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(54) **A piston engine and an engine device comprising the same**

(57) The disclosure relates to a rotary piston, a piston engine comprising the rotary piston, and an engine device comprising the piston engine. The rotary piston comprises a piston body having a triangular vertical cross-section, mutually engaged large and small planetary gears fixed at the middle of the piston body, and a crankshaft running through the small planetary gear. The three angles of the triangular cross-section extend outwards to form protruded ends. The two sides of each protruded end form a compression groove and a combustion groove, respectively. The piston engine of the present disclosure comprises a shell, a crankshaft in the shell and two sets of rotary pistons, wherein the crankshaft has two ends and the two sets of rotary pistons are positioned symmetrically at the two ends of the crankshaft and separated by a holder positioned between the two sets of pistons.

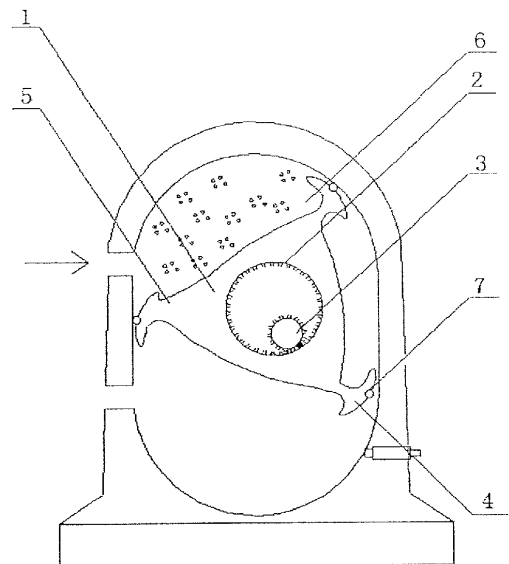


FIG. 1



EUROPEAN SEARCH REPORT

Application Number
EP 14 19 1768

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	W0 2013/091797 A1 (AVL LIST GMBH [AT]) 27 June 2013 (2013-06-27) * figure 1 *	1-7	INV. F01C1/22
X	US 4 024 842 A (DUMAINE FERNAND) 24 May 1977 (1977-05-24) * figures 7,8 *	1-7	
X	DE 34 47 321 A1 (PAPPERT JOSEF) 3 July 1986 (1986-07-03) * figures 2-4 *	1-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			F01C
<p>The present search report has been drawn up for all claims</p>			
Place of search		Date of completion of the search	Examiner
Munich		25 June 2015	Grilli, Muzio
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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Application Number

EP 14 19 1768

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-7

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 14 19 1768

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-7

Rotary piston to embedded in an engine

2. claims: 8-15

Piston engine comprising two sets of rotary pistons

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 19 1768

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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25-06-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2013091797 A1	27-06-2013	AT 512152 A4	15-06-2013
		DE 112012005349 A5	25-09-2014
		JP 2015504999 A	16-02-2015
		US 2014202419 A1	24-07-2014
		WO 2013091797 A1	27-06-2013

US 4024842 A	24-05-1977	DE 2522960 A1	18-12-1975
		FR 2273159 A1	26-12-1975
		GB 1494275 A	07-12-1977
		IT 1028972 B	10-02-1979
		JP S517321 A	21-01-1976
		US 4024842 A	24-05-1977

DE 3447321 A1	03-07-1986	NONE	
