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**United States Patent** [19]  
**Albrecht et al.**

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[54] **METHOD OF ELECTRICAL CONNECTION BETWEEN HEAD TRANSDUCER AND SUSPENSION BY SOLDER WIRE BUMPING AT SLIDER LEVEL AND LASER REFLOW**

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[51] **Int. Cl.**<sup>6</sup> ..... **B23K 26/00**

[52] **U.S. Cl.** ..... **219/121.64; 29/603.06; 228/180.22; 228/111.5**

[58] **Field of Search** ..... **29/603.04, 603.06; 228/180.22, 111.5; 360/104; 219/121.64, 121.66, 121.85**

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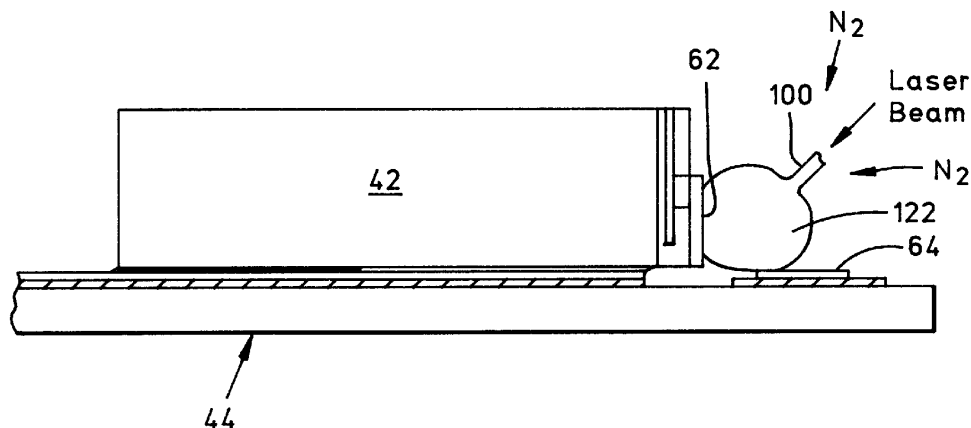
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[57] **ABSTRACT**

A method of making a solder connection between a slider pad and a suspension pad is provided by forming a solder bump on the solder pad at the slider level, affixing the slider to the suspension so that solder can be reflowed between the slider pad and the suspension pad and then employing a laser beam to reflow at least the solder bump to form a solder connection between the slider pad and the suspension pad. Various embodiments of the method are employed for forming the solder connection. Geometric features are also optionally incorporated in the suspension pad region of the integrated suspension that can be employed to bias the suspension pads against the solder bumps in the pre-reflow state.

**56 Claims, 12 Drawing Sheets**



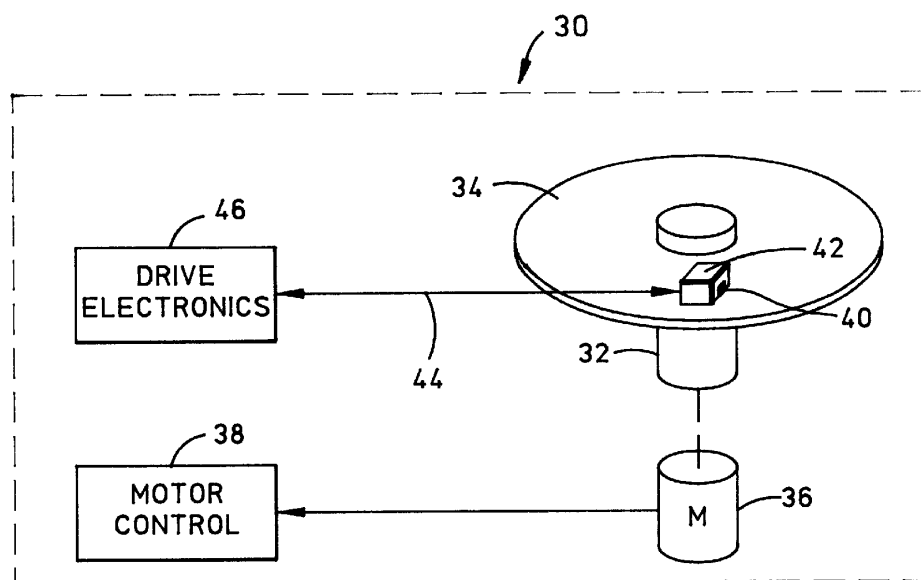


FIG. 1

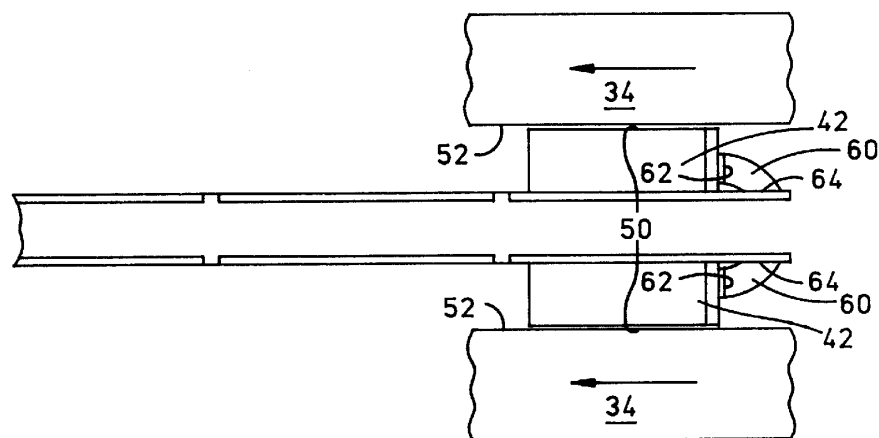
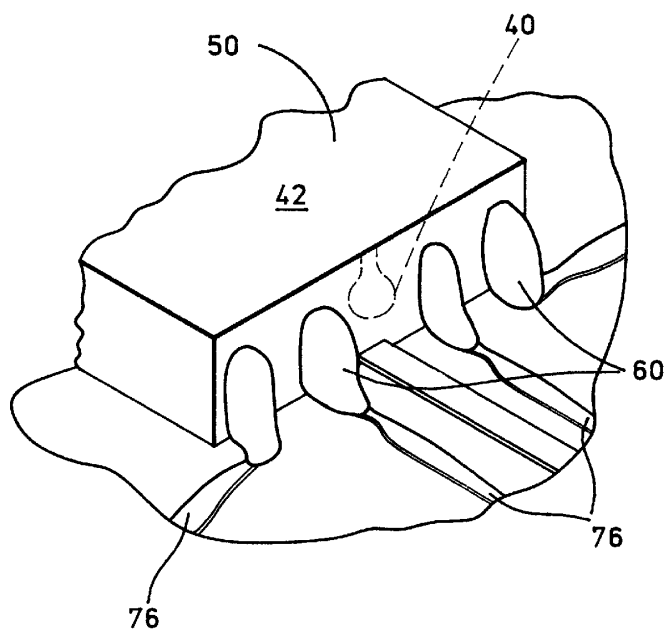
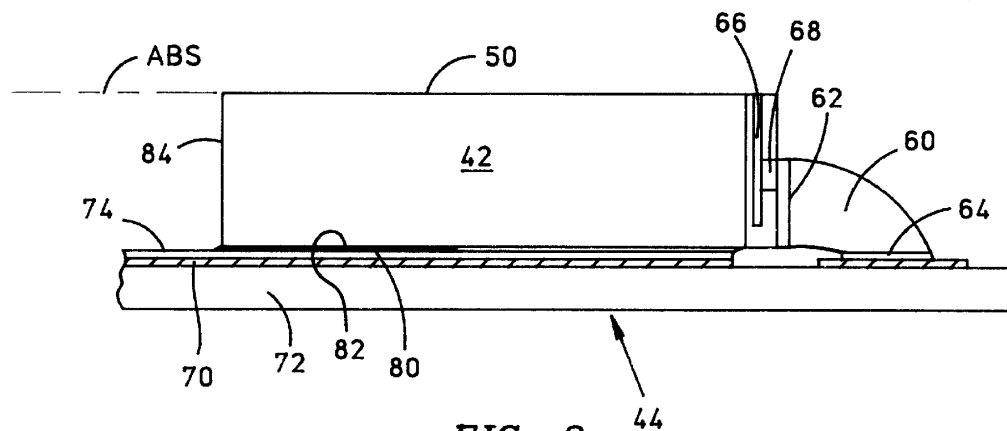
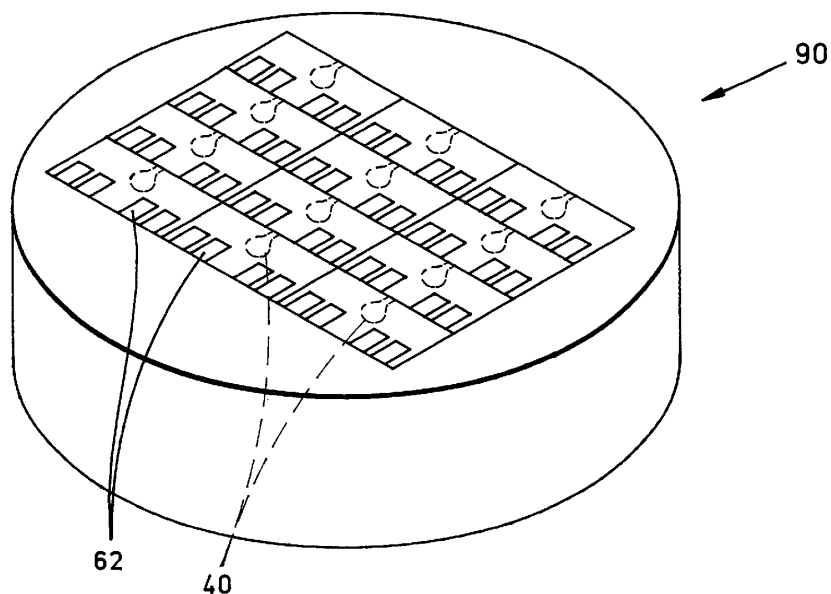
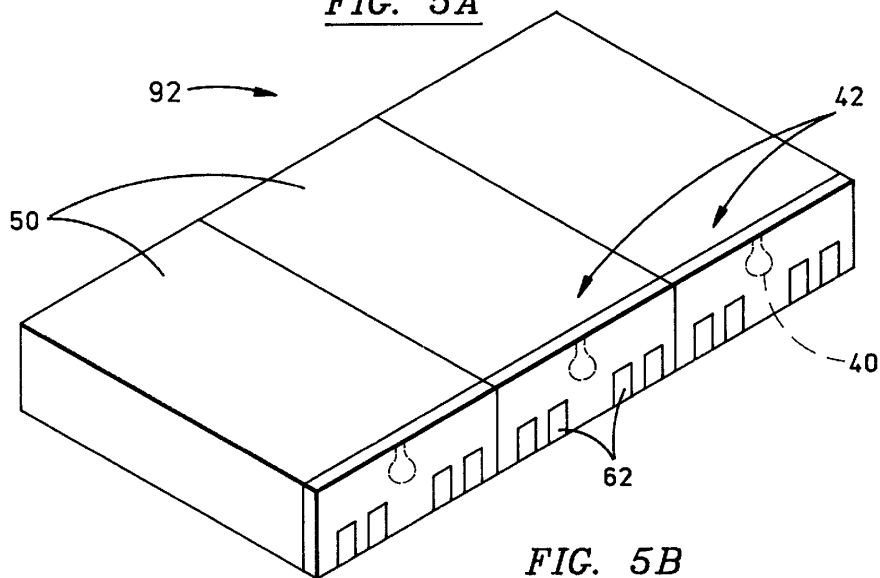


FIG. 2



FIG. 5AFIG. 5B

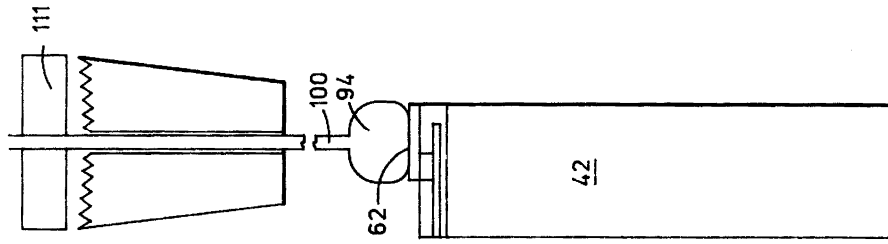


FIG. 6D

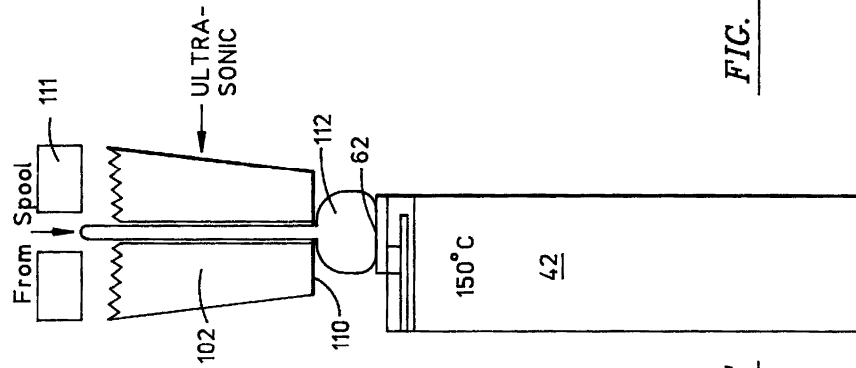


FIG. 6C

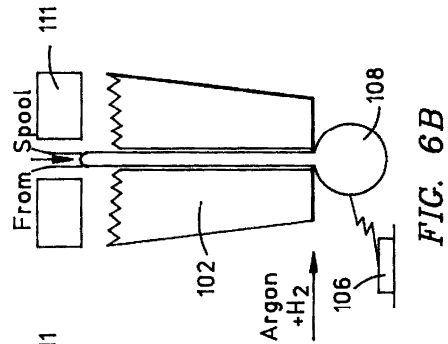


FIG. 6B

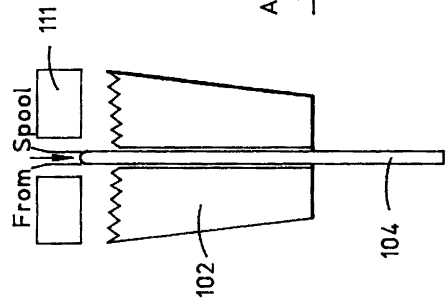


FIG. 6A

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