

CLAIMS:

1. An electroplating processor comprising:
a bowl;
a membrane in the bowl;
an upper membrane support in the bowl above the membrane; and
a lower membrane support in the bowl below the membrane, with the lower membrane support comprising a flexible sheet having a pattern of through openings.
2. The processor of claim 1 with a perimeter of the membrane overlying a perimeter of the lower membrane support, and with both perimeters clamped together at a perimeter seal of the bowl.
3. The processor of claim 1 with the lower membrane support having a thickness less than 10% of the thickness of the upper membrane support.
4. The processor of claim 3 with the upper membrane support comprising a rigid non-metal element.
5. The processor of claim 4 with the upper membrane support having through-openings substantially aligned with the through-openings of the lower membrane support.
6. The processor of claim 1 with the membrane held into up-facing conical shape between the upper and lower membrane supports.
7. The processor of claim 1 further including a head having a rotor for holding a wafer, with the head movable to position the wafer into the bowl, and with the processor having a height of less than 450 mm.

8. The processor of claim 1 with the lower membrane support having a thickness of less than 10 mm.

9. The processor of claim 8 with the lower membrane support having a plurality of spaced apart radial arms and wedge shaped through-openings between the arms.

10. An electroplating processor comprising:

a membrane in a bowl;

a rigid cup in the bowl above the membrane, with the rigid cup having a plurality of radial segments and through-openings between the segments;

a lower membrane support in the bowl below the membrane, with the lower membrane support comprising a flexible sheet having a pattern of through openings; and a perimeter of the membrane overlying a perimeter of the lower membrane support, and with both perimeters clamped together at a perimeter of the bowl.

11. The processor of claim 10 with the lower membrane support having a thickness less than 10% of the thickness of a minimum thickness of the rigid cup.

The invention claimed is:

1. An electroplating processor comprising:
a bowl;
a membrane in the bowl;
an upper membrane support in the bowl above the membrane; and
a lower membrane support in the bowl below the membrane, with the lower membrane support comprising a flexible sheet having a pattern of through openings.
2. The processor of claim 1 with a perimeter of the membrane overlying a perimeter of the lower membrane support, and with both perimeters clamped together at a perimeter seal of the bowl.
3. The processor of claim 1 with the lower membrane support having a thickness less than 10% of the thickness of the upper membrane support.
4. The processor of claim 3 with the upper membrane support comprising a rigid non-metal element.
5. The processor of claim 4 with the upper membrane support having through-openings substantially aligned with the through-openings of the lower membrane support.
6. The processor of claim 1 with the membrane held into up-facing conical shape between the upper and lower membrane supports.
7. The processor of claim 1 further including a head having a rotor for holding a wafer, with the head movable to position the wafer into the bowl, and with the processor having a height of less than 18 inches.
8. The processor of claim 1 with the lower membrane support having a thickness of less than 0.40 inches.
9. The processor of claim 8 with the lower membrane support having a plurality of spaced apart radial arms and wedge shaped through-openings between the arms.
10. An electroplating processor comprising:
a membrane in a bowl;
a rigid cup in the bowl above the membrane, with the rigid cup having a plurality of radial segments and through-openings between the segments;
a lower membrane support in the bowl below the membrane, with the lower membrane support comprising a flexible sheet having a pattern of through openings; and
a perimeter of the membrane overlying a perimeter of the lower membrane support, and with both perimeters clamped together at a perimeter of the bowl.
11. The processor of claim 10 with the lower membrane support having a thickness less than 10% of the thickness of a minimum thickness of the rigid cup.