

CHAMBER STRUCTURE FOR CLEARING WASTE IN POLISHING PAD GROOVES AND CLEARING METHOD THEREOF

TECHNICAL FIELD

The present disclosure relates to the technical field of wafer polishing processing equipment, in particular to a chamber structure for clearing waste in polishing pad grooves and a clearing method thereof.

BACKGROUND

In the process of substrate polishing, the main process steps are as follows: first, the polishing head sucks the substrate and places the substrate on the polishing pad; then a downward pressure is exerted on the substrate through the polishing head; at the same time, the slurry is supplied to the polishing pad through a delivery system; the polishing pad and the polishing head rotate in the same direction but on different axes; and the slurry reaches the bottom of the substrate with the rotation of the polishing pad, and due to the relative motion between the polishing pad and the substrate, the particles in the slurry grind and polish the substrate.

After polishing, defects may appear on the substrate surface. Among the substrate surface defects, mechanical damage is one of the more common types of substrate surface defects and is also a more serious substrate surface defect. This defect generally occurs in the step of chemical mechanical polishing of the substrate or step of slicing of the substrate.

One of the main causes of mechanical damage on the substrate surface in chemical mechanical polishing is being scratched by the waste in the polishing pad grooves. Since the slurry is a viscous liquid, it is easy to form crystals in the grooves of the polishing pad during long-term mechanical polishing processes. The width of the grooves of the polishing pad is relatively small (about 0.7mm), making it difficult to effectively clear and treat the crystalline waste in the grooves of the polishing pad.

In the prior art, process adjustments are made to the polishing pad by a pad conditioner. The main functions of the pad conditioner are as follows: 1) achieving uniform distribution of the slurry on the polishing pad; 2) adjusting the roughness of polishing pad surface through the pad conditioner; 3) removing the residual crystalline waste in the grooves on the polishing pad surface by brushing the polishing pad with the pad conditioner.

Specifically, the hard disc of the pad conditioner has bumps on the bottom surface, and the pad conditioner makes a reciprocating circular motion on the polishing pad. The hard disc with the bumps repeatedly scratches the polishing pad surface to adjust the roughness of polishing pad surface and clean up the waste and particles on the polishing pad surface.

However, because the bumps on the hard disc of the pad conditioner cannot perfectly fit the shape of the polishing pad grooves, the crystalline waste attached to the polishing pad grooves cannot be fully cleaned up. Further, since the polishing pad surface is a porous rough surface and a downward pressure generated during the reciprocating circular motion of the pad conditioner is exerted on the granular waste, the granular waste on the polishing pad surface are caused to be pressed into the gaps on the porous polishing pad, making it difficult to clear.

In view of the shortcomings of ineffective clearing of the waste in the grooves of the polishing pad in the prior art, there is a need to design a new chamber structure suitable for clearing waste in polishing pad grooves.

SUMMARY

Therefore, the technical problem to be solved by the present disclosure is to overcome the shortcomings of ineffective clearing of the waste in the grooves of the polishing pad in the prior art, thereby providing a chamber structure suitable for clearing waste in polishing pad grooves and a clearing method thereof.

In order to solve the above technical problem, the following technical solutions of the present disclosure are provided.

A chamber structure for clearing waste in polishing pad grooves, wherein the chamber structure is provided, in its interior, with a cleaning chamber and a vacuum suction chamber that are independent of each other; the chamber structure is provided, on its outer wall, with a cleaning chamber interface connected to the cleaning chamber and a vacuum suction interface connected to the vacuum suction chamber; the cleaning chamber interface is suitable for connecting to a cleaning device to allow a cleaning medium to enter the cleaning chamber; the vacuum suction interface is suitable for connecting to a vacuum suction device to suck out the cleaning medium in the vacuum suction chamber; the chamber structure is further provided, at its bottom, with a lower cavity; bottom opening of the lower cavity is suitable for being sealed by upper surface of a polishing pad; and the chamber structure is further provided, in its interior, with cleaning holes connecting the lower cavity and the

cleaning chamber, and vacuum suction holes connecting the lower cavity and the vacuum suction chamber.

Optionally, the pressure between side wall of the chamber structure and the upper surface of the polishing pad is 0.1psi to 0.2psi.

Optionally, the height of the cleaning chamber is not less than 11mm, and the distance between top wall of the lower cavity corresponding to the cleaning chamber and the upper surface of the polishing pad is not less than 4 mm.

Optionally, the height of the vacuum suction chamber is 10mm to 15mm, and the distance between top wall of the lower cavity corresponding to the vacuum suction chamber and the upper surface of the polishing pad is 1.5mm to 2.2mm.

Optionally, the pressure of the vacuum suction chamber is -15psi to -5psi.

Optionally, the vacuum suction chamber includes a first vacuum suction chamber and a second vacuum suction chamber; the first vacuum suction chamber and the second vacuum suction chamber are located on two opposite sides of the cleaning chamber respectively.

Optionally, the vacuum suction interface corresponding to the first vacuum suction chamber is provided on outer side wall of the chamber structure; the vacuum suction interface corresponding to the second vacuum suction chamber is provided on top wall of the chamber structure; and the cleaning chamber interface is provided on the top wall of the chamber structure.

Optionally, the chamber structure is divided into two mutually independent sub-chamber structures, each of the sub-chamber structures is provided with the cleaning chamber, the cleaning interface, the cleaning holes connecting the lower cavity and the cleaning chamber, the vacuum suction chamber, the vacuum suction interface, and the vacuum holes connecting the lower cavity and the vacuum suction chamber.

Optionally, a terminal side wall of the chamber structure, closer to the centre of the upper surface of the polishing pad, extends laterally to form a baffle, and the baffle is adapted to guide ultrapure water for cleaning the upper surface of the polishing pad outside the chamber structure to flow along longitudinal side wall of the chamber structure toward the outer edge of the polishing pad.

Optionally, the cleaning holes are elongate holes and faces the grooves on the upper surface of the polishing pad; the elongate holes have a size of 5mm×2mm; and the vacuum suction holes are round holes with a diameter of 5mm to 6mm.

The technical solutions of the present disclosure have the following benefits:

1. In the chamber structure for clearing waste in polishing pad grooves provided by the present disclosure, after the cleaning medium entering from the cleaning chamber interface is flushed out from the cleaning hole, it rushes toward the waste in the grooves, and the fluidity characteristics of the cleaning medium enable it to flush the grooves without dead corners, thereby impacting and breaking down the waste in the grooves on the upper surface of the polishing pad, and peeling it off the inner wall of the grooves. The cleaning medium with waste flows on the upper surface of the polishing pad corresponding to the lower cavity, and is then sucked by the vacuum suction holes to enter the vacuum suction chamber and finally enters the vacuum suction device, thereby achieving effective waste cleaning in the grooves.

2. In the chamber structure for clearing waste in polishing pad grooves provided by the present disclosure, the pressure between the side wall of the chamber structure and the upper surface of the polishing pad is 0.1psi to 0.2psi, which not only ensures the normal rotation of the polishing pad, but also ensures the formation of a relatively sealed environment between the chamber structure and the polishing pad to make sure that the cleaning medium with waste can be quickly vacuum sucked and cleared.

3. In the chamber structure for clearing waste in polishing pad grooves provided by the present disclosure, the terminal side wall of the chamber structure, closer to centre of the polishing pad, extends laterally to form a baffle. While using the ultrapure water to wash the upper surface of the polishing pad outside the chamber structure and on the side where the chamber structure is located, the ultrapure water flows toward the side wall of the chamber structure, and after being blocked and guided by the baffle, it flows toward the outer edge of the polishing pad along the side wall of the chamber structure. This prevents excessive ultrapure water from entering the central area of the polishing pad or area closer to the polishing head, which causes the dilution of the slurry in the area and results in low substrate polishing efficiency and inability of meeting the substrate manufacturing requirements for other processes.

4. In the chamber structure for clearing waste in polishing pad grooves provided by the present disclosure, the chamber structure is divided into two mutually independent sub-chamber structures, which can reduce the length of the vacuum chamber to allow the cleaning medium with waste to flow in a relatively small range, facilitating suction and clearing through the vacuum suction holes.

A method for clearing waste in polishing pad grooves, comprising:

placing on a polishing pad the aforementioned chamber structure for clearing waste in the polishing pad grooves;

cleaning the upper surface of the polishing pad, physically or physicochemically, using the cleaning medium that enters the chamber structure;

discharging waste from the upper surface of the polishing pad using the vacuum suction device connected to the chamber structure.

The technical solutions of the present disclosure have the following benefits:

1. The method for clearing waste in polishing pad grooves provided by the present disclosure has the advantages of the aforementioned chamber structure for clearing waste in polishing pad grooves.

BRIEF DESCRIPTION OF DRAWINGS

In order to more clearly illustrate embodiments of the present disclosure or the technical solutions in the prior art, the following will briefly describe the drawings used in the description of the embodiments or the prior art. Clearly, the drawings of the following descriptions are some embodiments of the present disclosure. Those of ordinary skill in the art may obtain other drawings based on these drawings without creative effort.

Fig. 1 is a schematic diagram illustrating a position of a chamber structure of the present disclosure in a substrate chemical mechanical polishing system;

Fig. 2 is a schematic diagram illustrating positional relationship between the chamber structure of the present disclosure and a slurry dispensing module;

Fig. 3 is a schematic diagram illustrating positional relationships among the chamber structure of the present disclosure, an ultrapure water cleaning module and a polishing head on a polishing pad;

Fig. 4 is a schematic diagram illustrating the position of the chamber structure of the present disclosure on the clockwise rotating polishing pad;

Fig. 5 is a schematic diagram of a perspective view of the chamber structure of the present disclosure;

Fig. 6 is a schematic diagram of a perspective view of part of the chamber structure of the present disclosure;

Fig. 7 is a schematic diagram of a plan view of the chamber structure of the present disclosure;

Fig. 8 is a schematic diagram illustrating suction mechanism of a vacuum suction device connected to the chamber structure in the present disclosure.

Reference numerals:

1. chamber structure; 1a. inner side sub-chamber; 1b. outer side sub-chamber; 11. cleaning chamber; 111. cleaning chamber interface; 112. cleaning hole; 12. vacuum suction chamber; 12a. first vacuum suction chamber; 12b. second vacuum suction chamber; 121. vacuum suction interface; 122. vacuum suction hole; 13. lower cavity; 14. baffle; 2. upper surface of polishing pad; 3. polishing head; 4. pad conditioner; 5. slurry dispensing module; 6. ultrapure water cleaning module; 7. pressure regulating valve; 8. filter.

DETAILED DESCRIPTION

The technical solutions of the present disclosure will be more clearly and completely described below with reference to the drawings. Clearly, the described embodiments are only some of the embodiments of the present disclosure, not all of the embodiments. Based on the embodiments in the present disclosure, all other embodiments obtainable by those of ordinary skill in the art without creative efforts shall fall within the protection scope of the present disclosure.

In the description of the present disclosure, it should be noted that orientation or positional relationship indicated by the terms "centre", "upper", "lower", "left", "right", "vertical", "horizontal", "inner", "outer", etc. is based on the orientation or positional relationship as shown in the drawings, only for the convenience of describing and simplifying the description, and does not indicate or imply that the referred apparatus or element must have a specific orientation, or constructed or operated in a specific orientation. Thus, it should not be construed as a limitation of the present disclosure. Further, the terms "first", "second", "third" are used for descriptive purposes only and cannot be construed as indicating or implying relative importance.

In the description of the present disclosure, it should be noted that, unless otherwise expressly specified and limited, the terms "install", "connect" and "connection" should be construed in a broad sense. For example, it may be a fixed connection or a detachable connection, or integral connection. It may be mechanical connection or electrical connection. It may be direct connection, or indirect connection through an intermediate medium, or internal communication between two components. For those of ordinary skill in the art, the

specific meanings of the above terms in the present disclosure can be understood in specific situations.

In addition, the technical features involved in the different embodiments of the present disclosure described below can be combined with each other as long as they do not conflict with each other.

Embodiment 1

As shown in Fig. 1 to Fig. 8, the embodiment provides a chamber structure suitable for clearing waste in the polishing pad grooves, which is used to clear waste in the grooves on the upper surface of the polishing head 2. Fig. 1 to Fig. 3 show the positional relationships of the chamber structure 1 in the substrate chemical mechanical polishing system with the upper surface of the polishing pad 2, the polishing head 3, the pad conditioner 4, the slurry dispensing module 5, and the ultrapure water cleaning module 6. During the process of clearing waste in the polishing pad grooves, the polishing pad rotates and the chamber structure 1 is stationary.

The size of the chamber structure 1 matches the size of the substrate. In the embodiment, the exterior dimension of the chamber structure 1 is 270*40*19mm. The chamber structure 1 is provided, in its interior, with a cleaning chamber 11 and a vacuum suction chamber 12 that are independent of each other.

The cleaning chamber 11 has a length of 266mm and a width of 9mm, and the height of cleaning chamber 11 is not less than 11mm. A plurality of cleaning holes 112 are opened at the bottom of the cleaning chamber 11, and the cleaning holes 112 are in communication with the cleaning chamber 11. The cleaning holes 112 are elongate holes, and the cleaning holes 112 are arranged in a line at equal intervals. The cleaning holes have a length of 5mm and a width of 2mm. The distance between the bottom surface of the cleaning chamber 11 and the upper surface of the polishing pad 2 is not less than 4mm, and each cleaning hole 112 corresponds to one or two grooves on the upper surface of the polishing pad 2 (not shown), to effectively impact and break down the waste in the grooves.

The vacuum suction chamber 12 includes a first vacuum suction chamber 12a and a second vacuum suction chamber 12b located on two opposite sides of the cleaning chamber 11 respectively. The first vacuum suction chamber 12a faces the ultrapure water cleaning module 6. The first vacuum suction chamber 12a and the second vacuum suction chamber 12b have the same size, with a length of 266mm, a width of 12mm, and a height of 10mm to 15mm, preferably 13mm. The distance between the bottom surface of the vacuum suction

chamber 12 and the upper surface of the polishing pad 2 is 1.5mm to 2.2mm, preferably 2mm. The same number of vacuum suction holes 122 are opened at the bottoms of the first vacuum suction chamber 12a and the second vacuum suction chamber 12b, and the vacuum suction holes 122 are in communication with the vacuum suction chamber 12. The number of vacuum suction holes 122 corresponding to the first vacuum suction chamber 12a and that corresponding to the second vacuum suction chamber 12b are both 32, and the 32 vacuum suction holes are arranged in a line at equal intervals. The vacuum suction holes 112 are round holes. The round vacuum suction holes 112 have a diameter of 5mm to 6mm, to effectively suck the waste that is impacted and broken down by the cleaning medium from the grooves on the upper surface of the polishing pad 2.

The chamber structure 1 is provided, on its outer wall, with a cleaning chamber interface 111 connected to the cleaning chamber 11 and a vacuum suction interface 121 connected to the vacuum suction chamber 12.

The cleaning chamber interface 111 is suitable for connecting to a cleaning device (not shown) to allow the cleaning medium to enter the cleaning chamber 11. The vacuum suction interface 121 is suitable for connecting to a vacuum suction device (not shown) to suck out the cleaning medium with waste in the vacuum suction chamber 12. In the embodiment, the vacuum suction device is a liquid vacuum ejector, which has anti-corrosion effect. The main material of the vacuum ejector is polytetrafluoroethylene (PTFE). Fig. 8 illustrates the suction mechanism of the vacuum suction device connected to the vacuum suction interface 121. In the design of the vacuum suction pipeline, the pressure is adjusted using the pressure regulating valve 7 to meet the pressure requirements for vacuum suction, and a filter 8 is added in the vacuum suction pipeline to filter large particles in the waste and prevent the waste from adhering to the interior of the pipeline to cause blockage of the pipeline and devices.

The vacuum suction interfaces 121 corresponding to the first vacuum suction chamber 12a are opened on the side wall of the chamber structure 1. The reasons for such design are as follows. First, the chamber structure 1 is used in conjunction with the slurry dispensing module 5, and the upper part of the slurry dispensing module 5 is provided with a linkage mechanism (not shown); the linkage mechanism needs to swing when adjusting the position of the slurry dispensing module 5 on the polishing pad, and if the vacuum suction interfaces 121 corresponding to the first vacuum suction chamber 12a are provided on the top wall of the chamber structure 1, it is prone to mechanical interference and collision with the linkage

mechanism. Second, the chamber structure 1 is connected to the slurry dispensing module 5, and in order to avoid the chamber structure 1 being too large, which results in a relatively large overall weight of the chamber structure 1 and the slurry dispensing module 5 and in turn affects the rotation of the polishing pad, the size of the chamber structure 1 should be smaller. Thus, in the case where the size of the chamber structure 1 needs to be relatively small, it is logically difficult to arrange more vacuum suction interfaces 121 on the top wall of the chamber structure 1, to avoid increasing the difficulty in arranging the vacuum suction interfaces 121 and to avoid mutual interference. In the embodiment, two vacuum suction interfaces 121 corresponding to the second vacuum suction chamber 12b are opened on the top wall of the chamber structure 1. The number of vacuum suction interfaces 121 corresponding to the second vacuum suction chamber 12b may be other values, which can be set as required. Four cleaning chamber interfaces 111 are arranged in a line at intervals, and the cleaning chamber interfaces 111 are also provided on the top wall of chamber structure 1.

The chamber structure 1 is further provided, at its bottom, with a lower cavity 13, and the top wall of the lower cavity 13 is formed by the connecting the bottom walls of the cleaning chamber 11 and the vacuum suction chamber 12. The bottom opening of the lower cavity 13 is suitable for being sealed by the upper surface of the polishing pad 2; and the pressure between the side wall of the chamber structure 1 and the upper surface of the polishing pad 2 is 0.1psi to 0.2psi. This not only ensures the normal rotation of the polishing pad, but also ensures the formation of a relatively sealed environment between the chamber structure and the polishing pad to make sure that the cleaning medium with waste can be quickly vacuum sucked and cleared.

The chamber structure 1 is further provided, in its interior, with the cleaning holes 112 connecting the lower cavity 13 and the cleaning chamber 11, and the vacuum suction holes 122 connecting the lower cavity 12 and the vacuum suction chamber 12. The pressure range of the pressurized cleaning medium in the cleaning chamber 11 entered from the cleaning chamber interfaces 111 is set to 5psi to 21psi to ensure that the cleaning medium is able to effectively impact and break down the crystalline waste. The pressure in the vacuum suction chamber 12 is -15psi to -5psi to ensure that the cleaning medium containing the waste after impact and breaking down is sufficiently sucked and cleared.

In the embodiment, from the perspective of Fig. 7, the chamber structure 1 is divided into two mutually independent sub-chamber structures 1, which are the inner side sub-

chamber structure 1a and the outer side sub-chamber structure 1b. Each of the sub-chamber structures is provided with the cleaning chamber 11, the cleaning chamber interfaces 111, the cleaning holes 112 connecting the lower cavity 13 and the cleaning chamber 11, the vacuum suction chamber 12, the vacuum suction interfaces 121, and the vacuum suction holes 122 connecting the lower cavity 13 and the vacuum suction chamber 12. In this way, the lengths of the first vacuum suction chamber 12a and the second vacuum suction chamber 12b are both shortened, reducing the flow range of the cleaning medium and facilitating the vacuum suction holes 122 to suck and clear the cleaning medium containing the broken down waste. In the embodiment, four vacuum suction interfaces 121 corresponding to the first vacuum suction chamber 12a are provided, and this number may be other values, which can be set as required. In the middle part of the first vacuum suction chamber 12a, the distance between two adjacent vacuum suction interfaces 121 on both sides of the partition plate dividing the chamber structure 1 is smaller. The reason for such design is that the slurry participates more in polishing in this area, and the waste formed on the polishing pad is also more; and by narrowing the distance between two adjacent vacuum suction interfaces 121 in this area, sufficient suction and clearing of more waste in this area can be enhanced.

Further, in the embodiment, a terminal side wall of the chamber structure 1, closer to the centre of the upper surface of the polishing pad 2, extends laterally to form a baffle 14, and the baffle 14 is adapted to guide the ultrapure water for cleaning the upper surface of the polishing pad 2 outside the chamber structure 1 to flow along longitudinal side wall of the chamber structure 1 toward the outer edge of the polishing pad. This prevents more ultrapure water from entering the central area of the polishing pad or area closer to the polishing head 3, which causes the dilution of the slurry in the area and results in low substrate polishing efficiency and inability of meet the substrate manufacturing requirements for other processes.

The working process of the chamber structure 1 in the embodiment is described below.

As shown in Fig. 4, when the polishing pad needs to be cleaned, the polishing pad begins to rotate clockwise.

The cleaning chamber interfaces 111 are connected and the cleaning device is started. The pressurized cleaning medium rushes from the cleaning device, the cleaning chamber interfaces 111, the cleaning chamber 11 and the cleaning holes 112 toward the grooves on the upper surface of the polishing pad 2 to physically impact the waste in the groove to break it down and peel it off from the inner wall of the grooves. The waste flows on the upper

surface of the polishing pad 2 with the cleaning medium. In the embodiment, the cleaning medium is ultrapure water. Of course, deionized water, activator and gaseous fluids may also be used. When pressurized activator is used for cleaning, it is physicochemically cleaning. The activators for use are not limited to neutralizers, surfactants, and corrosion inhibitors.

At the same time, the vacuum suction interfaces 121 are connected and the vacuum suction device is started, so that the vacuum suction chamber 12 has a negative pressure in the range of -15psi to -5psi, ensuring that the cleaning medium containing the waste flowing on the upper surface of the polishing pad 2 is sucked out of the chamber structure 1 through the vacuum suction holes 122, the vacuum suction chamber 12 and the vacuum suction device. Since the first vacuum suction chamber 12a and the second vacuum suction chamber 12b are respectively provided on both sides of the cleaning chamber 11, and both are provided with vacuum suction holes 122, and the number of vacuum suction interfaces 121 corresponding to the first vacuum suction chamber 12a is more than that corresponding to the second vacuum suction chamber 12b, the first vacuum suction chamber 12a can perform first suction and clearing of the cleaning medium containing waste, and then the second vacuum suction chamber 12b performs secondary suction and clearing of the cleaning medium containing waste. Further, the chamber structure 1 is divided into two independent sub-chambers in the longitudinal direction, and each sub-chamber is provided with the cleaning chamber 11, the cleaning chamber interfaces 111, the cleaning holes 112 connecting the lower cavity 13 and the cleaning chamber 11, the vacuum suction chamber 12, the vacuum suction interfaces 121, and the vacuum suction holes 122 connecting the lower cavity 13 and the vacuum suction chamber 12. In this way, the lengths of the first vacuum suction chamber 12a and the second vacuum suction chamber 12b are both shortened, and the cleaning medium with waste flows in a relatively small range, facilitating the vacuum suction holes 122 to perform sufficient suction and clearing.

Further, in the embodiment, in the rotation direction of the polishing pad, since the chamber structure 1 is located in front of the ultrapure water cleaning module 6, while using the ultrapure water to wash the upper surface of the polishing pad 2, the ultrapure water flows toward the side wall of the chamber structure 1, and after being blocked and guided by the baffle 14, it flows toward the outer edge of the polishing pad along the side wall of the chamber structure 1. This prevents excessive ultrapure water from entering the central area of the polishing pad or area closer to the polishing head 3.

In sum, in the embodiment, after the cleaning medium entering from the cleaning chamber interfaces is flushed out from the cleaning holes, it rushes toward the waste in the grooves, and the fluidity characteristics of the cleaning medium enable it to flush the grooves without dead corners, thereby impacting and breaking down the waste in the grooves on the upper surface of the polishing pad, and peeling it off the inner wall of the grooves. The cleaning medium with waste flows on the upper surface of the polishing pad corresponding to the lower cavity, and is then sucked by the vacuum suction holes to enter the vacuum suction chamber and finally enter the vacuum suction device, thereby achieving effective clearing of the waste in the grooves.

Embodiment 2

The embodiment provides a method for clearing waste in polishing pad grooves, comprising:

- placing on a polishing pad the aforementioned chamber structure for clearing waste in the polishing pad grooves;

- cleaning the upper surface of the polishing pad 2, physically or physicochemically, using the cleaning medium connected to the chamber structure 1;

- discharging granular waste from the upper surface of the polishing pad 2 using the vacuum suction device connected to the chamber structure 1.

Clearly, the above embodiments are only examples for clear description, and are not intended to limit the manner of implementation. For those of ordinary skill in the art, there are other variations or changes that can be made in different forms based on the above description. It is not necessary or possible to exhaust all embodiments here. The obvious variations or changes derived therefrom are still within the protection scope of the present disclosure.

CLAIMS

1. A chamber structure for clearing waste in polishing pad grooves, wherein the chamber structure (1) is provided, in its interior, with a cleaning chamber (11) and a vacuum suction chamber (12) that are independent of each other; the chamber structure (1) is provided, on its outer wall, with a cleaning chamber interface (111) connected to the cleaning chamber (11) and a vacuum suction interface (121) connected to the vacuum suction chamber (12); the cleaning chamber interface (111) is suitable for connecting to a cleaning device to allow a cleaning medium to enter the cleaning chamber (11); the vacuum suction interface (121) is suitable for connecting to a vacuum suction device to suck out the cleaning medium that entered the vacuum suction chamber (12) with waste; the chamber structure (1) is further provided, at its bottom, with a lower cavity (13); bottom opening of the lower cavity (13) is suitable for being sealed by upper surface of a polishing pad (2); and the chamber structure (1) is further provided, in its interior, with cleaning holes (112) connecting the lower cavity (13) and the cleaning chamber (11), and vacuum suction holes (122) connecting the lower cavity (13) and the vacuum suction chamber (12).

2. The chamber structure for clearing waste in polishing pad grooves according to claim 1, wherein pressure between side wall of the chamber structure (1) and the upper surface of the polishing pad (2) is 0.1psi to 0.2psi.

3. The chamber structure for clearing waste in polishing pad grooves according to claim 1, wherein a height of the cleaning chamber (11) is not less than 11mm, and a distance between top wall of the lower cavity (13) corresponding to the cleaning chamber (11) and the upper surface of the polishing pad (2) is not less than 4 mm.

4. The chamber structure for clearing waste in polishing pad grooves according to claim 1, wherein a height of the vacuum suction chamber (12) is 10mm to 15mm, and a distance between top wall of the lower cavity (13) corresponding to the vacuum suction chamber (12) and the upper surface of the polishing pad (2) is 1.5mm to 2.2mm.

5. The chamber structure for clearing waste in polishing pad grooves according to claim 4, wherein pressure of the vacuum suction chamber (12) is -15psi to -5psi.

6. The chamber structure for clearing waste in polishing pad grooves according to claim 1, wherein the vacuum suction chamber (12) includes a first vacuum suction chamber (12a) and a second vacuum suction chamber (12a); the first vacuum suction chamber (12a) and

the second vacuum suction chamber (12b) are located on two opposite sides of the cleaning chamber (11) respectively.

7. The chamber structure for clearing waste in polishing pad grooves according to claim 6, wherein the vacuum suction interface (121) corresponding to the first vacuum suction chamber (12a) is provided on outer side wall of the chamber structure (1); the vacuum suction interface (121) corresponding to the second vacuum suction chamber (12b) is provided on top wall of the chamber structure (1); and the cleaning chamber interface (111) is provided on the top wall of the chamber structure (1).

8. The chamber structure for clearing waste in polishing pad grooves according to any one of claims 1 to 7, wherein the chamber structure (1) is divided into two mutually independent sub-chamber structures (1), each of the sub-chamber structures (1) is provided with the cleaning chamber (11), the cleaning chamber interface (111), the cleaning holes (112) connecting the lower cavity (13) and the cleaning chamber (11), the vacuum suction chamber (12), the vacuum suction interface (121), and the vacuum suction holes (122) connecting the lower cavity (13) and the vacuum suction chamber (12).

9. The chamber structure for clearing waste in polishing pad grooves according to claim 8, wherein a terminal side wall of the chamber structure (1), closer to centre of the upper surface of the polishing pad (2), extends laterally to form a baffle, and the baffle is adapted to guide ultrapure water for cleaning the upper surface of the polishing pad (2) outside the chamber structure (1) to flow along longitudinal side wall of the chamber structure (1) toward outer edge of the polishing pad.

10. The chamber structure for clearing waste in polishing pad grooves according to claim 8, wherein the cleaning holes are elongate holes and face grooves on the upper surface of the polishing pad (2); the elongate holes have a size of 5mm×2mm; and the vacuum suction holes (122) are round holes with a diameter of 5mm to 6mm.

11. A method for clearing waste in polishing pad grooves, comprising:

placing on a polishing pad the chamber structure for clearing waste in polishing pad grooves according to any one of claims 1 to 10;

cleaning the upper surface of the polishing pad (2), physically or physicochemically, using the cleaning medium that enters the chamber structure (1);

discharging waste from the upper surface of the polishing pad (2) using the vacuum suction device connected to the chamber structure (1).