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(54) Title: MULTI-MODE AUDIO CODEC AND CELP CODING ADAPTED THEREFORE

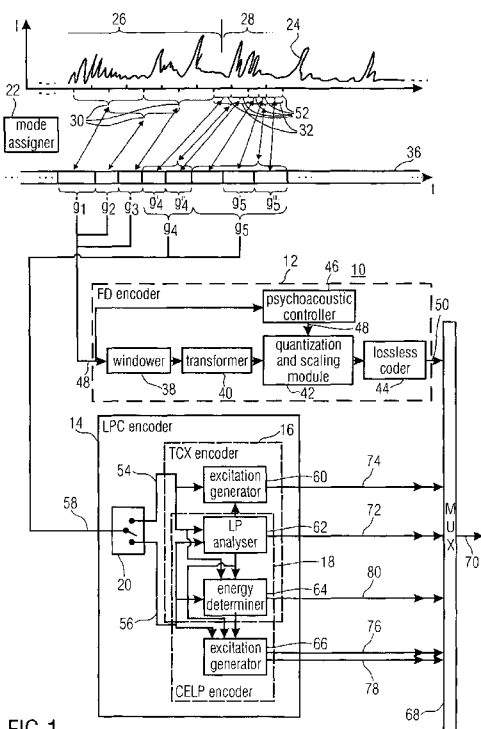


FIG 1

(57) Abstract: In accordance with a first aspect of the present invention, bitstream elements of sub-frames are encoded differentially to a global gain value so that a change of the global gain value of the frames results in an adjustment of an output level of the decoded representation of the audio content. Concurrently, the differential coding saves bits otherwise occurring when introducing a new syntax element into an encoded bitstream. Even further, the differential coding enables the lowering of the burden of globally adjusting the gain of an encoded bitstream by allowing the time resolution in setting the global gain value to be lower than the time resolution at which the afore-mentioned bitstream element differentially encoded to the global gain value adjusts the gain of the respective sub-frame. In accordance with another aspect, a global gain control across CELP coded frames and transform coded frames is achieved by co-controlling the gain of the codebook excitation of the CELP codec, along with a level of the transform or inverse transform of the transform coded frames. According to even another aspect, a variation of the loudness of a CELP coded bitstream upon changing the respective gain value is rendered more well adapted to the behavior of transform coded level adjustments, by performing the gain value determination in CELP coding in the weighted domain of the excitation signal.



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