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**18.08.93 Bulletin 93/33**(71) Applicant: **NEC CORPORATION**  
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**D-81634 München (DE)**(54) **Method for speech coding and voice-coder.**

(57) A method for speech coding and a voice-coder for coding speech signals divided into frames spaced with a constant interval are disclosed. An adaptive codebook storing excitation signal determined in advance and a plurality of excitation codebooks for multi-stage vector quantization are provided. Each frame is divided into subframes. For each subframe, a candidate of a first predetermined number of adaptive codevectors is selected, and

then candidates of each predetermined number of excitation codevectors are selected from each excitation codebook, respectively, by using the candidate of the adaptive codevector. Finally, a combination of the adaptive codevector and each of the excitation codevector is selected from the candidates of the adaptive codevector and each of the sound codevectors.

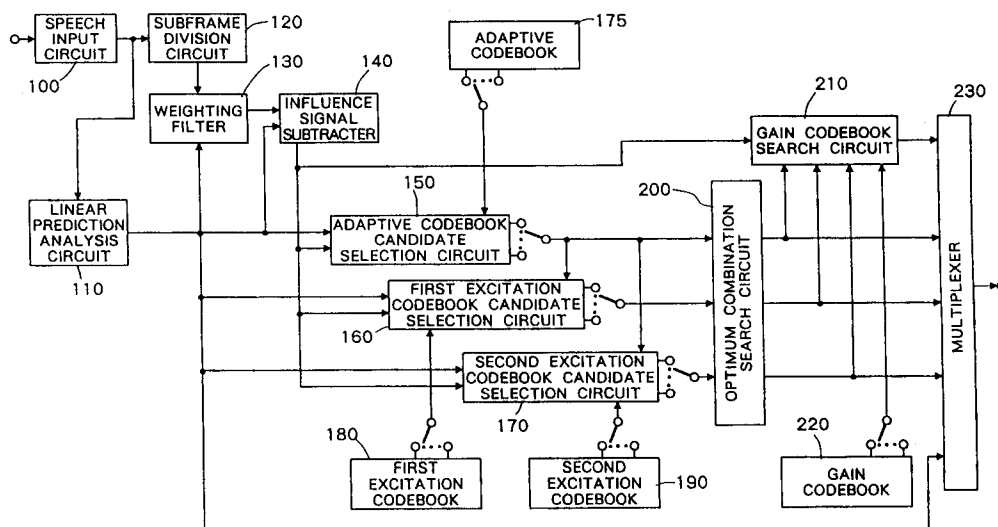


FIG. 1

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	EP-A-0 443 548 (NEC)	1,2,7,10,11	G10L9/14
A	* page 7, line 15 - page 10, line 16; figure 1 * * page 13, line 16 - page 14, line 23; claims 1-4,6; figure 5 * ---	3	
P,X	EP-A-0 477 960 (NEC)  * page 2, line 54 - page 4, line 52; figure 1 * ---	1,2,7,10,11	
A	NEC RESEARCH AND DEVELOPMENT vol. 32, no. 4, October 1991, TOKYO JAPAN pages 549 - 555 UNNO ET AL 'Learned codebook excited linear predictive speech codec for digital cellular system' * abstract * * page 550-551, section 2,3; figure 1; table II * ---	1,2,4	
A	IEEE TRANSACTIONS ON CONSUMER ELECTRONICS vol. 37, no. 4, November 1991, NEW YORK US pages 772 - 782 SUNWOO, PARK 'Real time implementation of the VSELP on a 16-bit DSP chip' * pages 772-773, section IIA, figures 1, 2 * ---	1	TECHNICAL FIELDS SEARCHED (Int. Cl.5)  G10L
A	INTERNATIONAL CONFERENCE ON ACOUSTICS SPEECH AND SIGNAL PROCESSING vol. 1, 23 May 1989, GLASGOW SCOTLAND U.K. pages 65 - 68 JAYANT, CHEN 'Speech coding with time varying bit allocations to excitation and LPC parameters' * Introduction; table 3; figure 2 * --- -/--	4,9	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 22 JUNE 1993	Examiner FARASSOPOULOS A.
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>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</p> <p>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 ----- &amp; : member of the same patent family, corresponding document</p>			



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A	INTERNATIONAL CONFERENCE ON ACOUSTICS SPEECH AND SIGNAL PROCESSING vol. 1, 3 April 1990, ALBUQUERQUE NEW MEXICO USA pages 461 - 464 GERSON, JASIUK 'Vector sum excited linear prediction speech coding at 8Kbps' * pages 461-463, sections I-V *  -----	1-3,7,8, 10-12
		CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
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The present search report has been drawn up for all claims		
Place of search THE HAGUE	Date of completion of the search 22 JUNE 1993	Examiner FARASSOPOULOS A.
<b>CATEGORY OF CITED DOCUMENTS</b> 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		