ABSTRACT

A DEVICE AND PROCESS FOR ENCODING AUDIO DATA

An MPEG-1 layer 3 audio encoder, including a scalefactor generator for determining first scalefactors for encoding a block of audio data if a temporal masking transient is not detected in said block of audio data; and for selecting the maximum of said scalefactors for encoding said block of audio data if a temporal masking transient is detected in said block of audio data to enable greater compression of said audio data. Increases in quantization error due to use of the maximum scalefactor are pre-masked or post-masked by the temporal masking transient. In cases where the last portion of a block includes a temporal masking transient that masks the preceding portions of the block, the maximum scalefactor is only used to encode the block if the resulting increase in quantization error is less than 30% of the quantization error for the block.

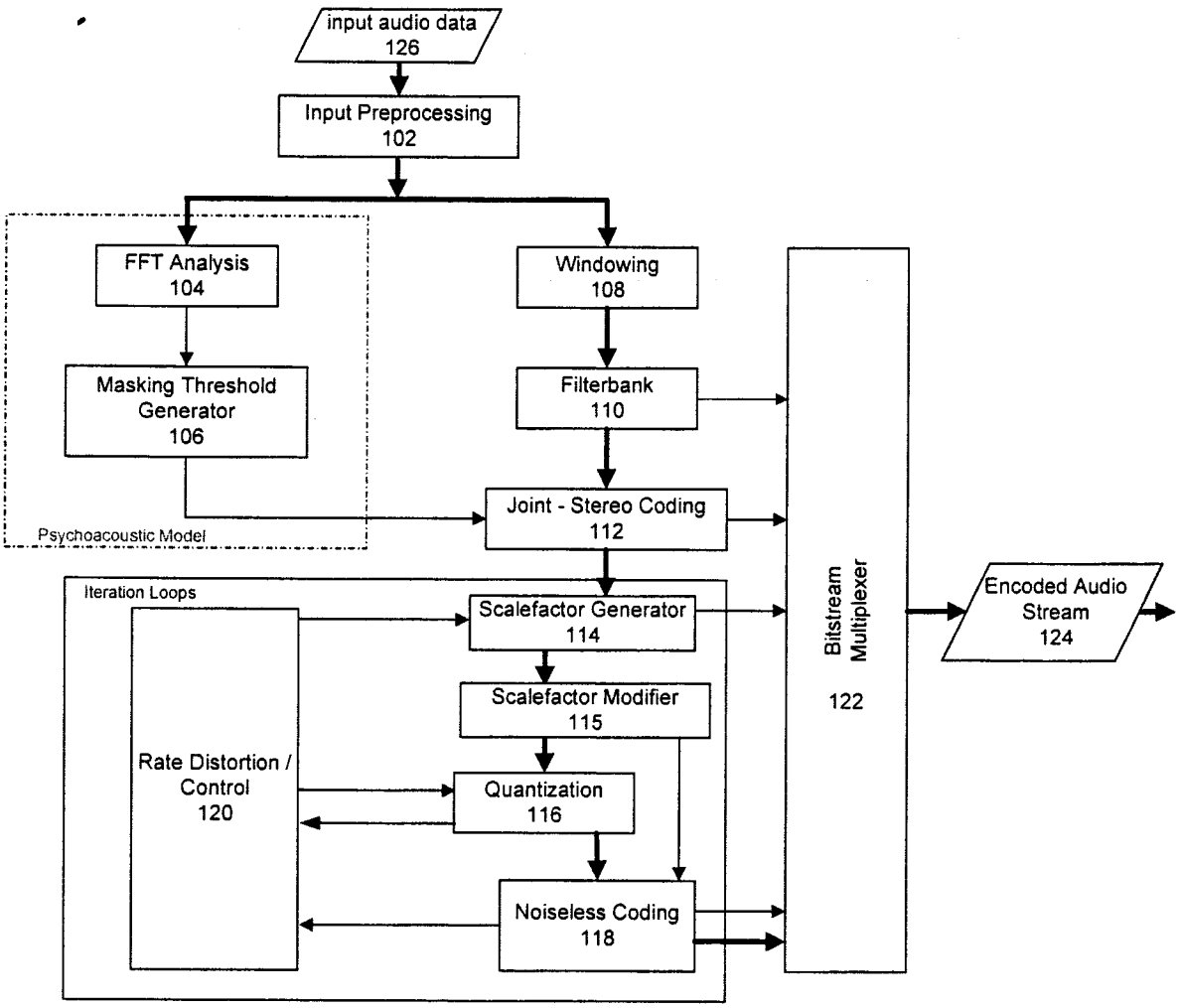
input audio data
126
Input Preprocessing
102
FFT Analysis
104
Masking Threshold
Generator
106
Psychoacoustic Model
Windowing
108
Filterbank
110
Joint - Stereo Coding
112
Iteration Loops
Scalefactor Generator
114
Scalefactor Modifier
115
Rate Distortion /
Control
120
Quantization
116
Noiseless Coding
118
Bitstream
Multiplexer
122
Encoded Audio
Stream
124

Figure 1

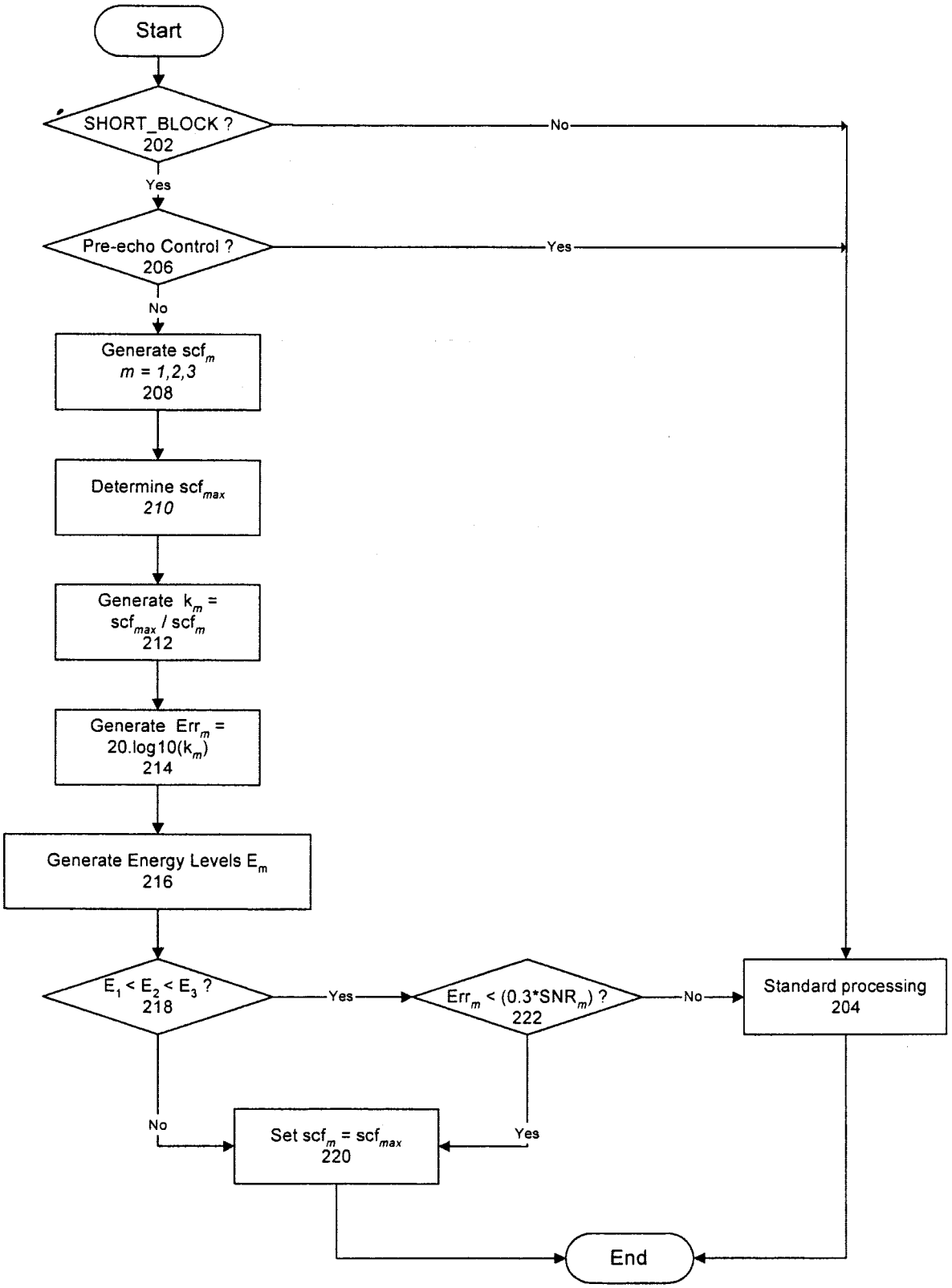
Start
SHORT_BLOCK ?
202
No
Yes
Pre-echo Control ?
206
Yes
No
Generate scf_m
m = 1,2,3
208
Determine scf_max
210
Generate k_m = scf_max / scf_m
212
Generate Err_m = 20.log10(k_m)
214
Generate Energy Levels E_m
216
E_1 < E_2 < E_3 ?
218
Yes
Err_m < (0.3*SNR_m) ?
222
No
Standard processing
204
No
Set scf_m = scf_max
220
Yes
End

Figure 2

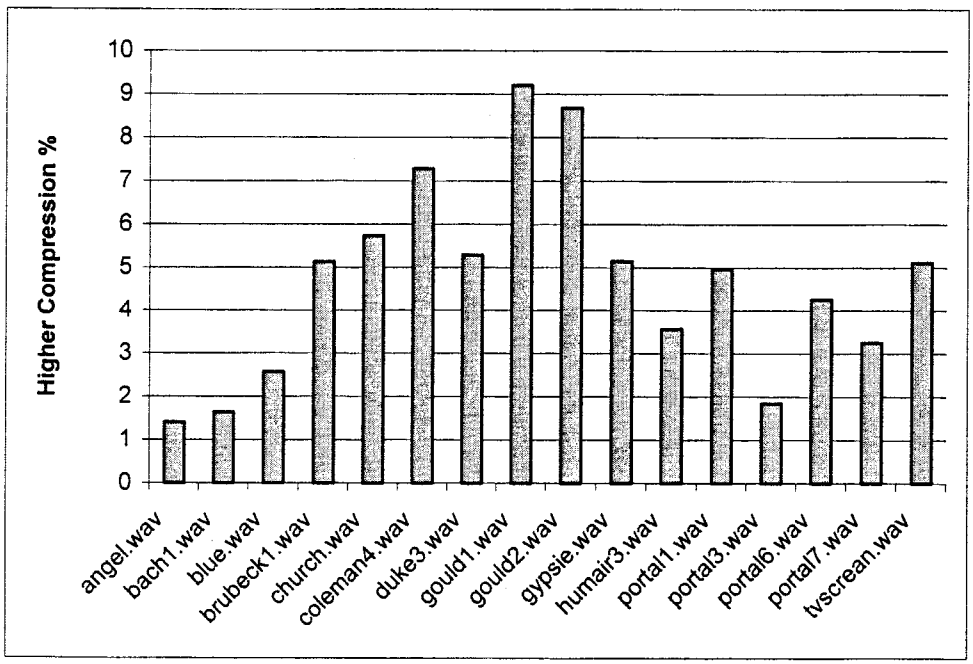

Figure 3

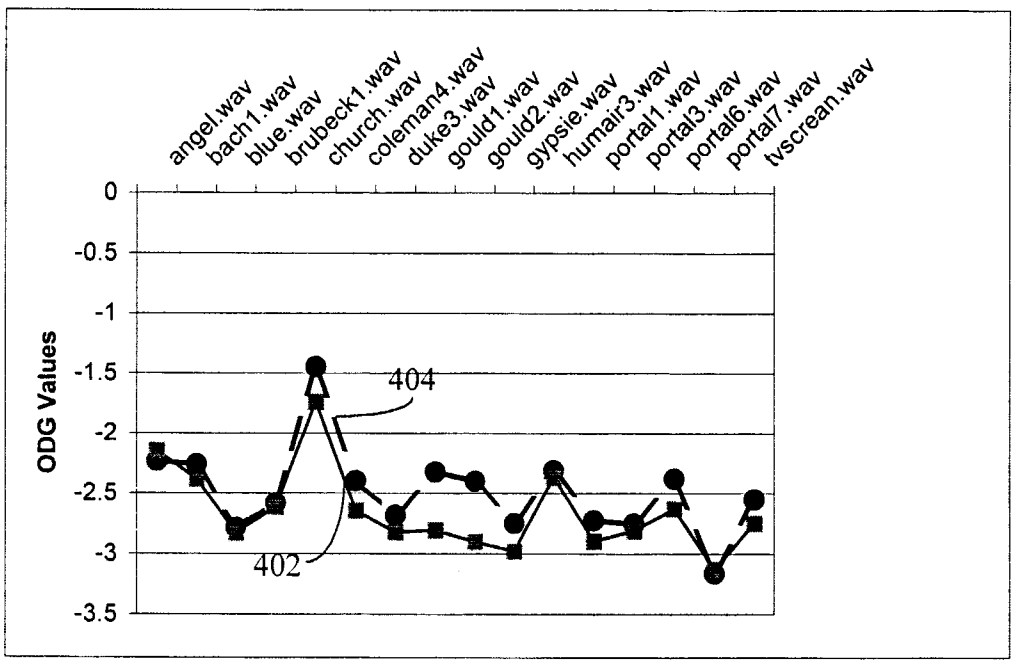

Figure 4