

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
18 September 2003 (18.09.2003)

PCT

(10) International Publication Number
WO 03/076777 A1

(51) International Patent Classification⁷: **F02B 57/00**,
75/32

(21) International Application Number: PCT/US03/03713

(22) International Filing Date: 6 February 2003 (06.02.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/094,578 6 March 2002 (06.03.2002) US

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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

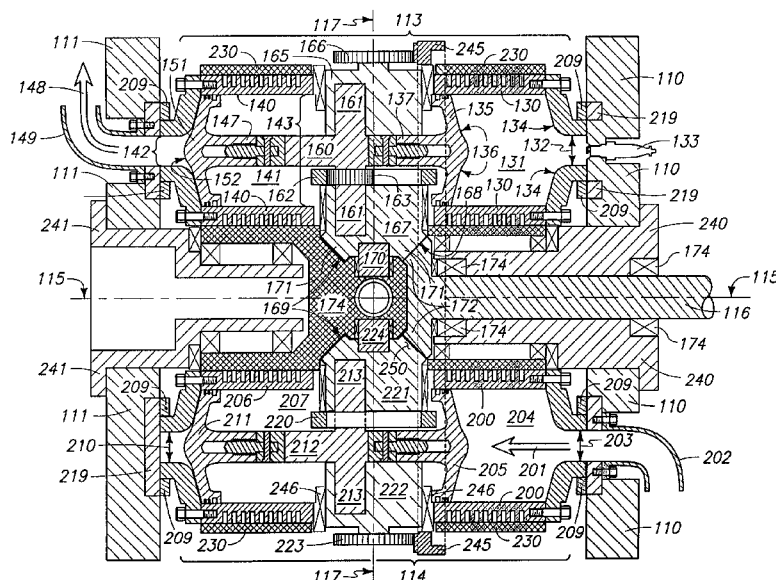
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: RECIPROCATING AND ROTARY INTERNAL COMBUSTION ENGINE, COMPRESSOR AND PUMP



(57) Abstract: A rotary engine, pump or compressor (102) with a framework is provided with intake/exhaust ports in end plates (219) and a rotatably mounted block mounted there-between. In the four cylinder embodiment of this invention, first and second opposing cylinder sets (113, 114) are mounted in the block and each cylinder set includes first and second opposing cylinders (130, 140) with proximal ends and terminal ends (143, 134), and with transfer ports (132, 142) disposed to alternately form passageways with the intake and exhaust ports as the cylinders rotate with the block. Each crankset includes a crankpin (161) eccentrically mounted to the piston set to rotate about a crankpin axis, a crankpin gear (163) fixed to the crankpin, an internal gear (162, 220) fixed relative to the first cylinder set, the internal gear having an internal gear configured to mate with

the crankpin gear as the crankpin gear rotates within the internal gear, wherein the eccentric rotation of the crankpin offsets the rotation of the crankpin gear within the internal gear to provide approximately linear movement of the piston heads within the first and second cylinders and such that the crankpin also rotates about a crank-set axis; and an inward side of the crankpin being eccentrically mounted to an inner crank gear (167, 171), such that the rotation of the crankpin also rotates the inner crank gear about the crank-set axis (117); wherein the generally linear movement of the circular base aperture (160, 212, 370) of the piston set drives the crankpin gear to rotate around within the internal gear, thereby driving the crankpin to rotate about the crankpin axis; the inner crank gear mating with a drive-shaft gear (172) such that the rotation of the inner crank gear rotates the drive-shaft. The rotation of the block is provided by any one of a number of different mechanisms.



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