Claims:

1. A device for holding a wafer-shaped article, comprising clamping elements adapted to contact a peripheral edge of a wafer-shaped article, said clamping elements being biased toward a closed position by an actuating mechanism that engages said clamping elements, and at least one damping mechanism configured to contact said actuating mechanism as said clamping elements are moved toward said closed position, thereby to control a force with which said clamping elements impact the wafer edge when moving to the closed position, and wherein the clamping elements are a series of pins that are conjointly movable from an outer open position in which the pins do not contact a wafer-shaped article to said closed position.

2. A device for holding a wafer-shaped article, comprising clamping elements adapted to contact a peripheral edge of a wafer-shaped article, said clamping elements being biased toward a closed position by an actuating mechanism that engages said clamping elements, and at least one damping mechanism configured to contact said actuating mechanism as said clamping elements are moved toward said closed position, thereby to control a force with which said clamping elements impact the wafer edge when moving to the closed position, and wherein said device is a spin chuck in a process module for single wafer wet processing.

3. The device according to claim 1, wherein the pins are arranged in a circular series, and each pin projects upwardly from a respective pivotal base along an axis parallel to and offset from a pivot axis of said pivotal base.

4. The device according to claim 4, wherein said actuating mechanism comprises a common gear ring in meshing engagement with gear teeth formed on each pivotal base.

5. The device according to claim 5, wherein said damping mechanism is connected to the common gear ring and a body of said device so as to damp relative motion therebetween.

6. The device according to claim 1, wherein said damping mechanism comprises a housing affixed to a body of said device and a rod projecting from said housing and urged outwardly from said housing, the rod being positioned so as to contact said actuating mechanism, such that relative motion in a first direction between the body and the actuating mechanism forces the rod inwardly of the housing against the action of a bias-exerting mechanism of said actuating mechanism.

7. The device according to claim 7, wherein the bias-exerting mechanism is a coil spring.

8. The device according to claim 7, wherein the bias-exerting mechanism is an elastic strip or membrane.

9. The device according to claim 1, wherein the damping mechanism is configured such that the clamping elements have a closing velocity not greater than 1 cm/s (0.01 m/s).

10. The device according to claim 1, wherein the damping mechanism comprises a linear dashpot having a damping coefficient (force per velocity) in the range of 2 - 200 Ns/m.

11. The device according to claim 1, wherein the damping mechanism comprises a rotary dashpot having a damping coefficient (torque per angular velocity) in the range of 0.07 - 7 Nms/rad.

12. The device according to claim 5, wherein the damping mechanism is configured such that the overall damping coefficient acting on the common gear ring is in the range of 0.07 - 7 Nms/rad (torque per angular velocity).

13. A device for holding a wafer-shaped article, comprising clamping elements adapted to contact a peripheral edge of a wafer-shaped article, said clamping elements being biased toward a closed position by an actuating mechanism that engages said

clamping elements, and at least one damping mechanism configured to contact said actuating mechanism as said clamping elements are moved toward said closed position, thereby to control a force with which said clamping elements impact the wafer edge when moving to the closed position, and wherein said actuating mechanism comprises a ring gear that drives said clamping elements.

14. The device according to claim 1, wherein said device is a spin chuck in a process module for single wafer wet processing.

15. The device according to claim 1, wherein said actuating mechanism comprises a ring gear that drives said clamping elements.

16. The device according to claim 3, wherein the clamping elements are a series of pins that are conjointly movable from an outer open position in which the pins do not contact a wafer-shaped article to said closed position.

17. The device according to claim 3, wherein said actuating mechanism comprises a ring gear that drives said clamping elements.

18. The device according to claim 13, wherein the clamping elements are a series of pins that are conjointly movable from an outer open position in which the pins do not contact a wafer-shaped

article to said closed position.

19. The device according to claim 13, wherein said device is a spin chuck in a process module for single wafer wet processing.

Claims

[Claim 0001] A device for holding a wafer-shaped article, comprising clamping elements adapted to contact a peripheral edge of a wafer-shaped article, said clamping elements being biased toward a closed position, and at least one damping mechanism that controls a force with which said clamping elements impact the wafer edge when moving to the closed position.

[Claim 0002] The device according to claim 1, wherein the clamping elements are a series of pins that are conjointly movable from an outer open position in which the pins do not contact a wafer-shaped article to said closed position.

[Claim 0003] The device according to claim 1, wherein said device is a spin chuck in a process module for single wafer wet processing.

[Claim 0004] The device according to claim 2, wherein the pins are arranged in a circular series, and each pin projects upwardly from a respective pivotal base along an axis parallel to and offset from a pivot axis of said pivotal base.

[Claim 0005] The device according to claim 4, further comprising a common gear ring in meshing engagement with gear teeth formed on each pivotal base.

[Claim 0006] The device according to claim 5, wherein said damping mechanism is connected to the common gear ring and a body of said device so as to damp relative motion therebetween.

[Claim 0007] The device according to claim 1, wherein said damping mechanism comprises a housing affixed to a body of said device and a rod projecting from said housing and urged outwardly from said housing, the rod being positioned so as to contact an actuating mechanism for the clamping elements, such that relative motion in a first direction between the body and the actuating mechanism forces the rod inwardly of the housing against the action of a bias-exerting mechanism.

[Claim 0008] The device according to claim 7, wherein the bias-exerting mechanism is a coil spring.

[Claim 0009] The device according to claim 7, wherein the bias-exerting mechanism is an elastic strip or membrane.

[Claim 0010] The device according to claim 1, wherein the damping mechanism is configured such that the clamping elements have a closing velocity not greater than 1 cm/s (0.01 m/s).

[Claim 0011] The device according to claim 1, wherein the damping mechanism comprises a linear dashpot having a damping coefficient (force per velocity)in the range of 2 – 200 Ns/m.

[Claim 0012] The device according to claim 1, wherein the damping mechanism comprises a rotary dashpot having a damping coefficient (torque per angular velocity) in the range of 0.07 – 7 Nms/rad.

[Claim 0013] The device according to claim 5, wherein the damping mechanism is configured such that the overall damping coefficient acting on the common gear ring is in the range of 0.07 – 7 Nms/rad (torque per angular velocity)