

Claims

[Claim 1]

An alignment device (8) to be used for applying a protective tape (PT) to a semiconductor wafer (W), comprising:

a rotary table (80) configured to support and rotate the semiconductor wafer (W);

illumination means (83) for illuminating the semiconductor wafer (W) with red light from one surface side of the semiconductor wafer (W); and

image pickup means (84) for imaging the semiconductor wafer (W) on another surface side of the semiconductor wafer (W),

wherein the alignment device (8) is configured to determine a center position of the semiconductor wafer (W) through detection of an outer peripheral edge portion of the semiconductor wafer (W) based on a reception state of the red light by the image pickup means (84).

[Claim 2]

An alignment device (8) according to claim 1, wherein the image pickup means (84) is configured to image the semiconductor wafer (W) through intermediation of an optical filter (840) configured to transmit light in a wavelength range of the red light in incident light.

[Claim 3]

An alignment device (8) according to claim 2, wherein the optical filter (840) is configured to block light having a

wavelength of 600 nm or less.

[Claim 4]

An alignment device (8) according to any one of claims 1 to 3, further comprising a table moving mechanism (82) configured to move the rotary table (80) horizontally in an X direction and in a Y direction orthogonal to the X direction,

wherein the alignment device (8) is configured to perform positional adjustment of a center of the semiconductor wafer (W) through determination of a positional displacement amount by comparing the center position of the semiconductor wafer (W) to a predefined reference position and through control of the table moving mechanism (82) based on the positional displacement amount.

[Claim 5]

An alignment device (5) to be used for applying a protective tape (PT) to a semiconductor wafer (W), comprising:

a tape holding body (30) configured to hold the protective tape (PT) laminated with a circular protective layer (PL) having an outer diameter smaller than an outer diameter of the protective tape; ~~and (PT);~~

one or more image pickup means (50) for imaging a portion at a plurality of parts, the portion being of an outer peripheral edge portion of the protective layer (PL); and

a holding-body moving mechanism (31) configured to move the tape holding body (30) horizontally in the X direction and in the Y direction orthogonal to the X direction, and for supplying the protective tape (PT) held by the tape holding

body (30) onto the semiconductor wafer (W),

wherein the alignment device (5) is configured to determine a center position of the protective layer (PL) based on positional information on ~~each of~~ the portion at the plurality of parts of the outer peripheral edge portion of the protective layer (PL) through determination of the positional information on the ~~each of~~ portion at the plurality of parts based on image data acquired by imaging of the image pickup means.

~~{Claim 6}~~

~~An alignment device according to claim 5, comprising one image pickup means and further comprising image pickup means moving mechanism configured to move the image pickup means horizontally in an X direction and in a Y direction orthogonal to the X direction.~~

~~{Claim 7}~~

~~An alignment device according to claim 5 or 6, further comprising illumination means for illuminating the plurality of parts of the outer peripheral edge portion of the protective layer to be imaged by the image pickup means, the illumination means being arranged on a periphery of the image pickup means.~~

~~{Claim 8}~~

~~An alignment device according to any one of claims 5 to 7, further comprising a holding body moving mechanism configured to move the tape holding body horizontally in the X direction (50), and in the Y direction orthogonal to the X direction,~~

wherein the alignment device (5) is configured to perform positional adjustment of a center of the protective ~~tape~~layer (PL) through determination of a positional displacement amount by comparing the center position of the protective layer (PL) to a predefined reference position and through control of the holding-body moving mechanism (31) to move the ~~tape holding~~body (30) horizontally based on the positional displacement amount.

[~~Claim 9~~]-6]

An alignment ~~method~~device (5) according to claim 5, comprising one image pickup means (50) and further comprising image pickup means moving mechanism (52) configured to move the image pickup means (50) horizontally in an X direction and in a Y direction orthogonal to the X direction.

[Claim 7]

An alignment device (5) according to claim 5 or 6, further comprising illumination means (51) for illuminating the plurality of parts of the outer peripheral edge portion of the protective layer (PL) to be imaged by the image pickup means (50), the illumination means (51) being arranged on a periphery of the image pickup means (50).

[Claim 8]

An alignment method to be performed for applying a protective tape (PT) to a semiconductor wafer (W), comprising:
rotating the semiconductor wafer (W);
illuminating the semiconductor wafer (W) with red light

from one surface side of the semiconductor wafer ~~(W)~~;

imaging the semiconductor wafer (W) on another surface side of the semiconductor wafer ~~(W)~~; and

determining a center position of the semiconductor wafer (W) through detection of an outer peripheral edge portion of the semiconductor wafer (W) based on a reception state of the red light.

[Claim ~~10~~—9]

_____ An alignment method to be performed for applying a protective tape (PT) to a semiconductor wafer ~~(W)~~, comprising the steps of:

holding the protective tape (PT) laminated with a circular protective layer (PL) having an outer diameter smaller than an outer diameter of the protective tape ~~(PT)~~, by a tape holding body (30);

imaging a portion at a plurality of parts, the portion being of an outer peripheral edge portion of the protective layer ~~and~~ (PL);

determining a center position of the protective layer (PL) based on positional information on ~~each of~~ the portion at the plurality of parts of the outer peripheral edge portion of the protective layer (PL) through determination of the positional information on the ~~each of~~ portion at the plurality of parts based on image data acquired by imaging ~~;~~

determining of a positional displacement amount by comparing the center position of the protective layer (PL) to a predefined reference position;

performing positional adjustment of a center of the

protective layer (PL) by moving the tape holding body (30)
horizontally based on the positional displacement amount; and
supplying the protective tape (PT) held by the tape
holding body (30) onto the semiconductor wafer (W).