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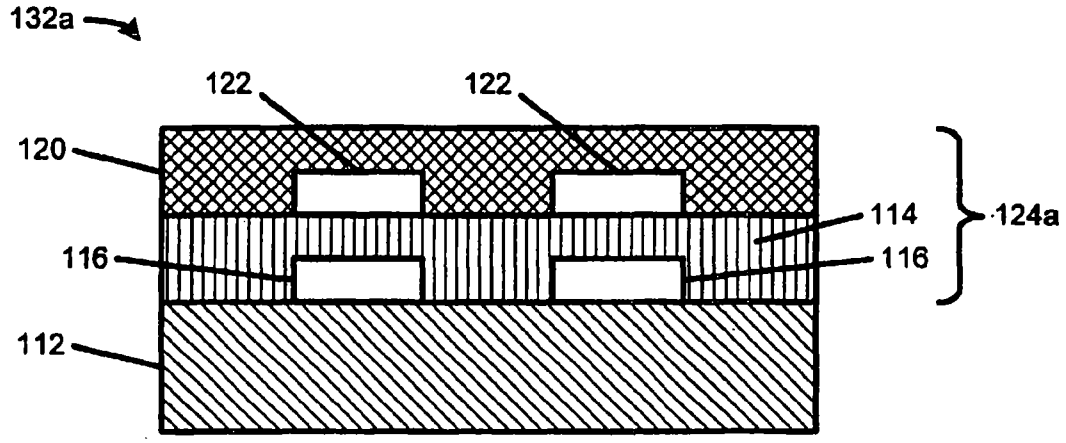
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(54) Title: FABRICATION OF SEMICONDUCTOR DEVICES WITH AIR GAPS FOR ULTRA LOW CAPACITANCE INTERCONNECTION STRUCTURES



(57) Abstract: A method of forming an air gap or gaps within solid structures and specifically semiconductor structures to reduce capacitive coupling between electrical elements such as metal lines, wherein a sacrificial material (110, 118) is used to occupy a closed interior volume in a semiconductor structure is disclosed. The sacrificial material is caused to decompose into one or more gaseous decomposition products which are removed, in one embodiment by diffusion, through an overcoat layer (114, 120). The decomposition of the sacrificial material leaves an air gap or gaps (116, 122) at the closed interior volume previously occupied by the sacrificial material. The air gaps may be disposed between electrical leads to minimize capacitive coupling therebetween. Also disclosed are methods of forming multi-level air gaps and methods or forming over-coated conductive line or leads wherein a portion of the overcoating is in contact with at least one air gap.

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