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Published:
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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:
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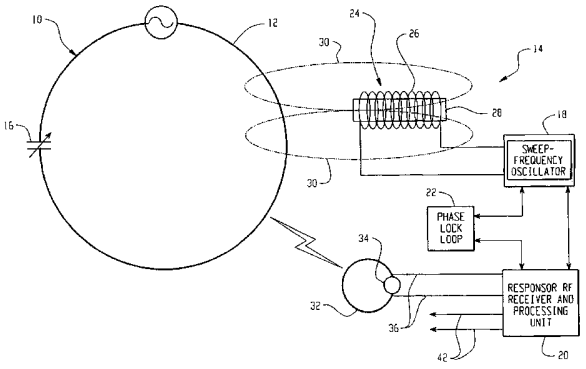
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A WIRELESS TIRE PRESSURE AND/OR WHEEL SPEED SENSING SYSTEM FOR AIRCRAFT



(57) Abstract: A wireless tire pressure sensing system for an aircraft comprises: dual resonant circuits mounted to a wheel of the aircraft, each resonant circuit comprising: a variable capacitance sensor (16) and a wire loop (12) of a predetermined inductance coupled thereto, one capacitance sensor for monitoring the pressure of a tire mounted to the wheel, and the other capacitance sensor operative as a reference to the one capacitance sensor; an interrogating circuit (18) magnetically coupleable to the dual resonant circuits and operative to induce magnetically a variable frequency current in the dual resonant circuits, the one resonant circuit responding to the induced current with an E-field signal at a first resonant frequency commensurate with the capacitance of the one sensor, and the other resonant circuit responding to the induced current with an E-field signal at a second resonant frequency commensurate with the capacitance of the other sensor; a receiving circuit (20) E-field coupleable to the dual resonant circuits and operative to receive the E-field signals at the first and second resonant frequencies and to generate first and second signals representative thereof; and a processing circuit coupled to the receiving circuit for processing the first and second signals to generate a compensated pressure reading of the tire. The pressure sensing system may be modified to provide and/or include wheel speed sensing.

WO 2005/043264 A3

INTERNATIONAL SEARCH REPORT

Inter ıl Application No
PCT/US2004/027443

A. CLASSIFICATION OF SUBJECT MATTER
B60C23/04

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)
B60C

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 198 53 135 A1 (ROBERT BOSCH GMBH) 25 May 2000 (2000-05-25) column 1, line 64 - column 2, line 68; figures 1-3	1,23
A	GB 2 065 896 A (BOSCH GMBH ROBERT) 1 July 1981 (1981-07-01) page 1, line 1 - line 120; figures 1,2	1,23
Y	DE 199 22 707 A1 (ALGONQUIN SCIENTIFIC, LLC) 27 January 2000 (2000-01-27) column 9, line 44 - line 59; figures 12a,12b	31,37
A		32-36
X	column 6, line 17 - column 9, line 59; figures 5-8,12a,12b,14	38-41,45

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

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

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"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	Date of mailing of the international search report
19 December 2005	12. 01. 2006

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Smeyers, H

INTERNATIONAL SEARCH REPORT

Inter ıl Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	ɛvant to claim No.
Y	WO 03/038447 A (JOHNSON CONTROLS AUTOMOTIVE ELECTRONICS; PINARD, THIERRY; MICHEL, NICO) 8 May 2003 (2003-05-08) page 1, line 1 - line 28	31,37
A		32-36
X	PATENT ABSTRACTS OF JAPAN vol. 013, no. 143 (M-811), 7 April 1989 (1989-04-07) & JP 63 306905 A (SUMITOMO ELECTRIC IND LTD), 14 December 1988 (1988-12-14) abstract	41-44

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2004/027443

Box II Observations where certain claims were found unsearchable (Continuation of iter 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 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 fee, this Authority did not invite payment of any additional fee.

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.:

1-45

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.

☐ 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: 1-30

dual resonant circuits

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2. claims: 31-37

tire pressure and wheel speed sensing system

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3. claims: 38-40 41 45

second wire loop receiving signals within E-field null of the magnetic coupling of the interrogator circuit

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4. claims: 41-44

phase locking the variable frequency signal to the coupled resonant frequency

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5. claim: 41 46

conveying the pressure reading over a bus of the aircraft

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6. claim: 41 47

displaying tire pressure on a non-volatile indicator

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7. claims: 48-62

wireless wheel speed sensing system

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter I Application No
PCT/US2004/027443

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