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(54) **SURGE CONTROL SYSTEMS AND METHODS FOR DYNAMIC COMPRESSORS**

(57) A system includes a dynamic compressor, a variable frequency drive (VFD), and a controller. The dynamic compressor includes a motor having a driveshaft rotatably supported within the dynamic compressor, and a compression mechanism connected to the driveshaft and operable to compress a working fluid upon rotation of the driveshaft. The VFD includes a sensor configured to sense a current provided to the motor. The controller is connected to the motor and includes a processor and a memory. The memory stores instructions that program the processor to operate the motor using the VFD to compress the working fluid, determine when surge events have occurred, store in the memory an indication of each determined surge event, and determine whether or not to take protective action when the processor determines that a surge event has occurred.

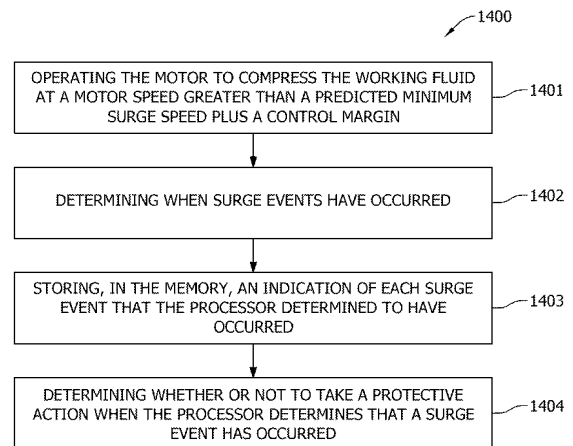


FIG. 14

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Application Number

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	<p>US 2011/093133 A1 (TURNERY ROBERT D [US] ET AL) 21 April 2011 (2011-04-21)</p> <p>* paragraphs [0004] - [0008], [0034], [0040], [0042], [0049], [0050], [0052], [0062], [0065], [0069], [0070], [0076] *</p> <p>* paragraphs [0077], [0080], [0081], [0083], [0088], [0090], [0091], [0097] - [0099], [0102] - [0104] *</p> <p>* figures 2, 4, 6D, 8A, 8B, 10, 13-15 *</p> <p>-----</p>	1-15	<p>INV.</p> <p>F04D17/12</p> <p>F04D25/06</p> <p>F04D27/00</p> <p>F04D27/02</p> <p>F04D29/056</p>
X	<p>US 4 608 833 A (KOUNTZ KENNETH J [US]) 2 September 1986 (1986-09-02)</p> <p>* column 3, lines 8-25 *</p> <p>* column 5, line 67 - column 6, line 14 *</p> <p>* column 6, lines 45-54 *</p> <p>* column 7, lines 21-30 *</p> <p>* column 7, line 67 - column 8, line 19 *</p> <p>* column 8, line 65 - column 9, line 10 *</p> <p>-----</p>	1-15	
A	<p>US 2017/002820 A1 (BENIM ALEXANDER [US]) 5 January 2017 (2017-01-05)</p> <p>* paragraphs [0009], [0015], [0023], [0027], [0030], [0049] *</p> <p>* page 2B *</p> <p>-----</p>	1-15	<p>TECHNICAL FIELDS SEARCHED (IPC)</p> <p>F04D</p>
A	<p>US 2014/260388 A1 (UMEDA NOBUHIRO [US] ET AL) 18 September 2014 (2014-09-18)</p> <p>* paragraphs [0120], [0128] *</p> <p>* figure 9 *</p> <p>-----</p>	1-15	
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		1 September 2023	De Tobel, David
CATEGORY OF CITED DOCUMENTS		<p>T : theory or principle underlying the invention</p> <p>E : earlier patent document, but published on, or after the filing date</p> <p>D : document cited in the application</p> <p>L : document cited for other reasons</p> <p>.....</p> <p>&amp; : member of the same patent family, corresponding document</p>	
<p>X : particularly relevant if taken alone</p> <p>Y : particularly relevant if combined with another document of the same category</p> <p>A : technological background</p> <p>O : non-written disclosure</p> <p>P : intermediate document</p>			

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ANNEX TO THE EUROPEAN SEARCH REPORT  
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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