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XiaoPing

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(54) **APPARATUS AND METHODS FOR
DETECTING A CONDUCTIVE OBJECT AT A
LOCATION**

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patent is extended or adjusted under 35
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This patent is subject to a terminal dis-
claimer.

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USPC **345/173**; 345/174; 345/179; 178/18.01;
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See application file for complete search history.

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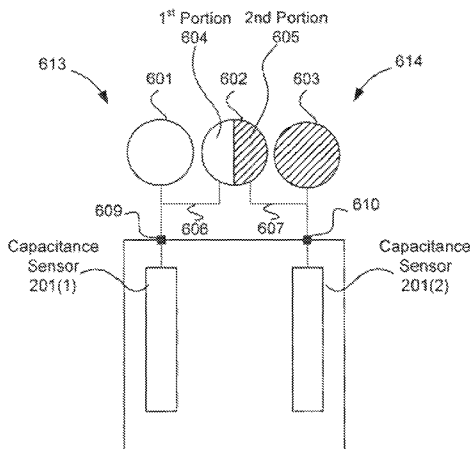
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(57) **ABSTRACT**

A method and apparatus to determine capacitance variations
of a first number of two or more sense elements of a touch
screen device. A processing device is configured to detect a
presence of a conductive object on any one of a second num-
ber of three or more button areas of the touch screen device.
The first number of sense elements is less than the second
number of button areas. The processing device is further
configured to recognize an activation of one of the three or
more button areas using the determined capacitance varia-
tions of the first number of two or more sense elements.

20 Claims, 10 Drawing Sheets



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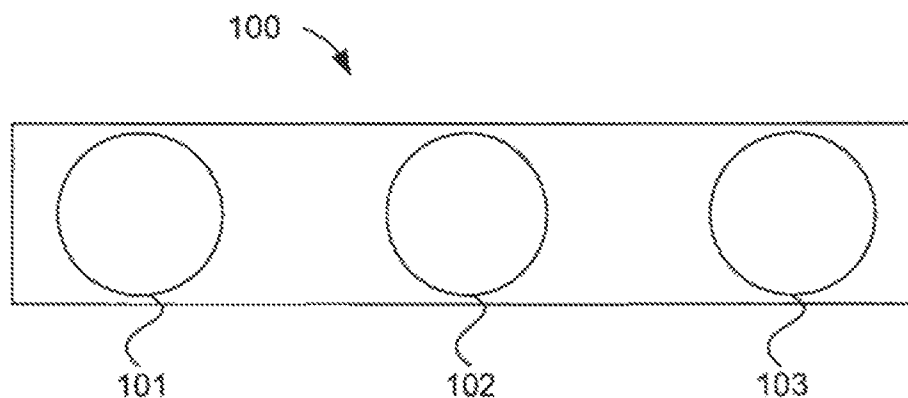


FIG. 1A

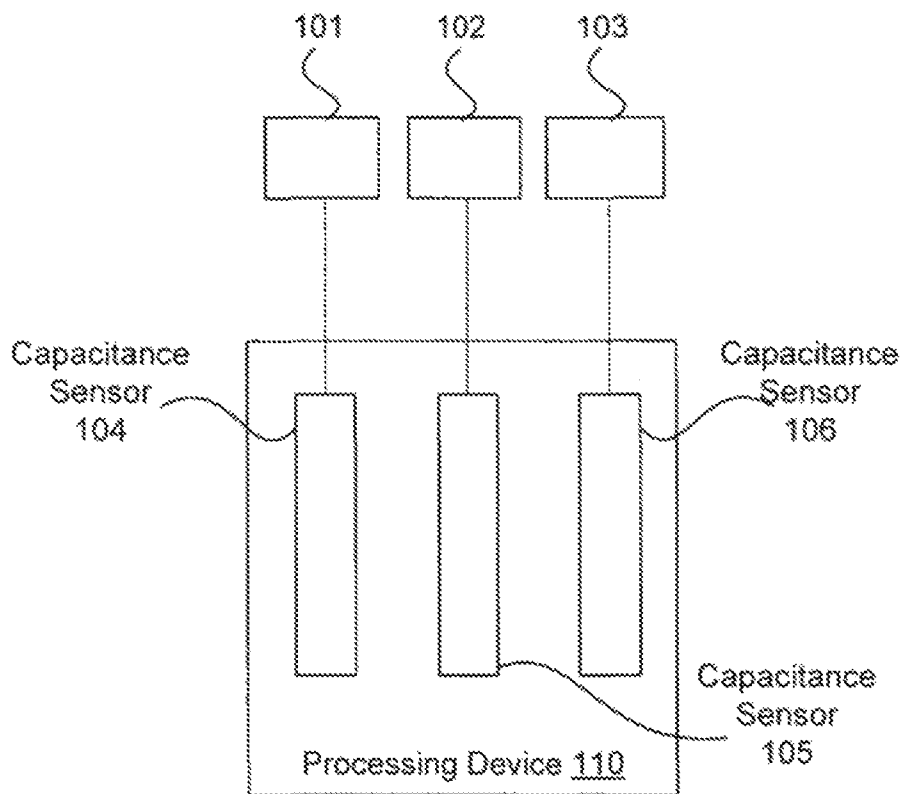


FIG. 1B

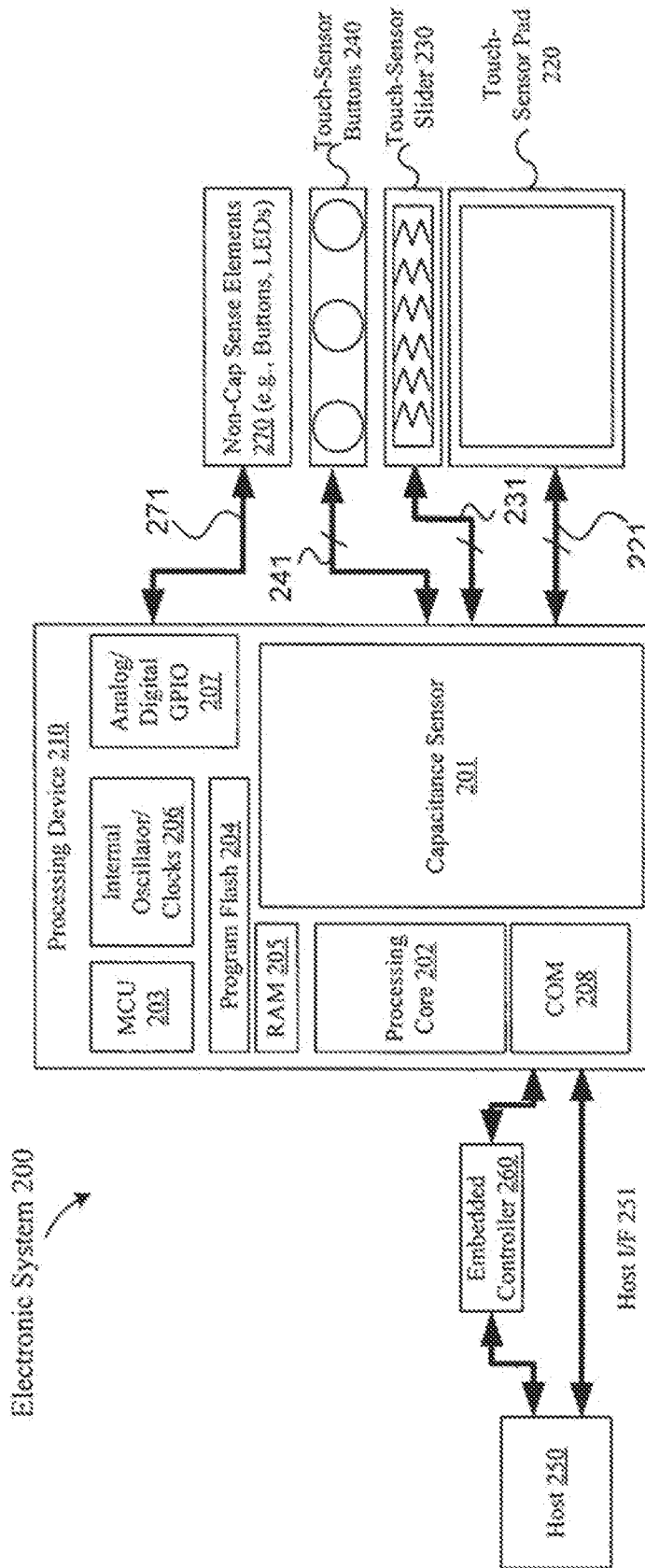


FIG. 2

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