**[0026]** According to the aspect, for example, by repetitively carrying out test production, so that the inclination of the holding surface with respect to the transfer stage is substantially zero, the transfer defect of the flux can be suppressed. In particular, in the case where the size of the electronic component is large, that is, in the case where the inclination of the holding surface with respect to the transfer stage has a significant influence on the transfer defect of the flux at the end of the electrode formation surface, the transfer defect can be effectively suppressed.

**[0027]** In the above aspect, the flux transfer method may further include adjusting a posture of the transfer stage or the holding tool based on the inclination.

**[0028]** In the above aspect, the flux transfer method may further include: releasing the electronic component without mounting the electronic component to a target, and immersing an electrode formation surface of another electronic component into the flux stored in the transfer stage.

**[0029]** In the above aspect, the flux transfer method may further include: immersing the electronic component into the flux stored in the transfer stage again.

**[0030]** In this way, by reusing the electronic component in which the transfer of the flux is insufficient, the loss of the electronic component can be reduced.

**[0031]** A mounting apparatus according to another aspect of the invention mounts an electronic component in which a flux is transferred onto an electrode formation surface to a target and includes: a transfer stage, storing the flux; a mounting tool, holding the electronic component by using a holding surface, so that the electrode formation surface of the electronic component is immersed into the flux stored in the transfer stage, and mounting the electronic component to the target; an image capturing part, obtaining a captured image of at least one of the electrode formation surface of the electronic component after flux transfer and the transfer stage after flux transfer; and a detection part, detecting an inclination of the holding surface with respect to the transfer stage based on the captured image.

## DESCRIPTION OF EMBODIMENTS

**[0035]** In the following, the embodiments of the invention are described with reference to the drawings. The drawings of the embodiments are examples, and the dimensions and shapes of respective parts are schematic, and the technical scope of the invention should not be construed as being limited to the embodiments.

**[0036]** <Embodiment 1>

Firstly, the configuration of a flux transfer device 1 according to the first embodiment of the invention is described with reference to FIGs. 1 and 2. FIG. 1 is a schematic view illustrating a configuration of a flux transfer apparatus according to the first embodiment. FIG. 2 is a schematic view illustrating a configuration of a posture control unit according to the first embodiment.

**[0037]** The flux transfer apparatus 1 includes a conveyance unit 10, a transfer unit 20, a posture control unit 30, and a mounting unit 40.

**[0038]** The conveyance unit 10 conveys an electronic component CP. Specifically, the conveyance unit 10 is configured to be able to convey the electronic component CP between the transfer unit 20 and the posture control unit 30 and between the posture control unit 30 and the mounting unit 40. The conveyance unit 10 conveys the electronic component CP taken out from a feeder (not shown) to the transfer unit 20, conveys the electronic component CP to which a flux FX is transferred to the posture control unit 30, and conveys the electronic component CP for which an image of an electrode formation surface CPa is captured to the mounting unit 40. The conveyance unit 10 may also convey the electronic component CP for which the image of the electrode formation surface CPa is captured to the transfer unit 20 again, and may also release the electronic component CP to a tray (not shown).

**[0039]** The conveyance unit 10 includes a bonding head 11 and an actuator 17. The bonding head 11 holds the electronic component CP. The actuator 17 moves the bonding head 11 in

parallel to each other. The posture of the holding tool 13 with respect to the mounting stage 41, for example, is defined as the inclination of the holding surface 13a of the holding tool 13 with respect to a placement surface 41a of the mounting stage 41.

**[0045]** The transfer unit 20 transfers the flux FX to the electrode formation surface CPa (a surface on a side where a bump electrode is formed) of the electronic component CP.

**[0046]** The transfer unit 20 includes the transfer stage 21.

**[0047]** An immersion area 23 is formed on the transfer surface 21a of the transfer stage 21. The immersion area 23 is a concave part formed with a predetermined depth. For example, after the flux FX coated on the transfer surface 21a of the transfer unit 20 is leveled by using a first squeegee, a second squeegee is used to scrapes off excessive flux FX from the transfer surface 21a. Accordingly, the flux FX is evenly stored in the immersion area 23. The surface of the flux FX is provided to be substantially flush with the transfer surface 21a of the transfer stage 21. The electrode formation surface CPa of the electronic component CP held by the holding tool 13 of the conveyance unit 10 is immersed with respect to the flux FX stored in the immersion area 23 of the transfer unit 20.

**[0048]** The posture control unit 30 detects the inclination of the holding surface 13a with respect to the transfer stage 21, and controls the posture of the holding tool 13 so that the inclination is substantially zero. In other words, based on the detected inclination, the posture of the holding tool 13 is changed, so that the surface of the flux FX of the transfer stage 21 and the electrode formation surface CPa of the electronic component CP are substantially parallel to each other.

**[0049]** The posture control unit 30 includes an image capturing part 31, a lighting 33, a detection part 35, and a control part 37.

**[0050]** The image capturing unit 31 captures an image of the electronic component CP held by the holding tool 13, and obtains a captured image of the electrode formation surface CPa after

[Reference Signs List]

**[0096]**

1: Flux transfer apparatus;

10: Conveyance unit;

11: Bonding head;

13: Holding tool;

15: Inclination adjustment mechanism;

17: Actuator;

20: Transfer unit;

21: Transfer stage;

32: Immersion area;

25: Inclination adjustment mechanism;

30: Posture control unit;

31: Image capturing part;

33: Lighting;

35: Detection part;

37: Control part;

40: Mounting unit;

41: Mounting stage;

FX: Flux;

CP: Electronic component;

CPa: Electrode formation surface;

BD: Substrate.

WHAT IS CLAIMED IS:

1. A flux transfer apparatus, transferring a flux to an electrode formation surface of an electronic component, the flux transfer apparatus comprising:

a transfer stage, storing the flux;

a holding tool, holding the electronic component by using a holding surface, so that the electrode formation surface of the electronic component is immersed into the flux stored in the transfer stage;

an image capturing part, obtaining a captured image of at least one of the electrode formation surface of the electronic component after flux transfer and the transfer stage after flux transfer; and

a detection part, detecting a degree of parallism of the holding surface with respect to the transfer stage based on the captured image.

2. The flux transfer apparatus as claimed in claim 1, further comprising a first adjustment part configured to be able to adjust a posture of the holding tool based on the degree of parallism.

3. The flux transfer apparatus as claimed in claim 1 or 2, further comprising a second adjustment part configured to be able to adjust a posture of the transfer stage based on the degree of parallism.

4. The flux transfer apparatus as claimed in claim 1, wherein the image capturing part captures an image of the electrode formation surface of the electronic component after flux transfer from a bottom.

5. The flux transfer apparatus as claimed in claim 4, wherein the detection part compares the captured image and a reference image obtained from an electrode formation surface of an electronic component after a flux is normally transferred.

6. The flux transfer apparatus as claimed in claim 5, wherein the detection part obtains an

image of at least one sub area from the captured image, and performs comparison with the reference image for the at least one sub area.

7. The flux transfer apparatus as claimed in claim 6, wherein the at least one sub area comprises a corner sub area provided at a corner of the electrode formation surface.

8. The flux transfer apparatus as claimed in claim 6 or 7, wherein the at least one sub area area comprises a band-shaped sub area extending along a long side or a short side of the electrode formation surface.

9. The flux transfer apparatus as claimed in any one of claims 1 to 8, wherein the holding tool is a bonding tool mounting the electronic component to a target.

10. A flux transfer method for transferring a flux to an electrode formation surface of an electronic component, the flux transfer method comprising:

storing the flux in a transfer stage;

holding the electronic component by using a holding surface of a holding tool;

immersing the electrode formation surface of the electronic component into the flux stored in the transfer stage;

obtaining a captured image of at least one of the electrode formation surface of the electronic component after flux transfer and the transfer stage after flux transfer; and

detecting a degree of parallism of the holding surface with respect to the transfer stage based on the captured image.

11. The flux transfer method as claimed in claim 10, further comprising adjusting a posture of the transfer stage or the holding tool based on the degree of parallism.

12. The flux transfer method as claimed in claim 11, further comprising: releasing the electronic component without mounting the electronic component to a target, and immersing an electrode formation surface of another electronic component into the flux stored in the transfer stage.

13. The flux transfer method as claimed in claim 11, further comprising: immersing the electronic component into the flux stored in the transfer stage again.

14. A mounting apparatus, mounting an electronic component in which a flux is transferred onto an electrode formation surface to a target, the mounting apparatus comprising:

a transfer stage, storing the flux;

a mounting tool, holding the electronic component by using a holding surface, so that the electrode formation surface of the electronic component is immersed into the flux stored in the transfer stage, and mounting the electronic component to the target;

an image capturing part, obtaining a captured image of at least one of the electrode formation surface of the electronic component after flux transfer and the transfer stage after flux transfer; and

a detection part, detecting a degree of parallism of the holding surface with respect to the transfer stage based on the captured image.