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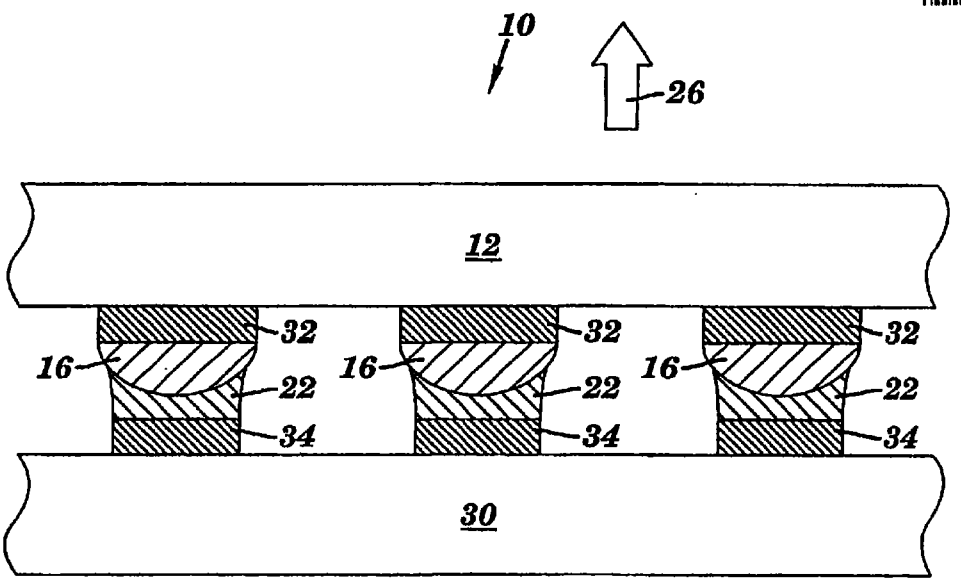
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(54) Title: LEAD-FREE SOLDER STRUCTURE AND METHOD FOR HIGH FATIGUE LIFE

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(57) Abstract: A method and structure for solderably coupling an electronic module (e.g. a ceramic or plastic ball grid array module) to a circuit board. A lead-free solder ball is soldered to the module without using a joining solder to effectuate the soldering. The solder ball comprises a tin-antimony alloy that includes about 3 % to about 15 % antimony by weight. The solder ball is soldered to the circuit board with a lead-free joiner solder. The joiner solder comprises a tin- silver-copper alloy that includes by weight about 95.5-96.0 % tin, about 3.5-4.0 % silver, and about 0.5-1.0 % copper. The resultant solder connection between the module and the circuit board has a fatigue life of at least about 90 % of a fatigue life of a reference structure. The reference structure has a 90Pb/10Sn solder ball joined to both the module and the circuit card by a 63Sn/37Pb joiner solder.

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