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3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			SAWYER, STEVEN T	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte RAVI PALANISWAMY

Appeal 2019-004901
Application 15/554,251
Technology Center 2800

Before JEFFREY T. SMITH, MONTÉ T. SQUIRE, and
BRIAN D. RANGE, *Administrative Patent Judges*.

RANGE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–10. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as 3M Company and its affiliate 3M Innovative Properties Company. Appeal Br. 2.

CLAIMED SUBJECT MATTER²

Appellant describes the invention as relating to a multilayer substrate for a light emitting semiconductor device (LESD). Spec. 1:26–37. In particular, the invention seeks to address excessive heat buildup that can deteriorate LESD materials. *Id.* at 6:13–24. Claims 1 and 10 are the only independent claims on appeal. Claim 1, which we reproduce below with emphases added to certain key recitations, is illustrative:

1. A flexible multilayer substrate for attaching a light emitting semiconductor device comprising:
 - a first dielectric layer having a first side and a second side;
 - a plurality of conductive vias extending from the first side to the second side of the first dielectric layer;**
 - a circuit layer disposed on the second side of the first dielectric layer in communication with the plurality of conductive vias;
 - a first thermally conductive layer** disposed on the circuit layer opposite the first dielectric layer;
 - a discontinuous metal support layer disposed on the first thermally conductive layer opposite the circuit layer, wherein the discontinuous metal support layer is electrically continuous and includes an array of openings extending through the discontinuous metal support layer; and
 - a second thermally conductive layer disposed on the discontinuous metal support layer opposite the first thermally conductive layer, wherein the second thermally conductive layer is in contact with the first thermally conductive layer in the openings through the discontinuous metal support layer.

Appeal Br. 7 (Claim Appendix).

² In this Decision, we refer to the Final Office Action dated September 6, 2018 (“Final Act.”), the Appeal Brief filed December 27, 2018 (“Appeal Br.”), the Examiner’s Answer dated April 5, 2019 (“Ans.”), and the Reply Brief filed June 3, 2019 (“Reply Br.”).

REFERENCES

The Examiner relies upon the prior art below in rejecting the claims on appeal:

<u>Name</u>	<u>Reference</u>	<u>Date</u>
Conlon et al. ("Conlon")	US 5,035,939	July 30, 1991
Bunyan	US 2004/0081843 A1	Apr. 29, 2004
Sunohara	US 2009/0139751 A1	June 4, 2009
Park et al. ("Park")	US 2013/0075144 A1	Mar. 28, 2013
Kaiya	US 2013/0092421 A1	Apr. 18, 2013
Uehara	US 2015/0003083 A1	Jan. 1, 2015

REJECTIONS

The Examiner maintains (Ans. 3) the following rejections on appeal:

- A. Claims 1, 6, 8, and 10 under 35 U.S.C. § 103 as obvious over Park in view of Uehara. Final Act. 2.
- B. Claims 2 and 7 under 35 U.S.C. § 103 as obvious over Park in view of Uehara and Conlon. *Id.* at 6.
- C. Claim 3 under 35 U.S.C. § 103 as obvious over Park in view of Uehara and Bunyan. *Id.* at 6.
- D. Claim 4 under 35 U.S.C. § 103 as obvious over Park in view of Uehara and Kaiya. *Id.* at 6.
- E. Claims 5 and 9 under 35 U.S.C. § 103 as obvious over Park in view of Uehara and Sunohara. *Id.* at 9.

OPINION

We review the appealed rejections for error based upon the issues identified by Appellant and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential), (cited with approval in *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (“[I]t has long been the Board’s practice to require an applicant to identify the alleged error in the examiner’s rejections.”)). After considering the evidence presented in this Appeal and each of Appellant’s arguments, we are not persuaded that Appellant identifies reversible error. Thus, we affirm the Examiner’s rejections for the reasons expressed in the Final Office Action and the Answer. We add the following primarily for emphasis.

The Appellant does not separately argue any claim other than claim 1. We therefore limit our discussion to claim 1. All other claims stand or fall with claim 1.

The Examiner finds that Park teaches a multilayer substrate having claim 1’s recited structure. Appeal Br. 2–3. The Examiner finds that Park’s “vias shown in dielectric layer 90 having solder S therein” correspond to claim 1’s “plurality of conductive vias.” *Id.* at 2. The Examiner finds that Park teaches “insulating layer 50” as a thermally conductive layer. *Id.* The Examiner finds that Park does not teach that its substrate is “for attaching a light emitting semiconductor device.” *Id.* at 3. The Examiner finds that Uehara teaches a multilayer substrate for attaching such a device and determines it would have been obvious to modify Park as taught by Uehara to form a lighting feature. *Id.*

Appellant argues that Park’s solder S is not a conductive via. Appeal Br. 4. This argument does not identify error in the Examiner’s findings.

Appellant acknowledges that Appellant's "conductive vias 190 may be filled metal." *Id.* The vias of Park are similarly filled with metal (i.e., solder).

Appellant further argues that solder S does not extend from the first side of the second side of solder resist layer 90. Appeal Br. 4. With respect to the first side, Appellant argues that solder S "extends well above the top side of the solder resist layer." Appeal Br. 4–5; *see also* Reply Br. 1. Appellant's argument is unpersuasive because the language of claim 1 requires vias "extending from the first side to the second side of the first dielectric layer." Appeal Br. 7 (Claims App.). Claim 1's language does not prohibit the vias extending past the first and second sides of the first dielectric layer. Indeed, Appellant's Specification indicates that the vias may have a domed surface. Spec. 5:32–36 ("The via plug can extend from the second side of the first dielectric layer . . . to a position at or near the first side of the first dielectric layer and can have a domed surface disposed adjacent to the first side of the first dielectric layer."). Park's solder-filled via is similarly domed.

With respect to the second side, Appellant argues that Park's solder S does not extend "down through the entire thickness of solder resist layer 90 [which the Examiner maps to the claim 1's first dielectric layer]." Appeal Br. 4–5. Claim 1 does not, however, require the recited via to extend all the way through the first dielectric layer. Rather, claim 1 requires that the dielectric layer have a first side and a second side and that the via extend from the first side to the second side. The Examiner finds that Park's top surface of solder resist layer 90 is a first side and the lower edge of the upper lip of solder resist layer 90 is a second side. Ans. 4 (providing annotated version of Park Fig. 1). Park's solder S extends from the Examiner's identified first and second sides of layer 90. *Id.*; *see also* Park Fig. 1.

Appellant does not persuasively establish error in the Examiner’s findings in this regard.

Appellant further argues that the Examiner errs in identifying Park’s “insulating layer 50” as being a “thermally conductive layer” as claim 1 recites. Appeal Br. 5–6. Appellant argues that Park’s electrically insulating layer is instead “likely to be a poor conductor of heat.” *Id.* at 5. Claim 1, however, does not require that the “thermally conductive layer” meet any particular standard for thermal conductivity. Ans. 5. Moreover, Appellant’s Specification states that Appellant’s thermally conductive layers “can be any suitable insulating interface material.” Spec. 6:30–38; *see also* Ans. 5. Park’s insulating layer thus falls within the scope of claim 1’s “thermally conductive layer” recitation.

Because Appellant’s arguments do not identify Examiner error, we sustain the Examiner’s rejections.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 6, 8, 10	103	Park, Uehara	1, 6, 8, 10	
2, 7	103		2, 7	
3	103		3	
4	103		4	
5, 9	103		5, 9	
Overall Outcome			1–10	

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TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED