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(71) Applicant: **Mindspeed Technologies, Inc.**
Newport Beach, CA 92660-3095 (US)

(72) Inventors:
- **Thyssen, Jes**
  Laguna Niguel, CA 92677 (US)
- **Su, Huan-yu**
  San Clemente, CA 92673-3029 (US)
- **Gao, Yang**
  Mission Viejo, CA 92692-6101 (US)
- **Benyassine, Adil**
  Irvine, CA 92606 (US)

(74) Representative: **Cefai, Robin**
Cabinet Plasseraud
52 rue de la Victoire
75440 Paris Cedex 09 (FR)

(54) Speech decoder employing noise compensation

(57) A multi-rate speech codec supports a plurality of encoding bit rate modes by adaptively selecting encoding bit rate modes to match communication channel restrictions. In higher bit rate encoding modes, an accurate representation of speech through CELP (code excited linear prediction) and other associated modeling parameters are generated for higher quality decoding and reproduction. For each bit rate mode selected, pluralities of fixed or innovation subcodebooks are selected for use in generating innovation vectors. The speech coder distinguishes various voice signals as a function of their voice content. For example, a Voice Activity Detection (VAD) algorithm selects an appropriate coding scheme depending on whether the speech signal comprises active or inactive speech. The encoder may consider varying characteristics of the speech signal including sharpness, a delay correlation, a zero-crossing rate, and a residual energy. In another embodiment of the present invention, code excited linear prediction is used for voice active signals whereas random excitation is used for voice inactive signals; the energy level and spectral content of the voice inactive signal may also be used for noise coding. The multi-rate speech codec may employ distributed detection and compensation processing the speech signal. For high quality perceptual speech reproduction, the speech codec may perform noise detection in both an encoder and decoder. The noise detection may be coordinated between the encoder and decoder. Similarly, noise compensation may be performed in a distributed manner among both the decoder and the encoder.

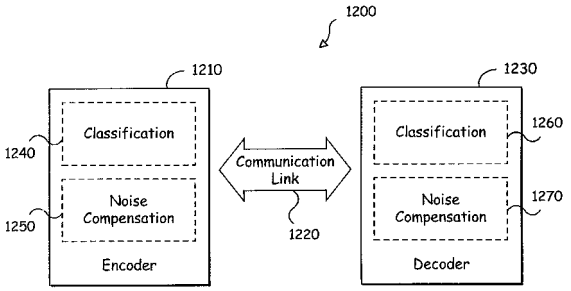

Fig. 12

EP 1 930 881 A3

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EUROPEAN SEARCH REPORT

Application Number
EP 08 15 2711

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	TANIGUCHI T ET AL: "Enhancement of VSELP Coded Speech under Background Noise" 19950920; 19950920 - 19950922, 20 September 1995 (1995-09-20), pages 67-68, XP010269480 * abstract; figure 4 * * page 68, line 1 - line 22 * -----	1,7	INV. G10L21/02

TECHNICAL FIELDS SEARCHED (IPC)

G10L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	7 August 2008	Zimmermann, Elko

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
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