

METHOD AND APPARATUS FOR REPRODUCING SPEECH SIGNALS,
METHOD AND APPARATUS FOR DECODING THE SPEECH, METHOD AND
APPARATUS FOR SYNTHESIZING THE SPEECH AND PORTABLE
RADIO TERMINAL APPARATUS

ABSTRACT

A method for reproducing speech signals at a controlled speed whereby rate conversion of the time axis may be facilitated, and a method for synthesizing the speech whereby pitch conversion can be realized by a simplified structure based on the encoded speech data without changing the phoneme. With the speech reproducing method, an encoding unit 2 discriminates whether an input speech signal is voiced or unvoiced. Based on the results of discrimination, the encoding unit 2 performs sinusoidal synthesis and encoding for a signal portion found to be voiced, while performing vector quantization by closed-loop search for an optimum vector for a portion found to be unvoiced using an analysis-by-synthesis method, in order to find encoded parameters. The decoding unit 3 compands the time axis of the encoded parameters obtained every pre-set frames at a period modification unit 4 for modifying the output period of the parameters for creating modified encoded parameters associated with different time points corresponding to the pre-set frames. A speech synthesis unit 6 synthesizes the voiced speech portion and the unvoiced speech portion based on the modified encoded parameters. With the speech synthesizing unit, an encoded bit stream or encoded data is outputted by an encoded data outputting unit 301. Of these data, at least pitch data and amplitude data of the spectral envelope are sent via a data conversion unit 302 to a waveform synthesis unit 302, where the number of amplitude data of the spectral envelope is changed without changing the shape of the spectral envelope depending on

a pitch desired pitch value. A waveform synthesis unit 303 synthesizes the speech waveform based on the converted spectral envelope data and pitch data.

Figure 1 & 15