CLAIMS

1. An electroplating system, comprising:

a vessel; and

a paddle disposed within the vessel, wherein:

the paddle is characterized by a first surface and a second surface, the first surface of the paddle comprising a plurality of ribs that extend upward from the first surface;

the plurality of ribs are arranged in a generally parallel manner about the first surface;

the paddle defines a plurality of apertures through a thickness of the paddle;

each of the plurality of apertures has a diameter of less than 10 mm;

the paddle has an open area of less than 30%; and

the paddle comprises a plurality of vertical dividers extending transversely between each of the plurality of ribs.

2. The electroplating system of claim 1, wherein:

each of the plurality of apertures extends from the second surface through a top surface of a respective one of the plurality of ribs.

3. The electroplating system of claim 1, wherein:

each of the plurality of apertures extends from the second surface through a top surface of a respective one of the plurality of vertical dividers.

4. The electroplating system of claim 1, wherein:

the paddle defines a number of slots, openings, or both slots and openings between at least some of the plurality of ribs.

5. The electroplating system of claim 1 further comprising:

a wafer holder movable to position a wafer in the vessel, wherein a distance between the paddle and a face of the wafer holder is less than 10 mm.

6. The electroplating system of claim 1, wherein:

a position of each of the plurality of apertures corresponds with a dense region of a die pattern used with the electroplating system.

7. A method of electroplating a substrate, comprising:

placing a substrate into contact with liquid electrolyte in a vessel;

conducting ionic current through the liquid electrolyte; and

moving a paddle within the liquid electrolyte below the substrate with a horizontal movement that selectively shields a portion of the substrate, wherein:

the paddle is characterized by a first surface and a second surface, the first surface of the paddle comprising a plurality of ribs that extend upward from the first surface;

the plurality of ribs are arranged in a generally parallel manner about the first surface;

the paddle defines a plurality of apertures through a thickness of the paddle;

each of the plurality of apertures has a diameter of less than 5 mm;

the paddle has an open area of less than 15%; and

the paddle comprises a plurality of vertical dividers extending transversely between each of the plurality of ribs.

8. The method of electroplating a substrate of claim 7, further comprising:

rotating the substrate while the ionic current is being conducted through the electrolyte.

9. The method of electroplating a substrate of claim 7, further comprising:

adjusting an alignment of the substrate relative to the paddle; and

de-plating the substrate within the vessel.

10. The method of electroplating a substrate of claim 7, further comprising:

identifying a die pattern of the substrate, the die pattern comprising a plurality of dense regions and a plurality of sparse regions; and

fabricating the paddle, wherein each of the plurality of apertures is generally aligned with one of the dense regions.

11. The method of electroplating a substrate of claim 7, wherein:

each of the plurality of apertures extends from the second surface through a top surface of a respective one of the plurality of ribs.

12. The method of electroplating a substrate of claim 7, wherein:

each of the plurality of apertures extends from the second surface through a top surface of a respective one of the plurality of vertical dividers.