



mounting head 60 is raised by an unillustrated driving apparatus as shown by a hollow arrow A3 after the solenoid valve 43 is closed and the suction of the vacuum suction path 32 is stopped, the semiconductor die 80 and the semiconductor die 70 bonded to the semiconductor die 80 are left on the bonding stage 50. Then, when the temperature is reduced, the molten bump 74 solidifies to a bonding metal 74b, and the thermoset resin 75a is cured to a filling resin 75c which fills the gap between the upper surface of the die body 81 of the semiconductor die 80 and the lower surface of the die body 71 of the semiconductor die 70.

[0045] As shown in FIG. 10, even in a state that the semiconductor die 70 is mounted on the semiconductor die 80 and the mounting head 60 is raised, there is also a concern that the gas generated during the process shown in FIG. 9 remains, and the gas flows into the vacuum suction path 32 of the body portion 31 as shown by an arrow A4. However, as already described using FIG. 9, the gas is heated by the path heater 90B arranged in the vacuum suction path 32 and directly rises into the vacuum suction path 32 without liquefying on the way to rise (for example, the range surrounded by the dotted line C in the vacuum suction path 32). The rising gas is cooled by the cooling portion 90C arranged in the vacuum suction path 32 and thereby liquefies (condenses). Then, the condensed liquid is stored in the storage portion 90A arranged in the vacuum suction path 32 as the stored article 91, or a solid formed by solidification of the liquid is stored in the storage portion 90A as the stored article 91.

[0046] FIG. 11 is a configuration diagram showing another example configuration of the body portion used in the flip-chip bonding apparatus of the embodiment of the present invention. As shown in FIG. 11, the body portion 31 is configured to be divisible into upper and lower in the division face DF passing through the storage

portion 90A. In the body portion 31, the bottom 95 of the storage portion 90A is arranged in a lower body portion 31B formed by division of the division face DF. In addition, the body portion 31 includes a third opening portion 36 of the storage portion 90A in an upper body portion 31A formed by division of the division face DF. The third opening portion 36 is formed into a tapered shape so as to become smaller gradually toward the downstream side in the suction direction of the gas, and is configured so that the diameter of one end surface S1 of the third opening portion 36 is larger than the diameter of the other end surface S2 of the third opening portion 36 on the downstream side in the suction direction.

[0047] FIG. 12 is a cross-section view of the body portion observed from a direction XII-XII. As shown in FIG. 11 and FIG. 12, the storage portion 90A is disposed along an outer periphery of the vacuum suction path 32. In such a storage portion 90A, the liquid formed by condensation of gas faces the bottom 95 along a wall surface of the storage portion 90A, and thus a foreign matter can be appropriately stored at a position different from the positions of the vacuum suction holes 16, 22 in the cross-section view of the body portion 31 orthogonal to the axial direction of the vacuum suction holes 16, 22 shown in FIG. 10.

[0048] FIG. 13 is a configuration diagram showing another example configuration of the body portion used in the flip-chip bonding apparatus of the embodiment of the present invention. As shown in FIG. 13, the body portion 31 may be configured to include a projection portion 90D at a position facing the position where the storage portion 90A is arranged in the vacuum suction path 32. In this way, by lengthening a length of the vicinity where the storage portion 90A is arranged in the vacuum suction path 32, the gas can be cooled naturally. Therefore, since the cooling portion 90C as shown in FIG.