WHAT IS CLAIMED IS:

1. A laser processing apparatus for processing a plate-shaped workpiece by applying a laser beam to the workpiece, the laser processing apparatus comprising:

a cassette table for placing thereon a cassette in which a plurality of workpieces are accommodated;

carrying-out means for carrying out the workpiece from the cassette placed on the cassette table;

temporary placing means for temporarily placing the workpiece carried out by the carrying-out means;

carrying means for carrying the workpiece from the temporary placing means to a chuck table;

imaging means for detecting a region to be processed of the workpiece held on the chuck table; and

laser beam applying means for applying a laser beam to the workpiece held on the chuck table,

wherein the carrying-out means carries out the workpiece having been processed by the laser beam applying means from the chuck table and accommodates the workpiece into the cassette placed on the cassette table.

2. The laser processing apparatus according to claim 1, wherein a direction in which the carrying-out means is disposed in relation to the temporary placing means being an X-axis direction, and a direction orthogonal to the X-axis direction

being a Y-axis direction, then a receiving position at which the chuck table receives the workpiece is set in the Y-axis direction in relation to the temporary placing means;

the focusing unit is disposed in the X-axis direction in relation to the receiving position of the chuck table;

the carrying means carries the workpiece placed on the temporary placing means to the chuck table positioned in the Y-axis direction;

X-axis moving means for moving the chuck, table moves the chuck table between the receiving position and a processing position at which the workpiece is processed by the laser beam applied from the focusing unit;

the carrying-out means includes a carrying-out guide rail disposed in the Y-axis direction, a movable carrying-out moving base disposed on the carrying-out guide rail, and a robot hand disposed on the carrying-out moving base; and

the robot hand is positioned between the cassette table and the temporary placing means, carries out the workpiece from the cassette, temporarily places the workpiece on the temporary placing means, is positioned adjacently to the chuck table positioned at the receiving position, carries out the processed workpiece from the chuck table, and accommodates the processed workpiece into the cassette.

3. The laser processing apparatus according to claim 1, wherein the temporary placing means includes a temporary placing

table which is rotatable, and a periphery detecting section including a light emitting element and a light receiving element at positions on upper and lower opposite sides of a periphery of the workpiece temporarily placed on the temporary placing table,

the periphery detecting section is for detecting a maximum and a minimum of the distance between a periphery of a circularly shaped wafer serving as the workpiece and a periphery of the temporary placing table attendant on rotation of the temporary placing table, periphery positions corresponding to the maximum and the minimum, and the position of a notch indicative of crystal orientation of the wafer, detects an angle at which the notch is detected, and positions a direction of a straight line connecting the positions corresponding to the maximum and the minimum into the Y-axis direction, and determines a center of the wafer, and

the center of the wafer is positioned at the rotational center of the chuck table when the wafer is carried to and placed on the chuck table by the carrying means.

4. The laser processing apparatus according to claim 2, wherein the X-axis moving means for moving the chuck table includes at least an X-axis guide rail disposed in the X-axis direction, a moving base positioned on the X-axis guide rail so as to be movable, and a drive source for moving the moving base, and

the moving base is formed from a carbon fiber-reinforced plastic, and supports the chuck table.

5. The laser processing apparatus according to claim 3, wherein the temporary placing table includes a transparent plate, and the periphery detecting section is configured to be able to be advanced and retracted in a radial direction correspondingly to a size of the wafer.