

(19) World Intellectual Property Organization
International Bureau



(10) International Publication Number
WO 2012/021179 A3

(43) International Publication Date
16 February 2012 (16.02.2012)

(51) International Patent Classification:
B64F 5/00 (2006.01)

JKOWSKI, Wayne, R. [US/US]; 627 Bugle Hill Dr.,
Florissant, MO 63034 (US).

(21) International Application Number:
PCT/US2011/030150

(74) Agents: **COUSINS, Clifford, G.** et al.; The Boeing Com-
pany, P.O. Box 2515, MC 110-SD54, Seal Beach, CA
90740-1515 (US).

(22) International Filing Date:
28 March 2011 (28.03.2011)

(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.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
12/854,671 11 August 2010 (11.08.2010) US

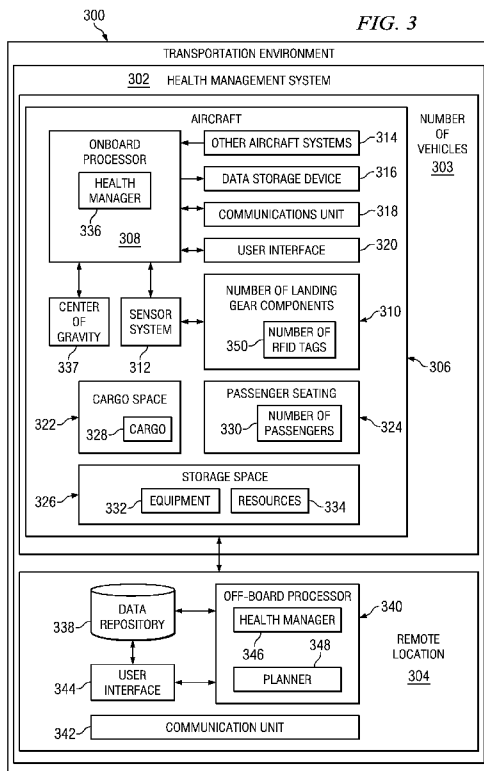
(71) Applicant (for all designated States except US): **THE
BOEING COMPANY** [US/US]; 100 North Riverside
Plaza, Chicago, IL 60606-2016 (US).

(72) Inventors; and
(75) Inventors/Applicants (for US only): **FOLLOWELL,
David, A.** [US/US]; 1200 Saddle Post, Wildwood, MO
63038 (US). **MAGGIORE, Jeanne, C.** [US/US]; 2517
Grover Ridge Dr., Wildwood, MO 63040 (US). **MA-**

(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,

[Continued on next page]

(54) Title: SYSTEM AND METHOD TO ASSESS AND REPORT THE HEALTH OF LANDING GEAR RELATED COMPONENTS



(57) Abstract: The different advantageous embodiments provide an apparatus comprising a number of landing gear components (310) for a vehicle, a number of systems (314), and a number of processor units (308). The number of systems is configured to generate data about the number of landing gear components and the vehicle. The number of processor units is configured to monitor the data and manage health of the number of landing gear components.

WO 2012/021179 A3



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).

— *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))*

Published:

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

(88) Date of publication of the international search report:
12 April 2012

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2011/030150

A. CLASSIFICATION OF SUBJECT MATTER

INV. B64F5/00
ADD.

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)

B64F B64C

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

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

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2006/053433 A1 (MESSIER DOWTY INC [CA]; SCHMIDT R KYLE [CA]; GEDEON STEVEN A [CA]) 26 May 2006 (2006-05-26)	1,5-12
A	page 1, paragraph 1 page 3, paragraph 2 - page 4, paragraph 3 page 5, paragraph 2 - page 8, paragraph 3; figures 1,4,8	2,3
X	----- US 6 293 141 B1 (NANCE C KIRK [US]) 25 September 2001 (2001-09-25) column 4, lines 22-36 column 5, lines 6-18 column 6, line 66 - column 7, line 14; figures 4,9	1-3,5,6
X	----- EP 2 208 971 A1 (HONEYWELL INT INC [US]) 21 July 2010 (2010-07-21) paragraphs [0008], [0019], [0020], [0022]; figures 1-3	1-4

 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 document 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 another 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

20 October 2011

Date of mailing of the international search report

16/02/2012

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Busto, Mario

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/030150

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.:
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:

see additional sheet

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 an 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.:

1-12

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-12

Independent claims 1 and 7 deal with : an apparatus comprising:
a number of landing gear components for a vehicle;
a number of systems configured to generate data about the number of landing gear components and the vehicle; and
a number of processor units configured to monitor the data and manage health of the number of landing gear components, and a method to operate said apparatus.

2. claims: 13-15

Claim 13 deals with : a method for managing a center of gravity for a vehicle during load operations, the method comprising:
detecting initiation of a load operation for the vehicle;
calculating a weight on each landing gear of the vehicle to identify the center of gravity;
actively outputting results having the center of gravity location during the load operation; and
displaying the results on a user interface.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2011/030150

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
WO 2006053433	A1	26-05-2006	BR PI0518305 A2	11-11-2008
			CA 2487704 A1	18-05-2006
			EP 1815224 A1	08-08-2007
			US 2006144997 A1	06-07-2006
			WO 2006053433 A1	26-05-2006

US 6293141	B1	25-09-2001	CA 2286113 A1	22-10-1998
			EP 0991927 A1	12-04-2000
			JP 3786714 B2	14-06-2006
			JP 2001526779 A	18-12-2001
			US 6128951 A	10-10-2000
			US 6237406 B1	29-05-2001
			US 6237407 B1	29-05-2001
			US 6293141 B1	25-09-2001
			WO 9846972 A1	22-10-1998

EP 2208971	A1	21-07-2010	CN 101793547 A	04-08-2010
			EP 2208971 A1	21-07-2010
			US 2010185413 A1	22-07-2010
