



(51) International Patent Classification:

F02G 1/043 (2006.01) *F02G 1/057* (2006.01)
F02G 1/047 (2006.01)

(21) International Application Number:

PCT/NO2011/000105

(22) International Filing Date:

25 March 2011 (25.03.2011)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

20100447 26 March 2010 (26.03.2010) NO
20110250 14 February 2011 (14.02.2011) NO

(71) Applicant (for all designated States except US): **VIKING HEAT ENGINES AS** [NO/NO]; Postboks 22, N-4661 Kristiansand (NO).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **RISLÅ NES, Harald** [NO/NO]; Parkveien 7, N-4790 Lillesand (NO).

(74) Agent: **HÅMSØ PATENTBYRÅ ANS**; Postboks 171, N-4302 Sandnes (NO).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

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

(54) Title: THERMODYNAMIC CYCLE AND HEAT ENGINES

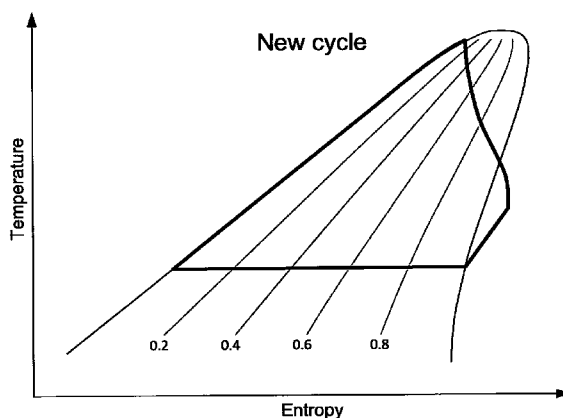


Fig. 16b

(57) Abstract: 1. Abstract A method for heat exchanging in and work exchanging with a working fluid in a heat engine, or a heat pump if the method and its sub-processes are substantially reversed, is described, wherein a thermodynamic cycle for the working fluid is approximately described through the polytropic relation $PV^n = \text{constant}$, where P is the pressure, V is the volume and n is the polytropic index of the working fluid with adiabatic index γ (?), and wherein the engine consists of at least one working mechanism (1) provided with a first (150) and at least a second volume change chamber (151, 151'), the method comprising in sequence at least the following steps: a) in a first volume change process, to carry out a first polytropic volume change of the working fluid in a first volume change chamber (150) where $n < \gamma$, and b) in a second volume change process, to carry out at least one second near-adiabatic or polytropic volume change of the working fluid from a first (150) to a second (151) volume change chamber, where $n < \gamma$, or where a volume change starts with $n < \gamma$ and ends near-adiabatic ($n \approx \gamma$). Also described is a heat engine arrangement for practicing the method.