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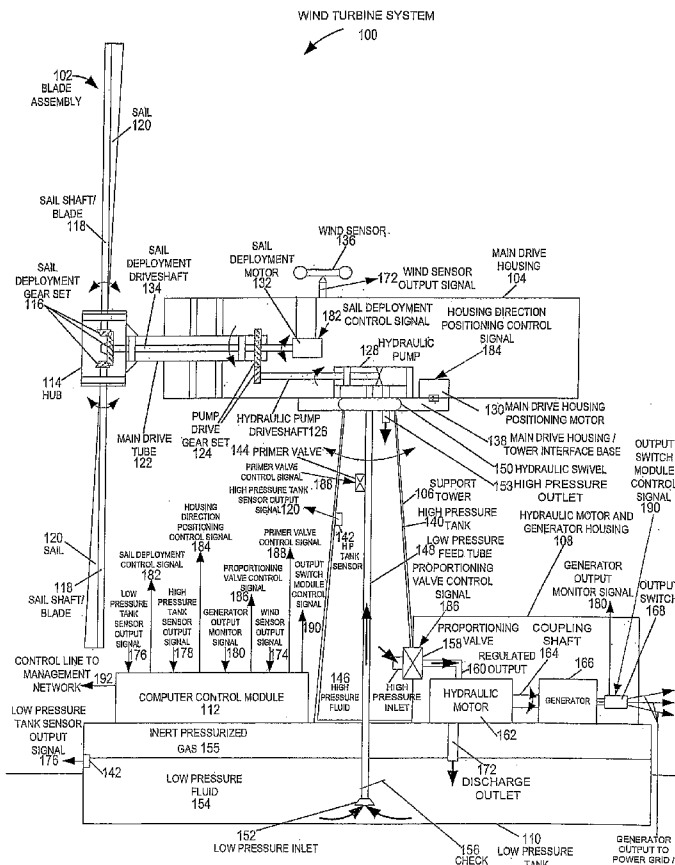
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(54) Title: METHODS AND APPARATUS FOR ADVANCED WIND TURBINE DESIGN



(57) Abstract: A wind turbine system includes a variable blade assembly including adjustable sails and wing shaped masts expanding the wind velocity capture envelope. The blade assembly turns a hydraulic pump, which pressurizes fluid and stores the pressurized fluid in a chamber in the support tower. Pressurized fluid is directed via an electronically controllable proportioning valve to a hydraulic motor which is coupled to an electric generator. A computer control module operates the proportioning valve regulating pressure to the hydraulic motor, maintaining generator rotational speed, and providing consistent output frequency to the power grid. Stored energy in the high pressure tank is used to continue generator operation after the winds cease, allowing early warning notification to the power management system of impending power loss. Residual pressure maintained in the high pressure tank allows restart operations via hydraulic pressure rather than power grid energy drain. On site high energy capacitors store additional energy.

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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US06/28905

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC: **F03D 9/00( 2006.01);H02P 9/04( 2006.01)**  
  
 USPC: **290/55**  
 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. : 290/55, 43, 44, 54; 60/398

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
 NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
 Please See Continuation Sheet

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,911,743 B2 (ISHIZAKI) 28 June 2005 (28.06.2005) see entire document	1-26
A	US 6,748,737 B2 (LAFFERTY) 15 June 2004 (15.06.2004) see entire document	1-26
A	US 5,495,128 A (BRAMMEIER) 27 February 1996 (27.02.1996) see entire document	1-26
A	US 4,815,936 A (STOLTZE) 28 March 1989 (28.03.1989) see entire document	1-26
A	US 4,792,700 A (AMMONS) 20 December 1988 (20.12.1988) see entire document	1-26

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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"O"	document referring to an oral disclosure, use, exhibition or other means	
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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 Jose Dees <i>[Signature]</i> Telephone No. 571-272-1569

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Continuation of B. FIELDS SEARCHED Item 3:

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