

be capable of individually controlling the amount of the processing gas to be supplied to the respective wafers W. In addition, the shower heads 40 may be a post-mix type shower head configured to be capable of individually supplying plural types of processing gases without mixing the processing gases with each other.

[0023] As illustrated in FIGS. 1 and 2, the partition wall 13 includes two cylindrical portions 50 and 50 that individually surround the two stages 11 and 11, and an upper flange portion 51 provided at upper ends of the cylindrical portions 50 and 50, and lower flange portions 52 and 52 provided at lower ends of the cylindrical portions 50 and 50. An inner diameter of each cylindrical portion 50 is set to be larger than an outer diameter of the stage 11. A gap is formed between the cylindrical portion 50 and the stage 11.

[0024] In addition, the partition wall 13 is provided with a heater (not illustrated), and is heated to, for example, 100 degrees C to 150 degrees C. Due to this heating, foreign matter contained in the processing gas is prevented from adhering to the partition wall 13.

[0025] As illustrated in FIG. 1, seal members 53 such as, for example, O-rings, are provided on an upper surface of the upper flange portion 51 in a correspondence relationship with the respective stages 11. The seal members 53 hermetically block gaps between the upper flange portion 51 and the frame body 41 when the upper flange portion 51 and the frame body 41 are brought into contact with each other with the upward movement of the partition wall 13 by the lifting mechanism 14. In addition, seal members 54 such as, for example, O-rings, are also provided on protruded portions 71 (to be described later) of the inner walls 15 in a correspondence relationship with the respective stages 11. The seal members 54 hermetically block gaps between the protruded portions 71 and the lower flange portions 52 when the protruded portions 71 and the lower flange portions 52 are brought into contact with each other. Then, the partition wall 13 is moved upward such that the frame body 41 and the seal members 53 are brought into contact with each other and the lower flange portions 52 and the seal members 54 are brought into contact with each other. Thus, processing spaces S surrounded by the stages 11, the partition wall 13, and the shower heads 40 are formed.

[0026] As illustrated in FIG. 3, a height of the partition wall 13 is set such that the upper surface

of the processing gas are different from each other between a portion in which the slit 72 is formed and a portion in which the slit 72 is not formed. That is, the flow velocity of the processing gas is increased in the portion in which the slit 72 is formed rather than in the portion in which the slit 72 is not formed.

[0050] FIG. 9 shows a simulation result of pressure distribution when the processing gas is supplied when each of the number of the slits 72 and the number of the grooves 74 is six.

Referring to FIG. 9, in the outer periphery of the inner wall 15, the pressures of the processing gas are different from each other between a portion in which the slit 72 is formed and a portion in which the slit 72 is not formed. Thus, the flow velocities of the processing gas are different from each other in the portions.

[0051] FIG. 10 shows a simulation result of pressure distribution when the processing gas is supplied in the case in which each of the number of the slits 72 and the number of the grooves 74 is fourteen. Referring to FIG. 10, in the outer periphery of the inner wall 15, the pressures of the processing gas are substantially the same between a portion in which the slit 72 is formed and a portion in which the slit 72 is not formed. Thus, the flow velocities of the processing gas becomes uniform in the portions.

[0052] As a result of the earnest research conducted by the present inventors, it was found that, when each of the number of slits 72 and the number of grooves 74 is seven or more, the pressure distribution of the processing gas in the outer periphery of the inner wall 15 is made uniform as shown in FIG. 10 and thus the flow velocities of the processing gas are made uniform. In such a case, the processing gas is discharged in a more uniform manner. Thus, the processing gas remaining on the wafer W in the processing space S is also made uniform in the plane of the wafer W, and thus it is possible to further improve the in-plane uniformity of wafer processing. Accordingly, each of the number of slits 72 and the number of grooves 74 in the inner wall 15 is preferably seven or more.

[0053] As a result of the earnest research conducted by the present inventors, it was found that, regardless of whether each of the number of the slits 72 and the number of the grooves 74 is three or six, the pressure distribution of the processing gas in the outer periphery of the inner

wall 15 illustrated in FIGS. 8 and 9 becomes non-uniform when the grooves 74 are not formed in the inner wall 15. In other words, even though the pressure distribution of the processing gas becomes somewhat non-uniform regardless of whether each of the number of slits 72 and the number of grooves 74 is three or six, it can be said that when the grooves 74 are formed in the inner wall 15 as in the present embodiment, there is sufficient effect in making the pressure distribution of the processing gas uniform.

[0054] Next, the arrangement relationship between the inner walls 15 and the exhaust pipe 81 will be described. As illustrated in FIG. 11, the exhaust pipe 81 is disposed outside two inner walls 15 and 15 in the bottom plate 22 of the processing container 10. In the case in which the exhaust pipe 81 is disposed outside the inner walls 15 in this way, when the grooves 74 are not formed in the inner walls 15 as in the related art, the processing gas is strongly pulled at the side close to the exhaust pipe 81 so that the flow velocity of the processing gas is increased, and the processing gas is weakly pulled at the side far from the exhaust pipe 81 so that the flow velocity of the processing gas is reduced. As a result, the pressure distribution of the processing gas on the outer peripheries of the inner walls 15 becomes non-uniform. In contrast, in the present embodiment, even in the case in which the exhaust pipe 81 is disposed outside the inner walls 15, the flow of the processing gas is rectified by the grooves 74 in the inner walls 15, and thus it is possible to make the pressure distribution of the processing gas uniform.

[0055] In addition, the slits 72 are arranged to be offset from straight lines L (dotted lines in FIG. 11) connecting the centers of the inner walls 15 and the center of the exhaust pipe 81 in a plan view. In such a case, the paths until the processing gas discharged from the slits 72 flows into the exhaust pipe 81 becomes longer. In a case where the slits 72 are arranged on the straight lines L, the processing gas discharged from the slits 72 is drawn more strongly, so that the flow velocity of the processing gas is increased. In contrast, in the present embodiment, it is possible to reduce the flow velocity of the processing gas discharged from the slits 72, and to cause the processing gas to sufficiently remain on the front surfaces of the wafers W in the processing spaces S. Therefore, it is possible to appropriately perform the COR process using the processing gas.