

Claims:

1. An apparatus for use in supporting a plurality of workpieces 12 each having first and second sides and an outer peripheral edge 15 having an annular region inside a plasma chamber having a processing space for simultaneously dry etching the first and second sides of each workpiece 12 with a plasma, the apparatus comprising:

a fixture 10 configured to be supported inside the processing space, said fixture 10 including a horizontally-oriented carrier plate 14 having a thickness and comprising:

a planar top surface 34;

a planar bottom surface 38; and

a plurality of first openings 16 extending through the thickness of said carrier plate 14 from said planar top surface 34 to said planar bottom surface 38, each of said plurality of first openings 16 having a centerline 20 that is parallel to the thickness of the carrier plate 14, within each of said plurality of first openings 16 is a first annular beveled surface 22 that is inwardly and downwardly angled from said planar top surface 34 towards said centerline 20, ~~beveled relative to said planar top surface~~, a second annular beveled surface 36 that is inwardly angled from ~~beveled relative to said planar bottom surface 38 towards said centerline 20~~, and an annular groove extending circumferentially about ~~each of said first and second annular beveled surfaces 22, 36~~, said annular groove having an annular sidewall 24 and an annular lip 26,

wherein each of said annular grooves is configured to contact ~~one of the workpieces over an~~ said annular region at an ~~a lower portion of said outer peripheral edge 15 of one of the workpieces 12~~ so that substantially all of the first and second sides of each of the workpieces 12 are positioned to be exposed to the plasma when the workpieces 12 are seated in the respective said annular groove.

2. The apparatus of claim 1 wherein said carrier plate 14 includes one or more second openings 18 extending through the thickness of said carrier plate 14, said one or more second openings 18 configured to pass a process gas used to generate the plasma.

3. The apparatus of claim 1 wherein said carrier plate 14 includes an outer rim 40 extending about said planar top surface 34 and raised relative to said planar top surface 34, and said outer rim 40 includes one or more exterior edges 42-45 beveled relative to said planar bottom surface 38 with an included angle greater than 90°.

4. The apparatus of claim 1 wherein said annular groove is separated from said planar top surface 34 by said first annular beveled surface 22.

5. The apparatus of claim 1 wherein each of said plurality of openings 16 is round and has a diameter slightly less than the diameter of the workpieces.

6. The apparatus of claim 1 wherein each of said first annular beveled surfaces 22 is frustoconical and each of said second annular beveled surfaces 36 is frustoconical.

~~7. The apparatus of claim 1 wherein each of said first annular surfaces is inwardly and downwardly angled relative to the planar top surface.~~

~~78. The apparatus of claim 18 wherein each annular groove is disposed between said first annular beveled surface 22 and said second annular beveled surface 36 of said second annular surfaces is inwardly and downwardly angled relative to the planar bottom surface.~~

~~89. The apparatus of claim 1 wherein each of said second annular beveled surfaces 36 is inwardly and downwardly angled relative to the planar bottom surface 38 from the annular lip 26 to the planar bottom surface 38.~~

~~10. The apparatus of claim 1 wherein said planar top surface and said planar bottom surface are contained in parallel planes separated by a thickness of said carrier plate, and said first annular surface and said second annular surface are separated by a distance that is less than said thickness of said carrier plate.~~

11. — The apparatus of claim 10 wherein said distance decreases with decreasing distance from a centerline of each of said first openings.