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14/562,349	12/05/2014	Vage Oganesian	375046-990541	1073
26379	7590	09/16/2019	EXAMINER	
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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* VAGE OGANESIAN and ZHENHUA LU

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Appeal 2018-008920  
Application 14/562,349  
Technology Center 2800

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Before CATHERINE Q. TIMM, JEFFREY T. SMITH, and  
KAREN M. HASTINGS, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant,<sup>1</sup> Optiz, Inc., appeals from the Examiner's decision to reject claims 1 and 4 under 35 U.S.C. § 103 as

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<sup>1</sup> We use the word "Appellant" to refer to "Applicant" as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Optiz, Inc. Appeal Br. 2.

obvious over Matsuo<sup>2</sup> in view of Glenn,<sup>3</sup> Lin,<sup>4</sup> and Wood,<sup>5</sup> and adding Okada<sup>6</sup> to reject claim 2. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

### CLAIMED SUBJECT MATTER

The claims are directed to a sensor device. Claim 1, reproduced below with emphasis on key limitations, is illustrative of the claimed subject matter:

1. A sensor device comprising:

a sensor die comprising:

*a first substrate having front and back surfaces*, a sensor disposed in or at the front surface, *bond pads disposed in or at the front surface* and electrically coupled to the sensor, and a plurality of openings formed in the first substrate each extending from the back surface to one of the bond pads, wherein each of the openings comprises a trench formed into the back surface and a hole having a width less than that of the trench extending from a bottom surface of the trench to one of the bond pads;

a second substrate having top and bottom surfaces and a lateral size larger than that of the first substrate, wherein the bottom surface of the second substrate is mounted to the front surface of the first substrate;

a printed circuit board mounted to the back surface of the first substrate and electrically coupled to at least some of the bond pads through at least some of the openings by

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<sup>2</sup> Matsuo et al., US 2009/0284631 A1, published Nov. 19, 2009.

<sup>3</sup> Glenn et al., US 6,268,654 B1, issued July 31, 2001.

<sup>4</sup> Lin et al., US 2010/0200898 A1, published Aug. 12, 2010.

<sup>5</sup> Wood et al., US 2006/0261446 A1, published Nov. 23, 2006.

<sup>6</sup> Okada et al., US 2010/0065929 A1, published Mar. 18, 2010.

Appeal 2018-008920  
Application 14/562,349

wirebondings, wherein the printed circuit board has a lateral size smaller than that of the first substrate; and

encapsulant material that surrounds the wirebondings, extends along a portion of the printed circuit board, extends into the openings, and extends along a portion of the bottom surface of the second substrate.

Appeal Br. 17 (claims appendix).

### OPINION

Claim 1 requires the sensor device include bond pads disposed *in or at* the front surface of a first substrate. The Examiner finds that Matsuo discloses a sensor device having bond pads in the required location and, in the alternative, finds a suggestion within the prior art to place the bond pads of Matsuo in the location of Wood, which is at the front surface of the substrate.

We agree with Appellant that (1) the Examiner's interpretation of "at the front surface" is unreasonable as it is inconsistent with the Specification, and (2) the Examiner has not provided a reasonable rationale, supported by adequate evidence, to support the Examiner's finding of a reason to modify Matsuo's bond pad location so it is "in or at the front surface" as required by all the claims.

#### *Claim Interpretation*

The Examiner has read the claim 1 recitation "at the front surface" too broadly. According to the Examiner, the plain and ordinary meaning of "at the front surface" does not require the pad be embedded within the substrate, but merely "in the vicinity of" the front surface. Ans. 2. The Examiner uses the analogy of a person being *at* the front door of a house to support the determination. *Id.* According to the Examiner, the person *at* the front door of

Appeal 2018-008920  
Application 14/562,349

a house need not be touching or in the doorway, but need only be in the vicinity of the front door. *Id.*

We agree with Appellant that “at” in the context of Appellant’s claims and Specification is more limited than “in the vicinity” and the Examiner’s analogy is flawed. Reply Br. 4–5.

Dictionary.com indicates that “at,” when used to indicate a point or place occupied in space, can mean “in, on, or near.” Dictionary.com/browse/at (accessed Sept. 6, 2019). Although “at” can mean “in, on, or near” and can encompass someone standing “at the door,” the “near” meaning is inconsistent with Appellant’s Specification, which uses “at” more in keeping with the meaning “in or on.” See Spec. ¶ 6 (“bond pads disposed *in or at* the front surface”); Spec. ¶ 13 (describing the back surface of substrate 12 as “opposite the front surface of substrate 12 *at which* the sensors 15 and *bond pads 16 are located.*”); Figs. 1–13 (all depicting bond pad 16 as embedded in the substrate 10 such that the bond pad 16 is “in” substrate 10 in such a way that it is “at” the substrate’s front surface).

Because the meaning “near,” or “in the vicinity of,” when taken to mean separated from but close, is inconsistent with the meaning of “at” as used in the Specification, we agree with Appellant that the Examiner’s interpretation is unreasonably broad.

As stated in *In re Smith*,

The correct inquiry in giving a claim term its broadest reasonable interpretation in light of the specification is not whether the specification proscribes or precludes some broad reading of the claim term adopted by the examiner. And it is not simply an interpretation that is not inconsistent with the specification. It is an interpretation that corresponds with what and how the inventor describes his invention in the

specification, *i.e.*, an interpretation that is “consistent with the specification.”

*In re Smith Int’l, Inc.*, 871 F.3d 1375, 1382–83 (Fed. Cir. 2017) (quoting *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997)).

As stated by Appellant (Appeal Br. 8), the spacing of bond pads 16 away from substrate 12 is directly contradicted by the Specification. Figs. 1–13. Thus, interpreting “at” as allowing the bond pads to be spaced away from the substrate and embedded in a dielectric layer as taught by Matsuo is inconsistent with the meaning of “at” as used by Appellant.

Thus, Appellant has identified a reversible error in the Examiner’s finding that Matsuo teaches a bond pad (electrode 26) “in or at” the front surface of substrate 10.

*Suggestion to combine*

The Examiner provides an alternative rationale to support the obviousness conclusion. This alternative rationale relies on the combination of Matsuo and Wood as suggesting the placement of Matsuo’s bond pads 26 “at” the front surface of substrate 10. Final 7–8. In the Final Office Action, the Examiner reasons that the ordinary artisan would have done so “in order to have the predictable result of using a wire bonding process which can simplify manufacture by not having to perform a metallization process and using a wire bonding process instead.” Final 7–8. In response to Appellant’s argument that repositioning the bonding pad would not avoid performing a metallization process (Appeal Br. 9), the Examiner refines the finding, stating that “[b]y combining the teachings of Woods, the portion of the metallization 23 shown in the small cavity of Matsuo (FIG 2) would not be required.” Ans. 3 (underlining omitted). The Examiner appears to find that the portion of conductive layer 23 within the dielectric material 13 is a

metallization within a small cavity. *Id.* According to the Examiner, “[f]orming metallization in a small cavity may result in poor step coverage and thus poor electrical connection between [Matsuo’s] pad 26 and solder ball 60.” *Id.*

We agree with Appellant that the Examiner’s finding of a suggestion to combine is not supported by the prior art. Reply Br. 6. Neither Matsuo nor Wood discuss a problem of poor step coverage and poor electrical connection in small cavities. Moreover, as pointed out by Appellant, Matsuo’s device includes a contact plug (not shown in Fig. 2) for electrically connecting electrodes 26 and 27. Matsuo ¶ 40. This contact plug would be in a small cavity on the upper side of electrode 26. Shifting Matsuo’s electrode 26 (bond pad) downward so it is in or at the front surface of substrate 10 would eliminate the small cavity below electrode 26 and within dielectric 13, but it would lengthen the contact plug between electrodes 26 and 27. If there were an issue of poor step coverage and poor electrical connection in small cavities, it appears it would be exacerbated by moving electrode 26 downward to the surface of substrate 10 because moving electrode 26 downward would lengthen the small cavity above electrode 26. In any case, we reiterate that neither Matsuo nor Wood provide any evidence that poor step coverage and poor electrical connection was a problem in Matsuo’s device. Thus, a preponderance of the evidence fails to support the Examiner’s finding of a reason to make the combination.

The Examiner’s further reliance on Glenn and Lin to reject claims 1 and 4, and the further reliance on Okada to reject claim 2, does not cure the deficiencies. Thus, we do not sustain either rejection.

DECISION

<b>Claims Rejected</b>	<b>Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1 and 4	§ 103 Matsuo, Glenn, Lin, and Wood		1 and 4
2	§ 103 Matsuo, Glenn, Lin, Wood, and Okada		2
<b>Overall Outcome</b>			1, 2, and 4

REVERSED

<b>Notice of References Cited</b>	Application/Control No. 14/562,349	Applicant(s)/Patent Under Patent Appeal No. 2018-008920	
	Examiner	Art Unit 2822	Page 1 of 1

**U.S. PATENT DOCUMENTS**

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U	At: "1 (used to indicate a point or place in space); in, on, or near: to stand at the door; at the bottom of the barrel." Dictionary.com (accessed Sept. 6, 2019), <a href="http://www.dictionary.com/browse/at">http://www.dictionary.com/browse/at</a> .
V	
W	
X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



definitions



at



**at**<sup>1</sup> [ at; *unstressed uh t*, it ] [SHOW IPA](#)

[WORD ORIGIN](#) | [IDIOMS](#)

[SEE MORE SYNONYMS FOR at ON THESAURUS.COM](#)

### *preposition*

- 1 (used to indicate a point or place occupied in space); in, on, or near:  
*to stand at the door; at the bottom of the barrel.*
- 2 (used to indicate a location or position, as in time, on a scale, or in order):  
*at zero; at noon; at age 65; at the end; at the lowest point.*
- 3 (used to indicate presence or location):  
*at home; at hand.*
- 4 (used to indicate amount, degree, or rate):  
*at great speed; at high altitudes.*
- 5 (used to indicate a direction, goal, or objective); toward:  
*Aim at the mark. Look at that.*
- 6 (used to indicate occupation or involvement):  
*at work; at play.*
- 7 (used to indicate a state or condition):  
*at ease; at peace.*
- 8 (used to indicate a cause or source):  
*She was annoyed at his stupidity.*
- 9 (used to indicate a method or manner):  
*He spoke at length.*
- 10 (used to indicate relative quality or value):  
*at one's best; at cost.*

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