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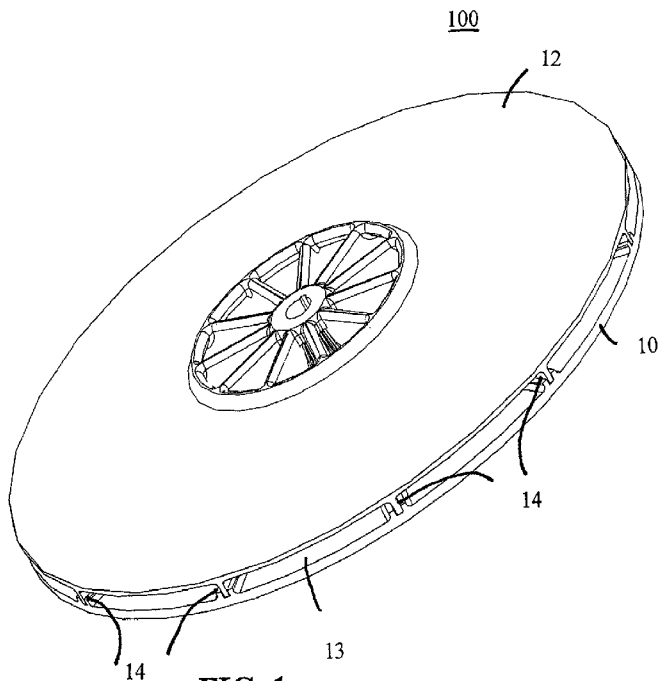
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(54) Title: IMPELLER ASSEMBLY AND METHOD FOR DEFINING AERODYNAMIC CHANNELS



**FIG. 1**

(57) Abstract: An impeller assembly and method of providing a plurality of radially-aligned aerodynamic channels including a rim plate defining a plurality of blades and the backplate defining a blade interlock structure for aligning and coupling the plates together. The rim plate defines a plurality of fluid-engaging blades with the aerodynamic channels being defined between adjacent pairs of the blades. The interlock structure includes a plurality of tine-shaped interlocks extending from the backplate. Each blade of the impeller may engage the interlock structure in a saddle manner. The backplate is defined by areas of reduced thickness allowing outer portions of the backplate to flex (rotate) toward further contact with the rim plate. The impeller assembly is provided with a plurality of aerodynamic channels defined by complex curved surfaces of the back plate and the rim plate to improve efficiency.



**INTERNATIONAL SEARCH REPORT**

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(8) - F04D 29/18 (2012.01) USPC - 416/182 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) USPC: 416/182 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched USPC: 415/97, 98, 203, 206; 416/179, 180, 181, 182, 185, 189, 214R, 222 (text search - see terms below) Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PubWEST(USPT,PGPB,EPAB,JPAB); Google Search Terms: impeller, channels, blade, airfoil, interlock, flexible, centrifugal, hub, backplane, torque		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008/0286130 A1 (PURVINES) 20 November 2008 (20.11.2008), entire document especially Figs 1-4; paras [0022], [0038]	10-13
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Y		1-9, 14-21
Y	US 2,465,625 A (AUE) 29 March 1949 (29.03.1949), entire document especially Figs 1-4; col 3, lns 14-45	1-9, 15-21
Y	US 3,510,229 A (SMITH) 05 May 1970 (05.05.1970), entire document especially col 2, lns 3-12	5, 14
A	US 7,008,189 B2 (JARRAH et al.) 07 March 2006 (07.03.2006), entire document especially col 1, lns 51-63; col 3, lns 42-58	1-21
A	US 2010/0263373 A1 (DECKER et al.) 21 October 2010 (21.10.2010), entire document	1-21
A	US 3,743,440 A (MOORE) 03 July 1973 (03.07.1973), entire document especially col 3, lns 5-25	1-21
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Date of the actual completion of the international search 08 May 2012 (08.05.2012)		Date of mailing of the international search report <p align="center" style="font-size: 1.2em;"><b>24 MAY 2012</b></p>
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201		Authorized officer: <p align="center">Lee W. Young</p> PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774