NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

GRAFTECH INTERNATIONAL HOLDINGS, INC.,
Appellant

v.

LAIRD TECHNOLOGIES INC.,
Appellee

2015-1796

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. IPR2014-00023.

GRAFTECH INTERNATIONAL HOLDINGS, INC.,
Appellant

v.

LAIRD TECHNOLOGIES, INC.,
Appellee

2015-1797, 2015-1798

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2014-00024 and IPR2014-00025.

Decided: June 17, 2016

ERIN M. DUNSTON, Buchanan Ingersoll & Rooney PC, Alexandria, VA, argued for appellant. Also represented by TRAVIS WILLIAM BLISS, Wilmington, DE.

MATTHEW L. CUTLER, Harness, Dickey & Pierce, PLC, St. Louis, MO, argued for appellee.

Before REYNA, CLEVENGER, and WALLACH, *Circuit Judges.*

WALLACH, *Circuit Judge.*

Appellee Laird Technologies, Inc. ("Laird") sought inter parties review of various claims of U.S. Patent Nos. 6,482,520 ("the '520 patent"), 6,982,874 ("the '874 patent"), and 7,292,441 ("the '441 patent") (collectively, "the patents-in-suit") before the United States Patent and Trademark Office's Patent Trial and Appeal Board ("PTAB"). In separate Final Written Decisions, the PTAB found the disputed claims of the patents-in-suit invalid as obvious. *See Laird Techs., Inc. v. GrafTech Int'l Holdings, Inc.* (*GrafTech I*), No. IPR2014-00023, 2015 WL 1385390 (P.T.A.B. Mar. 25, 2015) (addressing the '520 patent); *Laird Techs., Inc. v. GrafTech Int'l Holdings, Inc.* (*GrafTech II*), No. IPR2014-00024, 2015 WL 1385391 (P.T.A.B. Mar. 25, 2015) (addressing the '874 patent); *Laird Techs., Inc. v. GrafTech Int'l Holdings, Inc.* (*GrafTech III*), No. IPR2014-00025, 2015 WL 1385392 (P.T.A.B. Mar. 25, 2015) (addressing the '441 patent). Appellant GrafTech International Holdings, Inc.

("GrafTech") appeals the PTAB's decisions. For the reasons provided below, we affirm.

DISCUSSION

I. Subject Matter Jurisdiction and Standard of Review

We possess subject matter jurisdiction over GrafTech's appeals pursuant to 28 U.S.C. § 1295(a)(4)(A) (2012). We review the PTAB's legal conclusions de novo, *In re Elsner*, 381 F.3d 1125, 1127 (Fed. Cir. 2004), and its factual findings for substantial evidence, *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). "Substantial evidence" constitutes the evidence that a reasonable mind would accept to support a finding. *See Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938).

II. The PTAB Properly Found the Disputed Claims of the '520 Patent Obvious

A patent claim would have been obvious and therefore invalid "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art [('PHOSITA')] to which said subject matter pertains." 35 U.S.C. § 103(a) (2006).[1] Obviousness is a question of law based on underlying findings of fact. *Gartside*, 203 F.3d at 1316. The underlying factual findings include (1) "the scope and content of the prior art," (2) "differences between the prior art and the claims at issue," (3) "the level of ordinary skill in the pertinent art,"

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[1] In passing the Leahy-Smith America Invents Act ("AIA"), Congress amended § 103. Pub. L. No. 112-29, § 3(c), 125 Stat. 284, 287–88 (2011). However, because the application that led to the '520 patent was filed before March 16, 2013, the pre-AIA § 103 applies. *Id.*, § 3(n)(1), 125 Stat. at 293.

and the presence of (4) secondary considerations of non-obviousness such "as commercial success, long-felt but unsolved needs, [and] the failure of others." *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17–18 (1966).

The PTAB found claims 1, 2, and 21–23 of the '520 patent obvious over various prior art references. *GrafTech I*, 2015 WL 1385390, at *8–15. It also found evidence as to secondary considerations did not warrant the opposite result. *Id.* at *15–19. GrafTech challenges these findings and alleges that the PTAB afforded undue weight to testimony from Laird's expert witness, William Bagot, in reaching its conclusions. We address each argument in turn.

A. The '520 Patent

The '520 patent "relates to a system effective for dissipating the heat generated by an electronic component using a thermal management system that includes a thermal interface formed from a flexible graphite sheet and/or a heat sink formed from a graphite article." '520 patent, Abstract.[2] The invention seeks to dissipate heat generated from increasingly "sophisticated electronic components . . . having smaller size and more complicated power requirements . . . ," such as microprocessors. *Id.* col. 1. ll. 12–20. Independent claim 1 is representative and recites:

> A thermal management system comprising a heat source having an external surface and an anisotropic flexible graphite sheet formed of compressed particles of exfoliated natural graphite and having a planar area greater than the area of

[2] After the '520 patent issued in 2002, its claims were amended in 2007 and 2009, respectively, as a result of separate ex parte reexaminations. Where appropriate, we cite the '520 patent's claims as amended.

> the external surface of the heat source, the flexible graphite sheet having first and second major planar surfaces and having axes of higher thermal conductivity parallel to said major planar surfaces such that the ratio of thermal conductivity of the flexible graphite sheet parallel to said major planar surfaces to the thermal conductivity of the flexible graphite sheet transverse to said major surfaces is at least about 20, one of said major planar surfaces being in direct operative contact with the heat source.

J.A.-1796, at 144 ('520 patent First Ex Parte Reexamination Certificate), col. 1 ll. 26–40.[3] Dependent claim 2 limits the "heat source" recited in claim 1 to "an electronic component." '520 patent col. 13 l. 67. Claims 21–23 depend from claim 1 and provide additional limitations to the graphite sheet used in the invention. J.A.-1796, at 144 ('520 patent First Ex Parte Reexamination Certificate), col. 2 ll. 30–39. The central issues in this appeal concern the graphite sheet claimed in the '520 patent.

B. The PTAB Properly Found that the Prior Art Renders Obvious the Disputed Claims of the '520 Patent

The PTAB concluded that claims 1, 2, 22, and 23 of the '520 patent would have been obvious over Japanese Laid-Open Patent Application No. H10-56114 ("Inoue"), J.A.-1796, at 1384–97, in view of the Grafoil Engineering Design Manual ("Grafoil Manual"), J.A.-1796, at 1192–1280. *GrafTech I*, 2015 WL 1385390, at *8–14. The PTAB also found claim 21 obvious over Inoue in view of

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[3] The suffix -1796 denotes the materials in Appeal No. 2015-1796, while the suffix -1797 denotes those in Appeal Nos. 2015-1797 and -1798. In July 2015, the court consolidated Appeal Nos. 2015-1797 and -1798 and designated Appeal No. 2015-1796 as a companion case.

the Grafoil Manual and an entry from the Thermagon, Inc. website ("Thermagon Paper"), J.A.-1796, at 1374–75. *GrafTech I,* 2015 WL 1385390, at *14–15. GrafTech challenges the PTAB's findings.

GrafTech first alleges that a PHOSITA "would not have been motivated to combine Inoue with the Grafoil Manual," such that the PTAB erred in finding claims 1, 2, 22, and 23 of the '520 patent obvious. Appellant's Br.-1796, at 4, 32 (capitalization omitted). This is so, GrafTech argues, because Inoue *requires* the use of a carbonaceous sheet with a thermal conductivity higher than that of copper or aluminum, *id.* at 29–31, and the Grafoil Manual does not disclose a sheet with such properties, *id.* at 31–32.[4] GrafTech argues that this discrepancy demonstrates that a PHOSITA would not expect success in combining the references. *Id.* at 34–35.

As part of the obviousness inquiry, we consider "whether a [PHOSITA] would have been motivated to combine the prior art to achieve the claimed invention and whether there would have been a reasonable expectation of success in doing so." *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006) (citation omitted). The answers to these questions require producing factual findings that we review for substantial evidence. *Gartside*, 203 F.3d at 1316.

Substantial evidence supports the PTAB's finding that a motivation existed to combine Inoue with the

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[4] According to GrafTech, the "in-plane thermal conductivity of copper is 400 [watts per meter kelvin ('W/m·K')] and that of aluminum is 200 W/m·K," whereas the thermal conductivity of the graphite sheets in the Grafoil Manual "is but 140 W/m·K." Appellant's Br.-1796, at 3.

Grafoil Manual and that a PHOSITA would have a reasonable expectation of success in combining the references. GrafTech's argument rests on the premise that a PHOSITA would not have been motivated to combine Inoue with the Grafoil Manual because doing so would not yield an invention that meets the thermal conductivity requirement allegedly found in Inoue, which does not appear in the disputed claims of the '520 patent. '520 patent col. 13 ll. 66–67 (claim 2); J.A.-1796, at 144 ('520 patent First Ex Parte Reexamination Certificate), col. 1 ll. 26–40 (claim 1), col. 2 ll. 30–39 (claims 21–23). The PTAB held that Inoue does not *require* the use of a carbonaceous sheet with a thermal conductivity higher than that of copper or aluminum, but instead found that "a person of skill in the relevant technology . . . would have the requisite skill and creativity to select the appropriate graphite material for the task at hand." *GrafTech I*, 2015 WL 1385390, at *12. The record supports this conclusion because Inoue discloses a carbonaceous sheet with a thermal conductivity higher than that of copper or aluminum in its description of one preferred embodiment and does not make it a requirement. J.A.-1796, at 1386–87 ¶¶ 6, 8 (Inoue), 4848 (GrafTech acknowledging that "[t]he word[] '*must*' [is] not in either [of the relevant paragraphs of Inoue]." (emphasis added)). An obviousness inquiry is not limited to the prior art's preferred embodiment. *See, e.g.*, *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1370 (Fed. Cir. 2007).

GrafTech next avers that substituting the carbonaceous sheet disclosed in Inoue with the graphite sheet in the Grafoil Manual would yield an inoperable product, such that the PTAB erred in finding that a PHOSITA would be motivated to combine them. Appellant's Br.-1796, at 34–37. GrafTech did not raise this argument before the PTAB, *see* J.A.-1796, at 1760–1843 (GrafTech's Response), and accordingly GrafTech has waived it, *see, e.g.*, *Redline Detection, LLC v. Star Envirotech, Inc.*, 811

F.3d 435, 450 (Fed. Cir. 2015) (explaining that the court does not consider arguments not raised before the PTAB).

GrafTech further argues that the PTAB "fell into the hindsight trap" in reaching its obviousness conclusion because it allegedly relied upon "modern evidence" in reaching its conclusion that the prior art does not teach away from the disputed claims of the '520 patent. Appellant's Br.-1796, at 38 (capitalization altered). According to GrafTech, the PTAB "impermissibly used knowledge of GrafTech's actual invention in its obviousness inquiry." *Id.* at 39 (citation omitted); *see also id.* at 39–43 (raising related arguments).

"A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *Galderma Labs., L.P. v. Tolmar, Inc.*, 737 F.3d 731, 738 (Fed. Cir. 2013) (citation omitted). In assessing whether prior art teaches away from the claimed invention, the PTAB may consider "only knowledge which was within the level of ordinary skill in the art at the time the claimed invention was made," but may not consider the claimed invention itself. *In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971). Whether a reference teaches away presents a factual question reviewed for substantial evidence. *Gartside*, 203 F.3d at 1316.

GrafTech argued that the graphite sheets disclosed in the disputed claims of the '520 patent would not meet the thermal conductivity requirement allegedly required by Inoue, such that Inoue teaches away from the claims of the '520 patent. *See GrafTech I*, 2015 WL 1385390, at *11. However, the PTAB observed that a skilled artisan would be able to select the appropriate graphite for the particular application, including the products in the Grafoil Manual that were available at the time and satis-

fy the relevant claim elements. *Id.* at *12. As a result, we disagree with GrafTech that the PTAB's analysis rested on impermissible hindsight.

Finally, as to claim 21 of the '520 patent, GrafTech argues that the "Thermagon Paper does not remedy the inoperative result of combining Inoue with the Grafoil Manual." Appellant's Br.-1796, at 4, 43 (capitalization omitted). As discussed above, GrafTech did not present this argument before the PTAB and, thus, has waived any argument that combining Inoue with the Grafoil Manual would yield an inoperable result. In any event, the PTAB did not cite the Thermagon Paper to remedy a problem that would arise in combining Inoue with the Grafoil Manual. Instead, the PTAB observed that the Thermagon Paper teaches the limitation of claim 21 of the '520 patent, *GrafTech I*, 2015 WL 1385390, at *14–15, which requires that "the contact pressure between the flexible graphite sheet and the heat source is less than 50 [pounds per square inch]." J.A.-1796, at 144 ('520 patent First Ex Parte Reexamination Certificate), col. 2 ll. 30–32 (claim 21).

C. Substantial Evidence Supports the PTAB's Findings With Respect to Secondary Considerations

A party may counter an obviousness challenge by demonstrating that, inter alia, "the commercial success of [a] product *results from* the claimed invention." *J.T. Eaton & Co. v. Atl. Paste & Glue Co.*, 106 F.3d 1563, 1571 (Fed. Cir. 1997) (emphasis added). The PTAB considered the evidence as to commercial success, among other objective indicia of non-obviousness,[5] and determined that

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[5] Notably, GrafTech does not challenge the PTAB's findings as to the other objective indicia of non-obviousness—i.e., industry praise, failure of others, and copying. *See generally* Appellant's Br.-1796. Thus, even if

none of the evidence established a nexus with the subject matter claimed in the '520 patent. *GrafTech I*, 2015 WL 1385390, at *15–19. GrafTech challenges the PTAB's conclusions as to commercial success. Appellant's Br.-1796, at 46–56.

GrafTech alleges that, in finding no nexus existed between the evidence of commercial success and the disputed claims of the '520 patent, the PTAB confused "GrafTech's arguments about the teachings of the cited [prior] art, specifically the Grafoil® Manual, with GrafTech's evidence of the commercial-successfully [graphite sheet] being employed today." Appellant's Br.-1796, at 47–48. GrafTech also asserts that it "established the required nexus between the claimed invention and the evidence of commercial success," *id.* at 51 (capitalization omitted), citing revenues for products such as the Apple iPhone and the Amazon Kindle Fire HD, *id.* at 52–54.

We agree with GrafTech that the PTAB applied an incorrect analysis in assessing commercial success. GrafTech properly notes that the PTAB compared the teachings of the prior art to evidence of commercial success, instead of comparing the requirements of the disputed claims of the '520 patent to evidence of commercial success. *See GrafTech I,* 2015 WL 1385390, at *16–18. The appropriate standard teaches that "[e]vidence of commercial success . . . is only significant if there is a nexus *between the claimed invention and the commercial success*." *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1311–12 (Fed. Cir. 2006) (emphasis added). "When a

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GrafTech demonstrated reversible error as to commercial success, that error would not disturb the substantial evidence supporting the PTAB's conclusion that the other objective indicia of non-obviousness "do[] not tip the balance in favor of [GrafTech]." *GrafTech I*, 2015 WL 1385390, at *19.

patentee can demonstrate commercial success, usually shown by significant sales in a relevant market, and that the successful product is the invention disclosed and claimed in the patent, it is presumed that the commercial success is due to the patented invention." *J.T. Eaton*, 106 F.3d at 1571 (citation omitted). The patentee bears the initial burden of demonstrating that the requisite nexus exists. *See id.* Whether the requisite nexus exists raises a factual question that we review for substantial evidence. *See Gartside*, 203 F.3d at 1316.

GrafTech failed to meet its burden of demonstrating the requisite nexus. First, GrafTech submitted the same evidence in each of the inter partes reviews to establish the commercial success of the patents-in-suit. *Compare* Appellant's Br.-1796, at 45–65, *with* Appellant's Br.-1797, at 62–80. That strategy undermines its commercial success arguments because GrafTech argues that the patents-in-suit are directed to different inventions. *See infra* Section III.A; *Ormco Corp.*, 463 F.3d at 1311–12 (explaining that a nexus must exist "between *the claimed invention* and the commercial success" (emphasis added)). Second, GrafTech does not assert that the commercial success of products like the Apple iPhone and the Amazon Kindle Fire HD *resulted from* the products covered by the '520 patent or that the products covered by the '520 patent are coextensive with the Apple iPhone and Amazon Kindle Fire HD; instead, GrafTech asserts that the Apple iPhone and Amazon Kindle Fire HD used products covered by the '520 patent *and* enjoyed commercial success. Appellant's Br.-1796, at 52–54. Evidence of the latter is insufficient to demonstrate the requisite nexus. *See, e.g.*, *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988) ("When the thing that is commercially successful is not coextensive with the patented invention . . . [,] the patentee must show *prima facie* a legally sufficient relationship between that which is patented and that which is sold." (emphasis

added)); *see also Ormco Corp.*, 463 F.3d at 1311–12 (explaining that a nexus must exist "between *the claimed invention* and the commercial success" (emphasis added)).

D. Substantial Evidence Supports the PTAB's Decision to Rely upon Mr. Bagot's Testimony

The PTAB relied upon the testimony of Mr. Bagot throughout its obviousness analysis. *See GrafTech I*, 2015 WL 1385390, at *10–15. GrafTech contends that the PTAB "erred in relying upon the testimony of Mr. Bagot and failed to act as an impartial adjudicator." Appellant's Br.-1796, at 59 (capitalization omitted).[6] "Because Mr. Bagot is not an expert in the pertinent art," GrafTech continues, the PTAB "failed to uphold its 'gatekeeping' role." *Id.* GrafTech clarifies in its reply that it contests "the *weight* to be afforded Mr. Bagot's opinions, not their admissibility." Appellant's Reply-1796, at 29 (citation omitted).

GrafTech's argument suffers from two flaws. First, GrafTech's argument asks us to reweigh the evidence, which we may not do under the substantial evidence standard of review. *See In re NTP, Inc.*, 654 F.3d 1279, 1292 (Fed. Cir. 2011) (explaining that, under the substantial evidence standard of review, "[t]his court does not reweigh evidence on appeal, but rather determines whether substantial evidence supports the [PTAB's] fact findings"); *Nutrinova Nutrition Specialties & Food Ingre-*

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[6] Laird alleges that GrafTech has waived this argument by failing to raise it below. Appellee's Br.-1796, at 43. However, Laird's argument confuses the admissibility of the testimony with the weight afforded to such testimony. The record indicates that GrafTech argued that the PTAB should afford no weight to Mr. Bagot's testimony, just as it does on appeal. *See* J.A.-1796, at 1907.

dients GmbH v. Int'l Trade Comm'n, 224 F.3d 1356, 1359 (Fed. Cir. 2000) ("Even if we might have found some of the facts differently, or even if we might have drawn some inferences from the facts differently, . . . that is not the role of an appellate court."). Second, the record does not support GrafTech's argument. During cross-examination, Mr. Bagot testified that he worked extensively with graphite and that his education in Britain is equivalent to a bachelor's degree in science engineering in the United States. J.A.-1796, at 2579–80. Mr. Bagot also testified that he possesses over five years of experience in thermal management and electronics and that he has worked with flexible graphite sheets for over five years. J.A.-1796, at 2581–82. These are the qualifications that GrafTech alleged an individual should possess to qualify as an expert. *See GrafTech I*, 2015 WL 1385390, at *5. Thus, substantial evidence supports the PTAB's decision to rely upon Mr. Bagot's testimony.

III. GrafTech Does Not Demonstrate PTAB Error as to the '874 and '441 Patents

The PTAB gives "[a] claim . . . its broadest reasonable construction in light of the specification of the patent in which it appears." 37 C.F.R. § 42.100(b) (2015).[7] A speci-

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[7] In *In re Cuozzo Speed Techs., LLC*, the Supreme Court is considering whether the PTAB "may construe claims in an issued patent according to their broadest reasonable interpretation rather than their plain and ordinary meaning." Brief for Petitioner at *II, *In re Cuozzo Speed Techs., LLC* (No. 15-446), 2016 WL 737452 (Feb. 22, 2016). Even if the Supreme Court finds that the PTAB should construe terms consistent with their plain and ordinary meaning, that holding would not change our conclusion in this case because GrafTech's proffered construction improperly would impose an extraneous limitation on the disputed claims, as discussed below.

fication "includes both the written description and the claims" of the patent in question. *In re Packard*, 751 F.3d 1307, 1320 n.11 (Fed. Cir. 2014). If a specification does not assign or suggest a particular definition to a claim term, and the PTAB relies upon evidence extrinsic to the specification to construe a claim, "[w]e review [the] underlying factual determinations concerning extrinsic evidence for substantial evidence and the ultimate construction of the claim de novo." *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1280 (Fed. Cir. 2015) (citation omitted), *cert. granted sub nom.*, *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 890 (2016).

In separate decisions, the PTAB found claims 1–20 of the '874 patent and claims 1–16 of the '441 patent would have been obvious over various prior art references. *GrafTech II*, 2015 WL 1385391, at *2 (addressing the '874 patent); *GrafTech III*, 2015 WL 1385392, at *2 (addressing the '441 patent). Before making its obviousness determinations, the PTAB construed "thermal shielding" in independent claims 1 and 11 of the '874 patent and independent claim 1 of the '441 patent to mean "a structure that protects against heat." *GrafTech II*, 2015 WL 1385391, at *10 (addressing the '874 patent); *GrafTech III*, 2015 WL 1385392, at *10 (addressing the '441 patent) (explaining that "thermal shielding" means "protection against heat"). Because the specification does not define "shield," the PTAB relied upon a dictionary definition to construe "thermal shielding." *GrafTech II*, 2015 WL 1385391, at *10 (addressing the '874 patent); *GrafTech III*, 2015 WL 1385392, at *10 (addressing the '441 patent).

GrafTech challenges the PTAB's construction of "thermal shielding" in the '874 and '441 patents. Appellant's Br.-1797, at 39–48. Because of that allegedly erroneous construction, GrafTech avers, the PTAB's obviousness determinations are necessarily defective. *Id.* at 49 (The "erroneous construction of 'thermal shield' *caused* the [PTAB] to conclude that the challenged claims

[would have been] obvious." (emphasis added) (capitalization omitted)). We address each argument in turn.

A. The '874 and '441 Patents

The '874 and '441 patents relate generally to a "thermal solution for an electronic device, which is positioned between a heat source and an external surface of the electronic device and/or another component of the electronic device."[8] '874 patent, Abstract; '441 patent, Abstract (explaining that the invention relates to a "thermal solution for a *portable* electronic device [(i.e., a cell phone)], which is positioned between a heat source and another component of the electronic device" (emphasis added)). The inventions covered by the '874 and '441 patents "facilitate[] heat dissipation from the heat source while shielding the external surface and/or second component from the heat generated by the heat source." '874 patent, Abstract; '441 patent, Abstract (explaining that the invention "facilitates heat dissipation from the heat source while shielding the second component from the heat generated by the heat source").

Independent claims 1 and 11 are representative of the '874 patent. Independent claim 1 recites:

> A *thermal* dissipation and *shielding* system for an electronic device, comprising:

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[8] The patent application that matured into the '441 patent was originally filed as a continuation-in-part of the application that resulted in the '874 patent. "[A] continuation-in-part application contain[s] a portion or all of the disclosure of an earlier application together with added matter not present in that earlier application." *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1304 n.3 (Fed. Cir. 2008) (citation omitted).

> an electronic device comprising a first component which comprises a heat source, wherein the first component transmits heat to an external surface of the electronic device;
>
> a thermal solution comprising two major surfaces, the thermal solution positioned such that one of its major surfaces is in operative contact with the first component such that it is interposed between the first component and the external surface of the electronic device,
>
> wherein the thermal solution comprises at least one sheet of compressed particles of exfoliated graphite which *thermally shields* the external surface of the electronic device from heat generated by the first component.

'874 patent col. 16 ll. 32–46 (emphases added). Independent claim 11 is similar to claim 1, but also requires a "second component," and further requires the graphite sheet disclosed in claim 1 to be interposed between the first and second components. *Id.* col. 17 ll. 9–21; *see also* J.A.-1797, at 189 (Certificate of Correction addressing Claim 11). Independent claim 1 is representative of the '441 patent and recites:

> A *thermal* dissipation and *shielding* system for a cell phone, comprising:
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> a cell phone comprising a first component which comprises a heat source and a second component to which the first component transmits heat;
>
> a thermal solution interposed between the first component and the second component,
>
> wherein the thermal solution comprises at least one sheet of compressed particles of exfoliated graphite which *thermally shields* the second com-

> ponent from heat generated by the first component.

'441 patent col. 16 l. 63–col. 17 l. 6 (emphases added).

B. The PTAB Properly Construed "Thermal Shielding" in the '874 and '441 Patents

GrafTech contests the PTAB construction of "thermal shielding." As an initial matter, GrafTech raises several arguments in its opening brief that it did not present to the PTAB. *See* Appellant's Br.-1797, at 39–48. "[W]e have often barred parties from changing the scope of their claim construction position on appeal" because, when an appellant fails to make an argument to the PTAB, "we do not have the benefit of the [PTAB's] informed judgment on this issue for our review." *In re Watts*, 354 F.3d 1362, 1368 & n.3 (Fed. Cir. 2004) (citations omitted). Before the PTAB, GrafTech limited its argument on the construction of "thermal shielding" as follows:

> The [PTAB] utilizes a general dictionary definition to define "shield" as "to cover and protect," and to, in turn, define "thermally shields" or "thermal shielding" as "any structure that protects against heat." Though this definition is not entirely inaccurate, GrafTech submits that this definition is somewhat incomplete as it fails to take into account the description of thermal shielding from the specification and the accepted definition of a thermal shield within the art. The disclosure of the '874 [p]atent demonstrates that thermal shielding is protection of a portion of the device *other than the heat source itself* from the heat generated by a heat source.
>
> Thus, GrafTech submits that the broadest reasonable interpretation of ["]thermally shields" or "thermal shielding" as used in the '874 [p]atent is

> protection of a region other than the heat source itself from heat generated by the heat source.

J.A.-1797, at 1160–61 (citations omitted); *see also* J.A.-1797, at 5314–15 (where GrafTech presents nearly identical arguments as to the construction of "thermal shielding" in the '441 patent). As a result, our analysis focuses on the limited question of whether the PTAB erred by not including the clause "other than the heat source itself" when it construed "thermal shielding" to mean "a structure that protects against heat." *See* Appellant's Br.-1797, at 40, 48 (where GrafTech presents the argument that was raised before the PTAB).

The PTAB's construction of "thermal shielding" in claims 1 and 11 of the '874 patent and claim 1 of the '441 patent does not suffer from error because adopting GrafTech's proffered construction would introduce an extraneous limitation into the claims' terms. "If we need not rely on a [proffered] limitation to interpret what the patentee meant by a particular term or phrase in a claim, that limitation is 'extraneous' and cannot constrain the claim." *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1249 (Fed. Cir. 1998) (citations omitted). The challenged claims already explicitly require a graphite sheet to shield a component other than the heat source itself from the heat generated by that source. Specifically, claim 1 of the '874 patent requires a graphite sheet to "shield[] the external surface of the electronic device from the heat generated by the first component," thus protecting a portion of the device (external surface) that is not the heat source (first component). '874 patent col. 16 ll. 45–46. Claim 11 of the '874 patent similarly requires a graphite sheet to "shield[] [a second component] of the electronic device from heat generated by the first com[p]onent," thus protecting a portion of the device (second component) that is not the heat source (first component). *Id.* col. 17 ll. 20–21. And claim 1 of the '441 patent requires a graphite sheet to "shield[] the second

component from heat generated by the first component." '441 patent col. 17 ll. 5–6. Thus, we find no error in the PTAB's construction of the challenged claims.

C. The Court Need Not Address the PTAB's Obviousness Determinations as to the '874 and '441 Patents

GrafTech alleges that the "erroneous construction of 'thermal shield' [in the '874 and '441 patents] *caused* the [PTAB] to conclude that the challenged claims [would have been] obvious." Appellant's Br.-1797, at 49 (capitalization omitted) (emphasis added). Because we conclude that the PTAB did not err in its construction of "thermal shield," we need not address GrafTech's conditional arguments as to the PTAB's obviousness determinations.[9]

CONCLUSION

We have considered GrafTech's remaining arguments and find them unpersuasive. Accordingly, the Final Written Decisions of the United States Patent and Trademark Office's Patent Trial and Appeal Board are

AFFIRMED

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[9] GrafTech challenges the PTAB's analysis of commercial success and the weight that the PTAB afforded to Mr. Bagot's testimony in finding the disputed claims of the '874 and '441 patents invalid as obvious. It raises arguments nearly identical to those that it raised in its challenge to the PTAB's obviousness determination as to the '520 patent. *Compare* Appellant's Br.-1796, at 45–65, *with* Appellant's Br.-1797, at 62–80. We reject them for the same reasons that we reject GrafTech's appeal as to the '520 patent.