CLAIMS

WHAT IS CLAIMED IS:

1. A device that holds a substrate in a substrate holder and/or releases the holding of the substrate using the substrate holder,

wherein the substrate holder comprises a first frame and a second frame that sandwich the substrate,

the first frame and the second frame have openings that expose the substrate, respectively,

the device comprises a substrate supporting unit that sandwiches the substrate between the first frame and the second frame,

the substrate supporting unit comprises

a lower substrate supporter that supports the substrate from below, and

an upper substrate supporter that supports the substrate from above,

the lower substrate supporter is configured to come into contact with the substrate through the opening of the first frame which is positioned on a lower side, and

the upper substrate supporter is configured to come into contact with the substrate through the opening of the second frame which is positioned on an upper side.

2. The device according to claim 1,

wherein the substrate supporting unit comprises

a lower-substrate-supporter vertical movement mechanism that vertically moves the lower substrate supporter, and

an upper-substrate-supporter vertical movement mechanism that vertically moves the upper substrate supporter, and

the substrate supporting unit is configured to be capable of moving the substrate between a first position at which the substrate is capable of being sandwiched

by the first frame and the second frame and a second position which is higher than the first position and at which the substrate is capable of being unloaded from the device.

3. The device according to claim 1 or 2, further comprising:

a first base on which the substrate holder is horizontally mounted; and

a second base that is disposed above the first base and configured to be capable of moving vertically,

wherein the second base positions the second frame which is positioned on the upper side so that the substrate is sandwiched by the first frame and the second frame, and

the second base is configured to be capable of lifting the second frame which is positioned on the upper side.

4. The device according to claim 3,

wherein the second base is configured to press the substrate holder mounted on the first base toward the first base.

5. The device according to claim 3 or 4,

wherein the second base comprises a frame lifting claw that lifts the second frame which is positioned on the upper side,

the first base comprises a frame pusher that lifts the second frame which is positioned on the upper side, and

the frame pusher forms, between the first frame and the second frame, a gap into which the frame lifting claw is inserted.

6. The device according to claim 5,

wherein the frame pusher lifts the first frame or the second frame to a position at which the substrate holder is capable of being semi-locked.

7. The device according to any one of claims 1 to 6,

wherein the substrate holder comprises a clamper that clamps the first frame and the second frame, and

the device further comprises a clamper opener that opens the clamper.

8. The device according to any one of claims 1 to 7, further comprising:

a substrate position detection unit that calculates a position and/or an angle of the substrate before the substrate supporting unit sandwiches the substrate.

9. The device according to claim 8,

wherein the substrate position detection unit is at least one set of a light source and a camera,

the light source is configured to be capable of moving between a light source waiting position at which attachment and detachment of the substrate are not inhibited and an irradiation position at which a corner of the substrate is capable of being irradiated with light, and

the camera is configured to be capable of moving between a camera waiting position at which the attachment and detachment of the substrate are not inhibited and which is present within the opening of the second frame which is positioned on the upper side and an imaging position at which a section of the substrate which is irradiated by the light source and is a reference for detecting the position and/or the angle of the substrate is capable of being imaged.

10. A plating apparatus comprising:

a plating treatment portion that performs plating on a substrate held by a substrate holder;

the device according to any one of claims 1 to 9 that holds the substrate in

the substrate holder and/or releases the holding of the substrate using the substrate holder;

a transporter that transfers the substrate holder between the plating treatment portion and the device; and

a substrate transfer robot that receives the substrate from the device and delivers the substrate to the device.

11. A plating apparatus comprising:

a plating treatment portion that performs plating on a substrate held by a substrate holder;

the device according to claim 8 or 9 that holds the substrate in the substrate holder and/or releases the holding of the substrate using the substrate holder;

a transporter that transfers the substrate holder between the plating treatment portion and the device; and

a substrate transfer robot that receives the substrate from the device and delivers the substrate to the device,

wherein the substrate transfer robot is capable of adjusting, based on a position and/or an angle of the substrate calculated by the substrate position detection unit, the position and/or the angle of the substrate when the substrate is delivered to the device.

12. A device that holds a substrate in a substrate holder and/or releases the holding of the substrate using the substrate holder,

wherein the substrate holder comprises

a first frame facing a first surface of the substrate and used to sandwich the substrate, and

a second frame facing a second surface of the substrate and used to sandwich the substrate,

the first frame and the second frame have openings that expose the substrate, respectively,

the device comprises a substrate supporting unit that sandwiches the substrate between the first frame and the second frame,

the substrate supporting unit comprises

a first substrate supporter that supports the first surface of the substrate and

a second substrate supporter that supports the second surface of the substrate,

the first substrate supporter is configured to come into contact with the substrate through the opening of the first frame, and

the second substrate supporter is configured to come into contact with the substrate through the opening of the second frame.