Claims:

1. A substrate carrier system, to provide a high substrate throughput, the system comprising:

a plurality of carrier arms each having a midpoint between opposing ends and arranged to rotate about the midpoint in planes parallel to one another, the plurality of carrier arms each further having at least one rotary-mounted substrate carrier mounted on each of the opposing ends;

a hub including a plurality of concentrically-mounted drives, each of the plurality of drives being coupled near the midpoint of a respective one of the plurality of carrier arms, each of the plurality of concentrically-mounted drives being configured to move respective ones of the plurality of carrier arms in at least a full 360^0 arc in either direction simultaneously, at least a portion of the plurality of carrier arms configured to be driven independently of a remaining portion of the plurality of carrier arms;

a drive motor coupled respectively to each of the concentrically-mounted drives and configured to move a coupled one of the plurality of carrier arms in a rotary manner;

a linear traverser mechanism coupled in proximity to the plurality of carrier arms, the linear traverser mechanism having a plurality of linear substrate carriers mounted thereon, each of the plurality of linear substrate carriers being configured to transport substrates independently of the plurality of carrier arms and in a plane substantially parallel to the planes of the plurality of carrier arms with each of the plurality of linear substrate carriers being in a different plane from one another; and

an inner track section and an outer track section each mounted concentrically with the hub and arranged to support, respectively, an inner periphery and an outer periphery of each of the rotary-mounted substrate carriers.

2. The substrate carrier system of claim 1, further comprising at least one substrate transport slot positioned proximal to an outer periphery of a rotational path traversed by the plurality of carrier arms.

3. The substrate carrier system of claim 2, further comprising a substrate lifter positioned beneath the rotational path traversed by the plurality of carrier arms and

positioned on a radial line between the midpoint of the plurality of carrier arms and the at least one substrate transport slot.

4. The substrate carrier system of claim 1, wherein a transport plane of each of the plurality of linear substrate carriers is positioned approximately 10 mm from one another.

5. The substrate carrier system of claim 1, wherein each of the plurality of linear substrate carriers is independently driven by a separate motor.

6. The substrate carrier system of claim 1, further comprising a substrate processing chamber coupled to the plurality of carrier arms.

7. The substrate carrier system of claim 1, wherein the linear traverser mechanism is operationally coupled above the plurality of carrier arms.

8. The substrate carrier system of claim 1, wherein each of the plurality of linear substrate carriers has a c-shaped structure to position one of the substrates concentrically above a substrate lifter.

9. The substrate carrier system of claim 1, wherein the linear traverser mechanism further comprises:

at least two upper tracks;

at least two lower tracks; and

linear drive mechanisms respectively coupled to each of the at least two upper tracks and the two lower tracks, each of the plurality of linear substrate carriers mechanically coupled to a unique one of the linear drive mechanisms.

10. The substrate carrier system of claim 9 wherein the at least one chemical-release head is positioned above a path of the rotary-mounted substrate carriers.

11. The substrate carrier system of claim 9 wherein the at least one chemical-release head is positioned below a path of the rotary-mounted substrate carriers.

12. The substrate carrier system of claim 9 wherein the at least one chemical-release head has a wider cross-sectional width at an outer periphery of the head than at an inner periphery of the head.

13. The substrate carrier system of claim 1 further comprising at least one chemical-release head, the at least one chemical release head being positioned proximate to a rotational path of each of the rotary mounted substrate carriers.

14. A substrate carrier system, comprising:

a plurality of carrier arms each having a midpoint between opposing ends and arranged to rotate about the midpoint in planes parallel to one another, the plurality of carrier arms each further having at least one rotary-mounted substrate carrier mounted on each of the opposing ends;

a hub including a plurality of concentrically-mounted drives, each of the plurality of drives being coupled near the midpoint of a respective one of the plurality of carrier arms, each of the plurality of concentrically-mounted drives being configured to move respective ones of the plurality of carrier arms, at least a portion of the plurality of carrier arms configured to be driven independently of a remaining portion of the plurality of carrier arms;

a drive motor coupled respectively to each of the concentrically-mounted drives and configured to move a coupled one of the plurality of carrier arms in a rotary manner; and

an inner track section and an outer track section each mounted concentrically with the hub and arranged to support, respectively, an inner periphery and an outer periphery of each of the rotary-mounted substrate carriers.

CLAIMS

What is claimed is:

1. A substrate carrier system to provide a high substrate throughput, the system comprising:

a plurality of carrier arms each having a midpoint between opposing ends and arranged to rotate about the midpoint in planes parallel to one another, the plurality of carrier arms each further having at least one rotary-mounted substrate carrier mounted on each of the opposing ends;

a hub including a plurality of concentrically-mounted drives, each of the plurality of drives being coupled near the midpoint of a respective one of the plurality of carrier arms, at least a portion of the plurality of carrier arms configured to be driven independently of a remaining portion of the plurality of carrier arms;

a drive motor coupled respectively to each of the concentrically-mounted drives and configured to move a coupled one of the plurality of carrier arms in a rotary manner; and

a linear traverser mechanism coupled in proximity to the plurality of carrier arms, the linear traverser mechanism having a plurality of linear substrate carriers mounted thereon, each of the plurality of linear substrate carriers being configured to transport substrates in a plane substantially parallel to the planes of the plurality of carrier arms with each of the plurality of linear substrate carriers being in a different plane from one another.

2. The substrate carrier system of claim 1, further comprising at least one substrate transport slot positioned proximal to an outer periphery of a rotational path traversed by the plurality of carrier arms.

3. The substrate carrier system of claim 2, further comprising a substrate lifter positioned beneath the rotational path traversed by the plurality of carrier arms and positioned on a radial line between the midpoint of the plurality of carrier arms and the at least one substrate transport slot.

4. The substrate carrier system of claim 1, further comprising an inner track section and an outer track section each mounted concentrically with the hub and arranged to support, respectively, an inner periphery and an outer periphery of each of the rotary-mounted substrate carriers.

5. The substrate carrier system of claim 1, wherein a transport plane of each of the plurality of linear substrate carriers is positioned approximately 10 mm from one another.

6. The substrate carrier system of claim 1, wherein each of the plurality of linear substrate carriers is independently driven by a separate motor.

7. The substrate carrier system of claim 1, further comprising a substrate processing chamber coupled to the plurality of carrier arms.

8. The substrate carrier system of claim 1, wherein the linear traverser mechanism is operationally coupled above the plurality of carrier arms.

9. The substrate carrier system of claim 1, wherein each of the plurality of linear substrate carriers has a c-shaped structure to position one of the substrates concentrically above a substrate lifter.

10. The substrate carrier system of claim 1, wherein the linear traverser mechanism further comprises:

at least two upper tracks;

at least two lower tracks; and

linear drive mechanisms respectively coupled to each of the at least two upper tracks and the two lower tracks, each of the plurality of linear substrate carriers mechanically coupled to a unique one of the linear drive mechanisms.

11. The substrate carrier system of claim 1 further comprising at least one chemical-release head, the at least one chemical-release head being positioned proximate to a rotational path of each of the rotary-mounted substrate carriers.

12. The substrate carrier system of claim 11, wherein the at least one chemical-release head is positioned above a path of the rotary-mounted substrate carriers.

13. The substrate carrier system of claim 11, wherein the at least one chemical-release head is positioned below a path of the rotary-mounted substrate carriers.

14. The substrate carrier system of claim 11, wherein the at least one chemical-release head has a wider cross-sectional width at an outer periphery of the head than at an inner periphery of the head.