application publication No. S58-35961

Patent Literature 2: Japanese laid-open patent publication No. S58-039772

SUMMARY OF INVENTION

TECHNICAL PROBLEM

[0004]

The properties of a film formed by thermal spray are greatly affected by the conditions at the time of film formation. One of the conditions is the temperature of a base material on which the film is formed. In a thermal spray process, the film-forming material in a molten state or a semi-molten state is sprayed, so that the base material becomes hot. When the thermal spray is completed, the temperature of the base material decreases. When the temperature of the base material decreases, thermal stress is generated in the base material, causing problems such as the film peeling off from a surface of the base material, and cracks occurring in the film.

[0005]

An aspect of the invention is defined in the independent claim. Some optional features of the invention are defined in the dependent claims.

SOLUTION TO PROBLEM

[0006]

In one disclosed arrangement, a rotary device comprises a rotary stage detachably supporting a base material having an inlet, an outlet, and a flow path connecting the inlet and the

outlet of a liquid at a predetermined temperature, the rotary stage having a liquid supply port supplying the liquid to the base material and a liquid discharge port discharging the liquid from the base material, a rotary support supporting the rotary table, the rotary support having a first pipe connected to the liquid supply port and a second pipe connected to the liquid discharge port inside, a rotary mechanism rotating the rotary support and a liquid supply part supplying the liquid to the base material.

[0007]

In one disclosed arrangement, a thermal spraying apparatus comprises the rotary device described above and a thermal spray gun.

ADVANTAGEOUS EFFECTS OF INVENTION

[0008]

According to an embodiment of the present disclosure, it is possible to provide a rotary device and a thermal spraying apparatus capable of reducing thermal stress of a base material and preventing peeling of the film from the base material and cracking of the film.

BRIEF DESCRIPTION OF DRAWINGS

[0009]

FIG. 1 is a diagram for explaining a configuration of a thermal spraying apparatus according to an embodiment of the

CLAIMS

1. A rotary device which, when assembled, comprises:

a rotary stage mounted with a base material and detachably supporting the base material, the base material having an inlet and an outlet for a liquid at a predetermined temperature provided on a bottom surface thereof, and a flow path connecting the inlet and the outlet provided inside;

a rotary support for supporting the rotary stage connected to the rotary stage at one end, the rotary support supporting the rotary stage from an opposite side surface to a surface the rotary stage on which the base material is mounted;

a rotary mechanism for rotating the rotary stage around the rotary support; and

a liquid supply part for supplying the liquid to the base material,

wherein the rotary stage has a liquid supply port for supplying the liquid to the base material and a liquid discharge port for discharging the liquid from the base material,

wherein, when the base material is mounted on the rotary stage, the liquid supply port and the inlet are connected, and the liquid discharge port and the outlet are connected,

wherein the rotary support has a first pipe connected to the liquid supply port and a second pipe connected to the liquid discharge port inside, and

wherein, when the base material is mounted on the rotary stage, the rotary stage and the base material rotate with the rotary support.

2. The rotary device according to claim 1, wherein the rotary stage has a plate shape.

3. The rotary device according to claim 1 or 2, wherein the liquid supply part comprises:

a hot-water tank for supplying hot-water at a relatively high temperature;

a cold-water tank for supplying cold-water at a relatively low temperature; and

a supply unit for mixing the hot-water supplied from the hot-water tank and the cold-water supplied from the cold-water tank, adjusting the mixed water to a predetermined temperature, and supplying the water to the base material.

4. The rotary device according to claim 3, wherein the liquid supply part further comprises a pressurizing device for pressurizing the water adjusted to the predetermined temperature.

5. The rotary device according to claim 3 or 4 wherein the liquid supply part further comprises a heat exchanger for providing room temperature water to the cold-water tank.

6. The rotary device according to any one of claims 1 to 5, wherein the predetermined temperature is in a range of 85°C or higher and 120°C or lower.

7. The rotary device according to claim 1, wherein the predetermined temperature is in a range of 25°C or higher and 270°C or

lower.

8. The rotary device according to any one of claims 1 to 7, wherein the liquid supply part is arranged to supply the liquid to the base material via the first pipe and to collect the liquid from the base material via the second pipe while the rotary stage is rotating.

9. The rotary device according to claim 8, wherein the first pipe is connected to the liquid supply part via a rotary joint.

10. The rotary device according to any one of claims 1 to 9, wherein the liquid supply port is arranged to be aligned with the inlet and the liquid discharge port is arranged to be aligned with the outlet.

11. The rotary device according to any one of claims 1 to 10, further comprising: a chuck mechanism for holding the base material on the rotary stage.

12. The rotary device according to claim 11, wherein the chuck mechanism is a vacuum chuck mechanism, and the vacuum chuck mechanism comprises:

a through hole arranged in the rotary stage,

a suction pipe arranged in the rotary support and connected to the through hole; and

a vacuum pump connected to the suction pipe.

13. The rotary device according to claim 12, wherein at least a portion of the base material contains a porous material.

14. The rotary device according to claim 12, wherein the suction pipe is connected to the vacuum pump via a rotary joint.

15. The rotary device according to any one of claims 1 to 14, wherein the flow path provided in the base material is provided along the circumferential direction of the base material.

16. A thermal spraying apparatus comprising:

the rotary device according to any one of claims 1 to 15, and

a thermal spray gun.

17. The thermal spraying apparatus according to claim 16, wherein

the thermal spray gun is arranged to spray a thermal spray material onto a surface of the base material supported by the rotary stage; and

the liquid supply part is arranged to supply the liquid to the base material while the thermal spray material is sprayed from the thermal spray gun.

18. The thermal spraying apparatus according to claim 17, wherein the rotary device further comprises a gas supply unit for supplying a pressurized gas to the base material, and the gas supply unit is arranged to supply the gas to the base material before the thermal spray material is sprayed from the thermal spray gun.