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(54) **Title:** APPARATUS TO MANIPULATE GUIDED MODES ON A NANOSCALE USING ELECTRO-OPTIC EFFECTS

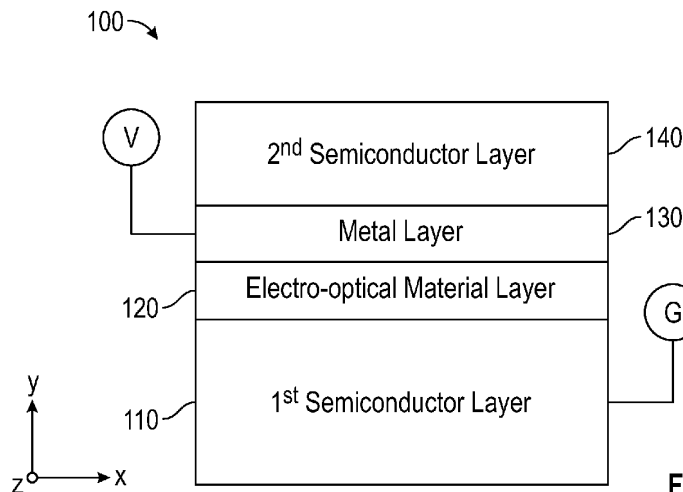


FIG. 1

(57) **Abstract:** An optical apparatus and device for integrated opto-electronic platforms to manipulate and control guided modes using electro-optic effects in an electromagnetic waveguide. The electromagnetic waveguide comprises a first semiconductor layer, an electro-optical material layer, a metal layer adjacent to the electro-optical material layer, and a second semiconductor layer. The optical apparatus is configured to transfer light in the electro-optical material layer, the electromagnetic waveguide is configured to create coupled plasmonic modes in the electro-optical material layer, and the electro-optical material layer is configured to modulate the light based on a voltage applied across a thickness of the electro-optical material layer.

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