Claims

1. A wafer shipping system, comprising:

a plurality of wafer support rings (36), each wafer support ring (36) comprising: a flange portion (64) concentric about a central axis (62), said flange portion (64) including a first axial face (66) and a second axial face (68), said second axial face (68) being opposite said first axial face (66);

a ridge portion (70) that protrudes in an axial direction (74) parallel to said central axis (62) from said first axial face (66) of said flange portion (64);

the wafer shipping system being characterized in that it further comprises:

a structure defining a channel (90a) on said second axial face (68),

wherein a first wafer support ring (60a) of said plurality of wafer support rings (36) is stacked atop a second wafer support ring (60b) of said plurality of wafer support rings (36) such that a distal edge (75b) of said ridge portion (70b) of said second wafer support ring (60b) is registered within said channel (90a) of said first wafer support ring (60a), the first and second wafer support rings (60a, 60b) defining a gap (96) therebetween, said gap (96) being configured for containing a wafer (44) so that an axial force exerted on said first wafer support ring (60a) is transferred to said second wafer support ring (60b) without transferring force to said wafer (44).

2. The wafer shipping system of claim 1, wherein:

said channel (90) includes an inner radial wall (91) defining an inner radius (R,) relative to said central axis (62) and an outer radial wall (92) defining an outer radius (Ro)relative to said central axis (62);

said ridge portion (70) and said channel (90) of each of said plurality of wafer support rings (36) are axially aligned so that said ridge portion (70) is within said inner radius (R,) and said outer radius (Ro) defined by said channel (90).

3. The wafer shipping system of claim 1, wherein said channel (90) is continuous.

4. The wafer shipping system of claim 3, wherein said ridge portion (70) is continuous and surrounds said gap (96) defined between said first and second wafer support rings (60a, 60b) and wherein a substantially continuous band of contact is defined between said distal edge (75b) of said ridge portion (70) and said channel (90).

5. The wafer shipping system of claim 4, wherein said first axial face (66) of said flange portion (64) of each of said plurality of wafer support rings (36) includes a planar [registration] surface portion (76) that is radially inset from and adjacent to said ridge portion (70), said planar surface portion (76) defining a registration plane (78) for a wafer (44).

6. The wafer shipping system of claim 5, wherein:

said first wafer support ring (60a) is configured for engaging a first wafer (44) to provide a substantially continuous band of contact between said first wafer (44) and said planar surface portion (76) of said first wafer support ring (60a); and

said second wafer support ring (60b) is configured for engaging a second wafer (44) to provide a substantially continuous band of contact between said second wafer (44) and said planar surface portion (76) of said second wafer support ring (60b),

whereby said first wafer support ring (60a) and said second wafer support ring (60b) are configured for defining an enclosed void (99) when said first wafer (44) is disposed in said first wafer support ring (60a) and said second wafer (44) is disposed in said second wafer support ring (60b).

7. The wafer shipping system of any one of claims 1 - 6, comprising:

a receptacle portion (34); and

a cover portion (32) configured to provide closure of said receptacle portion (34),

wherein said plurality of wafer support rings (36) are arranged in a stack (38), said stack (38) being disposed in said receptacle portion (34), said cover portion (32) contacting said stack (38) when said cover portion (32) is in closure with said receptacle portion (34) to secure said stack (38) between said cover portion (32) and said receptacle portion (34).

8. The wafer shipping system of claim 5 or claim 6, comprising:

a receptacle portion (34); and

a cover portion (32) configured to provide closure of said receptacle portion (34), wherein said plurality of wafer support rings (36) are arranged in a stack (38), said stack (38) being seated on a base portion (55) of said receptacle portion (34), said cover portion (32) contacting said stack (38) when said cover portion (32) is in closure with said receptacle portion (34) to secure said stack (38) between said cover portion (32) and said base portion (55), and

wherein said stack (38) includes a lowermost wafer support ring (36z) that engages said base portion (55) of said receptacle portion (32) to define a substantially continuous band of contact (108) therebetween, said lowermost wafer support ring (36z) being configured for engaging a lowermost wafer (44z) to provide a substantially continuous band of contact (108) between said lowermost wafer (44z) and said planar surface portion (76) of said lowermost wafer support ring (36z),

whereby said lowermost wafer support ring (36z) and said base portion (55) are configured for defining an enclosed gas pocket (109) when said lowermost wafer (44z) is disposed in said lowermost wafer support ring (36z).

9. A wafer support ring, comprising:

a continuous flange portion (64) concentric about a central axis (62), said continuous flange portion (64) including a first axial face (66) and a second axial face (68), said second axial face (68) being opposite said first axial face (66);

a continuous ridge portion (70) that protrudes in an axial direction (74) parallel to said central axis (62) from said first axial face (66) of said continuous flange portion (64);

the wafer support ring being characterized in that it further comprises:

a structure defining a continuous channel (90) on said second axial face (68),

wherein said first axial face (66) of said continuous flange portion (64) includes a planar surface portion (76) that is radially inset from and adjacent to said continuous ridge portion (70), said planar surface portion (76) defining a registration plane (78) for a wafer

(44), said continuous ridge portion (70) being of a uniform axial dimension relative to said registration plane (78).

10. The wafer support ring of claim 9, wherein:

said continuous channel (90) includes an inner radial wall (91) defining an inner radius (R_i)relative to said central axis (62) and an outer radial wall (92) defining an outer radius (R_o) relative to said central axis (62); said continuous ridge portion (70) and said continuous channel (90) are axially aligned so that said continuous ridge portion (70) is within said inner radius (R_i) and said outer radius (R_o) defined by said continuous channel (90).

11. The wafer support ring of claim 10, wherein:

said continuous channel (90) presents a recessed axial face (93) extending radially between said inner radial wall (91) and said outer radial wall (92);

said flange portion (64) includes an axial thickness (95) defined between said recessed axial face (93) and said registration plane (78).

12. The wafer support ring of claim 9, wherein said continuous ridge portion (70) defines a uniform radial thickness.

13. The wafer support ring of claim 9, wherein said continuous ridge portion (70) defines a first radial thickness (114) and a second radial thickness (116), said second radial thickness (116) being greater than said first radial thickness (114).

14. The wafer support ring of claim 13, wherein said continuous ridge portion (70) includes a plurality of ridge sections (122), each ridge section including a first arc segment (124) of said first radial thickness (114), and a second arc segment (126) including said second radial thickness (116).

15. The wafer support ring of claim 13, wherein said continuous ridge portion (70) includes at least one transition (118) between said first radial thickness (114) and said second radial thickness (116), said at least one transition (118) being included in said second arc segment (126).