TAGUCHI YUKIHIKO) 26 July 1994 (1994-07-26)	1,2,4-8	F04B27/18
Y	* abstract * * column 4, line 66 - column 8, line 52 * * column 13, line 23 - column 15, line 33; figures 1-3,7 *	3	
Y	DE 197 33 099 A (TOYODA AUTOMATIC LOOM WORKS) 12 February 1998 (1998-02-12)	3	
A	* column 3, line 5 - column 14, line 67 * * figures 1-5 *	1,5,7,8	
Y	EP 0 864 749 A (SAGINOMIYA SEISAKUSHO INC ;TOYODA AUTOMATIC LOOM WORKS (JP)) 16 September 1998 (1998-09-16)	1-7	
Y	* abstract * * column 7, line 54 - column 8, line 21 * * figures 1-3,5 *		
Y	EP 0 498 552 A (SANDEN CORP) 12 August 1992 (1992-08-12)	1-7	
	* column 19, line 26 - column 20, line 9 * * figures 3,4 *		TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	US 5 282 329 A (TERANISHI TOSHIHIRO) 1 February 1994 (1994-02-01)	1,2,4-7	F04B
	* abstract * * column 3, line 14 - column 5, line 63 * * figures 1-3 *		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 14 November 2000	Examiner Kolby, L
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			

EPO FORM 1503 03/82 (P04C01)

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

EP 00 10 2697

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.

14-11-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5332365 A	26-07-1994	JP 5099136 A	20-04-1993
		AU 659217 B	11-05-1995
		AU 2620792 A	08-04-1993
		CA 2080066 A,C	08-04-1993
		EP 0536989 A	14-04-1993
		US RE35672 E	25-11-1997
DE 19733099 A	12-02-1998	FR 2752020 A	06-02-1998
		JP 10103249 A	21-04-1998
		US 6010312 A	04-01-2000
EP 0864749 A	16-09-1998	JP 10318155 A	02-12-1998
		US 6102668 A	15-08-2000
EP 0498552 A	12-08-1992	JP 4252877 A	08-09-1992
		JP 4262074 A	17-09-1992
		AU 639385 B	22-07-1993
		AU 1049692 A	30-07-1992
		CA 2060130 C	13-08-1996
		CN 1064731 A,B	23-09-1992
		DE 69200356 D	06-10-1994
		DE 69200356 T	16-02-1995
		KR 9703250 B	15-03-1997
		SG 9590720 A	01-09-1995
		US 5242274 A	07-09-1993
US 5282329 A	01-02-1994	JP 5288150 A	02-11-1993
		DE 4310922 A	07-10-1993
		KR 9701758 B	15-02-1997