



[54] SOLID STATE ELECTROMAGNETIC RADIATION DETECTOR FET ARRAY

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[73] Assignee: Minnesota Mining and Manufacturing Company, St. Paul, Minn.

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[21] Appl. No.: 564,632

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[22] Filed: Aug. 8, 1990

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[51] Int. Cl.<sup>5</sup> ..... H01L 27/14

[52] U.S. Cl. .... 257/40; 250/338.1; 250/338.3; 250/338.4; 257/292; 257/444; 257/442; 257/59; 257/41

[58] Field of Search ..... 357/41, 30 G, 30 H, 357/30 I, 30 D, 32, 28, 59 F, 2, 25, 8, 4; 250/338.1, 338.3, 338.4

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Primary Examiner—William Mintel

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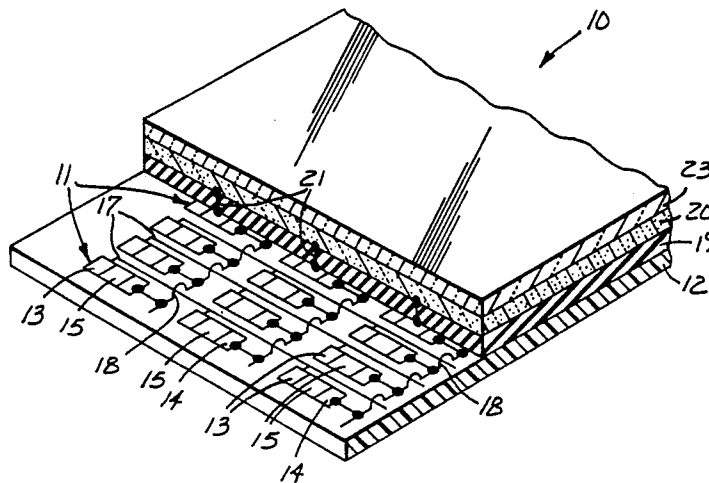
Attorney, Agent, or Firm—Gary L. Griswold; Walter N. Kirn; David B. Kagan

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[57] ABSTRACT

The present invention provides a large area, high pixel density solid state radiation detector with a real-time and a non-destructive read-out. The solid state detector comprises a plurality of field effect transistors deposited onto a substrate to form an array. A planarization layer is deposited over the array of transistors. An energy sensitive layer is deposited onto the planarization layer. Means is provided for electrically connecting the energy sensitive layer with each transistor of the array. A top electrode layer is deposited onto the energy sensitive layer. The solid state detector also comprises circuitry means for providing electronic read-out from each FET of the array.

31 Claims, 6 Drawing Sheets



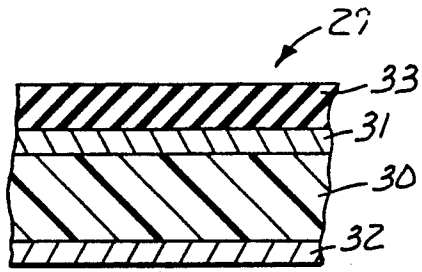


Fig. 3a

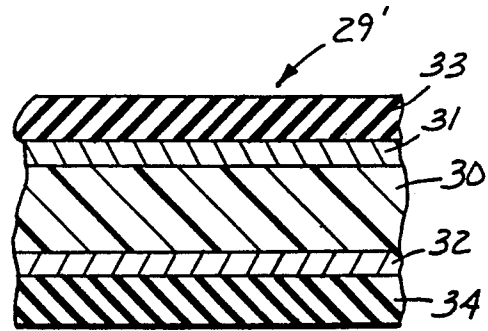


Fig. 3b

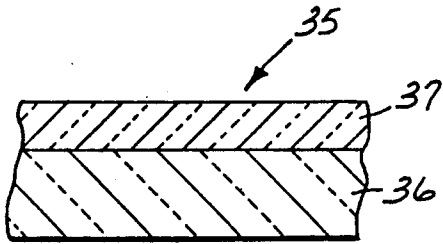


Fig. 3c

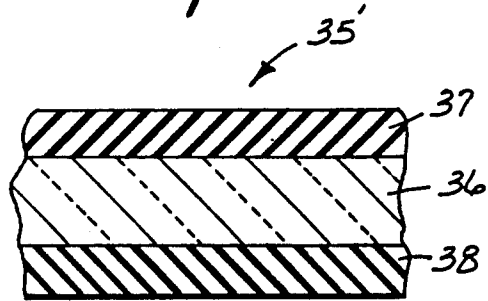


Fig. 3d

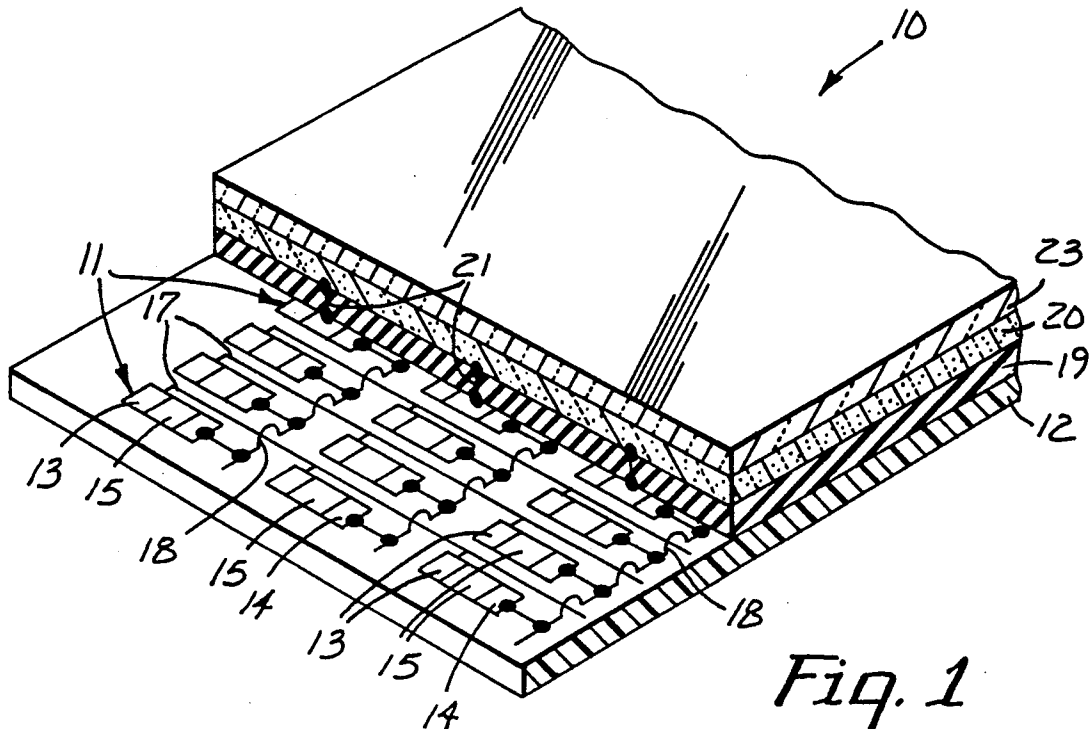


Fig. 1

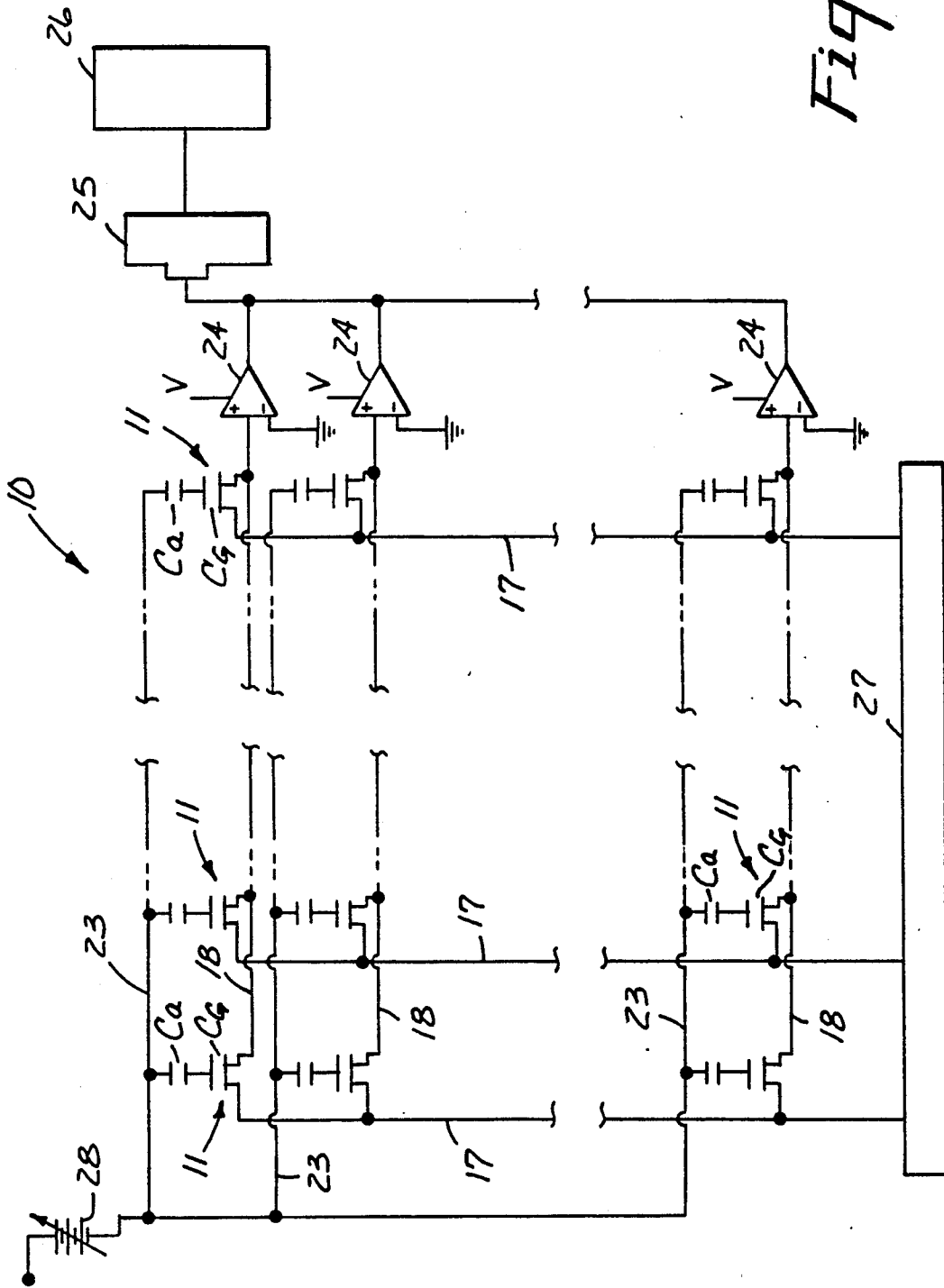


Fig. 2

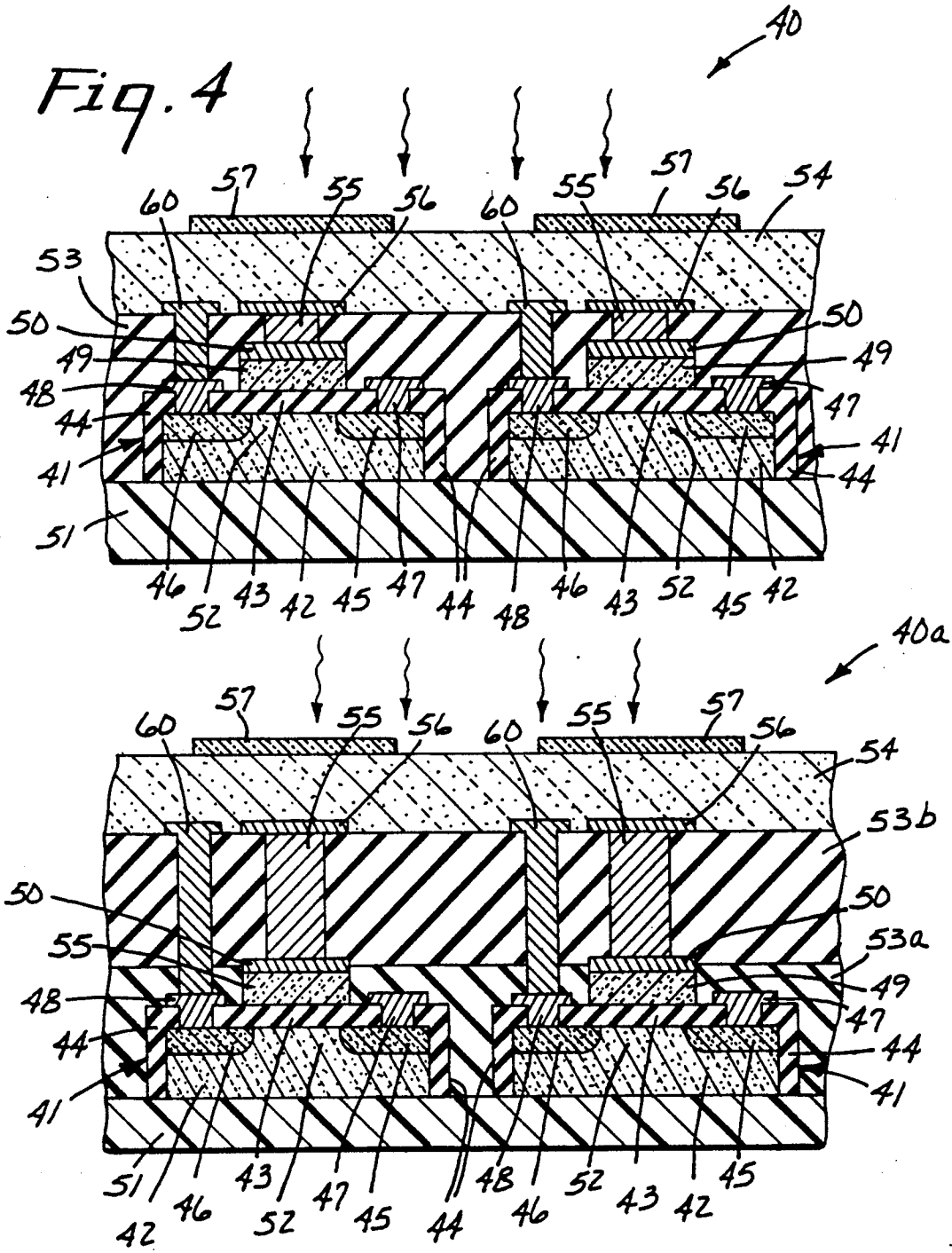
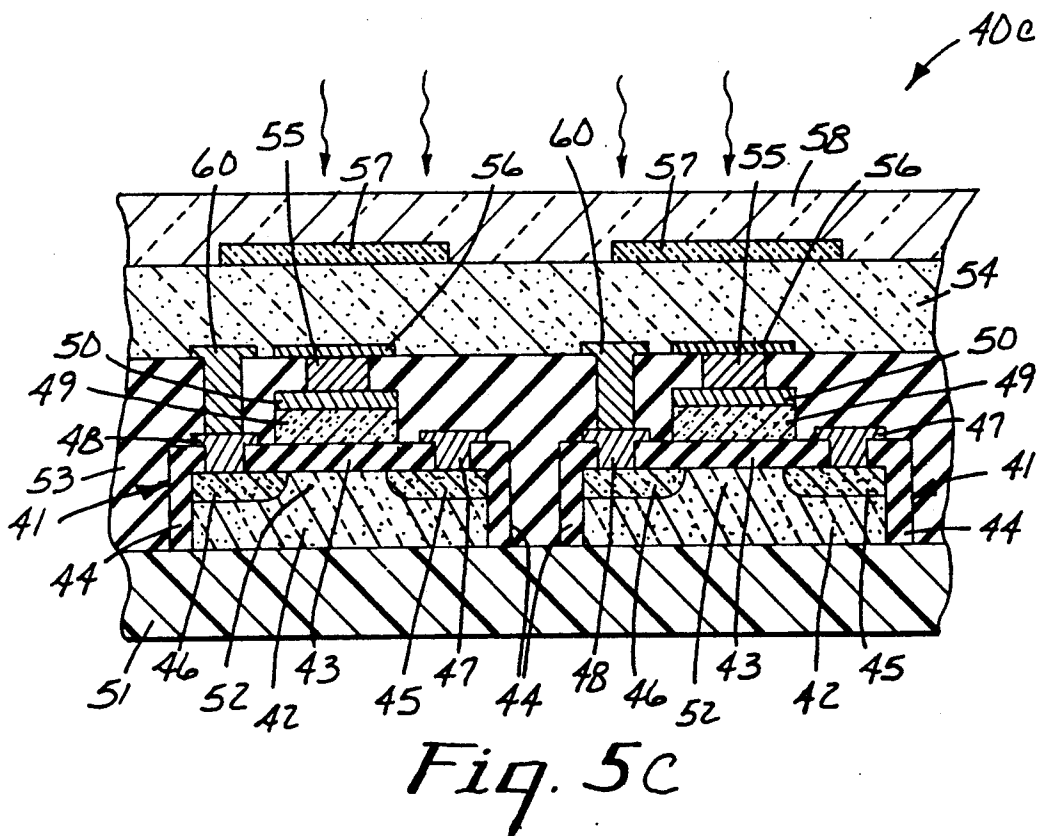
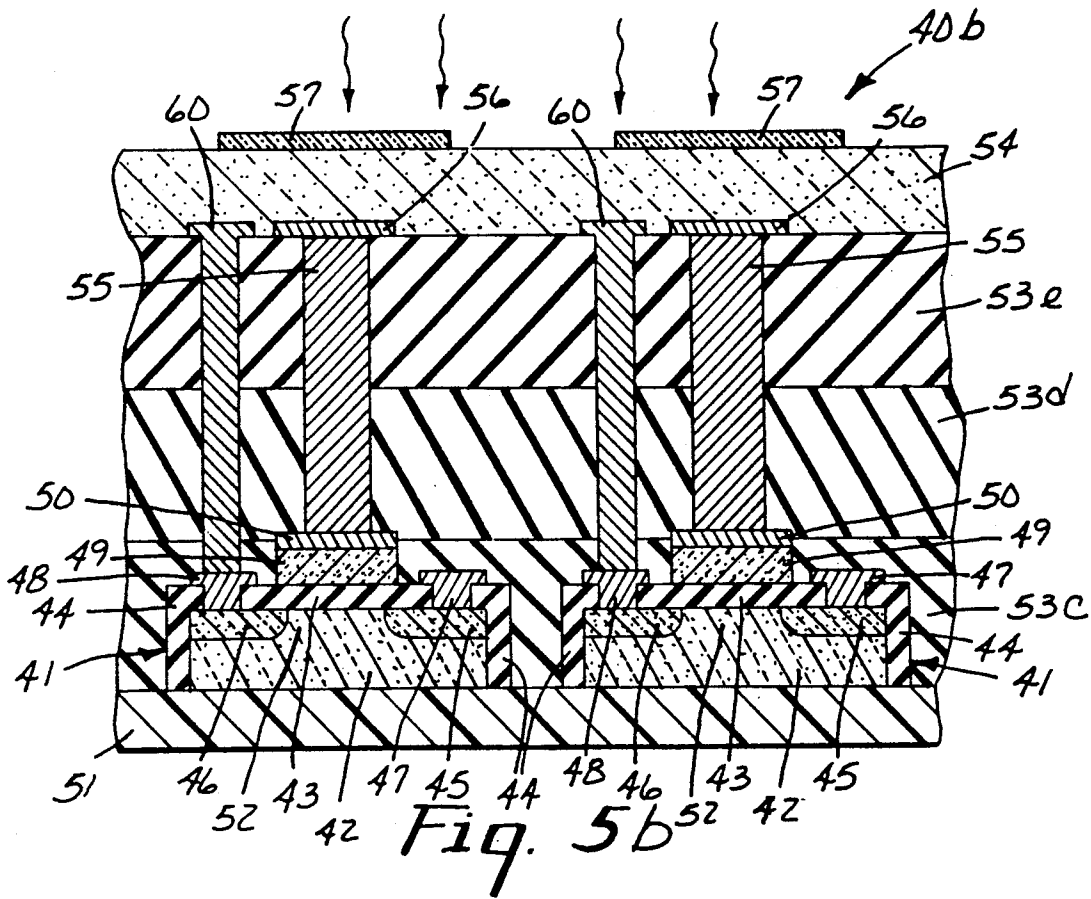


Fig. 5a



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