



(51) International Patent Classification:
B64C 27/10 (2006.01)

(21) International Application Number:
PCT/US2016/045129

(22) International Filing Date:
2 August 2016 (02.08.2016)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
62/200,866 4 August 2015 (04.08.2015) US

(71) Applicant: SIKORSKY AIRCRAFT CORPORATION
[US/US]; 6900 Main Street, P.O. Box 9729, Stratford, Connecticut 06615 (US).

(72) Inventors: SBABO, Thomas L.; 19 Vine St., Hamden, Connecticut 06518 (US). DARROW, JR., David A.; 4904 S. Power Rd, Ste 103-284, Mesa, Arizona 85212 (US).

(74) Agent: LEVY, Howard I.; CANTOR COLBURN LLP, 20 Church Street, 22nd Floor, Hartford, Connecticut 06103 (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, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, 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, SA, 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, ST, 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, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

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:
15 June 2017

(54) Title: COAXIAL SPLIT TORQUE GEAR BOX

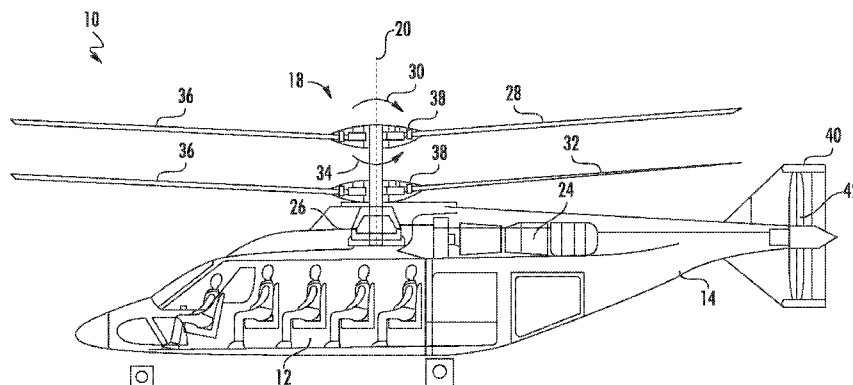


FIG. 1

(57) Abstract: A gearbox system includes a first drive gear rotatable about an axis of rotation and a second drive gear disposed coaxial with the first drive gear and rotatable about the axis of rotation. An input shaft provides a first torque and includes an input gear. Driving pinions are operably connected to the input gear and positioned between the first drive gear and the second drive gear compliantly along a direction parallel to the axis of rotation. Each driving pinion drives the first drive gear in a first direction about the axis of rotation and drives the second drive gear in a second direction opposite the first direction about the axis of rotation. Each driving pinion transfers an equal second torque to the first drive gear and the second drive gear.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 16/45129

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

- 1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

- 2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

- 3. Claims Nos.: 5-6 and 11-12
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

- 1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
- 2. As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
- 3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

- 4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 16/45129

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B64C 27/10 (2017.01)

CPC - B64C 27/10

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)

See Search History Document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History Document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History Document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2015/0060596 A1 (GARCIA) 05 March 2015 (05.03.2015), entire document, especially Fig 1-5; para [0015]-[0020]	1-4, 7-10, 13-15
Y	US 5,807,202 A (SAMMATARO) 15 September 1998 (15.09.1998), entire document especially Fig 2-3; col 4, ln 13-17, 56-59; col 5, ln 40-47; col 6, ln 45-62; col 9, ln 21-31	1-4, 7-10, 13-15
A	US 8,899,926 B2 (GARCIA) 02 December 2014 (02.12.2014), entire document	1-4, 7-10, 13-15
A	US 7,621,480 B2 (DARROW, JR et al.) 24 November 2009 (24.11.2009), entire document	1-4, 7-10, 13-15
A	US 7,413,142 B2 (GMIRYA) 19 August 2008 (19.08.2008), entire document	1-4, 7-10, 13-15
A	US 5,601,257 A (MCKANN) 11 February 1997 (11.02.1997), entire document	1-4, 7-10, 13-15

 Further documents are listed in the continuation of Box C.


* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"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	

Date of the actual completion of the international search

08 March 2017

Date of mailing of the international search report

14 APR 2017

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450
Facsimile No. 571-273-8300

Authorized officer:

Lee W. Young

PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774