CLAIMS

1. A mask transfer system, comprising an internal mask storage for storing masks, a rotary manipulator for transferring masks, a mask fork connected to the rotary manipulator and configured to pick up masks, and a fine-tuning member, wherein the fine-tuning member is configured to cooperate with the rotary manipulator to compensate for a position offset of a mask picked up by the mask fork, so as to achieve a pre-alignment of masks,

wherein the rotary manipulator comprises a manipulator body and a liftable lifting arm rotatably connected to the manipulator body, and the lifting arm is provided with a telescopic member, and wherein the fine-tuning member is a precision rotating shaft disposed at an end of the telescopic member and is configured to drive the mask fork to perform a high precision motion in X direction, Y direction and Rz direction.

2. The mask transfer system of claim 1, wherein the telescopic member comprises a plurality of manipulator segments that are successively connected, and the fine-tuning member is located between two of the connected manipulator segments or between the rotary manipulator and the mask fork.

3. The mask transfer system of claim 1 or 2, wherein a transfer mechanism is disposed at one side of the rotary manipulator and is configured to transfer a mask from an external source, and wherein the rotary manipulator is configured to transfer the mask on the transfer mechanism into the internal mask storage .

4. The mask transfer system of claim 3, wherein the mask is held in a mask cassette and the transfer mechanism is configured to transfer the mask cassette.

5. The mask transfer system of claim 3, wherein the transfer mechanism comprises a guide rail inclined relative to a horizontal plane and a carrier stage in movable connection with the guide rail, the carrier stage configured to transfer the mask.

6. The mask transfer system of claim 1, wherein a plurality of internal mask storages are provided.

7. The mask transfer system of claim 6, wherein distances from the plurality of the internal mask storages to the manipulator body are different.

8. The mask transfer system of claim 1, wherein the rotary manipulator is provided, at one side thereof, a code scanning component for scanning a code information of the mask.

9. The mask transfer system of claim 8, wherein the code scanning component is also located at one side of the internal mask storage and is configured to scan a code information of a mask in the internal mask storage.

10. The mask transfer system of claim 1, further comprising a pre-alignment unit configured to detect X direction, Y direction and Rz direction information of the mask picked up by the mask fork and to transmit the detected information to the fine-tuning member directly or indirectly.

11. The mask transfer system of claim 1, wherein the fine-tuning member is configured to drive the mask picked up by the mask fork to perform a small scale of rotary motion relative to a large scale of rotary motion driven by the rotary manipulator.

12. A mask transfer method, using an internal mask storage, a rotary manipulator, a fine-tuning member and a mask fork, wherein the rotary manipulator comprises a manipulator body and a liftable lifting arm rotatably connected to the manipulator body and provided with a telescopic member, and the mask fork is connected to the rotary manipulator via the fine-tuning member, wherein the fine-tuning member is a precision rotating shaft disposed at an end of the telescopic member and is configured to drive the mask fork to perform a high precision motion in X direction, Y direction and Rz direction, wherein the mask transfer method achieves

transfer of a mask through the following steps:

S1) picking up a mask from the internal mask storage by the mask fork under a driving of the rotary manipulator;

S2) moving the mask fork to a pre-alignment unit under the driving of the rotary manipulator;

S3) detecting, by the pre-alignment unit, a position information of the mask picked up by the mask fork, and compensating, by the rotary manipulator in cooperation with the fine-tuning member, a position offset in the X direction, Y direction and Rz direction of the mask picked up by the mask fork to achieve a pre-alignment of the mask picked up by the mask fork; and

S4) conveying the mask to a mask stage by the mask fork under the driving of the rotary manipulator, after the mask picked up by the mask fork has been adjusted in the X direction, Y direction, and Rz direction.

13. The mask transfer method of claim 12, wherein the fine-tuning member is configured to drive the mask picked up by the mask fork to perform a small scale of rotary motion relative to a large scale of rotary motion driven by the rotary manipulator.

14. A mask transfer method, using a transfer mechanism for transferring a mask, a rotary manipulator, a mask fork connected to the rotary manipulator, an internal mask storage and a fine-tuning member, the transfer mechanism comprising a guide rail and a carrier stage in movable connection with the guide rail, the carrier stage configured to convey a mask from an external source to the rotary manipulator via a feeding port for transferring a mask, the rotary manipulator comprising a manipulator body and a liftable lifting arm rotatably connected to the manipulator body and provided with a telescopic member, the fine-tuning member being a precision rotating shaft disposed at an end of the telescopic member and

configured to drive the mask fork to perform a high precision motion in X direction, Y direction and Rz direction, wherein the mask transfer method achieves transfer of a mask through the following steps:

1) placing the mask onto the carrier stage, and moving the carrier stage to a mask transfer position under a driving of the guide rail;

2) adjusting a position of the mask fork and picking up the mask on the carrier stage by the mask fork, under a driving of the rotary manipulator and the fine-tuning member; and

3) driving, by the rotary manipulator, the mask fork to move the mask picked up by the mask fork into the internal mask storage.

15. The mask transfer method of claim 14, further comprising a step of 4): moving the carrier stage to the feeding port after picking up the mask on the carrier stage by the mask fork under the driving of the rotary manipulator.

16. The mask transfer method of claim 14, wherein the rotary manipulator further comprises a manipulator body that is provided, at one side thereof, with a code scanning component.

17. The mask transfer method of claim 16, wherein step 3) comprises:

31) picking up the mask by the mask fork under the driving of the rotary manipulator, so as to move the mask out of the carrier stage;

32) moving the mask picked by the mask fork under the driving of the rotary manipulator to a scanning position, where information of the mask is scanned and uploaded by the code scanning component or scanned and recorded by the code scanning component;

33) conveying, by the rotary manipulator, the mask picked up by the mask fork into the internal mask storage.

18. The mask transfer method of claim 16, further comprising: scanning and uploading, or scanning and recording a code of the mask in the internal mask storage by the code scanning component.