[0006] The technical problem to be solved by the present invention is as described above. To solve this problem, a resin molding device according to the present invention comprises an upper platen, wherein an upper mold is fixed to the upper platen; a lower platen, wherein a lower mold is fixed to the lower platen; a plurality of tie bars, wherein the tie bars connect the upper platen and the lower platen; a mold clamping mechanism, wherein the mold clamping mechanism moves the lower platen vertically; and a position adjustment mechanism, wherein the position adjustment mechanism is capable of adjusting a position of the upper platen with respect to the tie bars for each of the tie bars.

[0007] Further, a method for producing resin molded article according to the present invention is a method for producing resin molded article using the resin molding device, comprising an adjustment process of adjusting the position of the upper platen with respect to the tie bar; a mold clamping process of moving the lower platen with respect to the upper platen to perform mold clamping after the adjustment process; and a resin molding process of resin molding a molding target after the mold clamping process.

Effects of Invention

[0008] According to the present invention, it is possible to finely adjust the interval between the lower platen and the upper platen.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is a schematic plan view showing the overall configuration of a resin molding device according to one embodiment.

FIG. 2 is a schematic front view showing the configuration of a molding mechanism.

FIG. 3 is a schematic front cross-sectional view showing a mold set.

FIG. 4 is a schematic front cross-sectional view showing the configuration of a position adjustment mechanism (individual adjustment mechanism).

FIG. 5 (a) is a view showing a state where a servo motor is driven. (b) is a view showing a state

where a fixed platen moves upward.

FIG. 6(a) is a view showing an example of strain of each tie bar when mold clamping is performed. (b) is a view showing a state where the position of a fixed platen is adjusted.

FIG. 7(a) is a view showing an example of a clamping position when a predetermined strain occurs in each tie bar. (b) is a view showing a state where the position of a fixed platen is adjusted.

FIG. 8 is a flowchart showing a method for producing resin molded article according to one embodiment.

DESCRIPTION OF THE EMBODIMENTS

[0010] In the following, the directions indicated by arrow U, arrow D, arrow L, arrow R, arrow F, and arrow B shown in the figures are defined as upward, downward, leftward, rightward, forward, and backward directions, respectively, for the description.

[0011] <Overall Configuration of Resin Molding Device 1>

First, the configuration of the resin molding device 1 will be described with reference to FIG. 1. The resin molding device 1 is for resin sealing electronic elements such as semiconductor chips (hereinafter simply referred to as "chip 2a" (see FIG. 3)) and producing resin molded articles. In particular, in the present embodiment, a resin molding device 1 that performs resin molding using a transfer molding method is illustrated. Note that the chip 2a is omitted from the notation except in FIG. 3.

[0012] The resin molding device 1 includes, as components, a supply module 10, a resin molding module 20, and an unloading module 30. Each component is attachable, detachable, and exchangeable with respect to other components.

[0013] <Supply Module 10>

The supply module 10 supplies a lead frame 2, which is a type of substrate on which the chip 2a is mounted, and a resin tablet T to the resin molding module 20. Note that the lead frame 2 is one embodiment of a molding target according to the present invention. In the present embodiment, the lead frame 2 is illustrated as an example of a substrate to be a molding target, but

the molding mechanism 100. After that, the loader 17 places the lead frame 2 on the upper surface of the lower mold 160 and accommodates (sets) the resin tablet T in the pot 161 of the lower mold 160 (step S14 in FIG. 8).

[0094] After placing the lead frame 2 on the lower mold 160 and housing the resin tablet T in the pot 161, the loader 17 retreats rearward from the mold set (step S15 in FIG. 8).

[0095] Next, mold clamping of the mold set is performed by the mold clamping mechanism 150 (step S16 in FIG. 8). Specifically, the mold clamping mechanism 150 is driven to raise the lower mold 160 toward the upper mold 170. When the lower mold 160 approaches the upper mold 170, the lead frame 2 is sandwiched between the lower mold 160 and the upper mold 170.

[0096] Next, injection of the resin material into the cavity is performed by the transfer mechanism 180 (step S17 in FIG. 8). Specifically, the resin tablet T accommodated in the pot 161 is heated and melted by heaters (the lower mold heater 162 and the upper mold heater 173) provided in the mold set. The transfer mechanism 180 can inject the melted resin tablet T (resin material) into the cavity by raising the plunger 181.

[0097] After the resin material is injected by the transfer mechanism 180, by waiting until a predetermined time elapses, the resin material is cured, and the chip 2a of the lead frame 2 may be resin sealed.

[0098] Next, mold opening of the mold set is performed by the mold clamping mechanism 150 (step S18 in FIG. 8). Specifically, the mold clamping mechanism 150 is driven to lower the lower mold 160 away from the upper mold 170. By this, the resin sealed lead frame 2 can be released from the upper mold 170. Thereafter, the lead frame 2 is unloaded from the mold set (step S19 in FIG. 8). Specifically, the lead frame 2 is unloaded from the mold set by the unloader 31 shown in FIG. 1 and housed in the substrate housing part 32 of the unloading module 30. In this manner, the resin sealed lead frame 2 (resin molded article) is manufactured.

[0099] Although the embodiment of the present invention has been described above, the present invention is not limited to the above embodiment, and appropriate modifications are possible