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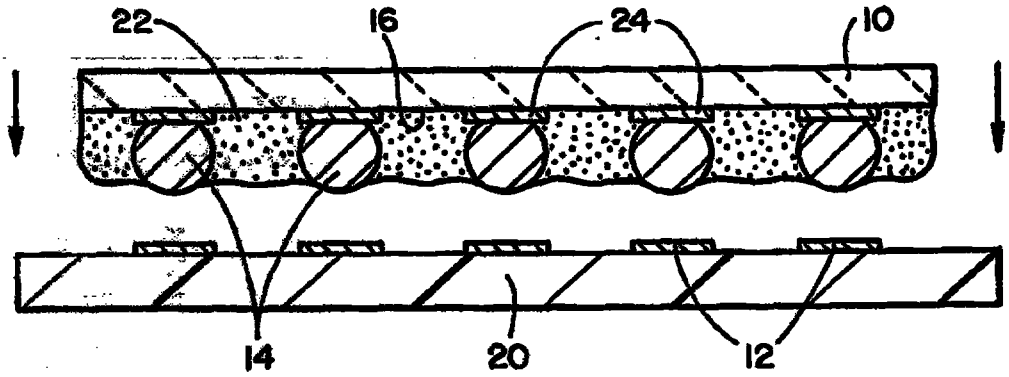
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(54) Title: SEMICONDUCTOR FLIP-CHIP PACKAGE AND METHOD FOR THE FABRICATION THEREOF



(57) Abstract

A simplified process for flip-chip attachment of a chip (10) to a substrate (20) is provided by pre-coating the chip (10) with an encapsulant underfill material (22) having discrete solder columns therein to eliminate the conventional capillary flow underfill process. Such a structure permits incorporation of remeltable layers for rework, test, or repair. It also allows incorporation of electrical redistribution layers. In one aspect, the chip (10) and pre-coated encapsulant are placed at an angle to the substrate and brought into contact with the pre-coated substrate, then the chip (10) and pre-coated encapsulant are pivoted about the first point of contact, expelling any gas therebetween until the solder bumps (14) on the chip are fully in contact with the substrate (20). There is provided a flip-chip configuration having a compliant solder/flexible encapsulant understructure that deforms generally laterally with the substrate (20) as the substrate (20) undergoes expansion and contraction. With this configuration, the compliant solder/flexible encapsulant understructure absorbs the strain caused by the substrate without bending the chip (10) and substrate (20).