



(51) International Patent Classification:

F02C 3/107 (2006.01) *F02K 3/072* (2006.01)
F02C 3/067 (2006.01)

(21) International Application Number:

PCT/US2013/037674

(22) International Filing Date:

23 April 2013 (23.04.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

13/455,198 25 April 2012 (25.04.2012) US

(71) Applicant: UNITED TECHNOLOGIES CORPORATION [US/US]; One Financial Plaza, Hartford, CT 06101 (US).

(72) Inventors: SUCIU, Gabriel, L.; 27 Tanglewood Drive, Glastonbury, CT 06033 (US). SCHWARZ, Frederick, M.; 121 Steep Hollow Drive, Glastonbury, CT 06033 (US).

(74) Agent: OLDS, Theodore, W.; Carlson, Gaskey & Olds/Pratt & Whitney, c/o CPA Global, P.O. Box 52050, Minneapolis, MN 55402 (US).

(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, BN, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, 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, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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).

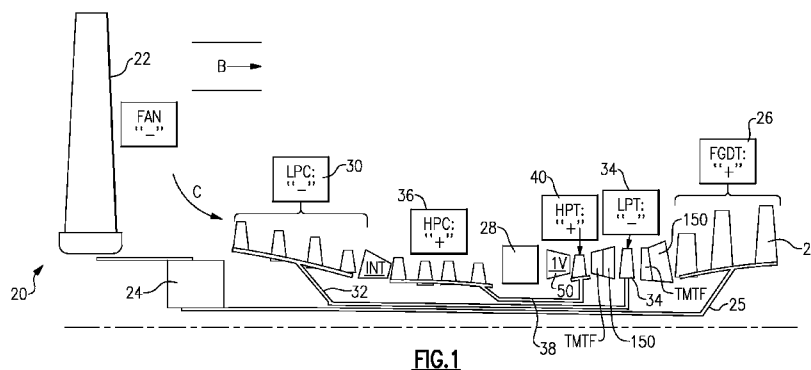
Published:

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

(88) Date of publication of the international search report:

27 March 2014

(54) Title: GEARED TURBOFAN WITH THREE TURBINES ALL COUNTER-ROTATING



(57) Abstract: A gas turbine engine has a fan rotor, a first compressor rotor and a second compressor rotor. The second compressor rotor compresses air to a higher pressure than the first compressor rotor. A first turbine rotor drives the second compressor rotor and a second turbine rotor. The second turbine drives the compressor rotor. A fan drive turbine is positioned downstream of the second turbine rotor. The fan drive turbine drives the fan through a gear reduction. The first compressor rotor and second turbine rotor rotate as an intermediate speed spool. The second compressor rotor and first turbine rotor together as a high speed spool. The high speed spool and the fan drive turbine configured to rotate in the same first direction. The intermediate speed spool rotates in an opposed, second direction.

