curvature of the wafers, and with an open top and open bottom such as the device disclosed in U.S. Patent 5,782,362 hereby fully incorporated herein by reference.

Recently, the semiconductor industry has begun using wafers having a very thin cross sectional dimension. The thickness of these thin silicon wafers can be as thin as 200 μm, in contrast with a typical conventional SEMI standard wafer thickness. Also, a thin germanium wafer thickness can be 125 μm. Thin wafers present unique design considerations, and cassette style shippers are unsatisfactory in several respects for use with the thinner wafers. Thin wafers can be considered any wafer thickness that is less than the SEMI standard nominal thickness for wafers.

Another characteristic of thin wafers is that they can be substantially more fragile and prone to physical damage than a standard wafer. A conventional wafer carrier having limited support for the wafer around the extreme periphery of the wafer, causes increased stresses during shock events. The stress created makes the wafer even more prone to physical damage from shock or vibration.

The edges of thin wafers can be very sharp, and are formed from very hard materials, like silicon and germanium. These sharp edges can get caught on the cushion when the cover is installed causing cross-slotting and potentially causing damage to the wafer. Additionally, thin wafers may cut through softer materials that come into contact with the peripheral edge of the wafer, for example the wafer carrier plastic material.

Although existing containers are designed to reduce the effects of physical shock which can damage thin and fragile wafers, wafer containers are needed with improved shock reducing properties. There is a need for a wafer carrier specifically designed to be suitable for use with very thin wafers, in particular to accommodate their increased fragility while maintaining low manufacturing cost.

One such improved container is disclosed in PCT Application Publication No. 2011/113033, which is hereby incorporated by reference. Although this container provides significant advantages over the previous art making it suitable for use with thin wafers, further enhancements for wafer protection are desirable.

SUMMARY OF THE INVENTION

According to a first aspect of the present invention, there is provided a wafer container for holding a spaced stack of wafers, the stack having an axis extending through the centers of the wafers, each wafer having a circular peripheral edge and a thickness, the container comprising: a base portion for receiving the stack of wafers, the base portion

having a plurality of walls defining an open interior and four of said walls defining an opening perimeter; a cover portion that cooperatively connects with the base portion to form a closed interior for containing the stack of wafers, the cover portion having an inside surface with attachment structure; a wafer cushion attached to the inside surface of the cover portion at the attachment structure, the wafer cushion having a length and a width, the length extending in a direction parallel to the axis of the stack of wafers, the wafer cushion comprising a pair of opposing side support structures and a central row of cantilevered wafer engaging finger portions extending from the opposing side support structures, each wafer engaging finger portion comprising a pair of legs extending from one of the two side support structures, the pair of legs extending to a mid-portion of the wafer engaging finger portion, the two legs joining at the mid-portion, the wafer engaging finger portion having a distal portion comprising a wafer engaging pad; and wherein each pair of legs of each wafer engaging finger portion defines a width and said width is a maximum width of the respective wafer engaging finger.

According to a second aspect of the present invention, there is provided a wafer container for holding a spaced stack of wafers, the stack having an axis extending through the centers of the wafers, each wafer having a circular peripheral edge and a thickness, the container comprising: a base portion for receiving the stack of wafers, the base portion having a plurality of walls defining an open interior and four of said walls defining an opening perimeter; a cover portion that cooperatively connects with the base portion to form a closed interior for containing the stack of wafers, the cover portion having an inside surface with attachment structure; a wafer cushion attached to the inside surface of the cover portion at the attachment structure, the wafer cushion having a length and a width, the length extending in a direction parallel to the axis of the stack of wafers, the wafer cushion comprising generally rectangular support structure defining a central elongate cushion window with a pair of opposing side support structures, a central row of cantilevered wafer engaging finger portions extending from the opposing side support structures down lengthwise in the window, each wafer engaging finger portion for engaging a single one of the stack of wafers, each wafer engaging finger portion comprising a pair of legs extending from one of the two side support structures, the pair of legs extending to a mid-portion of the wafer engaging finger portion, the two legs joining at the midportion, the wafer engaging finger portion having a distal portion comprising a wafer engaging pad; wherein each of the finger portions has a flared distal end that is positioned adjacent a narrowed portion of an adjacent finger portion.

According to a third aspect of the present invention, there is provided a wafer container for holding a spaced stack of wafers, the stack having an axis extending through the centers of the wafers, each wafer having a circular peripheral edge and a thickness, the container comprising: a base portion for receiving the stack of wafers, the base portion having a plurality of walls defining an open interior and four of said walls defining an opening perimeter; a cover portion that cooperatively connects with the base portion to form a closed interior for containing the stack of wafers, the cover portion having an inside surface with attachment structure; a wafer cushion attached to the inside surface of the cover portion at the attachment structure, the wafer cushion having a length and a width, the length extending in a direction parallel to the axis of the stack of wafers, the wafer cushion comprising generally rectangular support structure defining a central elongate cushion window with a pair of opposing side support structures, a central row of cantilevered wafer engaging finger portions extending from the opposing side support structures down lengthwise in the window, each wafer engaging finger portion for engaging a single one of the stack of wafers, each wafer engaging finger portion comprising a pair of legs extending from one of the two side support structures, the pair of legs extending to a mid-portion of the wafer engaging finger portion, the two legs joining at the midportion, the wafer engaging finger portion having a distal portion comprising a wafer engaging pad; wherein each pair of legs of each wafer engaging finger defines a width and said width is a maximum width of the respective wafer engaging finger.

According to a fourth aspect of the present invention, there is provided a wafer container for holding a spaced stack of wafers, the stack having an axis extending through the centers of the wafers, each wafer having a circular peripheral edge and a thickness, the container comprising: a base portion for receiving the stack of wafers, the base portion having a plurality of walls defining an open interior and four of said walls defining an opening perimeter; a cover portion that cooperatively connects with the base portion to form a closed interior for containing the stack of wafers, the cover portion having an inside surface with attachment structure; a wafer cushion attached to the inside surface of the cover portion at the attachment structure, the wafer cushion having a length and a width, the length extending in a direction parallel to the axis of the stack of wafers, the wafer cushion comprising generally rectangular support structure defining a central elongate cushion window with a pair of opposing side support structures, a central row of cantilevered wafer engaging finger portions extending from the opposing side support structures down lengthwise in the window, each wafer engaging finger portion for

engaging a single one of the stack of wafers, each wafer engaging finger portion comprising a pair of legs extending from one of the two side support structures, the pair of legs extending to a mid-portion of the wafer engaging finger portion, the two legs joining at the midportion, the wafer engaging finger portion having a distal portion comprising a wafer engaging pad; wherein the wafer cushion comprises a pair of ribbed sections on opposing sides of the central row of wafer engaging finger portions and wherein each ribbed section comprising a plurality of slots and each slot having a bottom seating region for seating one of the wafers therein, each bottom seating region having a curvature and a pair of ends, each of the ends having a flare whereby the seating region flares outwardly at the ends.

According to a fifth aspect of the present invention, there is provided a wafer container for holding a spaced stack of thin wafers having a diameter of one of 100mm and 150mm, and a thickness of 200 μm or less, the stack having an axis extending through the centers of the wafers, each wafer having a circular peripheral edge and a thickness, the container comprising: a H-bar carrier with a plurality of slots for the stack of wafers, the slots defining a wafer pitch, a base portion for receiving the H-bar wafer carrier therein with the stack of wafers, the base portion having a bottom wall upon which the H-bar wafer carrier seats and attachment structure, a base wafer cushion attached at the bottom wall positioned below the H-bar carrier, the wafer cushion having a plurality of ribs defining a plurality of slots corresponding to and aligned with the slots of the H-bar carrier, each slot having a bottom seating region for seating one of the wafers therein, each bottom seating region of each slot having a curvature and a pair of ends, a cover portion that cooperatively connects with the base portion to form a closed interior for enclosing the H-bar carrier with the stack of wafers, the cover portion having an uppermost wall with attachment structure thereon, and a cover wafer cushion secured to the attachment structure and defining slots corresponding with the slots in the H-bar carrier, the cover wafer cushion having a pair of side support structures with a row of cantilevered wafer engaging finger portions extending from the side supports, each wafer engaging finger portion for engaging a wafer, each wafer engaging finger portion comprising a pair of legs extending from one of the two side support structures, and having a distal portion comprising a wafer engaging pad, and wherein each pair of legs of each wafer engaging finger defines a width where the pair of legs connect to the respective side support structure and said width is a maximum width of the respective wafer engaging finger.

According to a sixth aspect of the present invention, there is provided a wafer container for holding a spaced stack of thin wafers, the stack having an axis extending through the centers of the wafers in a y direction of an x-y-z coordinate system, each wafer having a circular peripheral edge and a thickness, the container comprising: a plurality of teethed sections defining slots for the stack of wafers, the slots defining a wafer pitch, the wafers received in the plurality of teeth in the z direction of the x-y-z coordinate system, a base portion having a base wall with attachment structure, a base wafer cushion attached at the base wall the wafer cushion having a plurality of ribs defining a plurality of slots each slot having a base seating region for seating one of the wafers therein, each bottom seating region of each slot having a curvature and a pair of ends, a cover portion that cooperatively connects with the base portion in the z direction, to form a closed interior for enclosing the stack of wafers, the cover portion having a wall with attachment structure thereon, a cover wafer cushion secured to the attachment structure and defining slots corresponding with the slots in the base seating cushion, the cover wafer cushion having a pair of side support portions with a row of cantilevered wafer engaging finger portions extending from the side support portions, each wafer engaging finger portion for engaging a wafer, each wafer engaging finger portion comprising a pair of legs extending from one of the two side support portions, and having a distal portion comprising a wafer engaging pad, and wherein each pair of legs of each wafer engaging finger portion defines a width where the pair of legs connect to the respective side support portion and said width is a maximum width of the respective wafer engaging finger.

The invention as depicted is an embodiment of an improved wafer container for use in transporting, storing or processing thin data semiconductor wafers or other thin substrates. Wafer container includes a cassette portion placed into a two-piece container portion for transport. This container portion comprises a top cover which attaches to a bottom cover with a juncture at about the middle of the cassette. Each of the top cover and

rotation of the elongate finger whilst not affecting or reducing the resistance to forces in the direction of the wafer engagement, the z direction.

A feature and advantage of embodiments of the present invention is wafer slots in bottom cushion that include a flared portion at the ends of slots. As each slot approaches the edge of the cushion, the slot flares outwardly at an angle to provide a wider surface between adjacent wafer engagement ribs that define the slot. Flared portion can define a generally Y-shaped configuration between adjacent ribs at the end of slots. The wider end surface provided by flared portion can help guide the wafer into the slot to prevent cross slotting and also results in a sturdier cushion that provides more stable wafer support. The gradual flare compared to the more abrupt ending of the ribs of a conventional slot allows for support of a flexed wafer that has some flex right at the end of the slot, this provides greater shock protection that the conventional abrupt slot termination. The portion of the wafer that bends is essentially spread out over a greater circumferential length of the wafer reducing the stress on the wafer at the end of the slot. The flared slot portion may begin its flaring at a distance from the end of the ribs at least about the distance between adjacent ribs, or the ptich. The ribs and slots of the upper wafer cushion may also have the flared portion.

Additional ~~objects~~embodiments, advantages, and novel features of the invention will be set forth in part in the description which follows, and in part will become apparent to those skilled in the art upon examination of the following or may be learned by practice of the invention. The ~~objects~~embodiments and advantages of the invention may be realized and attained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a wafer shipper according to an embodiment of the present invention.

Figure 2 is an exploded view of a wafer shipper according to an embodiment of the present invention.

Figure 3 is a cross sectional view of the wafer shipper of Figure 1.

Figure 4 is a top perspective view of a portion of a wafer shipper according to an embodiment of the present invention.

Figure 5 is a bottom perspective view of the portion of the wafer shipper of Figure 4.

Claims

1. A wafer container for holding a spaced stack of wafers, the stack having an axis extending through the centers of the wafers, each wafer having a circular peripheral edge and a thickness, the container comprising:

a base portion for receiving the stack of wafers, the base portion having a plurality of walls defining an open interior and four of said walls defining an opening perimeter;

a cover portion that cooperatively connects with the base portion to form a closed interior for containing the stack of wafers, the cover portion having an inside surface with attachment structure;

a wafer cushion attached to the inside surface of the cover portion at the attachment structure, the wafer cushion having a length and a width, the length extending in a direction parallel to the axis of the stack of wafers, the wafer cushion comprising generally rectangular support structure defining a central elongate cushion window with a pair of opposing side support structures, a central row of wafer engaging finger portions extending from the opposing side support structures down lengthwise in the window, each wafer engaging finger portion for engaging a single one of the stack of wafers, each wafer engaging finger portion comprising a pair of legs extending from one of the two side support structures, the pair of legs extending to a mid-portion of the wafer engaging finger portion, the wafer engaging finger portion having a distal portion comprising a wafer engaging pad.

2. The wafer container of claim 1 wherein each wafer engaging pad is flared toward a distal tip.

3. The wafer container of claim 1 or 2 wherein each finger portion extends from the side support opposite that of an adjacent finger portion.

4. The wafer container of claim 1 or 2 wherein each side support structure is integral to a row of ribs defining a row of slots, each slot having an associated finger portion.

5. The wafer container of any one of claim 1 or 2, wherein each of the finger portions has a flared distal end that is positioned adjacent a narrowed portion of an adjacent finger portion.

6. The wafer container of any one of claim 1 or 2, further comprising a H-bar carrier seated in the base portion and a base wafer cushion positioned below the H-bar carrier.

7. The wafer container of claim 6 wherein the base wafer cushion has a plurality of ribs defining a plurality of slots, each of the slots being defined by a bottom seating strip for seating one of the spaced stack of wafers, the bottom seating strip expanding at each of two ends of each slot providing a flare at each end.

8. The wafer container of any of claim 1 or 2, wherein the wafer cushion comprises a pair of ribbed sections on opposing sides of the central row of wafer engaging finger portions.

9. The wafer container of claim 8 wherein each ribbed section comprising a plurality of slots and each slot having a bottom seating region for seating one of the wafers therein, each bottom seating region having a curvature and a pair of ends, each of the ends having a flare whereby the seating region flares outwardly at the ends.

10. A wafer container for holding a spaced stack of thin wafers in combination with the stack of thin wafers, the wafers having a diameter of one of 100mm and 150mm, and a thickness of 200 μm or less, the stack having an axis extending through the centers of the wafers, each wafer having a circular peripheral edge and a thickness, the container comprising:

an H-bar carrier with a plurality of slots for the stack of wafers, the slots defining a wafer pitch,

a base portion for receiving the H-bar wafer carrier therein with the stack of wafers, the base portion having a bottom wall upon which the H-bar wafer carrier seats and attachment structure,

a base wafer cushion attached at the bottom wall positioned below the H-bar carrier, the wafer cushion having a plurality of ribs defining a plurality of slots corresponding to and aligned with the slots of the H-bar carrier, each slot having a bottom seating region for seating one of the wafers therein, each bottom seating region of each

slot having a curvature and a pair of ends, each of the ends having a flare whereby the seating region flares outwardly at the ends,

a cover portion that cooperatively connects with the base portion to form a closed interior for enclosing the H-bar carrier with the stack of wafers, the cover portion having an uppermost wall with attachment structure thereon, and

a cover wafer cushion secured to the attachment structure and defining slots corresponding with the slots in the H-bar carrier, the cover wafer cushion having a row of wafer engaging finger portions.

11. The combination of the wafer container and stack of thin wafers of claim 10 wherein the flare at the two ends of the slots in the base wafer cushion commences from the end of the slot a distance of at least about the wafer pitch.

12. The combination of the wafer container and stack of thin wafers of claim 10 wherein the cover wafer cushion has a pair of support portions defining a wafer cushion window and wherein the row of wafer cushions extend into said window from said pair of support portions, and wherein each finger portion has a proximal portion, a mid portion, and a distal portion, and wherein each distal portion comprises two legs.

13. The combination of the wafer container and stack of thin wafers of one of claim 10, 11, and 12, wherein each finger portion extends from a support portion in a direction opposite to that of an adjacent finger portion.

14. The combination of the wafer container and stack of thin wafers of one of claim 10, 11, and 12 wherein each of the finger portions has a narrowed portion in the direction parallel to the axis of the stack of wafers and said narrowed portion is positioned next to a flared portion of an adjacent finger portion, the flared portion flared in a direction parallel to the axis of the stack of wafers..

15. The combination of the wafer container and stack of thin wafers of any one of claim 10 through 12 wherein each of the finger portions has a distal portion with a distal tip and with a slot for engaging a wafer, and each of the distal portions being flared in the direction toward the wafers with the maximum flare at or adjacent the distal tip.

16. The combination of the wafer container and stack of thin wafers of any one of claim 10 through 12 wherein each of the finger portions has a proximal portion, a mid portion and a distal portion, and wherein each of the finger portions having an S-shape with the proximal portion having a concave curvature facing the wafers and the distal portion having a convex curvature facing the wafers.

17. The combination or container of any one of the above claims 1-16 wherein each of the finger portions has a width in the direction parallel to the axis of the stack of wafers and the widest portion of each finger portion is positioned at the juncture of the finger portion with the support portion from which it extends.

18. The combination or container of claim 17 wherein the finger portion has two legs at the juncture of the finger portion and the support portion.

19. Any one of the above claims wherein each of the finger portions is cantilevered from the support portion from which said finger portion extends.

20. Any one of the above claims wherein each of the finger portions has a flex direction toward and away from the wafers the finger portion engages and wherein each finger portion tapers from the juncture of the finger portion to a neck portion, the taper in a direction transverse to the direction of flexing of each of the finger portions, and wherein each of the finger portions tapers from a distal portion to the neck portion, the taper also in the direction transverse to the direction of flexing of each of the finger portions.

21. Any one of the above claims wherein the finger portion has a bow tie shape when viewed from the front of the wafer cushion.

22. Any one of claims 1 through 9 wherein the wafer container is in combination with a stack of thin wafers in combination with the stack of thin wafers, the wafers having a diameter of one of 100mm and 150mm, and a thickness of about 200 μm or less.

23. A wafer container for holding a spaced stack of thin wafers, the stack having an axis extending through the centers of the wafers in a y direction of an x-y-z coordinate system, each wafer having a circular peripheral edge and a thickness, the container comprising:

a plurality of teethed sections defining slots for the stack of wafers, the slots defining a wafer pitch, the wafers received in the plurality of teeth in the z direction of the x-y-z coordinate system,

a base portion having a base wall with attachment structure,

a base wafer cushion attached at the base wall the wafer cushion having a plurality of ribs defining a plurality of slots each slot having a base seating region for seating one of the wafers therein, each bottom seating region of each slot having a curvature and a pair of ends,

a cover portion that cooperatively connects with the base portion in the z direction, to form a closed interior for enclosing the stack of wafers, the cover portion having an wall with attachment structure thereon,

a cover wafer cushion secured to the attachment structure and defining slots corresponding with the slots in the base seating cushion, the cover wafer cushion having a row of wafer engaging finger portions.

24. The wafer container of claim 23 wherein each of the ends of each of the slots in the base wafer having a flare whereby the seating region flares outwardly at the ends, the flare being in the z direction.

25. The wafer container of claim 23 wherein the flare at the two ends of the slots in the base wafer cushion commences from the end of the slot a distance of at least about the wafer pitch.

26. The wafer container of one of claim 23 to 25 wherein the cover wafer cushion has a pair of support portions defining a wafer cushion window and wherein the row of wafer cushions extend into said window from said pair of support portions, and wherein each finger portion has a proximal portion, a mid portion, and a distal portion, and wherein each distal portion comprises two legs, the two legs extending in the x direction.

27. The wafer container of one of claim 23 to 25 wherein each finger portion extends from a support portion in a direction opposite to that of an adjacent finger portion.

28. The wafer container of one of claim 23 to 25, wherein each of the finger portions has a narrowed portion in the direction parallel to the axis of the stack of wafers and said narrowed portion is positioned next to a flared portion of an adjacent finger portion, the flared portion flared in the y direction, the direction parallel to the axis of the stack of wafers.

29. The wafer container of one of claim 23 to 25 wherein each of the finger portions has a distal portion with a distal tip and with a slot for engaging a wafer, and each of the distal portions being flared in the z direction toward the wafers with the maximum flare at or adjacent the distal tip.

30. The wafer container of one of claim 23 to 25, wherein each of the finger portions has a proximal portion, a mid portion and a distal portion, and wherein each of the finger portions having an S-shape with the proximal portion having a concave curvature facing the wafers and the distal portion having a convex curvature facing the wafers.

31. The wafer container of one of claim 23 to 25, wherein each of the finger portions has a width in the y direction, parallel to the axis of the stack of wafers, and the widest portion of each finger portion is positioned at the juncture of the finger portion with the support portion from which the finger portion extends.

32. The wafer container of one of claim 23 to 25, wherein the finger portion has two legs at the juncture of the finger portion and the support portion.

33. The wafer container of one of claim 23 to 25, wherein each of the finger portions is cantilevered from the support portion from which said finger portion extends.

34. The wafer container of one of claim 23 to 25, wherein each of the finger portions has a flex direction in the z direction and wherein each finger portion tapers from the juncture of the finger portion to a neck portion, the taper in the y direction, and wherein

each of the finger portions tapers from a distal portion to the neck portion, the taper in the y direction.

35. The wafer container of one of claim 23 to 25 wherein the finger portion has a bow tie shape when viewed from the front of the wafer cushion.

36. The wafer container of one of claim 23 to 25 wherein each of the finger portion has a Y- shape when viewed from the front of the wafer cushion, the two upper legs of the Y extending from the support portion and the lower leg of the Y cantilevered outwardly and including wafer engagement pad.

37. The wafer container of one of claim 23 to 25, wherein the wafer container is in combination with a stack of thin wafers in combination with the stack of thin wafers, the wafers having a diameter of one of 100mm and 150mm, and a thickness of about 200 μm or less.

38. The wafer container of one of claim 23 to 25 wherein the flaring is the thinning of the rib in the y direction as the end of the rib is approached,

39. The wafer container of claim 38 wherein the thinning comprises a taper, and the taper starts at about a distance, at least, a pitch distance from the end of the rib.

40. The wafer container of one of claim 23 to 25 wherein the flaring is the decrease of the angle between adjacent inclined rib surfaces defining a slot as the end of the rib is approached.

41. The wafer container of claim 40 wherein the decrease in angle defined by adjacent rib inclined surfaces starts at about a distance, at least, a pitch distance from the end of the rib.

Claims:

1. A wafer container for holding a spaced stack of wafers, the stack having an axis extending through the centers of the wafers, each wafer having a circular peripheral edge and a thickness, the container comprising:

a base portion for receiving the stack of wafers, the base portion having a plurality of walls defining an open interior and four of said walls defining an opening perimeter;

a cover portion that cooperatively connects with the base portion to form a closed interior for containing the stack of wafers, the cover portion having an inside surface with attachment structure;

a wafer cushion attached to the inside surface of the cover portion at the attachment structure, the wafer cushion having a length and a width, the length extending in a direction parallel to the axis of the stack of wafers, the wafer cushion comprising a pair of opposing side support structures and a central row of cantilevered wafer engaging finger portions extending from the opposing side support structures, each wafer engaging finger portion comprising a pair of legs extending from one of the two side support structures, the pair of legs extending to a mid-portion of the wafer engaging finger portion, the two legs joining at the mid-portion, the wafer engaging finger portion having a distal portion comprising a wafer engaging pad; and

wherein each pair of legs of each wafer engaging finger portion defines a width and said width is a maximum width of the respective wafer engaging finger.

2. The wafer container of claim 1 wherein each wafer engaging pad is flared toward a distal tip, and wherein the two legs, the mid-portion and the wafer engaging portion have a bow tie shape.

3. The wafer container of claim 1 wherein each finger portion extends from the side support opposite that of an adjacent finger portion and wherein all of the finger portions are in vertical alignment.

4. The wafer container of claim 1 wherein each side support structure is integral to a row of ribs defining a row of slots, each slot having an associated finger portion.

5. A wafer container for holding a spaced stack of wafers, the stack having an axis extending through the centers of the wafers, each wafer having a circular peripheral edge and a thickness, the container comprising:

a base portion for receiving the stack of wafers, the base portion having a plurality of walls defining an open interior and four of said walls defining an opening perimeter;

a cover portion that cooperatively connects with the base portion to form a closed interior for containing the stack of wafers, the cover portion having an inside surface with attachment structure;

a wafer cushion attached to the inside surface of the cover portion at the attachment structure, the wafer cushion having a length and a width, the length extending in a direction parallel to the axis of the stack of wafers, the wafer cushion comprising generally rectangular support structure defining a central elongate cushion window with a pair of opposing side support structures, a central row of cantilevered wafer engaging finger portions extending from the opposing side support structures down lengthwise in the window, each wafer engaging finger portion for engaging a single one of the stack of wafers, each wafer engaging finger portion comprising a pair of legs extending from one of the two side support structures, the pair of legs extending to a mid-portion of the wafer engaging finger portion, the two legs joining at the midportion, the wafer engaging finger portion having a distal portion comprising a wafer engaging pad;

wherein each of the finger portions has a flared distal end that is positioned adjacent a narrowed portion of an adjacent finger portion.

6. The wafer container of claim 1, further comprising a H-bar carrier seated in the base portion and a base wafer cushion positioned below the H-bar carrier.

7. The wafer container of claim 6 wherein the base wafer cushion has a plurality of ribs defining a plurality of slots, each of the slots being defined by a bottom seating strip for seating one of the spaced stack of wafers, the bottom seating strip expanding at each of two ends of each slot providing a flare at each end.

8. A wafer container for holding a spaced stack of wafers, the stack having an axis extending through the centers of the wafers, each wafer having a circular peripheral edge and a thickness, the container comprising:

a base portion for receiving the stack of wafers, the base portion having a plurality of walls defining an open interior and four of said walls defining an opening perimeter;

a cover portion that cooperatively connects with the base portion to form a closed interior for containing the stack of wafers, the cover portion having an inside surface with attachment structure;

a wafer cushion attached to the inside surface of the cover portion at the attachment structure, the wafer cushion having a length and a width, the length extending in a direction parallel to the axis of the stack of wafers, the wafer cushion comprising generally rectangular support structure defining a central elongate cushion window with a pair of opposing side support structures, a central row of cantilevered wafer engaging finger portions extending from the opposing side support structures down lengthwise in the window, each wafer engaging finger portion for engaging a single one of the stack of wafers, each wafer engaging finger portion comprising a pair of legs extending from one of the two side support structures, the pair of legs extending to a mid-portion of the wafer engaging finger portion, the two legs joining at the midportion, the wafer engaging finger portion having a distal portion comprising a wafer engaging pad;

wherein each pair of legs of each wafer engaging finger defines a width and said width is a maximum width of the respective wafer engaging finger.

9. A wafer container for holding a spaced stack of wafers, the stack having an axis extending through the centers of the wafers, each wafer having a circular peripheral edge and a thickness, the container comprising:

a base portion for receiving the stack of wafers, the base portion having a plurality of walls defining an open interior and four of said walls defining an opening perimeter;

a cover portion that cooperatively connects with the base portion to form a closed interior for containing the stack of wafers, the cover portion having an inside surface with attachment structure;

a wafer cushion attached to the inside surface of the cover portion at the attachment structure, the wafer cushion having a length and a width, the length extending in a direction parallel to the axis of the stack of wafers, the wafer cushion comprising generally rectangular support structure defining a central elongate cushion window with a pair of opposing side support structures, a central row of cantilevered wafer engaging finger portions extending from the opposing side support structures down lengthwise in the window, each wafer engaging finger portion for engaging a single one of the stack of wafers, each wafer engaging finger portion comprising a pair of legs extending from one of the two side support structures, the pair of legs extending to a mid-portion of the wafer engaging finger portion, the two legs joining at the midportion, the wafer engaging finger portion having a distal portion comprising a wafer engaging pad;

wherein the wafer cushion comprises a pair of ribbed sections on opposing sides of the central row of wafer engaging finger portions and wherein each ribbed section comprising a plurality of slots and each slot having a bottom seating region for seating one of the wafers therein, each bottom seating region having a curvature and a pair of ends, each of the ends having a flare whereby the seating region flares outwardly at the ends.

10. A wafer container for holding a spaced stack of thin wafers having a diameter of one of 100mm and 150mm, and a thickness of 200 μm or less, the stack having an axis extending through the centers of the wafers, each wafer having a circular peripheral edge and a thickness, the container comprising:

a H-bar carrier with a plurality of slots for the stack of wafers, the slots defining a wafer pitch,

a base portion for receiving the H-bar wafer carrier therein with the stack of wafers, the base portion having a bottom wall upon which the H-bar wafer carrier seats and attachment structure,

a base wafer cushion attached at the bottom wall positioned below the H-bar carrier, the wafer cushion having a plurality of ribs defining a plurality of slots corresponding to and aligned with the slots of the H-bar carrier, each slot having a bottom seating region for seating one of the

wafers therein, each bottom seating region of each slot having a curvature and a pair of ends, a cover portion that cooperatively connects with the base portion to form a closed interior for enclosing the H-bar carrier with the stack of wafers, the cover portion having an uppermost wall with attachment structure thereon, and

a cover wafer cushion secured to the attachment structure and defining slots corresponding with the slots in the H-bar carrier, the cover wafer cushion having a pair of side support structures with a row of cantilevered wafer engaging finger portions extending from the side supports, each wafer engaging finger portion for engaging a wafer, each wafer engaging finger portion comprising a pair of legs extending from one of the two side support structures, and having a distal portion comprising a wafer engaging pad, and wherein each pair of legs of each wafer engaging finger defines a width where the pair of legs connect to the respective side support structure and said width is a maximum width of the respective wafer engaging finger.

11. The combination of the wafer container and stack of thin wafers of claim 10 wherein the cover wafer cushion has a pair of support portions defining a wafer cushion window and wherein the row of wafer cushions extend into said window from said pair of support portions, and wherein each finger portion has a proximal portion, a mid portion, and a distal portion, and wherein each distal portion comprises two legs.

12. The wafer container and stack of thin wafers of claim 10, wherein each finger portion extends from a support portion in a direction opposite to that of an adjacent finger portion.

13. The wafer container and stack of thin wafers of claim 12 wherein each of the finger portions has a narrowed portion in the direction parallel to the axis of the stack of wafers and said narrowed portion is positioned next to a flared portion of an adjacent finger portion, the flared portion flared in a direction parallel to the axis of the stack of wafers..

14. The wafer container and stack of thin wafers of any one of claim 10 or 11 wherein each of the finger portions has a distal portion with a distal tip and with a slot for engaging a wafer, and each of the distal portions being flared in the direction toward the wafers with the maximum flare at or adjacent the distal tip.

15. The combination of the wafer container and stack of thin wafers of claim 10 wherein each of the finger portions has a proximal portion, a mid portion and a distal portion, and wherein each of the finger portions having an S-shape with the proximal portion having a concave curvature facing the wafers and the distal portion having a convex curvature facing the wafers.

16. The wafer container of claim 10 wherein each of the finger portions has a flex direction toward and away from the wafers the finger portion engages and wherein each finger portion tapers from the juncture of the finger portion to a neck portion, the taper in a direction transverse to the direction of flexing of each of the finger portions, and wherein each of the finger portions tapers from a distal portion to the neck portion, the taper also in the direction transverse to the direction of flexing of each of the finger portions.

17. The wafer container of claim 10 wherein each finger portion has a bow tie shape when viewed from the front of the wafer cushion.

18. The wafer container of claim 10 wherein the wafer container is in combination with the stack of thin wafers, the wafers having a diameter of one of 100mm and 150mm, and a thickness of about 200 μm or less.

19. A wafer container for holding a spaced stack of thin wafers, the stack having an axis extending through the centers of the wafers in a y direction of an x-y-z coordinate system, each wafer having a circular peripheral edge and a thickness, the container comprising:

a plurality of teethed sections defining slots for the stack of wafers, the slots defining a wafer pitch, the wafers received in the plurality of teeth in the z direction of the x-y-z coordinate system,

a base portion having a base wall with attachment structure,

a base wafer cushion attached at the base wall the wafer cushion having a plurality of ribs defining a plurality of slots each slot having a base seating region for seating one of the wafers therein, each bottom seating region of each slot having a curvature and a pair of ends,

a cover portion that cooperatively connects with the base portion in the z direction, to form a closed interior for enclosing the stack of wafers, the cover portion having a wall with attachment structure thereon,

a cover wafer cushion secured to the attachment structure and defining slots corresponding with the slots in the base seating cushion, the cover wafer cushion having a pair of side support portions with a row of cantilevered wafer engaging finger portions extending from the side support portions, each wafer engaging finger portion for engaging a wafer, each wafer engaging finger portion comprising a pair of legs extending from one of the two side support portions, and having a distal portion comprising a wafer engaging pad, and wherein each pair of legs of each wafer engaging finger portion defines a width where the pair of legs connect to the respective side support portion and said width is a maximum width of the respective wafer engaging finger.

20. The wafer container of claim 19 wherein each of the ends of each of the slots in the base wafer cushion have a flare whereby the seating region flares outwardly at the ends, the flare being in the z direction.

21. The wafer container of claim 19 wherein the pair of side support portions define a wafer cushion window and wherein the wafer engaging finger portions extend into said window from said pair of side support portions.