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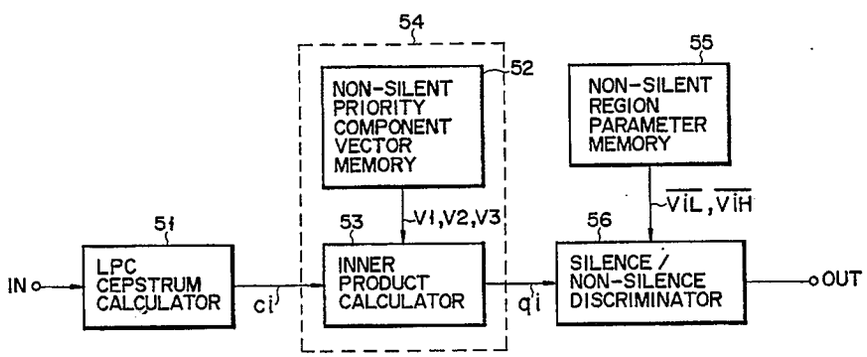
(54) Silence/non-silence discrimination apparatus.

(57) A speech signal is input to an LPC cepstrum calculator (51) and the LPC cepstrums of the speech signal for each frame are calculated as characteristic parameters. The cepstrum is input to a characteristic parameter projection circuit (54) including an inner product calculator (53) and a memory (52) storing first to third priority component vectors that are obtained by applying a priority component analysis to the LPC cepstrums of the non-silent parts of the speech. The inner product calculator (53) calculates inner products of the cepstrum vector and the priority component vectors stored in the priority component vector memory (52) to obtain a projected point of the LPC cepstrums in a vector space formed by the first to third priority component vectors. The output of the inner product calculator (53) is supplied to a silence/non-silence discriminator (56) to which a non-silent region parameter memory (55) storing parameters defining a non-silent region in the non-silent priority component vector space. The silence/non-silence discriminator (56) determines if the speech is silent or non-silent based on whether the projected point is within the non-silent region.



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EUROPEAN SEARCH REPORT

Application Number

EP 90 30 1081

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.5)
A	US-A-4 720 862 (NAKATA) * Claims 1-3; figures 4,5 *	1	G 10 L 3/00
A	IEEE TRANSACTIONS ON ACOUSTICS, SPEECH AND SIGNAL PROCESSING, vol. 24, no. 3, June 1976, pages 201-212, IEEE, New York, US; B.S. ATAI et al.: "A pattern recognition approach to voiced-unvoiced-silence classification with applications to speech recognition" * Pages 201-207, paragraphs I-III *	1,15	
A	IEE PROCEEDINGS, vol. 131, part F, no. 2, April 1984, pages 146-152, Old Woking, Surrey, GB; G.R. DATTATREYA et al.: "Decision tree design and applications in speech processing"		
A	IEEE TRANSACTIONS ON ACOUSTICS, SPEECH AND SIGNAL PROCESSING, vol. 31, no. 3, June 1983, pages 678-684, IEEE, New York, US; P. DE SOUZA: "A statistical approach to the design of an adaptive self-normalizing silence detector" * Paragraph 2: "Verification algorithm" *		TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	IEEE TRANSACTIONS ON COMPUTER, vol. C-20, no. 9, September 1971, pages 972-978; L.C.W. POLS: "Real-time recognition of spoken words" * Pages 974-975: "Dimensional analysis of speech" *	1	G 01 L H 04 J
A	PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON ACOUSTICS, SPEECH AND SIGNAL PROCESSING, ICASSP'87, 6th - 9th April 1987, Dallas, Texas, pages 2392-2395; J.M. NAIK et al.: "Evaluation of a high performance speaker verification system for access control" * Page 2392, paragraphe 2: "Verification algorithm" *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	08 February 91	FARASSOPOULOS A.

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
Y: particularly relevant if combined with another document of the same catagory
A: technological background
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P: intermediate document
T: theory or principle underlying the invention

E: earlier patent document, but published on, or after the filing date
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&: member of the same patent family, corresponding document