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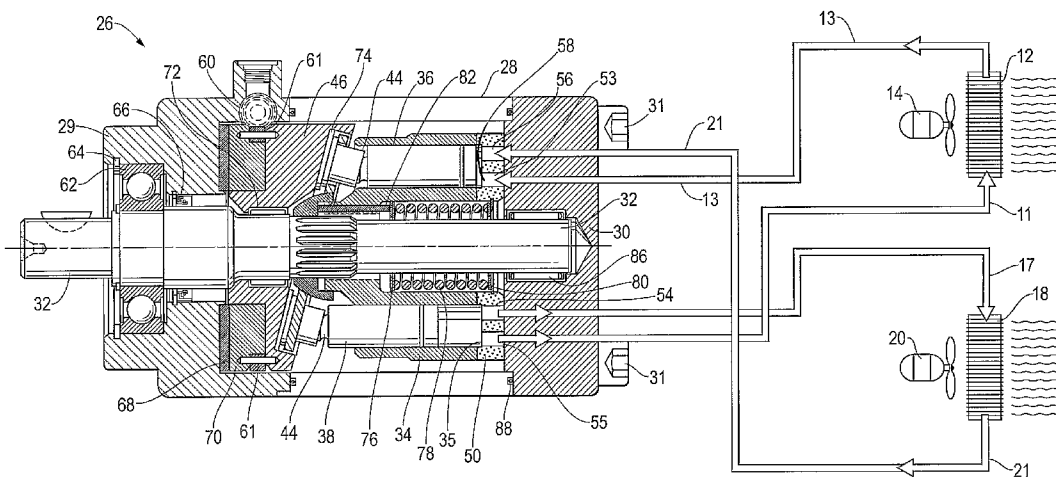
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(54) Title: INTEGRATED COMPRESSOR/EXPANSION ENGINE



(57) Abstract: A multi cylinder compressor/expansion engine having a centrally mounted drive shaft. A cylinder barrel is mounted on the drive shaft and both the cylinder barrel and the drive shaft rotate about a common axis. There is a plurality of cylinders in the cylinder barrel with pistons disposed in each of the cylinders. Some of the cylinders are compression cylinders and some of the cylinders are expansion cylinders. The compression cylinders discharge a fluid at a first high pressure from the engine. The expansion cylinders receive fluid at a second pressure which provides energy to the engine thereby reducing the energy required for the engine to rotate the drive shaft.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC: F25B 9/00( 2006.01);I700( 2006.01);3/00( 2006.01);F25D 9/00( 2006.01);F04B 1/12( 2006.01);49/00( 2006.01);F01B 3/00( 2006.01);13/04( 2006.01);F16D 39/00( 2006.01);F16H 23/00( 2006.01);35/08( 2006.01)

USPC: 62/86.87.401,402,498,499;417/269,310;91//499,505,506;92/12.2,57,70;60/487;74/60,839

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 62/86. 87. 401, 402, 498, 499; 417/269. 310; 91//499, 505, 506; 92/12.2, 57, 70; 60/487; 74/60, 839

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
Conducted electronic search by using search engine EAST.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,629,488 B2 (HUGELMAN) 07 October 2003 (07.10.2003), see the entire document.	1-31
A	US 5,979,294 A (HUGELMAN) 09 November 1999 (09.11.1999), see the entire document.	1-31
A	US 5,724,879 A (HUGELMAN) 10 March 1998 (10.03.1998), see the entire document.	1-31
A	US 6,880,448 B1 (LANGENFELD) 19 April 2005 (19.04.2005), see the entire document.	1-31
A	US 3,223,042 A (G. N. THRESHER) 14 December 1963 (14.12.1963), see the entire document.	1-31

Further documents are listed in the continuation of Box C.

See patent family annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

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