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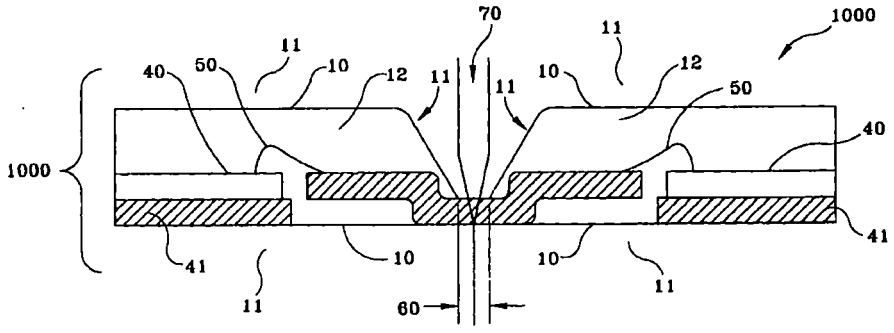
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(54) Title: LEADLESS SEMICONDUCTOR PRODUCT PACKAGING APPARATUS HAVING A WINDOW LID AND METHOD FOR PACKAGING



(57) Abstract: A natural-resource-conservative, environmentlaly-friendly, cost-effective, leadless semiconductor packaging apparatus (1000), having superior mechanical and electrical properties, and having an optional windowed housing which uniquely seals and provides a mechanism for viewing the internally packaged integrated semiconductor circuits (chips/die) (40). A uniquely stamped and/or bent lead-frame (30, 41) is packaged by a polymeric material (12) during a unique compression-modling process using a mold, specially contoured to avoid the common "over-packaging" problem in related art techniques. The specially contoured mold facilitates delineation of the internal portions from the external portions of the lead-frame, as the external portions are the effective solderable areas that contact pads on a printed circuit board, thereby avoiding a laborious environmentally-unfriendly masking step and de-flashing step, streamlining the device packaging process. The compression-mold effectively provides a compressive sealing orifice from which the effective solderable areas of the lead-frame may extend and be exposed and, thus, avoid being coated with the polymer which is uniquely contained by the mold for packaging the internal portions of the lead-frame. The lead-frame is uniquely stamped and/or bent, conforming it to electro-mechanical requirements of a particular semiconductor product. By uniquely stamping and/or bending, the related art "half-etching" of the lead for conforming it to electro-mechanical requirements of the packaged semiconductor product is no longer required. Environmental enhancement is achieved by conserving natural resources and by eliminating hazardous material by products otherwise liberated in related art packaging techniques.

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