CLAIMS

1. A liquid material application apparatus comprising:

a discharge head discharging a liquid material;

a robot moving the discharge head relative to a workpiece;

a movement control unit controlling relative movement of the discharge head and the workpiece in accordance with an application program; and

a discharge control unit controlling an operation of discharging the liquid material from the discharge head,

the movement control unit and the discharge control unit cooperatively performing work of applying the liquid material onto the workpiece in a predetermined application pattern,

wherein the discharge control unit executes, in a switchable manner in accordance with the application program, first mode discharge control of changing a discharge amount of the liquid material, which is discharged from the discharge head per unit time, depending on a relative moving speed between the discharge head and the workpiece, and second mode discharge control of operating the discharge head to discharge the liquid material in a predetermined discharge amount per unit time regardless of the relative moving speed, and can perform a line drawing application in the first mode discharge control and the second mode discharge control.

2. The liquid material application apparatus according to Claim 1, wherein, in the first mode discharge control, a line drawing application of drawing an application line in a constant application amount per unit length is performed in accordance with the application program.

3. The liquid material application apparatus according to Claim 2, wherein the application pattern includes an application pattern including a linear portion and a corner portion, and wherein, in the first mode discharge control, a line drawing application of drawing an application line in a constant line width is performed in the corner portion where the relative moving speed is changed in accordance with the application program.

4. The liquid material application apparatus according to Claim 2, wherein, in the second mode discharge control, at least one among a dumping application, a trial application, and a spot application can also be performed in accordance with the application program.

5. The liquid material application apparatus according to any one of Claims 1 to 4, wherein the discharge control unit switches over the first mode discharge control and the second mode discharge control upon receiving a signal output from the movement control unit in accordance with the application program.

6. The liquid material application apparatus according to any one of Claims 1 to 4, wherein the discharge control unit is able to set plural types of the first mode discharge control in which relations between the relative moving speed and the discharge amount per unit time are different from one another, and plural types of the second mode discharge control in which the predetermined discharge amounts per unit time are different from one another, and to selectively execute one

among the plural types of the first mode discharge control and the plural types of the second mode discharge control.

7. The liquid material application apparatus according to any one of Claims 1 to 4, wherein the discharge control unit has a function of automatically calculating, on the basis of a first relative moving speed, a first discharge amount per unit time corresponding to the first relative moving speed, a second relative moving speed, and a second discharge amount per unit time corresponding to the second relative moving speed, a third discharge amount per unit time corresponding to a third relative moving speed, and

in the first mode discharge control, the discharge control unit controls the discharge head in a manner of, while moving the discharge head at one of the first to third relative moving speeds, discharging the liquid material in the discharge amount per unit time corresponding to the one relative moving speed from the discharge head.

8. A liquid material application method using a liquid material application apparatus comprising:

a discharge head discharging a liquid material;

a robot moving the discharge head relative to a workpiece;

a movement control unit controlling relative movement of the discharge head and the workpiece in accordance with an application program; and

a discharge control unit controlling an operation of discharging the liquid material from the discharge head,

the movement control unit and the discharge control unit

cooperatively performing work of applying the liquid material onto the workpiece in a predetermined application pattern,

wherein the discharge control unit includes first mode discharge control of changing a discharge amount of the liquid material, which is discharged from the discharge head per unit time, depending on a relative moving speed between the discharge head and the workpiece, and second mode discharge control of operating the discharge head to discharge the liquid material in a predetermined discharge amount per unit time regardless of the relative moving speed, and can perform a line drawing application in the first mode discharge control and the second mode discharge control, and

wherein the first mode discharge control and the second mode discharge control are executed in a switchable manner in accordance with the application program.

9. The liquid material application method according to Claim 8, wherein, in the first mode discharge control, a line drawing application of drawing an application line in a constant application amount per unit length is performed in accordance with the application program.

10. The liquid material application method according to Claim 9, wherein the application pattern includes an application pattern including a linear portion and a corner portion, and wherein, in the first mode discharge control, a line drawing application of drawing an application line in a constant line width is performed in the corner portion where the relative moving speed is changed in accordance with the application program.

11. The liquid material application method according to Claim 9, wherein, in the second mode discharge control, at least one among a dumping application, a trial application, and a spot application is also performed in accordance with the application program.

12. The liquid material application method according to any one of Claims 8 to 11, wherein the discharge control unit switches over the first mode discharge control and the second mode discharge control upon receiving a signal output from the movement control unit in accordance with the application program.

13. The liquid material application method according to any one of Claims 8 to 11, wherein the discharge control unit sets plural types of the first mode discharge control in which relations between the relative moving speed and the discharge amount per unit time are different from one another, and plural types of the second mode discharge control in which the predetermined discharge amounts per unit time are different from one another, and selectively executes one among the plural types of the first mode discharge control and the plural types of the second mode discharge control.

14. The liquid material application method according to any one of Claims 8 to 11, wherein the discharge control unit has a function of automatically calculating, on the basis of a first relative moving speed, a first discharge amount per unit time corresponding to the first relative moving speed, a second relative moving speed, and a second discharge

amount per unit time corresponding to the second relative moving speed, a third discharge amount per unit time corresponding to a third relative moving speed, and

in the first mode discharge control, the discharge control unit controls the discharge head in a manner of, while moving the discharge head at one of the first to third relative moving speeds, discharging the liquid material in the discharge amount per unit time corresponding to the one relative moving speed from the discharge head.

15. The liquid material application method according to any one of Claims 8 to 11, wherein the first mode discharge control is executed when performing a line drawing application in which the relative moving speed is changed depending on the application pattern, and

the second mode discharge control is executed when performing a line drawing application at a constant relative moving speed.

16. The liquid material application method according to any one of Claims 8 to 11, wherein the workpiece is prepared as one or more semiconductor chips, one or more substrates each including one semiconductor chip mounted thereto, or one or more substrates each including a plurality of semiconductor chips mounted thereto.