SUMMARY

[0003] The purpose of the present disclosure provides a magnetic structure in a semiconductor apparatus and the semiconductor apparatus, which can not only improve a process result but also satisfy different process requirements.

[0004] To realize the above purpose, according to an aspect of the present disclosure, the present disclosure provides a magnetic structure in a semiconductor apparatus. The magnetic structure is arranged outside of a reaction chamber of the semiconductor apparatus. The magnetic structure includes an annular support member, a plurality of angle adjustment assemblies, and a plurality of a magnetic member.

The annular support member is arranged around the reaction chamber of the semiconductor apparatus.

The plurality of angle adjustment assemblies are connected to the annular support member and distributed along a circumferential direction of the annular support member.

The magnetic members are connected to the angle adjustment assemblies in a one-to-one correspondence. The angle adjustment assemblies are configured to fix the corresponding magnetic members at the annular support member and adjust a magnetic field line direction of the magnetic member and a magnitude of an included angle between a magnetic field line of the magnetic member and an axis of the reaction chamber.

[0005] In some embodiments, each of the angle adjustment assemblies includes a support body and a first fastener.

The support body is configured to support the magnetic member. The support body includes an outer peripheral surface, and on the outer peripheral surface. A plurality of first

CLAIMS

WHAT IS CLAIMED IS:

1. A magnetic structure in a semiconductor apparatus, the magnetic structure being arranged outside of a reaction chamber of the semiconductor apparatus, comprising an annular support member, a plurality of angle adjustment assemblies, and a plurality of magnetic members, wherein:

the annular support member is arranged around the reaction chamber of the semiconductor apparatus;

the plurality of angle adjustment assemblies are connected to the annular support member and distributed along a circumferential direction of the annular support member; and

the magnetic members are connected to the angle adjustment assemblies in a one-to-one correspondence, and the angle adjustment assemblies are configured to fix the corresponding magnetic members at the annular support member and adjust a magnetic field line direction of the magnetic member and a magnitude of an included angle between a magnetic field line of the magnetic member and an axis of the reaction chamber,

wherein each of the angle adjustment assemblies includes:

a support body, which includes a plurality of first mounting holes arranged at intervals along a circumferential direction of the support body, a second mounting hole being arranged at the annular support member; and

a first fastener, which is arranged in any one of the first mounting holes and the second mounting hole and configured to adjust the magnetic field line direction of the magnetic member and the magnitude of the included angle between the magnetic field line of the magnetic member and the axis of the reaction chamber.

2. The magnetic structure according to claim 1, wherein the support body is configured to support the magnetic member, the support body includes an outer peripheral surface, and the plurality of first mounting holes are arranged on the outer peripheral surface; and

the first fastener is arranged in any one of the first mounting holes and the second mounting hole and configured to fix the support body at the annular support, and by positioning the first fastener in different first mounting holes to adjust the magnetic field line direction of the magnetic member and the magnitude of the included angle between the magnetic field line of the magnetic member and the axis of the reaction chamber.

3. The magnetic structure according to claim 2, wherein the outer peripheral surface includes a plurality of sub-planes arranged in sequence along the circumferential direction of the outer peripheral surface, and each of the sub-planes is provided with the first mounting hole.

4. The magnetic structure according to claim 3, wherein the magnetic member is cylindrical, the support body has a regular polygonal prism structure, and the plurality of the sub-planes form a regular polygonal surface.

5. The magnetic structure according to any one of claims 2 to 4, wherein the annular support member includes an upper ring frame, a lower ring frame, and a connection member, wherein the upper ring frame and the lower ring frame are arranged opposite to each other in a vertical direction and are parallel to each other, the connection member is supported between the upper ring frame and the lower ring frame, and the connection member is detachably connected to the upper ring frame and/or the lower ring frame; and

corresponding to each of the angle adjustment assemblies, the second mounting hole is arranged on at least one of two surfaces of the upper ring frame and the lower ring frame that are opposite to each other, and the support body is fixed between the upper ring frame and the lower ring frame by the first fastener.

6. The magnetic structure according to claim 2, wherein accommodation space is arranged in the support body, and the magnetic member is located in the accommodation space, the accommodation space includes an inner peripheral surface, a plurality of mounting grooves are arranged at intervals on the inner peripheral surface along a circumferential direction of the inner peripheral surface, a mounting member is arranged at a magnetic pole of the magnetic member, the mounting member is cooperated with any one of the mounting grooves to fix the magnetic member in the accommodation space, by cooperating the mounting member with different mounting grooves, the magnetic field line direction of the magnetic member and the magnitude of the included angle between the magnetic field line of the magnetic member and the axis of the reaction chamber are adjusted.

7. The magnetic structure according to claim 6, wherein the plurality of the mounting grooves are arranged in pairs, and each pair of the mounting grooves are opposite to each other, the other magnetic pole of the magnetic member is also arranged with a mounting member, and the two mounting members are cooperated with any one pair of mounting grooves, respectively.

8. The magnetic structure according to claim 6 or 7, wherein the support body has a side surface neighboring to the inner peripheral surface, an opening communicated with the mounting groove is formed on the side surface, the opening is configured to move the mounting member into or out of the mounting groove, and a position limiting structure is arranged on the side surface and at the opening and configured to limit the magnetic member in the mounting groove.

9. The magnetic structure according to claim 8, wherein the position limiting structure includes a position limiting member and two second fasteners, wherein,

the position limiting member is stacked on the side surface and blocks the opening;

two third mounting holes are arranged on the side surface and on two sides of the opening, respectively, two fourth mounting holes are correspondingly arranged on the position limiting member, and the two fourth mounting holes and the two third mounting holes are arranged coaxially; and

the two second fasteners are in a one-to-one correspondence with the two third mounting holes, and each of the second fasteners is mounted in the third mounting hole and the fourth mounting hole that is coaxially arranged with the third mounting hole and configured to fixedly connect the position limiting member and the support body.

10. A semiconductor apparatus, comprising a reaction chamber and the magnetic structure according to any one of claims 1 to 9, wherein the magnetic structure is arranged around outside of the reaction chamber.