

## Notice of reasons for refusal (Patent application 2019-531897)

P. 1

### Notice of the Reasons of Refusal

|                           |                                                                                      |
|---------------------------|--------------------------------------------------------------------------------------|
| Patent application number | Patent Application 2019 - 531897                                                     |
| Drafting date             | October 6, 2021                                                                      |
| Patent Office Examiner    | Junichi Shimazaki 9107 2S00                                                          |
| Patent Application Agent  | Patent business corporation Asahina & Co.                                            |
| Applicable Articles       | Article 29, Paragraph 1, Item 3 (Novelty)<br>Article 29, Paragraph 2 (Inventiveness) |

This application should be refused for the following reasons. If you have any opinions in relation to this matter, please submit them within three months from the date this notice is sent.

### Reasons

1. (Novelty) Since the inventions Claimed in the following Claims of this application are inventions described in the publications listed below that were distributed in Japan or

abroad prior to the filing of the application, and are inventions that have become available to the public through telecommunications lines, it falls under Article 29, Paragraph 1, Item 3 of the Patent Act and cannot be patented.

2. (Inventiveness) Since the invention Claimed in the following Claims of this application could have been easily invented by a person having ordinary knowledge in the technical field to which the invention pertains before filing the application based on an invention described in the following publications distributed in Japan or abroad before the application, or an invention made available to the public through telecommunications lines, a patent cannot be obtained according to the provisions of Article 29, Paragraph 2 of the Patent Act.

Remarks (For cited documents, etc., refer to the List of Cited Documents, etc.)

- Concerning Reason 1:
- Claims 14, 11, 12, 15, 16, 20
- Cited documents etc. 1
- Notes

In relation to Claim 1, specification paragraphs 0032 to 0038, 0042, Fig. 2 of the Cited Document 1 describe a technique in which conductive layer 20 and conductive trace 40 are formed on the sides of first guide hole 11b and second guide hole 12b. Furthermore, in relation to Claim 2, Paragraph 0044 of the specification of Cited Document 1 states that the conductive layer 20 is connected to the ground, and Fig. 7, Paragraph 0062 of the specification of the same document states that the conductive trace 40 is connected to the power supply.

---

P. 2

In relation to Claims 3 and 4, paragraph 0051, Figs. 5a and 5b of the specification of Cited Document 1 states that the conductive part is formed on both one side of surface and the other side of surface of the guide. Furthermore, as is clear from Figures 5a and 5b, different types of conductive parts are separated by non-conductive parts.

In relation to Claim 11, see the Cited Document 1 specification Fig. 7. In relation to Claims 12, see paragraph 0040 of the Cited Document 1 specification.

In relation to Claim 15, it is clear from the description in Figures 5a and 5b of the cited document 1 that the area of the conductive part is smaller than the loading surface of the guide.

In relation to Claim 16, the Cited Document 1 specification, Figs. 5a, describes that the holes indicated by G are connected to each other by a conductive part.

In relation to Claim 20, Figs. 5a and 5b of the Cited Document 1 specification describes that the conductive parts of the group indicated by G are connected to each other by a conductive trace 40.

- Concerning Reason 2:

- Claims 1 ~ 21

- Cited Documents etc. 1 ~ 6

- Notes

In relation to Claims 14, 11, 12, 15, 16, and 20, see the notes concerning Reason 1.

In relation to Claim 5, forming an insulating film on the non-conductive part as described in Cited Document 2 Publication Paragraphs 0030 and 0032 and Fig. 3 can be said to be a design matter.

In relation to Claims 6 and 7, although the technology described in cited document 1 has only two guides, providing three guides, as shown in Figure 1 of the Cited Document 3 Publication 0012, is a design change that can be made by a person skilled in the art. Furthermore, at the time, it is a matter for those skilled in the art to appropriately select which guide hole the conductive part is to be provided with.

In relation to Claim 8, paragraph 0044 of Cited Document 1 specification describes ground connection.

In relation to Claims 9 and 10, Paragraph 0006, Figure 4 of the Cited Document 4 Publication classifies conductive contact pins into three groups, namely a group

connected to the power supply layer, a group connected to the GND layer, and a group of signal pins not connected to any layer, and it is clear that the signal pins perform input and output to and from the test equipment.

In relation to Claim 13, Cited Paragraphs 0021 to 0023 and Figures 1 and 3 of the Document 5 Publication describe that the ground block is electrically connected through the metal pipe which is the casing of ground probe having pogo pin structure.

In relation to claims 14 and 17, according to the description in Cited Document 1

---

### P.3

Specification 0053, 0054, Fig. 7, a thick wire J is connected and extends from the conductive trace 40. According to the description, those skilled in the art can easily recall that there is some kind of common pad for electrical connection between conductive trace 40 and thick wire J.

In relation to Claim 18, it is easy for a person skilled in the art to embed the conductive part in the guide as described in Paragraph 0036 and Figure 4 of the Cited Document 4 Publication.

In relation to Claim 19, see Cited Document 4, Publication Paragraph 0053, Figure 10.

In relation to Claim 21, see Cited document 6 Specification 0041 to 0043, Figs. 7A, 7B.

### < List of cited documents, etc. >

1. US Patent Application Publication No. 2015/0198632 Specification
  2. Japanese Unexamined Patent Application Publication No. 2007-171138
  3. Japanese Unexamined Patent Application Publication No. Hei 11-248745
  4. Japanese Unexamined Patent Application Publication No. 2012-1594222
  5. Japanese Unexamined Patent Application Publication No. 2007-178165
  6. U.S. Patent Application Publication No. 2015/0309074 Specification
- 

### < Record of prior art literature search results >

- Field of search     IPC G01R1/073

- Prior art literature

International Publication No. 2005/006003

This record of prior art literature search results does not constitute a reason for refusal.

---

If you have any inquiries regarding the contents of this notice of reasons for refusal or would like to request an interview, please contact us at the following contact information. If you would like to receive draft amendments etc. by e-mail, etc., please let us know by phone.

Examination Department 1    Distance/Electrical Measurement    Junichi Shimazaki

TEL. 03-3581-1101            Extension 3216



---

|                       |               |                    |
|-----------------------|---------------|--------------------|
| Chief Examiner/Deputy | Examiner      | Assistant Examiner |
| Eiji Kobayashi        | Jun Shimazaki |                    |
| 9713                  | 9107          |                    |

---

STATE of NEW YORK    )  
                                          )  
COUNTY of NEW YORK    )

SS:

**CERTIFICATE OF ACCURACY**

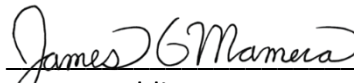
This is to certify that the document, "2021.10.19 Office action" is to the best of our knowledge and belief, a true, accurate, and complete translation from Japanese into English.

Dated: 2/12/2024

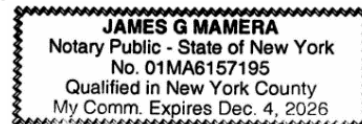


Heather Cameron  
Project Manager  
Consortra Translations

Sworn to and signed before ME  
This 12th day of February, 2024



Notary Public



Your  
legal  
translation  
partner

## Inquiry on the status

---

### Procedural Amendment (Patent Application 2019-531897)

P. 1

|                              |                                                     |
|------------------------------|-----------------------------------------------------|
| 【Document name】              | Procedural Amendment                                |
| 【Reference number】           | JP20353PCT                                          |
| 【Date of submission】         | April 15, 2022                                      |
| 【Recipient】                  | Mr. Kiyoshi Mori, Commissioner of the Patent Office |
| 【Name of incident】           |                                                     |
| 【Application number】         | Patent application 2019-531897                      |
| 【Person making amendment】    |                                                     |
| 【Identification number】      | 519046085                                           |
| 【Name or title】              | Technoprobe Societa Per Acioni                      |
| 【Agent】                      |                                                     |
| 【Identification number】      | 110001896                                           |
| 【Name or title】              | Patent business corporation Asahina & Co.           |
| 【Representative】             | Masahiro Mishima                                    |
| 【Telephone number】           | 06-6943-8922                                        |
| 【Procedural amendment 1】     |                                                     |
| 【document to be amended】     | Scope of claims                                     |
| 【Items subject to amendment】 | Full text                                           |
| 【Amendment method】           | Alteration                                          |
| 【Content of amendment】       |                                                     |

【Document name】      Scope of claims

【Claim 1】

A test head (20) configured to verify the operation of a device under test integrated on a semiconductor wafer, wherein

the test head (20) has at least one guide (40, 41, 42) with a plurality of guide holes (40h, 41h, 42h) and a plurality of contact elements (21', 21'', 21''') housed within the plurality of guide holes (40h, 41h, 42h), and

each of the contact elements (21', 21'', 21''') has a body (21pr, 21pp) extending between a first end (24) and a second end (25), and

said at least one guide (40, 41, 42) has

at least one first group (40', 41', 42') of the plurality of guide holes (40h, 41h, 42h), and at least one first conductive part (30') electrically connecting the corresponding first group of the contact elements (21') housed within the at least one first group (40', 41', 42') of the plurality of guide holes (40h, 41h, 42h), and

at least one second group (40'', 41'', 42'') of the plurality of guide holes (40h, 41h, 42h), and at least one second conductive part (30'') electrically connecting the corresponding first group of the contact elements (21'') housed within the at least one second group (40'', 41'', 42'') of the plurality of the guide holes (40h, 41h, 42h), and

the contact elements of the same group are configured to carry the same type of signal, and the contact elements of different groups are configured to carry respective signals of different types, and

at least one conductive part (30', 30'', 30''') is separated from another conductive part and locally separated by at least one non-conductive zone (31, 31', 31'') so as not to allow electrical connections between contact elements configured to carry different types of signals and/or between contact elements that must not be short-circuited, and

said at least one guide (40, 41, 42) is provided with at least one insulation covering to cover the at least one non-conductive zone (31, 31', 31'').

**【Claim 2】**

The test head (20) of Claim 1, wherein  
a first contact element (21') housed within the first group (40', 41', 42')

---

P.2

of the plurality of guide holes (40h, 41h, 42h) is configured to carry a ground signal, and  
a second contact element (21'') housed within the second group (40'', 41'', 42'') of the  
plurality of guide holes (40h, 41h, 42h) carries a power signal.

**【Claim 3】**

The test head (20) of Claim 1 or Claim 2, wherein one of the first and second conductive parts  
(30', 30'') is formed on one surface (FA, FB; FC, FD) of the at least one guide (40, 41, 42),  
and the other of the first and second conductive parts (30'', 30') is formed on the opposite  
surface (FB, FA; FD, FC) of the at least one guide (40, 41, 42).

**【Claim 4】**

Test head (20) according to any one of claims 1 to 3, wherein  
the test head (20) has at least one lower guide (40), at least one intermediate guide (41) and at  
least one upper guide (42), and  
the lower guide (40) and the intermediate guide (41) are separated from each other by a first  
gap (32'), and  
the intermediate guide (41) and the upper guide (42) are separated from each other by a second  
gap (32''), and  
each of the guides (40, 41, 42) has the plurality of guide holes (40h, 41h, 42h) for housing the  
corresponding contact element (21', 21'', 21'''), and  
one of the first and second conductive parts (30', 30'') is formed on the surface (FA, FB) of the  
lower guide (40), and the other of the first and second conductive parts (30'', 30') is formed on  
the surface (FC, FD) of the intermediate guide (41).

**【Claim 5】**

The test head (20) according to any one of Claims 1 to 3, wherein  
the test head (20) has at least one lower guide (40), at least one intermediate guide (41) and at least one upper guide (42), and  
the lower guide (40) and the intermediate guide (41) are separated from each other by a first gap (32'), and  
the intermediate guide (41) and the upper guide (42) are separated from each other by a second gap (32''), and  
each of the guides (40, 41, 42) has the plurality of guide holes (40h, 41h, 42h) for housing the corresponding contact element (21', 21'', 21'''), and  
both the lower guide (40) and the intermediate guide (41) include both the first conductive part (30') and the second conductive part (30''), and  
the first conductive part (30') and the second conductive part (30'') are physically and electrically separated from each other by the non-conductive zones (31, 31', 31'') of the guides (40, 41).

**【Claim 6】**

The test head according to Claim 4 or Claim 5 (20), wherein  
the first contact element (21') housed within the first group (40', 41', 42') of the plurality of guide holes (40h, 41h, 42h) is configured to carry a ground signal, and a second contact element (21'') housed within the second group (40'', 41'', 42'') of the plurality of guide holes (40h, 41h, 42h) is configured to carry a power signal.

**【Claim 7】**

The test head (20) according to any one of Claims 1 to 6, wherein  
the test head (20) has a plurality of holes in a third group (40''', 41''', 42''') of the plurality of the guide holes (40h, 41h, 42h), and includes at least one third conductive part (30''') that electrically connects the plurality of holes to each other, and the third group (40''', 41''', 42''') houses the third contact element (21''').

**【Claim 8】**

The test head of Claim 7 (20), wherein  
 the third contact element (21''') housed within the third group (40''', 41''', 42''') of the plurality of guide holes (40h, 41h, 42h) is configured to convey input/output signals between the device under test and test equipment.

**【Claim 9】**

The test head (20) according to any one of Claims 1 to 8, wherein  
 said at least one conductive part (30', 30'', 30''') covers at least a portion of the inner surface of the guide hole (40'W, 40''W, 40'''W; 41W, 41''W, 41'''W) of the group (40', 40'', 40'''; 41', 41'', 41''') of the plurality of guide holes (40h, 41h).

**【Claim 10】**

The test head (20) according to any one of Claims 1 to 9, wherein  
 the contact element (21', 21'', 21''') is a contact probe having a deformed part in the main body (21pr).

**【Claim 11】**

The test head (20) according to any one of Claims 1 to 3, wherein  
 the contact element (21', 21'', 21''') is a pogo pin, and  
 the main body (21pp) includes a casing (33) and an elastic body (34) arranged within the casing (33), and  
 said casing (33) defines a first surface (S1) and a second surface (S2), and  
 at least one of the surfaces (S1, S2) is suitable for abutting the at least one guide (40, 42), and  
 the electrical connection between the contact element (21', 21'', 21''') and at least one electrically conductive part (30', 30'', 30''') is the pressing contact through the first and/or the second surface (S1, S2).

**【Claim 12】**

The test head according to any one of Claims 1 to 11 (20), wherein at least one guide (40, 41, 42) has at least one common pad (36', 36'', 36''') connected to at least one conductive part (30', 30'', 30''') by a conductive track (37', 37'', 37''').

**【Claim 13】**

The test head (20) according to any one of Claims 1 to 12, wherein at least one conductive part (30', 30'', 30''') is arranged on the surface (FA, FB, FC, FD, FE) of the at least one guide (40, 41, 42), and has an area smaller than the area of the surface (FA, FB, FC, FD, FE) of the at least one guide (40, 41, 42).

**【Claim 14】**

The test head (20) according to any one of Claims 1 to 12, wherein at least one conductive part (30', 30'', 30''') covers a surface of the at least one guide (40, 41, 42), and the at least one conductive part (30', 30'', 30''') electrically connects each other the plurality of holes of the at least one group (40', 41', 42"; 40'', 41'', 42"; 40''', 41''', 42''') of the guide holes (40h, 41h, 42h), except for the area where the guide hole not belonging to at least one group (40', 41', 42"; 40'', 41'', 42"; 40''', 41''', 42''') is formed.

**【Claim 15】**

The test head (20) according to any one of Claims 1 to 14, wherein said at least one guide (40, 41, 42) has at least one further conductive part (30bis) including one of the plurality of guide holes (40h, 41h, 42h) suitable for housing a single contact element, and the at least one guide (40, 41, 42) has a further common pad (36 bis) connected to the at least one further conductive part (30 bis) by a further conductive track (37 bis) and/or or has a conductive track connecting the at least one further conductive part (30 bis) to another conductive part.

---

**【Claim 16】**

The test head (20) according to Claim 1, wherein  
at least one conductive part (30', 30'', 30''') is embedded in the at least one guide  
(40, 41, 42).

**【Claim 17】**

The test head (20) according to any one of Claims 1 to 16, wherein  
at least one conductive part (30', 30'', 30''') has a plurality of conductive parts that overlap  
each other and are electrically insulated from each other.

**【Claim 18】**

The test head (20) according to any one of Claims 1 to 17, wherein  
the test head (20) has at least one conductive track (39) electrically connecting at least two  
conductive parts that has the plurality of holes in two respective groups of the plurality of guide  
holes (40h, 41h, 42h), electrically connects the plurality of holes to each other, and is configured  
to contact each group of said contact elements (21', 21'', 21'''), and the contact elements  
included in each group are configured to carry the same type of signal.

**【Claim 19】**

The test head (20) according to any one of Claims 1 to 18, wherein  
said test head (20) has at least one circuit component (50), preferably a capacitor,  
electrically connected to at least one conductive part of the at least one guide (40, 41,  
42).



STATE of NEW YORK     )  
                                          )  
COUNTY of NEW YORK    )

SS:

**CERTIFICATE OF ACCURACY**

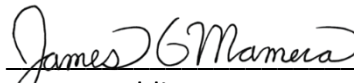
This is to certify that the document, "2022.04.15 Amendment" is to the best of our knowledge and belief, a true, accurate, and complete translation from Japanese into English.

Dated: 2/12/2024

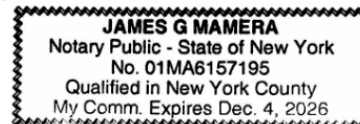


Heather Cameron  
Project Manager  
Consortra Translations

Sworn to and signed before ME  
This 12th day of February, 2024



Notary Public



Your  
legal  
translation  
partner

## Inquiry on the status

### Opinion (Patent application 2019-531897)

---

P1

|                         |                                                     |
|-------------------------|-----------------------------------------------------|
| 【Document name】         | Opinion                                             |
| 【Reference number】      | JP20353PCT                                          |
| 【Date of submission】    | April 15, 2022                                      |
| 【Recipient】             | Mr. Kiyoshi Mori, Commissioner of the Patent Office |
| 【Name of incident】      |                                                     |
| 【Application number】    | Patent application 2019-531897                      |
| 【Patent applicant】      |                                                     |
| 【Identification number】 | 519046085                                           |
| 【Name or title】         | Technoprobe Societa Per Acioni                      |
| 【Agent】                 |                                                     |
| 【Identification number】 | 110001896                                           |
| 【Name or title】         | Patent business corporation Asahina & Co.           |
| 【Representative】        | Masahiro Mishima                                    |
| 【Telephone number】      | 06-6943-8922                                        |
| 【Delivery number】       | 733985                                              |

#### 【Opinion】

(1) In the notice of reasons for refusal dated October 6, 2021 (delivery date: October 19, 2021. The last day of the submission period for written opinions requested through a period extension request is April 19, 2022), the Examiner cited U.S. Patent Application Publication No. 2015/0198632 (hereinafter referred to as Cited Document 1), Japanese Unexamined Patent Publication No. 2007-171138 (hereinafter referred to as Cited

Document 2), Japanese Unexamined Patent Publication No. Hei 11-248745 (hereinafter referred to as Cited Document 3), Japanese Unexamined Patent Publication No. 2012-159422 (hereinafter referred to as Cited Document 4), Japanese Unexamined Patent Publication No. 2007-178165 (hereinafter referred to as Cited Document 5) and U.S. Patent Application Publication No. 2015/0309074 (hereinafter referred to as Cited Document 6), and stated that Claims 14, 11, 12, 15, 16, and 20 are described in the Cited Document 1 and fall under Article 29, Paragraph 1, Item 3 of the Patent Law, and it was determined that a patent cannot be granted pursuant to the provisions of Article 29, Paragraph 2 of the Patent Law. In addition, among Claims 1 to 21 of the present application, Cited Document 2 was referred to regarding Claim 5, Cited Document 3 was referred to regarding Claims 6 and 7, Cited Document 1 was referred to regarding Claim 8, Cited Document 4 was referred to regarding Claims 9 and 10, Cited Document 5 was referred to regarding Claim 13, Cited Document 2 was referred to regarding Claim 5, Cited Document 1 was referred to regarding Claims 14 and 17, Cited Document 4 was referred to regarding Claim 18, Cited Document 4 was referred to regarding Claim 19, Cited Document 6 was referred to regarding Claim 21, and it was determined that a patent cannot be granted pursuant to the provisions of Article 29, Paragraph 2 of the Patent Law.

(2) Concerning amendment

(2 - 1) Content of amendment

The applicant has amended Claim 1 through a procedural amendment submitted at the same time as this written opinion. Specifically, the correction was made to incorporate in Claim 1 before the amendment that at least one conductive part is isolated from another conductive part and is locally separated by at least one non-conductive zone, which is one of the features of Claim 4 before the amendment, and the at least one guide has at least one covering insulation covering at least one non-conductive zone, which is a feature of Claim 5 before amendment. With this amendment, Claims 4 and 5 before the amendment were deleted, and the top numbers of Claims 6 to 21 were moved up to 4 to 19.

(2-2) Basis of amendment

The above amendment to Claim 1 is based on Claims 4 and 5 before the amendment, paragraphs 0078 to 0080 of the specification of the present application, Figures 3A to 3D, etc. There are no new items added. We believe that due to the above-mentioned amendment, the invention of Claim 1 after the amendment in the present application could no longer be easily accomplished by a person skilled in the art based on Cited Documents 1 to 6. I will explain the reason below.

### (3) Reasons why the Claimed invention should be patented

---

#### P.2

##### (3-1) Description of the Claimed invention

The test head, which is the invention according to Claim 1 after the amendment, includes at least one conductive part separated from another conductive part and locally separated by at least one non-conductive zone, and at least one guide with at least one coated insulation covering at least one non-conductive zone. This configuration prevents metal debris, which can result from rubbing of the contact elements, from settling (depositing) in the grooves, which are non-conductive zones between the conductive parts, and causing short circuits between the conductive parts, as described in paragraph 0080 of the specification of the Claimed invention.

##### (3-2) Explanation of cited document

The semiconductor test equipment disclosed in Cited Document 1 has an upper plate and a lower plate with guide holes for accommodating test pins. The conductive part, which consists of a conductive layer 20 formed in the guide hole that makes contact with the test pin 30, and a conductive trace 40 formed on the surface of the guide, covers multiple guide holes. Test pins within a group that transmit the same signal are electrically connected to each other by conductive parts. The test pins are disclosed to be for signal, ground, or power. However, Cited Document 1 does not disclose the covered insulation part that covers the non-conductive zone of the guide.

Cited Document 2 discloses a probe guide having a probe 1 and a support substrate 20. The wiring layer that forms part of the inner wall surface of the probe mounting part and the upper surface of the support substrate is formed on the insulating film covering the silicon substrate. That is, Cited Document 2 discloses a configuration in which there is a recessed part whose bottom is made of a coated insulation film between each of a plurality of wiring layers, but there is no disclosure or suggestion of a covered insulation part covering the non-conductive zone of the guide.

In addition, there is no disclosure or suggestion of the covered insulation part that covers the non-conductive zone of the guide in either Cited Document 3 which discloses a test head for

microstructures having a guide panel with an opening into which a pin-shaped contact element is inserted, Cited Document 4 which discloses a socket for an IC device where the power layer on the base of the socket has multiple conductive contact pins connected to the GND layer, Cited Document 5 which discloses a high frequency/high speed inspection unit equipped with a pogo pin type contact probe that is inserted into a through hole in an insulating block, or Cited Document 6 which discloses a probe card for testing a device under test, comprising a bottom die with a capacitive device positioned on the top surface.

(3-3) Differences between the Claimed invention and the invention described in the Cited Document

The test head, which is the invention according to Claim 1 after the amendment, has a covered insulation part that covers the non-conductive zone. This covered insulation part prevents metal debris, which can result from rubbing of contact elements, from settling in the grooves, which are non-conductive zones between conductive parts, and causing short circuits.

In the notice of reasons for refusal, the examiner referred to Cited Document 2 and stated that “forming an insulating film on non-conductive parts can be considered a design matter.” However, the coated insulation film disclosed in Cited Document 2 is provided to insulate the wiring layer and the silicon substrate, as described in paragraph 0034 and Figure 3 etc. As mentioned above, in Cited Document 2, there is a recessed part with an insulating cover layer at the bottom between each of the multiple wiring layers. In short, the insulating cover layer in Cited Document 2 constitutes the “non-conductive zone” in Claim 1 after the amendment, and does not cover the non-conductive zone. In the first place, Cited Document 2 does not identify the task of solving the problem of metal debris generating short circuits between conductive parts. Therefore, there is no disclosure or suggestion of covering the concave portion between wiring layers with an insulating cover layer. Regarding preventing short circuits between conductive parts, Cited Document 2 merely discloses in paragraph 0035 etc. that no wiring layer is formed on the lower surface of the support substrate 20. We believe that, when the insulating cover layer disclosed in Cited Document 2 is applied to the plate disclosed in Cited Document 1, unlike the test head according to Claim 1 after the amendment, a covered insulation part that covers a non-conductive zone cannot be realized since only an insulating layer is formed between the conductive part and the plate.

P.3

Therefore, we are convinced that the test head that is the invention according to Claim 1 after the amendment of the present application could not have been conceived by a person skilled in the art based on Cited Documents 1 and 2 before filing the application, and has an inventiveness over Cited Documents 1 and 2.

(4) Therefore, we are convinced that the inventions according to Claims 1 to 19 after the amendment of the present application do not fall under the provisions of Article 29, Paragraph 1, Item 3 of the Patent Act and Article 29, Paragraph 2 of the Patent Act.

Therefore, we wish to request that a patent for this patent application would be granted.





STATE of NEW YORK    )  
                                  )  
COUNTY of NEW YORK    )

SS:

**CERTIFICATE OF ACCURACY**

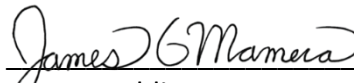
This is to certify that the document, "2022.04.15 Remarks" is to the best of our knowledge and belief, a true, accurate, and complete translation from Japanese into English.

Dated: 2/12/2024

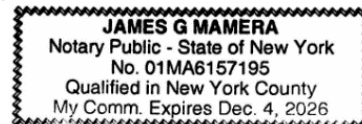


Heather Cameron  
Project Manager  
Consortra Translations

Sworn to and signed before ME  
This 12th day of February, 2024



Notary Public



Your  
legal  
translation  
partner

## Notice of reasons for refusal (Patent application 2019-531897)

P. 1

### Notice of the Reasons of Refusal

|                           |                                           |
|---------------------------|-------------------------------------------|
| Patent application number | Patent Application 2019 - 531897          |
| Drafting date             | August 4, 2022                            |
| Patent Office Examiner    | Junichi Shimazaki 9107 2S00               |
| Patent Application Agent  | Patent business corporation Asahina & Co. |
| Applicable Articles       | Article 29, Paragraph 2 (Inventiveness)   |

< < Final > >

This application should be refused for the following reasons. If you have any opinions in relation to this matter, please submit them within three months from the date this notice is sent.

### Reasons

(Inventiveness) Since the invention Claimed in the following Claims of this

application could have been easily invented by a person having ordinary knowledge in the technical field to which the invention pertains before filing the application based on an invention described in the following publications distributed in Japan or abroad before the application, or an invention made available to the public through telecommunications lines, a patent cannot be obtained according to the provisions of Article 29, Paragraph 2 of the Patent Act.

Remarks (For cited documents, etc., refer to the List of Cited Documents, etc.)

- Concerning Reason (inventiveness):
- Claims 1 ~ 19
- Cited Document 1 ~ 7
- Notes

In relation to claim 1, Cited Document 1 Specification Paragraphs 0032~0038, 0042, Fig. 2 discloses a technique for forming conductive layer 20 and conductive trace 40 on the sides of first guide hole 11B and second guide hole 12b.

Also, as stated in Cited Document 2 Publication Paragraphs 0030 and 0032 and Figure 3, providing a non-conductive part between conductive parts can be considered a design matter.

In this case, it is up to those skilled in the art to appropriately select whether to form a recess in the non-conductive part between the conductive parts as described in Cited Document 7 Publication Paragraph 0015, Figures 3 A and B, or to form the non-conductive parts between the conductive parts so as to be covered with an

---

## P.2

insulating part up to the same height as the conductive part without leaving any recesses as described in Cited Document 7 Publication Paragraph 0017, Figures 4 A and B.

In relation to claim 2, Cited Document 1 Specification Paragraph 0044 states that the conductive layer 20 is connected to the ground, and Cited Document 1 Specification Paragraph 0062, Fig. 7 states that the conductive trace 40 is connected to the power source.

In relation to Claim 3, Cited Document 1 Specification Paragraph 0051, Figs. 5a and 5b state that conductive parts are formed on both one side and the other side of the guide. Furthermore, as is clear from Figures 5a and 5b, different types of conductive parts are separated by non-conductive parts.

Regarding Claims 4 and 5, although the technology described in Cited Document 1 has only two guides, providing three guides as shown in Cited Document 3 Publication 0012, Figure 1 is a design change that can be made by those skilled in the art as appropriate.

In relation to Claim 6, Cited Document 1 Specification Paragraph 0044 describes ground connection.

In relation to Claims 7 and 8, Cited Document 4 Publication Paragraph 0006, Figure 4 describes the classification of conductive contact pins groups into three groups, namely a group with signal pins connected to the power supply layer, a group with signal pins connected to the GND layer, and a group with signal pins not connected to any layer, and it is clear that the signal pins provide input and output to and from the test equipment.

Regarding Claim 9, see Cited Document 1 Specification Fig. 7.

In relation to Claim 10, see Cited Document 1 Specification Paragraphs 0040.

In relation to Claim 11, Cited Document 5 Publication Paragraphs 0021 to 0023 and Figures 1 and 3 state that the pogo pin structure ground probe is electrically connected to the ground block via a metal pipe that is the casing.

In relation to Claims 12 and 15, according to the description in Cited Document 1 Specification 0053, 0054, Fig. 7, a thick wire J is connected and extends from the conductive trace 40. According to the description, those skilled in the art can easily recall that there is a common pad between conductive trace 40 and thick wire J for some kind of electrical connection.

In relation to Claim 13, it is clear from the description in Cited Document 1 Specification Figs. 5a and 5b that the area of the conductive part is smaller than the loading surface of the guide.

In relation to Claim 14, Cited Document 1 Specification Figs. 5a states that the holes indicated by G are connected by a conductive part.

In relation to Claim 16, it is easy for those skilled in the art to embed the conductive part in the guide as described in Cited Document 4 Publication Paragraph 0036, Figure 4.

Regarding Claim 17, see Cited Document 4, Publication Paragraph 0053, Figure 10.

In relation to Claim 18, Cited Document 1, Figs. 5a and 5b, states that the conductive parts of the group indicated by G are connected by conductive trace 40.

---

### P.3

In relation to Claim 19, see Cited Document 6 specifications 0041~ 0043, Figs. 7A, 7B.

#### < Reason for final notification of reasons for refusal >

This notice of reasons for refusal only notifies reasons for refusal that have become necessary due to amendments made in response to the first notice of reasons for refusal.

#### < List of cited documents, etc. >

1. US Patent Application Publication No. 2015/0198632 Specification
2. Japanese Unexamined Patent Application Publication No. 2007-171138
3. Japanese Unexamined Patent Application Publication No. Hei 11-248745
4. Japanese Unexamined Patent Application Publication No. 2012-1594222
5. Japanese Unexamined Patent Application Publication No. 2007-178165
6. U.S. Patent Application Publication No. 2015/0309074 Specification
7. Registered utility model No. 3195187 publication (newly cited document)

---

If you have any inquiries regarding the contents of this notice of reasons for refusal or would like to request an interview, please contact us at the following contact information. If you would like to receive draft amendments etc. by e-mail, etc., please let us know by phone.

Examination Department 1, Measurement (PA2F)  
TEL. 03-3581-1101      Extension 3216

Junichi Shimazaki (Junichi Shimazaki)

---

| <u>Chief Examiner/Deputy</u> | <u>Examiner</u>      | <u>Assistant Examiner</u> |
|------------------------------|----------------------|---------------------------|
| <u>Junya Goto</u>            | <u>Jun Shimazaki</u> |                           |
| <u>3101</u>                  | <u>9107</u>          |                           |

---

STATE of NEW YORK    )  
                                          )  
COUNTY of NEW YORK    )

SS:

**CERTIFICATE OF ACCURACY**

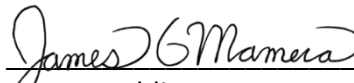
This is to certify that the document, "2022.08.16 Office action" is to the best of our knowledge and belief, a true, accurate, and complete translation from Japanese into English.

Dated: 2/12/2024

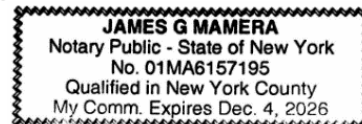


Heather Cameron  
Project Manager  
Consortra Translations

Sworn to and signed before ME  
This 12th day of February, 2024



Notary Public



Your  
legal  
translation  
partner

## Inquiry on the status

---

### Opinion (Patent application 2019-531897)

P1

|                         |                                                   |
|-------------------------|---------------------------------------------------|
| 【Document name】         | Opinion                                           |
| 【Reference number】      | JP20353PCT                                        |
| 【Date of submission】    | November 10, 2022                                 |
| 【Recipient】             | Mr. Mr. Junichi Shimazaki, Patent Office Examiner |
| 【Name of incident】      |                                                   |
| 【Application number】    | Patent application 2019-531897                    |
| 【Patent applicant】      |                                                   |
| 【Identification number】 | 519046085                                         |
| 【Name or title】         | Technoprobe Societa Per Acioni                    |
| 【Agent】                 |                                                   |
| 【Identification number】 | 110001896                                         |
| 【Name or title】         | Patent business corporation Asahina & Co.         |
| 【Representative】        | Masahiro Mishima                                  |
| 【Telephone number】      | (omitted)                                         |
| 【Delivery number】       | 389653                                            |

#### 【Opinion】

(1) In the notice of reasons for refusal dated August 4, 2022 (delivery date: August 16, 2022), the Examiner cited U.S. Patent Application Publication No. 2015/0198632 (hereinafter referred to as Cited Document 1), Japanese Unexamined Patent Publication No. Hei 11-248745 (hereinafter

referred to as Cited Document 3), Japanese Unexamined Patent Publication No. 2012-159422 (hereinafter referred to as Cited Document 4), Japanese Unexamined Patent Publication No. 2007-178165 (hereinafter referred to as Cited Document 5) and U.S. Patent Application Publication No. 2015/0309074 (hereinafter referred to as Cited Document 6), and Registered Utility Model Publication No. 3195187 (hereinafter referred to as Cited Document 7), and stated that Claims 1 to 19 of the present application cannot be patented pursuant to Article 29, Paragraph 2 of the Patent Act.

(2) Reasons why the claimed invention should be patented

The test head, which is the invention according to Claim 1 includes at least one conductive part separated from another conductive part and locally separated by at least one non-conductive zone, and at least one guide with at least one coated insulation covering at least one non-conductive zone. This configuration prevents metal debris, which can result from rubbing of the contact elements, from settling (depositing) in the grooves, which are non-conductive zones between the conductive parts, and causing short circuits between the conductive parts.

In the notice of reasons for refusal, the Examiner stated that, regarding the inventiveness of Claim 1, providing a non-conductive part between a conductive part and a conductive part as described in cited document 2 can be said to be a matter of design item, and further stated that when providing a non-conductive part, it is up to those skilled in the art to decide whether to form it so as to leave a recess between the conductive parts as described in Cited Document 7, or to make it at the same height as the conductive part. However, we believe that there are many technical obstacles for those skilled in the art to combine Cited Documents 1, 2, and 7.

Specifically, we believe that the configuration of the conductive block 40 and the insulating layer 30 disclosed in Cited Document 7 is not applicable to the configuration of the wiring layer 21 and coating insulating layer 24 of the supporting substrate 20 of Cited Document 2. The method of forming the insulation layer 24 and wiring layer 21 in Cited Document 2 is completely different from the method of forming the insulating layer 30 and conductive block 40 in Cited Document 7. First, in Cited Document 2, referring to paragraphs 0049 to 0052, etc., a coated insulation film 24 is formed over the entire surface of the wafer 69 by thermal oxidation of the surface of the wafer 69. A copper plating layer is then formed to cover the entire surface of the coated insulation film 24. Next, a patterned resist is formed on the surface

of the copper plating layer, and the copper plating layer exposed from the resist pattern is removed by etching to form the wiring layer 21. On the other hand, the method for forming the insulating layer 30 and the conductive block 40 disclosed in Cited Document 7 goes through a

---

## P.2

process involving the lamination of insulating layers 30 (31, 50), opening 32a for insulating layers 31 and 50, formation of 50a, and forming conductive blocks 40 (linear connecting columns 42, cylindrical contact pads 44) inside openings 32a and 50a. In the method for manufacturing wiring layer 21 in Cited Document 2, a copper plating layer is formed over the entire area above the covering insulating layer 24. Accordingly, it is theoretically impossible for the top surface of the covering insulating layer 24 to be formed horizontally to the top surface of the wiring layer 21 (for the insulating cover layer 24 to be formed to the same height as the wiring layer 21), and we believe therefore it is impossible to configure the non-coated insulation part in Claim 1 by combining the structure of the coated insulation film and wiring layer disclosed in Cited Document 2 with the technology disclosed in Cited Document 7.

In the first place, cited document 7 discloses the formation of a conductive block formed in a space transformer, and the space transformer itself does not have any conductive parts to shorten the multiple contact probes. Therefore, we believe that a person skilled in the art would have no motivation to combine the structure of the plate in Cited Document 1 and the support substrate in Cited Document 2 with the structure of the conductive block and insulating layer in Cited Document 7.

Furthermore, neither Cited Document 1 nor Cited Document 2 discloses the issue of metal debris generating short circuits between conductive parts. Therefore, we believe that a person skilled in the art would have no motivation to further apply Cited Document 7 to form a covered insulation part when applying cited document 2 to cited document 1.

Suppose, when applying Cited Document 2 to Cited Document 1, if we adopt the structure of Cited Document 7 and try to form the covered insulating part at the same height as the conductive part, in principle, it is considered necessary to stack an additional insulation layer on top of the insulation cover and wiring layer. In this case, an additional non-insulating layer will be formed on the side surface (inner surface) of the guide hole, and even if the insulating layer on the conductive part on the plate surface can be removed by polishing, it is thought that it is difficult to remove the insulating layer formed on the inner surface of the guide hole.

Therefore, it is considered that when applying Cited Document 2 to Cited Document 1, if the configuration of Cited Document 7 is adopted, the test pin will not be able to contact the conductive part on the inner surface of the guide hole, and the test device will therefore not be able to function.

Therefore, we are convinced that the test head that is the invention according to Claim 1 of the present application could not have been conceived by a person skilled in the art based on Cited Documents 1, 2 and 7 before filing the application, and has an inventiveness at least over Cited Documents 2 and 7.

(3) Therefore, we are convinced that the inventions according to claims 1 to 19 of the present application do not fall under the provisions of Article 29, Paragraph 2 of the Patent Act.

Accordingly, we wish to request that a patent for this patent application would be granted.



STATE of NEW YORK    )  
                                      )  
COUNTY of NEW YORK    )

SS:

**CERTIFICATE OF ACCURACY**

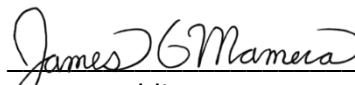
This is to certify that the document, "2023.01.17 Remarks" is to the best of our knowledge and belief, a true, accurate, and complete translation from Japanese into English.

Dated: 2/12/2024

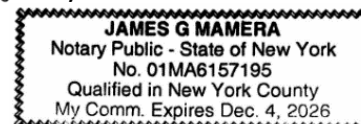


Heather Cameron  
Project Manager  
Consortra Translations

Sworn to and signed before ME  
This 12th day of February, 2024



Notary Public



Your  
legal  
translation  
partner

## Inquiry on the status

---

### Decision to grant patent (Patent application 2019-531897)

P.1

#### Decision to grant patent

|                           |                                            |
|---------------------------|--------------------------------------------|
| Patent application number | Patent application 2019-531897             |
| Drafting date             | January 6, 2023                            |
| Patent Office Examiner    | Junichi Shimazaki 9107 2S00                |
| Name of invention         | Test head with improved frequency response |
| Number of claims          | 19                                         |
| Patent applicant          | Technoprobe Societa Per Acioni             |
| Agent                     | Patent business corporation Asahina & Co.  |

Since we have not found any reason for refusal, we will grant a patent for this application.

| Chief Examiner/Deputy | Examiner      | Assistant Examiner | Classification Official |
|-----------------------|---------------|--------------------|-------------------------|
| Takahiko Toyama       | Jun Shimazaki |                    | Takaaki Taguchi         |
| 9855                  | 9107          |                    | 6002                    |

P. 2

- Application type            Normal
- References                 Yes
- Article 30 of the Patent Act   No
- Change of name of invention   No

- Deposit of a microorganism

Reference information

Patent application number      Patent application 2019-531897

|         |         |   |   |
|---------|---------|---|---|
| - F I   |         |   |   |
| G 0 1 R | 1/0 7 3 | D | ' |
| G 0 1 R | 1/0 6 7 | C | ' |
| H 0 1 L | 2 1/6 6 | B | ' |
| G 0 1 R | 3 1/2 6 | J | ' |
| G 0 1 R | 3 1/2 8 | K | ' |
| G 0 1 R | 1/0 7 3 | E |   |

• Investigated fields (IPC, DB names)

G 0 1 R      1/0 7 3

G 01 R 1/0 6 7  
G 01 R 3 1/2 6  
G 01 R 3 1/2 8  
H 01 L 2 1/6 6

- Reference patent documents

|                                                                      |          |
|----------------------------------------------------------------------|----------|
| US Patent Application Publication No. 2015/0198632                   | (US, A1) |
| Japanese Unexamined Patent Application Publication No. 2007-171138   | (JP, A)  |
| Japanese Unexamined Patent Application Publication No. Hei 11-248745 | (JP, A)  |
| Japanese Unexamined Patent Application Publication No. 2012-159422   | (JP, A)  |
| Japanese Unexamined Patent Application Publication No. 2007-178165   | (JP, A)  |
| U.S. Patent Application Publication No. 2015/0309074                 | (US, A1) |
| Registered utility model No. 3195187                                 | (JP, U)  |
| International Publication No. 2005/006003                            | (WO, A1) |
| Japanese Unexamined Patent Application Publication No. Hei 5-55316   | (JP, A)  |

- Reference books and magazines

---

STATE of NEW YORK     )  
                                          )  
COUNTY of NEW YORK    )

SS:

**CERTIFICATE OF ACCURACY**

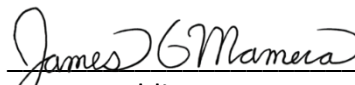
This is to certify that the document, "2023.02.13 Notice of Allowance" is to the best of our knowledge and belief, a true, accurate, and complete translation from Japanese into English.

Dated: 2/12/2024

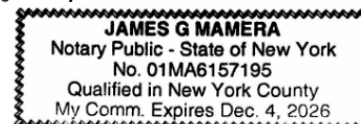


Heather Cameron  
Project Manager  
Consortra Translations

Sworn to and signed before ME  
This 12th day of February, 2024



Notary Public



Your  
legal  
translation  
partner