

two voice coil motors 38 can be selected. The collet 34A disposed to straddle between the voice coil motors 38 is driven by two voice coil motors 38. Then, the collet 34A can be made larger than, for example, the collets 34B and 34C which can be driven by one voice coil motor 38. That is, the area of the collet suction surface 34S of the collet 34A
5 can be increased. As a result, the area of the chip main surface 101a of the semiconductor chip 101 that can be held is increased. Thus, the thin semiconductor chip 101 can be carried. As the second mode, a mode in which the collets 34B and 34C are attached to each of the voice coil motors 38 can be selected. According to the second mode, by being sucked to the collet suction surface 34Sb of the collet 34B and
10 the collet suction surface 34Sc of the collet 34C respectively, the small semiconductor chip 101 can be carried. As a result, the mounting device 1 capable of selecting the first mode and the second mode can carry the semiconductor chips 101 of various shapes.

[0049]

In other words, the mounting device 1 has a configuration in which the collet
15 34A and the collets 34B and 34C can be exchanged with each other. Thus, the mounting device 1 can handle the semiconductor chips 101 of various shapes. The exchange work of the collets 34A, 34B, and 34C is relatively easier than the exchange work of the voice coil motor 38. That is, when the semiconductor chip 101 to be picked up is changed, large-scale work such as exchange work of the voice coil motor 38 does not occur.

20 [0050]

The mounting device 1 can use all pickup motors 36A and 36B of the pickup unit 30 even when the shape of the semiconductor chip 101 to be picked up is changed. For example, as shown in Fig. 6, there is a case in which the semiconductor chip 101 is larger than the gap of the pickup heads 33. In this case, if the semiconductor chip 101 is
25 picked up only using the pickup motor 36A, another pickup motor 36B adjacent to the

[CLAIMS]

[Claim 1]

A mounting device, comprising:

a plurality of heads which are capable of moving independently, and

5 respectively have a motor of direct-acting type in which a movable element reciprocatingly moves along an axis relative to a fixed element; and

a chip holder which is attached to an end portion side of the heads and sucks and holds a semiconductor chip,

10 wherein the plurality of heads are arranged in a manner that the axes are parallel to each other, and

wherein the chip holder is attached to straddle end portion sides of at least two heads in the plurality of heads.

[Claim 2]

The mounting device according to claim 1, further comprising:

15 a control unit which provides a control signal to the motor to control the position of the fixed element,

wherein the motor includes a position information acquiring unit which obtains a position along the axis of the movable element relative to the fixed element, and

20 wherein the control unit acquires representative position information from the position information acquiring unit of a representative motor selected from the plurality of motors and controls the positions of the plurality of heads using the representative position information.

[Claim 3]

The mounting device according to claim 1 or 2,

25 wherein the motor is a voice coil motor.

[Claim 4]

The mounting device according to any one of claims 1 to 3,
wherein the head further includes a chuck which is provided at an end portion
of the movable element and to which the chip holder is connected in an attachable and
5 detachable manner, and

wherein the chuck includes a chuck mechanism which connects the chip holder
to the chuck and a chuck detector which detects whether or not the chip holder exists in
the chuck.

[Claim 5]

10 The mounting device according to any one of claims 1 to 3,
wherein the semiconductor chip includes a chip held surface which is held by
the chip holder,

wherein the chip holder includes a chip holding surface which holds the
semiconductor chip in an attachable and detachable manner, and

15 wherein an area of the chip holding surface is larger than an area of the chip held
surface.

[Claim 6]

The mounting device according to any one of claims 1 to 5,
wherein the semiconductor chip includes a chip held surface which is held by
20 the chip holder, and

wherein the mounting device further comprises a push-up mechanism which
pushes a surface on the side opposite to the chip held surface and pushes up the
semiconductor chip toward the chip holder.