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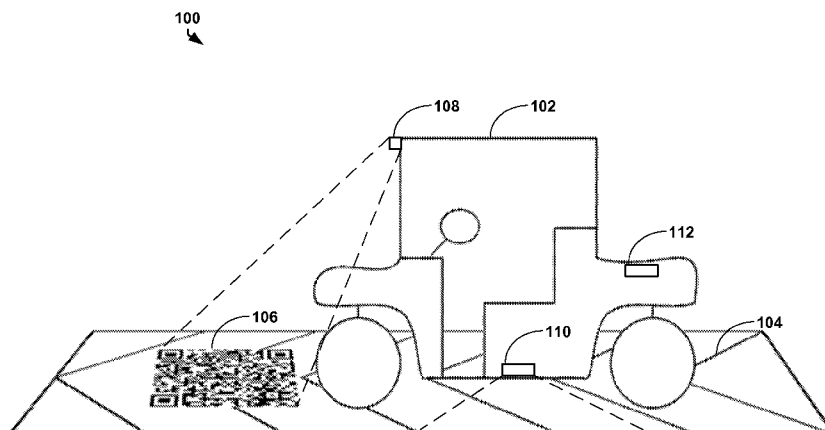


FIGURE 1

(57) **Abstract:** Disclosed are methods and devices for transitioning a mixed-mode autonomous vehicle from a human driven mode to an autonomously driven mode. Transitioning may include stopping a vehicle on a predefined landing strip and detecting a reference indicator. Based on the reference indicator, the vehicle may be able to know its exact position. Additionally, the vehicle may use the reference indicator to obtain an autonomous vehicle instruction via a URL. After the vehicle knows its precise location and has an autonomous vehicle instruction, it can operate in autonomous mode.



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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 2 136 275 A1 (FIAT RICERCHE [IT]) 23 December 2009 (2009-12-23) figures 1, 3, 6 paragraphs [0011] - [0013], [0015], [0023], [0027]	1-20
A	----- US 2008/040029 A1 (BREED DAVID S [US]) 14 February 2008 (2008-02-14) paragraph [0318]	1-20
A	----- US 2010/066515 A1 (SHIMAZAKI KAZUNORI [JP] ET AL) 18 March 2010 (2010-03-18) figures 1,3 paragraph [0120]	1-20
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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.
A	US 2007/198145 A1 (NORRIS WILLIAM R [US] ET AL NORRIS WILLIAM ROBERT [US] ET AL) 23 August 2007 (2007-08-23) figure 1 paragraphs [0083], [0105] -----	1-20
A	US 2010/185353 A1 (BARWICK STOTT [US] ET AL) 22 July 2010 (2010-07-22) paragraphs [0020], [0057]; figures 1,3 paragraph [0120] -----	1-20

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2136275	A1	23-12-2009	NONE
US 2008040029	A1	14-02-2008	NONE
US 2010066515	A1	18-03-2010	AU 2007340727 A1 10-07-2008 CN 101573257 A 04-11-2009 EP 2100778 A1 16-09-2009 JP 5126069 B2 23-01-2013 KR 20090096736 A 14-09-2009 TW 200846219 A 01-12-2008 US 2010066515 A1 18-03-2010 WO 2008081655 A1 10-07-2008
US 2007198145	A1	23-08-2007	AU 2006304812 A1 26-04-2007 AU 2006304838 A1 26-04-2007 AU 2006306522 A1 03-05-2007 AU 2006306523 A1 03-05-2007 DE 112006002892 T5 06-11-2008 DE 112006002894 T5 18-09-2008 DE 112006003007 T5 16-10-2008 DE 112006003044 T5 23-10-2008 GB 2445507 A 09-07-2008 US 2007193798 A1 23-08-2007 US 2007198144 A1 23-08-2007 US 2007198145 A1 23-08-2007 US 2007219666 A1 20-09-2007 US 2011071718 A1 24-03-2011 US 2012046820 A1 23-02-2012 WO 2007048003 A2 26-04-2007 WO 2007048029 A2 26-04-2007 WO 2007050406 A1 03-05-2007 WO 2007050407 A1 03-05-2007
US 2010185353	A1	22-07-2010	CA 2749506 A1 22-07-2010 CA 2749509 A1 22-07-2010 CA 2750618 A1 22-07-2010 CN 102341322 A 01-02-2012 CN 102356367 A 15-02-2012 EP 2387526 A1 23-11-2011 EP 2387539 A2 23-11-2011 EP 2387738 A2 23-11-2011 SG 173002 A1 29-08-2011 SG 173003 A1 29-08-2011 US 2010181136 A1 22-07-2010 US 2010183409 A1 22-07-2010 US 2010185353 A1 22-07-2010 US 2013041546 A1 14-02-2013 WO 2010083472 A2 22-07-2010 WO 2010083473 A1 22-07-2010 WO 2010083474 A2 22-07-2010