Patent claims

1. A method for providing a respective flat working layer (32, 39) on each of the two working disks (13, 26) of a double-side processing apparatus comprising a ring-shaped upper working disk (13), a ring-shaped lower working disk (26) and a rolling apparatus (20, 21), wherein the two working disks (13, 26) and also the rolling apparatus (20, 21) are mounted in a manner rotatable about the axis of symmetry (28) of the double-side processing apparatus, and wherein the method comprises the following steps in the stated order:

(a) applying a lower intermediate layer (29) on the surface of the lower working disk (26) and an upper intermediate layer (16) on the surface of the upper working disk (13);

(b) simultaneously leveling both intermediate layers (16, 29) by means of at least three trimming apparatuses, each comprising a trimming disk (34), at least one trimming body (35, 36) containing an abrasive substance, and an outer toothing (37), wherein the trimming apparatuses are moved by means of the rolling apparatus (20, 21) and the outer toothing (37) under pressure and with addition of a cooling lubricant, which contains no substances with abrasive action, on cycloidal paths over the intermediate layers (16, 29) and thus bring about a material removal from the intermediate layers (16, 29); and

(c) applying a lower working layer (32) of uniform thickness to the lower intermediate layer (29) and an upper working layer (39) of uniform thickness to the upper intermediate layer (16).

2. The method as claimed in claim 1, wherein the intermediate layers (16, 29) consist of a plastic.

3. The method as claimed in either of claims 1 and 2, wherein the at least one trimming body (35, 36), in step (b), releases abrasive substance upon contact with the intermediate layers (16, 29) and thus brings about a material removal from the intermediate layers (16, 29) by means of loose grain.

4. The method as claimed in claim 3, wherein the abrasive substance contained in the at least one trimming body (35, 36) contains at least one of the following substances: aluminum oxide (Al_2O_3), silicon carbide (SiC), zirconium dioxide (ZrO_2), boron nitride (BN), boron carbide (B_4C), quartz (SiO_2), cerium dioxide (CeO_2).

5. The method as claimed in either of claims 1 and 2, wherein the at least one trimming body (35, 36), in step (b), contains a fixedly bonded abrasive substance that brings about a material removal from the intermediate layers (16, 29) by means of fixedly bonded grain.

6. The method as claimed in claim 5, wherein the abrasive substance contained in the at least one trimming body (35, 36) contains diamond or silicon carbide (SiC).

7. The method as claimed in any of claims 1 to 6, wherein, after step (b) has been carried out, each of the intermediate layers (16, 29) still completely covers the respective working disk (13, 26) and the remaining minimum thickness of each intermediate layer (16, 29) is a maximum of 1/10

of the remaining maximum thickness of the relevant intermediate layer (16, 29).

8. The method as claimed in any of claims 1 to 7, wherein the working layers (32, 39) are polishing pads which are suitable for the chemical mechanical polishing of semiconductor wafers and which contain no abrasive substances.

9. The method as claimed in claim 8, wherein, after step (c), an additional step (d) is performed, comprising simultaneously trimming both working layers (32, 39) by means of at least three trimming apparatuses, each comprising a trimming disk (34), at least one trimming body (35, 36) containing a fixedly bonded abrasive substance, and an outer toothing (37), wherein the trimming apparatuses are moved by means of the rolling apparatus (20, 21) and the outer toothing (37) under pressure and with addition of a cooling lubricant, which contains no substances with abrasive action, on cycloidal paths over the working layers (32, 39) and thus bring about a material removal from the working layers (32, 39) by means of bonded grain, wherein the material removal is less than 1/10 of the useful layer thickness of the respective working layer (32, 39).

10. The method as claimed in claim 9, wherein the abrasive substance contained in the at least one trimming body (35, 36) contains diamond or silicon carbide (SiC).

11. The method as claimed in any of claims 1 to 7, wherein the working layers (32, 39) are grinding pads which are suitable for the grinding of

semiconductor wafers and which contain fixedly bonded abrasive substance.

12. The method as claimed in claim 11, wherein, after step (c), an additional step (d) is performed, comprising simultaneously trimming both working layers (32, 39) by means of at least three trimming apparatuses, each comprising a trimming disk (34), at least one trimming body (35, 36), and an outer toothing (37), wherein the trimming apparatuses are moved by means of the rolling apparatus (20, 21) and the outer toothing (37) under pressure and with addition of a cooling lubricant, which contains no substances with abrasive action, on cycloidal paths over the working layers (32, 39), wherein the at least one trimming body (35, 36) releases abrasive substance upon contact with the working layers (32, 39) and thus brings about a material removal from the working layers (32, 39) by means of loose grain, and wherein the material removal is less than 1/50 of the useful layer thickness of the respective working layer (32, 39).

13. The method as claimed in claim 12, wherein the abrasive substance contained in the at least one trimming body (35, 36) contains at least one of the following substances: aluminum oxide (Al_2O_3), silicon carbide (SiC), zirconium dioxide (ZrO_2), ~~boron nitride (BN), boron carbide (B_4C).~~

Patent Claims

1. A method for providing a respective flat working layer on each of the two working disks of a double-side processing apparatus comprising a ring-shaped upper working disk, a ring-shaped lower working disk and a rolling apparatus, wherein the two working disks and also the rolling apparatus are mounted in a manner rotatable about the axis of symmetry of the double-side processing apparatus, and wherein the method comprises the following steps in the stated order:
(a) applying a lower intermediate layer on the surface of the lower working disk and an upper intermediate layer on the surface of the upper working disk;
(b) simultaneously leveling both intermediate layers by means of at least three trimming apparatuses, each comprising a trimming disk, at least one trimming body containing an abrasive substance, and an outer toothing, wherein the trimming apparatuses are moved by means of the rolling apparatus and the outer toothing under pressure and with addition of a cooling lubricant, which contains no substances with abrasive action, on cycloidal paths over the intermediate layers and thus bring about a material removal from the intermediate layers; and
(c) applying a lower working layer of uniform thickness to the lower intermediate layer and an upper working layer of uniform thickness to the upper intermediate layer.

2. The method as claimed in claim 1, wherein the intermediate layers consist of a plastic.

3. The method as claimed in either of claims 1 and 2, wherein the at least one trimming body, in step (b), releases abrasive substance upon contact with the intermediate layers and thus

brings about a material removal from the intermediate layers by means of loose grain.

4. The method as claimed in claim 3, wherein the abrasive substance contained in the at least one trimming body contains at least one of the following substances: aluminum oxide (Al_2O_3), silicon carbide (SiC), zirconium dioxide (ZrO_2), boron nitride (BN), boron carbide (B_4C), quartz (SiO_2), cerium dioxide (CeO_2).

5. The method as claimed in either of claims 1 and 2, wherein the at least one trimming body, in step (b), contains a fixedly bonded abrasive substance that brings about a material removal from the intermediate layers by means of fixedly bonded grain.

6. The method as claimed in claim 5, wherein the abrasive substance contained in the at least one trimming body contains diamond or silicon carbide (SiC).

7. The method as claimed in claim 1 or 2, wherein, after step (b) has been carried out, each of the intermediate layers still completely covers the respective working disk and the thickness remaining after trimming at the thinnest location of each intermediate layer is a maximum of 1/10 of the remaining thickness of the thickest location of the intermediate layer.

8. The method as claimed in claim 1 or 2, wherein the working layers are polishing pads for the chemical mechanical polishing of semiconductor wafers and which contain no abrasive substances.

9. The method as claimed in claim 8, wherein, after step (c), an additional step (d) is performed, comprising simultaneously trimming both working layers by means of at least three trimming apparatuses, each comprising a trimming disk, at least one trimming body containing a fixedly bonded abrasive substance, and an outer toothing, wherein the trimming apparatuses are moved by means of the rolling apparatus and the outer toothing under pressure and with addition of a cooling lubricant, which contains no substances with abrasive action, on cycloidal paths over the working layers and thus bring about a material removal from the working layers by means of bonded grain, wherein the material removal is less than 1/10 of the useful layer thickness of the respective working layer.

10. The method as claimed in claim 9, wherein the abrasive substance contained in the at least one trimming body contains diamond or silicon carbide (SiC).

11. The method as claimed claim 1 or 2, wherein the working layers are grinding pads which are suitable for the grinding of semiconductor wafers and which contain fixedly bonded abrasive substance.

12. The method as claimed in claim 11, wherein, after step (c), an additional step (d) is performed, comprising simultaneously trimming both working layers by means of at least three trimming apparatuses, each comprising a trimming disk, at least one trimming body, and an outer toothing, wherein the trimming apparatuses are moved by means of the rolling apparatus and the outer toothing under pressure and with addition of a cooling lubricant, which contains no substances with abrasive action, on cycloidal paths over the working layers, wherein the at least

one trimming body releases abrasive substance upon contact with the working layers and thus brings about a material removal from the working layers by means of loose grain, and wherein the material removal is less than 1/50 of the useful layer thickness of the respective working layer.

13. The method as claimed in claim 12, wherein the abrasive substance contained in the at least one trimming body contains at least one of the following substances: aluminum oxide (Al_2O_3), silicon carbide (SiC), zirconium dioxide (ZrO_2), boron nitride (BN), boron carbide (B_4C).