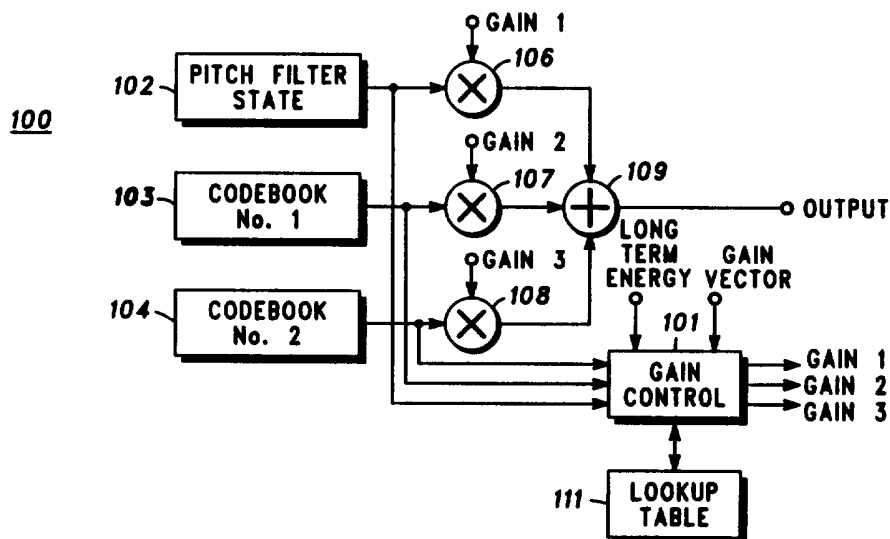




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁵ : G10L 3/00</p>	<p>A3</p>	<p>(11) International Publication Number: WO 91/06943 (43) International Publication Date: 16 May 1991 (16.05.91)</p>
<p>(21) International Application Number: PCT/US90/05693 (22) International Filing Date: 9 October 1990 (09.10.90) (30) Priority data: 422,927 17 October 1989 (17.10.89) US (71) Applicant: MOTOROLA, INC. [US/US]; 1303 East Algonquin Road, Schaumburg, IL 60196 (US). (72) Inventors: GERSON, Ira, Alan ; 1120 Nottingham Lane, Hoffman Estates, IL 60195 (US). JASIUK, Mark, Antoni ; 6611 N. Hiawatha, Chicago, IL 60646 (US). (74) Agents: PARMELEE, Steven, G. et al.; Motorola, Inc., Intellectual Property Department, 1303 East Algonquin Road, Schaumburg, IL 60196 (US).</p>		<p>(81) Designated States: AT (European patent), AU, BE (European patent), BR, CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), JP, KR, LU (European patent), NL (European patent), SE (European patent). Published <i>With international search report.</i> (88) Date of publication of the international search report: 20 August 1992 (20.08.92)</p>

(54) Title: DIGITAL SPEECH CODER HAVING OPTIMIZED SIGNAL ENERGY PARAMETERS



(57) Abstract

A speech coder and decoder methodology wherein pitch excitation and codebook excitation source energies (100) are represented by parameters that are readily transmissible with minimal transmission capacity requirements. The parameters are the long term energy value, a short term correction factor which is applied to the long term energy value to match the short term energy, and proportionality factor(s) that specify the relative energy contribution of the excitation sources to the short term value (101)

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INTERNATIONAL SEARCH REPORT

International Application No **PCT/US90/05693**

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ²		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC (5): G10L 3/00		
U.S. CL: 381/30, 31, 35		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁴		
Classification System	Classification Symbols	
U.S.	381/29-40.	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁶		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁰		
Category ⁸	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
X	US, A, 4,868,867 (DAVIDSON ET AL.) 19 September 1989, See entire document.	1-8
Y,P	US, A, 4,933,957 (BOTTAU ET AL.) 12 June 1990 See entire document.	1-8
Y,P	US, A, 4,932,061 (KROON ET AL.) 05 June 1990 See fig. 1,2,6,7,8, col. 17-18.	1-8
A,T	US, A, 4,969,192 (CHEN ET AL.) 06 November 1990 See entire document.	1-8
A,P	US, A, 4,910,781 (KETCHUM ET AL.) 20 March 1990 See entire document.	1-8
A,P	US, A, 4,899,385 (KETCHUM ET AL.) 06 February 1990, See entire document.	1-8
A	US, A, 4,817,157 (GERSON) 28 March 1989 See entire document.	1-8
Y	IEEE ICASS p 85, 26-29 March 1985 (Hyatt Regency Hotel, Tampa, FL, USA) Schroeder et al., "Code-Excited Linear Prediction (CELP): High-Quality Speech at Very Low Bit-Rates", pp. 937-940.	1-8
<p>⁸ Special categories of cited documents: ¹⁵</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"Y" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search ²⁰	Date of Mailing of this International Search Report ²¹	
04 DECEMBER 1990	18 APR 1991	
International Searching Authority ²²	Signature of Authorized Officer ²³	
RO/US	DAVID D. KNEPPER	

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

A	IEEE Journal on Selected Areas in Communications, Vol. 6, No. 2, February 1988, Kroon et al., "A class of Analysis-by-Synthesis predictive coders for High Quality Speech Coding at Rates Between 4.8 and 16 Kbits/s., see abstract.	1-8
Y	IEEE, April 1987, Kroon et al., "Quantization Procedures for the Excitation in CELP coders", pp. 1649-1652.	1-8
A	Bell Communications Research (Morristown, New Jersey, USA), Daniel Lin, "High Quality 4800BPS Speech Coding for Real-Time Applications", pp. 1-3.	1-8

V. OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE¹

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. Claim numbers because they relate to subject matter not required to be searched by this Authority, namely:

2. Claim numbers because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claim numbers because they are dependent claims not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING²

This International Searching Authority found multiple inventions in this international application as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

The additional search fees were accompanied by applicant's protest.

No protest accompanied the payment of additional search fees.