

CLAIMS

1. A batch bonding apparatus, comprising:
 - a chip supply unit, configured to provide chips to be bonded;
 - a substrate supply unit, configured to provide a substrate;
 - a conveying unit, configured to transfer the chips between the chip supply unit and the substrate supply unit; and
 - a pickup unit, disposed above the chip supply unit and configured to, pick up each chip from the chip supply unit and load the chip onto the conveying unit after flipping a mark surface of the chip to a required orientation,wherein the pickup unit comprises a first pickup assembly and a second pickup assembly, wherein the first pickup assembly is disposed above the chip supply unit, and comprises a first rotating part and a first pickup head disposed on the first rotating part, wherein the second pickup assembly comprises a second rotating part and a second pickup head disposed on the second rotating part, wherein the first pickup head picks up the chip from the chip supply unit and transfers the chip to the conveying unit or to the second pickup head.
2. The batch bonding apparatus of claim 1, wherein a rotational angle of each rotation of the first rotating part is 90° or 180°.
3. The batch bonding apparatus of claim 1, wherein the second pickup assembly further comprises a first alignment part configured to identify a position of the chip on the second pickup head.
4. The batch bonding apparatus of claim 3, wherein there is one second pickup head, and the second pickup head is driven by the second rotating part to switch among an alignment position corresponding to the first alignment part, a handover position corresponding to the first pickup head, and a transfer position corresponding to the conveying unit.
5. The batch bonding apparatus of claim 3, wherein there are at least three second pickup heads, wherein the at least three second pickup heads are uniformly disposed on the second rotating part and spaced apart from one another along a circumference of the second rotating part, and when the second rotating part stops rotation, three of the at least three second pickup heads are located at an alignment position corresponding to the first alignment part, a handover position corresponding to the first pickup head, and a transfer position corresponding to the conveying unit, respectively.

6. The batch bonding apparatus of claim 5, wherein an angle of each rotation of the second rotating part is equal to an angle between adjacent second pickup heads.

7. The batch bonding apparatus of claim 1, wherein the batch bonding apparatus further comprises a fine tuning unit, wherein the fine tuning unit comprises a second alignment part and a fine regulator, wherein the second alignment part scans a position of the chip on the conveying unit, and the fine regulator adjusts the position of the chip depending on a scanning result of the second alignment part.

8. The batch bonding apparatus of claim 1, wherein the conveying unit comprises a guide rail and a carrying platform mounted on the guide rail and being slidable along the guide rail, and the carrying platform is provided with a suction head for suction of the chips.

9. A batch bonding method, used with the batch bonding apparatus according to claim 1, and comprising the following steps:

S1: loading a wafer having chips onto a chip supply unit, and loading a substrate onto a substrate supply unit;

S2: determining a required orientation of mark surfaces of the chips during bonding;

S3: if the mark surfaces are required to face downwards during bonding, picking up, by a pickup unit, the chips from the chip supply unit successively, rotating the chips by 180° successively, and delivering the rotated chips to a conveying unit which conveys all the chips to the substrate of the substrate supply unit to simultaneously bond all the chips to the substrate; and

S4: if the mark surfaces are required to face upwards during bonding, picking up, by a pickup unit, the chips from the chip supply unit, flipping the chips over, and delivering the chips to the conveying unit which conveys all the chips to the substrate of the substrate supply unit to simultaneously bond all the chips to the substrate.

10. The batch bonding method of claim 9, wherein step S3 and step S4 each further comprises: moving, by the conveying unit, the chips to a location above a fine tuning unit, and adjusting, by the fine tuning unit, a position of each of the chips on the conveying unit.

11. The batch bonding method of claim 9, wherein the step of picking up, by the pickup unit, the chips from the chip supply unit and flipping the chips over in step S4 comprises: picking up, by a first pickup assembly, the chips from the chip supply unit

and transferring the chips to a second pickup assembly after rotating the chips by 90°; and loading, by the second pickup assembly, the chips onto the conveying unit.

12. The batch bonding method of claim 11, wherein step S4 further comprises: identifying, by a first alignment part, a position of the chips on the second pickup assembly, and then transferring the chips to the conveying unit in an aligned manner.