

[0039] The conveying device 1 includes the chuck 2 and the guides 3. The chuck 2 holds the semiconductor chip 103 in a non-contact manner to face the holding surface 2B. The guide 3 has the guide probe 9 capable of abutting the chip side surface 103s of the semiconductor chip 103. For the semiconductor chip 103 held by the chuck 2, the guide probe 9 limits the movement of the semiconductor chip 103 in the lateral direction that intersects the direction of the normal N of the holding surface 2B. The guide probe 9 is capable of performing reciprocating movement in which the probe tip 9a moves toward and away from the holding surface 2B.

[0040] The guide probe 9 of the guide 3 included in the conveying device 1 limits the movement of the semiconductor chip 103 held by the chuck 2 in the lateral direction. The guide probe 9 is capable of moving toward and moving away from the holding surface 2B of the chuck 2. Then, when the chuck 2 is brought close to the semiconductor chip 103, the guide probe 9 can move to be close to the holding surface 2B. Therefore, even when other semiconductor chips 104 exist around the semiconductor chip 103, the chuck 2 can be easily brought close to the semiconductor chip 103. Then, when the chuck 2 holding the semiconductor chip 103 is lifted, the guide probe 9 moves to be away from the holding surface 2B of the chuck 2. As a result, the guide probe 9 exists on the chip side surface 103s of the semiconductor chip 103. Therefore, the movement of the semiconductor chip 103 in the lateral direction is limited. That is, the conveying device 1 can both limit the movement of the semiconductor chip 103 in the lateral direction and lift the semiconductor chip 103. Therefore, the semiconductor chip 103 can be picked up stably.

[0041] For example, unlike the conveying device 1, the guide probe 309 of the guide 303 of the conveying device 300 according to the comparative example shown in the part (a) of FIG. 8 is fixed to the guide main body 307. According to this configuration, when the holding surface 302B of the chuck 302 is brought close to the semiconductor chip 103, the probe tip 309a is pressed against the chip main surface 104t of another semiconductor chip 104 adjacent to the semiconductor

103 to be picked up are slightly displaced, the conveying device 1A can still guide the semiconductor chip 103 to a predetermined holding position. Therefore, the conditions of the position where the semiconductor chip 103 can be held can be relaxed. As a result, the conveying device 1A can hold the semiconductor chip 103 more stably.

5 **[0052]** The mechanism that allows the horizontal displacement of the semiconductor chip with respect to the conveying device can also be realized by a mechanism different from the mechanism shown in FIG. 6. For example, as shown in FIG. 7, the guide probes 9C and 9D of the guides 3C and 3D have inclined probe side surfaces 9s. In other words, the shapes of the guide probes 9C and 9D are tapered. With such a configuration, even if the position of the semiconductor chip 103 to be picked up is slightly displaced with respect to the conveying device 1B, the semiconductor chip 103 can still be guided to the predetermined holding position.

[0053] The conveying device 1 of the embodiment is applied to convey the semiconductor chip 103. The conveying device may also be applied to convey a semiconductor wafer.

[Descriptions of Reference Numerals]

15 **[0054]**

1, 1A, 1B ... conveying device; 2 ... chuck (chuck part); 2B ... holding surface; 3, 3A, 3B, 3C, 3D, 303 ... guide (guide part); 4 ... control plate; 7 ... guide main body; 8 ... spring; 9, 9A, 9B, 9C, 9D ... guide probe; 100 ... semiconductor wafer; 101, 103, 104 ... semiconductor chip; 201 ... dicing tape; 202 ... pickup pin; SA ... holding force acting region; FK ... holding force; FS ... urging force; N ... normal.