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(54) **DRESSING DEVICE, CHEMICAL MECHANICAL POLISHING APPARATUS INCLUDING THE SAME, AND DRESSER DISC USED IN THE SAME**

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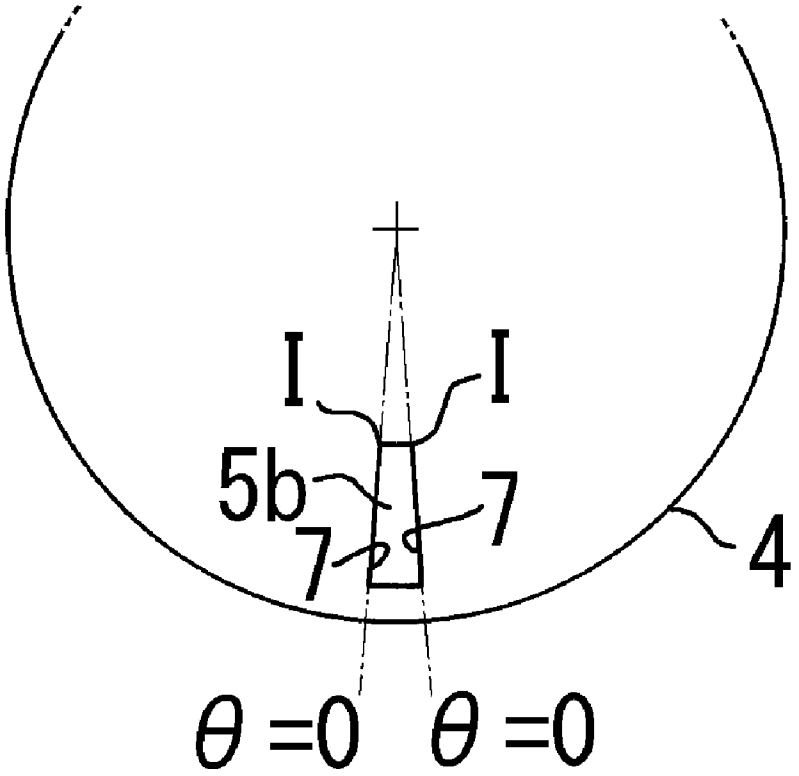
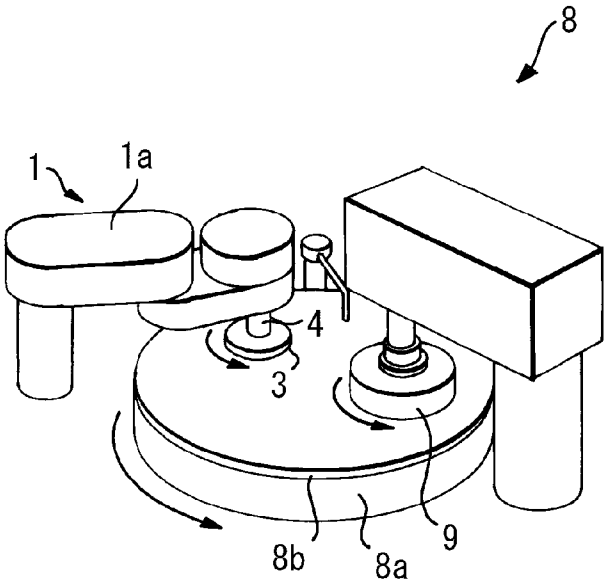
(57) **ABSTRACT**

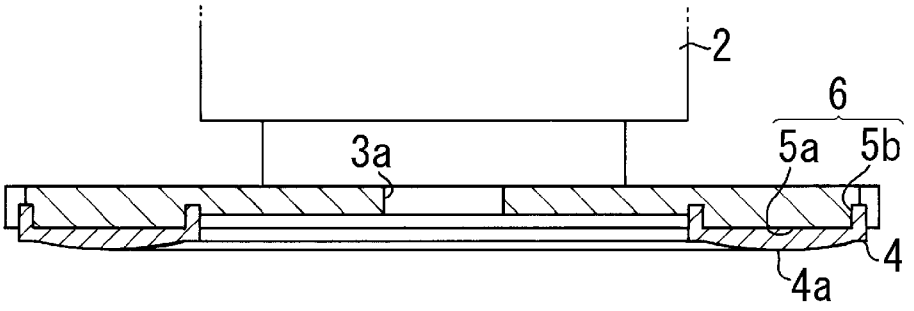
A dressing device capable of remedying wobbly rotation of a dresser disc, a CMP apparatus, and a dresser disc. The dressing device is capable of dressing a polishing pad and includes a holder which can be coupled to a dresser driving shaft capable of rotating and moving upward and downward, a dresser disc which can be mounted to the holder and has a dressing surface to be rubbed against a polishing pad, a set of concave and convex torque transmitting sections extending in a disc radial direction which are formed at the holder and the dresser disc and fit together when the dresser disc is mounted to the holder, and a set of contact surfaces in the shapes of flat surfaces which are formed as one surfaces around the set of torque transmitting sections and come into surface-to-surface contact at the time of transmitting torque of the dresser driving shaft.



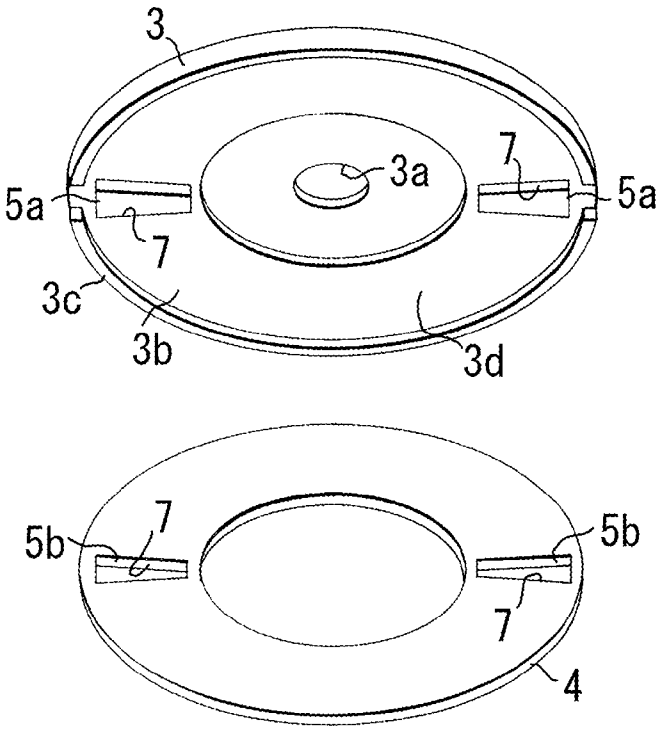
[Fig.1]



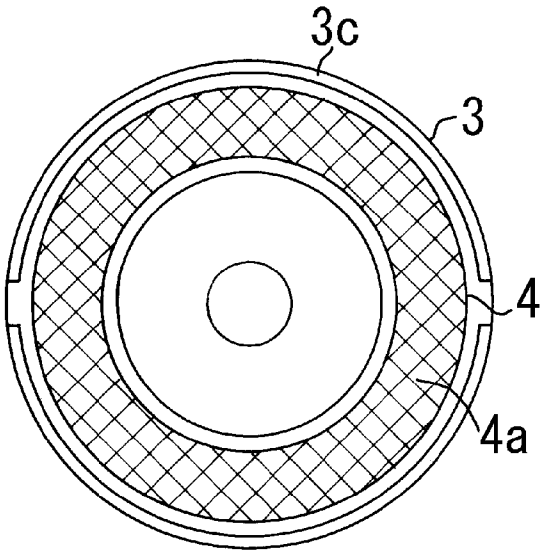
[Fig.2]



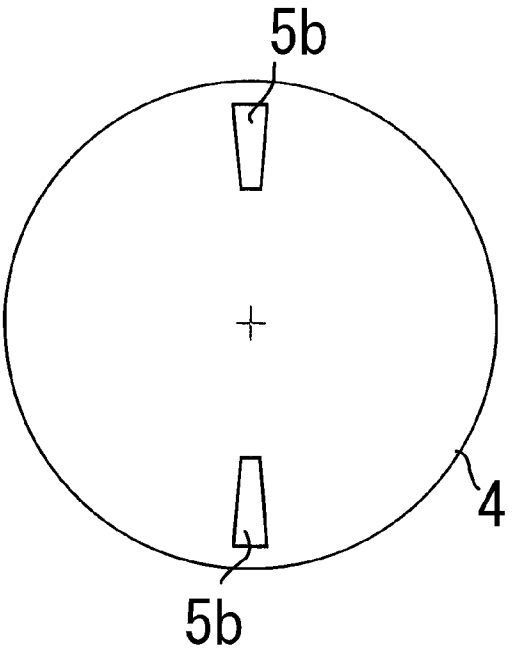
[Fig.3]



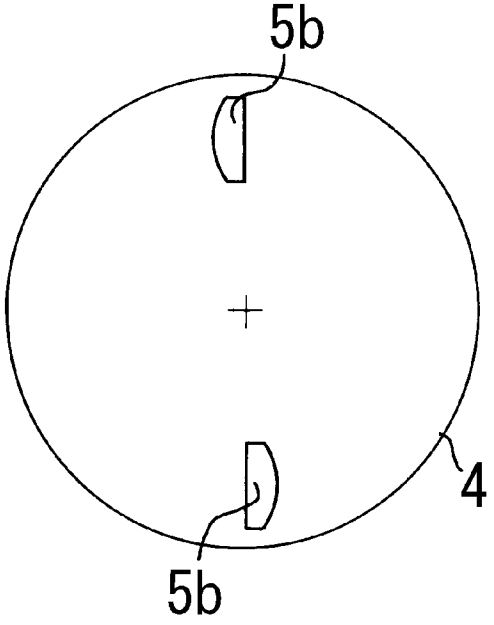
[Fig.4]



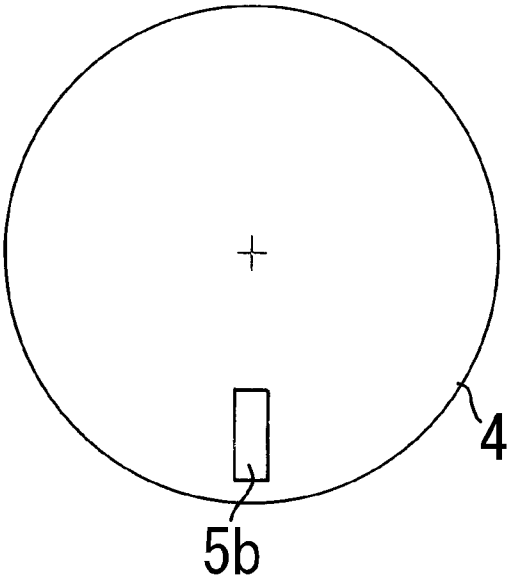
[Fig.5]



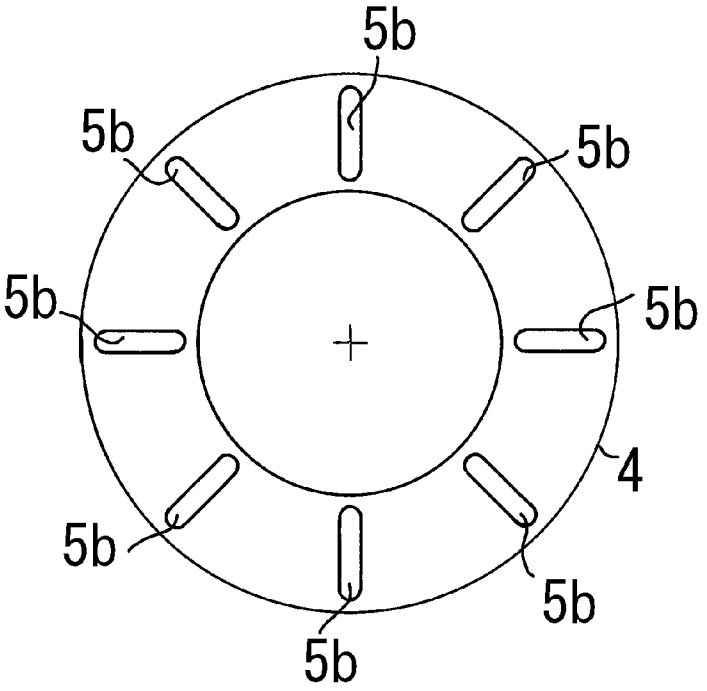
[Fig.6]



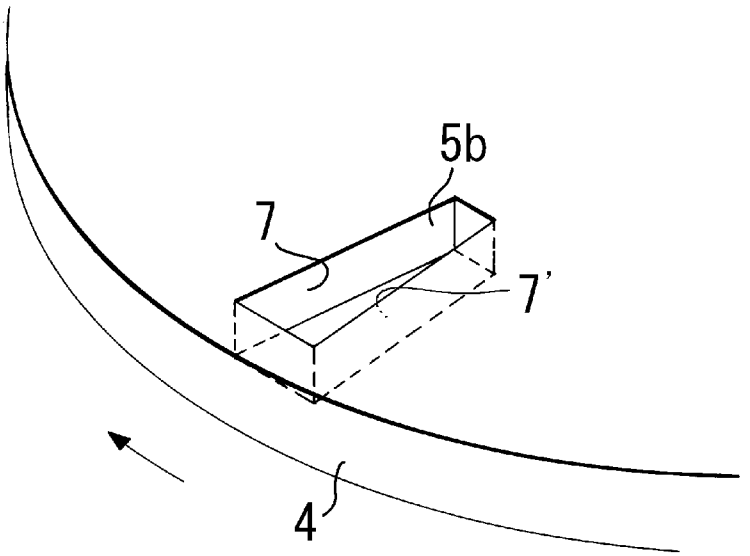
[Fig.7]



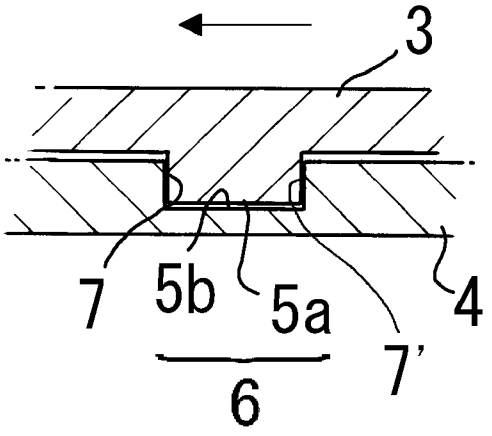
[Fig.8]



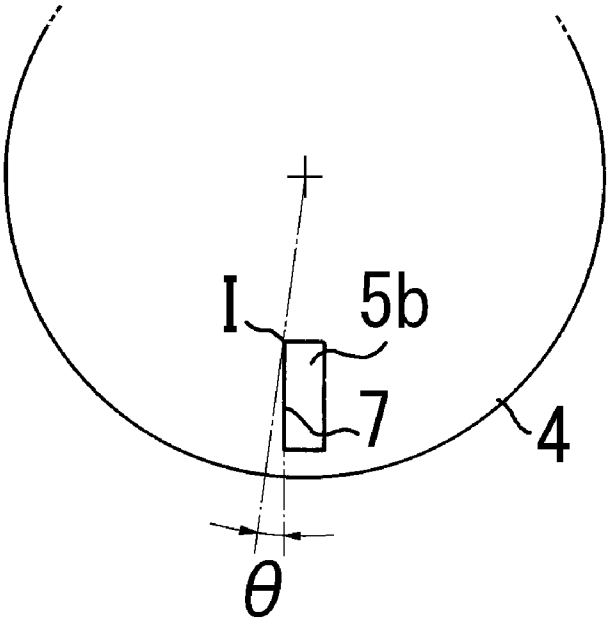
[Fig.9]



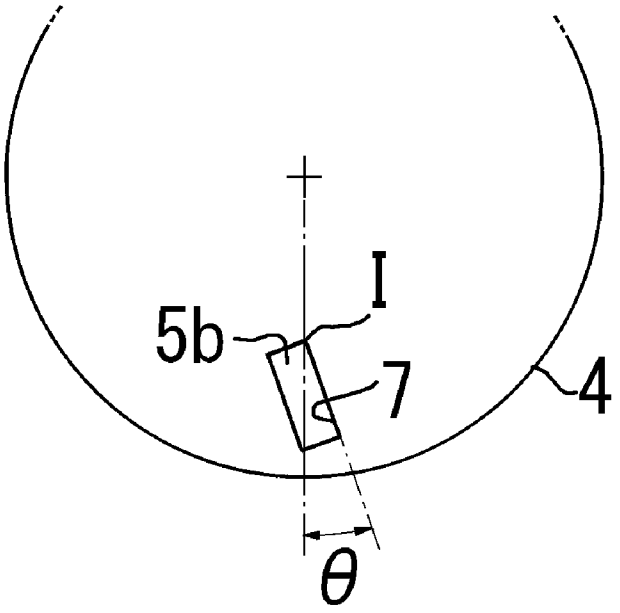
[Fig.10]



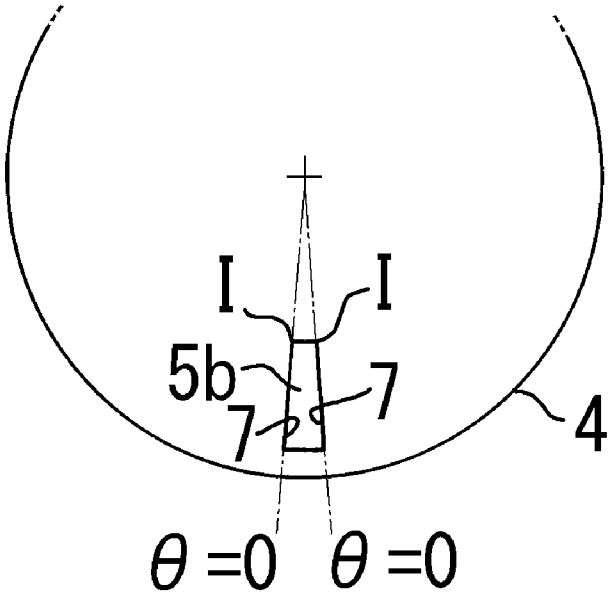
[Fig.11]



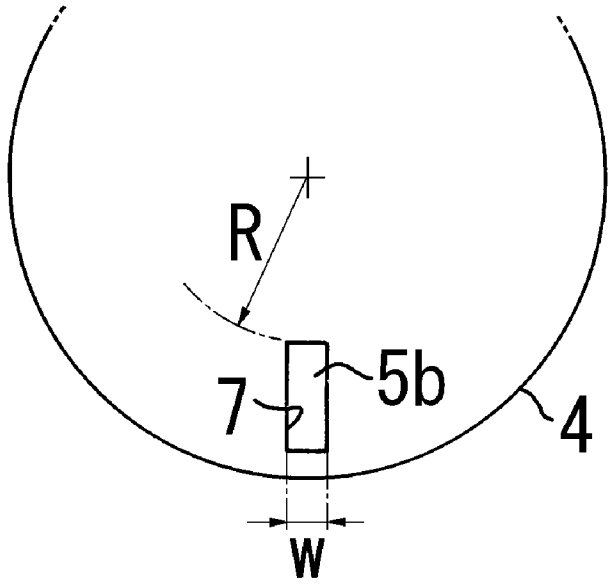
[Fig.12]



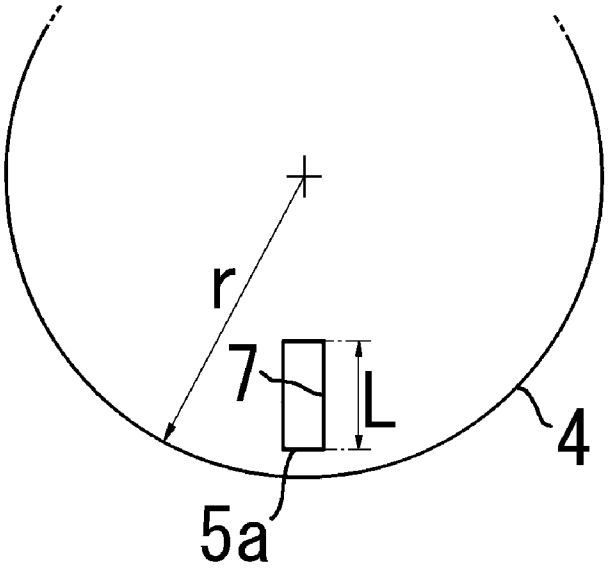
[Fig.13]



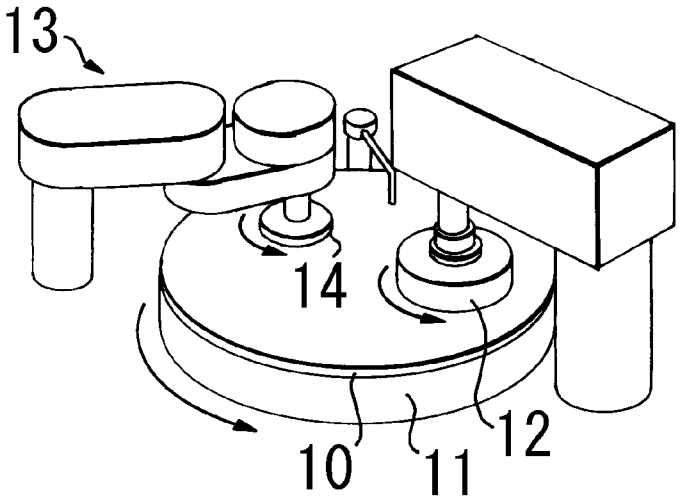
[Fig.14]



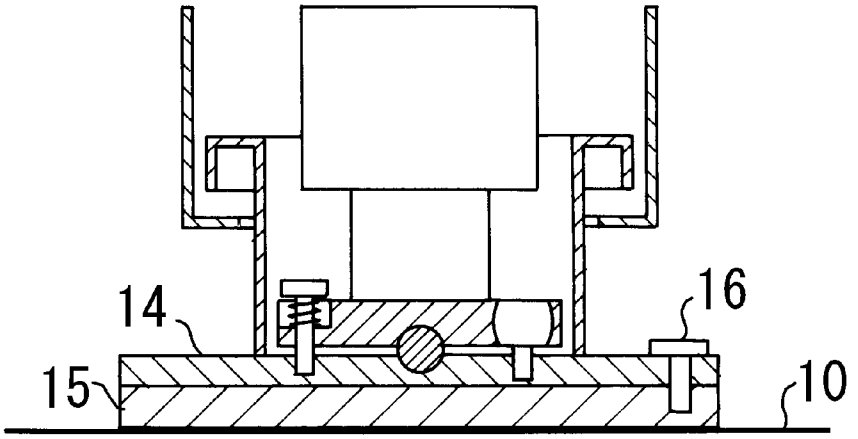
[Fig.15]



[Fig.16]



[Fig.17]



DRESSING DEVICE, CHEMICAL MECHANICAL POLISHING APPARATUS INCLUDING THE SAME, AND DRESSER DISC USED IN THE SAME

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to Japanese Patent Application No. 2013-177741 filed on 29 Aug. 2013, the entire contents of which are hereby incorporated by reference.

DESCRIPTION OF THE RELATED ART

[0002] In recent years, semiconductor devices have been becoming finer and more complicated, and a semiconductor device manufacturing process requires planarization of a surface of a substrate, such as a semiconductor wafer, on the order of nanometers. To implement this, for example, a chemical mechanical polishing apparatus (hereinafter referred to as a CMP (Chemical Mechanical Polishing) apparatus) is used for planarization of a surface of a semiconductor wafer or the like.

[0003] The CMP apparatus includes, for example, a polishing table **11** having a polishing pad **10** at an upper surface and a top ring **12** which holds a substrate, such as a semiconductor wafer, as shown in FIG. **16**. A surface of a substrate held in the top ring **12** can be polished by rotating the polishing pad **10** and the top ring **12** in respective directions of arrows and pressing the substrate against the polishing pad **10** with predetermined pressure while supplying a polishing liquid onto the polishing pad **10**. For example, an alkaline solution with fine particles of, e.g., silica suspended therein as abrasive grains can be used as the polishing liquid. For this reason, the surface of the substrate is planarized not only through polishing using the polishing pad but also by chemical polishing action of an alkali in the polishing liquid and mechanical polishing action of abrasive grains.

[0004] During repetition of polishing of the substrate in the CMP apparatus, the polishing pad **10** becomes smooth, and the polishing performance decreases due to adherence of abrasive grains, polishing waste, and the like to the polishing pad **10**. To recover the polishing performance, dressing (toothing) needs to be performed. For dressing of the polishing pad **10**, the CMP apparatus may be provided with a dressing device **13**.

[0005] The dressing device **13** includes, for example, a rotatable holder **14** and a dresser disc which is mounted to the holder. A bottom surface of the dresser disc is a dressing surface, and diamond particles or the like are electrodeposited on the dressing surface. The dressing device **13** can dress the polishing pad **10** and remove abrasive grains, polishing waste, and the like adhering to the polishing pad **10** by rubbing the dressing surface against the polishing pad while rotating the dressing surface.

[0006] As a conventional dresser disc, Japanese Patent Laid-Open No. 2001-121417 discloses a conditioning disc (corresponding to a dresser disc) which has diamond particles electrodeposited in a ring-like pattern on a surface of a base metal and can sufficiently scrape out polishing waste.

[0007] As a conventional dressing device, Japanese Patent Laid-Open No. 2010-172996 discloses a dressing device including a spherical bearing which allows a dressing member (corresponding to a dresser disc) to tilt with respect to a dresser driving shaft and a spring mechanism which generates force against tilting motion of the dressing member and free of partial wear of a polishing pad.

[0008] Japanese Patent Laid-Open No. 2012-250309 discloses a method for monitoring a polishing surface of a polishing pad by producing a height distribution within the polishing surface through repetition of measurement of the height of the polishing surface and calculation of the position of a measurement point during conditioning of the polishing surface.

SUMMARY OF THE INVENTION

[0009] As disclosed in Japanese Patent Laid-Open Nos. 2001-121417 to 2012-250309 and the like, planarization of a polishing pad is achieved through various methods in order to implement miniaturization and complication of semiconductor devices.

[0010] However, a conventional dressing device has, for example, a configuration in which the holder **14** and a dresser disc **15** are coupled with a fixture **16**, such as a fixing screw or a pin in the shape of a round bar to transmit running torque of the holder **14** to the dresser disc **15**, as shown in FIG. **17** (FIG. 4 of Japanese Patent Laid-Open No. 2010-172996).

[0011] The transmission of running torque to the dresser disc **15** through the fixture **16**, such as a fixing screw or a pin in the shape of a round bar, may cause stress to concentrate locally on the fixture **16** and its vicinity. In this case, rotation of the dresser disc **15** may become subtly wobbly and may fail to maintain horizontal rotation. For this reason, the status of contact with the polishing pad **10** may change microscopically to affect dressing of the polishing pad **10**.

[0012] The embodiment relates to a dressing device for dressing a polishing pad used to polish an object to be polished, such as a semiconductor wafer, a chemical mechanical polishing apparatus including the dressing device, and a dresser disc used in the dressing device, and the embodiment proposes a dressing device capable of remedying wobbly rotation of a dresser disc, a CMP apparatus including the dressing device, and a dresser disc used in the dressing device.

[0013] According to one aspect of the embodiment, there is provided a dressing device for dressing a polishing pad, including a holder which can be coupled to a dresser driving shaft capable of rotating and moving upward and downward, a dresser disc which can be mounted to the holder and has a dressing surface to be rubbed against a polishing pad, a set of concave and convex torque transmitting sections extending in a disc radial direction which are formed at the holder and the dresser disc and fit together when the dresser disc is mounted to the holder, and a set of contact surfaces in the shapes of flat surfaces which are formed as one surfaces around the set of torque transmitting sections and come into surface-to-surface contact at the time of transmitting torque of the dresser driving shaft.

[0014] In a preferred aspect of the embodiment, of the set of torque transmitting sections, one on the dresser disc side can be formed in a groove-like shape, and one on the holder side can be formed in a ridge-like shape. Additionally, at least one pair of the sets of torque transmitting sections can be formed symmetrically with respect to a rotation center of the dresser disc in a disc plan view.

[0015] In a preferred aspect of the embodiment, the set of contact surfaces can be formed on a straight line passing through the rotation center of the dresser disc in a disc plan view. Alternatively, the set of contact surfaces can be formed

at an angle not more than 13° with respect to a straight line passing through the rotation center of the dresser disc in a disc plan view.

[0016] In a preferred aspect of the embodiment, the holder can have a peripheral wall section provided at an outer periphery which protrudes downward and can have a disc storage section formed inside the peripheral wall section which can store the dresser disc.

[0017] In a preferred aspect of the embodiment, the set of torque transmitting sections can be formed such that a width on the disc outer edge side is not more than ½ of a distance from an inner end point of the set of contact surfaces to the rotation center in a disc plan view. Alternatively, the set of contact surfaces can be formed such that a length of an edge portion appearing at an upper surface of the dressing disc is not less than 0.4 of a disc radius in a disc plan view.

[0018] According to another aspect of the embodiment, there is provided a chemical mechanical polishing apparatus including the above-described dressing device.

[0019] According to another aspect of the embodiment, there is provided a dressing disc which is used in a dressing device for dressing a polishing pad and is mountable to a holder that can be coupled to a dresser driving shaft capable of rotating and moving upward and downward, including a concave or convex torque transmitting section extending in a disc radial direction which fits when the dresser disc is mounted to the holder and a contact surface in the shape of a flat surface which is formed as one surface around the torque transmitting section.

[0020] According to the embodiment, the convex or concave torque transmitting sections extending in the disc radial direction are formed at the holder and the dresser disc, and the contact surfaces in the shapes of flat surfaces are formed at the torque transmitting sections. The dressing device is configured to be capable of transmitting torque of the dresser driving shaft through surface-to-surface contact at the surfaces. This configuration allows alleviation of stress concentration through distribution of stress and allows easier horizontal rotation of the dresser disc. The dressing device can dress a polishing pad without partial wear.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] FIG. **1** is a schematic perspective view showing a dressing device according to one embodiment of the embodiment;

[0022] FIG. **2** is a cross-sectional view of a holder, a dresser disc, and their vicinity of the dressing device shown in FIG. **1**;

[0023] FIG. **3** is a perspective view showing the holder and the dresser disc;

[0024] FIG. **4** is a bottom view showing a state in which the dresser disc is mounted to the holder;

[0025] FIGS. **5** to **8** are plan views showing respective modifications of the dresser disc;

[0026] FIG. **9** is an enlarged perspective view showing a portion to be fitted and its vicinity of the dresser disc;

[0027] FIG. **10** is an enlarged perspective view showing a torque transmitting section and its vicinity;

[0028] FIGS. **11** to **13** are views for explaining an angle of the torque transmitting section;

[0029] FIG. **14** is a view for explaining the relationship between the width and the position of the torque transmitting section;

[0030] FIG. **15** is a view for explaining the length of a contact surface of the torque transmitting section and a disc radius;

[0031] FIG. **16** is a schematic perspective view showing an example of a conventional CMP apparatus; and

[0032] FIG. **17** is a cross-sectional view showing an example of a conventional dressing device.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0033] A preferred embodiment of a dressing device according to the embodiment will be described below.

[0034] A dressing device **1** according to one embodiment of the embodiment can be used to dress a polishing pad **8***b* for polishing a semiconductor substrate or the like, as shown in FIG. **1**. The dressing device **1** includes a dresser driving shaft **2**, a holder **3**, and a dresser disc **4**, as shown in FIG. **2** and the like.

[0035] In the dressing device **1**, the holder **3** is coupled to a lower end portion of the dresser driving shaft **2**, as shown in FIG. **1**. The holder **3** has the dresser disc **4** mounted thereto. The polishing pad **8***b* can be dressed by rubbing the dresser disc **4** against the polishing pad **8***b* provided on a polishing table **8***a* which rotates while horizontally rotating the dresser disc **4**. The dresser driving shaft **2** is supported by a support arm **1***a* so as to be capable of moving to an appropriate position.

[0036] As shown in FIG. **1**, the dressing device **1** is included in a CMP apparatus **8**. The CMP apparatus **8** also includes a top ring **9** which holds a substrate, such as a semiconductor wafer, and the like. The CMP apparatus **8** can polish a surface of the substrate held in the top ring **9** by rotating the top ring **9** and the polishing pad **8***b* in respective directions of arrows and pressing the substrate against the polishing pad **8***b* with predetermined pressure while supplying a polishing liquid onto the polishing pad **8***b*. For example, an alkaline solution with fine particles of, e.g., silica suspended therein as abrasive grains can be used as the polishing liquid. For this reason, the surface of the substrate is planarized not only through polishing using the polishing pad **8***b* but also by chemical polishing action of an alkali in the polishing liquid and mechanical polishing action of abrasive grains.

[0037] As shown in FIG. **1**, **2**, or the like, the dresser driving shaft **2** is formed so as to be rotatable and movable upward and downward. The holder **3** can be fixed to a lower end of the dresser driving shaft **2**. Upward/downward movement of the dresser driving shaft **2** lifts/lowers the dresser disc **4** mounted to the holder **3**, which allows adjustment of a load on the polishing pad. Rotation of the dresser driving shaft **2** rotates the dresser disc **4** mounted to the holder **3**, which allows dressing of the polishing pad.

[0038] As shown in FIG. **2**, **3**, or the like, the holder **3** is formed in a disc-like shape. The holder **3** is formed such that the upper surface side thereof can be coupled to the lower end portion of the dresser driving shaft **2** and such that the dresser disc **4** can be mounted to the bottom surface side thereof. The material for the holder **3** is not particularly limited and can be selected from among synthetic resins and the like.

[0039] A circular opening **3***a* is formed at the center of the holder **3**, and the holder **3** can be coupled to the dresser driving shaft **2** by fitting the dresser driving shaft **2** into the opening **3***a*. A method for coupling to the dresser driving shaft **2** is not limited to this, and a coupling method well known in the art can be used. For example, the holder **3** can be coupled

so as to be tiltable with respect to the dresser driving shaft **2** by being fixed through, e.g., a spherical bearing.

[0040] A bottom surface **3***b* of the holder **3** is formed in the shape of a horizontal surface, and a peripheral wall section **3***c* which protrudes downward all around the bottom surface **3***b* is provided at an outer periphery. A portion inside the peripheral wall section **3***c* serves as a disc storage section **3***d* to which the dresser disc **4** can be mounted.

[0041] The peripheral wall section **3***c* is formed in a rectangular shape in cross-section, and an inner side surface thereof is formed so as to follow an outer edge of the mounted dresser disc **4**. The provision of the peripheral wall section **3***c* positions the dresser disc **4** and allows the dresser disc **4** to be prevented from deviating due to centrifugal force while rotating. [0024]

[0042] A convex fitting portion **5***a* which extends in a radial direction is formed at the bottom surface **3***b* of the holder **3** and can form a torque transmitting section **6** when fitted into a portion **5***b* to be fitted which is formed at the dresser disc **4**. The fitting portion **5***a* can also be formed to be concave, which will be described in detail later.

[0043] As shown in FIG. **3** or the like, the dresser disc **4** is formed in the shape of a discal plate having a circular opening at the center. The dresser disc **4** has a dressing surface **4***a* to be rubbed against the polishing pad formed at a bottom surface and is formed such that the upper surface side can be mounted to the holder **3**. The circular opening may not be provided.

[0044] As shown in FIG. **4** or the like, the dressing surface **4***a* is formed in the shape of a circular ring having a fixed width and is formed through electrodeposition or the like to have hard particles of, e.g., diamond. The shape of the dressing surface **4***a* is not limited to this, and a shape well known in the art can be adopted. For example, a convex portion of fixed width which protrudes downward at an outer periphery may be formed, and the dressing surface **4***a* may be formed at a distal end surface of the convex portion.

[0045] A method well known in the art can be used to mount the dresser disc **4** to the holder **3**. It is preferable to bury a magnet or the like in the holder **3** to allow the dresser disc **4** to be mounted by magnetic force. In this case, the dresser disc **4** is preferably formed of a metal having magnetism, such as stainless steel. In addition to this method, the dresser disc **4** can be mounted using, for example, a pin, a screw, a bolt, or the like. Alternatively, a through hole may be formed in an upper surface of the holder **3** to allow the dresser disc **4** to be mounted by suction.

[0046] The concave portion **5***b* to be fitted extending in the disc radial direction is formed at an upper surface of the dresser disc **4**, as shown in FIG. **2**, **3**, or the like. The portion **5***b* to be fitted is shaped so as to fit on the fitting portion **5***a* and forms the torque transmitting section **6** together with the fitting portion **5***a*.

[0047] The torque transmitting section **6** is composed of the fitting portion **5***a* and the portion **5***b* to be fitted that fit in with each other and can efficiently transmit torque of the dresser driving shaft **2** from the holder **3** to the dresser disc **4**. The portion **5***b* to be fitted can also be formed to be convex and can be formed in a corresponding concave/convex shape so as to fit in with the fitting portion **5***a*. The fitting portion **5***a* and the portion **5***b* to be fitted preferably fit substantially without any space when the fitting portion **5***a* and the portion **5***b* to be fitted are fitted together. Surfaces around the fitting portion **5***a* and the portion **5***b* to be fitted are preferably substantially vertical surfaces.

[0048] In the form shown in FIG. **2**, **3**, or the like, the groove-like portion **5***b* to be fitted is provided at the dresser disc **4**, and the ridge-like fitting portion **5***a* is provided at the holder **3**. The ridge-like portion **5***b* to be fitted may be provided at the dresser disc **4** while the groove-like fitting portion **5***a* may be provided at the holder **3**. In this case, however, the dresser disc **4** may succeed in being mounted as long as, for example, the upper surface of the dresser disc **4** is planar. In order to prevent erroneous mounting, it is preferable to form the portion **5***b* to be fitted in a groove-like shape and form the fitting portion **5***a* in a ridge-like shape.

[0049] The portion **5***b* to be fitted (or the fitting portion **5***a*) is formed in a shape extending in the disc radial direction in a disc plan view. For example, modifications of the portion **5***b* to be fitted in the dresser disc **4** are shown in FIGS. **5** to **8**. The portion **5***b* to be fitted can be formed in a wedge shape as shown in FIG. **5**, a semicircular shape or a hogbacked shape, for example, a shape which an opposing surface of a contact face in a rectangular is an arc-like shape, as shown in FIG. **6**, a rectangular shape as shown in FIG. **7**, an elliptical shape as shown in FIG. **8**, or the like. Forming the portion **5***b* to be fitted in a shape extending in the disc radial direction makes force less likely to act in the disc radial direction and stabilizes rotation of the dresser disc **4**. If the portion **5***b* to be fitted is formed in a semicircular shape or a hogbacked shape as shown in FIG. **6**, a positional shift is particularly unlikely to occur when the dresser disc rotates. Note that the portions **5***b* to be fitted shown in FIGS. **5** to **8** are formed in groove-like shapes.

[0050] The depth (or the protruding width) of the portion **5***b* to be fitted (or the fitting portion **5***a*) is not particularly limited. The portion **5***b* to be fitted (or the fitting portion **5***a*) can be formed to have a depth (or a protruding width) which causes the portions to fit in with each other at the time of torque transmission. The depth (or the protruding width) is preferably 20% to 80% of the thickness of the outer edge of the dresser disc **4**, particularly preferably 40% to 60%.

[0051] It suffices to form at least one torque transmitting section **6**. At least one pair of torque transmitting sections **6** is preferably formed symmetrically with respect to a rotation center of the dresser disc **4**, particularly preferably one pair to four pairs. With this configuration, stress concentration can be more alleviated. Four pairs of torque transmitting sections **6** may be formed symmetrically with respect to the rotation center of the dresser disc **4**, as shown in FIG. **8**.

[0052] As shown in FIG. **9**, **10**, or the like, the torque transmitting section **6** has a contact surface **7** in the shape of a flat surface formed such that the fitting portion **5***a* and the portion **5***b* to be fitted come into surface-to-surface contact with each other when the dresser driving shaft **2** rotates. The presence of the contact surface **7** causes stress to be appropriately distributed and allows transmission to the dresser disc **4** with lower loss. When the holder **3** rotates in a direction of an arrow, as shown in FIG. **10**, left surfaces of the fitting portion **5***a* and the portion **5***b* to be fitted in FIG. **10** are the contact surfaces **7**.

[0053] In order to efficiently transmit torque, the contact surface **7** is preferably a substantially vertical surface. Since the contact surface **7** is formed as a flat surface, an edge portion of the contact surface **7** appears as a straight line at the upper surface of the dresser disc **4**.

[0054] If the torque transmitting section **6** is formed in a wedge shape, an elliptical shape, a rectangular shape, or the

like in a plan view, surfaces facing the contact surfaces **7** can be made contact surfaces **7'**. The dresser disc **4** can support rotation in either direction.

[0055] As shown in FIG. **11** or **12**, the contact surface **7** is preferably formed such that an angle θ with respect to a straight line passing through the rotation center of the dresser disc **4** and an inner end point I of the contact surface **7** is not more than 13° in a disc plan view, particularly preferably not more than 5°. If the angle exceeds 13°, torque is likely to escape in the disc radial direction, and rotation of the dresser disc **4** is unlikely to be stabilized.

[0056] It is particularly preferable to form the contact surface **7** such that the contact surface **7** falls on a straight line passing through the rotation center of the dresser disc **4** and the inner end point I of the contact surface **7** (i.e., θ=0), as shown in FIG. **13**. The contact surface **7** may be diagonal to the disc radial direction, as shown in FIG. **11** or **12**. If the contact surface **7** extends in the disc radial direction, as shown in FIG. **13**, torque loss decreases, and torque can be reliably transmitted to the dresser disc **4**.

[0057] As shown in FIG. **14**, the torque transmitting section **6** is preferably formed such that a width W on the disc outer edge side is not more than ½ of a distance R from the inner end point I of the contact surface **7** to the rotation center in a disc plan view, particularly preferably not more than ¼. This configuration makes stress more unlikely to escape in the disc radial direction and reduces torque loss. Although FIG. **14** shows a case where the portion **5***b* to be fitted is formed in a rectangular groove-like shape in a disc plan view, the embodiment is not limited to this.

[0058] As shown in FIG. **15**, the contact surface **7** is preferably formed such that a length L of the end portion appearing at the upper surface of the dresser disc **4** is not less than 0.4 of a disc radius r in a disc plan view, particularly preferably not less than 0.7. Since this configuration causes stress to be appropriately distributed at the contact surface **7**, the dresser disc **4** can be prevented from wobbling at the time of rotation.

[0059] In the dressing device **1**, the convex or concave torque transmitting sections **6** extending in the disc radial direction are formed at the holder **3** and the dresser disc **4**, and the contact surfaces **7** in the shapes of flat surfaces are formed at the torque transmitting sections **6**. The dressing device **1** is configured to be capable of transmitting torque of the dresser driving shaft **2** through surface-to-surface contact at the surfaces. This configuration alleviates stress concentration and reduces wobbles when the dresser disc **4** rotates. The dressing device **1** can dress the polishing pad **8***b* without partial wear.

[0060] The dressing device **1** can be included in the CMP apparatus **8** and can dress a polishing pad used for polishing of an object to be polished, such as a semiconductor wafer.

[0061] The configuration of the above-described embodiment is not intended to limit the embodiment. The embodiment can be changed as long as the technical object remains the same. The embodiment is intended to include such changes.

REFERENCE SIGNS LIST

[0062] **1** dressing device
[0063] **1***a* support arm
[0064] **2** dresser driving shaft
[0065] **3** holder
[0066] **3***a* opening
[0067] **3***b* bottom surface
[0068] **3***c* peripheral wall section
[0069] **3***d* disc storage section
[0070] **4** dresser disc
[0071] **4***a* dressing surface
[0072] **5***a* fitting portion
[0073] **5***b* portion to be fitted
[0074] **6** torque transmitting section
[0075] **7** contact surface
[0076] **8** CMP apparatus
[0077] **8***a* polishing table
[0078] **8***b* polishing pad
[0079] **9** top ring

What is claimed is:

1. A dressing device for dressing a polishing pad, comprising:
- a holder which can be coupled to a dresser driving shaft capable of rotating and has a surface for contact a dresser disc;
- a dresser disc which can be mounted to the holder and has a dressing surface to be rubbed against a polishing pad and has a mount surface to be mounted to the holder;
  - wherein the mount surface of the dresser disc has a concave portion extending in a radial direction of the mount surface;
- the surface of the holder has a convex portion extending in a radial direction of the surface;
- the concave portion and the convex portion have flat surfaces each other;
- the concave portion is coupled to the convex portion;
- the concave portion and the covex portion form a torque transmitting section, and;
- the flat surfaces of the concave portion and the convex portion come into surface-to-surface contact each other for transmitting a torque of dresser driving shaft when the dresser disc is mounted to the holder.

2. A dressing device for dressing a polishing pad, comprising:
- a holder which can be coupled to a dresser driving shaft capable of rotating and has a surface for contact a dresser disc;
- a dresser disc which can be mounted to the holder and has a dressing surface to be rubbed against a polishing pad and has a mount surface to be mounted to the holder;
- wherein the mount surface of the dresser disc has a convex portion extending in a radial direction of the mount surface;
- the surface of the holder has a concave portion extending in a radial direction of the surface;
- the concave portion and the convex portion have flat surfaces each other;
- the convex portion is coupled to the concave portion;
- the convex portion and the concave portion form a torque transmitting section, and;
- the flat surfaces of the convex portion and the concave portion come into surface-to-surface contact each other for transmitting a torque of dresser driving shaft when the dresser disc is mounted to the holder.

3. The dressing device according to claim **1**, wherein at least one pair of the torque transmitting sections is formed symmetrically with respect to a rotation center of the dresser disc in a disc plan view.

4. The dressing device according to claim **1**, wherein the flat surfaces of the transmitting section is formed on a straight line passing through the rotation center of the dresser disc in a disc plan view.

5. The dressing device according to claim **3**, wherein the flat surfaces of the one pair of the torque section is formed on a straight line passing through the rotation center of the dresser disc in a disc plan view.

6. The dressing device according to claim **1**, wherein the flat surfaces is formed at an angle not more than 13° with respect to a straight line passing through the rotation center of the dresser disc in a disc plan view.

7. The dressing device according to claim **1**, wherein the holder has a peripheral wall provided at an outer periphery which protrudes downward and has a disc storage sections which can store the dresser disc inside the peripheral wall.

8. The dressing device according to claim **1**, wherein the a width on the disc outer edge side of the torque transmitting section is not more than ½ of a distance from an inner end point of the flat surfaces to the rotation center in a disc plan view.

9. The dressing device according to claim **1**, wherein a length of an edge portion of the torque transmitting section appearing at an upper surface of the dressing disc is not less than 0.4 of a disc radius in a disc plan view.

10. A dresser disc which is used in a dressing device for dressing a polishing pad and is mountable to a holder coupled to a dresser driving shaft capable of rotating, comprising:

a concave or convex torque transmitting section extending in a disc radial direction which couples when the dresser disc is mounted to the holder; and

a contact surface in the shape of a flat surface which is formed as one surface around the torque transmitting section.

11. The dressing device according to claim **2**, wherein at least one pair of the torque transmitting sections is formed symmetrically with respect to a rotation center of the dresser disc in a disc plan view.

12. The dressing device according to claim **2**, wherein the flat surfaces of the transmitting section is formed on a straight line passing through the rotation center of the dresser disc in a disc plan view.

13. The dressing device according to claim **11**, wherein the flat surfaces of the one pair of the torque section is formed on a straight line passing through the rotation center of the dresser disc in a disc plan view.

14. The dressing device according to claim **2**, wherein the flat surfaces is formed at an angle not more than 13° with respect to a straight line passing through the rotation center of the dresser disc in a disc plan view.

15. The dressing device according to claim **2**, wherein the holder has a peripheral wall provided at an outer periphery which protrudes downward and has a disc storage sections which can store the dresser disc inside the peripheral wall.

16. The dressing device according to claim **2**, wherein the a width on the disc outer edge side of the torque transmitting section is not more than ½ of a distance from an inner end point of the flat surfaces to the rotation center in a disc plan view.

17. The dressing device according to claim **2**, wherein a length of an edge portion of the torque transmitting section appearing at an upper surface of the dressing disc is not less than 0.4 of a disc radius in a disc plan view.

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