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(54) Title: EFFICIENT DESIGN OF MDCT / IMDCT FILTERBANKS FOR SPEECH AND AUDIO CODING APPLICATIONS

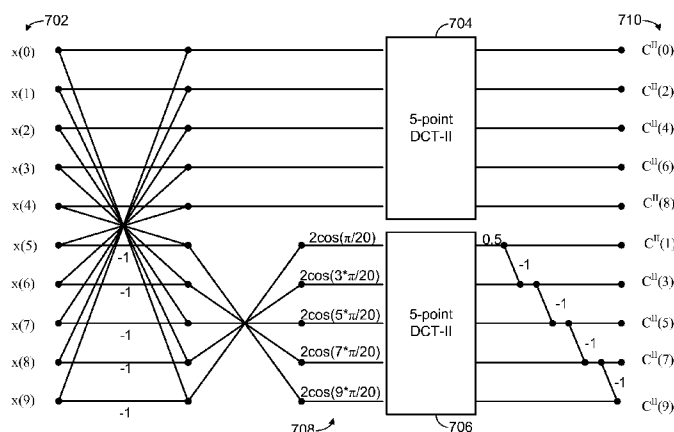


FIG. 7

(57) Abstract: A more efficient encoder/decoder is provided in which an N-point MDCT transform is mapped into smaller sized N/2-point DCT-IV and/or DCT-II transforms with isolated pre-multiplications which can be moved to a prior or subsequent windowing stage. That is, the windowing operations may be merged with first/last stage multiplications in the core MDCT/IMDCT functions, respectively, thus reducing the total number of multiplications. Additionally, the MDCT may be systematically decimated by factor of 2 by utilizing a uniformly scaled 5-point DCT-II core function as opposed to the DCT-IV or FFT cores used in many existing MDCT designs in audio codecs. The modified windowing stage merges factors from a transform stage and windowing stage to obtain piece-wise symmetric windowing factors, which can be represented by a sub-set of the piece-wise symmetric windowing factors to save storage space. Such features offer appreciable reduction in complexity and less memory usage than the prior art.

WO 2009/039451 A3



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