



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
21.01.2004 Bulletin 2004/04

(51) Int Cl.7: **G10K 11/178**

(43) Date of publication A2:
07.05.2003 Bulletin 2003/19

(21) Application number: **02079479.8**

(22) Date of filing: **25.10.2002**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
IE IT LI LU MC NL PT SE SK TR
 Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Vaishya, Manish**
Auburn Hills, Michigan 48326 (US)

(74) Representative: **Condon, Neil et al**
Intellectual Property Department,
Siemens Shared Services Limited,
Siemens House,
Oldbury
Bracknell, Berkshire RG12 8FZ (GB)

(30) Priority: **30.10.2001 US 341026 P**
15.10.2002 US 271440

(71) Applicant: **Siemens VDO Automotive Inc.**
Chatham, Ontario N7M 5M7 (CA)

(54) **Active noise cancellation using frequency response control**

(57) An active noise cancellation system (20) includes using a frequency domain response of a secondary path (44) of the system. The frequency domain response information provides an indication of a desired magnitude and phase of a reference signal that is used for generating a cancellation signal that drives a speaker (28) to achieve the desired amount of noise cancellation. Using a frequency domain response greatly reduces

the number of computations required and the amount of memory used within the system controller. In one example, a reference signal adjustment module (40) applies the desired magnitude and phase adjustments to a reference signal having a known frequency. In another example, the referenced signal tone generator (22, 40) incorporates the desired amplitude and phase in the reference signal.

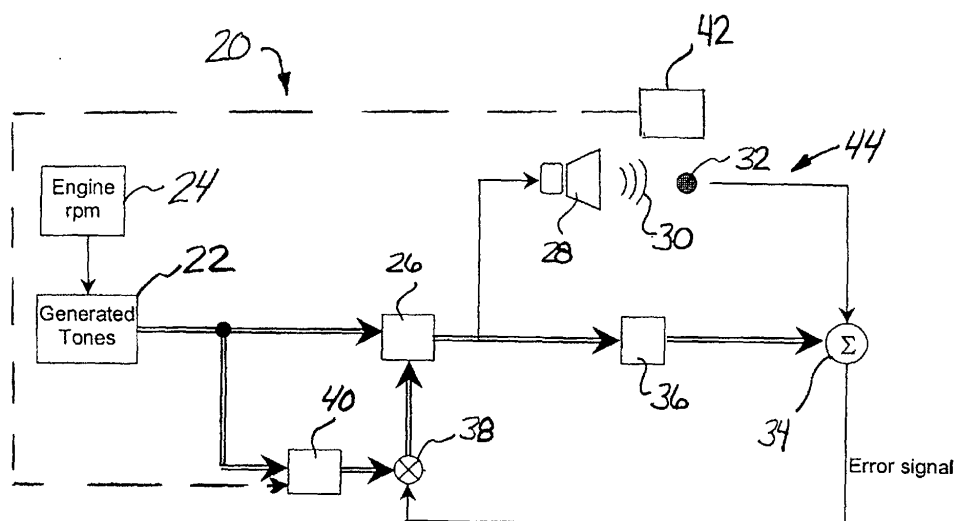


Fig 1



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 07 9479

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 768 124 A (BOWLES C L ET AL) 16 June 1998 (1998-06-16) * column 5, line 58 - column 6, line 58 * * column 7, line 49 - column 8, line 47 * * column 10, line 8 - column 11, line 9 * * figures 3,6,7 * ---	1-5,7,8, 10-12, 14,16	G10K11/178
A	US 5 692 052 A (KATO MASANORI ET AL) 25 November 1997 (1997-11-25) * column 10, line 17 - line 21; figure 17 * ---	6,13	
A	US 6 208 949 B1 (EATWELL GRAHAM P) 27 March 2001 (2001-03-27) * column 15, line 57 - column 17, line 5 * -----	9,15,17	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			G10K
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 28 November 2003	Examiner Häusser, T
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			

EPO FORM 1503 03/82 (P04C01)

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

EP 02 07 9479

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.

28-11-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5768124 A	16-06-1998	EP 0665977 A1 WO 9409480 A2 JP 8502593 T	09-08-1995 28-04-1994 19-03-1996
US 5692052 A	25-11-1997	JP 6330763 A JP 5209563 A EP 0625773 A2	29-11-1994 20-08-1993 23-11-1994
US 6208949 B1	27-03-2001	EP 0969341 A2	05-01-2000