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(54) DOUBLE-FACED DETECTING DEVICES FOR AN ELECTRONIC SUBSTRATE

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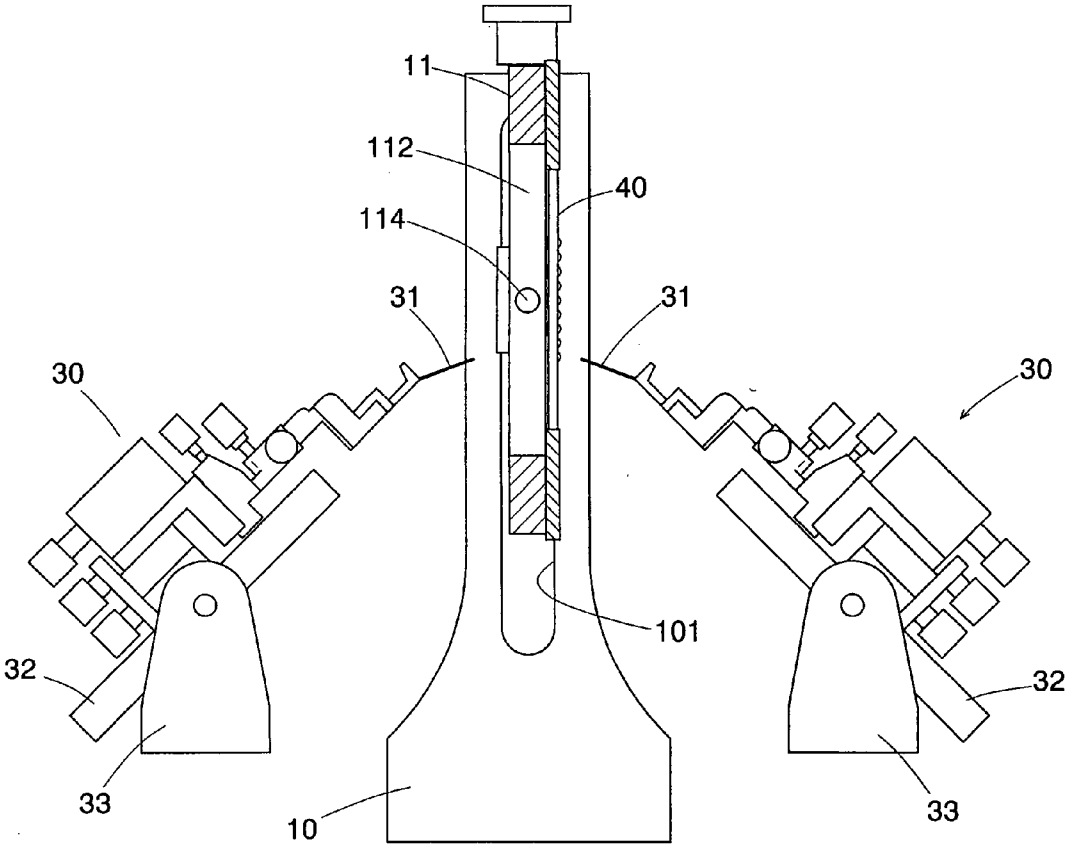
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(57) ABSTRACT

Double-faced detecting devices for an electronic substrate, the detecting device have a base and two probe-detecting machines oppositely located beside the base. The base has a guiding groove and a substrate platform with a through hole rotatably and movably mounted on the base via the guiding groove. Therefore, when the electronic substrate mounts on the substrate platform, the substrate platform enables to rotate from a horizontal position to a vertical position to expose two faces of the electronic substrate to face the two probe-detecting machines for a double-faced detection of the electronic substrate in high-frequency properties. Additionally, each probe-detecting machine is mounted on a pivot base and pivoted by the pivot base to adjust the height of probe to touch the electronic substrate at the vertical position.



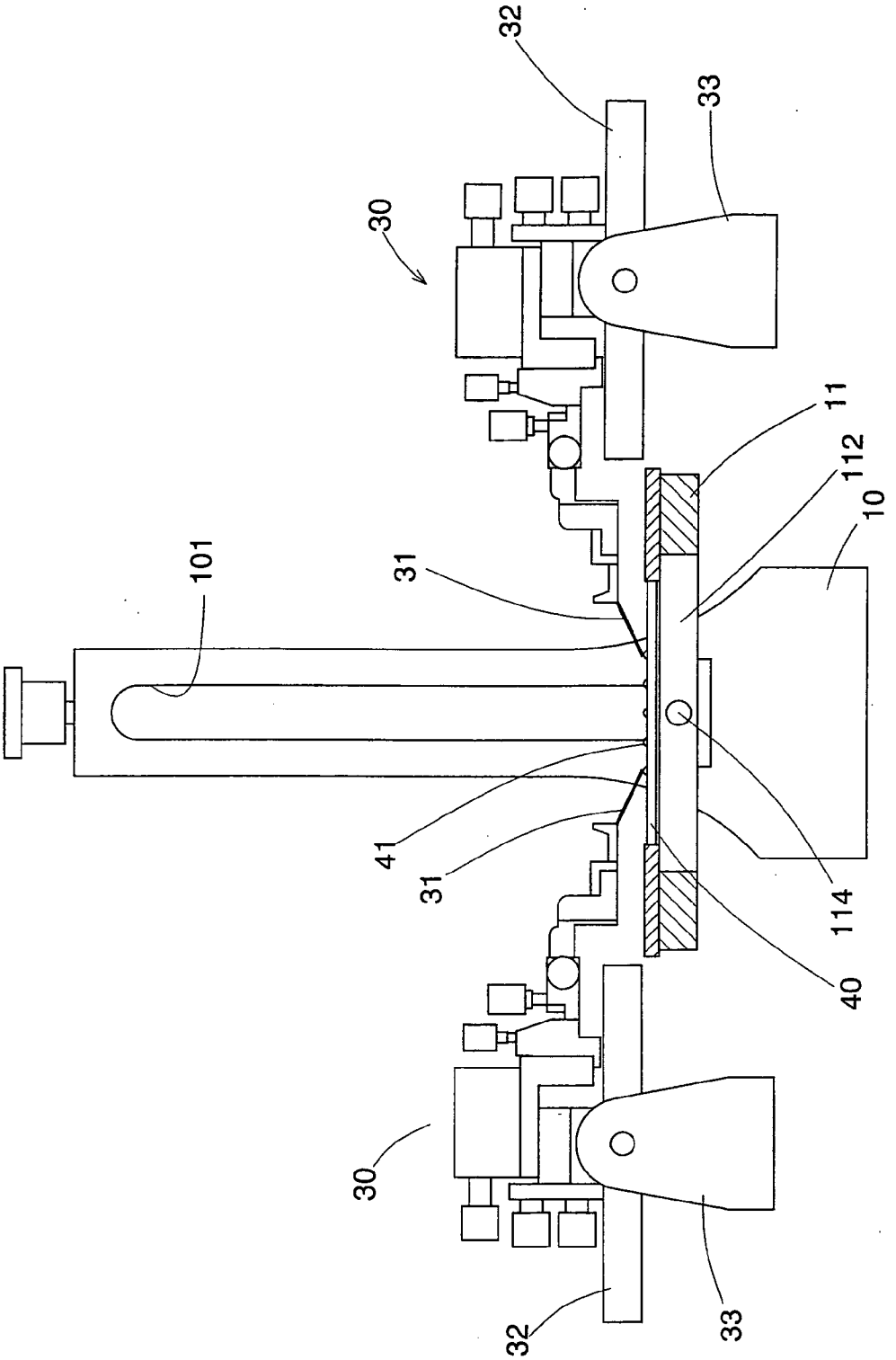


FIG. 1

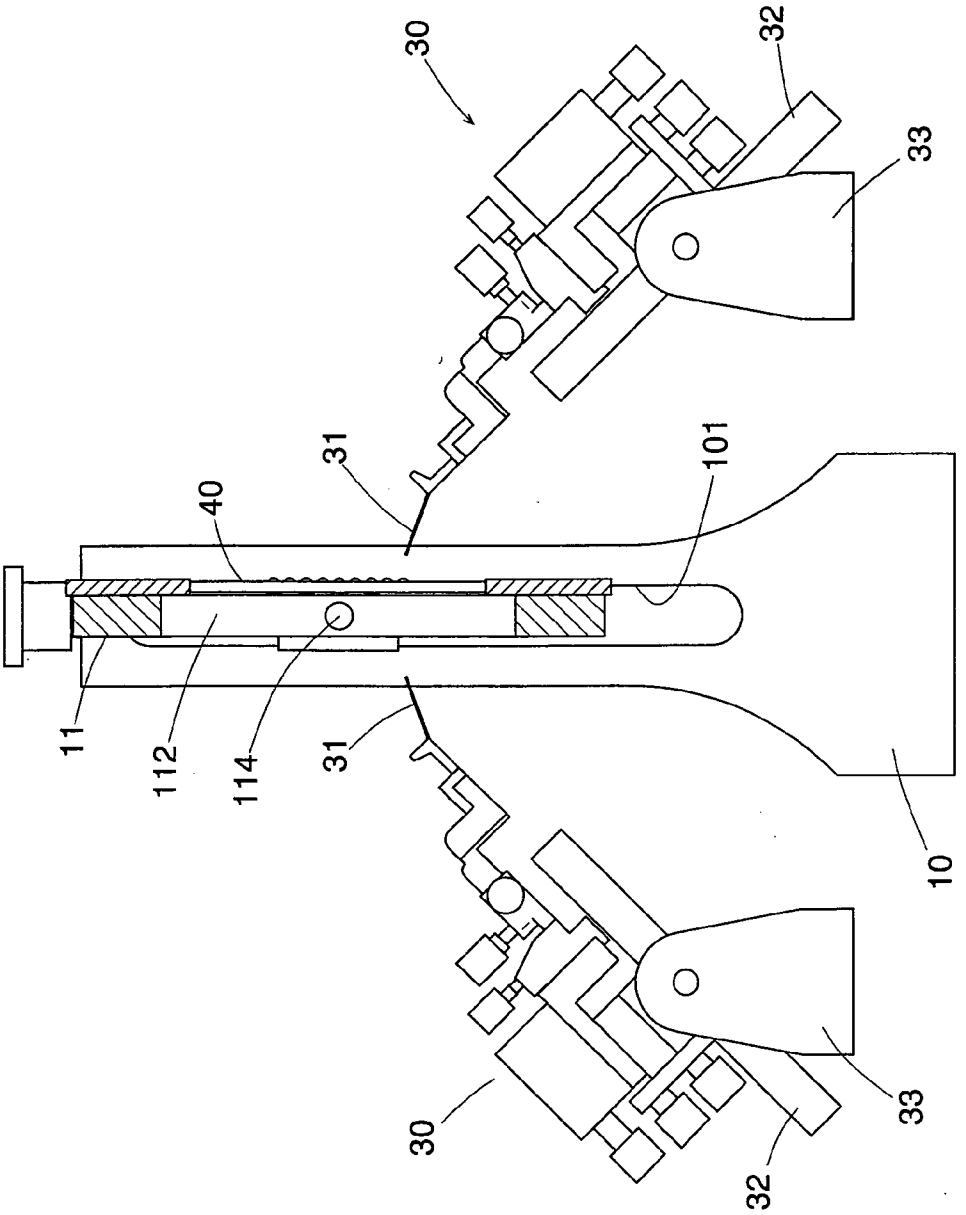


FIG. 2

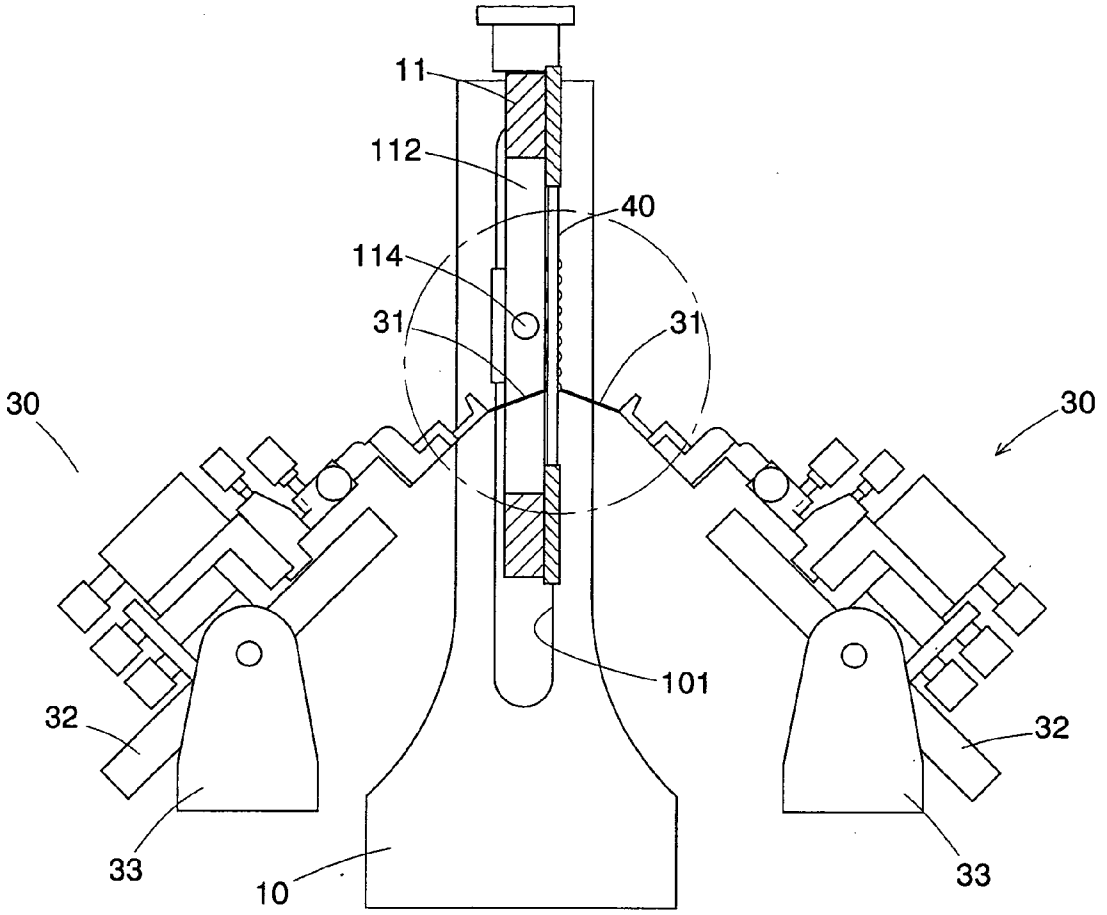


FIG. 3

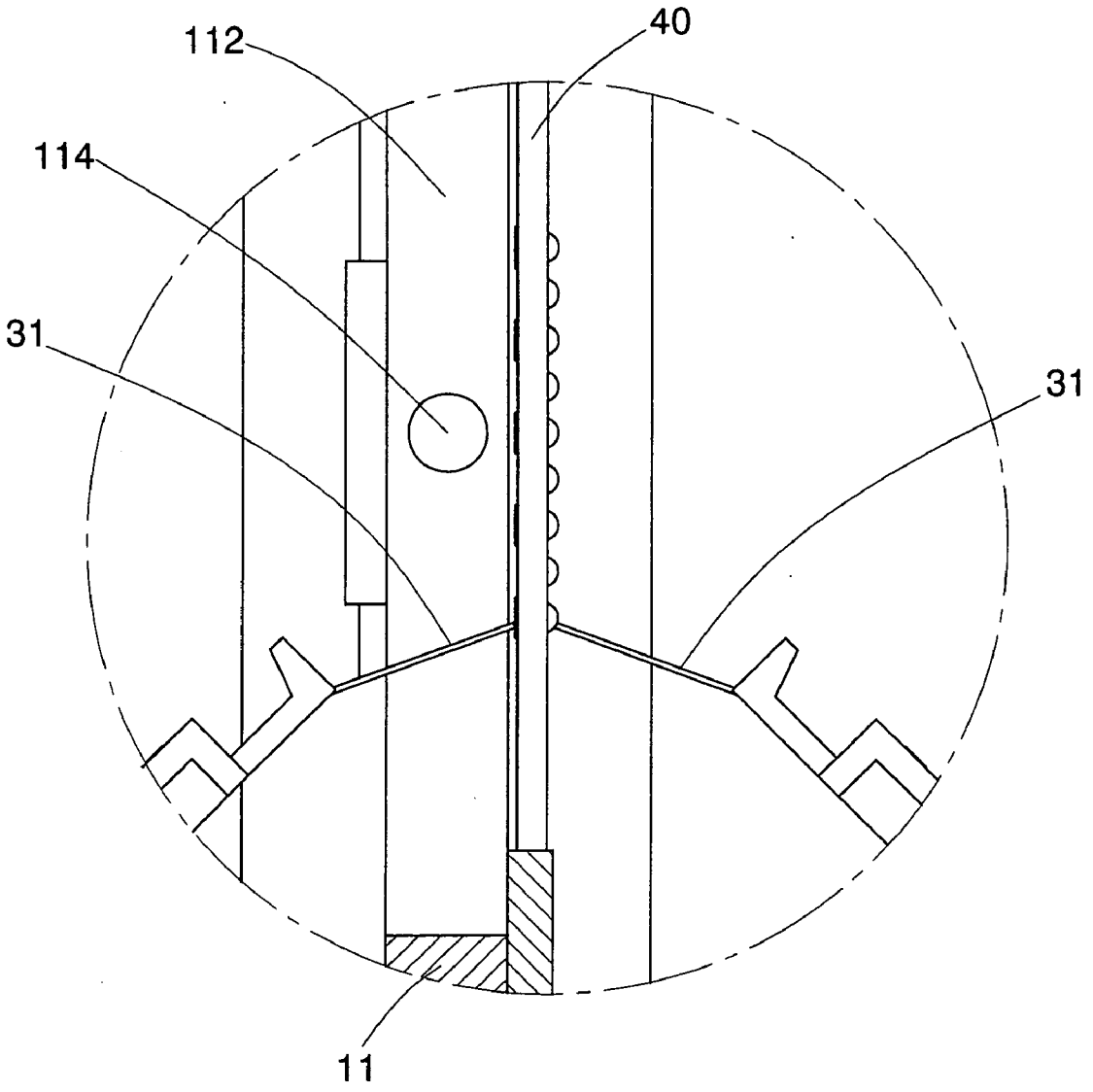


FIG. 4

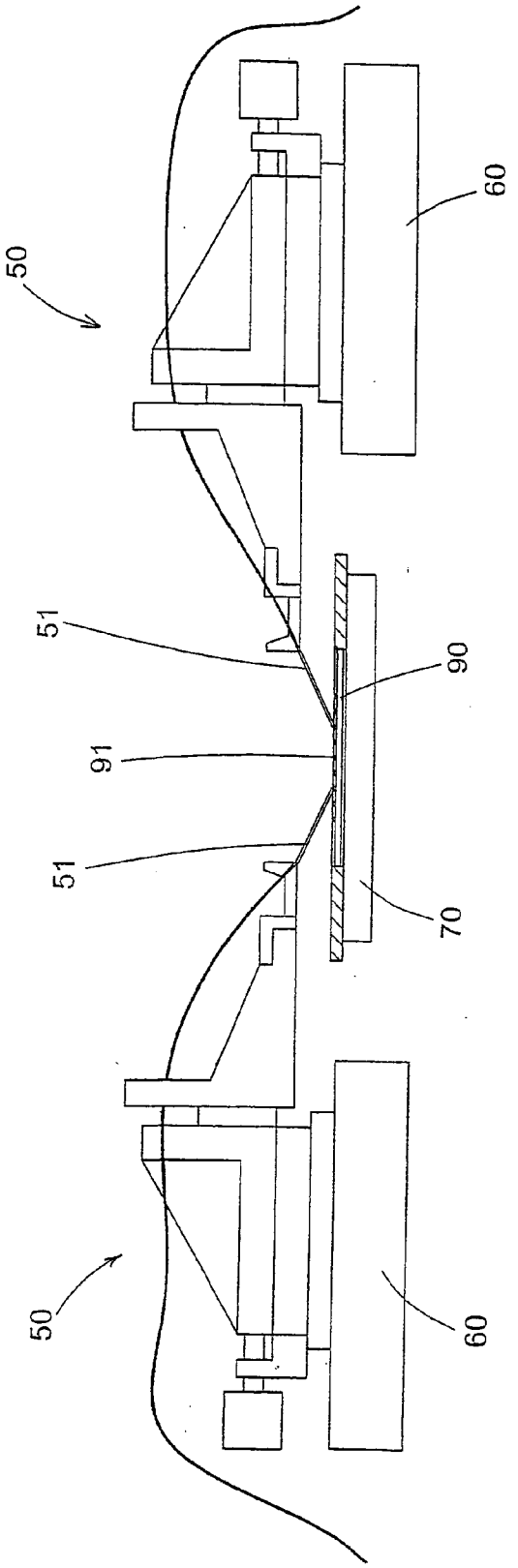


FIG. 5
PRIOR ART

DOUBLE-FACED DETECTING DEVICES FOR AN ELECTRONIC SUBSTRATE

FIELD OF THE INVENTION

[0001] In general, the present invention relates to double-faced detecting devices for an electronic substrate, and more particularly to detecting devices that enables to alternatively place the electronic substrate in a horizontal position or a vertical position to detect high-frequency properties of the electronic substrate.

BACKGROUND OF THE INVENTION

[0002] With reference to **FIG. 5**, conventional detecting devices for an electronic substrate, such as a flip chip, a wafer or a printed circuit board (PCB), in high-frequency properties comprises two opposite probe-detecting machines **50** and a substrate platform **70**. Each probe-detecting machine **50** has a probe **51** secured on an inward face of the probe-detecting machine **50** and connects to a detecting system (example: networking analysis instrument) via a high-frequency isolation wire (not shown). The two probe-detecting machines **50** are respectively mounted on two bases **60**. The substrate platform **70** is located between the two probe-detecting machines **50**. The substrate platform **70** has a top face for securing the flip chip, the wafer or the printed circuit board (not shown).

[0003] When the detecting devices operate, a calibration substrate **90** with multiple detecting points **91** (or so-called "pads") is placed on the top face of the substrate platform **70** for adjustment by the two probes **51** on the two probe-detecting devices **50**. After adjustment, the calibration substrate **90** is removed from the substrate platform **70**. Then, the flip chip, the wafer or the printed circuit board (not shown) with multiple detecting points is settled on the top face of the substrate platform **70**. The probes **51** on the probe-detecting machines **50** extend to touch multiple detecting points **91** to detect high-frequency properties of the electronic substrate.

[0004] However, the flip chip, the wafer or the printed circuit board usually has the multiple detecting points formed on a top face and a bottom face in an ideal configuration. For convenience in detection, most of the flip chips, the wafers or the printed circuit boards are designed to arrange the multiple detecting points of circuit on the same face. Unfortunately, data of high-frequency properties obtained from the designed wafers or the printed circuit boards are only simulating data that is not precise. Additionally, only 80% of the electronic substrates can be modified and be detected by the conventional detecting devices. Rest of the electronic substrate still can not be modified in circuit to arrange the multiple detecting points on the same face and thus can not be detected.

SUMMARY OF THE INVENTION

[0005] The present invention provides double-faced detecting devices for an electronic substrate in high-frequency properties, which conveniently contact multiple detecting points on two faces of the electronic substrate to detect the high-frequency properties.

[0006] To achieve the foregoing purpose, the double-faced detecting devices for an electronic substrate comprise:

[0007] a base with a substrate platform movably and rotatably attached to the base, and through hole defined in the substrate platform, wherein the substrate platform is adapted to settle the electronic substrate on the substrate platform and is controlled by a controlling device to locate at a horizontal position or a vertical position;

[0008] two pivot bases oppositely placed beside the substrate platform and each pivot base has a levering plate; and

[0009] two probe-detecting machines respectively and pivotally mounted on the levering plates of the two pivot bases, wherein each probe-detecting machine has a probe extending toward to the substrate platform to touch the electronic substrate.

[0010] Whereby, the electronic substrate is rotated and erected to the vertical position to expose two faces to respectively face the two probe-detecting machines to allow multiple detecting points on the two faces to be touched in a convenient way.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] **FIG. 1** is a schematically side plane view of double-faced detecting devices for an electronic substrate in accordance with the present invention;

[0012] **FIG. 2** is a schematically operational side plane view of the detecting devices for an electronic substrate in **FIG. 1**, wherein a substrate platform is located at a vertical position;

[0013] **FIG. 3** is a schematically operational side plane view of the detecting devices in **FIG. 2**, wherein two probes of two opposite probe-detecting machines extend to touch multiple detecting points on two sides of the electronic substrate;

[0014] **FIG. 4** is a partially enlarged side plane view of the detecting devices in **FIG. 3** to clearly show conjunctions of the probes and the detecting points of the electronic substrate; and

[0015] **FIG. 5** is a schematically operational side plane view of conventional detecting devices for an electronic substrate in accordance with prior art.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0016] With reference to **FIGS. 1 and 2**, double-faced detecting devices for an electronic substrate **40** in accordance with the present invention comprises a base **10** with a substrate platform **11**, two pivot bases **33**, two probe-detecting machines **30** respectively mounted on the two pivot bases **33**. Particularly, the electronic substrate **40** has a top face and a bottom face and multiple contacts **41** respectively arranged on the top and bottom faces.

[0017] The base **10** has an erecting post (not numbered) with a front face, an guiding groove **101** longitudinally defined in the front face of the erecting post, and the substrate platform **11** with a connecting rod **112** movably and rotatably attached to the erecting post via the guiding groove **101**. The substrate platform **11** has a top face. A through hole **114** is defined in the substrate platform **11** and

has a diameter smaller than that of the electronic substrate **40**. Therefore, the electronic substrate **40** enables to be mounted on the top face of the substrate platform **11** and exposes the bottom face of the electronic substrate **40** via the through hole **114**. The substrate platform **11** is controlled by a controlling device (not shown) to move vertically to change the height of electronic substrate **40**. Additionally, the substrate platform **11** also enables to be rotated to hold the electronic substrate **40** at a horizontal position or a vertical position. Preferably, the substrate platform **11** rotates from 0 to 90 degrees.

[**0018**] The two pivot bases **33** are oppositely located beside the substrate platform **11**. Each pivot base **33** has a levering plate **32**. Each probe-detecting machine **30** is mounted on the levering plate **32** and has a probe **31** retractably extending toward to the electronic substrate **40**. Whereby, the probe-detecting machine **30** can be pivoted to allow the probe **31** being inclined to extend upward to reach the contacts **41** at high locations when the electronic substrate **40** is in the vertical position.

[**0019**] With further reference to **FIGS. 3 and 4**, when the detecting devices operate to probe the electronic substrate **40**, the substrate platform **11** horizontally arises and then rotates to the vertical position to expose the two faces of the electronic substrate **40** to respectively face the two probe-detecting machines **30**. Because the contacts **41** on the electronic substrate **40** are at high positions when the substrate platform **11** is arisen to the vertical position, the pivot bases **33** rotate the levering plates **32** to adjust inclinations of the two probes **31** on the two probe-detecting machines **30**. Thereby, the probes **31** enable to probe the contacts **41** to detect the high-frequency properties of the electronic substrate **40**.

[**0020**] For an actually complete operation, a calibration substrate is applied on the detecting devices initially for adjustment as described in the conventional ones. Then, a flip chip, a wafer or a printed circuit board is mounted on the top face of the substrate platform **11** to detect high-frequency properties. Operational procedures of the detecting devices for each detection of any electronic substrate, whether the calibration substrate or the flip chip, the wafer or the printed circuit board, are the same as described as in the conventional detecting devices.

[**0021**] Although particular and specific embodiments of the invention have been disclosed in some detail, numerous modifications will occur to those having skill in the art, which modifications hold true to the spirit of this invention. Such modifications are deemed to be within the scope of the following claims.

What is claimed is:

1. Double-faced detecting devices for an electronic substrate with two faces, the detecting devices comprising:

a base having an erecting post with a front face, an guiding groove longitudinally defined in the front face of the erecting post, a substrate platform movably and rotatably attached to the erecting post via the guiding groove, and a through hole defined in the substrate platform, wherein the substrate platform is adapted to settle the electronic substrate on the substrate platform and is controlled by a controlling device to locate at a horizontal position or a vertical position;

two pivot bases oppositely placed beside the substrate platform, wherein each pivot base has a levering plate; and

two probe-detecting machines respectively and pivotally mounted on the levering plates of the two pivot bases, wherein each probe-detecting machine has a probe extending toward to the substrate platform and adapted to touch the electronic substrate.

2. The double-faced detecting devices as claimed in claim 1, wherein the substrate platform rotates within 0 to 90 degrees.

3. The double-faced detecting devices as claimed in claim 1, wherein the electronic substrate is a flip chip.

4. The double-faced detecting devices as claimed in claim 1, wherein the electronic substrate is a printed circuit board.

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