



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**25.02.2015 Bulletin 2015/09**

(51) Int Cl.:  
**F02N 11/08 (2006.01)**

(43) Date of publication A2:  
**31.03.2010 Bulletin 2010/13**

(21) Application number: **09170112.8**

(22) Date of filing: **11.09.2009**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR**

(30) Priority: **24.09.2008 JP 2008244098**

(71) Applicant: **Keihin Corporation**  
**Tokyo 163-0539 (JP)**

(72) Inventor: **Takahashi, Takeo**  
**Miyagi (JP)**

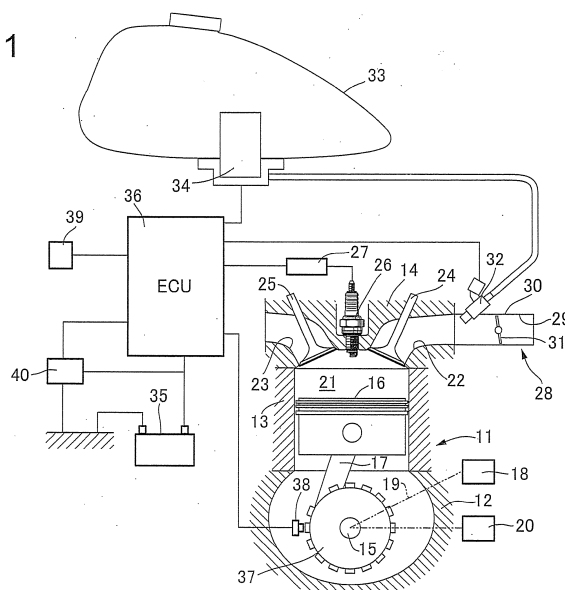
(74) Representative: **Prechtel, Jörg**  
**Weickmann & Weickmann**  
**Patentanwälte**  
**Postfach 86 08 20**  
**81635 München (DE)**

(54) **Starting system for fuel injection engine**

(57) In a control system for a fuel injection engine in which at least operations of a fuel injection valve and a fuel pump are controlled by an electrical control unit to become incapable of control processing in a state in which a voltage of a battery reaches a predetermined reset voltage or lower, prohibition signal output means (41) outputs a prohibition signal for prohibiting operation of the fuel pump (34) by detecting starting of operation of a starter motor; permission signal output means (42) outputs a permission signal for permitting operation of the fuel pump (34) by determining that a pump operation permission state capable of avoiding a voltage of the bat-

tery reaching a predetermined reset voltage or lower even by operation of the fuel pump (34) has reached prior to fuel injection by the fuel injection valve after operation of the fuel pump (34) is stopped in response to starting of operation of the starter motor; and pump drive means (43) drives the fuel pump (34) according to a prohibition signal output from the prohibition signal output means (41) and a permission signal output from the permission signal output means (42). Accordingly, it is possible to enhance engine startability when a battery has deteriorated.

FIG.1





## EUROPEAN SEARCH REPORT

 Application Number  
 EP 09 17 0112

## DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 5 555 872 A (TAKEUCHI SHIGERU [JP] ET AL) 17 September 1996 (1996-09-17) * column 2, line 13 - column 3, line 21 * * column 8, line 23 - column 10, line 3 * * figures 1, 2, 7 *	1-3	INV. F02N11/08
A	JP S62 131965 A (TOYOTA MOTOR CORP) 15 June 1987 (1987-06-15) * abstract *	1	
A	JP S60 164638 A (TOYOTA MOTOR CO LTD) 27 August 1985 (1985-08-27) * abstract *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			F02N F02D

The present search report has been drawn up for all claims

1

EPO FORM 1503 03.82 (P04C01)

Place of search

Munich

Date of completion of the search

16 January 2015

Examiner

De Vita, Diego

## CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone  
 Y : particularly relevant if combined with another document of the same category  
 A : technological background  
 O : non-written disclosure  
 P : intermediate document

T : theory or principle underlying the invention  
 E : earlier patent document, but published on, or after the filing date  
 D : document cited in the application  
 L : document cited for other reasons

& : member of the same patent family, corresponding document

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 17 0112

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-01-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5555872 A	17-09-1996	JP 3319150 B2	26-08-2002
		JP H07317620 A	05-12-1995
		US 5555872 A	17-09-1996
-----			
JP S62131965 A	15-06-1987	NONE	
-----			
JP S60164638 A	27-08-1985	NONE	
-----			

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82