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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DIPAK SENGUPTA,
SHRENIK DELIWALA, YING ZHAO, BRUCE FRIED,
WILLIAM SCHOPPEE, and WOODROW BECKFORD

Appeal 2019-002194
Application 14/276,238
Technology Center 2600

Before CARL W. WHITEHEAD JR., BARBARA A. BENOIT, and
MICHAEL J. ENGLE, *Administrative Patent Judges*.

Opinion for the Board filed by Administrative Patent Judge
MICHAEL J. ENGLE, *Administrative Patent Judge*.

Opinion Dissenting in part filed by Administrative Patent Judge
CARL W. WHITEHEAD JR., *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant¹ appeals under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1–4, 6–8, 10, 12–20, 22–27, 29–36, 38, and 39, which are all of the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

TECHNOLOGY

The application relates to the arrangement of components in a gesture sensor module. Spec. ¶ 4.

ILLUSTRATIVE CLAIM

Claim 1 is illustrative and reproduced below with the limitations at issue emphasized:

1. A gesture sensor module comprising:

an optical emitter die having an emitter surface, the optical emitter die mounted on a first mounting surface;

an optical sensor die having a sensor surface facing upwards, the optical sensor die mounted on a second mounting surface;

a package housing the optical emitter die disposed in a first cavity of the package and the optical sensor die disposed in a second cavity of the package, wherein the first mounting surface is disposed at a first height relative to a bottom surface of the package, the second mounting surface is disposed at a second height relative to the bottom surface of the package, wherein the

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies Analog Devices, Inc. as the real party in interest. Appeal Br. 4.

first height is different from the second height, and wherein a portion of an external surface of the package defines a surface for detecting a gesture by the optical sensor die; and

an Application Specific Integrated Circuit (ASIC) die, the optical sensor die stacked on the ASIC die such that the ASIC die is disposed between the optical sensor die and the bottom surface of the package, the ASIC die in electrical communication with the optical sensor die.

REFERENCES

The Examiner relies upon the following prior art references:

Name	Number	Date
Coffy	US 2013/0012276 A1	Jan. 10, 2013
Costello	US 2013/0292706 A1	Nov. 7, 2013
Lee	US 2011/0254763 A1	Oct. 20, 2011
Patel	US 8,604,436 B1	Dec. 10, 2013
Tajul	US 2007/0291490 A1	Dec. 20, 2007
Varaprasad	US 2009/0075092 A1	Mar. 19, 2009
Wiese	US 2010/0259766 A1	Oct. 14, 2010

REJECTIONS

All pending claims stand rejected under 35 U.S.C. § 103 as obvious over the combinations of references listed in the chart below. The Examiner withdrew the rejection under 35 U.S.C. § 112(b). Ans. 4.²

² Citations to “Ans.” are to the Examiner’s Answer dated January 7, 2019.

Claims	References	Final Act.³
1, 2, 12, 14–16, 23–25, 27, 29, 30, 36, 39	Wiese, Patel, Coffy	4
3, 4	Wiese, Patel, Coffy, Varaprasad	15
6, 31, 35, 38	Wiese, Patel, Coffy, Costello	16
17–20, 22	Wiese, Patel, Costello	19
7, 10, 13, 32	Wiese, Patel, Coffy, Lee	24
8	Wiese, Patel, Coffy, Lee, Tajul	27
26, 34	Wiese, Patel, Coffy, Tajul	27
33	Wiese, Patel, Costello, Tajul	29

ISSUES

1. Did the Examiner err in finding Coffy teaches or suggests “the optical sensor die stacked on the ASIC die such that the ASIC die is disposed between the optical sensor die and the bottom surface of the package,” as recited in claim 1?

2. Did the Examiner err in finding Coffy teaches or suggests “the different heights provided at least in part by an Application Specific Integrated Circuit (ASIC) die disposed underneath the sensor die,” as recited in claim 23?

3. Did the Examiner err in finding reason to modify Wiese’s straight barrier with Costello’s tapered barrier with respect to the limitation “the optical barrier tapers inwardly from a lower portion of the optical barrier to an upper portion of the optical barrier such that an uppermost portion of the first cavity is smaller than a lowermost portion of the first cavity,” as recited in claim 17?

³ There are no page numbers on the Final Office Action itself. Our references to specific pages start counting the “Office Action Summary” as page 1 and the beginning of the “Detailed Action” as page 2.

Figure 6 of Coffy depicts a cross-section of an electronic package during fabrication. *See* Coffy ¶¶ 20–23, 49. According to Coffy, “[t]he electronic package 1 comprises a receiving integrated circuit chip 6, . . . the front face 8 of which comprises . . . a main integrated light radiation optical sensor 9.” *Id.* ¶ 29. Thus, Coffy discloses the front face 8 of chip 6 *comprises an integrated* light radiation optical sensor 9.

We agree with Appellant that the Examiner fails to show how Coffy’s chip *comprising an integrated* sensor teaches an “optical sensor die stacked on the ASIC die,” as recited by claim 1. The sensor die cannot be “stacked on” the ASIC die if the sensor and ASIC are integrated on the same die. Unlike the legal precedent cited by the Examiner inquiring whether it would have been obvious to make a cap on a tube of lipstick removable, *see In re Dulberg*, 289 F.2d 522, 523 (CCPA 1961), here the Examiner has not sufficiently explained whether or why a person of ordinary skill in the art would have had reason to separate Coffy’s integrated chip into two separate chips or dies. *See* Reply Br. 4.

Accordingly, we do not sustain the Examiner’s rejection of claim 1, and its dependent claims 2, 12, 14–16, 29, 36, and 39.

Claims 23–25, 27, and 30

Independent claim 23 recites “the different heights provided at least in part by an Application Specific Integrated Circuit (ASIC) die disposed underneath the sensor die.”

Appellant relies on substantially the same argument as claim 1, i.e., that Coffy does not teach separate dies for the sensor and ASIC. Appeal Br. 15. The Examiner likewise relies on the same findings. Ans. 41–43.

As with claim 1, an ASIC die cannot be “disposed underneath” a sensor die if the ASIC and the sensor are on the same die.

Accordingly, we do not sustain the Examiner’s rejection of claim 23, and its dependent claims 24, 25, 27, and 30.

Claims 17–20 and 22

Claim 17 recites “the optical barrier tapers inwardly from a lower portion of the optical barrier to an upper portion of the optical barrier such that an uppermost portion of the first cavity is smaller than a lowermost portion of the first cavity.”

The Examiner determines that it would have been obvious to modify Wiese’s straight barrier with Costello’s sloped barrier. Final Act. 22.

Appellant argues the Examiner’s reasoning “at most . . . merely indicates that a skilled artisan *could* have combined the asserted teachings, **not** that there was any objective reason for doing so.” Appeal Br. 17.

We agree with Appellant. Even in the Answer, the Examiner addresses only what a person of ordinary skill *could* do, not what they *would* have had reason to do. For example, the Examiner finds that “Costello’s optical light barrier *could* be substituted for Wiese’s optical barrier as they would both prevent transmission of light” and “the tapered optical barrier *could* still be substituted for Wiese’s optical barrier as they both block light.” Ans. 44 (emphasis added).

“However, rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (quoted by *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007)). Thus, “the PTAB

must make a finding of a motivation to combine when it is disputed.” *In re NuVasive, Inc.*, 842 F.3d 1376, 1382 (Fed. Cir. 2016). “Although identifying a motivation to combine need not become a rigid and mandatory formula, the PTAB must articulate a *reason why* a PHOSITA would combine the prior art references.” *Id.* (quotation omitted).

Here, the Examiner fails to provide any reason why a person of ordinary skill would have combined the references as proposed.

Accordingly, we do not sustain the Examiner’s rejection of claim 17, and its dependent claims 18–20 and 22.

Claims 3, 4, 6–8, 10, 13, 31–35, and 38

The remaining claims ultimately depend from the independent claims discussed above (1, 17, or 23), and the Examiner does not rely on the additional references to cure the deficiencies of the independent claims. We therefore reverse the rejection of these dependent claims for the same reasons as their respective independent claims.

DECISION

The following table summarizes the outcome of each rejection:

Claims Rejected	35 U.S.C. §	References	Aff'd	Reversed
1, 2, 12, 14–16, 23–25, 27, 29, 30, 36, 39	103	Wiese, Patel, Coffy		1, 2, 12, 14–16, 23–25, 27, 29, 30, 36, 39
3, 4	103	Wiese, Patel, Coffy, Varaprasad		3, 4
6, 31, 35, 38	103	Wiese, Patel, Coffy, Costello		6, 31, 35, 38
17–20, 22	103	Wiese, Patel, Costello		17–20, 22
7, 10, 13, 32	103	Wiese, Patel, Coffy, Lee		7, 10, 13, 32
8	103	Wiese, Patel, Coffy, Lee, Tajul		8
26, 34	103	Wiese, Patel, Coffy, Tajul		26, 34
33	103	Wiese, Patel, Costello, Tajul		33
Overall				1–4, 6–8, 10, 12–20, 22–27, 29–36, 38, 39

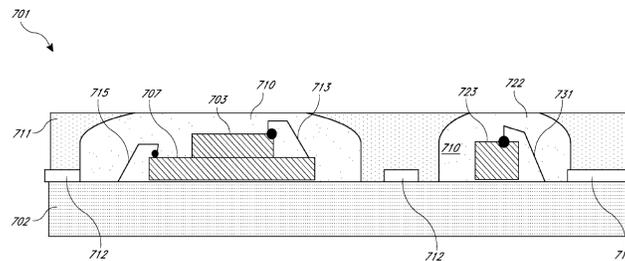
REVERSED

WHITEHEAD, JR., *Administrative Patent Judge*, dissenting in part.

I respectfully disagree with the majority’s decision in regard to reversing the Examiner’s obviousness rejection of independent claim 17.

Appellant indicates paragraph 47, element 711 provides support for the “wherein the optical barrier tapers inwardly from a lower portion of the optical barrier” limitation recited in claim 17. *See* Appeal Brief 6.

Appellant’s Figure 7 is reproduced below:



“FIG. 7 is a schematic illustration of a gesture sensor module having a laminate substrate 702 and molding compound deposited thereover.”
Specification ¶ 46.

The Specification discloses in paragraph 47, “The opaque molding compound 711 positioned laterally between the optical sensor die 703 and the optical emitter die 723 serves as an optical barrier, reducing the potential for cross-talk.” There is no mention of tapering the optical barrier, nor is there any mention of the significance of tapering the optical barrier in paragraph 47 of the Specification.

Appellant contends:

[T]he Examiner has not provided any reasoning or evidence to support the Examiner’s assertions that the references are functional equivalents. Moreover, the Examiner’s assertions with respect to such equivalence is not a reason to combine; at most, it merely indicates that a skilled artisan *could* have

combined the asserted teachings, **not** that there was any objective reason for doing so.

Appeal Brief 17 (emphasis added).

Appellant further contends:

[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention. *Personal Web Technologies LLC v. Apple Inc.*, [2016-1174] (Fed. Cir. February 14, 2017). Therefore, there is no reason or motivation to combine Costello’s blocking layer 33 that is angled with the opaque material 150 of Wiese and/or the radiation blocking material 118 of Patel, nor are the optical barriers “functional equivalents” as asserted by the Examiner.

Appeal Brief 17.

The Examiner finds Weise, as modified by Patel, fails to disclose tapering the optical barrier. *See* Final Action 21-22. The Examiner finds Costello discloses an optical barrier tapering inward and determines modification to the Wiese/Patel combination’s straight optical barrier would have been obvious to one of ordinary skill in the art. *See* Final Action 22.

I find the Examiner’s findings and determination sufficient to establish a prima facie case of obviousness because the Examiner cites to specific teachings in the references where optical barriers are deployed in the technology. *See* Final Action 21-22; *see also Personal Web Technologies LLC v. Apple Inc.*, 848 F.3d 987, 994 (2017) (“[A] clear, evidence-supported account of the contemplated workings of the combination is a prerequisite to adequately explaining and supporting a conclusion that a relevant skilled artisan would have been motivated to make the combination and reasonably expect success in doing so.”). I find Appellant’s arguments are conclusory because they do not provide any explanation as to why the prior art’s optical barriers are not functional equivalents. *See* Appeal Brief 17; *see also In re*

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Geisler, 116 F.3d 1465, 1470 (Fed. Cir. 1997) (attorney argument is not the kind of factual evidence required to rebut a prima facie case of obviousness). Further, the claimed optical barrier tapering does not appear to have any function other than providing the functions that a common optical barrier would provide. *See* Specification ¶ 47.

Constrained by the record, I would sustain the Examiner's obviousness rejection of claim 17.