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(54) SYSTEM AND METHOD FOR USING ACOUSTIC WAVES TO COUNTERACT **DEFORMATIONS DURING BONDING**

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A method includes moving at least one of a first element and a second element to contact first regions of the first and second elements with one another while second regions of the first and second elements are not in contact with one another. The first regions directly bond to one another to form a bond interface without adhesive. The method further includes directly bonding the second regions of the first and second elements to one another without adhesive by controllably releasing one of the first element and the second element such that the bond interface and a boundary between the bond interface and the second regions not in contact with one another expands radially away from the first regions. The second regions have first vibrations within a bond initiation region bordering the boundary. The method further includes externally applying second vibrations to at least one of the first and second elements during the directly

bonding. The second vibrations are in antiphase with the first

vibrations in the bond initiation region.

ABSTRACT

