

BASE-EQUIPPED BLADE

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a base-equipped blade used for cutting of a workpiece.

Description of the Related Art

By dividing a semiconductor wafer on which plural devices such as an integrated circuit (IC) and a large scale integration (LSI) are formed, plural device chips each including the device are manufactured. Further, by dividing a package substrate formed by coating plural device chips mounted on a substrate by a sealant (mold resin) composed of a resin, plural package devices each including the device chip covered by the mold resin are manufactured. The device chips and the package devices are mounted in various pieces of electronic equipment typified by mobile phones and personal computers.

A cutting apparatus is used for the dividing of the semiconductor wafer and the package substrate. The cutting apparatus includes a holding table that holds a workpiece and a cutting unit that cuts the workpiece by an annular blade. The workpiece is cut and divided by rotating the blade and causing the blade to cut into the

workpiece held by the holding table.

As the blade used for the cutting of the workpiece, the following blades are used: a hub-type blade including a cutting edge in which abrasive grains composed of diamond or the like are fixed by nickel plating or the like; and a washer-type blade formed of an annular cutting edge in which abrasive grains are fixed by a bond material composed of a metal, ceramic, resin, or the like. When the workpiece is cut, a proper blade is selected as appropriate according to the material of the workpiece, and so forth.

The hub-type blade is configured in such a manner that a base with a circular disc shape and a cutting edge formed along the outer circumferential edge of the base are monolithic, and is mounted on a blade mount fixed to the tip part of a rotating shaft (spindle) included in a cutting unit. Further, the washer-type blade is mounted on the tip part of the rotating shaft by a flange part included in a blade mount (fixed flange) and an attachable/detachable flange that clamps the blade with the fixed flange.

As described above, the method of mounting on the rotating shaft is different between the hub-type blade and the washer-type blade, and the shape, dimensions, and

so forth of the blade mount fixed to the rotating shaft are also different according to the kind of blade. For this reason, for example, when a hub-type blade mounted on the tip part of the rotating shaft is replaced by a washer-type blade, the blade mount also needs to be replaced, which makes replacement work of the blade troublesome. Thus, in recent years, base-equipped blades obtained by bonding a washer-type blade to a base with a circular disc shape have been proposed (for example, refer to Japanese Patent Laid-Open No. 2012-135833). When this base-equipped blade is used, it becomes possible to mount a washer-type blade on a blade mount for a hub-type blade and replacement work of the blade is simplified.

SUMMARY OF THE INVENTION

The above-described base-equipped blade is manufactured by integrating a base and a blade that are individually formed. Specifically, after an adhesive is applied to one surface of the base, the one surface of the base is made opposed to one surface of the blade, and the base and the blade are bonded to each other with the intermediary of the adhesive. Thereby, the base and the blade are joined to be integrated. In the base-equipped blade obtained through the above-described steps, the

blade is stuck to only the one surface of the base. In this state, the strength of the joining between the base and the blade is insufficient, in some cases. In particular, when a thick blade is fixed to the base, it is difficult to firmly integrate the base and the blade by only the adhesive applied to one surface of the base, in many cases.

The present invention is made in view of such a problem and intends to provide a base-equipped blade in which a base and a blade are firmly coupled.

In accordance with an aspect of the present invention, there is provided a base-equipped blade including a base with a circular disc shape and an annular blade having an opening part at a center. The base has an annular projecting part that protrudes from a front surface of the base. The blade has a recessed part formed from a side surface exposed at the opening part toward an outer circumferential edge side. In a state in which the projecting part is fitted into the opening part, the base and the blade are bonded to each other with intermediary of a first adhesive that adheres to the front surface of the base and are joined by a second adhesive with which the recessed part is filled and that infiltrates a gap between the projecting part and the

side surface.

Preferably, a groove filled with the first adhesive is formed in a region in which the projecting part is not formed in a side of the front surface of the base.

Further, preferably, a material of the first adhesive is same as a material of the second adhesive or the second adhesive has lower viscosity than the first adhesive.

In the base-equipped blade according to the aspect of the present invention, the base and the blade are bonded to each other with the intermediary of the first adhesive that adheres to the front surface of the base. In addition, the base and the blade are joined by the second adhesive with which the recessed part of the blade is filled and that infiltrates the gap between the projecting part of the base and the side surface of the blade. Due to this, the base-equipped blade in which the base and the blade are firmly coupled is obtained.

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 an exploded perspective view illustrating a base-equipped blade;

FIG. 2 is a sectional view illustrating how a base and a blade are coupled;

FIG. 3 is a sectional view illustrating the base-equipped blade in which the base and the blade are coupled;

FIG. 4 is a sectional view illustrating the base-equipped blade in which recessed parts of the blade are filled with an adhesive;

FIG. 5 is a sectional view illustrating the base-equipped blade obtained through coupling the base in which a groove is formed and the blade;

FIG. 6 is a perspective view illustrating a cutting apparatus; and

FIG. 7 is a perspective view illustrating a cutting unit.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

An embodiment of the present invention will be described below with reference to the accompanying drawings. First, a configuration example of a base-

equipped blade according to the present embodiment will be described. FIG. 1 is an exploded perspective view illustrating a base-equipped blade 2.

The base-equipped blade 2 includes a base 4 with a circular disc shape and an annular blade 6. The base 4 is composed of a metal such as an aluminum alloy, for example, and includes a first surface (front surface) 4a and a second surface (back surface) 4b that are substantially parallel to each other and an outer circumferential edge (outer circumferential surface) 4c. Further, at the center of the base 4, a circular columnar opening part 4d that penetrates the base 4 from the first surface 4a to the second surface 4b is made. On the side of the first surface 4a of the base 4, an annular projecting part 4e that protrudes from the first surface 4a toward the side of the blade 6 is disposed to surround the opening part 4d. The projecting part 4e is formed with a predetermined width along the contour of the opening part 4d and includes an outer circumferential surface 4f substantially perpendicular to the first surface 4a.

The blade 6 is formed into an annular shape by fixing abrasive grains composed of diamond, cubic boron nitride (cBN), or the like by a bond material composed of

a metal, ceramic, resin, or the like. The materials of the abrasive grains and the bond material contained in the blade 6 are selected as appropriate according to the specifications of the base-equipped blade 2, and so forth.

The blade 6 includes a first surface (front surface) 6a and a second surface (back surface) 6b that are substantially parallel to each other and an outer circumferential edge (outer circumferential surface) 6c connected to the first surface 6a and the second surface 6b. Further, at the center of the blade 6, a circular columnar opening part 6d that penetrates the blade 6 from the first surface 6a to the second surface 6b is made. The opening part 6d defines a side surface (inner circumferential surface) 6e of the blade 6 exposed at the opening part 6d. Moreover, the blade 6 has plural recessed parts 6f formed from the side surface 6e of the blade 6 toward the side of the outer circumferential edge 6c. The plural recessed parts 6f are formed to range from the first surface 6a of the blade 6 to the second surface 6b and are disposed at substantially equal intervals along the circumferential direction of the side surface 6e. In FIG. 1, an example in which eight recessed parts 6f are formed in the blade 6 is illustrated.

By coupling the base 4 and the blade 6, the base-equipped blade 2 in which the base 4 and the blade 6 are integrated is obtained. FIG. 2 is a sectional view illustrating how the base 4 and the blade 6 are coupled. When the base 4 and the blade 6 are coupled, first, a first adhesive (adhesive for bonding) is made to adhere to the first surface 4a of the base 4. Specifically, the first adhesive is made to adhere to a region located outside in the radial direction of the base 4 relative to the projecting part 4e in the first surface 4a of the base 4. For example, a sheet-shaped adhesive (adhesive sheet) may be stuck to the first surface 4a, or an epoxy resin-based adhesive or the like may be applied to the first surface 4a. The first adhesive may be made to adhere to the blade 6. Thereafter, the first surface 4a of the base 4 is made opposed to the first surface 6a of the blade 6, and the base 4 and the blade 6 are bonded to each other with the intermediary of the first adhesive. Thereby, the base 4 and the blade 6 are joined.

Here, the projecting part 4e of the base 4 has a shape corresponding to the opening part 6d of the blade 6. Specifically, the projecting part 4e is formed in such a manner that the diameter of the outer circumferential surface 4f of the projecting part 4e is substantially

equal to the diameter of the side surface 6e of the blade 6 and the shape of the outer circumferential surface 4f substantially corresponds with the shape of the side surface 6e. Further, the base 4 and the blade 6 are bonded to each other in such a manner that the projecting part 4e of the base 4 is fitted into the opening part 6d of the blade 6. Thereby, the base 4 and the blade 6 are disposed concentrically with each other, and position alignment between the base 4 and the blade 6 is executed.

In order for the projecting part 4e to be inserted smoothly into the opening part 6d of the blade 6, the diameter of the outer circumferential surface 4f of the projecting part 4e is set slightly smaller than the diameter of the side surface 6e of the blade 6. However, it is preferable that the difference between the diameter of the outer circumferential surface 4f of the projecting part 4e and the diameter of the side surface 6e of the blade 6 be equal to or smaller than 100 μm for high-accuracy position alignment between the base 4 and the blade 6.

FIG. 3 is a sectional view illustrating the base-equipped blade 2 in which the base 4 and the blade 6 are coupled. In the state in which the projecting part 4e of the base 4 is fitted into the opening part 6d of the

blade 6, the base 4 and the blade 6 are joined to be integrated. Thereby, the base-equipped blade 2 is obtained. The diameter of the outer circumferential edge 6c of the blade 6 is larger than the diameter of the outer circumferential edge 4c of the base 4. Thus, when the base 4 and the blade 6 are joined, the outer circumferential edge 6c of the blade 6 is disposed outside in the radial direction of the base 4 relative to the outer circumferential edge 4c of the base 4 and becomes the state of protruding from the outer circumferential edge 4c.

It is preferable that the height of the projecting part 4e (amount of protrusion from the first surface 4a) be equal to or smaller than the thickness of the blade 6. In this case, the projecting part 4e does not protrude from the side of the second surface 6b of the blade 6 when the projecting part 4e is inserted into the opening part 6d of the blade 6. Due to this, when the base-equipped blade 2 is mounted on a blade mount 44 (see FIG. 7) fixed to a rotating shaft 40, that the projecting part 4e gets contact with the blade mount 44 and the mounting of the base-equipped blade 2 is hindered can be prevented.

Next, the recessed parts 6f of the blade 6 stuck to

the base 4 are filled with a second adhesive (adhesive for filling). FIG. 4 is a sectional view illustrating the base-equipped blade 2 in which the recessed parts 6f of the blade 6 are filled with a second adhesive 8. As the second adhesive 8, an acrylic resin-based or epoxy resin-based adhesive is used, for example. The material of the second adhesive 8 may be the same as the material of the first adhesive used for the bonding of the base 4 and the blade 6 or may be different. When the material is different between the first adhesive and the second adhesive, it is preferable to use an adhesive having lower viscosity and higher fluidity than the first adhesive as the second adhesive 8.

Here, a slight gap with a length equal to or shorter than 50 μm , for example, is formed between the projecting part 4e of the base 4 and the side surface 6e of the blade 6. Further, when the recessed parts 6f are filled with the second adhesive 8, the second adhesive 8 flows in the gap between the outer circumferential surface 4f of the projecting part 4e and the side surface 6e of the blade 6 due to capillary action, and the second adhesive 8 infiltrates this gap. As a result, the outer circumferential surface 4f and the side surface 6e are joined by the second adhesive 8 with which the gap

between the outer circumferential surface 4f and the side surface 6e is filled.

When the second adhesive 8 infiltrates the gap between the projecting part 4e and the side surface 6e, in addition to the joining of the first surface 4a of the base 4 and the first surface 6a of the blade 6 by the first adhesive, further the projecting part 4e and the side surface 6e are joined by the second adhesive 8. Due to this, the base 4 and the blade 6 are firmly joined. In particular, when the blade 6 is thick, the joining region between the outer circumferential surface 4f and the side surface 6e can be widened by increasing the height (amount of protrusion) of the projecting part 4e of the base 4 according to the thickness of the blade 6. Due to this, the base 4 and the blade 6 can be joined more firmly. For example, the height of the projecting part 4e is set to be substantially the same as the thickness of the blade 6.

The number, position (interval), shape, size, and so forth of the recessed parts 6f filled with the second adhesive 8 are set in such a manner that the second adhesive 8 with which the recessed parts 6f are filled infiltrates the whole of the gap between the projecting part 4e and the side surface 6e due to capillary action.

However, when the recessed parts 6f are excessively large, there is a possibility that the strength of the blade 6 is affected. For this reason, it is preferable that the depth of the recessed parts 6f be equal to or smaller than $1/4$ of the width of the blade 6 (distance between the outer circumferential edge 6c and the side surface 6e).

As described above, in the base-equipped blade 2 according to the present embodiment, the base 4 and the blade 6 are bonded to each other with the intermediary of the first adhesive that adheres to the first surface 4a of the base 4. In addition, the base 4 and the blade 6 are joined by the second adhesive with which the recessed parts 6f of the blade 6 are filled and that infiltrates the gap between the projecting part 4e of the base 4 and the side surface 6e of the blade 6. Due to this, the base-equipped blade 2 in which the base 4 and the blade 6 are firmly coupled is obtained.

In the above, description has been made about the case in which the recessed parts 6f of the blade 6 are filled with the second adhesive 8 after the base 4 and the blade 6 are bonded to each other with the intermediary of the first adhesive. However, the method of the joining of the base 4 and the blade 6 is not

limited thereto. For example, the recessed parts 6f of the blade 6 may be filled with the adhesive when the base 4 and the blade 6 are bonded to each other. Specifically, when the base 4 and the blade 6 are bonded to each other, to the regions that overlap with the recessed parts 6f of the blade 6 (first regions) in the first surface 4a of the base 4, a large amount of first adhesive is applied compared with the other region (second region) in the first surface 4a. When the base 4 and the blade 6 are bonded to each other in this state, the recessed parts 6f of the blade 6 are filled with the first adhesive applied to the first regions. Then, the first adhesive with which the recessed parts 6f are filled flows in the gap between the outer circumferential surface 4f of the projecting part 4e and the side surface 6e of the blade 6 due to capillary action, and the first adhesive infiltrates this gap.

In the case of using the above-described method, part of the first adhesive is equivalent to the second adhesive 8 illustrated in FIG. 4. Thus, the material of the first adhesive is the same as the material of the second adhesive 8. It is preferable to use an adhesive with high fluidity (for example, acrylic resin-based or epoxy resin-based adhesive) as the first adhesive in

order to facilitate the infiltration of the first adhesive into the gap between the outer circumferential surface 4f of the projecting part 4e and the side surface 6e of the blade 6. Further, the amount of first adhesive applied to the first regions of the first surface 4a of the base 4 is adjusted as appropriate so that the recessed parts 6f of the blade 6 may be filled with the first adhesive.

Furthermore, in the above, description has been made about the example in which the first adhesive is applied to the first surface 4a of the base 4 formed into a flat surface shape when the base 4 and the blade 6 are bonded to each other. However, a groove filled with the first adhesive may be formed in the base 4. FIG. 5 is a sectional view illustrating the base-equipped blade 2 obtained through coupling the base 4 in which a groove 4g is formed and the blade 6.

In FIG. 5, the groove 4g with an annular shape is formed on the side of the first surface 4a of the base 4. For example, the groove 4g is formed from the first surface 4a toward the side of the second surface 4b in such a manner as to surround the projecting part 4e. The outer circumferential edge of the groove 4g (one end part of the groove 4g in the width direction) does not reach

the outer circumferential edge 4c of the base 4 and the inner circumferential edge of the groove 4g (the other end part of the groove 4g in the width direction) reaches the outer circumferential surface 4f of the projecting part 4e. There is no limit on the specific shape of the groove 4g. For example, in the base 4, one strip-shaped groove 4g may be continuously formed along the circumferential direction of the base 4, or plural grooves 4g may be formed along the circumferential direction of the base 4 at substantially equal intervals.

When the base 4 and the blade 6 are bonded to each other (see FIG. 2), the groove 4g is filled with a first adhesive (adhesive for bonding) 10. The amount of first adhesive 10 is adjusted according to the volume of the groove 4g and the surface of the first adhesive 10 with which the groove 4g is filled is positioned on substantially the same plane as the first surface 4a of the base 4.

Here, to the regions that overlap with the recessed parts 6f of the blade 6 in the groove 4g, the first adhesive 10 is applied in such a manner as to protrude from the first surface 4a of the base 4. The amount of first adhesive 10 applied to this region is adjusted in such a manner that the volume of the first adhesive 10

that protrudes from the first surface 4a of the base 4 becomes equal to or larger than the volume of the recessed part 6f of the blade 6. When the side of the first surface 4a of the base 4 and the side of the first surface 6a of the blade 6 are bonded to each other in this state, the base 4 and the blade 6 are joined with the intermediary of the first adhesive 10. In addition, the recessed parts 6f of the blade 6 are filled with the first adhesive 10 that protrudes from the first surface 4a of the base 4. Then, the first adhesive 10 with which the recessed parts 6f are filled flows in the gap between the outer circumferential surface 4f of the projecting part 4e and the side surface 6e of the blade 6 due to capillary action, and the first adhesive infiltrates this gap.

As described above, when the inside of the groove 4g is filled with the first adhesive 10, the contact area between the first adhesive 10 and the base 4 increases compared with the case in which the first adhesive 10 is applied to the first surface 4a of the base 4 in which the groove 4g is not formed. This can enhance the adhesive strength of the first adhesive 10 with respect to the base 4. Further, due to the filling of the groove 4g with the first adhesive 10, it is possible to prevent

the occurrence of the situation in which, when the base 4 and the blade 6 are bonded to each other, the first adhesive 10 is crushed to spread and protrudes to the outside of the outer circumferential edge 4c of the base 4. However, the region in which the groove 4g is formed can be changed as appropriate. For example, the groove 4g may be formed in such a manner that the inner circumferential edge of the groove 4g does not overlap with the recessed parts 6f of the blade 6. In this case, after the groove 4g is filled with the first adhesive 10 and the base 4 and the blade 6 are bonded to each other, the recessed parts 6f of the blade are filled with the second adhesive 8 separately.

The above-described base-equipped blade 2 is mounted on a cutting apparatus and cuts a workpiece. A configuration example of a cutting apparatus that cuts a workpiece by using the base-equipped blade 2 will be described below. FIG. 6 is a perspective view illustrating a cutting apparatus 20 that cuts a workpiece 11.

As examples of the workpiece 11 cut by the cutting apparatus 20, semiconductor wafers on which plural devices such as an IC and an LSI are formed and package substrates such as a chip size package (CSP) substrate

and a quad flat non-leaded package (QFN) substrate are cited. However, there is no limit on the kind, material, shape, structure, size, and so forth of the workpiece 11. For example, the workpiece 11 may be a substrate or the like, that is, composed of glass, sapphire, ceramic, resin, metal, or the like and has a circular disc shape or rectangular parallelepiped shape.

The cutting apparatus 20 includes a base 22 that supports the respective constituents configuring the cutting apparatus 20 and a cover 24 that covers the upper surface side of the base 22 is disposed over the base 22. A space in which processing of the workpiece 11 is executed (treatment space) is formed inside the cover 24, and a cutting unit 26 on which the base-equipped blade 2 is mounted is disposed in this space. A movement mechanism (not illustrated) is connected to the cutting unit 26, and this movement mechanism moves the cutting unit 26 in a Y-axis direction (indexing feed direction, front-rear direction) and a Z-axis direction (vertical direction, upward-downward direction).

A holding table (chuck table) 28 that holds the workpiece 11 is disposed under the cutting unit 26. The upper surface of the holding table 28 configures a holding surface that holds the workpiece 11, and this

holding surface is connected to a suction source (not illustrated) such as an ejector through a suction path (not illustrated) formed inside the holding table 28. When a negative pressure of the suction source is caused to act on the holding surface in the state in which the workpiece 11 is disposed on the holding surface of the holding table 28, the workpiece 11 is held under suction by the holding table 28. A movement mechanism (not illustrated) is connected to the holding table 28, and this movement mechanism moves the holding table 28 along an X-axis direction (processing feed direction, left-right direction). Further, a rotation mechanism (not illustrated) is connected to the holding table 28, and this rotation mechanism rotates the holding table 28 around a rotation axis substantially parallel to the Z-axis direction.

A cassette elevator 30 is disposed at a corner part on the front side of the base 22. A cassette 32 in which plural workpieces 11 can be housed is placed on the upper surface of the cassette elevator 30. The cassette elevator 30 is configured to be capable of rising and lowering and adjusts the height (position in the Z-axis direction) of the cassette 32 so that carrying-out of the workpiece 11 from the cassette 32 or carrying-in of the

workpiece 11 to the cassette 32 may be properly executed. Further, a monitor 34 of a touch panel system that serves as a user interface is disposed on the side of a front surface 24a of the cover 24.

The respective constituents that configure the cutting apparatus 20 (the cutting unit 26, the movement mechanism connected to the cutting unit 26, the holding table 28, the movement mechanism and the rotation mechanism connected to the holding table 28, the cassette elevator 30, the monitor 34, and so forth) are connected to a control unit (not illustrated). The control unit is configured by a computer or the like and controls operation of the constituents of the cutting apparatus 20.

FIG. 7 is a perspective view illustrating the cutting unit 26. The cutting unit 26 includes the circular cylindrical rotating shaft (spindle) 40 disposed along the Y-axis direction. The rotating shaft 40 is housed in a circular cylindrical housing 42. The tip part (one end part) of the rotating shaft 40 is exposed on the external of the housing 42, and the blade mount 44 is fixed to the tip part of the rotating shaft 40. Further, a rotational drive source (not illustrated) such as a motor that rotates the rotating shaft 40 is linked to the

base end part (the other end part) of the rotating shaft 40.

The blade mount 44 includes a flange part 46 with a circular disc shape and a circular cylindrical support shaft 48 that protrudes from the center of a front surface 46a of the flange part 46. An annular projecting part 46b that protrudes from the front surface 46a is disposed on the side of the front surface 46a of the outer circumferential part of the flange part 46. The projecting part 46b includes a tip surface 46c at its tip, and the tip surface 46c is formed in substantially parallel to the front surface 46a. A screw part 48a is formed in the outer circumferential surface of the tip part of the support shaft 48, and an annular fixing nut 50 is fastened to the screw part 48a. At the center of the fixing nut 50, a circular columnar opening part 50a that penetrates the fixing nut 50 in the thickness direction is formed. The opening part 50a is formed with substantially the same diameter as the support shaft 48, and a screw groove corresponding to the screw part 48a of the support shaft 48 is made at the opening part 50a.

When the support shaft 48 is inserted in the opening part 4d of the base 4 of the base-equipped blade 2, the base-equipped blade 2 is mounted on the blade

mount 44. When the fixing nut 50 is fastened to the screw part 48a of the support shaft 48 in this state, the blade 6 is clamped by the first surface 4a (see FIG. 1 and so forth) of the base 4 and the tip surface 46c of the projecting part 46b of the flange part 46. In this manner, the base-equipped blade 2 is fixed to the tip part of the rotating shaft 40.

When the rotating shaft 40 is rotated by the rotational drive source in the state in which the base-equipped blade 2 is mounted on the cutting unit 26, the base-equipped blade 2 rotates around the axial center of the rotating shaft 40. Then, the workpiece 11 is cut by causing the blade 6 of the base-equipped blade 2 that rotates to cut into the workpiece 11 held by the holding table 28 (see FIG. 6).

Structures, methods, and so forth according to the above-described embodiment can be implemented with appropriate changes without departing from the range of the object of the present invention.

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 base-equipped blade comprising:
a base with a circular disc shape; and
an annular blade having an opening part at a center, wherein
the base has an annular projecting part that protrudes from a front surface of the base,
the blade has a recessed part formed from a side surface exposed at the opening part toward an outer circumferential edge side, and,
in a state in which the projecting part is fitted into the opening part, the base and the blade are bonded to each other with intermediary of a first adhesive that adheres to the front surface of the base and are joined by a second adhesive with which the recessed part is filled and that infiltrates a gap between the projecting part and the side surface.
2. The base-equipped blade according to claim 1, wherein
a groove filled with the first adhesive is formed in a region in which the projecting part is not formed in a side of the front surface of the base.
3. The base-equipped blade according to claim 1, wherein

a material of the first adhesive is same as a material of the second adhesive.

4. The base-equipped blade according to claim 1, wherein

the second adhesive has lower viscosity than the first adhesive.