

Technical Field

The present invention belongs to the technical field of isolation and protection of wafers, and more specifically relates to a wafer supporting structure.

Background Art

A tensioning frame is a product specialized for wafer protection. The wafer is usually placed in the middle of the tensioning frame, and is connected to the tensioning frame by using specialized thin films provided at its two sides.

Nowadays, the tensioning frame is seldom being properly protected inside a container. A conventional wafer is a thin circular piece. Supporting platform is not provided. Therefore, it is disadvantageous during packaging and transportation of the tensioning frame containing the wafer at least in the following aspects:

1. The tensioning frame is easily subject to impact which causes rocking and frictions that may damage or contaminate the wafer;
2. If serious, the wafer will be broken;
3. It is an arduous task for the user to store and retrieve the wafer during use.

In view of the above, structural improvements are required for wafer transportation and storage device to achieve convenient use and easier storage.

Disclosure of the Invention

The technical problem to be solved by the present invention is the inconvenient use and inconvenient storage of wafer of the current wafer transportation and storage device.

A wafer supporting structure, positioned within a tensioning frame packaging box, comprises a supporting body, locking elements disposing around an outer periphery of the supporting body, and a supporting platform protruding out of a middle part of the supporting body for positioning a wafer.

In a preferred embodiment, the outer periphery of the supporting body is provided with ears; the locking elements have curved shapes; a root of each side of each ear is provided with one of the locking elements.

In a preferred embodiment, the supporting platform comprises a tapered portion and a flat portion; the flat portion is positioned in a middle part of the tapered portion.

In a preferred embodiment, a thin film is provided within a tensioning frame; a center part of the thin film is provided with a through hole; the supporting platform is placed on the thin film; a protruding side of the supporting platform tensions the thin film.

In a preferred embodiment, the ears are evenly distributed along the outer periphery of the supporting body; an outer periphery of each ear has an arc shape; all arc shaped outer peripheries of the ears are on a circumference of a same circle.

Compared with the prior art, the present invention is used with a tensioning frame packaging box, for isolating, supporting and limiting the position of a wafer, so that the wafer is

always in a non-contact condition and subject to only micro-movements during storage and transportation, and is thus being protected. A supporting platform of the present invention may employ a recessed structure formed by plastic suction molding such that the supporting platform looks like being hollowed inside to provide sufficient space for disposing the wafer. Functional regions of the wafer will not contact the present invention so as to effectively protect the wafer from contamination, damage, breakage or mutual displacement that lead to loss of functions.

Brief Description of Drawings

FIG. 1 is a structural view of the present invention.

FIG. 2 is a structural view of the present invention embodied in a tensioning frame packaging box.

FIG. 3 is an enlarged structural view of portion A shown in FIG. 2.

Best Mode for Carrying out the Invention

A wafer supporting structure, to be used with a tensioning frame packaging box, for isolating, supporting and limiting the position of a wafer is provided, so that the wafer is always in a non-contact condition and subject to only micro-movements during storage and transportation, and is thus being protected. A supporting platform of the present invention may employ a recessed structure formed by plastic suction molding such that the supporting platform looks like being hollowed inside to provide sufficient space for disposing the wafer. Functional regions of the wafer will not contact the present invention so as to effectively protect the wafer from contamination, damage, breakage or mutual displacement that lead to loss of functions. The present invention will be further described in detail below with reference to an embodiment and accompanying drawings.

As shown in FIG. 1, a wafer supporting structure, positioned within a tensioning frame packaging box 5, comprises a supporting body 1, locking elements 41 disposing around an outer periphery of the supporting body 1, and a supporting platform 2 protruding out of a middle part of the supporting body for positioning a wafer 7.

As mentioned, the locking elements 41 are provided around the outer periphery of the supporting body 1 for the purpose of limiting a position of the wafer supporting structure and for easy disposal and removal of the wafer supporting structure; the locking elements 41 match with corresponding grooves at an interior side of the tensioning frame packaging box 5 to reduce moving spaces of the wafer supporting structure inside the packaging box so as to minimize possible damage or breakage of the wafer 7, and to prevent contact and therefore contamination of the wafer 7 when the wafer 7 is conveniently taken out or placed in. Accordingly, the present invention provides convenience to users and increases efficiency.

As shown in FIG. 2 and FIG. 3, the present invention is used with the tensioning frame packaging box 5, for isolating, supporting and limiting the position of a wafer, so that the wafer 7 is always in a non-contact condition and subject to only micro-movements during storage and transportation, and is thus being protected. The supporting platform 2 may employ a recessed structure formed by plastic suction molding such that the supporting platform 2 looks like being hollowed inside to provide sufficient space for disposing the wafer 7. Functional regions of the wafer

7 will not contact the supporting platform 2 so as to effectively protect the wafer 7 from contamination, damage, breakage or mutual displacement that lead to loss of functions.

Nowadays, a prior art tensioning frame packaging box 5 is designed to contain a single tensioning frame 6. When the wafer 7 is placed on a thin film supported by the tensioning frame 6, and the present invention is positioned below the thin film, the present invention will maintain the thin film in a tensioned state, and the wafer 7 will then rest on the exposed supporting platform 2 of the present invention, such that the wafer 7 is firmly maintained against mutual movement with respect to the tensioning frame 6 to guarantee safety of the wafer 7 inside the packaging box 5. Without tension, the wafer 7 may shake or “bulge” and lead to unnecessary contact with near-by objects causing the wafer 7 to bend or crack.

The present invention has the following advantages: When multiple tensioning frames 6 are stacked, they can be mutually separated by the present invention. In other words, the present invention can be provided between each pair of tensioning frames 6. Since the present invention has a raised middle part but a flat surrounding, and has a certain thickness, apart from contacting the supporting platform 2, the wafer will only also contact with the tensioning frame 6. The wafer 7 is therefore effectively protected.

The outer periphery of the supporting body 1 is provided with ears 4. The locking elements 41 have curved shapes. A root of each side of each ear 4 is provided with one of the locking elements 41. Curved shaped locking elements 41 provide smoothness that significantly enhances the capability of its disposal so that it can be easily taken out or placed in.

The supporting platform 2 comprises a tapered portion 3 and a flat portion. The flat portion is positioned in a middle part of the tapered portion 3. This kind of structure can increase a thickness of the supporting platform 2 and to guarantee that the wafer 7 is smoothly positioned on the flat portion.

The thin film is provided within the tensioning frame 6; a center part of the thin film is provided with a through hole; the supporting platform 2 is placed on the thin film; a protruding side of the supporting platform 2 tensions the thin film. This kind of structure defines the positional and connective relationships between the present invention and a prior art tensioning frame 6, such that the tensioning frame 6, the thin film, the present invention and the wafer 7 together form an integral buffering structure against shock and vibration that has strengthened buffering performance and thereby further enhancing stability.

The ears 4 are evenly distributed along the outer periphery of the supporting body 1. An outer periphery of each ear 4 has an arc shape; all arc shaped outer peripheries of the ears 4 are on a circumference of a same circle. The ears 4 ensure balance and stability of the center of gravity of the present invention. Arc shaped outer peripheries match with the grooves of interior side walls of the packaging box 5 to facilitate easier processing.

The present invention is used (operation procedures) as follows:

Placing a wafer 7 on a thin film supported by a tensioning frame 6; placing the tensioning frame 6 with the wafer 7 into a tensioning frame packaging box 5; positioning the present invention

below the thin film to maintain tension of the thin film whereby the wafer 7 will then rest on a supporting platform 2 of the present invention; repeating the above steps such that a plurality of tensioning frames 6 are stacked inside the tensioning frame packaging box 5. Since a tensioned state is maintained no matter when being placed in or taken out, relative movements of the wafer 7 will not be affected, and so the wafer 7 will be protected against bending and cracking.

The present invention is used with a tensioning frame packaging box, for isolating, supporting and limiting the position of a wafer, so that the wafer is always in a non-contact condition and subject to only micro-movements during storage and transportation, and is thus being protected. A supporting platform of the present invention may employ a recessed structure formed by plastic suction molding such that the supporting platform looks like being hollowed inside to provide sufficient space for disposing the wafer. Functional regions of the wafer will not contact the present invention so as to effectively protect the wafer from contamination, damage, breakage or mutual displacement that lead to loss of functions.

The present invention should not be limited to the most preferred embodiment as described above. Any person skilled in this field of art should note that the same or similar technical solution as a result of structural changes in light of the teachings of the present invention should also fall within the scope of protection of the present invention.

CLAIMS

1. A wafer supporting apparatus, comprising a tensioning frame packaging box and a wafer supporting structure positioned within the tensioning frame packaging box; the wafer supporting structure comprises a supporting body, locking elements disposing around an outer periphery of the supporting body, and a supporting platform protruding out of a middle part of the supporting body for positioning a wafer; a thin film is provided within a tensioning frame of the tensioning frame packaging box; a center part of the thin film is provided with a through hole; the supporting platform is placed on the thin film; a protruding side of the supporting platform tensions the thin film.
2. The wafer supporting apparatus of claim 1, wherein the outer periphery of the supporting body of the wafer supporting structure is provided with ears; the locking elements have curved shapes; a root of each side of each ear is provided with one of the locking elements.
3. The wafer supporting apparatus of claim 1, wherein the supporting platform of the wafer supporting structure comprises a tapered portion and a flat portion; the flat portion is positioned in a middle part of the tapered portion.
4. The wafer supporting apparatus of claim 2, wherein the ears are evenly distributed along the outer periphery of the supporting body of the wafer supporting structure; an outer periphery of each ear has an arc shape; all arc shaped outer peripheries of the ears are on a circumference of a same circle.