DESCRIPTION

TITLE OF THE INVENTION

SUBSTRATE PROCESSING APPARATUS

TECHNICAL FIELD

[0001] The present disclosure relates to a substrate processing apparatus.

BACKGROUND

[0002] Patent Document 1 discloses an apparatus for processing a substrate, including a substrate support; an electrostatic chuck disposed on the substrate support and including a first portion, a second portion, and a third portion; and a processing kit surrounding the electrostatic chuck, the processing kit including a support ring disposed on a surface of the third portion of the electrostatic chuck; an edge ring disposed on a surface of the second portion of the electrostatic chuck and movable independently of the support ring; and a cover ring disposed on the support ring and having a first surface that is in contact with the support ring.

Related Art Document

Patent Document

[0003] Patent Document 1: Japanese National Publication of International Patent Application No. 2019-505088

SUMMARY

Problem to be solved by the invention

[0004] The present disclosure provides a substrate processing apparatus for aligning an edge ring.

Means for Solving the Problem

[0005] According to one aspect of the present disclosure, a substrate processing apparatus includes an electrostatic chuck having a substrate support surface and a ring support surface, the ring support surface including a first through-hole through which a lift pin is to be inserted into the ring support surface; an edge ring supported by the ring support surface; and a cylindrical member inserted into the first through-hole of the electrostatic chuck, the cylindrical

member including a second through-hole. The cylindrical member includes a first shaft portion inserted into the first through-hole of the electrostatic chuck; and a first head portion arranged on the ring support surface of the electrostatic chuck when the first shaft portion is inserted into the first through-hole of the electrostatic chuck. The edge ring includes a first groove in which the first head portion is to be arranged, the first groove being provided on a lower surface of the edge ring, and the first head portion has a diameter larger than a diameter of the first shaft portion.

[0005A] According to another aspect of the present disclosure, a substrate processing apparatus includes an electrostatic chuck having a substrate support surface and a ring support surface, the ring support surface including a first through-hole through which a lift pin is to be inserted into the ring support surface; an edge ring supported by the ring support surface; and a cylindrical member inserted into the first through-hole of the electrostatic chuck, the cylindrical member including a second through-hole. The cylindrical member includes a first shaft portion inserted into the first through-hole of the electrostatic chuck; and a first head portion arranged on the ring support surface of the electrostatic chuck when the first shaft portion is inserted into the first through-hole of the electrostatic chuck. The edge ring includes a first groove in which the first head portion is to be arranged, the first groove being provided on a lower surface of the edge ring; and the edge ring includes an under ring supported by the ring support surface and an inner ring disposed on the under ring; and the under ring includes: a first counterbore as the first groove, and a third through-hole communicating with the first counterbore, penetrating from a lower surface to an upper surface of the under ring, and communicating with the second through-hole of the cylindrical member such that the lift pin is insertable.

Effect of the invention

[0006] According to the present disclosure, a substrate processing apparatus for aligning an edge ring can be provided.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1 is an example of a diagram for explaining a configuration example of a plasma processing system;

FIG. 2 is an example of a diagram for explaining a configuration example of an inductively coupled plasma processing apparatus;

FIG. 3 is an example of one enlarged cross-sectional view of a substrate support according to a first embodiment;

FIG. 4 is an example of another enlarged cross-sectional view of the substrate support according to the first embodiment;

FIG. 5 is a diagram of the substrate support viewed from above;

FIG. 6A is an example of a perspective view for explaining an alignment structure of an under ring;

FIG. 6B is an example of a perspective view illustrating the alignment structure of the under ring;

FIG. 6C is an example of a perspective view illustrating the alignment structure of the under ring;

FIG. 7A is an example of a schematic view illustrating the alignment structure of the under ring;

FIG. 7B is an example of a schematic view illustrating the alignment structure of the under ring;

FIG. 8A is an example of a perspective view illustrating an alignment structure of an inner ring;

FIG. 8B is an example of a perspective view illustrating the alignment structure of the inner ring;