Title: DRIVER IDENTIFICATION AND DATA COLLECTION SYSTEMS FOR USE WITH MOBILE COMMUNICATION DEVICES IN VEHICLES

Abstract: Systems, methods, and devices for determining the location of one or more mobile devices within a vehicle comprising: (a) a controller located within the vehicle and configured to transmit at least two audio signals, a first audio signal directed generally into a driver space within the vehicle and a second audio signal directed generally into a passenger space within the vehicle, and (b) software code stored in memory of the mobile device and having instructions executable by a processor that performs the steps of: (i) detecting the at least two audio signals, (ii) sampling the at least two audio signals for a predetermined period of time; (iii) performing digital signal processing on the sampled at least two audio signals; and (iv) based on the results of the digital signal processing, determining whether the mobile device was located within the driver space of the vehicle during the predetermined period of time.
Declarations under Rule 4.17:
— of inventorship (Rule 4.17(iv))
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - H04B 1/034, 1/18 (2014-01)
CPC - H04W 84/18; G05B 19/10

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)

IPC: H04B 1/034, 1/18 (2014-01)
CPC: H04W 84/18, 8/245, G05B 19/10; B60R 1/0205 USPC: 455/99, 151.4, 152.1, 418. 456.1

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 practicable, search terms used)


C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>US 20120214470 A1 (TADAYON, S et al.) August 23, 2012, paragraph [0072], paragraph [0037], paragraph [0059], paragraph [0053].</td>
<td>1, 2, 4-8, 14 and 18</td>
</tr>
<tr>
<td>Y</td>
<td></td>
<td>3, 9, 10, 15-17</td>
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<tr>
<td>A</td>
<td></td>
<td>11-13, 19, and 20</td>
</tr>
<tr>
<td>X</td>
<td>US 200908001516 A1 (HUTZEL, B et al.) January 1, 2009, paragraph [0114] and paragraph [01 17].</td>
<td>21-31 and 36-37</td>
</tr>
<tr>
<td>Y</td>
<td></td>
<td>34 and 35</td>
</tr>
<tr>
<td>A</td>
<td></td>
<td>32 and 33</td>
</tr>
<tr>
<td>Y</td>
<td>US 8254592 B2 (SANDER, W et al.) August 28, 2012, column 13, lines 36-43.</td>
<td>9 and 10</td>
</tr>
<tr>
<td>Y</td>
<td>US 5410621 A (HYATT, G) April 25, 1995, column 147, lines 9-21.</td>
<td>17</td>
</tr>
<tr>
<td>Y</td>
<td>US 20110112969 A1 (ZAIID, S et al.) May 12, 2011, paragraph [0135].</td>
<td>34</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of Box C.

* 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 another citation or other special reason (as specified)
- "O" - document referred to in 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
- "R" - document member of the same patent family

Date of the actual completion of the international search: 22 September 2014 (22.09.2014)

Date of mailing of the international search report: 04 DEC 2014

Name and mailing address of the ISA/US: Shane Thomas

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

P.O. Box 1450, Alexandria, Virginia 22313-1450
Facsimile No.: 571-273-3201

Form PCT/ISA/2 10 (second sheet) (July 2009)
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).

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

- Group I: Claims 1-20 are directed toward a system for determining the location of a mobile device within a vehicle.
- Group II: Claims 21-37 are directed toward a device for collecting and transmitting operational data about a vehicle to a receiving device located within the vehicle.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

- See Supplemental Page-8-.

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.: 15

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.
The special technical features of Group I include a system for determining the location of a mobile device within a vehicle, comprising: a controller located within the vehicle and configured to transmit at least two audio signals, a first audio signal directed generally into a driver space within the vehicle and a second audio signal directed generally into a passenger space within the vehicle; software code stored in memory of the mobile device and having instructions executable by the processor that performs the steps of: (i) detecting the at least two audio signals, (ii) sampling the at least two audio signals for a predetermined period of time; (iii) performing digital signal processing on the sampled at least two audio signals; and (iv) based on the results of the digital signal processing, determining whether the mobile device was located within the driver space of the vehicle during the predetermined period of time, which are not present in Group II.

The special technical features of Group II include a device for collecting and transmitting operational data about a vehicle to a receiving device located within the vehicle, the device comprising: a housing mounted to the vehicle; and a power supply contained within the housing and adapted to provide power to electronic components contained within the housing, the electronic components including: a microprocessor; memory in electronic communication with the microprocessor and configured to store the operational data; an accelerometer for detecting movement of the vehicle, the detected movement being converted by the microprocessor into an acceleration value stored as one of the operational data in the memory; and a data transmission module, controlled by the microprocessor and configured to retrieve the operational data from the memory and to transmit the retrieved operational data to the receiving device, which are not present in Group I.

The common technical features shared by Groups I and II are a controller located within a vehicle; a memory; and transmitting a signal from the controller to a receiving device located within the vehicle.

However, these common features are previously disclosed by US 2012/0214470 A1 to Tadayon, S et al. (hereinafter 'Tadayon'). Tadayon discloses a controller located within a vehicle (localized unit 702 comprising a processor/controller, installed in a vehicle, figure 7(a), paragraph [0056]); a memory (localized unit comprises a memory, paragraph [0062]); and transmitting a signal from the controller to a receiving device located within the vehicle (localized unit 702 communicates with a mobile device 704 in the vehicle, including localization signals, which may be sound signals, and car status data, figure 7(a), paragraphs [0056], [0060], [0091], and [0106]).

Since the common technical features are previously disclosed by the Tadayon reference, these common features are not special and so Groups I and II lack unity.