Claims

1. An apparatus for transferring a solar wafer or cell, the apparatus comprising:

a rotary motor;

a gripper configured to hold the solar wafer or cell; and

a rotary arm connected between the rotary motor and the gripper, the rotary arm being drivable by the rotary motor in a first rotary direction through a transfer angle for transferring the solar wafer or cell between different positions; and

an angle-compensating device configured to drive the gripper to rotate by a same transfer angle as the rotary arm in a second rotary direction opposite to the first rotary direction, such that an angular orientation of the solar wafer or cell remains constant during rotation of the rotary arm.

2. The apparatus of claim 1, wherein the angle-compensating device has an angle-compensating accuracy of between 0.1 and 1 degree.

3. The apparatus of claim 1, wherein the angle-compensating device comprises:

a motor shaft connected to the rotary motor;

a gripper pulley connected to the gripper;

an endless belt rotatably connected to the motor shaft and the gripper pulley,

wherein the rotary arm is drivable by the rotary motor in the first rotary direction to drive the endless belt along a continuous path in the second rotary direction around the motor shaft, thereby driving the gripper in the second rotary direction to ensure that the angular orientation of the solar wafer or cell is maintained as the solar wafer or cell is moved by the gripper.

4. The apparatus of claim 3, wherein the motor shaft is housed in the rotary motor.

5. The apparatus of claim 4, wherein the motor shaft is anchored within a central region of the rotary motor.

6. The apparatus of claim 3, wherein the gripper pulley is connected to the gripper via a gripper shaft.

7. The apparatus of claim 3, wherein the endless belt is a timing belt.

8. The apparatus of claim 3, wherein the motor shaft of the angle-compensating device is a stator of the rotary motor.

Claims

1. An apparatus configured to transfer a solar wafer or a solar cell, the apparatus comprising:

a rotary motor;

a gripper configured to hold the solar wafer or the solar cell;

a rotary arm having a first end directly attached to a motor rotor of the rotary motor and a second end rotatably attached to the gripper, the rotary arm being drivable by the rotary motor in a first rotary direction through a transfer angle for transferring the solar wafer or the solar cell between different positions and the rotary arm being configured to orbit the gripper about a single stationary axis; and

an angle-compensating device configured to drive the gripper to rotate by a same transfer angle as the rotary arm but in a second rotary direction that is opposite to the first rotary direction, such that an angular orientation of the solar wafer or the solar cell remains constant during rotation of the rotary arm,

wherein the angle-compensating device comprises:

a stationary motor shaft of the rotary motor;

a gripper pulley of the gripper;

an endless belt being arranged on the stationary motor shaft and engaging the gripper pulley, the endless belt being movable relative to the stationary motor shaft and movable together with the gripper pulley, so that upon the rotary arm being driven by the rotary motor in the first rotary direction, the endless belt is accordingly driven by the rotary arm along a continuous path in the second rotary direction around the motor shaft, which accordingly drives the gripper in the second rotary direction to ensure that the angular orientation of the solar wafer or the solar cell is maintained as the solar wafer or the solar cell is moved by the gripper and as the rotary arm rotates about the single stationary axis.

2. The apparatus of claim 1, wherein the angle-compensating device has an angle-compensating accuracy of between 0.1 and 1 degree.

3. The apparatus of claim 1 or claim 2, wherein the stationary motor shaft is housed in the rotary motor.

4. The apparatus of claim 3, wherein the stationary motor shaft is anchored within a central region of the rotary motor.

5. The apparatus of any one of the preceding claims, wherein the gripper pulley is connected to the gripper via a gripper shaft.

6. The apparatus of any one of the preceding claims, wherein the endless belt is a timing belt.

7. The apparatus of any one of the preceding claims, wherein the stationary motor shaft of the angle-compensating device is a stator of the rotary motor.

8. The apparatus of any one of the preceding claims, wherein the gripper is a Bernoulli-effect gripper.