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(54) Title: LIGHT GUIDE ARRAY FOR AN IMAGE SENSOR

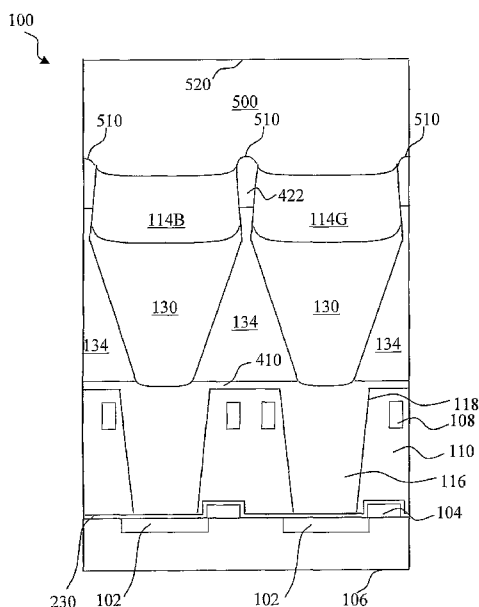


FIG. 22

(57) Abstract: An image sensor pixel that includes a photoelectric conversion unit (102) supported by a substrate (106) and an insulator (110) adjacent to the substrate. The pixel includes a cascaded light guide (116, 130) that is located within an opening of the insulator and extends above the insulator such that a portion of the cascaded light guide has an air interface. The air interface improves the internal reflection of the cascaded light guide. The cascaded light guide may include a self-aligned color filter (114B, 114G) having air-gaps (422) between adjacent color filters. Air-gaps may be sealed from above by a transparent sealing film. (500) The transparent sealing film may have a concave surface (510) over the air-gap (422) to diverge light away from the air-gap into adjacent color filters. These characteristics of the light guide eliminate the need for a microlens. Additionally, an anti-reflection stack (230) is interposed between the substrate and the light guide to reduce backward reflection from the image sensor. Two pixels of having different color filters may have a difference in the thickness of an anti-reflection film within the anti-reflection stack.