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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, BN, BR, BW, BY, BZ,

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**Declarations under Rule 4.17:**

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

(54) **Title:** METHODS AND SYSTEMS FOR NAVIGATING AUTONOMOUS AND SEMI-AUTONOMOUS VEHICLES

(57) **Abstract:** Methods and systems are disclosed for an improved control system in autonomous and semi-autonomous vehicles. More specifically, the methods and systems relate to powering control systems of autonomous and semi-autonomous vehicles through the use of computer vision based on delta images (i.e., delta-vision).

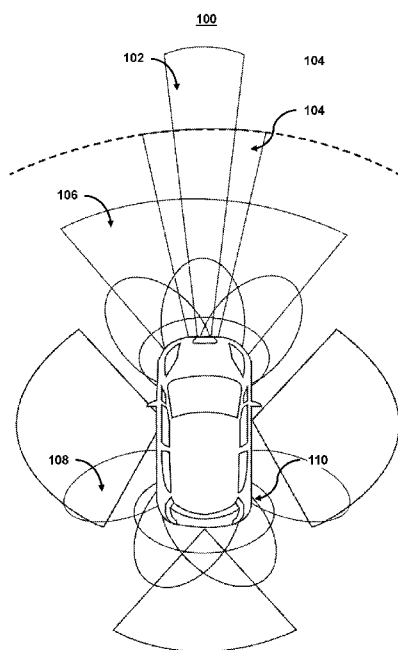


FIG. 1



**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))*

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**(15) Information about Correction:**

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**A. CLASSIFICATION OF SUBJECT MATTER****G06K 9/00(2006.01)i, G06K 9/62(2006.01)i**

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)  
G06K 9/00; G01S 17/42; G01S 17/89; G06K 9/46; G06K 9/62; G06T 1/00; G06T 3/40Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
Korean utility models and applications for utility models  
Japanese utility models and applications for utility modelsElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
eKOMPASS(KIPO internal) & Keywords: autonomous, artificial neural network, delta image, label**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2018-0012082 A1 (NAUTO, INC.) 11 January 2018 paragraphs [0016], [0058], [0073], [0080], [0083] and figure 1, 4	1-21
A	US 2018-0150713 A1 (SAP SE) 31 May 2018 paragraphs [0030]-[0032], [0041] and figures 1-5	1-21
A	US 8965104 B1 (RYAN M. HICKMAN et al.) 24 February 2015 claim 1 and figures 2-4	1-21
A	US 2018-0136332 A1 (WHEEGO ELECTRIC CARS, INC.) 17 May 2018 claim 1 and figures 3, 7	1-21
A	US 2017-0053167 A1 (QUALCOMM INCORPORATED) 23 February 2017 claim 1 and figures 2-4	1-21

 Further documents are listed in the continuation of Box C. See patent family annex.

\* Special categories of cited documents:

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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

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"&amp;" document member of the same patent family

Date of the actual completion of the international search

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2019/053169**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2018-0012082 A1	11/01/2018	US 10037471 B2 US 2018-0307916 A1 WO 2018-009552 A1	31/07/2018 25/10/2018 11/01/2018
US 2018-0150713 A1	31/05/2018	CN 108121997 A EP 3327616 A1 US 10289925 B2	05/06/2018 30/05/2018 14/05/2019
US 8965104 B1	24/02/2015	None	
US 2018-0136332 A1	17/05/2018	None	
US 2017-0053167 A1	23/02/2017	CN 107851318 A EP 3338248 A1 EP 3338248 B1 JP 2018-523877 A KR 10-2018-0042254 A US 10586102 B2 WO 2017-034683 A1	27/03/2018 27/06/2018 27/11/2019 23/08/2018 25/04/2018 10/03/2020 02/03/2017