

## WHAT IS CLAIMED IS:

1. A substrate processing apparatus, comprising:
  - a process chamber in which a substrate mounted on a boat is processed;
  - a substrate transfer chamber configured to transfer the substrate to the boat;
  - a pod transfer chamber adjacent to the substrate transfer chamber;
  - a transfer chamber system exhaust part installed at the pod transfer chamber;
  - a plurality of reinforcement structures installed along a wall of a housing constituting the substrate transfer chamber and forming a plurality of first confinement spaces between the reinforcement structures and the wall;
  - a communication hole installed at each of the plurality of reinforcement structures so that a space in the housing and each of the first confinement spaces communicate with each other;
  - a collecting pipe ~~connected to~~ having the plurality of reinforcement structures ~~connected~~ in the housing, ~~and~~ including a second confinement space communicating with the plurality of first confinement spaces, and extending to the pod transfer chamber;
  - an inert gas supply part configured to supply an inert gas into the housing constituting the substrate transfer chamber; and
  - a pressure regulator connected to the collecting pipe at the pod transfer chamber, and configured to perform a regulation so that a relationship of (pressure of the substrate transfer chamber)>(pressure of each of the first confinement spaces)>(pressure of the second confinement space)>(pressure of the pod transfer chamber) is satisfied.
2. The apparatus according to Claim 1, wherein each of the plurality of reinforcement structures includes a flange, and each of the plurality of reinforcement structures is fixed to the wall by welding the flange to the wall.

3. The apparatus according to Claim 2, wherein the communication hole is installed at an upstream side of each of the plurality of reinforcement structures with respect to a flow of the inert gas.

4. The apparatus according to Claim 3, wherein a substrate transfer chamber system exhaust part is installed at the substrate transfer chamber, and  
wherein the substrate transfer chamber system exhaust part is configured to stop an operation while the inert gas supply part supplies the inert gas to the housing in a state in which there is no substrate at the substrate transfer chamber.

5. The apparatus according to Claim 3, wherein a substrate transfer chamber system exhaust part is installed at the substrate transfer chamber,  
wherein the substrate transfer chamber system exhaust part is configured to perform an operation to exhaust an atmosphere from the substrate transfer chamber ~~while the inert gas—supply part supplies the inert gas to the housing~~ in a state in which there is no substrate at the substrate transfer chamber, and  
wherein after lapse of a predetermined time, the substrate transfer chamber system exhaust part is configured to stop the operation while the inert gas supply part supplies the inert gas.

6. The apparatus according to Claim 3, wherein the pressure regulator is configured to include a pressure regulation structure communicating with the pod transfer chamber, and  
wherein the pressure regulation structure is configured to include:  
a box-shaped structure constituting an internal space;  
a hole installed at the box-shaped structure; and

a lid configured to adjust a degree of opening of the hole.

7. The apparatus according to Claim 3, wherein the pressure regulator is configured to include a pressure regulation mechanism communicating with the pod transfer chamber, and wherein the pressure regulation mechanism is configured to include:

an upper buffer space;

a lower buffer space;

a hole communicating the upper buffer space with the lower buffer space; and

a pressure regulation device including a shaft, a valve body, and a weight.

8. The apparatus according to Claim 2, wherein a substrate transfer chamber system exhaust part is installed at the substrate transfer chamber, and

wherein the substrate transfer chamber system exhaust part is configured to stop an operation while the inert gas supply part supplies the inert gas to the housing in a state in which there is no substrate at the substrate transfer chamber.

9. The apparatus according to Claim 2, wherein a substrate transfer chamber system exhaust part is installed at the substrate transfer chamber,

wherein the substrate transfer chamber system exhaust part is configured to perform an operation to exhaust an atmosphere from the substrate transfer chamber ~~while the inert gas supply part supplies the inert gas to the housing~~ in a state in which there is no substrate at the substrate transfer chamber, and

wherein after lapse of a predetermined time, the substrate transfer chamber system exhaust part is configured to stop the operation while the inert gas supply part supplies the inert gas.

10. The apparatus according to Claim 2, wherein the pressure regulator is configured to include a pressure regulation structure communicating with the pod transfer chamber, and wherein the pressure regulation structure is configured to include:

- a box-shaped structure constituting an internal space;
- a hole installed at the box-shaped structure; and
- a lid configured to adjust a degree of opening of the hole.

11. The apparatus according to Claim 2, wherein the pressure regulator is configured to include a pressure regulation mechanism communicating with the pod transfer chamber, and wherein the pressure regulation mechanism is configured to include:

- an upper buffer space;
- a lower buffer space;
- a hole communicating the upper buffer space with the lower buffer space; and
- a pressure regulation device including a shaft, a valve body, and a weight.

12. The apparatus according to Claim 1, wherein the communication hole is installed at an upstream side of each of the plurality of reinforcement structures with respect to a flow of the inert gas.

13. The apparatus according to Claim 12, wherein a substrate transfer chamber system exhaust part is installed at the substrate transfer chamber, and wherein the substrate transfer chamber system exhaust part is configured to stop an operation while the inert gas supply part supplies the inert gas to the housing in a state in which there is no substrate at the substrate transfer chamber.

14. The apparatus according to Claim 12, wherein a substrate transfer chamber system

exhaust part is installed at the substrate transfer chamber, and

wherein the substrate transfer chamber system exhaust part is configured to perform an operation to exhaust an atmosphere from the substrate transfer chamber ~~while the inert gas supply part supplies the inert gas to the housing~~ in a state in which there is no substrate at the substrate transfer chamber, and

wherein after lapse of a predetermined time, the substrate transfer chamber system exhaust part is configured to stop the operation while the inert gas supply part supplies the inert gas.

15. The apparatus according to Claim 12, wherein the pressure regulator is configured to include a pressure regulation structure communicating with the pod transfer chamber, and

wherein the pressure regulation structure is configured to include:

a box-shaped structure constituting an internal space;

a hole installed at the box-shaped structure; and

a lid configured to adjust a degree of opening of the hole.

16. The apparatus according to Claim 12, wherein the pressure regulator is configured to include a pressure regulation mechanism communicating with the pod transfer chamber, and

wherein the pressure regulation mechanism is configured to include:

an upper buffer space;

a lower buffer space;

a hole communicating the upper buffer space with the lower buffer space; and

a pressure regulation device including a shaft, a valve body, and a weight.

17. The apparatus according to Claim 1, wherein a substrate transfer chamber system exhaust part is installed at the substrate transfer chamber, and

wherein the substrate transfer chamber system exhaust part is configured to stop an operation while the inert gas supply part supplies the inert gas to the housing in a state in which there is no substrate at the substrate transfer chamber.

18. The apparatus according to Claim 1, wherein a substrate transfer chamber system exhaust part is installed at the substrate transfer chamber,

wherein the substrate transfer chamber system exhaust part is configured to perform an operation to exhaust an atmosphere from the substrate transfer chamber ~~while the inert gas supply part supplies the inert gas to the housing~~ in a state in which there is no substrate at the substrate transfer chamber, and

wherein after lapse of a predetermined time, the substrate transfer chamber system exhaust part is configured to stop the operation while the inert gas supply part supplies the inert gas.

19. The apparatus according to Claim 1, wherein the pressure regulator is configured to include a pressure regulation structure communicating with the pod transfer chamber, and

wherein the pressure regulation structure is configured to include:

- a box-shaped structure constituting an internal space;
- a hole installed at the box-shaped structure; and
- a lid configured to adjust a degree of opening of the hole.

20. The apparatus according to Claim 1, wherein the pressure regulator is configured to include a pressure regulation mechanism communicating with the pod transfer chamber, and

wherein the pressure regulation mechanism is configured to include:

- an upper buffer space;
- a lower buffer space;

a hole communicating the upper buffer space with the lower buffer space; and  
a pressure regulation device including a shaft, a valve body, and a weight.

21. A method of manufacturing a semiconductor device in a substrate processing apparatus including:

a process chamber in which a substrate mounted on a boat is processed;

a substrate transfer chamber configured to transfer the substrate to the boat;

a pod transfer chamber adjacent to the substrate transfer chamber;

an exhaust part installed at the pod transfer chamber;

a plurality of reinforcement structures installed along a wall of a housing constituting the substrate transfer chamber and forming a plurality of first confinement spaces between the reinforcement structures and the wall;

a communication hole installed at each of the plurality of reinforcement structures so that a space in the housing and each of the first confinement spaces communicate with each other;

a collecting pipe ~~connected to~~ having the plurality of reinforcement structures ~~connected~~ in the housing, ~~and~~ including a second confinement space communicating with the plurality of first confinement spaces, and extending to the pod transfer chamber;

an inert gas supply part configured to supply an inert gas into the housing constituting the substrate transfer chamber; and

a pressure regulator connected to the collecting pipe at the pod transfer chamber, and  
the method comprising:

performing a regulation so that a relationship of (pressure of the substrate transfer chamber)>(pressure of each of the first confinement spaces)>(pressure of the second confinement space)>(pressure of the pod transfer chamber) is satisfied by supplying the inert gas to the substrate transfer chamber from the inert gas supply part in a state in which there is no

substrate at the substrate transfer chamber;

transferring the substrate to the boat arranged at the substrate transfer chamber from the pod transfer chamber after the regulation; and

transferring the boat to the process chamber and processing the substrate, after transferring the substrate.

22. A computer-readable recording medium storing a program that causes, by a computer, a substrate processing apparatus to perform a process, the substrate processing apparatus including:

a process chamber in which a substrate mounted on a boat is processed;

a substrate transfer chamber configured to transfer the substrate to the boat;

a pod transfer chamber adjacent to the substrate transfer chamber;

an exhaust part installed at the pod transfer chamber;

a plurality of reinforcement structures installed along a wall of a housing constituting the substrate transfer chamber and forming a plurality of first confinement spaces between the reinforcement structures and the wall;

a communication hole installed at each of the plurality of reinforcement structures so that a space in the housing and each of the first confinement spaces communicate with each other;

a collecting pipe ~~connected to~~ having the plurality of reinforcement structures ~~connected~~ in the housing, ~~and~~ including a second confinement space communicating with the plurality of first confinement spaces, and extending to the pod transfer chamber;

an inert gas supply part configured to supply an inert gas into the housing constituting the substrate transfer chamber; and

a pressure regulator connected to the collecting pipe at the pod transfer chamber, and

the process comprising:

performing a regulation so that a relationship of (pressure of the substrate transfer chamber)>(pressure of each of the first confinement spaces)>(pressure of the second confinement space)>(pressure of the pod transfer chamber) is satisfied by supplying the inert gas to the substrate transfer chamber from the inert gas supply part in a state in which there is no substrate at the substrate transfer chamber;

transferring the substrate to the boat arranged at the substrate transfer chamber from the pod transfer chamber after the regulation; and

transferring the boat to the process chamber and processing the substrate, after transferring the substrate.