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(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, QA, RO, RS, RU, RW, 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.

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- with international search report (Art. 21(3))
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17 January 2013

## (54) Title: DEVICES AND METHODS FOR COMPARING AND SELECTING ALTERNATIVE NAVIGATION ROUTES

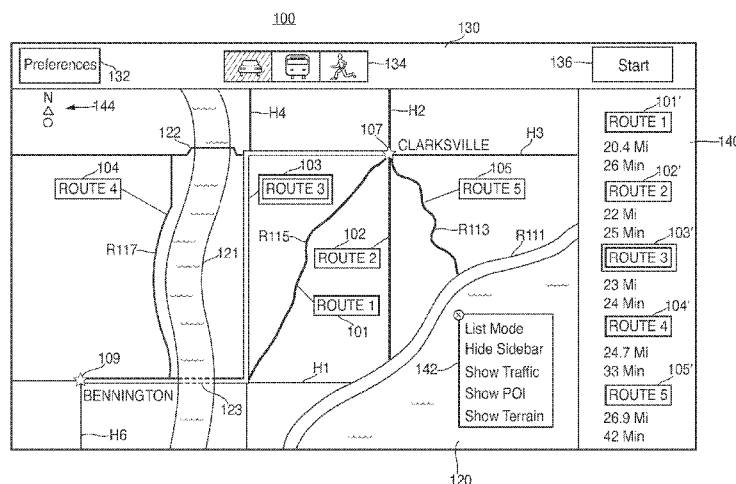


FIG. 1

(57) Abstract: Devices, methods, and machine-readable media to facilitate intuitive comparison and selection of calculated navigation routes are disclosed. An electronic device for navigation includes a touch-sensitive screen and a processing module for displaying a map, calculating a number or navigation routes simultaneously on the touch-sensitive screen, and receiving a selection of a route. Callouts (101-105), or markers for presenting key information about each route, are also displayed discretely on the map. Navigation tiles including key route information and route pictorials can also be created and displayed for each calculated route.

# INTERNATIONAL SEARCH REPORT

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <b>A. CLASSIFICATION OF SUBJECT MATTER</b><br>INV. G01C21/36      G01C21/20      G08G1/0969      G08G1/0968      G01C21/34<br>ADD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                               |                          |
| According to International Patent Classification (IPC) or to both national classification and IPC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                               |                          |
| <b>B. FIELDS SEARCHED</b><br>Minimum documentation searched (classification system followed by classification symbols)<br>G01C G08G G06F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                               |                          |
| 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)<br>EPO-Internal, WPI Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                               |                          |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                               |                          |
| Category*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Citation of document, with indication, where appropriate, of the relevant passages                                                                                            | Relevant to claim No.    |
| X<br><br>Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | US 2010/312466 A1 (KATZER JOCHEN [DE] ET AL) 9 December 2010 (2010-12-09)<br>paragraphs [0082], [0082]<br>figures 1,4<br><div style="text-align: center;">-----</div>         | 1-4,6,7,<br>19<br>5,9-14 |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | DE 195 31 766 A1 (HOCHSCHORNER K W GMBH [DE]) 6 March 1997 (1997-03-06)<br>abstract<br>column 4, line 3 - line 19<br>figure 1<br><div style="text-align: center;">-----</div> | 1,19                     |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | JP 2002 243480 A (KENWOOD CORP)<br>28 August 2002 (2002-08-28)<br>abstract<br>paragraph [0035]<br>figure 3<br><div style="text-align: center;">-----</div>                    | 1,19                     |
| -----<br>-/-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                               |                          |
| <div style="display: flex; justify-content: space-between;"> <span><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.</span> <span><input checked="" type="checkbox"/> See patent family annex.</span> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                               |                          |
| <div style="display: flex;"> <div style="flex: 1;"> <p>* Special categories of cited documents :</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="flex: 1;"> <p>"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</p> <p>"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</p> <p>"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</p> <p>"&amp;" document member of the same patent family</p> </div> </div> |                                                                                                                                                                               |                          |
| Date of the actual completion of the international search                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Date of mailing of the international search report                                                                                                                            |                          |
| 31 October 2012                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 26/11/2012                                                                                                                                                                    |                          |
| Name and mailing address of the ISA/<br>European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040,<br>Fax: (+31-70) 340-3016                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Authorized officer<br><br>Berbil Bautista, L                                                                                                                                  |                          |

## INTERNATIONAL SEARCH REPORT

International 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                                                     | Relevant to claim No. |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| X         | JP 2011 038815 A (ALPINE ELECTRONICS INC)<br>24 February 2011 (2011-02-24)<br>abstract<br>paragraph [0033]<br>figure 1<br>-----        | 1,19                  |
| X         | JP 2005 283168 A (PIONEER ELECTRONIC CORP)<br>13 October 2005 (2005-10-13)<br>abstract<br>paragraphs [0018], [0065]; figure 8<br>----- | 1,19                  |
| X         | US 2006/287818 A1 (OKUDE MARIKO [JP] ET<br>AL) 21 December 2006 (2006-12-21)<br>figures 15,16<br>paragraphs [0072] - [0074]<br>-----   | 1,19                  |
| Y         | US 2010/324817 A1 (HANSEN CODY R [US] ET<br>AL) 23 December 2010 (2010-12-23)<br>paragraph [0048]<br>-----                             | 5                     |
| Y         | US 2010/241975 A1 (KINUGAWA TAKAOMI [JP]<br>ET AL) 23 September 2010 (2010-09-23)<br>paragraphs [0042], [0044]<br>figure 5B<br>-----   | 9-14                  |
| Y         | US 4 914 605 A (LOUGHMILLER JR GEORGE E<br>[US] ET AL) 3 April 1990 (1990-04-03)<br>column 3, line 1 - line 11<br>-----                | 9-14                  |
| A         | EP 2 031 352 A1 (WAYFINDER SYSTEMS AB<br>[SE]) 4 March 2009 (2009-03-04)<br>paragraphs [0012], [0013]<br>-----                         | 9-14                  |
| A         | US 2004/243307 A1 (GEELEN PIETER [NL])<br>2 December 2004 (2004-12-02)<br>abstract<br>-----                                            | 9-14                  |
| A         | US 2010/268448 A1 (DOAN LINH [US] ET AL)<br>21 October 2010 (2010-10-21)<br>figure 7<br>-----                                          | 9-14                  |
| X         | US 2010/161160 A1 (WILSON BLAKE [US] ET<br>AL) 24 June 2010 (2010-06-24)<br>paragraph [0024]<br>figures 1,5<br>-----                   | 15-18                 |
| A         | US 2008/040683 A1 (WALSH DAVID [US])<br>14 February 2008 (2008-02-14)<br>figure 3A<br>-----                                            | 16-18                 |
| A         | US 2008/062141 A1 (CHANDHRI IMRAN [US])<br>13 March 2008 (2008-03-13)<br>figures 19A, 30A<br>-----                                     | 16-18                 |
|           | -----<br>-/--                                                                                                                          |                       |

## INTERNATIONAL SEARCH REPORT

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| C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT |                                                                                                                                                                                                                                                                                        |                       |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Category*                                            | Citation of document, with indication, where appropriate, of the relevant passages                                                                                                                                                                                                     | Relevant to claim No. |
| X                                                    | WO 2010/081538 A2 (TOMTOM INT BV [NL];<br>ABEN SJOERD [NL]; GEELEN PIETER [NL])<br>22 July 2010 (2010-07-22)<br>page 3, line 19 - line 25<br>page 4, line 4 - line 9<br>page 8, line 2 - line 9<br>page 12, line 36 - page 13, line 1<br>page 15, line 8 - line 9<br>figure 2<br>----- | 24-28                 |
| X                                                    | US 6 321 161 B1 (HERBST JAMES [US] ET AL)<br>20 November 2001 (2001-11-20)<br>figures 1,6,8<br>-----                                                                                                                                                                                   | 24                    |

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## 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.:  
1-7, 9-19, 24-28
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.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

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

1. claims: 1-7, 19

claims 1-7 and 19 deal with displaying the selected route more prominently than the other displayed routes

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2. claims: 8, 29

claims 8 and 29 deal with the route including a route-change indicator

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3. claims: 9-14

claims 9-14 deal with displaying the callouts in a place determined for the zoom factor

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4. claims: 15-18

claims 15-18 deal with displaying navigation routes on navigation tiles

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5. claim: 20

claim 20 deals with displaying a context-appropriate menu

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6. claims: 21-23

claims 21-23 deal with transit schedules

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7. claims: 24-28

claims 24-28 deal with recalculating a plurality of navigation routes

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/040550

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s)                                                                                                                                                                                                             | Publication<br>date                                                                                                                                                  |
|-------------------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US 2010312466 A1                          | 09-12-2010          | DE 102010006702 A1<br>EP 2224211 A1<br>US 2010312466 A1                                                                                                                                                                                | 02-09-2010<br>01-09-2010<br>09-12-2010                                                                                                                               |
| DE 19531766 A1                            | 06-03-1997          | NONE                                                                                                                                                                                                                                   |                                                                                                                                                                      |
| JP 2002243480 A                           | 28-08-2002          | NONE                                                                                                                                                                                                                                   |                                                                                                                                                                      |
| JP 2011038815 A                           | 24-02-2011          | NONE                                                                                                                                                                                                                                   |                                                                                                                                                                      |
| JP 2005283168 A                           | 13-10-2005          | JP 4342362 B2<br>JP 2005283168 A                                                                                                                                                                                                       | 14-10-2009<br>13-10-2005                                                                                                                                             |
| US 2006287818 A1                          | 21-12-2006          | DE 102006025911 A1<br>JP 2006337182 A<br>US 2006287818 A1                                                                                                                                                                              | 11-01-2007<br>14-12-2006<br>21-12-2006                                                                                                                               |
| US 2010324817 A1                          | 23-12-2010          | DE 102010023942 A1<br>US 2010324817 A1                                                                                                                                                                                                 | 24-02-2011<br>23-12-2010                                                                                                                                             |
| US 2010241975 A1                          | 23-09-2010          | JP 4798240 B2<br>JP 2010217140 A<br>US 2010241975 A1                                                                                                                                                                                   | 19-10-2011<br>30-09-2010<br>23-09-2010                                                                                                                               |
| US 4914605 A                              | 03-04-1990          | NONE                                                                                                                                                                                                                                   |                                                                                                                                                                      |
| EP 2031352 A1                             | 04-03-2009          | EP 2031352 A1<br>WO 2009027161 A1                                                                                                                                                                                                      | 04-03-2009<br>05-03-2009                                                                                                                                             |
| US 2004243307 A1                          | 02-12-2004          | US 2004243307 A1<br>US 2007027628 A1<br>US 2009138194 A1<br>US 2009143975 A1<br>US 2009143976 A1<br>US 2009150063 A1<br>US 2009150064 A1<br>US 2009171561 A1                                                                           | 02-12-2004<br>01-02-2007<br>28-05-2009<br>04-06-2009<br>04-06-2009<br>11-06-2009<br>11-06-2009<br>02-07-2009                                                         |
| US 2010268448 A1                          | 21-10-2010          | NONE                                                                                                                                                                                                                                   |                                                                                                                                                                      |
| US 2010161160 A1                          | 24-06-2010          | EP 2199747 A2<br>US 2010161160 A1                                                                                                                                                                                                      | 23-06-2010<br>24-06-2010                                                                                                                                             |
| US 2008040683 A1                          | 14-02-2008          | US 2008040683 A1<br>WO 2008021670 A2                                                                                                                                                                                                   | 14-02-2008<br>21-02-2008                                                                                                                                             |
| US 2008062141 A1                          | 13-03-2008          | AU 2007296558 A1<br>AU 2008101162 A4<br>AU 2008101164 A4<br>AU 2008101171 A4<br>CA 2661200 A1<br>DE 112007002143 T5<br>DE 202007018761 U1<br>DE 202007018762 U1<br>DE 212007000053 U1<br>EP 2064620 A2<br>GB 2455257 A<br>GB 2480573 A | 20-03-2008<br>08-01-2009<br>08-01-2009<br>08-01-2009<br>20-03-2008<br>02-07-2009<br>19-03-2009<br>19-03-2009<br>12-03-2009<br>03-06-2009<br>10-06-2009<br>23-11-2011 |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/040550

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|---------------------|----------------------------|---------------------|
|                                           |                     | JP 2010503130 A            | 28-01-2010          |
|                                           |                     | KR 20090040462 A           | 24-04-2009          |
|                                           |                     | KR 20110020954 A           | 03-03-2011          |
|                                           |                     | KR 20110022742 A           | 07-03-2011          |
|                                           |                     | US 2008062141 A1           | 13-03-2008          |
|                                           |                     | US 2009172532 A1           | 02-07-2009          |
|                                           |                     | US 2009198359 A1           | 06-08-2009          |
|                                           |                     | WO 2008033853 A2           | 20-03-2008          |
| -----                                     |                     |                            |                     |
| WO 2010081538                             | A2                  | 22-07-2010                 | NONE                |
| -----                                     |                     |                            |                     |
| US 6321161                                | B1                  | 20-11-2001                 | NONE                |
| -----                                     |                     |                            |                     |