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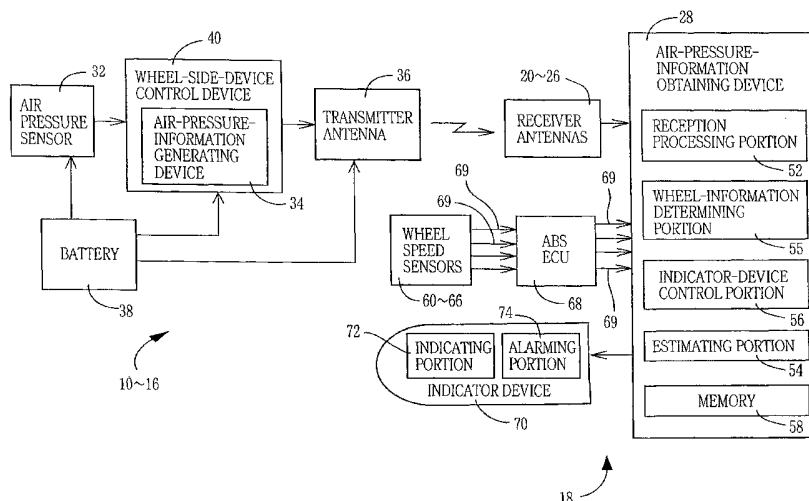
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: WHEEL-STATE OBTAINING APPARATUS, AND VEHICLE-STATE OBTAINING APPARATUS



(57) Abstract: wheel-state obtaining apparatus for a vehicle, including wheel-side devices (10-16) each having an air pressure sensor (32) for detecting an air pressure of a wheel tire of the vehicle, and a body-side device (18) having receiver antennas (20-26) and arranged to receive wheel-side information from the wheel-side devices through the receiver antennas and extract air-pressure information representative of the detected air pressure, that is, detected-air-pressure information, and wherein the body-side device includes an estimating portion (54) which is operable, in the event of a failure of any of the receiver antennas to receive the wheel-side information, to estimate the tire air pressure on the basis of detected speeds of the wheel, and obtain estimated-air-pressure information representative of the estimated air pressure. Thus, the wheel-state obtaining apparatus is capable of obtaining information on the air pressure even in the event of a failure of the receiver antennas (20-26) to receive the wheel-side information.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP 03/09360

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B60C23/04 B60C23/06

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)

IPC 7 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, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 044 829 A (CONTINENTAL AG) 18 October 2000 (2000-10-18) page 5 -page 8 claims 1,4	1,39-41
Y	figures 1,2	47,48
Y	DE 199 51 273 A (LUCAS VARITY GMBH) 7 June 2001 (2001-06-07) column 5 -column 7 figure 1	2-35, 42-46
Y	US 2002/044050 A1 (DAVIES SEAN PATRICK ET AL) 18 April 2002 (2002-04-18) figures 2,16,20,24	2-35, 42-46
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☒ Further documents are listed in the continuation of box C.

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

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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

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"&" document member of the same patent family

Date of the actual completion of the international search

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International Application No

PCT/JP 03/09360

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 03 006268 A (CONTINENTAL TEVES AG & CO OHG ;FENNEL HELMUT (DE); SAEGER PETER (D) 23 January 2003 (2003-01-23) page 6, line 4 - line 10 figure 1	1,39-41, 47,48
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Y	DE 100 29 282 A (BOSCH GMBH ROBERT) 20 December 2001 (2001-12-20) column 2 -column 4 figures 1-4	47,48
A	US 6 218 935 B1 (CORCORAN PAUL T ET AL) 17 April 2001 (2001-04-17) the whole document	38,47,48

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP 03/09360

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 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.:
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: 1-35, 39-46

Tyre air pressure is estimated by using wheel speed sensors in case of a failing wheel mounted pressure sensor

2. Claim : 36 37

Tyre temperature is estimated by using a vehicle load detecting device, a vehicle running state detecting device and an ambient-temperature detecting device in case of a failing wheel mounted temperature sensor

3. Claim : 38

Force acting on wheel is estimated by using driving state detecting device, braking state detecting device and turning state detecting device in case of a failing wheel mounted force sensor

4. Claims: 47, 48

An actuator portion (air-pressure adjusting apparatus or suspension control) is controlled on the basis of a wheel status (tyre air pressure)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP 03/09360

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