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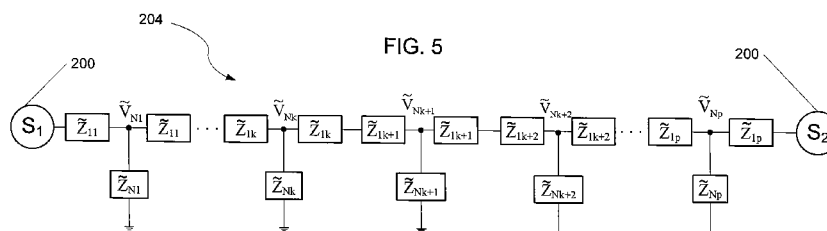
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(54) Title: DISTRIBUTION SYSTEM ANALYSIS USING METER DATA



(57) **Abstract:** A monitoring system includes a first sensor positioned at a first location along a phase conductor line and a second sensor position at a second location along the phase conductor line. The first sensor is configured to generate a first set of synchrophasor data. The second sensor is configured to generate a second set of synchrophasor data. The monitoring system includes a processor configured to receive the first and second sets of synchrophasor data. The processor is further configured to determine a primary side voltage of at least one distribution transformer electrically connected to the phase conductor line based on a secondary side voltage of the at least one distribution transformer. The primary side voltage is determined based on meter data from a plurality of metered loads electrically coupled to a secondary side of the at least one distribution transformer. The processor is further configured to determine at least one phase conductor line condition based on the first and second sets of synchrophasor data and the primary side voltage.