

CHUCK TABLE ASSEMBLY

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a chuck table assembly including a chuck table that holds a workpiece and a table base that detachably supports a lower surface of the chuck table.

Description of the Related Art

A wafer formed on a front surface thereof with a plurality of devices such as an integrated circuit (IC) and an large-scale integration (LSI) circuit partitioned by a plurality of intersecting streets is ground on a back surface thereof by a grinding apparatus to a desired thickness, and is then divided into individual device chips by such a processing apparatus as a laser processing apparatus and a cutting apparatus, and the thus divided device chips are used for electric apparatuses such as mobile phones and personal computers.

The processing apparatus includes a chuck table for holding under suction a workpiece, and the wafer held by the chuck table is processed into a desired form by each of such processing means as laser applying means and cutting means.

In addition, the diameter of the wafer has multiple variations, i.e., 5 inches, 6 inches, and 8 inches, chuck tables corresponding to the sizes of the wafers are prepared, and the chuck table is replaced, as required, according to the size of the wafer (see, for example, Japanese Patent No. 3424052).

SUMMARY OF THE INVENTION

However, the chuck table is heavy (10 to 30 kg), it takes much time for an operator to hold the chuck table to mount it on a table base, and to bring the table base and the chuck table accurately into a desired positional relation, so that there is a problem that it is difficult to mount the chuck table on the table base.

Accordingly, it is an object of the present invention to provide a chuck table assembly by which a chuck table can easily be mounted on a table base even if the chuck table is heavy.

In accordance with an aspect of the present invention, there is provided a chuck table assembly including a chuck table that has a holding surface for holding a workpiece and a lower surface on the opposite side of the holding surface, and a table base that detachably supports the lower surface of the chuck table. In the chuck table

assembly, the table base includes a support surface that supports the lower surface of the chuck table, a central suction hole formed in a central portion of the support surface, and a lower surface holding suction hole that is formed in the support surface and holds under suction the lower surface of the chuck table, the support surface of the table base has a first magnet embedded in a first region, and a second magnet embedded in a second region spaced from the first region, the lower surface of the chuck table includes a third magnet that is embedded in a third region corresponding to the first region and that has mutual attraction with the first magnet, and a fourth magnet that is embedded in a fourth region corresponding to the second region and that has mutual attraction with the second magnet, and the chuck table assembly further includes compressed air supplying means that supplies compressed air to the lower surface holding suction hole, at the time of mounting the chuck table on the support surface of the table base, to form an air layer between the lower surface of the chuck table and the support surface of the table base.

According to the chuck table assembly of the present invention, even when the chuck table is relatively heavy, the air layer formed between the lower surface of the chuck table and the support surface of the table base makes it

easy to move the chuck table, and the chuck table is properly positioned relative to the table base by the magnets, solving the problem of difficulty in mounting the chuck table on the table base.

The above and other objects, features and advantages of the present invention and the manner of realizing them will become more apparent, and the invention itself will best be understood from a study of the following description and appended claims with reference to the attached drawings showing a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a cutting apparatus to which a chuck table assembly is mounted;

FIG. 2 is an exploded perspective view of the chuck table assembly mounted to the cutting apparatus depicted in FIG. 1;

FIG. 3A is a plan view of a table base depicted in FIG. 2;

FIG. 3B is a sectional view taken along line A-A of FIG. 3A;

FIG. 4A is an upper perspective view of a chuck table used for wafers of 5 inches;

FIG. 4B is a sectional view taken along line B-B of

FIG. 4A;

FIG. 4C is a plan view of the chuck table depicted in FIG. 4A;

FIG. 4D is a lower perspective view of the chuck table depicted in FIG. 4A;

FIG. 5A is an upper perspective view of a chuck table used for wafers of 6 inches;

FIG. 5B is a sectional view taken along line C-C of FIG. 5A;

FIG. 5C is a plan view of the chuck table depicted in FIG. 5A;

FIG. 5D is a lower perspective view of the chuck table depicted in FIG. 5A;

FIG. 6 is a perspective view depicting an embodiment in which an operator mounts a chuck table on a table base;

FIGS. 7A to 7C are partial enlarged views of a chuck table and a table base, depicting the embodiment depicted in FIG. 6 according to progress; and

FIGS. 8A and 8B are lower perspective views depicting another embodiment of the chuck table.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A chuck table assembly according to an embodiment of the present invention will be described in detail below

referring to the attached drawings.

FIG. 1 illustrates a cutting apparatus 1 to which a chuck table assembly 3 of the present embodiment is applied. The cutting apparatus 1 in the present embodiment includes a substantially rectangular parallelepiped apparatus housing 2, and is configured to include the chuck table assembly 3 disposed as holding means for holding a wafer 10 as a workpiece and cutting means 4 including a cutting blade 41 for cutting the wafer 10 held by the chuck table assembly 3. Note that the wafer 10 to be processed in the present embodiment is, as depicted in FIG. 1, for example, a substantially disk-shaped semiconductor wafer having a diameter of 5 inches, formed on a front surface with a plurality of devices partitioned by a plurality of intersecting streets, and is supported on an annular frame F through a pressure sensitive adhesive tape T.

Further, the cutting apparatus 1 includes a cassette 5 (depicted in alternate long and two dashes line) that accommodates a plurality of cassettes 10; a tentative placing table 6 on which the wafer 10 accommodated in the cassette 5 is conveyed out and tentatively placed; conveying-in/conveying-out means 7 that conveys out the wafer 10 to the tentative placing table 6; conveying means 8 that conveys the wafer 10 conveyed out onto the tentative

placing table 6 onto the chuck table assembly 3 in a swiveling manner; cleaning means 9 (details are omitted) for cleaning the wafer 10 cut by the cutting means 4; cleaning conveying means 11 that conveys the cut wafer 10 from the chuck table assembly 3 to the cleaning means 9; imaging means 12 for imaging the wafer 10 on the chuck table assembly 3; and control means omitted from illustration. The cassette 5 is mounted on a cassette table 5a disposed to be vertically movable by unillustrated lifting means, and, when the wafer 10 is conveyed out from the cassette 5 by the conveying-in/conveying-out means 7, the height of the cassette 5 is adjusted, as required.

In the apparatus housing 2, there is disposed X-axis feeding means (illustration being omitted) that is means for relative processing feeding of the chuck table assembly 3 and the cutting means 4 and that moves the chuck table assembly 3 in an X-axis direction indicated by an arrow X which is a cutting feeding direction.

FIG. 2 depicts a perspective view of the chuck table assembly 3 mounted to the cutting apparatus 1, in a state in which a chuck table 20 that holds under suction the wafer 10 is detached upward from the chuck table assembly 3. As depicted in the figure, the chuck table assembly 3 includes, for example, the chuck table 20, which includes

a holding surface 24a formed in a size for holding under suction the wafer 10 having a diameter of 5 inches depicted in FIG. 1 and a lower surface 20b on the opposite side of the holding surface 24a, and a table base 120 which detachably supports the lower surface 20b of the chuck table 20. The chuck table 20 is configured to be rotatable together with the table base 120 by an unillustrated rotational drive mechanism. The chuck table assembly 3 is configured such that the chuck table can be replaced according to the size of the wafer 10 as the workpiece, as will be described later.

As depicted in FIG. 2, the table base 120 includes a support surface 122 that supports the lower surface 20b of the chuck table 20, a central suction hole 123 formed in a central portion of the support surface 122, and lower surface holding suction holes 127 that are formed in the support surface 122 and hold under suction the lower surface 20b of the chuck table 20. In addition, the support surface 122 of the table base 120 includes a first magnet 125 embedded in a first region C1 on the support surface 122 and a second magnet 126 embedded in a second region C2 spaced from the first region C1.

FIG. 3A depicts a plan view of the table base 120, and FIG. 3B depicts a sectional view taken along line A-A

of FIG. 3A. As can be understood from these figures, the first magnet 125 is formed in a ring shape, and is embedded in the support surface 122 in such a manner as to surround the central suction hole 123 of the support surface 122. In the present embodiment, the center of the first magnet 125 and the center of the central suction hole 123 are disposed to coincide with each other. The first magnet 125 is disposed such that an upper surface 125a exposed on the support surface 122 is an N pole while a lower surface 125b embedded is an S pole, and the second magnet 126 is disposed such that an upper surface 126a exposed on the support surface 122 is an S pole while a lower surface 126b embedded is an N pole. As depicted in FIG. 3B, the distance between the center position of the first magnet 125 and the center position of the second magnet 126 is set to W0.

Returning to FIG. 2 to continue description, compressed air supplying means 140 and suction means 150 are connected to the lower surface holding suction holes 127 of the table base 120 constituting the chuck table assembly 3 of the present embodiment. The compressed air supplying means 140 supplies compressed air H to the lower surface holding suction holes 127 of the table base 120 through a compressed air supply passage 142, an on-off valve 144 disposed on the compressed air supply passage 142,

and a communication passage 146. In addition, the suction means 150 is connected to the communication passage 146, which is used also for supply of the compressed air H, through a suction path 152 and an on-off valve 154 disposed on the suction path 152. By operation of the suction means 150, a negative pressure V is generated at the lower surface holding suction holes 127 of the table base 120. Note that a compressed air supply passage and a suction path which are omitted in illustration are connected also to the central suction hole 123 of the table base 120 through a communication passage 147, so that supply of compressed air H and generation of a negative pressure V can be performed at any timing, separately from supply of compressed air H and generation of a negative pressure V performed in the lower surface holding suction holes 127.

The chuck table assembly 3 of the present embodiment is configured such that a plurality of chuck tables different in outside diameter can be used in a replaced manner; not only the chuck table 20 for holding a wafer having a diameter of 5 inches depicted in FIG. 2, but also a chuck table 30 for holding a wafer having a diameter of 6 inches depicted in FIGS. 5A to 5D and a chuck table for holding a wafer having a diameter of 8 inches omitted in illustration, for example, can also be mounted.

Referring to FIGS. 4A to 4D, FIG. 4A depicts an upper perspective view of the chuck table 20 as viewed from an upper side, FIG. 4B depicts a sectional view of the chuck table 20 taken along line B-B of FIG. 4A, FIG. 4C depicts a plan view of the chuck table 20, and FIG. 4D depicts a lower perspective view of the chuck table 20 as viewed from a lower side. As can be understood from FIGS. 4A to 4D, the chuck table 20 includes at least a disk-shaped suction chuck 24 including the holding surface 24a for holding under suction a wafer having a diameter of 5 inches and a frame body 22 surrounding the suction chuck 24 and supporting the periphery thereof, and the suction chuck 24 and the frame body 22 form an internal space 221. The lower surface 20b of the chuck table 20 is formed with a communication hole 222 that is communicating with the internal space 221 and that is formed at a position corresponding to the central suction hole 123 formed in the table base 120. Note that the frame body 22 is formed from metal such as stainless steel, and the suction chuck 24 is, for example, formed from porous ceramic such as alumina (Al_2O_3).

As depicted in FIG. 4D, at the lower surface 20b of the chuck table 20, when the chuck table 20 is positioned at a prescribed position on the table base 120, a third

magnet 42 that has mutual attraction with the first magnet 125 is disposed in a third region C3 corresponding to the first region C1 of the table base 120, while a fourth magnet 44 that has mutual attraction with the second magnet 126 is disposed in a fourth region C4 corresponding to the second region C2 of the table base 120, the third magnet 42 is disposed such that an upper surface 42a thereof is an N pole and a lower surface 42b thereof is an S pole, and the fourth magnet 44 is disposed such that an upper surface 44a thereof is an S pole and a lower surface 44b thereof is an N pole. The distance W1 between the center of the third magnet 42 of the chuck table 20 and the center of the fourth magnet 44 is a distance coinciding with the abovementioned distance W0 between the center position of the first magnet 125 and the center position of the second magnet 126. Thus, when the chuck table 20 is positioned at a prescribed position on the table base 120, the N pole at the upper surface 125a of the first magnet 125 and the S pole at the lower surface 42b of the third magnet 42 mutually attract each other, and the S pole at the upper surface 126a of the second magnet 126 and the N pole at the lower surface 44b of the fourth magnet 44 mutually attract each other.

Referring to FIGS. 5A to 5D, FIG. 5A depicts an upper

perspective view of the chuck table 30 as viewed from an upper side, FIG. 5B depicts a sectional view of the chuck table 30 taken along line C-C of FIG. 5A, FIG. 5C depicts a plan view of the chuck table 30, and FIG. 5D depicts a lower perspective view of the chuck table 30 as viewed from a lower side. The chuck table 30 depicted in FIGS. 5A to 5D has a configuration substantially similar to that of the abovementioned chuck table 20, except that the diameter of the wafer to be held is 6 inches. In other words, the chuck table 30 includes at least a disk-shaped suction chuck 34 including a holding surface 34a for holding under suction the wafer having a diameter of 6 inches and a frame body 32 surrounding the suction chuck 34 and supporting the periphery thereof, and the suction chuck 34 and the frame body 32 form an internal space 321. The lower surface 30b of the chuck table 30 is formed with a communication hole 322 that is communicating with the internal space 321 and that is formed at a position corresponding to the central suction hole 123 formed in the table base 120. The frame body 32 is formed from metal such as stainless steel, and the suction chuck 34 is, for example, formed from porous ceramic such as alumina (Al_2O_3).

As depicted in FIG. 5D, at the lower surface 30b of the chuck table 30, when the chuck table 30 is positioned

at a prescribed position on the table base 120, the third magnet 42 that has mutual attraction with the first magnet 125 is disposed in the third region C3 corresponding to the first region C1 of the table base 120, and the fourth magnet 44 that has mutual attraction with the second magnet 126 is disposed in the fourth region C4 corresponding to the second region C2 of the table base 120. More specifically, the third magnet 42 is disposed such that the upper surface 42a thereof is an N pole while the lower surface 42b thereof is an S pole, and the fourth magnet 44 is disposed such that the upper surface 44a thereof is an S pole, while the lower surface 44b thereof is an N pole. The distance W2 between the center of the third magnet 42 of the chuck table 30 and the center of the fourth magnet 44 is a distance coinciding with the abovementioned distances W0 and W1. Thus, when the chuck table 30 is positioned at a prescribed position on the table base 120, the N pole at the upper surface 125a of the first magnet 125 and the S pole at the lower surface 42b of the third magnet 42 mutually attract each other, and the S pole at the upper surface 126a of the second magnet 126 and the N pole at the lower surface 44b of the fourth magnet 44 mutually attract each other.

Returning to FIG. 2 to continue description, the

chuck table assembly 3 of the present embodiment includes a table stand 110 on which the table base 120 is disposed, and includes four clamp mechanisms 130 disposed between the table stand 110 and the table base 120. The table stand 110 is formed in a cylindrical shape, and is configured to be able to be rotationally driven to have a desired angle by an unillustrated servo motor.

The four clamp mechanisms 130 are disposed between the table stand 110 and the table base 120, evenly at angular intervals of 90° in the circumferential direction. Each clamp mechanism 130 includes a pair of guide rails 131 projecting outward, a clamp section 132 mounted to be movable in the radial direction along the guide rails 131, and a lock section 133 for fixing the clamp section 132 to the guide rails 131.

The clamp section 132 includes a clamp claw 134 rotationally driven in the direction indicated by an arrow R1 by air supplied to the clamp section 132. By this clamp claw 134, the frame F holding the wafer 10 mounted on the chuck table 20 is pressed down, and is fixed to the clamp section 132.

The guide rails 131 are formed with a plurality of positioning recessed grooves for fixing the clamp section 132 moved in the direction indicated by an arrow R2

according to the size of the annular frame that holds the wafer mounted on the chuck table assembly 3. A positioning recessed groove 131a depicted in FIG. 2 is used for fixing the clamp section 132 when holding the frame holding a wafer having a diameter of 8 inches, and a positioning recessed groove 131b is used for fixing the clamp section 132 when holding the frame holding a wafer having a diameter of 6 inches. The clamp section 132 depicted in FIG. 2 is fixed to a positioning recessed groove for 5 inches omitted in illustration, through engagement of a tip portion (omitted in illustration) of the lock section 133.

The cutting apparatus 1 to which the chuck table assembly 3 of the present embodiment is mounted generally has the abovementioned configuration, and the functions and operations of the chuck table assembly 3 of the present embodiment will be described with reference to FIGS. 2, 6, and 7A to 7C. Note that, in the following embodiment, an embodiment when the chuck table 20 holding the wafer 10 having a diameter of 5 inches is mounted on the table base 120 will be described.

When mounting the chuck table 20 on the table base 120, first, the compressed air supplying means 140 depicted in FIG. 2 is operated, and the on-off valve 144 is opened, to jet compressed air H from the lower surface holding

suction holes 127 of the table base 120 through the compressed air supply passage 142, the on-off valve 144, and the communication passage 146. Next, as depicted in FIG. 6, the operator holds the chuck table 20 by both hands, and mounts, from above, the chuck table 20 on the support surface 122 of the table base 120 of the chuck table assembly 3 mounted to the cutting apparatus 1. Here, in the case where the operator mounts the chuck table 20 on the table base 120, in the initial state, as depicted in FIG. 7A, the positions of the first magnet 125 embedded in the first region C1 of the support surface 122 of the table base 120 and the third magnet 42 embedded in the third region C3 of the lower surface 20b of the chuck table 20 and the positions of the second magnet 126 embedded in the second region C2 of the support surface 122 and the fourth magnet 44 (indicated by a broken line) embedded in the fourth region C4 of the lower surface 20b of the chuck table 20 do not coincide with each other, so that they are not in a prescribed positional relation. In this instance, between the lower surface 20b of the chuck table 20 and the support surface 122 of the table base 120, compressed air H is supplied from the lower surface holding suction holes 127 of the table base 120 and an air layer P is formed, so that the chuck table 20 is floated above the table base

120. As a result, the operator can easily move the chuck table 20, which is heavy, in horizontal (in FIG. 6, plane defined by the X direction and the Y direction) directions, and, as depicted in FIG. 7B, the third magnet 42 disposed in the third region C3 of the chuck table 20 can easily be positioned relative to the first magnet 125 embedded in the support surface 122 of the table base 120. When the third magnet 42 of the chuck table 20 is positioned relative to the first magnet 125 of the table base 120, the two magnets mutually attract each other by their actions, whereby the center position of the table base 120 and the center position of the chuck table 20 coincide with each other, and the position is fixed.

The first magnet 125 of the table base 120 and the third magnet 42 of the chuck table 20 mutually attract each other, whereby the center positions of the table base 120 and the chuck table 20 are substantially fixed, and the chuck table 20 is put into a state of being movable in a rotating direction indicated by an arrow R3 depicted in FIG. 6. Here, the operator rotates the chuck table 20 in the direction indicated by the arrow R3, whereby, as depicted in FIG. 7C, the fourth magnet 44 embedded in the fourth region C4 of the chuck table 20 is positioned relative to the second magnet 126 embedded in the second region C2 of

the support surface 122 of the table base 120. As a result, the second magnet 126 of the table base 120 and the fourth magnet 44 of the chuck table 20 mutually attract each other, and, as viewed in plan, the chuck table 20 is positioned at a prescribed position relative to the table base 120.

When the chuck table 20 is accurately positioned relative to the table base 120, the on-off valve 144 for supplying the compressed air H is closed, and the operation of the compressed air supplying means 140 is stopped, to stop the supply of the compressed air H. As a result, the chuck table 20 is lowered, the first magnet 125 and the third magnet 42 come into close contact with each other, the second magnet 126 and the fourth magnet 44 come into close contact with each other, and the chuck table 20 is fixed with a prescribed positional relation relative to the table base 120, whereby mounting is completed.

When the mounting of the chuck table 20 on the table base 120 is completed, in the cutting apparatus 1, cutting of the wafer 10 is conducted. When performing the cutting, the abovementioned suction means 150 is operated and the on-off valve 154 is opened, to generate a negative pressure V at the lower surface holding suction holes 127, thereby sucking the chuck table 20 to the table base 120. Next, the wafer 10 as a workpiece is mounted on the holding

surface 24a of the chuck table 20, the abovementioned clamp mechanism 130 is operated to grasp the frame F supporting the wafer 10, and a suction negative pressure V is generated at the central suction hole 123 through the communication passage 147 depicted in FIG. 2, to hold the wafer 10 on the chuck table 20. When the wafer 10 is held on the chuck table 20, the X-axis feeding means omitted in illustration is operated, and the chuck table assembly 3 is positioned directly below the abovementioned imaging means 12 and imaged, so that an alignment step is performed. Next, in reference to position information concerning the processing position of the wafer 10 detected by the alignment step, the chuck table assembly 3 is positioned directly below the cutting means 4, and the streets of the wafer 10 are cut by the cutting blade 41 of the cutting means 4, so that the wafer 10 is divided into individual device chips (details are omitted).

When the wafer 10 is divided into the individual device chips as described above, the grasping of the frame F by the clamp mechanism 130 is cancelled, and the compressed air H is supplied to the central suction hole 123 of the table base 120, to thereby convey out the wafer 10 from the chuck table 20. Note that, in the above embodiment, an example in which the chuck table 20 holding

the wafer 10 having a diameter of 5 inches is mounted on the table base 120 relative to the chuck table assembly 3 has been described, but also in the case of mounting the chuck table 30 holding the wafer having a diameter of 6 inches, mounting can similarly be performed by the above procedure, and the details thereof are omitted.

According to the above-described embodiment, even if the chuck table 20 mounted on the table base 120 is relatively heavy, supply of the compressed air H between the lower surface 20b of the chuck table 20 and the support surface 122 of the table base 120 to form the air layer P makes it easy to move the chuck table 20 in horizontal directions, whereby the chuck table 20 can be positioned at a proper position by being moved in horizontal directions on the table base 120, solving the problem of difficulty in mounting the chuck table 20 on the table base 120.

Further, since, in the above embodiment, the first magnet 125 embedded in the support surface 122 of the table base 120 and the second magnet 126 are set such that the magnetic poles exposed on the support surface 122 side are different, erroneous attraction of the fourth magnet 44 of the chuck table 20 to the first magnet 125 of the table base 120 and erroneous attraction of the third magnet 42 to the second magnet 126 are prevented.

Note that the present invention is not limited to the above-described embodiment. For example, in the above embodiment, the fourth magnet 44 embedded in the fourth region C4 of the lower surface 20b of the chuck table 20 has been shaped such that its section is circular, but a magnet 46 whose section extending in a radial direction is rectangular, as depicted in FIG. 8A, may be used as the fourth magnet, and a chuck table 20A in which a lower surface 46b of the magnet 46 is an N pole can be realized. Note that, in the case where the abovementioned magnet 46 is used as the fourth magnet, the second magnet 126 on the table base 120 side is also made to be a magnet whose section extending in a radial direction corresponding to the magnet 46 is rectangular, whereby, in the case where the chuck table 20A is rotated in the direction indicated by the arrow R3 in FIG. 6, the chuck table 20A can be more accurately positioned at a prescribed position relative to the table base 120.

Further, in the above embodiment, the third magnet 42 has been disposed in the center of the lower surface 20b of the chuck table 20, in correspondence with the position of the ring-shaped first magnet 125 surrounding the central suction hole 123 disposed in a central portion of the support surface 122 of the table base 120, but the present

invention is not limited to this; for example, the configuration of a chuck table 20B depicted in FIG. 8B may be adopted. In other words, in the chuck table 20B, a magnet 47 as a third magnet is disposed in a predetermined third region of a lower surface 20Bb, and a magnet 48 as a fourth magnet is disposed in a predetermined fourth region spaced from the magnet 47. In this embodiment as well, a lower surface 47b of the magnet 47 is an S pole, a lower surface 48b of the magnet 48 is an N pole, and, while illustration is omitted, in the support surface 122 of the table base 120, a first magnet of a shape corresponding to the shape of the magnet 47 is embedded in a first region corresponding to the magnet 47, and a second magnet of a shape corresponding to the shape of the magnet 48 is embedded in a second region that is spaced from the first region and that is corresponding to the magnet 48.

Further, in the above embodiment, description has been made on the assumption that the magnets embedded in the table base 120 are permanent magnets, but the present invention is not limited to this, and electromagnets may also be adopted.

Note that, in the above embodiment, an example in which the chuck table assembly 3 of the present embodiment is applied to the cutting apparatus 1 has been described,

but the present invention is not limited to this; for example, the chuck table assembly 3 may be applied to a laser processing apparatus and a grinding apparatus. In addition, while description has been made such that the kind of the chuck table supported by the table base 120 is those for supporting wafers of 5 inches, 6 inches, and 8 inches, the chuck table may support wafers of other sizes, and the above embodiment is not limitative.

The present invention is not limited to the details of the above described preferred embodiment. The scope of the invention is defined by the appended claims and all changes and modifications as fall within the equivalence of the scope of the claims are therefore to be embraced by the invention.

WHAT IS CLAIMED IS:

1. A chuck table assembly comprising:

a chuck table that has a holding surface for holding a workpiece and a lower surface on an opposite side of the holding surface; and

a table base that detachably supports the lower surface of the chuck table,

wherein the table base includes

a support surface that supports the lower surface of the chuck table,

a central suction hole formed in a central portion of the support surface, and

a lower surface holding suction hole that is formed in the support surface and holds under suction the lower surface of the chuck table,

the support surface of the table base has a first magnet embedded in a first region and a second magnet embedded in a second region spaced from the first region,

the lower surface of the chuck table includes

a third magnet that is embedded in a third region corresponding to the first region and that has mutual attraction with the first magnet, and

a fourth magnet that is embedded in a fourth region corresponding to the second region and that has

mutual attraction with the second magnet, and

the chuck table assembly further includes compressed air supplying means that supplies compressed air to the lower surface holding suction hole, at a time of mounting the chuck table on the support surface of the table base, to form an air layer between the lower surface of the chuck table and the support surface of the table base.

2. The chuck table assembly according to claim 1, wherein the first region is a region in which the first magnet formed in a ring shape surrounding the central suction hole is to be embedded.

3. The chuck table assembly according to claim 1, wherein a magnetic pole exposed on the support surface of the first magnet embedded in the support surface of the table base and a magnetic pole exposed on the support surface of the second magnet are different.