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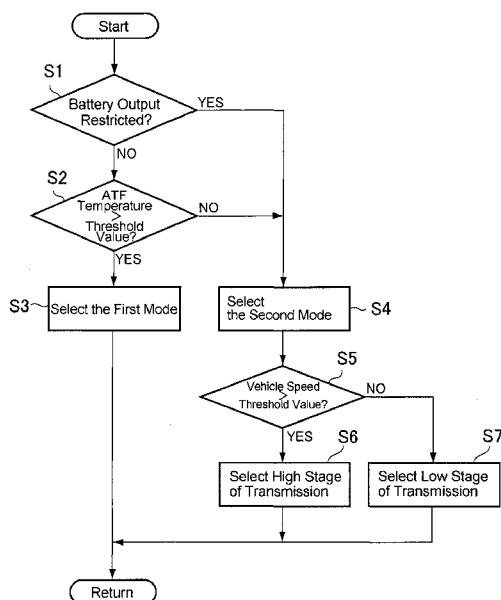
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(54) Title: VEHICLE CONTROL SYSTEM

[Fig. 1]



(57) Abstract: A vehicle control system for reducing shocks resulting from restarting an engine (1) under EV running mode. The vehicle control system is applied to a vehicle comprising an engagement device (C0, B0) that selectively connect the engine with the powertrain, and a motor (3) adapted to generate a drive force and connected with the powertrain. In the vehicle, a first mode is selected to propel the vehicle by the motor while interrupting the torque transmission between the engine and the powertrain and stopping the engine, and a second mode is selected to propel the vehicle by the motor while allowing the torque transmission between the engine and the powertrain and stopping the engine. The vehicle control system selects the second mode if a control response of at least any of the engagement device and the motor is estimated to be out of a predetermine range when the vehicle is running while stopping the engine (step S4).



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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)

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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)

EP0-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/153429 A1 (BOLL WOLF [DE]) 14 August 2003 (2003-08-14)	1,3,4
Y	paragraphs [0013] - [0015], [0026] - [0029] -----	2,5
Y	JP 2010 000858 A (TOYOTA MOTOR CORP) 7 January 2010 (2010-01-07) abstract; figure 1 -----	2,5
X	JP H10 54263 A (AQUEOUS RES KK) 24 February 1998 (1998-02-24) abstract paragraphs [0027] - [0035], [0044] - [0046] -----	1,3,4
A	US 2010/151990 A1 (SEEL ANDREAS [DE]) 17 June 2010 (2010-06-17) claims 1, 19-21 ----- -/--	1-5



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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	WO 2013/038857 A1 (NISSAN MOTOR [JP]; RENAULT SA [FR]; KONISHI YASUHIRO; KANEKO KAKUZOU;) 21 March 2013 (2013-03-21) paragraphs [0028] - [0044] -----	1-5

INTERNATIONAL SEARCH REPORT

Information on patent family members

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PCT/JP2014/073119

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003153429 A1	14-08-2003	DE 10158536 A1 US 2003153429 A1	03-07-2003 14-08-2003
JP 2010000858 A	07-01-2010	NONE	
JP H1054263 A	24-02-1998	JP 3612873 B2 JP H1054263 A	19-01-2005 24-02-1998
US 2010151990 A1	17-06-2010	CN 101259844 A CN 101626930 A DE 102007010770 A1 EP 2144800 A2 JP 2010534584 A KR 20090127882 A US 2010151990 A1 WO 2008107459 A2	10-09-2008 13-01-2010 11-09-2008 20-01-2010 11-11-2010 14-12-2009 17-06-2010 12-09-2008
WO 2013038857 A1	21-03-2013	CN 103987602 A EP 2757012 A1 JP 2013060132 A US 2014210216 A1 WO 2013038857 A1	13-08-2014 23-07-2014 04-04-2013 31-07-2014 21-03-2013