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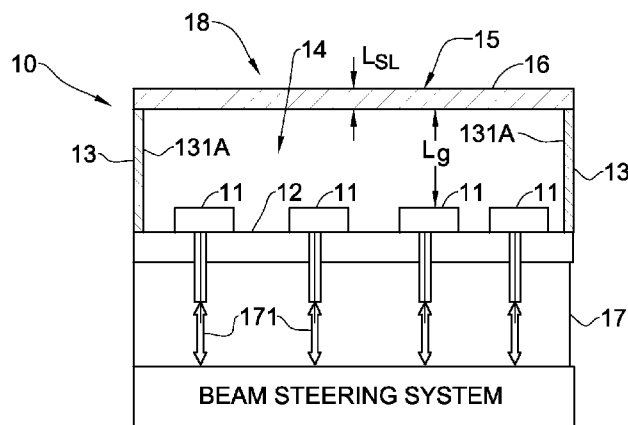


FIG. 1A

(57) **Abstract:** An antenna element having a vertically stacked structure and a phased array antenna that includes a plurality of antenna elements sharing a common conductive ground plane are described. The phased array antenna also includes a common conductive shell electrically coupled to the common conductive ground plane and extending away there from to encompass the antenna elements. The common conductive shell and the common conductive ground plane together define a common cavity having a common aperture. The phased array antenna also includes a common dielectric superstrate layer disposed over the common cavity at a predetermined distance from the antenna elements and a beam steering system coupled to the antenna elements and configured for steering an energy beam produced by the phased array antenna.