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(54) **Regenerative pump having vanes and side channels particularly shaped to direct fluid flow**

(57) A regenerative or toric pump adds energy to a fluid using an impeller having an axis of rotation and axially spaced, radially extending first and second surfaces. A casing encloses the impeller and has a fluid inlet and a fluid outlet separated by a stripper. The casing has axially spaced, radially extending first and second sidewalls facing the first and second surfaces of the impeller respectively. Axially and radially extending blades or vanes are formed on an outer radial periphery of the impeller for driving fluid from the inlet toward the outlet as the impeller rotates about the axis of rotation. A fixed surface is formed in at least one sidewall of the casing for directing fluid back toward the impeller. Improved operating characteristics and extended range are accomplished through modification to the vane configuration of the impeller and/or by modification of the side channel configuration of the pump chamber in an asymmetrical fashion. The vanes can be modified to include a radially inward based portion extending in a generally trailing direction with respect to rotation of the impeller and a radially outward tip portion extending in a generally leading direction. The blades may also include a chamfered surface on the trailing edge of the base portion. The impeller chamber can be modified separately by expanding a side channel in the casing, or by insertion of a spacer between the side channel and the remaining portion of the casing defining the impeller chamber.

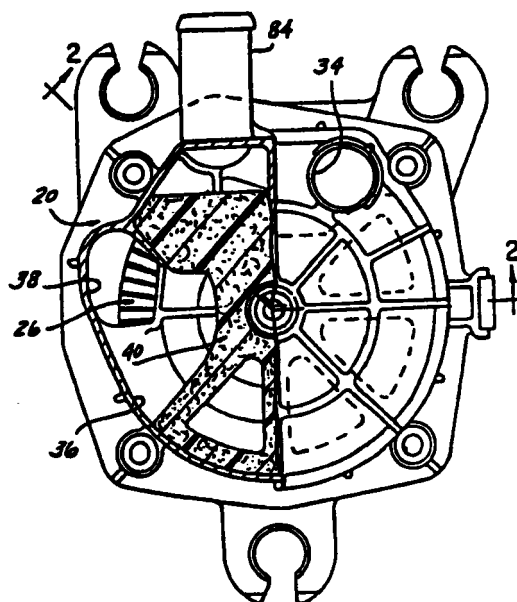


FIG-1

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EUROPEAN SEARCH REPORT

Application Number
EP 97 10 1009

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.6)
X	AU 128 026 B (BENDIX AVIATION) 31 October 1945 * column 3, line 15 - column 4, line 5; figures 1-8 *	1,2,6-8	F04D5/00 F04D29/18 F04D23/00
Y	---	3-5,9	
Y	DE 876 285 C (OESTERLEN) * the whole document *	3,4,9	
Y	---		
Y	US 1 650 873 A (KAY) 29 November 1927 * figure 1 *	5	
X	---		
X	EP 0 602 558 A (ALCATEL SEL) 22 June 1994 * page 2, column 2, line 3 - page 3, column 3, line 47; figures 1-4 *	1	
A,D	---		
A,D	US 5 302 081 A (SMITH) 12 April 1994 -----		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			F04D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16 December 1998	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			

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