WHAT IS CLAIMED IS:

1. A substrate processing apparatus, comprising:

a first nozzle configured to supply a process gas to a process chamber that processes a substrate;

a second nozzle arranged to be spaced apart by a predetermined distance from the first nozzle in a circumferential direction of the substrate and configured to supply an inert gas to the process chamber; and

a reaction container defining the process chamber therein and including a first protrusion protruding outward to accommodate the first nozzle and a second protrusion protruding outward to accommodate the second nozzle,

wherein the inert gas supplied from the second nozzle is supplied toward the process chamber to form a vortex flow of the inert gas in a vicinity of the second protrusion, to thereby cause a flow direction of the process gas to be oriented toward the substrate.

2. The substrate processing apparatus of Claim 1, wherein the inert gas supplied from the second nozzle is supplied to be more oriented to a side of the first nozzle than a side of a center of the substrate.

3. The substrate processing apparatus of Claim 1, wherein the process gas supplied from the first nozzle and flowing between an end portion of the substrate and an inner wall of the reaction container flows toward a center of the substrate by the vortex flow of the inert gas.

4. The substrate processing apparatus of Claim 1, further comprising:

an exhauster configured to exhaust an atmosphere in the process chamber,

wherein the inert gas supplied from the second nozzle is caused to flow toward the exhauster between an end portion of the substrate and an inner wall of the reaction container by the vortex flow of the inert gas near the second protrusion.

5. A substrate processing apparatus , comprising:

a first nozzle configured to supply a process gas to a process chamber that processes a substrate; and

a second nozzle configured to supply an inert gas to the process chamber;

wherein the inert gas supplied from the second nozzle is supplied at an angle directed away from a center of the substrate and to be more oriented to a side of the first nozzle than a side of the center of the substrate, to cause a flow direction of the process gas to be oriented toward the center of the substrate, by forming a vortex flow of the inert gas is formed to overlap with a part of a peripheral edge portion of the substrate.

6. The substrate processing apparatus of Claim 5, wherein a concentration of the process gas is reduced at the part of the peripheral edge portion of the substrate at which the vortex flow of the inert gas is formed.

7. The substrate processing apparatus of Claim 1, wherein the reaction container further comprises a third protrusion protruding outward to accommodate an inert gas nozzle.

8. The substrate processing apparatus of Claim 7, further comprising:

an exhauster configured to exhaust an atmosphere in the process chamber,

wherein the second nozzle accommodated by the second protrusion and the inert gas nozzle accommodated by the third protrusion are arranged line-symmetrically to a straight line connecting the first nozzle and the exhauster.

9. The substrate processing apparatus of Claim 1, wherein the vortex flow of the inert gas and the process gas repel each other without being mixed, and the flow direction of the process gas is changed to a flow direction of the vortex flow of the inert gas.

10. The substrate processing apparatus of Claim 1, wherein the second nozzle is arranged at

a position of 15 degrees or more and 120 degrees or less from a straight line connecting a center of the first nozzle and a center of the substrate in the circumferential direction of the substrate.

11. The substrate processing apparatus of Claim 1, wherein a flow rate of the inert gas supplied from the second nozzle is 1/4 or more and 2/3 or less of a total flow rate of the process gas supplied from the first nozzle.

12. A method of manufacturing a semiconductor device, comprising:

loading a substrate into a reaction container that defines a process chamber that processes the substrate therein and includes a first protrusion protruding outward to accommodate a first nozzle and a second protrusion protruding outward to accommodate a second nozzle; and

processing the substrate by supplying a process gas from the first nozzle to the process chamber,

wherein in the act of processing the substrate, an inert gas is supplied from a second nozzle to the process chamber to form a vortex flow of the inert gas in a vicinity of the second protrusion, to thereby cause a flow direction of the process gas to be oriented toward the substrate.

13. A non-transitory computer-readable recording medium storing a program that causes, by a computer, a substrate processing apparatus to perform a process comprising:

loading a substrate into a process chamber of the substrate processing apparatus;

processing the substrate by supplying a process gas from a first nozzle to the process chamber,

wherein in the act of processing the substrate, an inert gas is supplied from a second nozzle to the process chamber to form a vortex flow of the inert gas in a vicinity of the second protrusion, to thereby cause a flow direction of the process gas to be oriented toward the substrate.

14. A method of manufacturing a semiconductor device, comprising:

loading a substrate into a process chamber that processes the substrate; and

processing the substrate by supplying a process gas from a first nozzle to the process chamber,

wherein in the act of processing the substrate, an inert gas supplied from a second nozzle is supplied at an angle directed away from a center of the substrate and to be more oriented to a side of the first nozzle than a side of the center of the substrate, to cause a flow direction of the process gas to be oriented toward the center of the substrate, by forming a vortex flow of the inert gas to overlap with at least a part of a peripheral edge portion of the substrate.

15. A non-transitory computer-readable recording medium storing a program that causes, by a computer, a substrate processing apparatus to perform a process comprising:

loading a substrate into a process chamber that processes the substrate; and

processing the substrate by supplying a process gas from a first nozzle to the process chamber,

wherein in the act of processing the substrate, an inert gas supplied from a second nozzle is supplied at an angle directed away from a center of the substrate and to be more oriented to a side of the first nozzle than a side of the center of the substrate, to cause a flow direction of the process gas to be oriented toward the center of the substrate, by forming a vortex flow of the inert gas to overlap with at least a part of a peripheral edge portion of the substrate.

16. A gas supply assembly, comprising:

a first nozzle configured to supply a process gas to a process chamber that processes a substrate; and

a second nozzle configured to supply an inert gas to the process chamber,

wherein the second nozzle including a gas supply hole that is opened to be more oriented to a side of the first nozzle than a side of a center of the substrate, to cause a flow direction of the process gas to be oriented toward the substrate, by forming a vortex flow of the inert gas to

overlap with at least a part of a peripheral edge portion of the substrate.

17. The gas supply assembly of Claim 16, wherein the gas supply hole is opened so as to be more oriented to the side of the first nozzle than a side of a point where a line connecting a center of the second nozzle and the center of the substrate intersects with a line connecting a center of the first nozzle and the center of the substrate.

18. The gas supply assembly of Claim 16, wherein the gas supply hole is opened so as to be more oriented to the side of the first nozzle than a side of a point where a line connecting a center of the second nozzle and a center of the gas supply hole intersects with a line connecting a center of the first nozzle and the center of the substrate.