What is claimed is:

1. A coating treatment apparatus supplying a coating solution to a front surface of a rotated substrate and diffusing the supplied coating solution to an outer periphery side of the substrate to thereby apply the coating solution on the front surface of the substrate, said apparatus comprising:

a substrate holding part holding a substrate;

a rotation part rotating the substrate held on said substrate holding part;

a supply part supplying a coating solution to a front surface of the substrate held on said substrate holding part; ~~and~~

an airflow control plate provided at a predetermined position above the substrate held on said substrate holding part for locally changing an airflow above the substrate rotated by said rotation part at an arbitrary position;

a drive part moving said airflow control plate between the predetermined position and a waiting position distant in a lateral direction from the substrate held on said substrate holding part; and

a control unit controlling an operation of said rotation part and an operation of said supply part,

said control unit conducting control to move said airflow control plate from the waiting position to the predetermined position with the substrate being rotated by said rotation part while the coating solution is being supplied by said supply part to the substrate or after the coating solution is supplied by said supply part to the substrate to locally change the airflow above the rotated substrate by said airflow control plate provided at the predetermined position.

2. The coating treatment apparatus as set forth in claim 1,

wherein said airflow control plate is provided to be substantially parallel to the substrate, at the predetermined position above the substrate and distant from a rotation axis of the substrate.

~~3. The coating treatment apparatus as set forth in claim 1 or claim 2, further comprising:~~

~~a drive part moving said airflow control plate between the predetermined position and a waiting position distant in a lateral direction from the substrate held on said substrate holding part.~~

~~4. The coating treatment apparatus as set forth in any one of claim 1 to claim 3, further comprising:~~

~~a control unit controlling an operation of said rotation part and an operation of said supply part,~~

~~said control unit conducting control to locally change the airflow above the rotated substrate by said airflow control plate provided at the predetermined position with the substrate being rotated by said rotation part while the coating solution is being supplied by said supply part to the substrate or after the coating solution is supplied by said supply part to the substrate.~~

~~5. The coating treatment apparatus as set forth in claim 3, further comprising:~~

~~a control unit controlling an operation of said rotation part and an operation of said supply part,~~

~~wherein said airflow control plate is provided to be movable to the predetermined position for locally changing the airflow above the substrate rotated by said rotation part when said airflow control plate is placed at the predetermined position,~~

~~wherein said control unit is configured to conduct control to~~

~~supply the coating solution by said supply part to the front surface of the substrate with the substrate being rotated at a first rotation speed by said rotation part, then~~

~~stop the supply of the coating solution at a point in time when the substrate is decelerated to a second rotation speed lower than the first rotation speed by said rotation part or with the substrate being rotated at the second rotation speed by said rotation part, and~~

~~rotate the substrate at a third rotation speed higher than the second rotation speed by said rotation part, and~~

~~wherein said control unit is configured to conduct control to locally change the airflow above the rotated substrate by moving said airflow control plate to the predetermined position by said drive part, after stopping the supply of the coating solution to the front surface of the substrate.~~

~~6. The coating treatment apparatus as set forth in claim 5,~~

~~wherein said control unit is configured to conduct control to rotate, after starting the rotation at the third rotation speed, the substrate at a fourth rotation speed lower than the third rotation speed, and locally change the airflow above the rotated substrate by placing said airflow control plate at the predetermined position by said drive part while rotating the substrate at the fourth rotation speed.~~

3~~7~~. The coating treatment apparatus as set forth in ~~any one of~~ claim 14 or~~to~~ claim 2~~6~~,

wherein a rotation speed of the substrate when said airflow control plate is placed at the predetermined position is 50 to 100 rpm.

4~~8~~. The coating treatment apparatus as set forth in any one of claim 1 to claim 3~~7~~, wherein said airflow control plate is formed in a rectangular flat plate shape.

5~~9~~. The coating treatment apparatus as set forth in any one of claim 1 to claim 4~~8~~, further comprising:

an additional airflow control plate provided to be separated from said airflow control plate above the substrate held on said substrate holding part for locally changing an airflow above the substrate rotated by said rotation part at an arbitrary position.

6~~10~~. A coating and developing treatment system comprising:

a coating apparatus forming a coating film including a resist film on a substrate that is the coating treatment apparatus as set forth in any one of claim 1 to claim 5~~9~~; and

a developing apparatus developing the coating film formed by said coating treatment apparatus after the coating film is exposed to light.

~~11. A coating treatment method of supplying a coating solution to a front surface of a rotated substrate and diffusing the supplied coating solution to an outer periphery side of the substrate to thereby apply the coating solution on the front surface of the substrate, said method comprising:~~

~~locally changing an airflow above the rotated substrate by an airflow control plate provided at a predetermined position above the substrate with the substrate being rotated while supplying the coating solution to the substrate or after supplying the coating solution to the substrate.~~

7~~12~~. A coating treatment method of supplying a coating solution to a front surface of a rotated substrate and diffusing the supplied coating solution to an outer periphery side of the substrate to thereby apply the coating solution on the front surface of the substrate, said method comprising:

a first step of supplying the coating solution to the front surface of the substrate with the substrate being rotated at a first rotation speed;

a second step of stopping, after said first step, the supply of the coating solution at a point in time when the substrate is decelerated to a second rotation speed lower than the first rotation speed or with the substrate being rotated at the second rotation speed; and

a third step of rotating, after said second step, the substrate at a third rotation speed higher than the second rotation speed,

wherein an airflow above the rotated substrate is locally changed by moving an airflow control plate provided to be movable between~~to~~ a predetermined position above the substrate and a waiting position distant in a lateral direction from the substrate, from the waiting position to the predetermined position by a drive part with the substrate being rotated, after stop of the supply of the coating solution to the front surface of the substrate.

813. The coating treatment method as set forth in claim 712,

wherein said third step comprises:

a fourth step of rotating the substrate at the third rotation speed; and

a fifth step of rotating, after said fourth step, the substrate at a fourth rotation speed lower than the third rotation speed,

wherein in said fifth step, the airflow above the rotated substrate is locally changed by placing the airflow control plate at the predetermined position by the drive part while the substrate is being rotated at the fourth rotation speed.

~~14. The coating treatment method as set forth in any one of claim 11 to claim 13, wherein a rotation speed of the substrate when the airflow control plate is placed at the predetermined position is 50 to 100 rpm.~~

915. A computer-readable recording medium having a program recorded thereon for causing a computer to execute the coating treatment method as set forth in ~~any one of~~ claim 711 to claim 814.