
EXHIBIT G

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Yamaguchi

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- (54) **MOS IMAGE PICK-UP DEVICE AND CAMERA INCORPORATING THE SAME**
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- (73) Assignee: **Panasonic Corporation**, Osaka (JP)
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Related U.S. Patent Documents

Reissue of:

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- (51) **Int. Cl.**
H01L 31/103 (2006.01)
- (52) **U.S. Cl.** **257/292; 257/E27.133;**
257/374; 257/399; 257/446
- (58) **Field of Classification Search** **257/292**
See application file for complete search history.

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 (74) *Attorney, Agent, or Firm*—Hamre, Schumann, Mueller & Larson, P.C.

(57) **ABSTRACT**

A MOS image pick-up device including a semiconductor substrate, an imaging region formed on the semiconductor substrate by arraying plural unit pixels, and a peripheral circuit region including a driving circuit for operating the imaging region formed on the semiconductor substrate; the unit pixels include a photodiode, MOS (metal-oxide-semiconductor) transistors and a first device-isolation portion, the peripheral circuit region includes a second device-isolation portion for isolating devices in the driving circuit; wherein each of the first device-isolation portion and the second device-isolation portion is at least one portion selected from an electrically insulating film formed on the substrate in order not to erode the substrate, a electrically insulating film formed on the substrate so as to erode the substrate to a depth ranging from 1 nm to 50 nm, and an impurity diffusion region formed within the substrate. The MOS image pick-up device is incorporated in a camera. Thereby, devices are isolated between MOS transistors, and noise caused by leakage current is decreased.

12 Claims, 6 Drawing Sheets

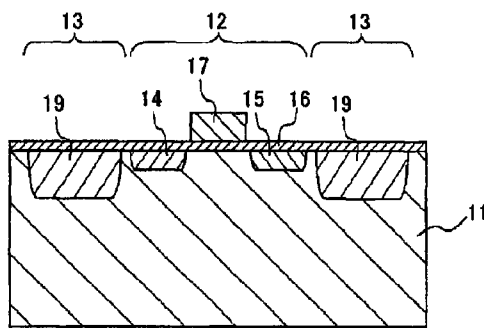
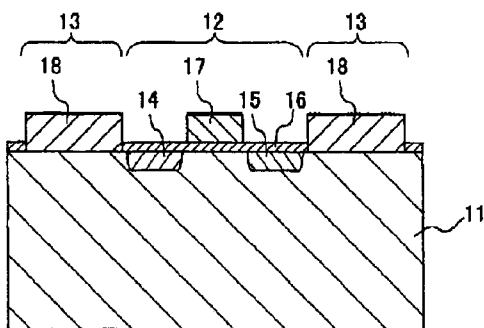


FIG.1A

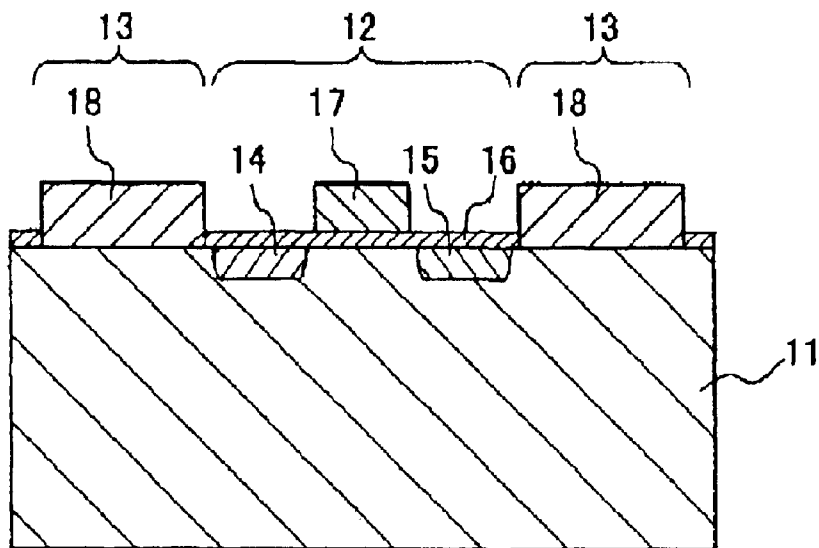
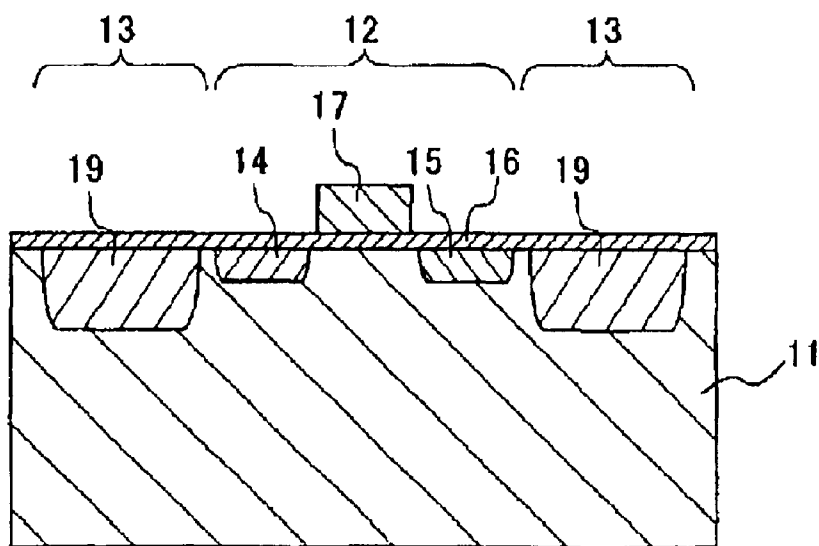


FIG.1B



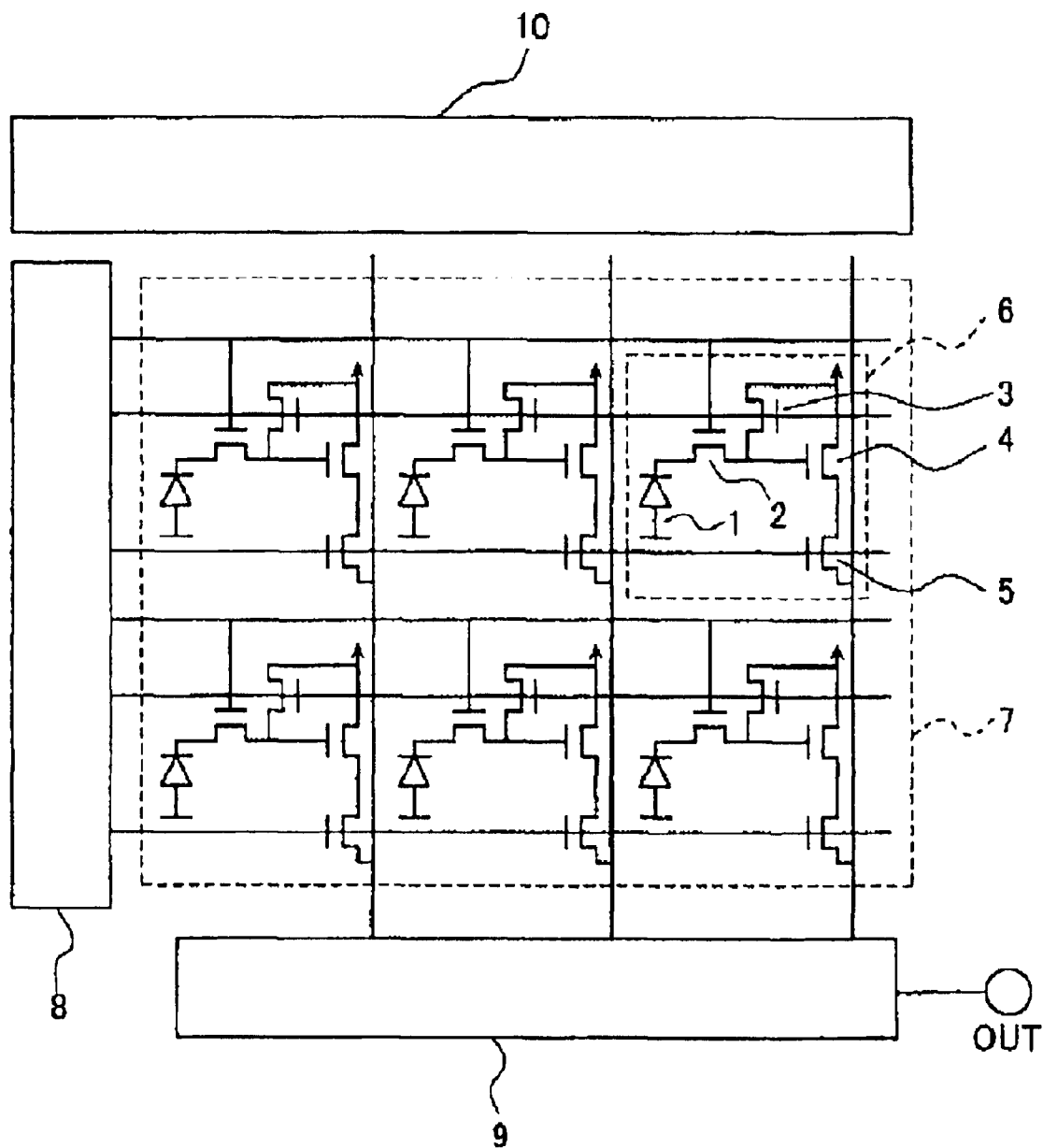


FIG. 2

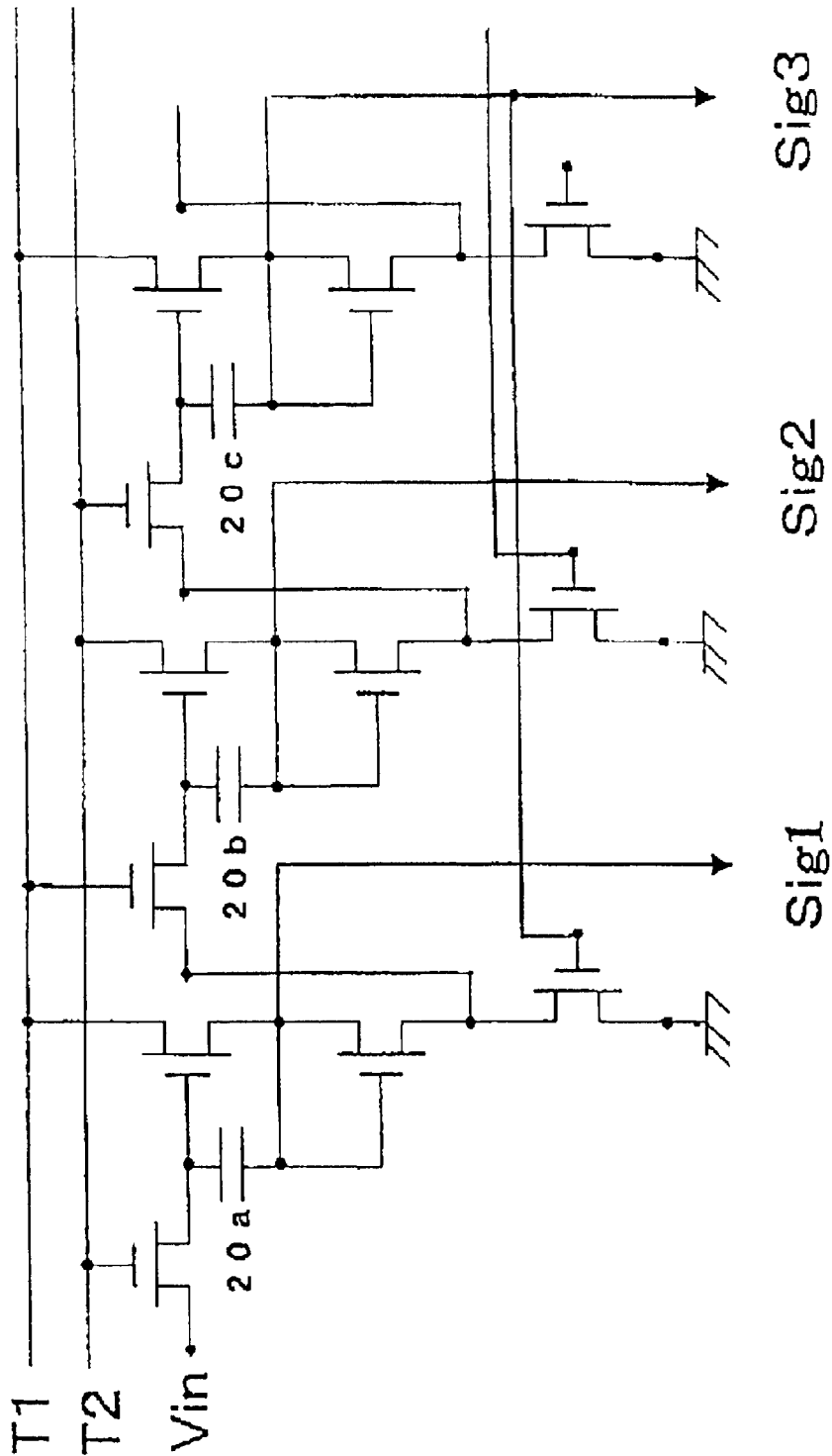


FIG.3

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