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[Continued on next page]

(54) Title: OSCILLATING PISTON ENGINE

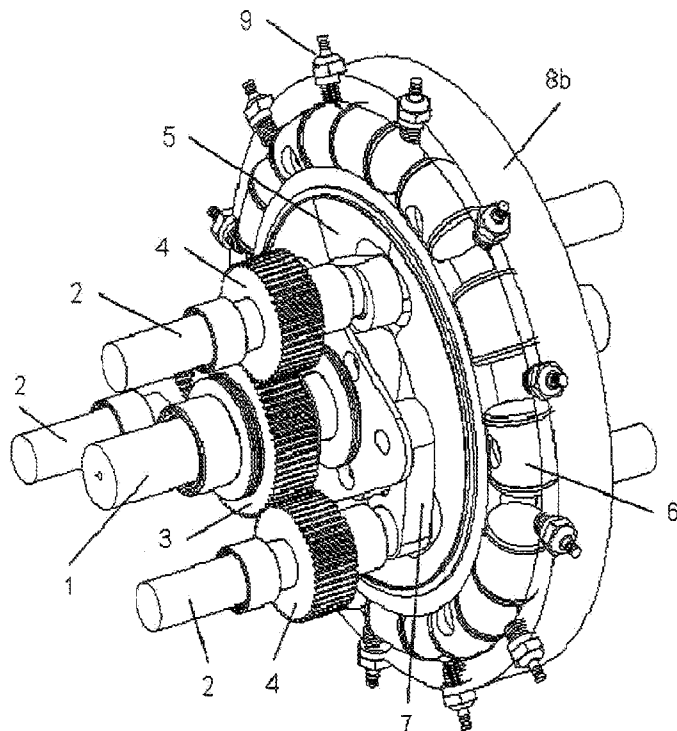


FIG. 2

(57) Abstract: An engine configuration that places multiple pistons on one or two oscillating discs. The engine can be configured to operate as an internal combustion engine that uses diesel fuel, gasoline, or natural gas, or it can be configured as an expander to convert high pressure high temperature gas to rotary power. For any given set of choices of numbers of pistons and sizes of pistons, disks, and gears, there are disclosed dimensional constraints useful for more efficient functioning of the engine. This engine is especially suited as a driver for electrical power generation as it delivers high torque at low engine speeds, among other uses. Its compact design results in high power to weight ratios.



SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments (Rule 48.2(h))*

Published:

— *with international search report (Art. 21(3))*

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A. CLASSIFICATION OF SUBJECT MATTER*F02B 53/00(2006.01)i, F02B 55/02(2006.01)i, F02B 55/08(2006.01)i, F02B 53/02(2006.01)i*

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)

F02B 53/00; F02B 75/28; F02B 75/06

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: oscillating, piston, engine, crankshaft, pushrod, gear

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A Y	US 05222463 A (FARRELL; MONTI) 29 June 1993 See column 3 line 48- col 4 line 29 and fig. 1	1-20 21-31
Y A	US 6990942 B2 (Yoshihiko Takeuchi) 31 January 2006 See paragraph [10] line 4-35, claim 12 and fig. 7	21-31 1-20
A	US 0556032 A (HOWARD; DUKE) 01 October 1996 See column 3 line 15- col 4 line 8 and fig. 1	1-31
A	US 2008-0245345 A1 (HUETTTLIN HERBERT) 09 October 2008 See paragraphs [52]-[56],[79]-[86],[89] and fig. 1	1-31

 Further documents are listed in the continuation of Box C. See patent family annex.

* 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 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

10 NOVEMBER 2011 (10.11.2011)

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Name and mailing address of the ISA/KR

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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:

- Group1, claims 1-9, drawn to a engine.
- Group2, claims 10-15, drawn to a engine.
- Group3, claims 16-19, drawn to a engine.
- Group4, claim 20, drawn to a engine.
- Group5, claims 21-22, drawn to a engine.
- Group6, claims 23-25, drawn to a engine.
- Group7, claims 26-29, drawn to a engine.
- Group8, claim 30, drawn to a engine.
- Group9, claim 31, drawn to a engine.

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 an additional fee, this Authority did not invite payment of any additional fee.
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.:

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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/030322

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