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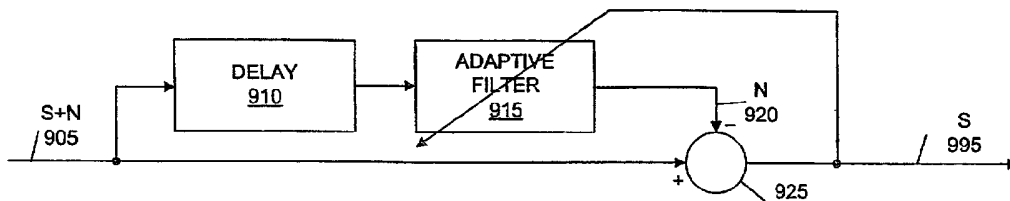
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(54) Abstract Title: **Downhole telemetry system using discrete multi-tone modulation with adaptive noise cancellation**

(57) A method and a downhole telemetry system using discrete multitone modulation and adaptive filtering. The downhole telemetry system includes a downhole transmitter, a cable, and a surface receiver coupled to the downhole transmitter via the cable. The surface receivers adaptively filters noise from a signal received from the downhole transmitter. The method includes receiving a time-domain signal carrying desired information at specific frequencies and adaptively filtering at least a portion of the noise from the time-domain signal. The time domain signal includes noise. The method may also include delaying the time-domain signal by a delay time to form a delayed time-domain signal, and adaptively filtering at least a portion of the periodic noise from the time-domain signal using the delayed time-domain signal. The method may also include receiving a reference signal from each of one or more sensors located to receive an indication of a component of the noise, and adaptively filtering at least a portion of each component of the noise from the time-domain signal using at least the reference signal from one of the one or more sensors.



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