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(54) Title: BOUNDARY LAYER EFFECT TURBINE

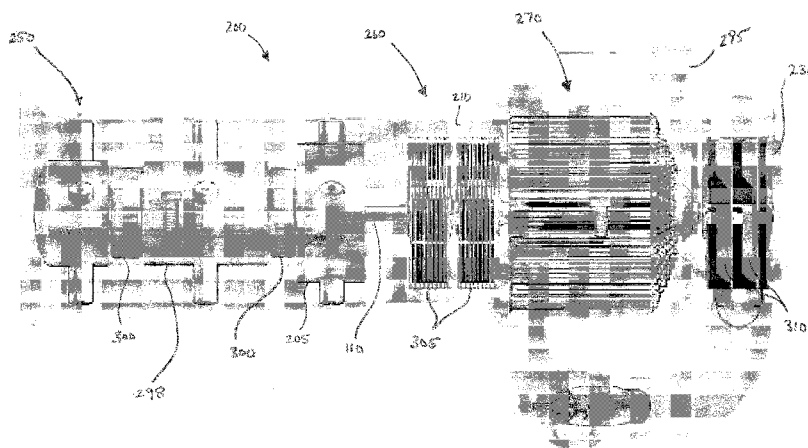


FIG. 5A

(57) Abstract: Described herein are embodiments of a boundary layer effect turbine and a hydrodynamic speed reducer. Described is a boundary layer effect turbine that utilizes the phenomena of the boundary layer to drive a turbine impeller that is made of a plurality of spaced disks oriented along a rotatable shaft. As operating fluid is directed over surfaces of the plurality of disks of the boundary layer effect turbine, energy is transferred from the fluid to the disks as a result of the adhesive and viscous properties of the fluid.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - F01D 1/36 (2009.01) USPC - 415/90 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) USPC: 415/90 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched USPC: 415/66, 68, 90, 914, 100 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PubWEST(PGPB,USPT,USOC,EPAB,JPAB); Freepatentsonline; Google Scholar Search Terms: boundary layer, turbine, disk, magnetic bearing, air bearing, venturi, bypass, eleccations, airfoil, helical, laminar flow, vane, compressor, diffuser, starter		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X — Y	US 2005/0169743 A1 (Hicks) 04 August 2005 (04.08.2005), entire document especially Abstract and Fig. 1A-1B, 12 and 34 and para [0004]-[0005], [0007], [0010], [0013], [0058], [0066], [0078]-[0079], [0083], [0085]-[0086], [0094], [0104], [0108] and [0110]	1,3-10 and 76-77 ----- 2,11-65,78-83 and 85-111
Y	US 4,402,647 A (Effenberger) 06 September 1983 (06.09.1983), especially Fig. 3 and col. 2, line 59-67, col. 3, line 1-26 and col. 7, line 20-22	2,14-21,38,40,47,49,54,56,60,85-89
Y	US 5,977,677 A (Henry et al.) 2 November 1999 (02.11.1999), especially Abstract and col. 1, line 40-41	11,19,33 and 43
Y	US 3,898,793 (Nakamura et al.) 12 August 1975 (12.08.1975), especially col. 3, line 66-67, col. 4, line 1-2 and col. 5, line 66-67	12,20,34 and 44
Y	US 6,327,860 B1 (Critchley) 11 December 2001 (11.12.2001), especially Fig. 11 and col. 4, line 34, 41 and 50-53	13,21,35,65 and 111
Y	US 2003/0053909 A1 (O'Hearen) 20 March 2003 (20.03.2003), especially Fig. 1 and para [0008] and [0012]	22-23,26-32,41,50,57,63,81-83 and 90-94
Y	US 2004/0009063 (Polacsek) 15 January 2004 (15.01.2004), especially Fig. 14a and para [0013]	24-25
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "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) "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 "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 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "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 "&" document member of the same patent family		
Date of the actual completion of the international search 20 February 2009 (20.02.2009)		Date of mailing of the international search report 27 APR 2009
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: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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International application No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,932,940 A (Epstein et al.) 03 August 1999 (03.08.1999), especially Fig. 13A-13B and col. 8, line 8-16	36-65,78-80 and 95-110
Y	US 2007/0092369 A1 (Wilson) 26 April 2007 (26.04.2007), especially para [0028] and [0039]	24-25,33-35,91-93,96-98, 101,103 and 106-108
Y	US 6,334,299 B1 (Lawlor) 01 January 2002 (01.01.2002), especially Fig. 3 and col. 7, line 58-61 and col. 8, line 15-17 and 23-32	87,92,97,102 and 107

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 08/88687

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid. The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because under PCT Rule 13.2 they lack the same or corresponding technical features for the following reasons:

Group I: claims 1-65, 76-83, 85-111 - drawn to a modified boundary layer turbine comprising a plurality of annular disks
Group II: claims 67-75, 84 - drawn to a speed reducer comprising a tubular divider element
Group III: claim 66 - drawn to a primary and secondary burner

Group I calls for a plurality of annular disks, which is not present or required in Groups II and III. Group II calls for a tubular divider element, which is not present or required in Groups I and III. Group III calls for a primary and secondary burner, which is not present or required in Groups I and II.

None of these technical features are common to the other groups, nor do they correspond to a special technical feature in the other groups. Therefore, unity of invention is lacking.

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-65, 76-83 and 85-111

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.