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(54) **MULTIPLE SIMULTANEOUS FREQUENCY DETECTION**

Publication Classification

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(57) **ABSTRACT**

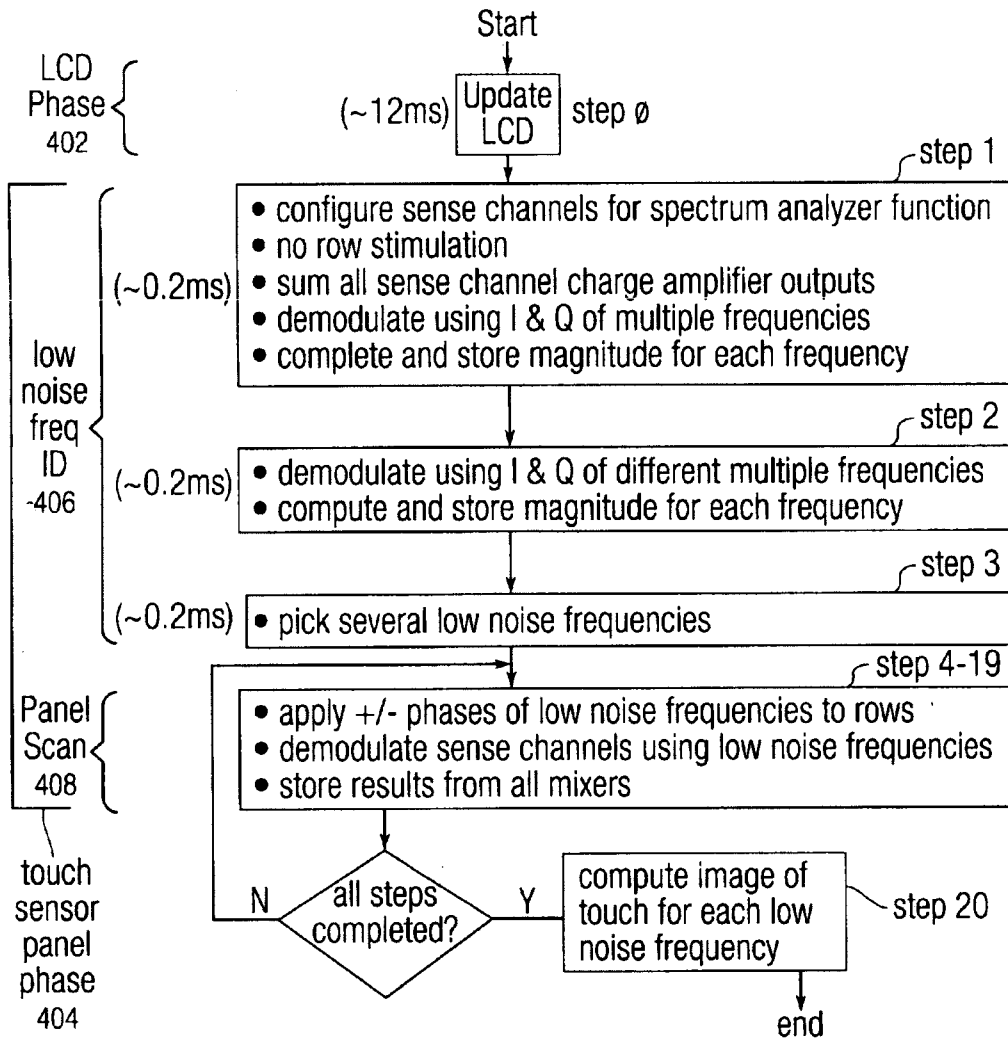
The use of multiple stimulation frequencies and phases to generate an image of touch on a touch sensor panel is disclosed. Each of a plurality of sense channels can be coupled to a column in a touch sensor panel and can have multiple mixers. Each mixer in the sense channel can utilize a circuit capable generating a demodulation frequency of a particular frequency. At each of multiple steps, various phases of selected frequencies can be used to simultaneously stimulate the rows of the touch sensor panel, and the multiple mixers in each sense channel can be configured to demodulate the signal received from the column connected to each sense channel using the selected frequencies. After all steps have been completed, the demodulated signals from the multiple mixers can be used in calculations to determine an image of touch for the touch sensor panel at each frequency.

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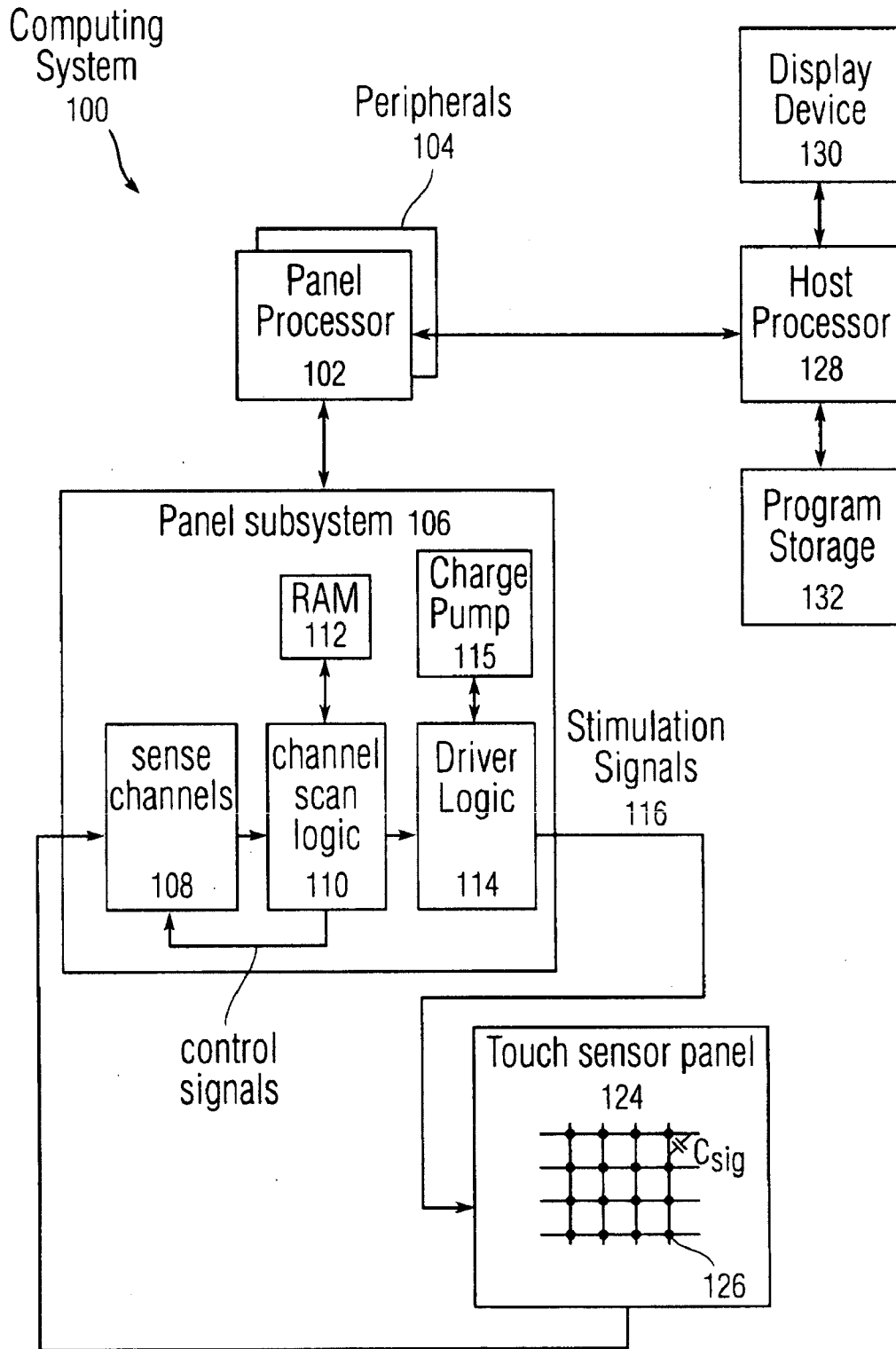


Fig. 1

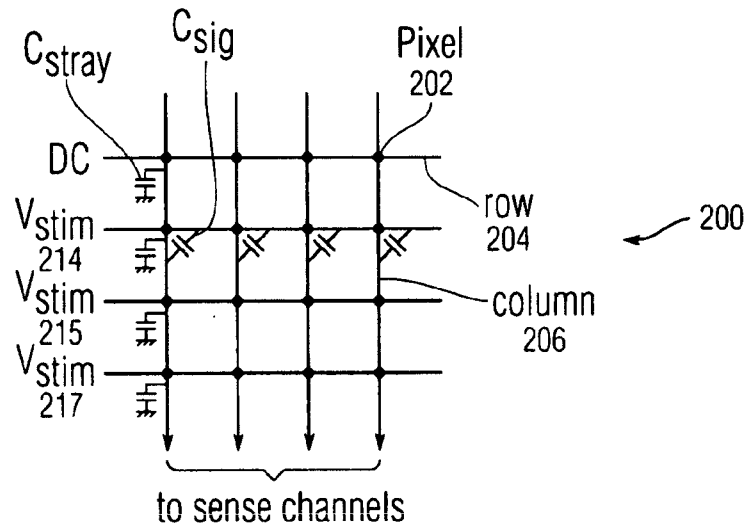


Fig. 2a

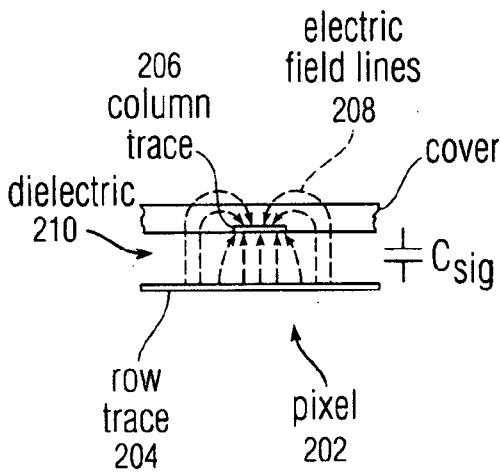


Fig. 2b

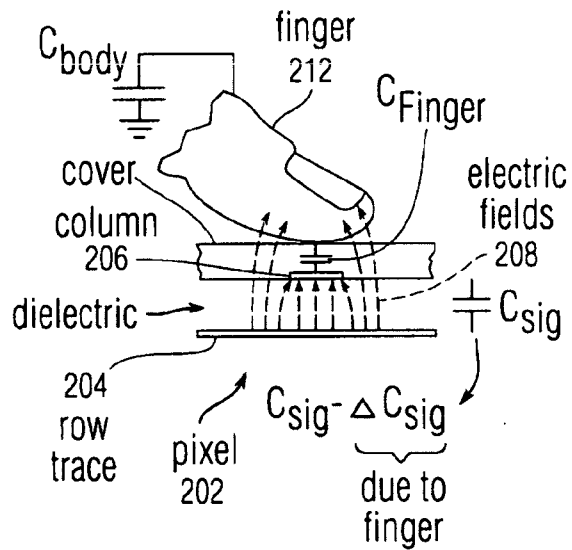


Fig. 2c

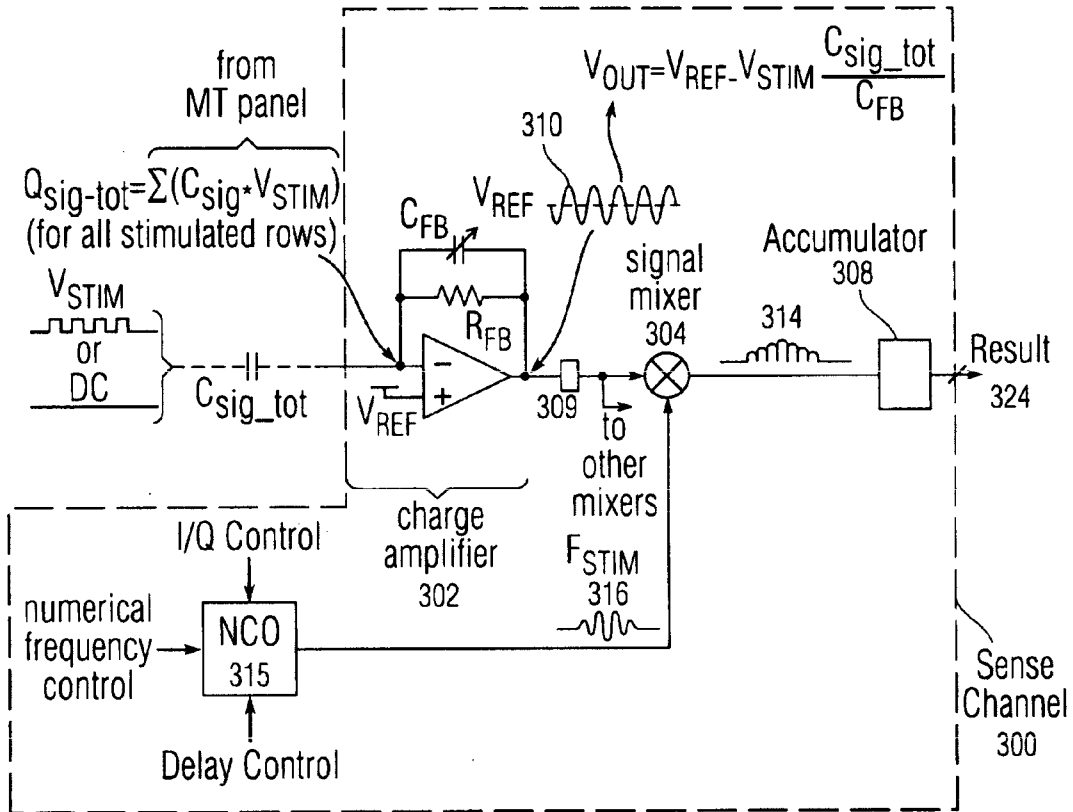


Fig. 3a

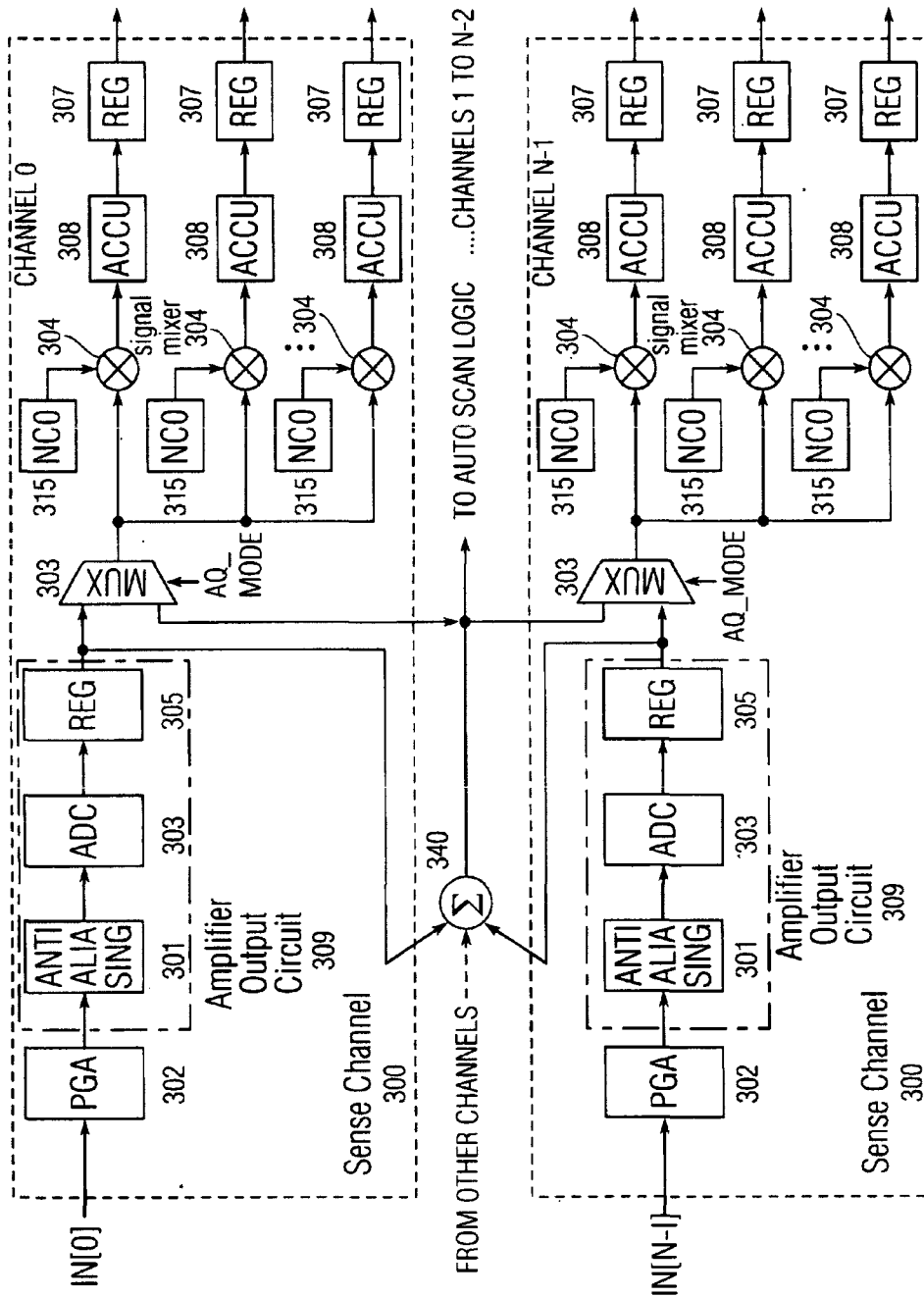


Fig. 3b

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