TROLLEY AND METHOD FOR SUPPORTING COMPONENT OF SUBSTRATE PROCESSING APPARATUS

TECHNICAL FIELD

[0001] The present disclosure relates to a trolley and a method for supporting a component of a substrate processing apparatus.

BACKGROUND

[0002] An example of a processing apparatus that processes a semiconductor wafer (hereinafter, referred to as a wafer), which is a substrate, may include a wafer inspecting apparatus that performs an inspection on the electrical characteristics of a semiconductor device formed on the wafer. Japanese Patent Laid-Open Publication No. 2020-021967 discloses the wafer inspecting apparatus, and discloses that a member that constitutes a cell of the wafer inspecting apparatus is pulled out from the cell and placed on a trolley for maintenance.

SUMMARY

[0003] According to a first aspect of the present invention, there is provided a trolley comprising: a trolley body including a wheel that is freely movable on a floor, and a first support configured to support a component of a substrate processing apparatus that slides in a lateral direction and is pulled out to an outside of the substrate processing apparatus; a second support connected to the trolley body so as to be freely movable between a first position where a width of the trolley in the lateral direction is a first length and a second position where the width in the lateral direction is a second length longer than the first length, and configured to support the component at the second position together with the first support; and a base configured to change a relative position in a front-rear direction with respect to the first support, the second support being provided on the base to be movable in a left-right direction, wherein at the first position, the second support is arranged in the left-right direction with respect to the first support, and wherein at the second position, the second support is arranged in the front-rear direction with respect to the first support.

[0003a] According to a second aspect of the present invention, there is provided a method for supporting a component of a substrate processing apparatus, the method comprising:

moving a trolley constituted by a trolley body including a wheel on a floor;

in a state where a second support connected to the trolley body is positioned at a first position and a width of the trolley in the lateral direction is a first length, supporting the component of the substrate processing apparatus pulled out to an outside of the substrate processing apparatus in a lateral direction by a first pull-out amount from the substrate processing apparatus, by a first support provided in the trolley body;

positioning the second support at a second position, and setting the width of the trolley in the lateral direction to a second length longer than the first length; and

in a state where the width of the trolley in the lateral direction is set to the second length, supporting the component of the substrate processing apparatus pulled out to the outside of the substrate processing apparatus in the lateral direction by a second pull-out amount larger than the first pull-out amount from the substrate processing apparatus, by the first support and the second support,

wherein at the first position, the second support is arranged in a left-right direction with respect to the first support, and

wherein at the second position, the second support is arranged in a front-rear direction with respect to the first support.

[0004] The foregoing summary is illustrative only and is not intended to be in any way

WHAT IS CLAIMED IS:

1. A trolley comprising:

a trolley body including a wheel that is freely movable on a floor, and a first support configured to support a component of a substrate processing apparatus that slides in a lateral direction and is pulled out to an outside of the substrate processing apparatus;

a second support connected to the trolley body so as to be freely movable between a first position where a width of the trolley in the lateral direction is a first length and a second position where the width in the lateral direction is a second length longer than the first length, and configured to support the component at the second position together with the first support; and

a base configured to change a relative position in a front-rear direction with respect to the first support, the second support being provided on the base to be movable in a left-right direction,

wherein at the first position, the second support is arranged in the left-right direction with respect to the first support, and

wherein at the second position, the second support is arranged in the front-rear direction with respect to the first support.

2. The trolley according to claim 1, wherein, when the lateral direction in which the component is pulled out is set to be a rear side, the first support and the second support in a set are provided apart from each other in the left-right direction in order to support a left side and a right side of the component, respectively.

3. The trolley according to claim 2, wherein a relative position in the front-rear direction between the first support and the second support in each set is changeable.

4. The trolley according to claim 3, further comprising:

a sliding body including a first slider and a second slider that are slidable with each other,

wherein the first slider and the second slider are provided in the first support and the second support, respectively.

5. The trolley according to claim 4, wherein the second support includes an intermediate support provided on a side of the first support in the front-rear direction, and an end side support provided on an opposite side of the first support with respect to the intermediate support,

a plurality of sliding bodies is provided,

the first slider and the second slider of the sliding body are provided in the first support and the intermediate support, respectively, and a relative position of the first support and the intermediate support is changeable in the front-rear direction, and

the first slider and the second slider of another sliding body are provided in the end side support and the intermediate support, respectively, and a relative position of the end side support and the intermediate support is changeable in the front-rear direction.

6. The trolley according to claim 2, wherein the second support in each set is freely rotatable around a rotation axis, and

at the second position, the second support extends to a side opposite to the first support with respect to the rotation axis.

7. The trolley according to claim 6, wherein the rotation axis is an axis extending along a vertical direction.

8. The trolley according to any one of claims 1 to 7, wherein the first support and the second support are provided in a plurality of tiers in the vertical direction.

9. The trolley according to claim 8, wherein a plurality of second supports in each tier is connected to each other via a connector such that a position is collectively changed between the first position and the second position.

10. The trolley according to claim 9, wherein the connector is provided with a wheel in order to roll and move on the floor.

11. The trolley according to any one of claims 1 to 10, further comprising:

a roller provided on each of the first support and the second support and configured to support a supported portion of the component from below and roll as the supported portion moves.

12. The trolley according to claim 11, wherein a plurality of rollers is provided at intervals in the front-rear direction, and

in each of a first state where the second support is positioned at the first position and a second state where the second support is positioned at the second position, a maximum distance between the plurality of rollers adjacent in the front-rear direction is equal to or less than a distance between a rear end of the supported portion and a center of gravity of the component in the front-rear direction.

13. A method for supporting a component of a substrate processing apparatus, the method comprising:

moving a trolley constituted by a trolley body including a wheel on a floor;

in a state where a second support connected to the trolley body is positioned at a first position and a width of the trolley in the lateral direction is a first length, supporting the component of the substrate processing apparatus pulled out to an outside of the substrate processing apparatus in a lateral direction by a first pull-out amount from the substrate processing apparatus, by a first support provided in the trolley body;

positioning the second support at a second position, and setting the width of the trolley in the lateral direction to a second length longer than the first length; and

in a state where the width of the trolley in the lateral direction is set to the second length, supporting the component of the substrate processing apparatus pulled out to the outside of the substrate processing apparatus in the lateral direction by a second pull-out amount larger than the first pull-out amount from the substrate processing apparatus, by the first support and the second support,

wherein at the first position, the second support is arranged in a left-right direction with respect to the first support, and

wherein at the second position, the second support is arranged in a front-rear direction with respect to the first support.