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- Published:**
- with international search report
  - before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

[Continued on next page]

(54) Title: EMBEDDED SILENCE AND BACKGROUND NOISE COMPRESSION

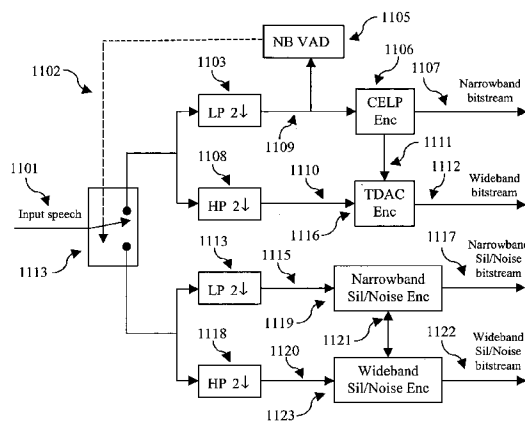


Figure 11: Silence/Background-Noise Encoding Mode for G.729.1 with Narrowband VAD and Separate Decimation Elements

(57) Abstract: There is provided a method for use by a speech encoder to encode an input speech signal. The method comprises receiving the input speech signal; determining whether the input speech signal includes an active speech signal or an inactive speech signal; low-pass filtering the inactive speech signal to generate a narrowband inactive speech signal; high-pass filtering the inactive speech signal to generate a high-band inactive speech signal; encoding the narrowband inactive speech signal using a narrowband inactive speech encoder to generate an encoded narrowband inactive speech; generating a low-to-high auxiliary signal by the narrowband inactive speech encoder based on the narrowband inactive speech signal; encoding the high-band inactive speech signal using a wideband inactive speech encoder to generate an encoded wideband inactive speech based on the low-to-high auxiliary signal from the narrowband inactive speech encoder; and transmitting the encoded narrowband inactive speech and the encoded wideband inactive speech.

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# INTERNATIONAL SEARCH REPORT

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. G10L19/14      G10L19/00				
According to International Patent Classification (IPC) or to both national classification and IPC				
<b>B. FIELDS SEARCHED</b>				
Minimum documentation searched (classification system followed by classification symbols) G10L				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched				
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, INSPEC				
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
A	BENYASSINE A ET AL: "ITU-T RECOMMENDATION G.729 ANNEX B: A SILENCE COMPRESSION SCHEME FOR USE WITH G.729 OPTIMIZED FOR V.70 DIGITAL SIMULTANEOUS VOICE AND DATA APPLICATIONS" IEEE COMMUNICATIONS MAGAZINE, IEEE SERVICE CENTER, PISCATAWAY, US, vol. 35, no. 9, 1 September 1997 (1997-09-01), pages 64-73, XP000704425 ISSN: 0163-6804 cited in the application page 67  <div style="text-align: center;">----- -/--</div>	1, 4, 10, 15, 18		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.				
* Special categories of cited documents :				
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;">                     *A* document defining the general state of the art which is not considered to be of particular relevance                      *E* earlier document but published on or after the international filing date                      *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)                      *O* document referring to an oral disclosure, use, exhibition or other means                      *P* document published prior to the international filing date but later than the priority date claimed                 </td> <td style="width: 50%; border: none; vertical-align: top;">                     *T* 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                      *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone                      *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.                      *&amp;* document member of the same patent family                 </td> </tr> </table>			*A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *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) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed	*T* 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 *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *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. *&* document member of the same patent family
*A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *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) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed	*T* 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 *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *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. *&* document member of the same patent family			
Date of the actual completion of the international search  <div style="text-align: center; font-size: 1.2em;">9 June 2008</div>		Date of mailing of the international search report  <div style="text-align: center; font-size: 1.2em;">17/02/2009</div>		
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer  <div style="text-align: center; font-size: 1.2em;">Ramos Sánchez, U</div>		

## INTERNATIONAL SEARCH REPORT

International application No

PCT/US2008/001356

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>JELINEK M ET AL: "Advances in Source-controlled variable bit rate wideband speech coding" SPECIAL WORKSHOP IN MAUI (SWIM): LECTURES BY MASTERS IN SPEECHPROCESSING, XX, XX, 12 January 2004 (2004-01-12), pages 1-8, XP002272510 page 2 - page 3</p> <p style="text-align: center;">-----</p>	1,4,10, 15,18
A	<p>MCCREE A ET AL: "An embedded adaptive multi-rate wideband speech coder" 2001 IEEE INTERNATIONAL CONFERENCE ON ACOUSTICS, SPEECH, AND SIGNAL PROCESSING. PROCEEDINGS. (ICASSP). SALT LAKE CITY, UT, MAY 7 - 11, 2001; [IEEE INTERNATIONAL CONFERENCE ON ACOUSTICS, SPEECH, AND SIGNAL PROCESSING (ICASSP)], NEW YORK, NY : IEEE, US, vol. 2, 7 May 2001 (2001-05-07), pages 761-764, XP010803767 ISBN: 978-0-7803-7041-8 the whole document</p> <p style="text-align: center;">-----</p>	1,4,10, 15,18

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2008/001356

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

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

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.:  
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.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

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

see additional sheet

1.  As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  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 claims Nos.:  
1-8, 10-20

### Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-8,10-20

Embedded coding of an inactive speech signal.  
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2. claim: 9

Bandwidth extension of decoded inactive narrowband speech signal.  
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