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G08G 1/00 (2006.01) *B60W 30/165* (2012.01)
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- (71) **Applicant: BENDIX COMMERCIAL VEHICLE SYSTEMS LLC** [US/US]; 901 Cleveland Street, Elyria, OH 44035 (US).
- (72) **Inventors: PILKINGTON, Andrew, J.**; 901 Cleveland Street, Elyria, OH 44035 (US). **MILLER, T., Stephen**; 901 Cleveland Street, Elyria, OH 44035 (US). **SZYM-**

CZAK, Scott; 901 Cleveland Street, Elyria, OH 44035 (US). **LESHER, Michael, K.**; 901 Cleveland Street, Elyria, OH 44035 (US). **ALABI, Adedapo, A.**; 901 Cleveland Street, Elyria, OH 44035 (US).

(74) **Agent: HUDZINSKI, Michael, E.**; Tucker Ellis LLP, 950 Main Avenue, Suite 1100, Cleveland, OH 44113 (US).

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(54) **Title:** INITIALIZATION AND SAFETY MAINTENANCE STRATEGY FOR PLATOONING VEHICLES

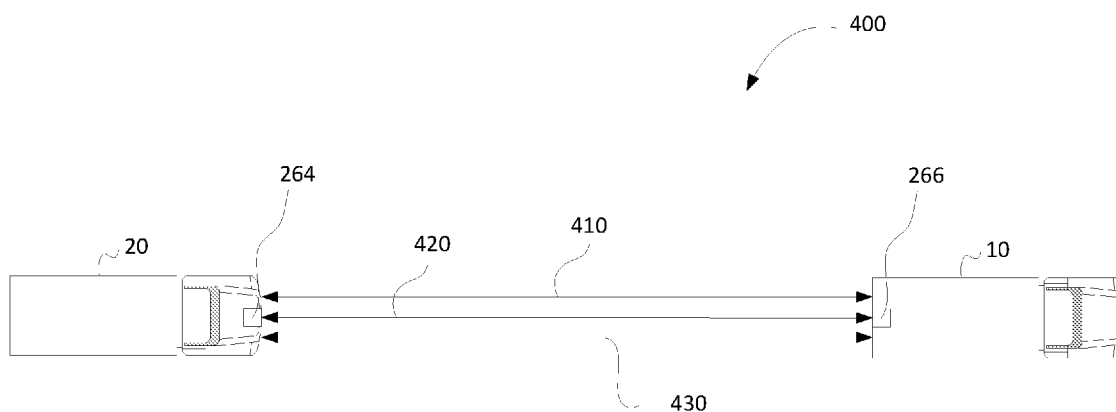


FIGURE 4

(57) **Abstract:** Systems and methods are provided for platoon initialization, redundant lane departure control, and redundant communication operation. A platooning initiation strategy requires continuous communication between vehicles for a more than a predefined duration, a demonstration of an operable brake light on the leading vehicle, and command control profile compatibility between the vehicles before allowing the vehicles to mutually platoon or to join an existing platoon. A set of computer readable labels visible to a Lane Departure System placed on a lead vehicle are used by a following vehicle when lane markings become invisible to sensors. A redundant brake lamp operable in a non-visible spectrum is provided for platooning. A specific brake lamp for use exclusively for platooning purposes may be provided.



(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

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17 October 2019 (17.10.2019)

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INTERNATIONAL SEARCH REPORT

REVISED VERSION

International application No

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A. CLASSIFICATION OF SUBJECT MATTER INV. G08G1/00 B60W30/165 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) G08G B60W											
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, WPI Data											
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <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>Y</td> <td> US 2017/344023 A1 (LAUBINGER LORENZ [US] ET AL) 30 November 2017 (2017-11-30) abstract paragraphs [0085] - [0090], [0134] - [0158], [0164] - [0204] figures 6, 7B, 19, 20, 37, 38 ----- </td> <td>1-34</td> </tr> <tr> <td>Y</td> <td> WO 2017/174108 A1 (VOLVO TRUCK CORP [SE]) 12 October 2017 (2017-10-12) abstract page 8, line 6 - page 9, line 9 claim 1 ----- -/-- </td> <td>1-9, 13-26, 30-34</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	Y	US 2017/344023 A1 (LAUBINGER LORENZ [US] ET AL) 30 November 2017 (2017-11-30) abstract paragraphs [0085] - [0090], [0134] - [0158], [0164] - [0204] figures 6, 7B, 19, 20, 37, 38 -----	1-34	Y	WO 2017/174108 A1 (VOLVO TRUCK CORP [SE]) 12 October 2017 (2017-10-12) abstract page 8, line 6 - page 9, line 9 claim 1 ----- -/--	1-9, 13-26, 30-34
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☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.											
* Special categories of cited documents : <table border="0"> <tr> <td> "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 referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed </td> <td> "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 "&" document member of the same patent family </td> </tr> </table>			"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 referring to 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 "&" document member of the same patent family							
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Date of the actual completion of the international search		Date of mailing of the international search report									
7 August 2019		21/08/2019									
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Van den Bosch, I									

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2018/067054

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 2 390 744 A1 (VOLVO CAR CORP [SE]) 30 November 2011 (2011-11-30) abstract paragraphs [0022], [0023] -----	1-9, 13-26, 30-34
Y	US 2017/186327 A1 (UYSAL MURAT [TR] ET AL) 29 June 2017 (2017-06-29) abstract paragraphs [0008], [0021] - [0024] figures 1-4 -----	10,27
A	EP 0 561 353 A1 (ROCKWELL INTERNATIONAL CORP [US]) 22 September 1993 (1993-09-22) abstract column 1, lines 3-7 column 3, line 8 - column 4, line 50 figure 2 -----	1-34
A	DE 10 2017 001656 A1 (SCANIA CV AB [SE]) 14 September 2017 (2017-09-14) abstract paragraph [0038] -----	1-34
Y	US 2016/267795 A1 (MIYAZAWA MASAKO [JP] ET AL) 15 September 2016 (2016-09-15) abstract paragraphs [0054], [0062], [0063] figures 1, 2 -----	11,12, 28,29
A	WO 2017/196165 A1 (DAF TRUCKS NV [NL]) 16 November 2017 (2017-11-16) abstract page 8, line 25 - page 11, line 5 figures 1, 2 -----	1-34

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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.:
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: 2-9, 13-17, 19-26, 30-34(completely); 1, 18(partially)

Initialization of platoon control responsive to communication persistency data and functional handshake data, wherein the functional handshake data is responsive to determining a correspondence between a first functional request command data and affirmative function detected data, and wherein the initialization is further responsive to a comparison between a control profile request and predetermined maximum control profile capabilities

2. claims: 10, 27(completely); 1, 18(partially)

Initialization of platoon control responsive to communication persistency data and functional handshake data, wherein the functional handshake data is responsive to determining a correspondence between a first functional request command data and affirmative function detected data, and wherein platoon commands are sent and received via IR light signals.

3. claims: 11, 12, 28, 29(completely); 1, 18(partially)

Initialization of platoon control responsive to communication persistency data and functional handshake data, wherein the functional handshake data is responsive to determining a correspondence between a first functional request command data and affirmative function detected data, and wherein a lane departure system is configured to generate vehicle steering control signals.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2018/067054

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