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Sir

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(54) **INTERCONNECTS WITH DIRECT METALIZATION AND CONDUCTIVE POLYMER**

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See application file for complete search history.

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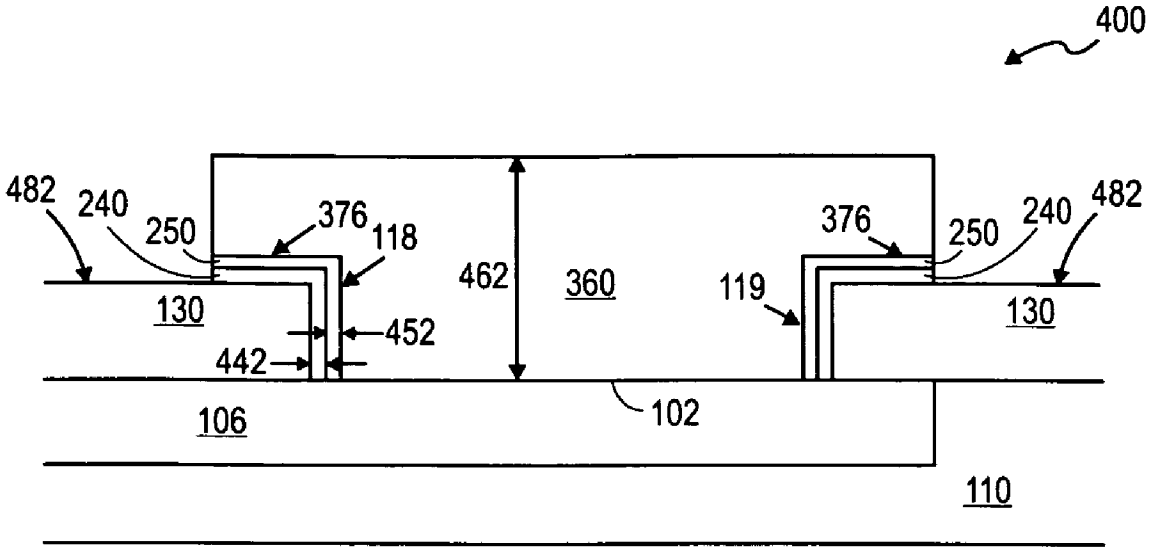
(57) **ABSTRACT**

Embodiments include an interconnect or trace of electrically conductive material with a contact surface, and a dielectric layer overlying the contact surface with a via formed on the dielectric layer and to the contact surface. The via sidewalls and perimeter are layered with a manganese oxide (MnO_2) layer which is layered over with a conductive polymer material. An interconnect material is formed in the via and in a trench above the perimeter of the via such that the interconnect material is on the conductive polymer material and contacts the contact surface. An additional dielectric layer may be formed over the interconnect material and an additional via may be formed therethrough so that an additional structure having a MnO_2 layer, conductive polymer material, and interconnect material can be formed in the additional via and to the interconnect material.

16 Claims, 6 Drawing Sheets