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(54) Title: NON-DESTRUCTIVE ACOUSTIC METROLOGY FOR VOID DETECTION

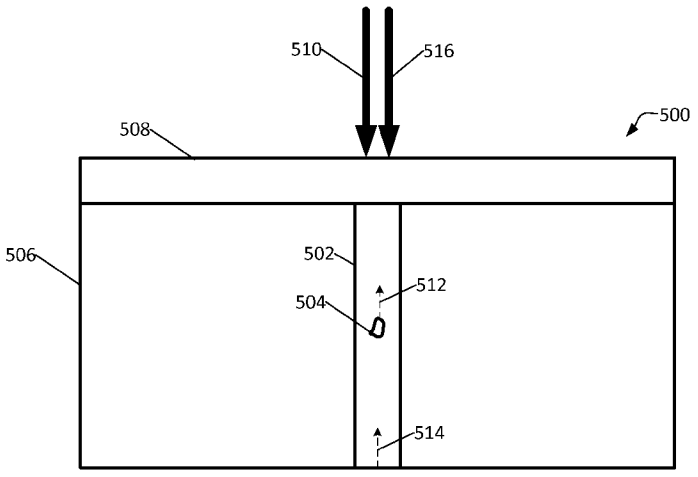

FIG. 5A

(57) Abstract: Advanced interconnect technologies such as Through Silicon Vias (TSVs) have become an integral part of 3-D integration. Methods and systems and provided for laser-based acoustic techniques in which a short laser pulse generates broadband acoustic waves that propagate in the TSV structure. An optical interferometer detects the surface displacement caused by the acoustic waves reflecting within the structure as well as other acoustic waves traveling near the surface that has information about the structure dimensions and irregularities, such as voids. Features of voids, such as their location, are also identified based on the characteristics of the acoustic wave as it propagates through the via. Measurements typically take few seconds per site and can be easily adopted for in-line process monitoring.

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