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[Continued on next page]

(54) Title: ENGINE FOR ENERGY CONVERSION

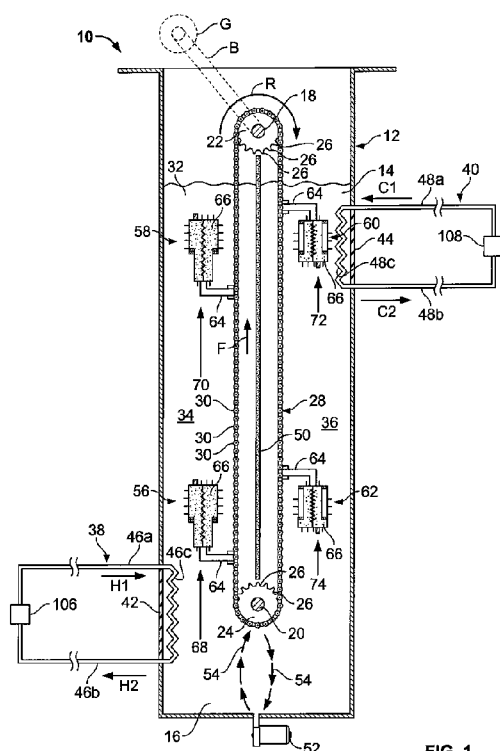


FIG. 1

(57) Abstract: An engine (10) for converting thermal energy to kinetic energy is provided. The engine (10) includes a body of fluid (32) having a first zone (34) and a second zone (36), a thermal energy source (38) thermally connected to the first zone (34) for providing thermal energy thereto, and a thermal energy sink (40) thermally connected to the second zone (36) for removing thermal energy therefrom such that the first zone (34) has a temperature greater than that of the second zone (36). The engine (10) further includes a movable loop (28), which extends between the first zone (34) and the second zone (36), and a plurality of containers (56, 58, 60, 62) which are positioned in the body of fluid (32) and attached to the loop (28) such that the loop (28) and the containers (56, 58, 60, 62) move conjointly between the first zone (34) and the second zone (36). Each of the containers (56, 58, 60, 62) expands to a first volume when it is in one of the first and second zones (34, 36), and contracts to a second volume when it is in the other one of the first and second zones (34, 36). A working fluid (66) is provided in each of the containers (56, 58, 60, 62) to cause the containers (56, 58, 60, 62) and the loop (28) to move between the first and second zones (34, 36).



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/053536**A. CLASSIFICATION OF SUBJECT MATTER*****F01K 27/00(2006.01)i, F03G 7/04(2006.01)i, F03B 9/00(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)

F01K 27/00; F03B 17/04; F03B 17/02; F03D 9/00; F03B 13/00

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: thermal, source, sink, volume, expansion, contraction

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,685,147 A (BRASSE, ANGEL) 11 November 1997 See column 3, line 56 - column 12, line 42; claims 6-27 and figures 1-13D.	1-20
A	JP 2001-200778 A (TAKEHARA FUJIO) 27 July 2001 See paragraphs 1-7; claims 1, 2 and figure 1.	1-20
A	JP 2007-100682 A (SATO YOSHIRO) 19 April 2007 See paragraphs 1-11; claims 1, 2 and figures 1-13.	1-20
A	US 6,100,600 A (PFLANZ, TASSILO) 08 August 2000 See column 7, line 12 - column 9, line 8; claims 1-42 and figures 1-3.	1-20

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

* Special categories of cited documents:

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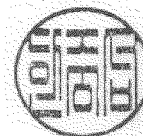
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Information on patent family members

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US 05685147A A

11.11.1997

US 05899066A A

04.05.1999

JP 2001-200778 A

27.07.2001

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JP 2007-100682 A

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None

US 06100600A A

08.08.2000

None