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(12) **United States Patent**
Kremin et al.

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(54) **CONTACT IDENTIFICATION AND TRACKING ON A CAPACITANCE SENSING ARRAY**

(58) **Field of Classification Search**
USPC 345/173-178
See application file for complete search history.

(75) Inventors: **Victor Kremin**, Lviv (UA); **Volodymyr Hutnyk**, Lviv (UA); **Vasyl Mandziy**, Shchelyrec Vil. (UA)

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(73) Assignee: **Cypress Semiconductor Corporation**, San Jose, CA (US)

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

* cited by examiner

(21) Appl. No.: **13/217,147**

Primary Examiner — Alexander Eisen
Assistant Examiner — Amit Chatly

(22) Filed: **Aug. 24, 2011**

Related U.S. Application Data

(57) **ABSTRACT**

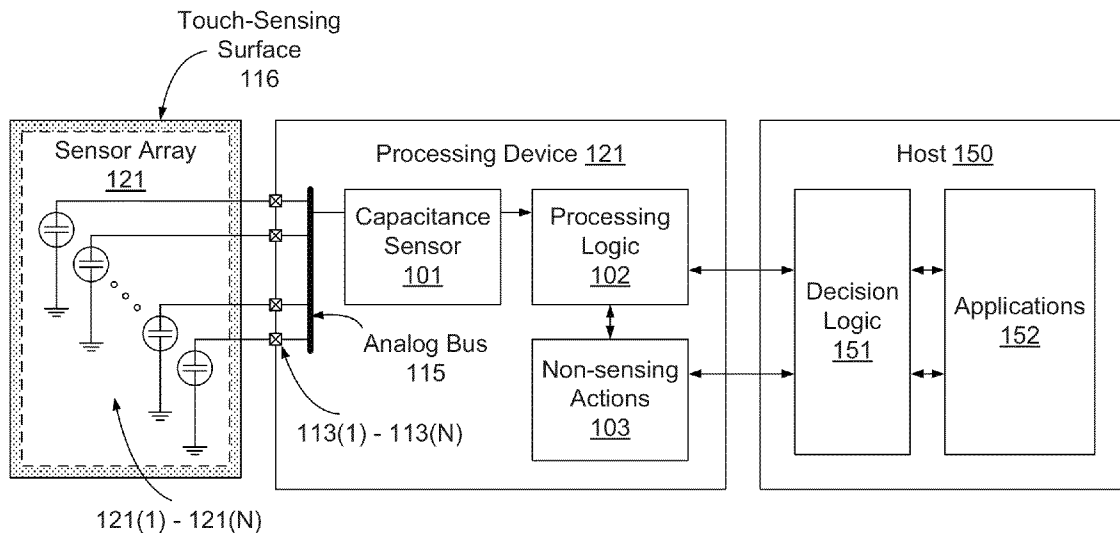
(60) Provisional application No. 61/376,656, filed on Aug. 24, 2010.

A technique for providing reliable position calculations for conductive inputs at the edges of a touch-sensitive array is disclosed. A matrix of sensors is completed using virtual sensors or nodes, allowing for a closer approximation of position of a conductive object. The matrix may be defined by a center point or sensor and a number of surrounding nodes or sensors.

(51) **Int. Cl.**
G06F 3/045 (2006.01)
G06F 3/042 (2006.01)

(52) **U.S. Cl.**
USPC **345/174; 345/173**

23 Claims, 25 Drawing Sheets



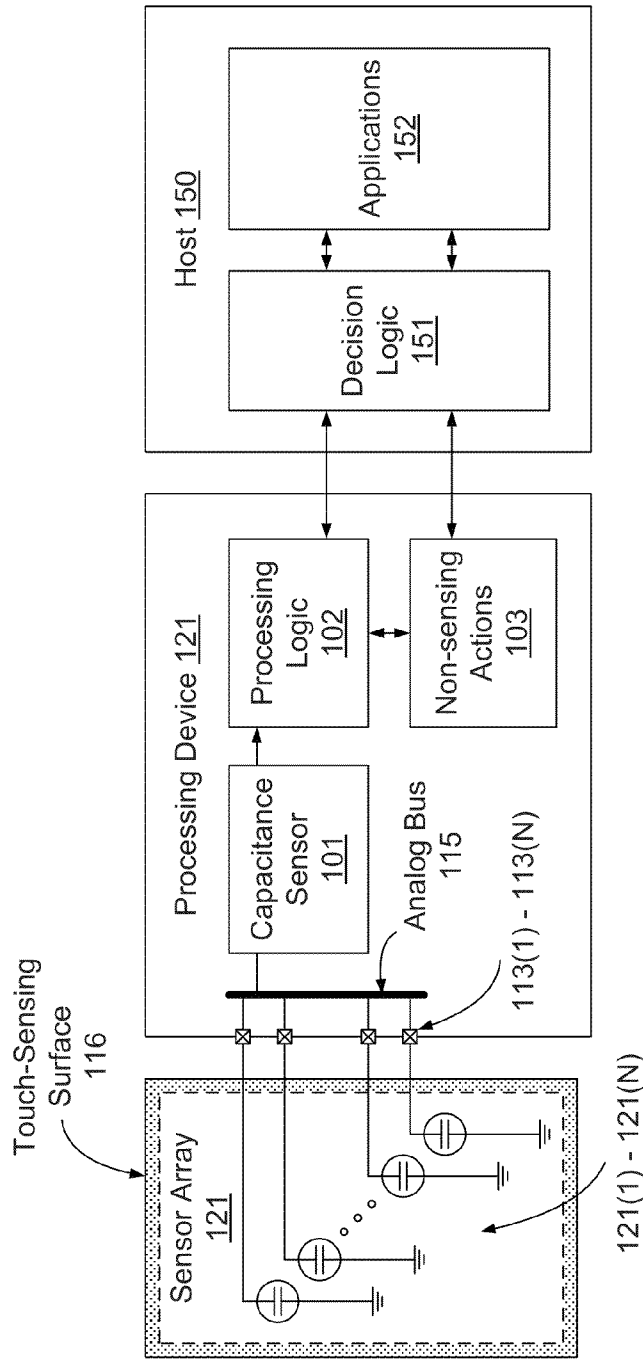


Figure 1

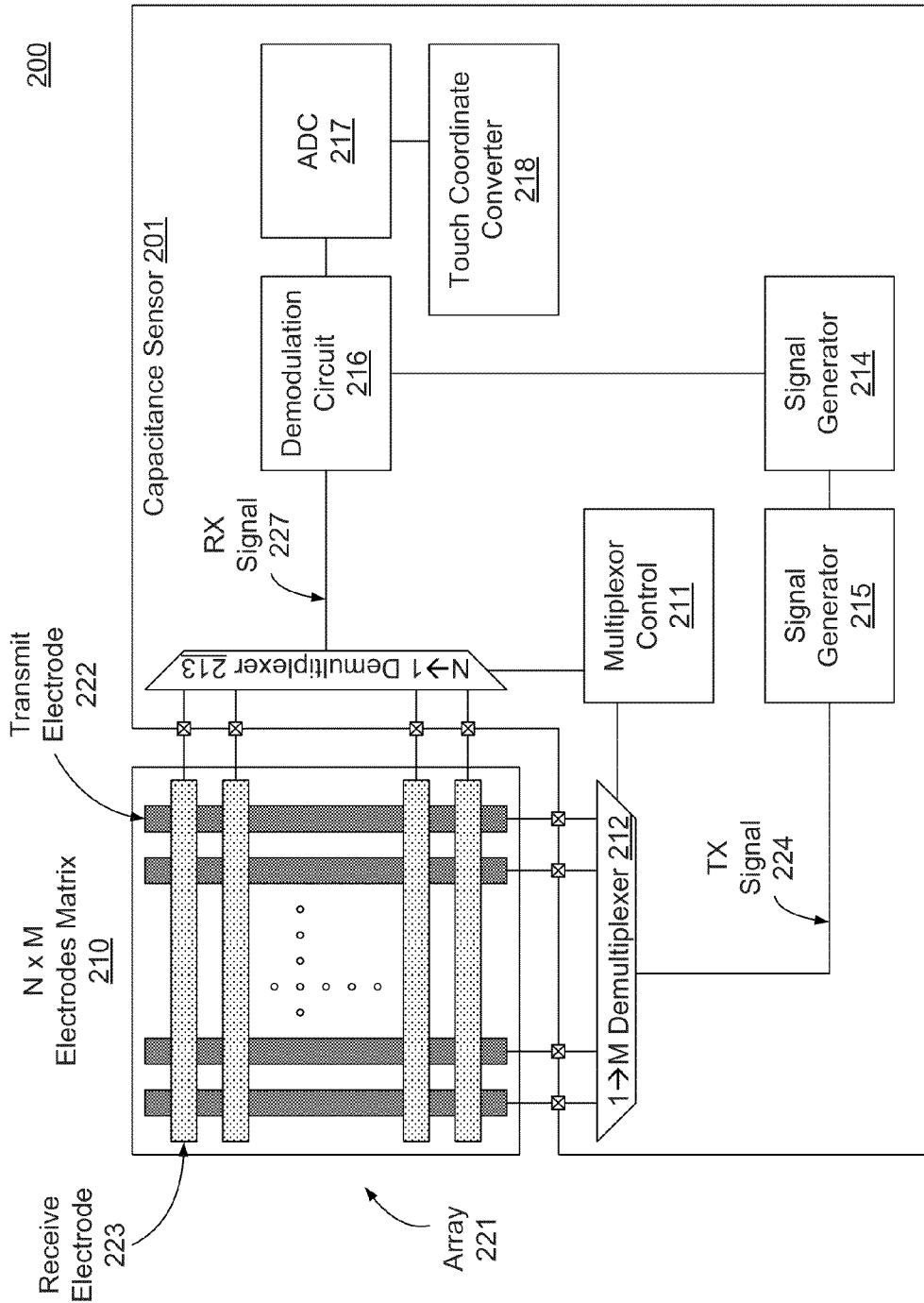


Figure 2

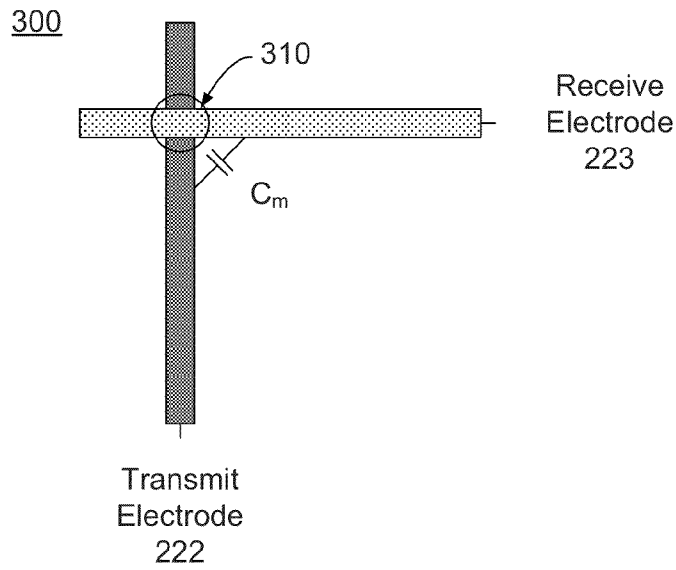


Figure 3A

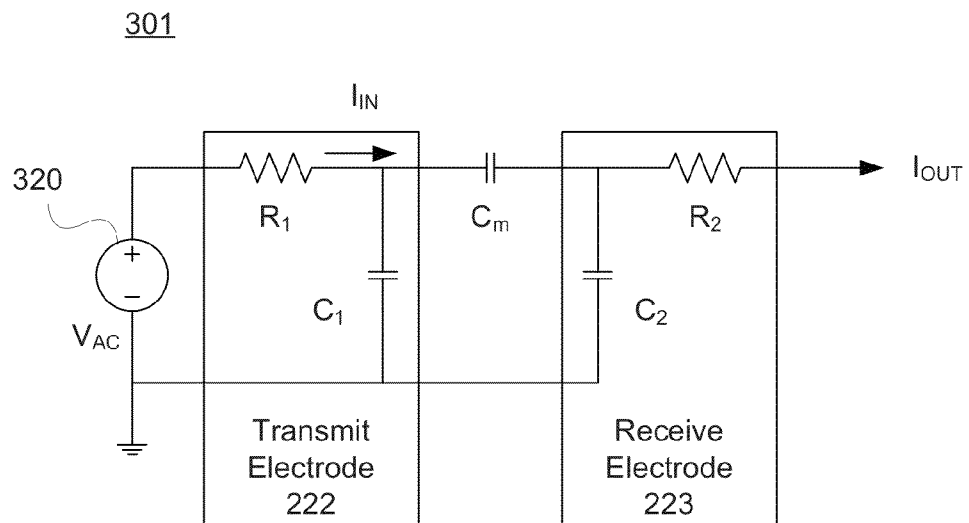


Figure 3B

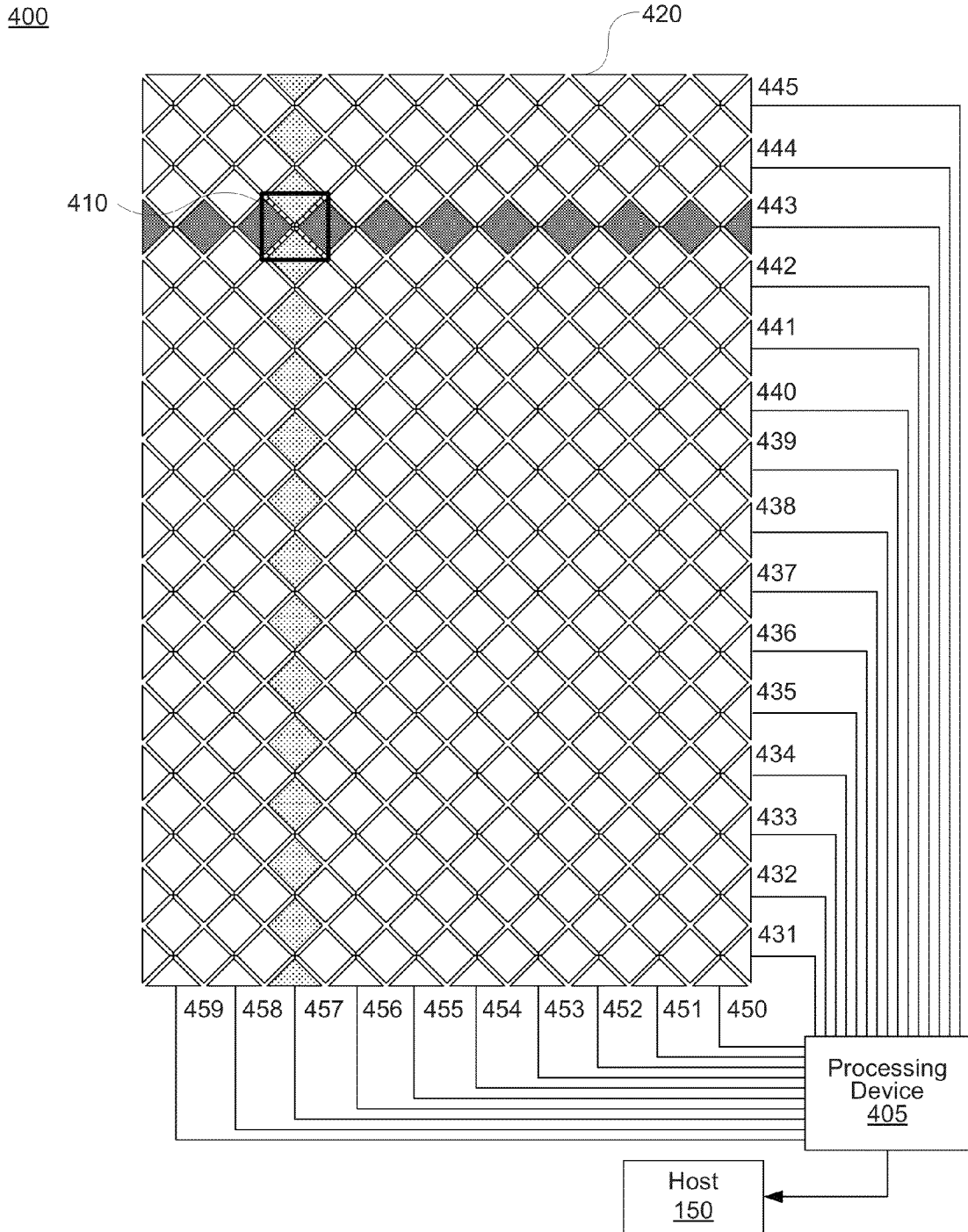


Figure 4A

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