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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ARTHUR CORNFELD, MARK A. STAN,
TANSEN VARGHESE, and FRED NEWMAN

Appeal 2019-004317
Application 11/860,183
Technology Center 1700

Before ADRIENE LEPIANE HANLON, CATHERINE Q. TIMM, and
MONTÉ T. SQUIRE, *Administrative Patent Judges*.

SQUIRE, *Administrative Patent Judge*.

DECISION ON APPEAL¹

Appellant² appeals under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 15 and 25–29.³ We have jurisdiction under 35 U.S.C. § 6(b).

¹ In this Decision, we refer to the Specification filed Sept. 24, 2007 (“Spec.”); Non-Final Office Action dated June 21, 2018 (“Non-Final Act.”); Appeal Brief filed Feb. 19, 2019 (“Appeal Br.”); Advisory Action dated Mar. 6, 2019 (“Advisory Act.”); Examiner’s Answer dated Mar. 20, 2019 (“Ans.”); and Reply Brief filed May 14, 2019 (“Reply Brief”).

² We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies SolAero Technologies Corp. as the real party in interest. Appeal Br. 1.

³ Claims 1–14, 16–24, and 30 are cancelled. *See* List of Claims filed Dec. 19, 2018.

We AFFIRM.

CLAIMED SUBJECT MATTER

The invention relates to the field of solar cell semiconductor devices, and particularly to multijunction solar cells including metamorphic layers.

Spec. ¶ 5. Claim 15 illustrates the subject matter on appeal and is reproduced below from the Claims Appendix to the Appeal Brief:

15. A multijunction solar cell comprising:

a lower solar subcell having a first band gap, wherein said lower solar subcell is composed of an InGaP emitter region and a Ga(In)As base region;

a first threading dislocation inhibition layer over the lower solar subcell;

a grading interlayer composed of InGaAlAs over and directly adjacent the first threading dislocation inhibition layer and having a second band gap of 1.5 eV that is greater than said first band gap;

a second threading dislocation inhibition layer having a thickness of about 1.0 micron and composed of InGa(Al)P, the second threading dislocation inhibition layer being over and directly adjacent to said grading interlayer for reducing the propagation of threading dislocations, said second threading dislocation inhibition layer having a composition different from a composition of the first threading dislocation inhibition layer;

a middle solar subcell over said threading dislocation inhibition layer and having a third band gap smaller than said second band gap and greater than said first band gap, the middle solar subcell being lattice mismatched with respect to said lower solar subcell, and including an InGaP emitter region and a Ga(In)As base region; and

an upper solar subcell over said middle solar subcell and having a fourth band gap greater than said third band gap, wherein said upper solar subcell is composed of an InGa(Al)P emitter region and an InGa(Al)P base region.

Appeal Br. 13 (key disputed claim language italicized and bolded).

REFERENCES

The Examiner relies on the following prior art references as evidence in rejecting the claims on appeal:

Name	Reference	Date
DePoy et al. (“DePoy”)	US 6,043,426	Mar. 28, 2000
King et al. (“King ’788”)	US 6,340,788 B1	Jan. 22, 2002
Patton et al. (“Patton”)	US 6,660,928 B1	Dec. 9, 2003
Wanlass	US 2006/0144435 A1	July 6, 2006
King et al. (“King ’411”)	US 2005/0274411 A1	Dec. 15, 2005

REJECTIONS

On appeal, the Examiner maintains (Ans. 3) the following rejections:

1. Claims 15 and 27–29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Wanlass in view of King ’788 and further in view of King ’411 and further in view of Patton (“Rejection 1”). Non-Final Act. 11–12.

2. Claims 25 and 26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Wanlass in view of King ’788 and further in view of King ’411 and further in view of Patton, as applied to claim 15 above, and further in view of DePoy (“Rejection 2”). *Id.* at 31.

OPINION

Having considered the respective positions the Examiner and Appellant advance in light of this appeal record, we affirm the Examiner's rejections based on the fact-finding and reasoning set forth in the Answer, Advisory Action, and Non-Final Office Action, which we adopt as our own. We add the following primarily for emphasis.

Rejection 1

The Examiner rejects claims 15 and 27–29 under 35 U.S.C. § 103(a) as obvious over the combination of Wanlass, King '788, King '411, and Patton. Non-Final Act. 11, 12, 22–30. In response to the Examiner's rejection, Appellant presents argument for the patentability of claims 15 and 27–29 as a group. Appeal Br. 2. We select claim 15 as representative and claims 27–29 stand or fall with claim 15. 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner determines that the combination of Wanlass, King '788, King '411, and Patton suggests a multijunction solar cell satisfying the limitations of claim 15 and concludes the combination would have rendered the claim obvious. Non-Final Act. 22–30 (citing Wanlass, Abstract, Figs. 1, 2, 3b, 3c, ¶¶ 9, 27, 29, 34, 38–43, 48, 59, 64; King '788, Abstract, Figs. 1b, 5b, 7:8–27, 7:28–33, 8:11–27, 8:35–40, 8:54–67, 9:8–15, 20:28–52; King '411, Abstract, Fig. 3, ¶¶ 20, 42, 47; Patton, Abstract, Fig. 1, 3:65–4:1, 4:64–65).

Appellant argues the Examiner's rejection of claim 15 should be reversed because Wanlass fails to disclose “a grading interlayer composed of InGaAlAs and having a band gap of 1.5 eV” and “threading dislocation inhibition layers, at least one of which is composed of InGa(Al)P, adjacent the grading interlayer.” Appeal Br. 5.

Appellant further argues the Examiner's rejection should be reversed because it is based on improper hindsight. Appeal Br. 5. In particular, Appellant contends

there would have been no rational basis to select the *particular claimed combination* of the grading interlayer and the threading dislocation inhibition layers other than by using the claimed invention itself as a blueprint.

Id. at 5; *see also id.* at 5 (arguing the Examiner "improperly uses the claimed invention as a guide to select individual features from the other references").

Appellant also contends that because the potential number of possible combinations of group II–V compound semiconductor materials for the claimed layers is "nearly infinite," without the guidance of the present application, "there would have been no rational basis even to try the particular combination of an InGaAlAs grading interlayer and an adjacent buffer layer composed of InGa(Al)P," as claimed. *Id.* at 5.

We do not find Appellant's arguments persuasive of reversible error in the Examiner's rejection in view of the fact-finding and reasons the Examiner provides at pages 3–8 of the Answer and pages 22–30 of the Non-Final Office Action, which a preponderance of the evidence supports.

Appellant's argument that Wanlass fails to disclose "a grading interlayer composed of InGaAlAs and having a band gap of 1.5 eV" and "threading dislocation inhibition layers, at least one of which is composed of InGa(Al)P" (Appeal Br. 5) is not persuasive because it is premised on what Appellant contends the Wanlass reference teaches individually, and not the combined teachings of the cited prior art references as a whole, and what the combined teachings of the references would have suggested to one of ordinary skill in the art. One cannot show non-obviousness by attacking references individually where the rejection is based on a combination of

references. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981). The Examiner does not rely solely upon Wanlass for teaching the “grading interlayer” and “threading inhibition layer” elements of the claim.

Rather, the Examiner relies upon the combined teachings of the cited art for suggesting those claim elements. In particular, regarding the claimed grading interlayer composed of InGaAlAs, as the Examiner finds (Ans. 5; Non-Final Act. 22–23, 27), Wanlass teaches the second solar subcell comprises GaAs and the third solar subcell comprises GaInAs and that the two subcells are lattice mismatched with graded interlayer 22 in between. Wanlass, Fig. 1, ¶¶ 27, 29, 39, 43, 64. As the Examiner further finds (Ans. 5; Non-Final Act. 27–28), King ’411 teaches a multijunction solar cell comprising a solar subcell comprising GaAs and an adjacent solar subcell comprising GaInAs with a grading interlayer in between made of InGaAlAs. King ’411, Fig. 3, ¶¶ 42, 47.

Thus, based on the combined teachings of the cited art, as the Examiner determines (Ans. 5; Non-Final Act. 28–29), it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wanlass’ multijunction solar cell by using a grading interlayer composed of InGaAlAs as taught by King ’411 because King ’411 teaches the grading interlayer minimizes internal stresses and strains caused by lattice mismatch between the two solar subcells. King ’411, ¶ 20 (disclosing “use of the graded buffer layer achieves the desired lattice matching and epitaxial relationship through the thickness of the solar cell” and “[t]his lattice matching and epitaxial relationship is needed to minimize internal stresses and strains, and for good electron movement through the thickness

of the solar cell”); *see also id.* ¶ 20 (“The result is improved performance of the individual subcells, and improved performance of the solar cell.”).

Regarding the composition and location of the claimed threading dislocation inhibition layers, as the Examiner finds (Ans. 5; Non-Final Act. 24), Wanlass teaches the use of GaInP to transition between the two subcells due to its lattice constant and bandgap. Wanlass, Fig. 1, ¶¶ 27, 29, 39, 64. As the Examiner further finds (Ans. 5; Non-Final Act. 24–26), King ’788 teaches the use of threading dislocation inhibition layers composed of GaInP on both sides of a grading interlayer within a multijunction solar cell and that the incorporation of the threading dislocation inhibition layers would further minimize the effects of dislocations that may exist between the middle and lower subcells due to the differences in their lattice constants. King ’788, Figs. 1b, 5b, 7:8–22, 7:28–33, 8:56–61, 20:28–52.

Thus, based on the combined teachings of the cited art, as the Examiner determines (Ans. 5–6; Non-Final Act. 26–27), it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate King ’788’s threading dislocation inhibition layers between the grading interlayer and the lower solar subcell and between the middle solar subcell and the grading interlayer of Wanlass to minimize the effects of dislocations that may exist between the middle and lower subcells due to the differences in their lattice constants. King ’788, 20:41–46, 20:46–52 (adding buffer layers “to accommodate the difference between the lattice constant d_s of the active substrate . . . and the lattice constant d_{Uw} of the lowermost group of upper subcells”).

Appellant’s arguments do not reveal reversible error in the Examiner’s factual findings and analysis in this regard.

Appellant's arguments that the Examiner's rejection is based on improper hindsight and the Examiner "improperly uses the claimed invention as a guide to select individual features from the other references" (Appeal Br. 5) are not persuasive because they are conclusory and unsupported by persuasive evidence in the record. *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984). Moreover, we find the Examiner's rejection is based on explicit disclosures in each of the cited references, and what those disclosures considered as a whole reasonably would have suggested to one of ordinary skill in the art, rather than based on impermissible hindsight reconstruction as Appellant argues. *See In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971) (acknowledging that "[a]ny judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning" but such reconstruction is proper "so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure").

Appellant's contentions that "there would have been no rational basis to select the *particular claimed combination* of the grading interlayer and the threading dislocation inhibition layers" and "there would have been no rational basis even to try the particular combination" (Appeal Br. 5) are equally unpersuasive because they too are conclusory and unsupported by persuasive evidence in the record. *De Blauwe*, 736 F.2d at 705.

Contrary to what Appellant argues, as previously discussed above, the Examiner does provide a reasonable basis, which a preponderance of the evidence in the record supports, to evince why one of ordinary skill in the art would have combined the teachings of the cited art to arrive at the claimed

invention. *See* Ans. 5–6; Non-Final Act. 23, 26–30; *see also* *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 420 (2007) (explaining that any need or problem known in the art can provide a reason for combining the elements in the manner claimed). Appellant’s disagreement as to the Examiner’s factual findings and reasons for combining the references, without more, is insufficient to establish reversible error. *SmithKline Beecham Corp. v. Apotex Corp.*, 439 F.3d 1312, 1320 (Fed. Cir. 2006) (“[M]ere statements of disagreement . . . as to the existence of factual disputes do not amount to a developed argument.”).

Appellant argues that the Examiner’s rejection should be reversed because a person of ordinary skill in the art would not have had reason to modify Wanlass based on Patton’s disclosure. Appeal Br. 5 (“[A] person of ordinary skill would not have considered modifying IMM solar cells such as described by Wanlass based on Patton’s non-IMM solar cells.”). In particular, Appellant contends that, in contrast to Wanlass, “Patton does not describe IMM photovoltaic cells” and “Patton’s overall growth process is the *opposite* of an IMM growth process.” *Id.* at 5–6. Appellant further contends that “Patton’s buffer layer serves essentially the same function as Wanlass’ ‘graded layer’ 22 (i.e., to provide a smooth transition from one lattice constant to another lattice constant).” *Id.* at 6.

We do not find Appellant’s arguments in this regard persuasive of reversible error in the Examiner’s rejection based on the fact-finding and for the reasons the Examiner provides at pages 6–8 of the Answer and pages 29–30 of the Non-Final Office Action. As the Examiner finds (Ans. 6; Non-Final Act. 29), both Wanlass and Patton are directed to multijunction solar cells comprising lattice mismatched layers. *See* Wanlass, Abstract,

¶¶ 3, 9; Patton, Abstract, 1:8–10. As the Examiner further finds (Ans. 7; Non-Final Act. 29), Patton teaches threading dislocation inhibition layer 14 directly adjacent to lower solar subcell 20 for reducing the propagation of threading dislocations and to alleviate the differences in lattice constants between the substrate and the lower solar subcell, and the layer having a thickness of about 1.0 micron. Patton, Fig. 1, 3:65–4:1, 4:64–65 (“Buffer layer **14** has a thickness from about 1.0 to about 2.0 μm , and preferably about 1.5 μm .”).

Thus, as the Examiner determines (Non-Final Act. 30), it would have been obvious to one of ordinary skill in the art at the time of the invention to have used a threading dislocation inhibition layer having a thickness of about 1.0 micron for modified-Wanlass’ multijunction solar cell because Patton teaches it is a suitable thickness for a monolithic threading dislocation inhibition layer in order to inhibit threading dislocations from propagating into the solar cell. Patton, 3:65–4:1, 4:64–65.

Appellant’s arguments at pages 5 and 6 of the Appeal Brief, without more, are insufficient to establish reversible error in the Examiner’s factual findings and analysis in this regard. Appellant’s contentions that “Patton does not describe IMM photovoltaic cells” and “Patton’s overall growth process is the *opposite* of an IMM growth process” (Appeal Br. 5–6) are not persuasive because Patton’s teachings are not limited to the disclosures in its preferred embodiments. *See In re Susi*, 440 F.2d 442, 445-46 (CCPA 1971) (explaining that disclosure of particular preferred embodiments does not teach away from a prior art reference’s broader disclosure); *see also In re Applied Materials, Inc.*, 692 F.3d 1289, 1298 (Fed. Cir. 2012) (“A reference

must be considered for everything that it teaches, not simply the described invention or a preferred embodiment.”).

As the Examiner finds (Ans. 6), Patton teaches a threading dislocation inhibition layer (buffer layer 14) within a multijunction solar cell comprising lattice mismatched subcells and the threading dislocation inhibition layer having a thickness of about 1.0 micron. Patton, 3:65–4:1 (“The substrate . . . need not be lattice matched because a buffer layer is provided between the substrate and the first subcell.”), 4:60–65 (disclosing the “buffer layer **14** is grown on top of substrate **11**” and “[t]he buffer layer can be monolithic or graded, and . . . preferably lattice matched to the first subcell”). The fact that Patton may describe an embodiment where the solar cell is not an IMM cell or formed via an IMM growth process, without more, does not negate or take away from Patton’s broad disclosure regarding a multijunction solar cell comprising lattice mismatched subcells and use of a threading dislocation inhibition layer having a thickness of about 1.0 microns. *See In re Preda*, 401 F.2d 825, 826 (CCPA 1968) (explaining that a prior art reference’s disclosure must be considered for all that it teaches, including “the inferences which one skilled in the art would reasonably be expected to draw therefrom”). In that regard, Appellant has not directed us to any persuasive evidence showing that the thickness of the monolithic threading dislocation inhibition layer disclosed in Patton would not have been reasonably expected by one of ordinary skill to inhibit threading dislocations from propagating in an IMM photovoltaic cell, as disclosed in Wanlass.

Appellant’s contention that “Patton’s buffer layer serves essentially the same function as Wanlass’ ‘graded layer’ 22 (i.e., to provide a smooth transition from one lattice constant to another lattice constant)” (Appeal

Br. 6) is misplaced because the Examiner does not rely on Patton for teaching incorporating the threading dislocation inhibition layer to transition between subcells having different lattice constants. *Keller*, 642 F.2d at 425. Rather, as discussed above, the Examiner relies principally on King '788 for teaching that element of the claim and relies on Patton for teaching the claimed thickness of the threading dislocation inhibition layer. Moreover, as the Examiner finds (Ans. 7–8), Patton teaches that its buffer layer can be monolithic or graded (Patton 4:60–65) and thus is not limited to a graded structure or functioning as a graded layer.

Lastly, Appellant argues the Examiner's rejection should be reversed based on objective evidence of nonobviousness. Appeal Br. 6–16; Reply Br. 1–11. Appellant cites and relies upon declarations submitted under 37 C.F.R. § 1.132 as evidence of (1) commercial success, (2) unexpected results, and (3) industry praise, and contends the evidence supports the nonobviousness of the claimed subject matter. *See* Appeal Br. 6, 15 (Evidence Appendix).⁴

Any initial obviousness determination is reconsidered anew in view of the proffered evidence of nonobviousness. *See In re Rinehart*, 531 F.2d 1048, 1052 (CCPA 1976); *In re Eli Lilly & Co.*, 902 F.2d 943, 945 (Fed. Cir. 1990). The ultimate determination of whether a claimed invention would

⁴ Appellant submits and relies upon the following declarations:
(a) Declaration of Paul Sharps dated Dec. 2, 2016 (“Sharps A”);
(b) Supplemental Declaration of Paul Sharps dated Apr. 11, 2018 (“Sharps B”); (c) Supplemental Declaration of Paul Sharps dated Dec. 17, 2018 (“Sharps C”); (d) Declaration of John Merrill dated Nov. 7, 2017 (“Merrill A”); (e) Supplemental Declaration of John Merrill dated May 2, 2018 (“Merrill B”); and (f) Declaration of Robert Little dated Apr. 24, 2018 (“Little”). Appeal Br. 15 (Evidence Appendix).

have been obvious or nonobvious is a legal conclusion, which is made based on considering and weighing all of the facts in evidence. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

Having considered Appellant’s arguments and declaration evidence, as well as the fact-finding and reasons the Examiner provides at pages 3–19 of the Answer, page 2 of the Advisory Action, and pages 2–30 of the Non-Final Office Action, on the record before us, we agree with the Examiner that Appellant’s proffered evidence of nonobviousness does not outweigh the evidence in favor of obviousness. *See Tokai Corp. v. Easton Enters., Inc.*, 632 F.3d 1358, 1371 (Fed. Cir. 2011) (“A strong case of prima facie obviousness . . . cannot be overcome by a far weaker showing of objective indicia of nonobviousness.”). We address Appellant’s proffered evidence of nonobviousness below.

1. Commercial Success

Appellant cites and relies upon the Sharps A, Merrill A, Merrill B, and Little Declarations as evidence of commercial success. *See* Appeal Br. 9–11; Reply Br. 6–10. Relying principally upon the Merrill B Declaration, Appellant argues that because IMM solar cells are not available for purchase commercially as off-the-shelf products and are not sold through traditional sales channels, it would be inappropriate to assess commercial success of the claimed solar cells based on the number of traditional commercial sales or based on market share of IMM solar cells sold as off-the-shelf products or sold commercially through traditional sales channels. Appeal Br. 10 (citing Merrill B ¶¶ 7–9).

Rather, Appellant contends and relies upon research and development contracts, for example, as evidence probative of the commercial success of

the claimed subject matter. *Id.* at 10–11 (citing Merrill B ¶ 10; Merrill A ¶¶ 2, 10, 14–19; Sharps A ¶¶ 5–9; Little ¶¶ 4–6). Appellant contends the commercial success of the claimed subject matter is “evidenced by the ongoing contracts with an agency of the US Government, as well as the government’s own interest in securing its rights in the invention,” and the “features of the solar cells that led to the subsequent contract(s) and the associated expenditures of funds are commensurate with the subject matter of claim 15.” *Id.* at 11 (citing Merrill A ¶¶ 9, 10, 15); *see also* Reply Br. 9 (“[T]he nexus between the commercial success and the claimed invention is indicated by the fact that, as explained by Mr. Merrill, significant additional contracts were awarded as a result of the exceptional results achieved by the solar cells having the features of the solar cell of claim 15.”).

We accord Appellant’s evidence of commercial success little weight because, as the Examiner finds and explains at pages 13–18 of the Answer, the evidence does not adequately show that the alleged commercial success is derived from the claimed invention. That is, Appellant has not sufficiently demonstrated a nexus between the alleged commercial success and the claimed invention. Merely stating that the “features of the solar cells that led to the subsequent contract(s) and the associated expenditures of funds are commensurate with the subject matter of claim 15” (Appeal Br. 11), without more, is insufficient to establish the requisite nexus between the claimed features and the alleged commercial success. *See In re Mageli*, 470 F.2d 1380, 176 USPQ 305 (CCPA 1973) (holding conclusory statements that commercial success is due to the merits of the invention are entitled to little weight).

For example, as the Examiner finds and explains (Ans. 13–16), although the Merrill B Declaration refers to “IMM solar cells,” it is unclear from the evidence, and Appellant does not adequately explain, what specific IMM solar cells are being referred to, how those IMM solar cells relate or correspond to the claimed features, and how the claimed features are tied to the IMM solar cells’ alleged commercial success. As the Examiner finds (Ans. 15–16), it is also unclear from the evidence and Appellant has not adequately established that the alleged funding and additional contracts were awarded to Appellant specifically due to the claimed features, rather than for other reasons not recited in the claim. *See Joy Techs., Inc. v. Manbeck*, 751 F. Supp. 225, 229 (D.D.C. 1990), *aff’d*, 959 F.2d 226, 228 (Fed. Cir. 1992) (determining that features responsible for commercial success were not recited in claims at issue, and therefore the evidence of commercial success was not commensurate in scope with the broad claims at issue).

2. Unexpected Results

Appellant cites and relies principally upon the Sharps B and Sharps C Declarations as evidence of unexpected results. *See* Appeal Br. 8–9; Reply Br. 3. In particular, based on the test results provided at paragraphs 15–16 of the Sharps B and Sharps C Declarations, Appellant argues the claimed subject matter demonstrates unexpected results based on comparative testing. Appeal Br. 8 (stating “the results of the comparative testing were ‘surprising,’ ‘unexpected,’ and ‘advantageous’”); *see also id.* at 9 (“The foregoing significant improvements in solar cell efficiency that can be achieved by incorporating a respective threading dislocation inhibition layer on both sides of an InGaAlAs grading interlayer in a 3J IMM solar cell structure were surprising, as well as advantageous.”).

We accord Appellant’s evidence of unexpected results little weight because, as the Examiner finds (Ans. 10–12), Appellant has not adequately established that the alleged showing of unexpected results is commensurate in scope with the claims. *See In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972) (explaining the burden rests with Appellant to establish, among other things, that the supplied evidentiary showing is commensurate in scope with the claimed subject matter); *see also In re Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011) (“Evidence of secondary considerations must be reasonably commensurate with the scope of the claims.”). As the Examiner finds (Ans. 10–11), besides the inclusion of an InGaAlAs grading interlayer and InGaP barrier layer, the Sharps B and Sharps C Declarations do not provide sufficient details regarding the 3J-IMM and IDJ solar cells tested or adequately explain why the solar cells tested are representative of the overall scope of the claims. For example, as the Examiner finds (Ans. 11), although claim 15 requires two threading dislocation inhibition layers, including one of the layers “having a thickness of about 1 micron and composed of InGa(Al)P,” the Sharps declarations refer to 3J-IMM solar cell having an InGaP barrier layer with a thickness of 0.5 microns and no second barrier layer on the opposite side of the grading interlayer, as claimed. Thus, we are not persuaded Appellant has provided data sufficient to show that the alleged unexpected results occur over the entire breadth of the claim.

3. Industry Praise

Appellant cites and relies principally upon the Sharps A, Merrill A, and Merrill B Declarations as evidence of industry praise. *See Appeal Br.* 7–8 (citing Sharps A ¶¶ 4–5; Merrill A ¶¶ 1–2, 4–6, 9, 11–14; Merrill B ¶¶ 3, 5, 11–14). Appellant argues the “evidence is indicative of strong

industry praise for the subject matter of claim 15.” Appeal Br. 8; *see also* Reply Br. 1 (arguing “the evidence establishes the necessary nexus between the industry praise and the claims of the present application”).

Although we acknowledge and accord Appellant’s evidence of industry praise some weight, we agree with the Examiner (Ans. 8–9) that it is largely unclear from the evidence to what extent the industry praise is attributable to the features of Appellant’s claimed invention. As with commercial success, evidence of industry praise is only relevant when it is directed to the merits of the invention claimed. *See Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1311 (Fed. Cir. 2006).

In sum, having considered the totality of the evidence, including the Appellant’s alleged objective evidence of nonobviousness, we determine a preponderance of the evidence favors the Examiner’s conclusion of obviousness as to claim 15.

Accordingly, we affirm the Examiner’s rejection of claims 15 and 27–29 under 35 U.S.C. § 103(a) as obvious over the combination of Wanlass, King ’788, King ’411, and Patton.

Rejection 2

The Examiner rejects claims 25 and 26 under 35 U.S.C. § 103(a) as obvious over the combination of Wanlass, King ’788, King ’411, Patton, and DePoy. Non-Final Act. 31–32. In response to the Examiner’s rejection, Appellant does not present any separate or additional substantive arguments in the Appeal Brief or the Reply Brief. Rather, Appellant relies principally on the same arguments previously discussed and presented above in response to the Examiner’s Rejection 1 and findings regarding the

combination of Wanlass, King '788, King '411, and Patton. *See generally* Appeal Br. 2–12.

Appellant's assertion that "DePoy does not cure the deficiencies of the other references" (Appeal Br. 6) is conclusory and, without more, insufficient to establish reversible error in the Examiner's rejection. *De Blauwe*, 736 F.2d at 705.

Thus, based on the fact-finding and reasoning the Examiner provides, and for principally the same reasons we discuss above for affirming the Examiner's Rejection 1, we affirm the Examiner's rejection of claims 25 and 26 under 35 U.S.C. § 103(a) as obvious over the combination of Wanlass, King '788, King '411, Patton, and DePoy (Rejection 2).

CONCLUSION

In summary:

Claim(s) Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
15, 27–29	103(a)	Wanlass, King '788, King '411, Patton	15, 27–29	
25, 26	103(a)	Wanlass, King '788, King '411, Patton, DePoy	25, 26	
Overall Outcome			15, 25–29	

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

AFFIRMED