~~Method for Determining the Position of an Axis of Rotation~~

Claims

1. Method for determining an alignment error of a X-Y position~~,~~ arranged in ~~an~~ a X-Y coordinate system, wherein the X-Y position is related to ~~of~~ an axis of rotation (12)~~, which is perpendicular to the X-Y coordinate system,~~ of a substrate holding means (14)~~ that can rotate~~, which is rotatable around the axis of rotation (12), and for ~~holding a substrate (3) with the following steps~~ determining an alignment error of contact points (4, 5), comprising the steps of:

- Determining a first X-Y reference position RP of a reference labeling (10) that is provided on the substrate holding means (14)~~ or on the substrate (3) by means of optical positional detecting means being fixed relative to the X-Y coordinate system~~,
- Rotating the substrate holding means (14) by a defined angle of rotation R~~, in particular 180 degrees,~~ around the axis of rotation (12),
- Determining ~~by means of said fixed optical positional detecting means~~ a second X-Y reference position RP' of the reference labeling (10) that is changed by the rotation, ~~and~~
- Calculating the ~~X-Y~~-position of the axis of rotation (12) in the substrate plane ~~relative to said fixed optical positional detecting means~~, and
- determining of the alignment error of contact points (4, 5),

wherein the substrate (3) is fixed on the substrate holding means (14) during the determination of the position of the axis of rotation (12) and during the determination of the alignment error of contact points.

2. Method according to Claims 1, wherein the rotation of the substrate (3) or the substrate holding means (14) around the axis of rotation (12) is ~~carried out~~ effected by rotation means ~~of the substrate holding means (14)~~.

3. Method according to one of ~~the preceding claims~~ Claim 1 or 2, wherein the ~~optical positional detecting means comprise~~ determination of the first reference position RP and the second reference position RP' is effected by optical position determination means, comprising in particular at least one lens (8,15) preferably with an optical axis (11) ~~that is~~ parallel to the axis of rotation (12).

4. Method according to one of the preceding claims, wherein the substrate holding means (14) can be moved relative to the optical positional ~~detecting~~ determination means in the ~~X-Y coordinate system~~ or parallel to the X-Y coordinate system, ~~whereby~~ wherein the relative movement ~~can be detected~~ in the X- direction and Y-directions can be determined in the X-Y coordinate system.

~~5. Method for determining an orientation error of a large number of contact points (4, 5), oriented to one another and arranged on two opposite sides of a substrate (3), with the following course of the method:~~

~~— Applying the substrate (3) on a substrate holding means (14) that can move along an X-Y coordinate system and that can rotate around an axis of rotation (12) that is perpendicular to the X-Y coordinate system,~~

~~— Determining the position of the axis of rotation (12) according to one of the preceding claims before or after applying the substrate (3) to the substrate holding means (14), and~~

~~— Determining the orientation error of the contact points that are oriented to one another in each case.~~

6. Method according to Claim 5, wherein the determination of the orientation error is carried out by the optical positional detecting means, in particular in each case a lens for each side of the substrate (3).

7. Method according to one of Claims 5 or 6, wherein the determination of the orientation error is carried out in a first rotational position and a second rotational position of the substrate rotated around the axis of rotation (12) relative to the first rotational position by an angle of rotation, in particular 180 degrees.

8. Method according to one of Claims 5 to 7, wherein the determination of the orientation error of a large number of contact points is done by the following sequence:

- Determining X-Y positions of the large number of contact points, in each case opposite to two sides of the substrate (3), in the first rotational position,
- Rotating the substrate (3) in the second rotational position,
- Determining the X-Y positions of the large number of contact points in the second rotational position.