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Published:

- with international search report (Art. 21(3))
- 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))

(88) Date of publication of the international search report:

21 May 2015

(54) Title: METHOD FOR DISPLAYING REAL RANGE OF ELECTRIC VEHICLES ON A MAP

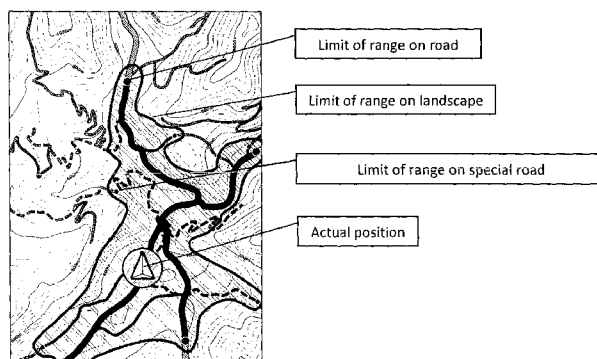


Fig. 4

(57) Abstract: Method for displaying the actual range of an electric vehicle from a starting point shown on a map, in the course of which based on the given parameters of the vehicle it is determined that on a horizontal surface for a covering a certain distance how much electric consumption is necessary, how much the maximum consumption can be, it is also determined that with respect to roads with different steepness to what extent (correction factors) the actual consumption varies from the consumption on a horizontal surface, then the map data is input into the map database with respect to a hypothetical range from the starting point and from the starting point the set of discrete peak points on the map is indicated, where the steepness of the surface between two neighboring peak points is considered steady, then the costs of the various available routes are determined from the starting point with Dijkstra algorithm and using a successive iteration, where the cost between two peak points mean the value modified by the correction factor related to the given steepness of the consumption measured on a horizontal surface, then with respect to those peak points where the costs reach the determined maximum consumption, it is specified as the points indicating the real range, and the location of such points are displayed on the map.



INTERNATIONAL SEARCH REPORT

International application No
PCT/HU2014/000066

A. CLASSIFICATION OF SUBJECT MATTER
 INV. G01C21/34 G01C21/36 B60L11/18
 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)
 G01C G09B B60L G08G B60K G05D G06Q

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)
 EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|---|-----------------------|
| X | US 2013/096818 A1 (VICHARELLI PABLO A [US] ET AL) 18 April 2013 (2013-04-18) | 1,3,5,10 |
| Y | paragraphs [0035] - [0054]; figures 6,11,12a,12b | 2,4,6-10 |
| Y | ----- KEVIN WAYNE: "Shortest Paths in a Graph = Google maps problem shortest path from Princeton math department to Einstein's house Slides by Shortest Path Problem = Google maps problem", HTTP://COURSES.CS.WASHINGTON.EDU/COURSES/SE190X/09SP/SLIDES/SHORTEST-PATHS-ALG.PDF, 31 December 2005 (2005-12-31), XP055161733, the whole document ----- -/-- | 2,4 |

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 | "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 |
| "E" earlier application or patent but published on or after the international filing date | "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 |
| "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) | "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 |
| "O" document referring to an oral disclosure, use, exhibition or other means | "&" document member of the same patent family |
| "P" document published prior to the international filing date but later than the priority date claimed | |

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| Date of the actual completion of the international search 17 March 2015 | Date of mailing of the international search report 30/03/2015 |
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/HU2014/000066

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.:

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: 1-5(completely); 10(partially)

Method for pruning intermediate stored node points in a range determination algorithm for an electric vehicle, taking into account steepness of road segments from map data.

2. claims: 1-9(completely); 10(partially)

Method for determining range for an electric off-road vehicle using data from a net.

INTERNATIONAL SEARCH REPORT

International application No
PCT/HU2014/000066

| C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|--|---|-----------------------|
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| A | EP 2 172 740 A1 (AISIN AW CO [JP]; TOYOTA MOTOR CO LTD [JP]) 7 April 2010 (2010-04-07) paragraph [0058]; figures 3,4 ----- | 1 |
| A | JP 2010 122117 A (AISIN AW CO) 3 June 2010 (2010-06-03) figures 4,12 ----- | 1 |
| Y | SG 191 541 A1 (THALES SA [FR]) 31 July 2013 (2013-07-31) figures 2,3,4 ----- | 6-10 |
| A | YAHJA A ET AL: "An efficient on-line path planner for outdoor mobile robots", ROBOTICS AND AUTONOMOUS SYSTEMS, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 32, no. 2-3, 31 August 2000 (2000-08-31), pages 129-143, XP004210042, ISSN: 0921-8890, DOI: 10.1016/S0921-8890(99)00114-1 page 5 ----- | 6-10 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/HU2014/000066

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
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| JP 2010122117 | A | 03-06-2010 | NONE |
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| SG 191541 | A1 | 31-07-2013 | FR 2985016 A1 28-06-2013 |
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