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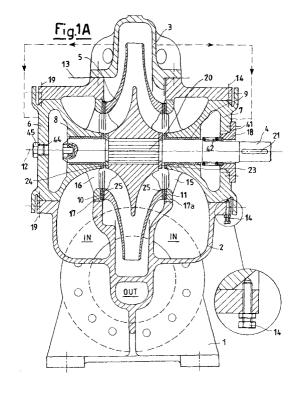
  MC NL PT SE TR

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- (54) Centrifugal pump with adjustment of the axial and radial clearances without opening the pump body
- (57) A centrifugal pump comprises a pump body or casing (2), a rotor (5) connected to a shaft (4), an upper removable cover (3), with the seal between the pump body (2) and the rotor (5) being ensured by rings (10, 11), attached to the casing (2), facing rings (25), at-

tached to the rotor (5), which are made to rotate with it. According to the invention, both the fixed sealing rings (10, 11) and the bearings for supporting the rotating part of the pump (8, 9; 8bis, 9bis) are assembled on two removable side covers (6, 7) arranged at the two sides of the pump body (2).





## **EUROPEAN SEARCH REPORT**

Application Number EP 02 07 6079

	DOCUMENTS CONSID	ERED TO BE RELEVANT					
Category	Citation of document with ir of relevant passa	idication, where appropriate, ges	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)			
A	FR 2 045 470 A (ITT 26 February 1971 (1 * page 2, line 3 - figures 2,4 *	971-02-26)	1,3,7,11	F04D29/62 F04D29/42 F04D29/16			
A	7 April 1932 (1932-	REY ET BERGERON SOC) 04-07) - column 2, line 56;	1,6				
A	AG) 23 October 1986	CHF AUGSBURG NUERNBERG (1986-10-23) - column 3, line 44;	1,2,4,5,				
A	US 6 004 094 A (PRE 21 December 1999 (1 * page 6, paragraph 2; figure 1 *		1,6				
				TECHNICAL FIELDS SEARCHED (Int.Cl.7)			
				F04D			
	MANUFACTOR OF THE PROPERTY OF		-				
	The present search report has t		1	Examiner			
	Place of search	Date of completion of the search	D;	Giorgio, F			
	MUNICH	4 February 2003					
X : parti Y : parti docu	TEGORY OF CITED DOCUMENTS oularly relevant if taken alone oularly relevant if combined with anothe ment of the same category	L. : document cited fo	oument, but publis e n the application or other reasons	hed on, or			
O:non-	nological background written disclosure mediate document		& : 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 02 07 6079

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.

04-02-2003

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
FR 2045470	Α	26-02-1971	BE DE FR NL	749160 2018576 2045470 7005537	A1 A5	20-10-1970 12-11-1970 26-02-1971 20-10-1970
FR 723344	A	07-04-1932	NONE	MAN PARK THE THE MAN SAME SAME SAME SAME SAME SAME	1 MB 460 ATT 100 400 400	NAME AND AND THE EAST MAD AND AND THE THE REST THE SHEET ALS
DE 3513116	Α	23-10-1986	DE	3513116	A1	23-10-1986
US 6004094	A	21-12-1999	IT AT DE DE DE DK EP ES PT	69801740 959254 959254	T D1 T2 T1 T3 A1	22-11-1999 15-10-2001 25-10-2001 04-07-2002 03-05-2001 07-01-2002 24-11-1999 16-01-2002 28-02-2002

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