

[CLAIMS]

[Claim 1]

A bonding apparatus comprising:

a bonding part that performs bonding work for a lead frame which has been conveyed to

5 a working region; and

a frame feeder that conveys the lead frame to the working region using a conveyance part and performs preliminary heating of the lead frame before being conveyed to the working region using a heater unit; and

a controller that controls operation of the bonding part and the frame feeder,

10 wherein the heater unit has

a heating body, and

a heater block which is disposed so as to face a rear surface of the lead frame on an upstream side of the working region in a conveyance direction of the lead frame and provides the lead frame with heat received from the heating body, and

15 wherein a heat dissipation part having a plurality of fins formed from a surface of the heater block in a depth direction is provided in the heater block,

wherein the controller

provides the bonding part with a control signal for causing the bonding part to perform bonding work during a first period, and

20 provides the frame feeder with a control signal for causing the heater unit to perform preliminary heating of the lead frame during a second period overlapping the first period, and

wherein a length of the second period is equal to or shorter than a length of the first period.

[Claim 2]

The bonding apparatus according to claim 1,
wherein the plurality of fins is separated from each other in a direction orthogonal to the conveyance direction of the lead frame.

5 [Claim 3]

The bonding apparatus according to claim 1 or 2,
wherein holes which are provided between the fins and penetrate the heater block in the depth direction are provided in the heater block.

10 [Claim 4]

The bonding apparatus according to any one of claims 1 to 3,
wherein lengths of the fins in the depth direction are longer than a distance from tips of the fins to the lead frame in the depth direction.

[Claim 5]

15 ~~_____The bonding apparatus according to any one of claims 1 to 4 further comprising:~~
~~_____a controller that controls operation of the bonding part and the frame feeder,~~
~~_____wherein the controller~~
~~_____provides the bonding part with a control signal for causing the bonding part to~~
~~perform bonding work during a first period, and~~
20 ~~_____provides the frame feeder with a control signal for causing the heater unit to~~
~~perform preliminary heating of the lead frame during a second period overlapping the first~~
~~period, and~~
~~_____wherein a length of the second period is equal to or shorter than a length of the first~~
~~period.~~

[Claim 6]

——— A frame feeder comprising:

——— a conveyance part that conveys a lead frame to a working region in which bonding work is performed for the lead frame; and

5 ——— a first heater unit that performs preliminary heating of the lead frame before being conveyed to the working region,

——— wherein the first heater unit has

——— a first heating body, and

10 ——— a first heater block which is disposed so as to face a rear surface of the lead frame on an upstream side of the working region in a conveyance direction of the lead frame and provides the lead frame with heat received from the first heating body, and

——— wherein a first heat dissipation part having a plurality of first fins formed from a surface of the first heater block in a depth direction is provided in the first heater block.

[Claim 7]

15 ——— The frame feeder according to claim 6 further comprising:

——— a second heater unit that heats the lead frame conveyed from the working region after the bonding work is performed,

——— wherein the second heater unit has

——— a second heating body, and

20 ——— a second heater block which is disposed so as to face the rear surface of the lead frame on a downstream side of the working region in the conveyance direction of the lead frame and provides the lead frame with heat received from the second heating body, and

——— wherein a second heat dissipation part having a plurality of second fins formed from a surface of the second heater block in the depth direction is provided in the second heater block.

[Claim 8]

~~———— A heater unit performing preliminary heating of a lead frame before being conveyed to a working region in which bonding work is performed for the lead frame, the heater unit comprising:~~

5 ~~———— a heating body; and~~

~~———— a heater block that is disposed so as to face a rear surface of the lead frame on an upstream side of the working region in a conveyance direction of the lead frame and provides the lead frame with heat received from the heating body;~~

10 ~~———— wherein a heat dissipation part having a plurality of fins formed from a surface of the heater block in a depth direction is provided in the heater block.~~

[Claim 9]

~~———— The heater unit according to claim 8,~~

~~———— wherein the plurality of fins is separated from each other in a direction orthogonal to the conveyance direction of the lead frame.~~

15 [Claim 10]

~~———— The heater unit according to claim 8 or 9,~~

~~———— wherein holes which are provided between the fins and penetrate the heater block in the depth direction are provided in the heater block.~~

[Claim 11]

20 ~~———— The heater unit according to any one of claim 8 to 10,~~

~~———— wherein lengths of the fins in the depth direction are longer than a distance from tips of the fins to the lead frame in the depth direction.~~