



(51) International Patent Classification:

F02K 3/065 (2006.01) *F01D 25/24* (2006.01)
F02K 3/04 (2006.01) *F02C 7/00* (2006.01)

(21) International Application Number:

PCT/US2013/025690

(22) International Filing Date:

12 February 2013 (12.02.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

13/397,771 16 February 2012 (16.02.2012) US

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

(72) Inventors: LUSSIER, Darin, S.; 53 Wildem Rd., Berlin, CT 06037 (US). ROBERTSON, Thomas, J., Jr.; 115 Heywood Dr., Glastonbury, CT 06033 (US). COSTA, Mark, W.; 322 Browns Rd., Storrs, CT 06268 (US). VOLETI, Sreenivasa, R.; 35 Baldwin Drive, Farmington, CT 06032 (US). NAIK, Rajiv, A.; 77 Palisade Terrace, Glastonbury, CT 06033 (US).

(74) Agent: GOTTSCHALK, William, S.; 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.

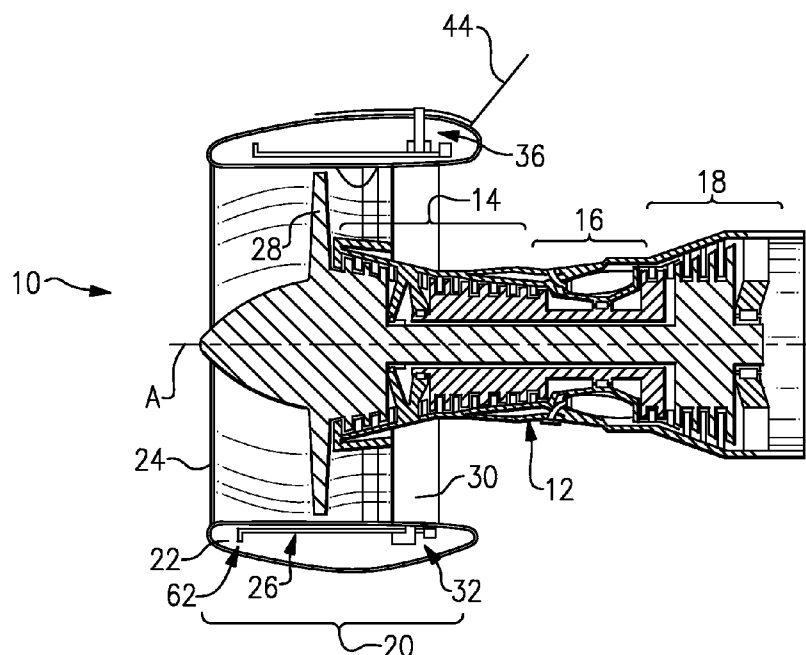
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, 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))

[Continued on next page]

(54) Title: COMPOSITE FAN CONTAINMENT CASE ASSEMBLY



(57) Abstract: A fan case for a gas turbine engine includes a composite fan containment case having an outer surface, a front and a rear. An attachment flange and a mounting ring are respectively provided on the front and the rear. A bolt attachment is supported on the outer surface. The composite fan containment case has a containment area that is configured to be axially aligned with a fan blade. A ballistic liner is arranged in the containment area.





— *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 December 2013

A. CLASSIFICATION OF SUBJECT MATTER**F02K 3/065(2006.01)i, F02K 3/04(2006.01)i, F01D 25/24(2006.01)i, F02C 7/00(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)

F02K 3/065; F01D 25/24; F02C 7/04; F02C 7/00; B65H 81/02; F01D 25//24; F02K 3/04

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:composite, complex, alloy, fan, case, frame, housing, cowl, shroud, mount, attach, flange, and bolt**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2011-0052383 A1 (LUSSIER, DARIN S.) 3 March 2011 See abstract; claims 1,7 and figure 3.	7,9-11
A		1-6,8
Y	JP 2011-256829 A (IHI CORP. et al.) 22 December 2011 See abstract; paragraphs [0005],[0019]-[0021]; claims 1,5 and figure 1.	7,9-11
A		1-6,8
A	US 7,866,939 B2 (HARPER et al.) 11 January 2011 See abstract; Claims 1,25 and figure 2.	1-11
A	US 6,206,631 B1 (SCHILLING JAN C.) 27 March 2001 See abstract; claim 1 and figure 1.	1-11
A	US 2012-0034076 A1 (XIE, MING) 9 February 2012 See abstract, claim 1, and figure 1.	1-11



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

22 October 2013 (22.10.2013)

Date of mailing of the international search report

22 October 2013 (22.10.2013)

Name and mailing address of the ISA/KR

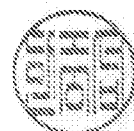
Korean Intellectual Property Office
189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City,
302-701, Republic of Korea

Facsimile No. +82-42-472-7140

Authorized officer

HAN, Joong Sub

Telephone No. +82-42-481-5606



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2013/025690

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2011-0052383 A1	03/03/2011	EP 2290197 A2	02/03/2011
JP 2011-256829 A	22/12/2011	None	
US 7866939 B2	11/01/2011	GB 0324549 D0	26/11/2003
		GB 0526104 D0	01/02/2006
		GB 2407344 A	27/04/2005
		GB 2407344 B	22/02/2006
		GB 2418957 A	12/04/2006
		GB 2418957 B	05/07/2006
		US 2009-0324390 A1	31/12/2009
US 6206631 B1	27/03/2001	DE 60032079 D1	11/01/2007
		DE 60032079 T2	21/06/2007
		EP 1083300 A2	14/03/2001
		EP 1083300 A3	21/01/2004
		EP 1083300 B1	29/11/2006
		JP 2001-123995 A	08/05/2001
US 2012-0034076 A1	09/02/2012	CA 2807395 A1	09/02/2012
		CN 103124834 A	29/05/2013
		EP 2601386 A1	12/06/2013
		WO 2012-018919 A1	09/02/2012