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(54) **Pitch lag estimation system**

(57) A pitch estimation device and method utilizing a multi-resolution approach to estimate speech pitch lag. The system includes sampling the speech 602 and applying, alternately, a discrete Fourier transform 606 and squaring the result 608. A DFT on the squared amplitude is then performed 610 to transform the speech samples into another domain. An initial pitch lag

can then be found with lower resolution. After getting the low-resolution pitch lag estimate, a refined algorithm is applied 618 to get a higher-resolution pitch lag. The refined algorithm is based on minimizing the prediction error in the time domain. The refined pitch lag then can be used directly in the speech coding.

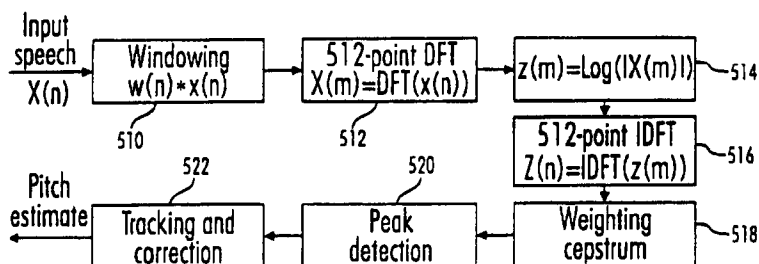


Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 95 11 8142

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.6)
X	MARKEL J D: "Application of a digital inverse filter for automatic formant and F/sub 0/ analysis" IEEE TRANSACTIONS ON AUDIO AND ELECTROACOUSTICS, JUNE 1973, USA, vol. AU-21, no. 3, ISSN 0018-9278, pages 154-160, XP002043263 * page 156-157, Paragraph "Automatic Fundamental Frequency Extraction" * * figure 2 *	1	G10L3/00
Y	idem	3,4,8	
Y	--- EP 0 415 163 A (CODEX CORP) 6 March 1991 * column 1, line 31 - line 38 * * column 5, line 7 - line 37 * * figure 1 *	3,4,8	
A	---	6,7	
A	US 5 189 701 A (JAIN JASWANT R) 23 February 1993 * column 7, line 34 - line 44 * * figure 6 * -----	2,5	TECHNICAL FIELDS SEARCHED (Int.Cl.6) G10L
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10 October 1997	Examiner Krembel, 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 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			

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