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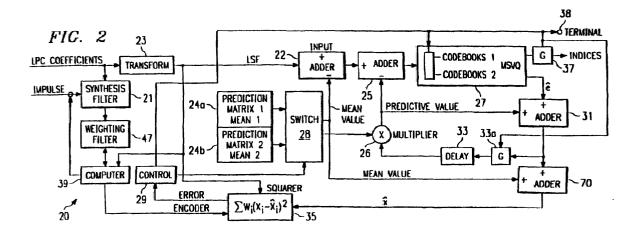
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#### (54) Quantization of linear prediction coefficients

(57) A new method for quantization of the LPC coefficients in a speech coder includes a new weighted error measure including every frame sampling an impulse response from LPC filter (21) of said coder, filtering the samples using a perceptual weighting filter (47)

and processing in a computer (39) to calculate autocorrelation function of the weighted impulse response, computing Jacobian matrix for LSF (Line Spectral Frequency), computing correlation of rows of Jacobian matrix and calculating LSF weights by multiplying correlation matrices.





### **EUROPEAN SEARCH REPORT**

Application Number EP 98 30 6906

	DOCUMENTS CONSID	ERED TO BE RELEVANT		
Category	Citation of document with i of relevant pass	ndication, where appropriate, ages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
P,X	with improved analy PROCEEDINGS OF THE CONFERENCE ON ACOUS PROCESSING, ICASSP NO.98CH36181), PROC IEEE INTERNATIONAL ACOUSTICS, SPEECH A SEATTLE, WA, USA, 1 vol.2, XP002109401	CEEDINGS OF THE 1998 CONFERENCE ON AND SIGNAL PROCESSING, 2-1, pages 593-596 USA, IEEE, USAISBN:	1-7	G10L9/14 G10L3/02
E	EP 0 905 680 A (TE) 31 March 1999 (1999 * page 5 *	(AS INSTRUMENTS INC) 1-03-31)	1-7	
D,A		995-09-01), pages 1	1-7	TECHNICAL FIELDS SEARCHED (Int.CI.6) G10L
		-/		
	The present search report has	oeen drawn up for all claims		
	Place of search	Date of completion of the search		Examiner
	THE HAGUE	16 July 1999	Kre	mbel, L
X : parti Y : parti docu A : tech O : non-	ATEGORY OF CITED DOCUMENTS oularly relevant if taken alone oularly relevant if combined with anot ment of the same category nological background written disclosure mediate document	L : document cited for	ment, but publis the application other reasons	hed on, or

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## **EUROPEAN SEARCH REPORT**

Application Number EP 98 30 6906

Category		ndication, where appropriate,	Relevant	CLASSIFICATION OF THE
Category A	of relevant pass  MCCREE A ET AL: "A candidate for the r Standard" 1996 IEEE INTERNATI ACOUSTICS, SPEECH, CONFERENCE PROCEEDI NO.96CH35903), 1996 CONFERENCE ON ACOUS SIGNAL PROCESSING OF ATLANTA, GA, USA, 7 vol. 1, XP002109402 1996, New York, NY,	ages A 2.4 kbit/s MELP coder new U.S. Federal ONAL CONFERENCE ON AND SIGNAL PROCESSING NGS (CAT. IEEE INTERNATIONAL ONFERENCE PROCEEDINGS, Y-10 M, pages 200-203	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	into LSF quantizati 1997 IEEE INTERNATI ACOUSTICS, SPEECH, (CAT. NO.97CB36052) INTERNATIONAL CONFE SPEECH, AND SIGNAL GERMANY, 21-24 APRI vol.2, XP002109403	ncorporating perception on some experiments" ONAL CONFERENCE ON AND SIGNAL PROCESSING, 1997 IEEE RENCE ON ACOUSTICS, PROCESSING, MUNICH, L 1997, pages 1347-1350  CA, USA, IEEE Comput. 1981-1981	1-7	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
X : parti Y : parti docu A : tech	The present search report has the present search and the present search are the present of the present of the same category nological background written disclosure	Date of completion of the search  16 July 1999  T: theory or principle E: earlier patent door after the filing date	underlying the in ument, but publis the application rother reasons	hed on, or

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# **EUROPEAN SEARCH REPORT**

Application Number EP 98 30 6906

Category	Citation of document with indication of relevant passages	on, where appropriate,	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.6)
A	PALIWAL K K ET AL: "EN QUANTIZATION OF LPC PAN BITS/FRAME" SPEECH PROCESSING 1, TO 1991, vol. 1, no. CONF. 16, 14 May 1991 (1991-05-14 XP000245315 INSTITUTE OF ELECTRICAL ENGINEERSISBN: 0-7803-6* paragraph [0003] *	RAMETERS AT 24 DRONTO, MAY 14 - 17,  1), pages 661-664,  AND ELECTRONICS D003-3	1,7	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
	The present search report has been de	Date of completion of the search		Examiner
	THE HAGUE	16 July 1999	Krer	mbel, L
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 disolosure		E : earlier patent docur after the filing date D : document cited in t L : document cited for c	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 oited for other reasons  8: member of the same patent family, corresponding	

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

EP 98 30 6906

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.

16-07-1999

Patent document	t ort 	Publication date	Patent family member(s)	Publicatio date
EP 0905680	Α	31-03-1999	NONE	
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82