the image taken, the controller 30 obtains an offset (x1, y1) of the island center point Ci with respect to an origin Og of the image taken. The offset (x1, y1) represents an offset of the optical axis of the camera 18 with respect to the island center point Ci. If the offset of the dispenser 16 with respect to the camera 18, that is, the basic offset OSs=(xs, ys), is added to the offset (x1, y1), a theoretical value of the offset of the dispenser 16 with respect to the island center point Ci can be specified.

[0028] However, the basic offset OSs is the design value of the offset of the camera 18 with respect to the dispenser 16. Hence, the actual offset of the camera 18 with respect to the dispenser 16 is often different from the basic offset OSs due to assembly errors or aging. In the following, an amount of error between the actual offset and the basic offset OSs is referred to as a machine offset OSm=(xm, ym). Due to a difference in optical characteristics between each camera 18, an optical offset OSo to be described later is present between the first processing head 14f and the second processing head 14s. Therefore, the controller 30 obtains the machine offset OSm and the optical offset OSo before the positioning of the processing head 14. Then, when the processing head 14 is positioned, a position where the offsets OSm and OSo are canceled out is set as the target position of the processing head 14.

[0029] Here, the machine offset OSm can be specified using a conventionally known method. For example, after the processing head 14 is positioned based on the basic offset OSs and the paste P is coated, an image may be taken of the island I coated with the paste P. Based on the image taken, a deviation amount of the paste P from the island center point Ci may be obtained, and the machine offset OSm may be obtained from the deviation amount.

[0030] Next, the optical offset OSo is described with reference to FIG. 5A and FIG. 5B. Regarding the camera 18, even the same product may differ in optical characteristics. The difference in optical characteristics is caused by, for example, individual differences between lenses or imaging elements, or a difference in inclination of the optical axis that occurs during assembly of the camera 18. Due to such variation in optical characteristics, even if an image is taken of the

camera 18s, an error corresponding to the optical offset OSo occurs in a relative positional relationship between the paste Pf and the paste Ps. For example, it is required that multiple pastes be arranged in a straight line in the X direction. However, in the example of FIG. 6, the paste Ps deviates from the paste Pf by yo. Similarly, in the case where multiple pastes are required to be coated at regular intervals of L in the X direction, an internal between the first area Af and the second area As in the X direction deviates by xo with respect to an ideal distance and becomes L+xo. As a result, when viewed as a whole of the lead frame 100, a coating position of the paste P varies, leading to deterioration in the quality of a semiconductor device finally manufactured.

[0033] Therefore, in this example, the optical offset OSo is also obtained before manufacture of the product is actually started. The acquisition of the optical offset OSo is described below. FIG. 7 and FIG. 8 are conceptual diagrams showing a flow of calculation processing of the optical offset OSo. In the case of obtaining the optical offset OSo, as shown in FIG. 7, the controller 30 instructs the first processing head 14f to perform paste coating on one island If. The one island If is an optical inspection part whose image is taken by both the first camera 18f and the second camera 18s. In the case where the first processing head 14f coats the paste Pf on one island If, the controller 30 causes an image to be taken of the coated paste Pf by the first camera 18f. The controller 30 acquires an image obtained by this image taking as a first optical inspection image 40f. FIG. 9A is a conceptual diagram of the first optical inspection image 40f. In FIG. 9A, a black circle indicates the island center point Ci, and a cross mark indicates a center point (hereinafter referred to as “paste center point Cp”) of the paste Pf. As shown in the example of FIG. 9A, in the first optical inspection image 40f, in the first camera 18f, an image is obtained in which the paste center point Cp deviates from the island center point Ci by (a, b).

[0034] Next, as shown in FIG. 8, the controller 30 causes the lead frame 100 to move in the X direction so that the island If being the optical inspection part is located within a field of view of the second camera 18s. Then, an image is taken of the optical inspection part by the second

camera 18s, and the thus obtained image is acquired as a second optical inspection image 40s. The second optical inspection image 40s is taken of the same paste Pf as the first optical inspection image 40f. FIG. 9B is a diagram showing an example of the second optical inspection image 40s. In FIG. 9B, a cross mark in broken line indicates a position of (a, b) from the island center point Ci, that is, a position of the paste center point Cp calculated based on the first optical inspection image 40f.

[0035] As shown in FIG. 9B, in the second optical inspection image 40s, the paste Pf deviates from the island center point Ci by (c, d). That is, despite the fact that the images are taken of the same paste Pf, not only a deviation amount of the paste center point Cp with respect to the island center point Ci in the image but also the position of the paste Pf relative to the reference (the island If in this example) differs. This is due to the difference in optical characteristics between the first camera 18f and the second camera 18s. In the example of FIG. 9B, the second camera 18s deviates by (e, f) as compared with the first camera 18f due to the difference in optical characteristics. Moreover, e=c−a and f=b−d.

[0036] The controller 30 acquires, as the optical offset OSo=(xo, yo), the difference (e, f) between the paste position obtained from the first camera 18f and the paste position obtained from the second camera 18s. That is, the difference is stored in the memory 34 that xo=e and yo=f. A value (−xo, −yo) that cancels out the optical offset OSo is stored in the memory 34 as a position correction value of the second processing head 14s. When the second processing head 14s is positioned, the value (−xo, −yo) that cancels out the optical offset OSo is added to the target position of the second processing head 14s. Accordingly, the positioning standard is consistent between the first processing head 14f and the second processing head 14s, and the relative positional relationship of the paste P coated on one lead frame 100 is close to an ideal value.

[0037] Next, a flow of calculating position correction values CVf and CVs respectively of the first processing head 14f and the second processing head 14s is described with reference to