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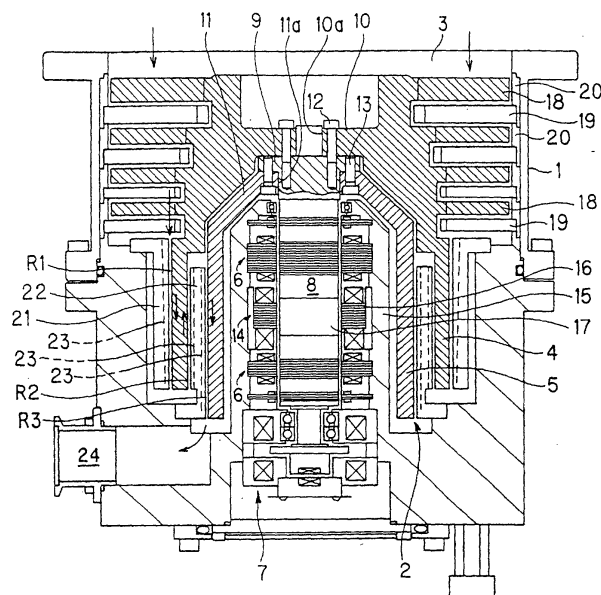
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(54) **Vacuum pump**

(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





European Patent
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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	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			F04D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		14 October 2003	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	

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**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
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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 DE 3768593 D1 EP 0260733 A1	01-03-1988 18-04-1991 23-03-1988
EP 0805275 A	05-11-1997	EP 0805275 A2 JP 10089285 A US 5848873 A	05-11-1997 07-04-1998 15-12-1998
JP 2001248587 A	14-09-2001	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82