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Paper 9
Entered: January 24, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FORMFACTOR, INC.,
Petitioners,

v.

TECHNOPROBE S.P.A.,
Patent Owner.

IPR2024-00933
Patent 11,035,885 B2

Before MICHELLE N. WORMMEESTER, JULIA HEANEY, and ANDREW L. NALVEN, *Administrative Patent Judges*.

NALVEN, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

FormFactor, Inc. ("Petitioner") filed a Petition (Paper 1, "Pet.") requesting *inter partes* review of claims 1–23 of U.S. Patent No. 11,035,885 B2 (Ex. 1001, "the '885 patent"). Technoprobe S.p.A. ("Patent Owner") filed a Preliminary Response (Paper 8, "Prelim. Resp.").

We have authority under 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a). Pursuant to 35 U.S.C. § 314(a), an *inter partes* review may not be instituted "unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." After considering the Petition, the Preliminary Response, and associated evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in demonstrating the unpatentability of claims 1–23 of the '885 patent. Accordingly, we institute an *inter partes* review.

II. BACKGROUND

A. Real Parties in Interest

Petitioner identifies itself as real party in interest. Pet. 2. Patent Owner also identifies itself as real party in interest. Paper 4, 1 (Patent Owner's Mandatory Notice).

B. Related Proceedings

The parties identify the following related case: *Technoprobe S.p.A. v. FormFactor, Inc.*, Case No. 1:23-cv-00842-JCG (D. Del.). *See* Pet. 2–3; Paper 4, 1.

C. The '885 Patent

The '885 patent describes a testing head to verify the operation of a device under test integrated on a semiconductor wafer. Ex. 1001, code (54), Abstract. Testing heads place "contact pads of a microstructure, such as an

electronic device integrated on a wafer, into electrical contact with corresponding channels of a testing machine." *Id.* at 1:20–24. The '885 patent explains that testing heads are useful to test devices that are integrated on a wafer to determine if the devices are defective prior to cutting and assembling in a chip containing package. *Id.* at 1:26–31. The '885 patent states that in prior testing heads, the presence of several contact elements to carry ground and power signals caused interference and noise in input/output signals, which limited the frequency performance of the testing head. *Id.* at 2:43–51. To address this issue, the '885 patent proposes a testing head with a conductive portion forming a conductive plane that electrically connects at least one group of guide holes. *Id.* at 3:7–26.

Figure 2A of the '885 patent, reproduced below, illustrates a testing head. Ex. 1001, 5:35–36.

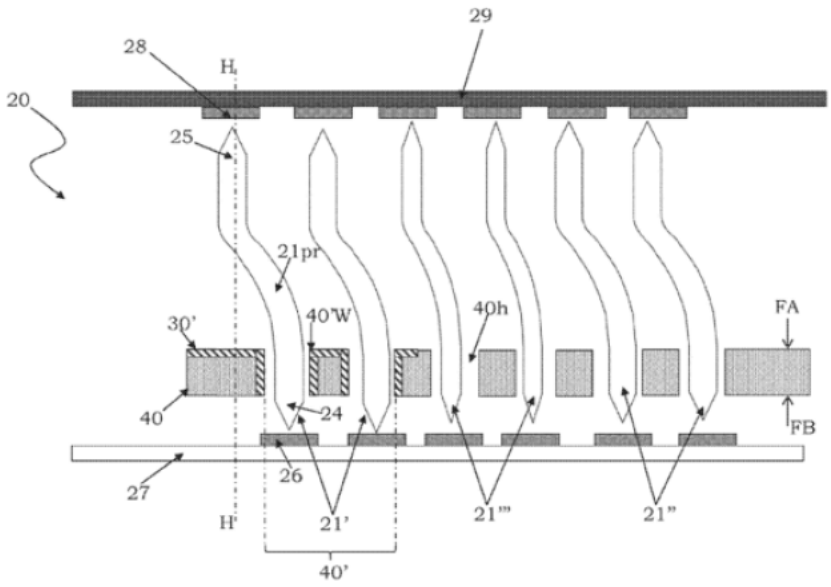


FIG. 2A

Figure 2A depicts testing head 20 comprised of guide 40 with plurality of guide holes 40h. *Id.* at 6:15–18. Guide holes 40h house contact elements 21

which carry a signal such as ground, power, or input/output operating signals. *Id.* at 6:44–53. For example, contact elements 21' carry a first signal, contact elements 21" carry a second type of signal, and contact elements 21'" carry a third type of signal. *Id.* at 6:18–24. According to the '885 patent, the "contact elements are in the form of contact probes, preferably formed by metallic wires, having a body 21*pr*." *Id.* at 7:2–4.

Figure 2A further depicts guide 40 including a first group of guide holes 40' that are electrically connected to each other by first conductive portion 30' and housing a group of contact elements 21'. *Id.* at 7:37–43. The '885 patent explains that first contact elements 21' are short-circuited among each other and are housed in a first group of 40' of the guide holes 40h. *Id.* at 7:49–51. As a result, first contact elements 21' carry the same signal, in this case a ground signal, which eliminates interference on the operating signals and improves the overall frequency performance of the contact head 20. *Id.* at 7:49–55, 8:27–32.

The '885 patent further states that the second contact elements 21" carrying power signals are electrically connected to each other via a second conductive portion 30". *Id.* at 8:38–49. As with the ground contact elements 21', guide 40 includes a second conductive portion 30" that electrically connects the holes of second group 40" of the guide holes 40h to each other. *Id.* This second group of contact elements 21" and second conductive portion 30" are physically separate from and not electrically connected to the first group of contact elements 21' and first conductive portion 30'. *Id.*

D. Illustrative Claim

Petitioner challenges claims 1–23 of the '885 patent, where claims 1, 16, and 23 are independent claims. Claim 1 is illustrative of the claimed invention and is reproduced below with Petitioner's labeling of elements.

> 1. [1P] A testing head configured to verify the operation of a device under test integrated on a semiconductor wafer, the testing head comprising:
>
> [1A] a plurality of contact elements, each comprising a body that extends between a first end portion and a second end portion, and
>
> [1B] at least one guide provided with a plurality of guide holes configured to house the contact elements,
>
> [1C] wherein the at least one guide comprises: a first conductive portion that includes and electrically connects a first group of guide holes, of the plurality of guide holes, to each other and is configured to contact corresponding first contact elements, of the plurality of contact elements, configured to carry a first type of signal; and
>
> [1D] a second conductive portion that incudes and electrically connects the holes of a second group of the guide holes to each other, the second group housing second contact elements of the plurality of contact elements, the second contact elements being configured to carry a second type of signal,
>
> [1E] the first and second types of signals chosen between ground signals and power signals.

Ex. 1001, 18:30–52; Pet. viii.

E. Asserted Challenges to Patentability

Petitioner challenges claims 1–23 of the '885 patent as follows.

Pet. 26–76.

Claims Challenged	35 U.S.C. §[1]	References/Basis
1, 2, 4, 8–11, 14	102	Kim[2]
1, 2, 4, 7–11, 14	103	Kim
5, 6, 16–20, 23	103	Kim, Schmid[3]
3	103	Kim, Fan[4]
12, 13	103	Kim, Bross[5]
15	103	Kim, SWTest[6]
21, 22	103	Kim, Bross, Schmid

In support of its challenge, Petitioner relies on a Declaration of Frederick L. Taber (Ex. 1003).

III. DISCUSSION

A. Principles of Law

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the

[1] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. §§ 102 and 103 effective March 16, 2013. Because the application from which the '885 patent issued claims priority after this date, the AIA versions of §§ 102 and 103 apply.
[2] Kim, U.S. Publ'n No. 2015/0198632 A1, published July 16, 2015 ("Kim," Ex. 1006).
[3] Schmid et al., U.S. Patent No. 6,417,684 B1, issued July 9, 2002 ("Schmid," Ex. 1009).
[4] Fan et al., U.S. Patent No. 9,470,715 B2, issued October 18, 2016 ("Fan," Ex. 1011).
[5] Bross et al., U.S. Patent No. 5,225,777, issued July 6, 1993 ("Bross," Ex. 1010).
[6] Chang et al, "A proposal of a new probe head design in vertical probe cards for low crosstalk and PDN impedance," presented June 5–8, 2016 ("SWTest," Ex. 1028).

grounds for the challenge to each claim")). This burden of persuasion never shifts to the patent owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

A claim is unpatentable under § 103 "if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains." 35 U.S.C. § 103; *see KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence, objective indicia of non-obviousness (i.e., secondary considerations).[7] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

We consider Petitioner's asserted challenges with the above-noted principles in mind.

B. Claim Construction

In an *inter partes* review proceeding, we construe a claim of a patent "using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b)." 37 C.F.R. § 42.100(b). That standard involves construing claims in accordance with the ordinary and customary meaning of such claims as would have been understood by one of ordinary skill in the art and the prosecution history pertaining to the

[7] Neither party presents evidence of secondary considerations at this stage.

patent. *See id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc).

First, Petitioner proposes a construction for the term "common pad." Pet. 22–24. Specifically, Petitioner asserts that a person of ordinary skill in the art ("POSITA") would have understood the term "common pad" as a pad that "allows access to the contact elements directly from the testing head." *Id.* at 24.

Second, Petitioner contends that claim 14, which depends from claim 1, is indefinite. *Id.* at 24–26. Specifically, Petitioner contends claim 1 recites a first conductive portion carrying a first type of signal and a second conductive portion carrying a second type of signal where the first and second types of signals are chosen between ground signals and power signals. *Id.* at 24–25. Petitioner asserts that in claim 1, the "'first' and 'second' types of signals are *different* types of signals, namely, ground and power." *Id.* at 25 (citing Ex. 1003 ¶ 215). Based on this contention, Petitioner asserts that "claim 14's requirement of a 'conductive track that electrically connects the first and second conductive portions' conflicts with claim 1 and is technically infeasible.'" *Id.* (citing Ex. 1001, 3:56–62; Ex. 1003 ¶ 217) (emphasis omitted). In other words, it is technically improper to electrically connect a first conductive portion carrying a power signal with a second conductive portion carrying a ground signal. *See* Ex. 1003 ¶ 217. Nevertheless, Petitioner addresses claim 14 assuming that Patent Owner may "argue[] that the claimed 'first and second types of signals' in claim 14 are the same type of signal." Pet. 26, 48–49.

Patent Owner makes no comment on claim construction. *See generally* Prelim. Resp.

Only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017). After reviewing the record, at this stage, we determine that only claim 14 requires express construction for purposes of this Decision.

As an initial matter, we note that indefiniteness is not a ground for *inter partes* review. 35 U.S.C. § 311(b) ("A petitioner in an inter partes review may request to cancel as unpatentable 1 or more claims of a patent only on a ground that could be raised under section 102 or 103 and only on the basis of prior art consisting of patents or printed publications.").

Further, we interpret claim 14, for purposes of this Decision, as contemplated by Petitioner such that the first and second types of signals may be the same type of signal. Pet. 26. In other words, the first and second type of signal may both be ground or power. This construction appears to have support within the '885 patent. For example, the '885 patent describes an embodiment where "at least two conductive portions . . . of the guide 40 are electrically connected to each other by means of a conductive track 39 in the guide, so as to be able to electrically connect to each other groups of contact elements apt to carry a same type of signal." Ex. 1001, 16:49–59. This construction also appears consistent with parent claim 1, which recites "the first and second types of signals chosen between ground signals and power signals." The parties are invited to address any claim construction issues during the course of trial.

C. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art would have had "at least a bachelor's degree in electrical engineering, mechanical

engineering, and materials engineering or another field applicable to wafer probing technology with three to five years of professional experience in designing and/or using probe technologies, or an equivalent level of skill, knowledge, and experience." Pet. 22 (citing Ex. 1003 ¶¶ 50–53). Patent Owner does not offer a position as to the level of ordinary skill in the art. *See generally* Prelim. Resp.

For purposes of this Decision, we adopt Petitioner's definition of a POSITA, which is consistent with the level of skill reflected in the Specification and asserted prior art.

D. Ground 1: Alleged Anticipation by Kim

Petitioner asserts that claims 1, 2, 4, 8–11 and 14 of the '885 patent are anticipated by Kim. Pet. 26–49. Patent Owner disagrees. *See generally* Prelim. Resp. For the reasons explained below, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in showing that claims 1, 2, 4, 8–11 and 14 of the '885 patent are anticipated by Kim.

Before addressing the parties' arguments, we provide an overview of the Kim reference.

1. Overview of Kim

Kim describes a semiconductor testing apparatus where "a testing pin is rendered to electrically connect to another testing pin or an external substrate through a conductive layer formed in the guide hole." Ex. 1006, Abstract. According to Kim, prior conventional probe cards produced imprecise results because the electrical contacts between testing pins could be unstable. *Id.* ¶ 12.

Figure 2 of Kim, reproduced below, illustrates a schematic cross-sectional view showing the semiconductor testing apparatus. *Id.* ¶ 32.

FIG. 2

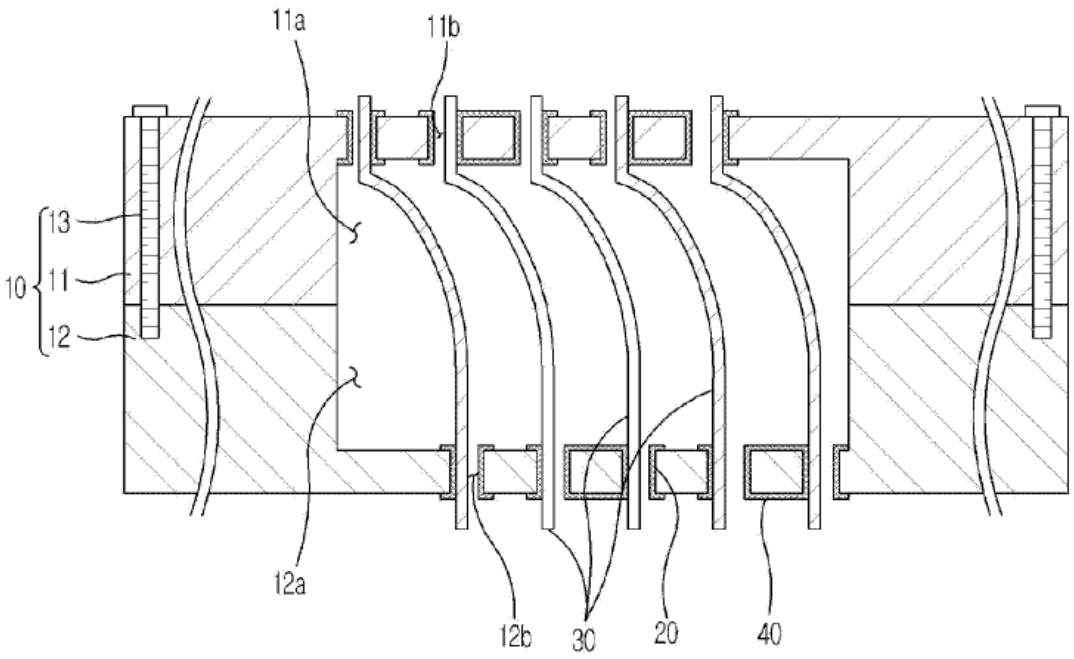


Figure 2 depicts a guide plate 10, a conductive layer 20, testing pins 30, and conductive trace 40. *Id.* ¶ 33. Guide plate 10 includes an upper plate 11 with a plurality of first guide holes 11b, a lower plate 12 with a plurality of second guide holes 12b, and a coupling member 13 to couple the upper plate 11 to the lower plate 12. *Id.* ¶ 34. Guide plate 10 supports testing pin 30 and includes conductive trace 40. *Id.*

According to Kim, the conductive layer 20 electrically connects the testing pin 30 and the conductive trace 40. *Id.* ¶ 38. Kim states that "the conductive trace 40 is formed on at least one surface of the inner and outer surfaces of the upper plate 11 and the lower plate 12." *Id.* ¶ 42. Figure 5a of Kim, depicted below, illustrates the upper surface of the upper plate. *Id.* ¶ 27.

FIG. 5a

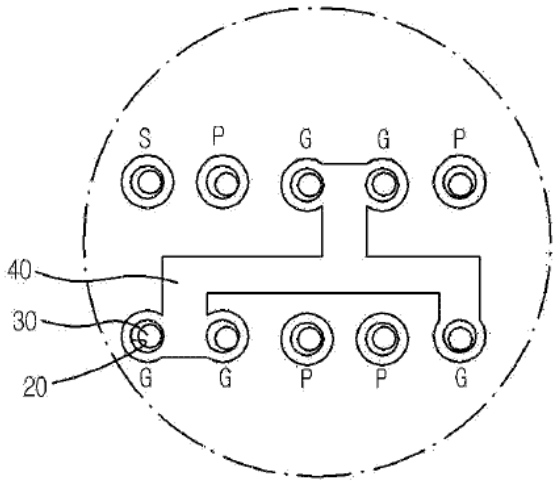
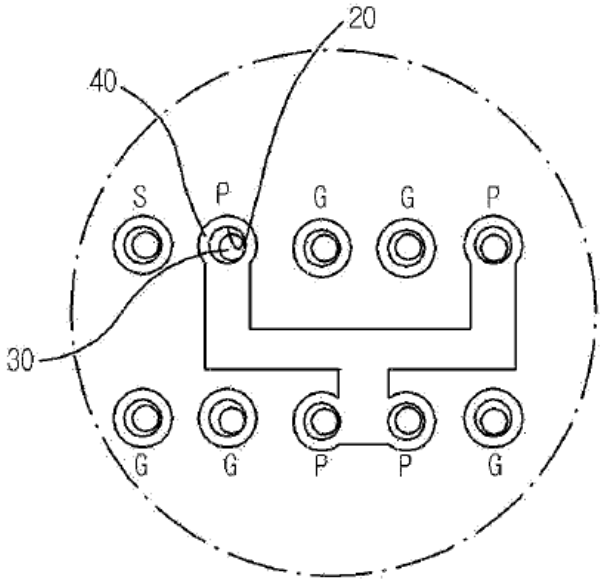


Figure 5a depicts an upper surface where conductive layers 20 contact testing pins 30 for the ground signal. *Id.* ¶ 51. Conductive trace 40 connects the conductive layers 20 and testing pins 30 carrying a ground signal. *Id.*

Figure 5b of Kim, depicted below, illustrates the lower surface of the upper plate. *Id.* ¶ 28.

FIG. 5b



In Figure 5b, conductive trace 40 connects conductive layers 20 and testing pins 30 carrying a power signal. *Id.* ¶ 51. According to Kim, placing conductive traces for different signals on the upper and lower surfaces allows testing pins 30 to transmit the same signal without interfering with a testing pin transmitting another signal. *Id.*

2. Independent claim 1

Claim 1 is directed to a "testing head configured to verify the operation of a device under test." Ex. 1001, 18:30–52. In addition to the preamble, which Petitioner designates as element 1P, claim 1 recites various limitations, which Petitioner designates as limitations 1A through 1E. We address the preamble and each limitation in turn.

a. Preamble 1[P]

The preamble of claim 1 recites "[a] testing head configured to verify the operation of a device under test integrated on a semiconductor wafer." To show that Kim teaches the preamble, Petitioner identifies Kim's semiconductor testing apparatus. Pet. 26–27 (citing Ex. 1006, Abstract, Fig. 2). Petitioner asserts that Kim discloses a semiconductor testing apparatus with a guide plate 10 including testing pins 30 housed in guide holes 11b and 12b. *Id.* at 27 (citing Ex. 1006 ¶¶ 51, 62, Fig. 2; Ex. 1003 ¶ 154). Petitioner contends that Kim's device is used "for testing the electrical characteristic of the chip manufactured in the wafer level." *Id.* (quoting Ex. 1006 ¶¶ 5–6; Ex. 1003 ¶¶ 153, 155).

Neither party takes a position on whether the preamble is limiting. At this stage of the proceeding, we do not determine whether the preamble is limiting, as we find Petitioner sufficiently shows that Kim discloses the subject matter of the preamble.

b. Limitation 1A

Claim 1 further recites "a plurality of contact elements, each comprising a body that extends between a first end portion and a second end portion." For this claim element, Petitioner identifies Kim's testing pins. Pet. 27–29. Specifically, Petitioner contends that Kim's testing pins "extend from the guide holes (11b) of the upper plate (11) to the guide holes (12b) of the lower plate (12)." *Id.* at 29 (citing Ex. 1006 ¶¶ 24–28; Ex. 1003 ¶ 160). Petitioner asserts that Kim's testing pins include a first end portion that electrically contacts with the device under test and a second end portion that contacts the space transformer. *Id.* (citing Ex. 1006 ¶ 12; Ex. 1003 ¶¶ 158, 160).

c. Limitation 1B

Claim 1 further recites "at least one guide provided with a plurality of guide holes configured to house the contact elements." For this claim element, Petitioner identifies Kim's disclosure of "a guide plate (10) comprising an upper plate (11) with a plurality of first guide holes (11b), and a lower plate (12) with a plurality of second guide holes (12b)." Pet. 30–31 (citing Ex. 1006 ¶¶ 34–37, Fig. 2A; Ex. 1003 ¶ 162). Petitioner, relying on the declaration testimony of Mr. Taber, asserts that either of the upper plate 11 or the lower plate 12 constitutes the claimed guide. *Id.* (citing Ex. 1003 ¶ 163).

d. Limitation 1C

Claim 1 further recites "a first conductive portion that includes and electrically connects a first group of guide holes, of the plurality of guide holes, to each other and is configured to contact corresponding first contact elements, of the plurality of contact elements, configured to carry a first type of signal." For this claim element, Petitioner identifies Kim's conductive layers 20 and conductive trace 40. Pet. 31 (citing Ex. 1003 ¶¶ 165, 168). Specifically, Petitioner contends that "[t]wo or more of the conductive layers (20) connected by some or all of the conductive trace (40) collectively constitute the claimed 'first conductive portion' that 'electrically connects a first group of guide holes' 'to each other' and 'is configured to contact corresponding first contact elements.'" *Id.*

Petitioner asserts that Kim's conductive layer 20 is on one side of the upper plate 11 or lower plate 12 and is formed on "an inner surface of the guide hole." *Id.* (citing Ex. 1006 ¶¶ 17, 38, Fig. 2, Abstract; Ex. 1003 ¶ 165). Petitioner further contends that Kim's conductive trace 40 is formed

on the inner or outer side of upper plate 11 or lower plate 12. *Id.* (citing Ex. 1006 ¶ 34, 42, Fig. 2; Ex. 1003 ¶ 165). Petitioner contends that Kim describes "one side of the conductive trace 40 is connected to one side of the conductive layer 20 and the other side thereof is connected to one side of other conductive layer 20." *Id.* at 32 (quoting Ex. 1006 ¶ 43). Petitioner asserts that this arrangement electrically connects a group of testing pins through conductive layer 20 formed in the guide hole. *Id.* at 32–33 (citing Ex. 1006 ¶¶ 3, 15, 39, 63, Abstract; Ex. 1003 ¶ 165).

Petitioner further asserts that Kim's testing pins are configured to carry a first type of signal. *Id.* at 33 (citing Ex. 1006 ¶ 44; Ex. 1003 ¶ 166). Specifically, Petitioner contends that "the conductive layers 20, with which the testing pin of transmitting the same signal is contacted, are connected to each other." *Id.* (quoting Ex. 1006 ¶ 44) (emphasis omitted). As a result, "the plurality of the conductive layers 20, with which the testing pin for ground is contacted, can be connected to each other." *Id.* (quoting Ex. 1006 ¶ 44; citing Ex. 1006 ¶ 25, Fig. 3; Ex. 1003 ¶ 167). Petitioner asserts that testing pins 30 can carry ground signals, electrically connected via conductive layers 20 formed within a group of guide holes and conductive trace 40 electrically connecting the conductive layers. *Id.* at 34 (citing Ex. 1006 ¶¶ 19, 27–28, 32, 50–51, 62, 64, Figs. 5a, 5b; Ex. 1003 ¶¶ 166, 262–264).

e. Limitation 1D

Claim 1 further recites "a second conductive portion that incudes and electrically connects the holes of a second group of the guide holes to each other, the second group housing second contact elements of the plurality of contact elements, the second contact elements being configured to carry a

second type of signal." For this claim element, Petitioner contends that Kim teaches electrically connecting another group of testing pins for carrying another type of signal. Pet. 35 (citing Ex. 1003 ¶¶ 169, 172). According to Petitioner, Figures 5a and 5b illustrate two different conductive portions where the two conductive portions electrically connect two different sets of guide holes and contact elements. *Id.* at 36–37 (citing Ex. 1003 ¶¶ 170–172; Ex. 1006, Fig. 3). For the claimed second conductive portion, Petitioner identifies Kim's disclosure that "testing pins carrying power signals (represented by 'P') are electrically connected via the conductive layers (20) and conductive trace (40)." *Id.* at 36 (citing Ex. 1006 ¶ 51, Fig. 5b; Ex. 1003 ¶ 169).

f. Limitation 1E

Claim 1 further recites "the first and second types of signals chosen between ground signals and power signals." For this limitation, Petitioner contends that Kim describes "testing pins transmitting identical or the same signals, using ground and power as examples." Pet. 37 (citing Ex. 1006 ¶¶ 42–45, 51, Figs. 3, 5a, 5b; Ex. 1003 ¶ 174). Petitioner argues that Kim discloses a first type of signal such as a ground signal. *Id.* at 37–38 (citing Ex. 1006 ¶ 44, Fig. 5a; Ex. 1003 ¶¶ 167–168). Petitioner further argues that Kim discloses a second type of signal such as a power signal. *Id.* at 38 (citing Ex. 1006, Fig. 5b; Ex. 1003 ¶ 171).

g. Patent Owner's Arguments

Patent Owner argues that the Petition fails to articulate with particularity how Kim anticipates claim 1. Prelim. Resp. 1–6. First, Patent Owner argues that the Petition's description of how Kim discloses "a first conductive portion" and "a second conductive portion," is nebulous and fails

to show how Kim discloses these elements arranged as in the claim. *Id.* at 1–2. Patent Owner highlights the Petition's statement that the "first conductive portion" is met by Kim's teaching of "*[t]wo or more* of the conductive layers (20) connected by *some or all* of the conductive trace (40) collectively constitute the claimed 'first conductive portion.'" *Id.* at 2 (quoting Pet. 31).

On this record, we are persuaded that Petitioner sufficiently shows Kim discloses all of the limitations of claim 1. We understand Patent Owner's argument to suggest that the Petition lacks particularity because stating "two or more" conductive layers and "some or all" conductive traces is unclear as to which conductive layers 20 and conductive traces 40 are mapped to the first conductive portion. We are not persuaded because we understand Petitioner's contentions to reflect that Kim's disclosure provides *examples* of how to electrically connect a group of testing pins carrying similar signals. Pet. 35 (citing Ex. 1006 ¶ 169). We determine that Petitioner, relying on Figure 5a of Kim, demonstrates that Kim discloses the recited first conductive portion. *Id.* at 34 (citing Ex. 1006 ¶¶ 19, 27–28, 32, 50–51, 62, 64, Figs. 5a, 5b; Ex. 1003 ¶¶ 166, 262–264). For example, as noted by Petitioner, Figure 5a depicts "the testing pins (30) carrying ground signals (represented by 'G') are electrically connected via the conductive layers (20) formed within a group of guide holes and the conductive trace (40) electrically connecting the conductive layers (20)." *Id.* (citing Ex. 1006, Fig. 5a; Ex. 1003 ¶ 166).

In a similar manner, Patent Owner argues that the Petition fails to clearly identify the "second conductive portion." Prelim. Resp. 4–6. Specifically, Patent Owner argues that "the Petition implies that the

conductive layers 20 and conductive trace 40 of Fig. 5b constitute one of two 'conductive portions.'" *Id.* at 4 (citing Pet. 36–37). Patent Owner further argues that the Petition "vaguely states that '[t]he disclosures cited above for limitation [1C] [(which recites the 'first conductive portion')] thus also apply to limitation [1D] [(which recites the 'second conductive portion')] and are incorporated herein.'" *Id.* (citing Pet. 35) (alterations in original). Further, according to Patent Owner, the Petition includes both conductive layers 20 and conductive trace 40 as part of both the first and second conductive portions. *Id.* at 4–5.

Again, we are not persuaded by Patent Owner's argument. On this record, we determine that Petitioner sufficiently demonstrates that Kim discloses a "second conductive portion." Pet. 35–37. First, the Petition references the discussion of limitation 1C. *Id.* at 35 (citing Ex. 1003 ¶ 172). There, the Petition explains that "conductive layers (20) are formed on 'an inner surface of the guide hole,'" and "conductive trace 40 is connected to one side of the conductive layer 20 and the other side thereof is connected to one side of other conductive layer 20." *Id.* at 31–32 (quoting Ex. 1006 ¶¶ 17, 43, Abstract, Figs. 2–3). The Petition then identifies a different group of conductive layers 20 and separate conductive trace 40 by identifying the connection of a group of testing pins carrying power signals rather than ground signals. *Id.* at 35–36 (citing Ex. 1003 ¶ 169). Here, Petitioner clearly identifies a different set of conductive layers 20 and conductive trace 40 as illustrated in Fig. 5b. Figure 5b illustrates the lower surface of a guide plate including conductive layers 20 and conductive trace 40 carrying power signals. *Id.* (citing Ex. 1006 ¶¶ 27–28; Ex. 1003 ¶ 170). In contrast, Figure 5a illustrates the upper layer of a guide plate including conductive

layers 20 and conductive trace 40 carrying ground signals. *Id.* at 34 (citing Ex. 1006, Figs. 5a; Ex. 1003 ¶ 166). Just as with the claimed "first conductive portion," we determine the Petition sufficiently demonstrates that Kim discloses a "second conductive portion" by disclosing a lower surface of a guide plate including conductive trace 40 connecting a second group of guide holes that include conductive layer 20. *Id.* at 35–36 (citing Ex. 1006 ¶ 51, Fig. 5b).

Patent Owner further argues that the Petition fails to demonstrate that Kim discloses a "conductive portion that includes and electrically connects . . . guide holes." Prelim. Resp. 7. Specifically, Patent Owner argues that the Petition does not demonstrate, or even allege, that Kim's guide holes are included in the first or second conductive portions. *Id.* Instead, Patent Owner contends that the Petition identifies Kim's guide holes 11b and 12b as the claimed guide holes (Pet. 30), but when addressing the first conductive portion of element 1C, the Petition does not identify guide holes 11b or 12b as included in the first conductive portion. Prelim. Resp. 7–8 (citing Pet. 31–35). Patent Owner argues that the Petition similarly fails to provide any discussion of how Kim's guide holes 11b and 12b are included in the second conductive portion. *Id.* at 8 (citing Pet. 35–37).

We are not persuaded by Patent Owner's argument. Although the Petition's analysis of elements 1C and 1D does not specifically cite Kim's guide holes 11b and 12b, on this record, we are persuaded that the Petition sufficiently demonstrates that Kim teaches a conductive portion that includes and electrically connects guide holes as required by elements 1C and 1D. *See* Pet. 31–37. For example, the Petition identifies Kim's guide holes when asserting that Kim's conductive layer 20 is on one side of the upper plate 11

or lower plate 12 and is formed on "an inner surface of the guide hole." *Id.* at 31 (citing Ex. 1006 ¶¶ 17, 38, Fig. 2, Abstract; Ex. 1003 ¶ 165). Next, Petitioner demonstrates an electrical connection between Kim's guide holes when asserting that Kim describes "one side of the conductive trace 40 is connected to one side of the conductive layer 20 and the other side thereof is connected to one side of other conductive layer 20." *Id.* at 32 (quoting Ex. 1006 ¶ 43). Taking these teachings together, on this record, we determine that Petitioner has sufficiently demonstrated that Kim's conductive trace 40 electrically connects a group of guide holes with conductive layer 20 formed on their inner surface. *Id.* at 31–32.

Based on the foregoing, on this record, we determine that the Petition demonstrates there is a reasonable likelihood that it would prevail in establishing unpatentability of claim 1.

3. Claims 2, 4, 8–11

Claim 2 recites "the first conductive portion is locally interrupted by at least one non-conductive zone." For this recitation, Petitioner identifies a non-conducting zone depicted in Figure 5a. Pet. 39–40 (citing Ex. 1006, Fig. 5a). Petitioner asserts that Kim discloses a first conductive portion connecting the guide holes for ground testing pins is locally interrupted by a non-conductive zone. *Id.* at 39 (citing Ex. 1006 ¶ 62; Ex. 1003 ¶ 179). According to Petitioner, Kim discloses testing pins for power signals are insulated from the electrically connected testing pins for ground signals. *Id.* (citing Ex. 1003 ¶ 179).

Claim 4 recites "the first conductive portion is formed on a first face of the at least one guide, and the second conductive portion is formed on a second face of the at least one guide, the second face being opposite to the

first face." For this recitation, Petitioner references the assertions made with regard to limitations 1C and 1D and further contends that Kim describes "where the first conductive portion is formed on the ***upper surface*** of the upper plate (11), and the second conductive portion is formed on the ***lower surface*** of the upper plate (11)." Pet. 40–41 (citing Ex. 1003 ¶¶ 183–84). Petitioner argues that the upper and lower surfaces of the guide are opposite to each other. *Id.* at 41 (citing Ex. 1003 ¶¶ 183–185).

Claim 8 recites "the first conductive portion covers at least one portion of an inner surface of each guide hole of the first group of guide holes." For this recitation, Petitioner contends that Kim's conductive layers 20 are formed on an inner surface of the guide holes and thus cover at least a portion of the surface of each guide hole. Pet. 41 (citing Ex. 1006 ¶ 17, Abstract, Fig. 2; Ex. 1003 ¶¶ 186–188).

Claim 9 recites "the at least one guide comprises at least one common pad connected to the at least one conductive portion by a conductive track." For this recitation, Petitioner contends that Kim teaches "[t]he conductive trace (40) connecting the group of the conductive layers (20) and testing pins (30) carrying a same type of signal can be extended from the testing area (T), where the conductive layers (20) are formed, to the external area (W) on the guide plate (10)." Pet. 42–43 (citing Ex. 1006 ¶¶ 46–47, Fig. 4; Ex. 1003 ¶¶ 198–200). Petitioner argues that the portion of the conductive trace extended to the external area (W) is a common pad "because it is a 'terminal for mechanical and electrical contact between two electrical components that allows access to the contact elements directly from the housing of the testing head.'" *Id.* at 44 (quoting Ex. 1003 ¶ 202).

Claim 10 recites "the at least one guide comprises a further conductive portion at one of the guide holes that is configured to house a single contact element, the at least one guide comprising a common pad connected to the further conductive portion by a conductive track." For this recitation, Petitioner first contends that Kim teaches conductive layers 20 and conductive trace 40 connecting guide holes for carrying a ground signal. Pet. 45 (Ex. 1003 ¶¶ 205–206). Petitioner argues that Figure 5a depicts guide holes with a conductive layer 20 formed at the bottom right where the guide holes are configured to house a single contact element or testing pin. *Id.* (citing Ex. 1006, Fig. 5a).

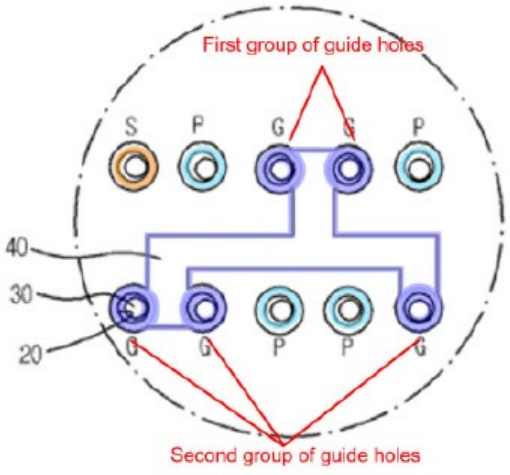
Further, in the same way as described for claim 9, Petitioner contends that Kim describes the at least one guide comprising a common pad connected to the further conductive portion by a conductive track. *Id.* at 46 (citing Ex. 1003 ¶¶ 204, 207); *see* Section III.D.2.e.

Claim 11 recites "the at least one guide comprises a further conductive portion at one of the guide holes that is configured to house a single contact element, the at least one guide comprising a conductive track that connects the conductive portion to other conductive portions." For this recitation, Petitioner references the discussion of claim 10 and contends that Kim discloses a guide hole housing a single contact element that includes a conductive portion in the form of conductive layer 20. Pet. 46–47. Petitioner asserts that this conductive portion in the form of conductive layer 20 is connected to other conductive portions 20 via conductive trace 40 formed on the guide plate. *Id.* at 46–47 (citing Ex. 1006, Fig. 5a; Ex. 1003 ¶¶ 208, 211).

We have reviewed Petitioner's contentions with respect to claims 2, 4, and 8–11, which depend from claim 1, and we determine that the Petition provides a sufficient showing, at this stage of the proceeding, that Kim discloses the subject matter of these claims. *See* Pet. 39–48. Patent Owner does not present any arguments specifically addressing claims 2, 4, and 8–11. *See* Prelim. Resp. 1–9. We determine, based on the current record, that Petitioner has demonstrated a reasonable likelihood that it will prevail in showing that claims 2, 4, and 8–11 are anticipated by Kim.

4. Claim 14

Claim 14 recites "at least one conductive track that electrically connects the first and second conductive portions including and electrically connecting the holes of the first and second groups of the guide holes to each other, the contact elements included in the second group being configured to carry the first type of signal." As we note above, on this preliminary record, we construe claim 14 in the manner proposed by Petitioner such that the first and second types of signals may be the same type of signal. *See* Section III.B. For this recitation, Petitioner argues that "Kim discloses a plurality of conductive layers (20) electrically connecting a plurality of guide holes (11b) formed on the upper plate (11) of the guide plate (10) for housing a plurality of 'contact elements' (testing pins (30)) carrying the same type of signal (ground), the 'first type of signal.'" Pet. 48 (citing Ex. 1006, Fig. 5a; Ex. 1003 ¶¶ 214, 219). Petitioner annotates Kim's Figure 5a shown below.



As shown in annotated Figure 5a, Petitioner contends that guide holes can be grouped separately, as shown by purple highlighting, such that a first group of guide holes housing ground testing pins are the claimed first conductive portion and are electrically connected via conductive track 40 to a second group of guide holes housing ground pins. *Id.* at 48–49 (citing Ex. 1003 ¶¶ 218–220).

Patent Owner argues that the portions of Kim relied upon by Petitioner for the first and second conductive portions recited in claim 1 are inconsistent with Petitioner's assertions regarding claim 14. Prelim. Resp. 1–3. Specifically, Patent Owner argues that for claim 1, "the Petition asserts that some of the conductive layers 20 'collectively' with 'some or all of' the conductive trace 40 constitute the claimed first conductive portion for claim 1." *Id.* at 3 (citing Pet. 31). Patent Owner argues that in contrast, for claim 14, the Petition relies on portions of the same conductive layers 20 and conductive trace 40 for both the claimed first and second conductive portions. *Id.* at 3–5 (citing Pet. 34, 36, 48–49). Hence, Patent Owner argues that the Petition's analysis of claims 1 and 14 identifies different elements in

Kim for the recited first and second conductive portions. *Id.* at 5 (citing Pet. 36, 49).

Although the Petition's analysis of claims 1 and 14 refers to similar disclosures in Kim that appear inconsistent, on this preliminary record, we are not persuaded by Patent Owner's argument because it is based on an overly restrictive reading of Kim's disclosure. To support its argument, Patent Owner specifically references Petitioner's different reliance on Kim's Figures 5a and 5b in its analysis of claims 1 and 14. Prelim. Resp. 5. However, Petitioner's contention for claim 14 merely asserts a different grouping of elements including guide holes, conductive layers 20, and conductive trace 40 in Figures 5a and 5b. Pet. 48–49 (citing Ex. 1003 ¶ 219). On this record, we consider Petitioner's use of different grouping of elements for claims 1 and 14 to be consistent with Kim's disclosure because Kim's Figures 5a and 5b are merely examples depicting how "testing pins 30 of transmitting the same signal can be easily connected without interfering with the testing pin 30 of transmitting the other signal." Ex. 1006 ¶ 51. Indeed, Kim contemplates a plurality of conductive layers 20 and conductive traces 40 and the potential for more than one electrically connected group on one surface of a guide plate. *Id.* ¶¶ 50 ("[T]he conductive layers 20, with which the testing pins 30 of transmitting the same signal are contacted, and the conductive traces for connecting them are set to a plurality of groups and each group is formed at the upper surface and the lower surface of the upper plate 11 respectively . . . ."), 44 ("Accordingly, two testing pins for ground, several tens of the testing pins for ground, or several thousands of the testing pin for ground can be connected to each

other according to the connectivity pattern."), 52 ("[A]t least one electrical connecting group can be formed on one surface . . . .").

Hence, on this preliminary record, we are persuaded that Petitioner's analysis of claims 1 and 14 is consistent because it reflects that Kim's disclosure teaches *how* groups of guide holes may be connected via conductive layers 20 and conductive traces 40 rather than a specific connection pattern. *See* Pet. 33 (citing Ex. 1006, Fig 3, ¶ 25 ("FIG. 3 is a conceptual diagram showing a state in that a conductive traces according to one embodiment of the present invention is connected between conductive layers, with which the testing pin of transmitting the same signal is contacted . . . .")). In this way, we determine that on this record, the Petition sufficiently demonstrates that Kim's Figure 5a shows how to electrically connect a first conductive portion and a second conductive portion carrying the same first step of signal. As this proceeding continues to *inter partes* review, Patent Owner will have the opportunity to further rebut the evidence and arguments set forth by Petitioner and to more fully develop the record on this issue.

Patent Owner further contends that "[f]or claim 1, the Petition asserts that some of the conductive layers 20 'collectively' with 'some or all of' the conductive trace 40 constitute the claimed first conductive portion for claim 1." Prelim. Resp. 3. Patent Owner then argues that "in its analysis of claim 14, the Petition describes the conductive trace 40 of *Kim* as constituting an entirely different claimed feature, namely the 'conductive track.'" *Id.* (citing Pet. 49).

We are not persuaded by Patent Owner's argument because we determine that Petitioner sufficiently demonstrates that Kim's conductive

trace 40 in combination with conductive layers 20 meets the recited claim elements. For example, claim 1 recites a first conductive portion that includes and electrically connects a first group of guide holes. As we note above, Petitioner demonstrates that Kim describes "one side of the conductive trace 40 is connected to one side of the conductive layer 20 and the other side thereof is connected to one side of other conductive layer 20." Pet. 32 (quoting Ex. 1006 ¶ 43). On this record, we agree with Petitioner that this arrangement utilizes a conductive trace 40 that electrically connects a group of testing pins through conductive layer 20 formed in the guide hole as required by claim 1. *Id.* at 32–33 (citing Ex. 1006 ¶¶ 3, 15, 39, 63, Abstract; Ex. 1003 ¶ 165).

Similarly, claim 14 recites a conductive track that electrically connects the first and second conductive portions. Here, Petitioner contends that guide holes can be grouped separately such that a first group of guide holes housing ground testing pins are the claimed first conductive portion and are electrically connected via conductive trace 40 to a second group of guide holes housing ground pins. *Id.* at 48–49 (citing Ex. 1003 ¶¶ 218–220). As we note above, Petitioner demonstrates that Kim teaches connecting groups of guide holes stating "the conductive layers 20, with which the testing pins 30 of transmitting the same signal are contacted, and the conductive traces for connecting them are set to a plurality of groups and each group is formed at the upper surface and the lower surface of the upper plate 11 respectively." Ex. 1006 ¶ 50. On this record, we determine that Petitioner sufficiently shows that Kim's conductive trace 40 and conductive layers 20 also satisfy the requirements of claim 14. *Id.* at 48–49. As with

the previous argument, Patent Owner will have the opportunity to more fully develop the record on this issue as we proceed to trial.

5. Summary

For the foregoing reasons, we determine that Petitioner has demonstrated a reasonable likelihood that it will prevail in showing that claims 1, 2, 4, 8–11, and 14 are anticipated by Kim.

E. Ground 2: Alleged Obviousness over Kim

Petitioner asserts that claims 1, 2, 4, 7–11, and 14 of the '885 patent would have been obvious over Kim. Pet. 49–58. Patent Owner disagrees. Prelim. Resp. 6, 8–9. For the reasons explained below, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to claims 1, 2, 4, 7–11, and 14.

1. Analysis of Claims 1–2, 4, 7–11, and 14

a. Claims 1–2, 4, 8–11, and 14

Petitioner contends that because Kim anticipates claims 1, 2, 4, 8–11, and 14, Kim also renders those claims obvious. Pet. 49–56 (citing Ex. 1003 ¶ 221; *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1373 (Fed. Cir. 2019)). Petitioner further asserts that if Patent Owner argues that Kim does not anticipate, then Kim renders claims 1, 2, 4, 8–11, and 14 obvious. *Id.* at 49–52. Patent Owner disagrees and argues that Petitioner's obviousness analysis does not remedy any of the deficiencies alleged by Patent Owner in the anticipation grounds in view of Kim. Prelim. Resp. 6, 8–9.

For the same reasons we identify above with respect to the anticipation grounds in view of Kim, Patent Owner's arguments are not persuasive. Accordingly, we find Petitioner has shown a reasonable

likelihood that it would prevail on its assertions that the subject matter of claims 1, 2, 4, 8–11, and 14 would have been obvious over Kim.

b. Claim 7

Claim 7 recites "the at least one guide includes at least one third conductive portion that includes and electrically connects a third group of the guide holes to each other and house third contact elements configured to carry input/output signals between the device under test and a test equipment." For this recitation, Petitioner contends that in addition to teaching conductive portions electrically connecting guide holes carrying ground and power signals, Kim further teaches testing pins carrying input/output signals. Pet. 57 (citing Ex. 1006, Figs. 3, 5a, 5b; Ex. 1003 ¶¶ 261, 266). Petitioner, relying on the testimony of Mr. Taber, contends that "a POSITA would understand that a testing head would include multiple input/output signal testing pins." *Id.* (citing Ex. 1003 ¶ 263).

Petitioner further contends that Kim discloses electrically connecting testing pins of the same signal to each other without limiting the connection of pins to any type of signal. *Id.* at 57–58 (citing Ex. 1006 ¶¶ 19, 25, 32, 42, 44, 45). Based on Kim's disclosure, Petitioner, relying on the testimony of Mr. Taber, contends that "it would be obvious to a POSITA that Kim's guide holes housing testing pins carrying input/output signals also could be electrically connected via a third conductive portion, forming a third group of guide holes, in the same way as the first and second groups of guide holes are electrically connected." *Id.* at 58 (citing Ex. 1003 ¶¶ 263–264). Petitioner asserts that a POSITA would have been motivated to electrically connect input/output signal testing pins to provide the benefit that "the signal transduction route is minimized through the testing pin and the impedance is

decreased, thereby remarkably improving the high frequency performance." *Id.* (quoting Ex. 1006 ¶ 64; citing Ex. 1006 ¶¶ 16, 48; Ex. 1003 ¶¶ 264–265).

At this stage of the proceeding, we find Petitioner sufficiently shows that Kim discloses the subject matter of this limitation. We further find, on this record, that Petitioner's proffered reasoning for modifying Kim, specifically, to improve frequency performance, shows that a person of ordinary skill in the art would have been motivated to modify Kim to electrically connect input/output signals in a similar manner to power and ground signals. *See id*. Accordingly, we find Petitioner has shown a reasonable likelihood that it would prevail on its assertions that the subject matter of claim 7 would have been obvious over Kim.

2. Summary

For the foregoing reasons, we determine that Petitioner has demonstrated a reasonable likelihood that it will prevail in showing that claims 1–2, 4, 7–11 and 14 would have been obvious over Kim.

F. Ground 3: Alleged Obviousness over Kim and Schmid

Petitioner asserts that claims 5, 6, 16–20, and 23 of the '885 patent would have been obvious over Kim and Schmid. Pet. 59–67. For the reasons explained below, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to claims 5, 6, 16–20, and 23.

Before addressing the parties' arguments, we provide an overview of the Schmid reference.

1. Overview of Schmid

Schmid describes "[a] test head for making contact with test points of an electric component under test and with contact points on a board."

Ex. 1009, Abstract. Figure 1 of Schmid, reproduced below, illustrates a schematic of a test head according to the Schmid's invention. *Id.* at 3:16–19.

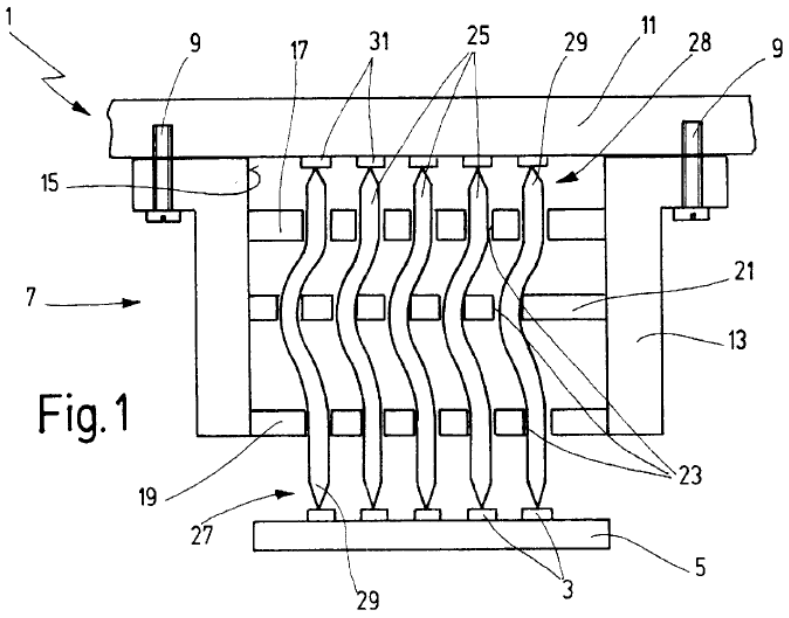


Figure 1 depicts test head 1 for contacting a plurality of test points 3 of an electric component under test 5. *Id.* at 3:31–33. Test head 1 includes device 7 for making contact that includes first guide panel 17, second guide panel 19, and third guide panel 21. *Id.* at 3:41–45. Each guide panel has feed through openings for test probes 25. *Id.* at 3:45–49.

3. Analysis of Claims 5–6, 16–20 and 23

a. Claim 5

Claim 5 recites "the at least one guide includes a lower guide, an intermediate guide, and an upper guide." For this recitation, Petitioner contends that Kim discloses the testing head of claim 1 and Schmid describes a test head having first, second, and third guide panels. Pet. 61–62 (citing Ex. 1009, 3:41–45; Ex. 1003 ¶¶ 282–282). Petitioner asserts that

Schmid describes a third guide panel placed between the first and second guide panels. *Id.* at 62 (citing Ex. 1009, 3:58–63, Fig. 1).

Claim 5 further recites "the lower guide and the intermediate guide being separated from each other by a first gap, the intermediate guide and the upper guide being separated from each other by a second gap." For this recitation, Petitioner contends that Schmid discloses the first, second, and third guide panels are held parallel to one another. *Id.* at 62–63 (citing Ex. 1009, 3:41–45, Fig. 1). Petitioner contends that Schmid's arrangement of guide panels includes a first gap between the first and third guide panels and a second gap between the second and third guide panels. *Id.* at 63 (citing Ex. 1003 ¶ 285).

Claim 5 further recites "each of the lower, intermediate and upper guides comprising respective guide holes for housing the contact elements." For this recitation, Petitioner contends that Schmid discloses that each of the first, second, and third guide panels include feed through openings through which contact elements or test probes, are guided. *Id.* at 63 (citing Ex. 1009, 3:45–49, Fig. 1; Ex. 1003 ¶ 287).

Claim 5 further recites "the first and second conductive portions being formed on respective faces of the upper, intermediate and lower guides." For this recitation identified by Petitioner as 5[D], Petitioner contends that Kim teaches that "the first and second conductive portions can be formed on the upper and/or lower guides and can be formed on the same guide face or different guide faces." Pet. 64 (citing Ex. 1006 ¶ 52; Ex. 1003 ¶¶ 291–296). Petitioner argues, relying on the testimony of Mr. Taber, that "[a] POSITA thus would have understood that the combination of Kim teaching a conductive pattern using the conductive layers (20) and the conductive trace

(40) to electrically connect two different groups of testing pins (30) carrying two different types of signals (*e.g.*, ground and power signals) with Schmid's teaching of three separate guide panels (17, 19, 21) would constitute limitation [5D]." *Id.* at 64–65 (citing Ex. 1003 ¶ 297).

Petitioner argues that it would have been obvious to modify the testing heads disclosed in Kim to add a third guide plate as disclosed in Schmid because "[t]he third guide panel also ensures that the contact elements do not touch one another, particularly during a test procedure, so that, if appropriate, electrical insulation between the contact elements can be dispensed with, and this reduces the cost of the test head." *Id.* at 60 (quoting Ex. 1009, 2:49–53). Further, Petitioner, relying on the testimony of Mr. Taber, asserts that Kim and Schmid describe the same type of probe head structure used for the same applications and a POSITA would have recognized the addition of a third guide as a well-known design choice. *Id.* at 59–60 (citing Ex. 1003 ¶¶ 52, 67, 71–72, 156, 133, 269–273; Ex. 1006 ¶¶ 5–6, 33–34, 37, 40; Ex. 1009, 3:48–54).

Patent Owner does not present any arguments specifically addressing claim 5. *See* Prelim. Resp. 1–9. At this stage of the proceeding, we find Petitioner sufficiently shows that Kim and Schmid disclose the subject matter of this claim. We further find, on this record, that Petitioner's proffered reasoning for modifying Kim with Schmid, specifically, to ensure that the contact elements do not touch one another, shows that a person of ordinary skill in the art would have been motivated to combine Kim and Schmid. *See id.*

b. Claim 6

Claim 6 recites substantially similar limitations to claim 5, except that claim 6 recites "the first and second conductive portions being formed on a same face of one of the upper, intermediate and lower guides and being physically and electrically separated from each other by at least one non-conductive zone." For this recitation, Petitioner contends that "a POSITA would have understood that the conductive portions taught in Kim could be arranged and patterned in various ways, including having both the first (ground) and second (power) portions formed on the same face of one guide." Pet. 65 (citing Ex. 1003 ¶¶ 302–305). Petitioner further asserts that Kim describes "more than one electrically connected group on a single surface." *Id.* at 65–66 (quoting Ex. 1005 ¶ 45; citing Ex. 1006 ¶¶ 17, 52; Ex. 1003 ¶¶ 307–308).

Patent Owner does not present any arguments specifically addressing claim 6. *See* Prelim. Resp. 1–9. At this stage of the proceeding, we find Petitioner sufficiently shows that the Kim and Schmid disclose the subject matter of this claim.

c. Claims 16–20 and 23

Petitioner contends that claims 16–20 and 23 include substantially similar limitations to those addressed previously and would have been obvious for the same reasons. *See* Pet. 26–38, 40–46, 57–58, 61–65. Patent Owner disagrees and argues that Petitioner's obviousness analysis does not remedy any of the deficiencies alleged in the anticipation grounds in view of Kim. Prelim. Resp. 8–9. For the same reasons we identify above with respect to the anticipation grounds in view of Kim, Patent Owner's arguments are not persuasive. Accordingly, at this stage of the proceeding,

we find Petitioner sufficiently shows that the Kim and Schmid disclose the subject matter of these claims.

4. Summary

For the foregoing reasons, we determine that Petitioner has demonstrated a reasonable likelihood that it will prevail in showing that claims 5, 6, 16–20, and 23 would have been obvious over Kim and Schmid.

G. Ground 4: Alleged Obviousness over Kim and Fan

Petitioner asserts that claim 3 of the '885 patent would have been obvious over the combination of Kim and Fan. Pet. 68–70. Patent Owner does not dispute Petitioner's contentions. For the reasons explained below, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to claim 3.

Before addressing Petitioner's arguments, we provide an overview of the Fan reference.

1. Overview of Fan

Fan describes a probe head including a plate, probe, and at least one composite coating layer. Ex. 1011, Abstract, 1:13–43. Fan describes an embodiment where plate 100 is insulated to prevent probes from electrically interrupting each other. *Id.* at 5:7–11. In this embodiment, insulating layer 600 is added to the surface. *Id.* at 5:11–14, Fig 4. Figure 4, reproduced below, illustrates the addition of an insulating layer to plate 100.

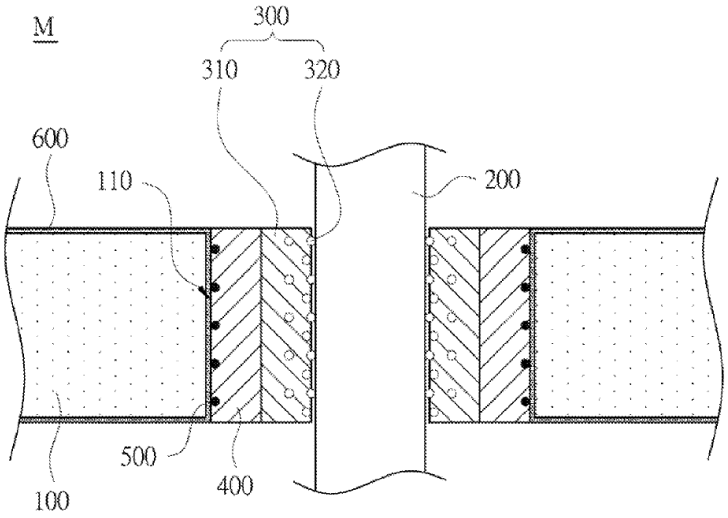


FIG. 4

Figure 4 depicts plate 100 covered with insulating layer 600. *Id.* at 5:11–14. Insulating layer 600 is disposed between metal layer 310 and plate 100. *Id.* Probe 200 is inserted through plate 100. *Id.* 5:7–11.

2. Analysis of claim 3

Claim 3 recites "the at least one guide comprises at least one coating dielectric portion that covers the at least one non-conductive zone." For this recitation, Petitioner contends that Fan discloses a probe head including a plate 100 where the guide plate "can be made of non-conductive materials." Pet. 68 (citing Ex. 1011, 1:62–63, 3:1–7, 3:41–42, Figs. 1A, 1B, 4; Ex. 1003 ¶¶ 331, 333) (emphasis omitted). Petitioner further contends that Fan discloses an insulating layer 600, i.e., dielectric material, covers or coats some or all of the surface of the guide plate. *Id.* at 68–69 (citing Ex. 1011, 1:65–67, 2:1–3, 5:1–34, Fig. 4; Ex. 1003 ¶¶ 331–332).

Petitioner contends that Kim discloses that testing pins and conductive portions carrying different types of signals should be electrically separated or insulated from each other by a non-conductive zone. *Id.* at 69–70 (citing

Ex. 1006, Figs. 5a, 5b, ¶ 62; Ex. 1003 ¶ 335). In light of this goal, Petitioner, relying on the testimony of Mr. Taber, argues that it would have been obvious to coat non-conductive zones on Kim's guide plates with Fan's insulating material because it would "improve Kim by helping to ensure that testing pins and conductive portions carrying different signal types remain electrically separated." *Id.* at 70 (citing Ex. 1003 ¶ 336).

Patent Owner does not present any arguments specifically addressing claim 3. At this stage of the proceeding, we find Petitioner sufficiently shows that Kim and Fan disclose the subject matter of this limitation. We further find, on this record, that Petitioner's proffered reasoning for modifying Kim with Fan, specifically, to ensure electrical separation between conductive elements, shows that a person of ordinary skill in the art would have been motivated to combine Kim and Fan. *See id.*

3. Summary

For the foregoing reasons, we determine that Petitioner has demonstrated a reasonable likelihood that it will prevail in showing that claim 3 would have been obvious over Kim and Fan.

H. Ground 5: Alleged Obviousness over Kim and Bross

Petitioner asserts that claims 12 and 13 of the '885 patent would have been obvious over the combination of Kim and Bross. Pet. 70–73. Patent Owner does not dispute Petitioner's contentions. For the reasons explained below, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to claims 12 and 13.

Before addressing Petitioner's arguments, we provide an overview of the Bross reference.

1. Overview of Bross

Bross describes a high density test probe assembly. Ex. 1010, Abstract. Bross describes its probe assembly as a multi-layer arrangement comprised of insulating and conducting layers that are bonded together to create a unitary structure. *Id.* at 4:37–46. Figure 2, reproduced below, depicts a cross-sectional view of Bross' probe assembly.

FIG. 2

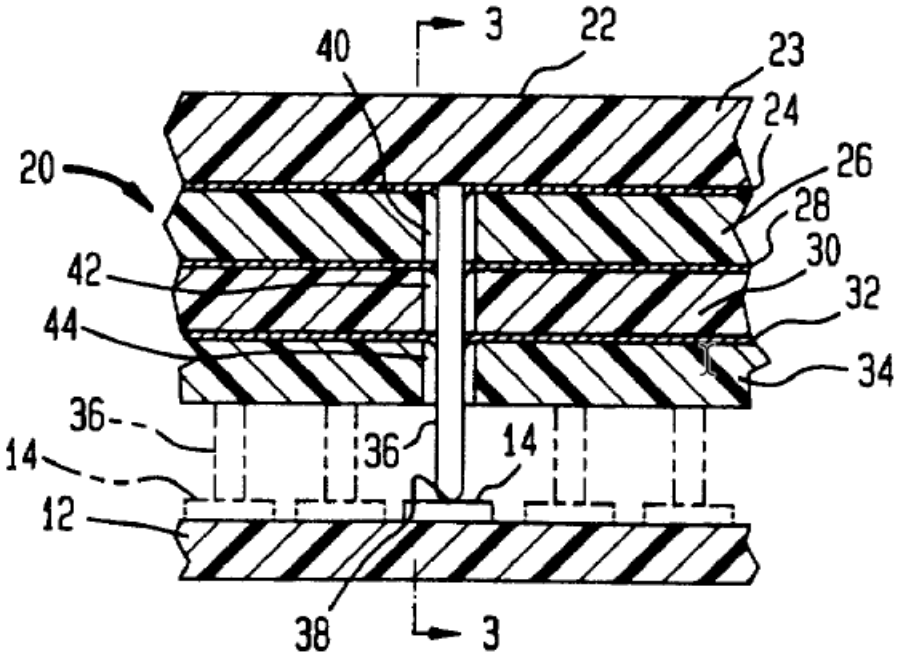


Figure 2 depicts probe assembly 20 comprising body 22, top insulating layer 23, first conductive layer 24, second insulating layer 26, second conductive layer 28, third insulating layer 30, third conductive layer 32, and fourth or bottom insulating layer 34. *Id.* at 4:37–46.

2. Claim 12

Claim 12 recites "the first conductive portion is embedded in the at least one guide." For this recitation, Petitioner contends that Bross discloses a first conductive portion embedded in a guide by teaching "a 'multi-layer'

probe assembly with alternating conductive (24, 28, 32) and insulating (23, 26, 30, 34) layers, such that the conductive layers are embedded within the probe assembly." Pet. 71–72 (citing Ex. 1010, Abstract, Claim 1, Figs. 2, 4A, 5, 6:23–32; Ex. 1003 ¶ 345). Petitioner asserts that Bross' "conductive layers" include conductive traces that electrically connect the probes. *Id.* at 72 (citing Ex. 1010, 6:30–31; Ex. 1003 ¶ 345). Alternatively, Petitioner asserts that "if the claimed term 'embedded' can be met just by having the conductive layer formed on the inside of the guide hole, Kim discloses claim 13, as explained above with respect to Claim 8." *Id.* (citing Ex. 1003 ¶¶ 342–344).

Petitioner, relying on the testimony of Mr. Taber, contends that a "POSITA would have found it obvious to select from known manufacturing methods, such as the ones from Bross, to form the conductive portion(s) in the guide of Kim." *Id.* at 70–71 (citing Ex. 1003 ¶ 338). Specifically, Petitioner asserts that it would have been obvious to use Bross' laminating method or multilayer technique because "[t]hese techniques have the desirable result that 'each probe element makes good mechanical and electrical contact to one or more selected conductors of the conductive layers.'" *Id.* at 71 (citing Ex. 1010, 2:21–24; Ex. 1003 ¶ 339).

Patent Owner does not present any arguments specifically addressing claim 12. *See* Prelim. Resp. 1–9. At this stage of the proceeding, we find Petitioner sufficiently shows that the combination of Kim and Bross discloses the subject matter of this limitation. We further find, on this record, that Petitioner's proffered reasoning for modifying Kim with Bross, specifically, to provide good mechanical and electrical contact between

conductors, shows that a person of ordinary skill in the art would have been motivated to combine Kim and Bross. *See* Pet. 71.

3. Claim 13

Claim 13 recites "the first conductive portion is one of a plurality of conductive portions overlapped to and electrically insulated from each other." For this recitation, Petitioner contends that Bross discloses "a multi-layer arrangement of insulating and conducting layers within the body of the probe assembly." Pet. 72 (quoting Ex. 1010, Abstract; citing Ex. 1003 ¶ 347). Petitioner asserts that Bross discloses a plurality of conductive portions overlapped to each other and electrically insulated from each other by insulating layers. *Id.* at 73 (citing Ex. 1010, Fig. 2; Ex. 1003 ¶ 347). Alternatively, Petitioner contends that Kim meets this limitation by disclosing first and second conductive portions on opposite faces of a guide plate. *Id.* (citing Ex. 1006, Figs. 5a, 5b; Ex. 1003 ¶ 346).

Patent Owner does not present any arguments specifically addressing claim 13. *See* Prelim. Resp. 1–9. At this stage of the proceeding, we find Petitioner sufficiently shows that the combination of Kim and Bross discloses the subject matter of this limitation. We further find for the same reasons as with claim 12, on this record, that Petitioner's proffered reasoning for modifying Kim with Bross shows that a person of ordinary skill in the art would have been motivated to combine Kim and Bross. *See id.*

4. Summary

For the foregoing reasons, we determine that Petitioner has demonstrated a reasonable likelihood that it will prevail in showing that claims 12 and 13 would have been obvious over Kim and Bross.

I. Ground 6: Alleged Obviousness over Kim and SWTest

Petitioner asserts that claim 15 of the '885 patent would have been obvious over the combination of Kim and SWTest. Pet. 73–75. For the reasons explained below, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing as to claim 15.

Before addressing the parties' arguments, we provide an overview of the SWTest reference.

1. Overview of SWTest

SWTest describes "a new probe head design in vertical probe cards for low crosstalk and PDN impedance." Ex. 1028, 1. SWTest discloses signal and ground probes inserted through top and bottom ceramic guides. *Id.* at 8. SWTest further discloses circuit components such as capacitors connected to the conductive portions of the test probe. *Id.* at 15; Ex. 1003 ¶ 140.

2. Claim 15

Claim 15 recites "a circuit component, which is electrically connected at least to the first conductive portion of the at least one guide." For this recitation, Petitioner contends that SWTest discloses "electrically connecting a circuit component, capacitors (de-caps), to the ground plane (the first conductive portion) of the guide plate." Pet. 73–74 (citing Ex. 1028, 15; Ex. 1003 ¶¶ 75–79, 350, 353–355). Petitioner, relying on the testimony of Mr. Taber, asserts that it would have been obvious to modify Kim with SWTest because "[d]e-caps are common electrical components that were known to be used in probe cards to improve power integrity, so a POSITA would be knowledgeable about their use, function and benefit and would have been

motivated to add them to probe cards to improve their performance." *Id.* at 74 (citing Ex. 1003 ¶ 350).

Patent Owner does not present any arguments specifically addressing claim 15. *See* Prelim. Resp. 1–9. At this stage of the proceeding, we find Petitioner sufficiently shows that Kim and SWTest disclose the subject matter of this limitation. We further find, on this record, that Petitioner's proffered reasoning for modifying Kim with SWTest, specifically, to improve power integrity, shows that a person of ordinary skill in the art would have been motivated to combine Kim and SWTest. *See id.*

3. Summary

For the foregoing reasons, we determine that Petitioner has demonstrated a reasonable likelihood that it will prevail in showing that claim 15 would have been obvious over Kim and SWTest.

J. Ground 7: Alleged Obviousness over Kim, Bross, and Schmid

Petitioner asserts that claims 21 and 22 of the '885 patent would have been obvious over the combination of Kim, Bross, and Schmid. Pet. 75. Specifically, Petitioner contends that the combination of Kim, Bross, and Schmid renders claim 21 obvious for the same reasons as with claims 12 and 16. *See* Pet. 26–38, 66, 71–72. Petitioner further contends that Kim, Bross, and Schmid renders claim 22 obvious for the same reasons as with claims 13 and 16. *See id.* at 26–38, 66, 72–73.

For the same reasons as described above, at this stage of the proceeding, we find Petitioner sufficiently shows that Kim, Bross, and Schmid disclose the subject matter of these limitations. *See* Sections III.H.2–3, III.F.2. Accordingly, we determine that Petitioner has

demonstrated a reasonable likelihood that it will prevail in showing that claims 21 and 22 would have been obvious over Kim, Bross, and Schmid.

IV. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated on the record before us a reasonable likelihood that it will prevail in showing at least one of the challenged claims of the '885 patent is unpatentable. We have not, however, made a final determination with respect to the patentability of the challenged claims or the constructions of any claim terms.

V. ORDER

For the reasons given, it is

ORDERED that pursuant to 35 U.S.C. § 314(a), an *inter partes* review of the '885 patent is hereby instituted for all of the challenged claims on all of the asserted grounds; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this Decision.

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