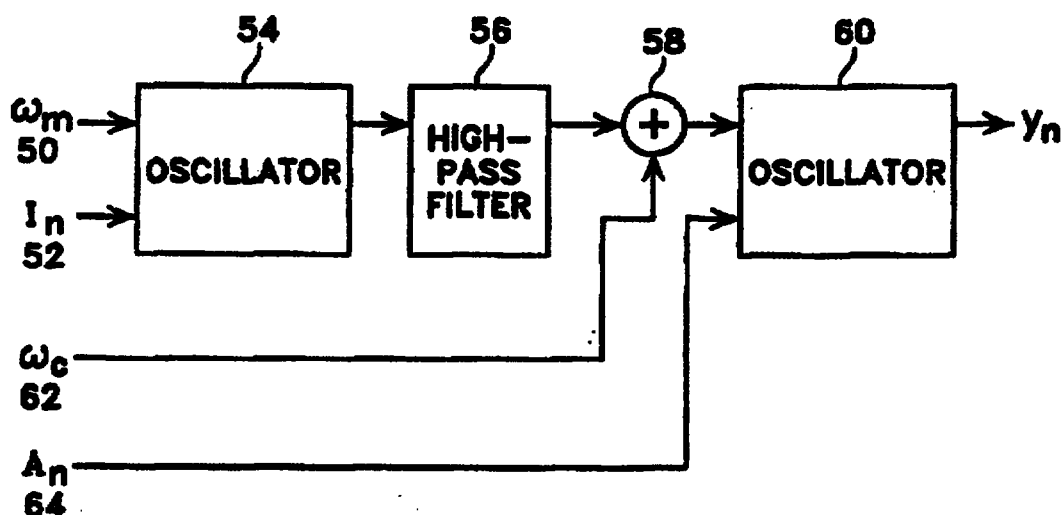


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(54) Title: **METHOD AND APPARATUS FOR SYNTHESIZING MUSICAL SOUNDS BY FREQUENCY MODULATION USING A FILTER**

(57) Abstract

In one embodiment, the circuit includes a first order FIR highpass filter (56) that is placed between a modulation phase increment oscillator (54) and a carrier phase increment oscillator (60). The invention may also include waveshaping circuits, adders, multipliers, time division multiplexing, and other types of filters. Another embodiment of the invention provides a music synthesis method where a modulation phase increment is multiplied by a modulation index to produce a modulation signal. That modulation signal is then filtered and added to a carrier phase increment. Finally, that sum is multiplied by an amplitude envelope to produce a signal representing a musical sound. The method may include using a first order FIR highpass filter, waveshaping of both sinusoidal and non-sinusoidal waveforms, additional multiplying and time division multiplexing. The invention also includes self-modulation and cascading.