



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 318 308 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
03.12.2003 Bulletin 2003/49

(51) Int Cl.7: **F04D 19/04, F04D 29/26**

(43) Date of publication A2:
11.06.2003 Bulletin 2003/24

(21) Application number: **02258145.8**

(22) Date of filing: **27.11.2002**

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

(72) Inventors:
• **Nonaka, Manabu**
Narashino-shi, Chiba (JP)
• **Miwata, Tooru**
Narashino-shi, Chiba (JP)
• **Kabasawa, Takashi**
Narashino-shi, Chiba (JP)

(30) Priority: **04.12.2001 JP 2001370627**

(71) Applicant: **BOC Edwards Technologies, Limited**
Narashino-shi, Chiba (JP)

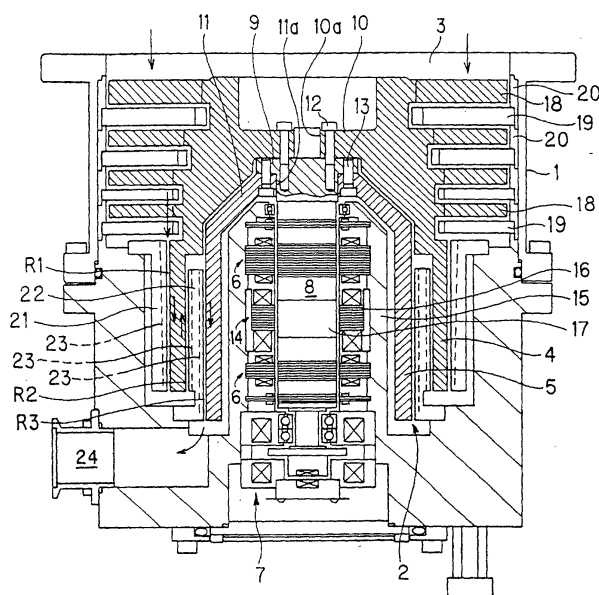
(74) Representative: **Sturt, Clifford Mark et al**
Miller Sturt Kenyon
9 John Street
London WC1N 2ES (GB)

(54) **Vacuum pump**

(57) A multiple cylinder (2) having a plurality of cylinders (4, 5) arranged concentrically and a rotor shaft (8) rotatably disposed on the center axis of the multiple

cylinder are provided in a pump casing (1). Each of the cylinders that constitute the multiple cylinder has a mounting portion (10, 11), through which the cylinders are integrally fixed to the rotor shaft.

FIG. 1



EP 1 318 308 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 25 8145

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)
Y	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 13, 30 November 1999 (1999-11-30) & JP 11 210674 A (EBARA CORP), 3 August 1999 (1999-08-03) * abstract *	1,2,10	F04D19/04 F04D29/26
Y	--- PATENT ABSTRACTS OF JAPAN vol. 2002, no. 03, 3 April 2002 (2002-04-03) & JP 2001 323892 A (SHIMADZU CORP), 22 November 2001 (2001-11-22) * abstract *	1,2,10	
A	--- EP 0 260 733 A (ULTRA CENTRIFUGE NEDERLAND NV) 23 March 1988 (1988-03-23) * figure 1 *	1,11	
A	--- EP 0 805 275 A (BOC GROUP PLC) 5 November 1997 (1997-11-05) * figure 1 *	1	
A	--- PATENT ABSTRACTS OF JAPAN vol. 2000, no. 26, 1 July 2002 (2002-07-01) & JP 2001 248587 A (KASHIYAMA KOGYO KK), 14 September 2001 (2001-09-14) * abstract *	6,8	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 14 October 2003	Examiner Teerling, J
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 03.02 (P04C01)

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

EP 02 25 8145

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.

14-10-2003

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
JP 11210674	A	03-08-1999	NONE		
JP 2001323892	A	22-11-2001	NONE		
EP 0260733	A	23-03-1988	NL	8602052 A	01-03-1988
			DE	3768593 D1	18-04-1991
			EP	0260733 A1	23-03-1988
EP 0805275	A	05-11-1997	EP	0805275 A2	05-11-1997
			JP	10089285 A	07-04-1998
			US	5848873 A	15-12-1998
JP 2001248587	A	14-09-2001	NONE		