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(54) Title: SEMICONDUCTOR CHARGED PARTICLE DETECTOR FOR MICROSCOPY

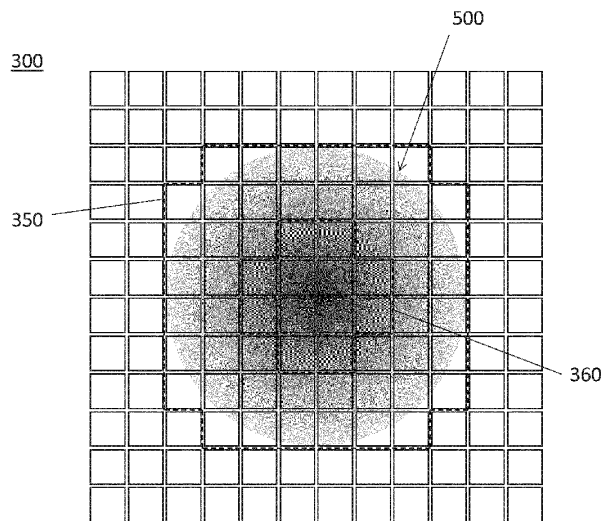


FIG. 3F

(57) Abstract: A detector may be provided with an array of sensing elements. The detector may include a semiconductor substrate including the array, and a circuit configured to count a number of charged particles incident on the detector. The circuit of the detector may be configured to process outputs from the plurality of sensing elements and increment a counter in response to a charged particle arrival event on a sensing element of the array. Various counting modes may be used. Counting may be based on energy ranges. Numbers of charged particles may be counted at a certain energy range and an overflow flag may be set when overflow is encountered in a sensing element. The circuit may be configured to determine a time stamp of respective charged particle arrival events occurring at each sensing element. Size of the sensing element may be determined based on criteria for enabling charged particle counting.

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