

NOTE: This disposition is nonprecedential.

# United States Court of Appeals for the Federal Circuit

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**IN RE RAJEN M. PATEL, GERT CLAASEN,  
WENBIN LIANG, KARIN KATZER, KENNETH B.  
STEWART, THOMAS ALLGEUER,  
AND JESUS NIETO**

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2013-1301

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Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Serial No. 11/578,646.

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Decided: July 16, 2014

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JAMES T. HOPPE, The Dow Chemical Company, Intellectual Property Law, of Freeport, Texas, argued for appellants. With him on the brief was RAY ASHBURG.

COKE MORGAN STEWART, Associate Solicitor, Office of the Solicitor, United States Patent and Trademark Office, of Alexandria, Virginia, argued for appellee. With her on the brief were NATHAN K. KELLEY, Solicitor, and JAMIE L. SIMPSON, Associate Solicitor.

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Before O'MALLEY and HUGHES, *Circuit Judges*.\*

O'MALLEY, *Circuit Judge*.

Applicants appeal from a Patent Trial and Appeal Board ("PTAB") decision affirming the patent examiner's rejection of claims 1–8, 30–38, 40–46, 49, and 50 of Patent Application No. 11/578,646 as obvious under 35 U.S.C. § 103. Because the PTAB erred in finding that the examiner established a prima facie case of obviousness for independent claims 1 and 36, we *vacate-in-part* and *remand* the PTAB's decision regarding those claims and their dependent claims 2–8, 30–35, 38, 40–43, 45, 46, 49, and 50. We also *affirm-in-part* the PTAB's decision affirming the examiner's obviousness rejection for claims 37 and 44.

#### BACKGROUND

On October 13, 2006, Appellants filed Patent Application No. 11/578,646 relating to nonwoven material comprised of monocomponent fibers, bicomponent fibers, or mixtures thereof. The claims at issue are directed to a nonwoven fabric made from the combination of two different components.

Representative independent claim 1<sup>1</sup> states:

1. A nonwoven material comprised of fibers having a surface comprising a polyethylene blend, said fibers being selected from the group consist-

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\* Randall R. Rader, who retired from the position of Circuit Judge on June 30, 2014, did not participate in this decision.

<sup>1</sup> Independent claim 37 contains very similar limitations except that it requires the first polymer to comprise 10 to 80 weight percent and a density from 0.921 to 0.950 g/cm<sup>3</sup>. J.A. 94.

ing of monocomponent fibers, bicomponent fibers or mixtures thereof, said nonwoven material having a fuzz/abrasion less than or equal to  $0.0214(\text{BW}) + 0.2714 \text{ mg/cm}^2$  when the material comprises monocomponent fibers and said nonwoven material having a fuzz/abrasion less than or equal to  $0.0071(\text{BW}) + 0.4071 \text{ mg/cm}^2$  when the material consists of bicomponent fibers, wherein the fibers are from 0.1 to 50 denier and wherein the polymer blend comprises:

a. *from 26 weight percent to 80 weight percent (by weight of the polymer blend) of a first polymer which is a homogeneous ethylene/ $\alpha$ -olefin interpolymer having:*

- i. a melt index of from about 1 to about 1000 grams/10 minutes, and
- ii. *a density of from 0.915 to 0.950 grams/centimeter<sup>3</sup>, and*

b. from 74 to 20 percent by weight of a second polymer which is an ethylene homopolymer or an ethylene/ $\alpha$ -olefin interpolymer having:

- i. a melt index of from about 1 to about 1000 grams/10 minutes, and
- ii. a density which is at least 0.01 grams/centimeter<sup>3</sup> greater than the density of the first polymer

wherein the overall melt index of the polymer blend is greater than 18 grams/10 min.

J.A. 66 (emphases added). The only limitations at issue on appeal are the weight percentage and the density range of the first polymer emphasized above.

On March 19, 2010, the examiner issued a Final Office Action rejecting claims 1–8, 30–38, 40–46, and 50

under 35 U.S.C. § 103(a) over U.S. Patent No. 6,015,617 (“Maugans”) and claim 49 under 35 U.S.C. § 103(a) over Maugans in view of U.S. Publication No. 2003/0003830 A1 (“Ouederni”).<sup>2</sup> In rejecting the claims, the examiner found that the density ranges disclosed in Maugans overlapped with the claimed range, and that the “Applicant has also not shown unexpected results between a density of .920 and .921 (as set forth in claim 37).” Joint Appendix (“J.A.”) 85. The rejection also incorporated previous arguments from a July 22, 2009 Office Action, which found several of Appellants’ arguments unpersuasive, including Appellants’ assertion that their comparative data evidences improved abrasion results when using a higher density of 0.915 g/cm<sup>3</sup>. Addressing the weight percentage issue, independent claims 1 and 36 listed a range of 26 to 80 weight percent of the first polymer. While Maugans discloses a range of 0.5 to 25 weight percent, the examiner “maintain[ed] that a patently distinguishable difference between 25 and 26 weight percent does not exist. As such, it is the position of the Examiner that . . . it would be obvious to one having ordinary skill in the art to vary the amount of the first and second polymer in the blend to achieve a desirable balance of properties.” J.A. 85. Appellants appealed the rejection to the PTAB.

On September 28, 2012, the PTAB filed its Decision on Appeal affirming the examiner’s § 103 rejections of claims 1–8, 30–38, 40–46, 49, and 50.<sup>3</sup> J.A. 4. The PTAB

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<sup>2</sup> The examiner also indicated that claims 39, 47, and 48 would be allowable if rewritten in independent form.

<sup>3</sup> The PTAB explained that Appellants did not argue the dependent claims separately, so it addressed only independent claims 1, 36, and 37. Independent claim 1 is representative of the independent claims.

agreed with the examiner that Maugans discloses the first polymer with “a density anywhere from 0.850 to 0.950 g/cm<sup>3</sup>.” J.A. 4–5. The PTAB also found that “Appellants have not adequately explained why the alleged improvement shown therein is considered significant and unexpected relative to the closest prior art, Maugans.” J.A. 6. Specifically, the PTAB explained that Appellants failed to show: (1) “why the evidence relied upon is reasonably commensurate in the scope with the claims” and (2) “why this limited evidence is representative of the scope of protection sought by the claimed invention covering various compositions having densities outside of that specified in the Example.” J.A. 6. Regarding weight percentage, the PTAB affirmed the examiner’s prima facie case of obviousness stating that “[s]ince 25 wt. % and 26 wt. % are so close in value, a person of ordinary skill in the art would have reasonably expected a blend comprising either 25 wt. % or 26 wt. % of the homogeneously branched component to have the same or similar properties.” J.A. 6.

On November 27, 2012, Appellants filed a Request for Rehearing. On December 24, 2012, the PTAB filed its Decision on Request for Rehearing declining to change its decision affirming the examiner’s § 103 rejections.

Appellants timely appealed. This court has jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

#### DISCUSSION

Whether an invention is obvious under 35 U.S.C. § 103 is a legal conclusion based on underlying findings of fact. *In re Dembiczak*, 175 F.3d 994, 998 (Fed. Cir. 1999). We review the ultimate determination of obviousness de novo, and the PTAB’s underlying factual findings for substantial evidence. *In re Peterson*, 315 F.3d 1325, 1328 (Fed. Cir. 2003).

During prosecution, the United States Patent and Trademark Office (“PTO”) bears the initial burden of establishing a prima facie case of obviousness. *In re Kumar*, 418 F.3d 1361, 1366 (Fed. Cir. 2005) (citing *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992)). If the PTO fails to meet this burden, the applicant is entitled to a patent. *In re Glaug*, 283 F.3d 1335, 1338 (Fed. Cir. 2002). If the examiner produces sufficient evidence to support a prima facie case, however, the burden shifts to the applicant to produce evidence or argument in rebuttal. *In re Kumar*, 418 F.3d at 1366 (citing *In re Piasecki*, 745 F.2d 1468, 1475 (Fed. Cir. 1984)). When rebuttal evidence or argument is provided, obviousness is then determined on the entirety of the evidence. *In re Kumar*, 418 F.3d at 1366 (citing *Oetiker*, 977 F.2d at 1445).

#### A. Weight Percentage

Appellants argue that the PTAB erred in sustaining the examiner’s rejection for claims 1–8, 30–36, and 42<sup>4</sup> because the examiner failed to establish a prima facie case of obviousness with respect to the weight percent amount of the first polymer. Specifically, they assert that, although the claims require a blend comprising from 26 to 80 weight percent of the blend of a first polymer, Maugans only discloses a first polymer with a blend from 0.5 to 25 weight percent. Appellants allege that, because the prior art reference “recites a range which does not overlap, nor abuts with the claimed range,” it is not

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<sup>4</sup> Appellants do not argue that the examiner failed to present a prima facie case of obviousness regarding weight percentage for claims 37, 38, 40, 41, 43–46, 49, and 50. See Appellants’ Br. 13. Unlike independent claim 1, independent claim 37 requires 10 to 80 weight percent of the first polymer, which overlaps with the 0.5 to 25 weight percent disclosed in Maugans. Compare J.A. 94, with J.A. 182.

proper support for a prima facie showing of obviousness with respect to that range. Appellants' Br. 8. Appellee responds that the examiner correctly rejected the claims, as one of ordinary skill in the art would have found the weight percent obvious because the end points of the ranges are so close to each other.

The key issue is whether the Maugans reference, disclosing a range of 0.5 to 25 weight percent, can establish a prima facie case of obviousness over the claimed range of 26 to 80 weight percent of the first polymer. We agree with Appellants that the examiner failed to establish a prima facie case of obviousness because the ranges do not overlap and the prior art does not teach that a broader range would be appropriate.

In rejecting the claimed weight percent as prima facie obvious, the PTAB stated that, "[s]ince 25 wt. % and 26 wt. % are so close in value, a person of ordinary skill in the art would have reasonably expected a blend comprising either 25 wt. % or 26 wt. % of the homogeneously branched component to have the same or similar properties." J.A. 6. In support of this proposition, the PTAB relied on three cases: (1) *In re Woodruff*, 919 F.2d 1575 (Fed. Cir. 1990), (2) *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775 (Fed. Cir. 1985), and (3) *In re Peterson*, 315 F.3d 1325 (Fed. Cir. 2003). See J.A. 6–7. Each of these cases is distinguishable from the circumstances here. In *In re Woodruff*, this court affirmed an obviousness rejection by the Board of Patent Appeals and Interferences ("BPAI") for a process for inhibiting the growth of fungi. 919 F.2d at 1575. The process discussed maintaining a modified gaseous atmosphere at specific percentages by volume. *Id.* at 1575–76. While the majority of the ranges were clearly found in the prior art, the prior art reference disclosed "about 1-5%" carbon monoxide whereas the claim limitation required ">5-25%" carbon monoxide. *Id.* at 1576. The court found that the prior art range and the claimed range overlapped because the statement

“*about* 1-5% does allow for concentrations slightly above 5%,” which established a prima facie case of obviousness. *Id.* at 1577 (emphasis added). Consequently, the court in *In re Woodruff* only addressed a prima facie case of obviousness for ranges that overlap. *In re Woodruff* says nothing about a situation where no overlap in ranges exists.

In *Titanium Metals*, claim 3 disclosed an alloy having 0.3% Molybdenum (“Mo”) and 0.8% Nickel (“Ni”). The court found that claim obvious over prior art which disclosed two alloys having the following characteristics: (1) 0.25% Mo with 0.75% Ni, and (2) 0.31% Mo with 0.94% Ni. *Titanium Metals*, 778 F.2d at 782–83. While it is true that, in finding the claim obvious, the court stated that “[t]he proportions are so close that prima facie one skilled in the art would have expected them to have the same properties,” *id.* at 783, the facts of the case put that comment in context. The claims and prior art in *Titanium Metals* disclosed single points, not ranges, and the claimed amount fell within the two single amounts disclosed by the prior art. In other words, the prior art establishes two measures—which were themselves not far apart—and the claim simply adopted a measure between those end points. *Titanium Metals* is thus a case much like the range cases where the claimed amount falls directly within the established prior art range. Here, unlike in *Titanium Metals*, the claimed range unquestionably falls outside the range disclosed by the prior art.

In *In re Peterson*, the Court affirmed the finding of obviousness regarding the composition of a nickel-based single-crystal superalloy. 315 F.3d at 1327. The prior art disclosed ranges that either fully or at least partially overlapped with the claimed ranges. It is well-established that a prima facie case of obviousness exists when the claimed and prior art ranges overlap. *See id.* at 1329. While the court in *In re Peterson* cited the proposition from *Titanium Metals* that “a prima facie case of obvious-



ness exists when the claimed range and the prior art range do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties,” *id.* at 1329 (citing *Titanium Metals*, 778 F.2d at 783) (emphasis omitted), that statement was dicta; all of the ranges in *In re Peterson* overlapped at least to some degree.

While a rejection based on ranges approaching each other might well be appropriate where there is a teaching in the prior art that the end points of the prior art range are approximate, or can be flexibly applied, the PTAB cites to no such evidence. And, Appellees are not able to cite to any evidence of such a teaching before us. Indeed, if anything, Maugans emphasizes limiting the amount of the first polymer, as increasing such amount negatively affects the spinnability and fabric strength. *See* Maugans at col. 12 ll. 47–58 (“fabrics prepared from fibers of the invention will exhibit a fabric strength which is at least 5 percent, more preferably at least 10 percent, and most preferably at least 20 percent of fabric prepared from fiber prepared from unmodified second polymer” and “fibers of the invention will exhibit a spinnability (maximum draw rpms) which is no more than 25 percent less than, more preferably no more than 15 percent less than the spinnability (maximum draw rpms) of fiber prepared from unmodified second polymer.”).

Depending on the technology, even small differences in formulations can be meaningful. Where differences clearly exist and there is no evidence that they are either not meaningful or one of skill in the art would know to discard the limits set by the prior art, proximity alone is not enough to establish a prima facie case of obviousness.

We find that the PTAB erred in finding that the examiner established a prima facie case of obviousness *solely* because the claimed range and the prior art range approach one another. Consequently, we need not ad-

dress whether the Maugans reference affirmatively teaches away from the claimed invention.

### B. Density

Appellants concede that the examiner established a prima facie case of obviousness regarding density as the claimed range of 0.915–0.950 g/cm<sup>3</sup> falls within the prior art range of 0.855–0.950 g/cm<sup>3</sup>.<sup>5</sup> Appellants' Br. 19. As a result, the primary point of contention is whether Appellants provided sufficient evidence of unexpected results to support a finding of non-obviousness over the prior art. We find that substantial evidence supports the PTAB's finding that Appellants failed to satisfy their burden to show unexpected results for the claimed range.

Whether an invention has produced unexpected results is a question of fact reviewed for substantial evidence. *In re Peterson*, 315 F.3d at 1328. "When an applicant seeks to overcome a prima facie case of obviousness by showing improved performance in a range that is within or overlaps with a range disclosed in the prior art, the applicant must 'show that the [claimed] range is *critical*, generally by showing that the claimed range achieves unexpected results relative to the prior art range." *In re Geisler*, 116 F.3d 1465, 1469–70 (Fed. Cir. 1997) (quoting *In re Woodruff*, 919 F.2d at 1578). Evidence of unexpected results must be commensurate with the scope of the rejected claims. *See In re Peterson*, 315 F.3d at 1329 ("the applicant's showing must be commensurate in scope with the claimed range"); *In re Clemens*, 622 F.2d 1029, 1035 (CCPA 1980) ("In order to establish unexpected results for a claimed invention, objective evidence of non-obviousness must be commensurate in

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<sup>5</sup> Independent claim 37 requires a density of 0.921 to 0.950 g/cm<sup>3</sup>, which also falls within the prior art range. *See* J.A. 94.

scope with the claims which the evidence is offered to support.”).

In support of its assertions of unexpected results, Appellants point to Examples 11 and 17 in the application. Example 17 uses Resin C, which has a density of 0.913 g/cm<sup>3</sup>. Example 11 uses Resin E, which has a density of 0.915 g/cm<sup>3</sup>. Example 17 also differs from Example 11 in that it contains 5 percent more of the first polymer. Appellants address this difference by stating that “[the first polymer] component would be expected to benefit abrasion performance . . . , so all things being equal, the additional 5% of the homogeneously branched component should improve abrasion performance.” Appellants’ Br. 20. They then allege that, “[d]espite this disadvantage, Example 11 shows a 0.076 mg (>15%) improvement in the Abrasion performance over Comparative Example 17.” Appellants’ Br. 20.

Despite these explanations, the PTAB found that “Appellants have not adequately explained why the alleged improvement shown therein is considered significant and unexpected relative to the closest prior art, Maugans.” J.A. 6. We agree, and find that Appellants’ reliance on the 15 percent improvement in the abrasion performance does not reach the level of unexpected results to overcome the finding of obviousness, even with the alleged disadvantage. *See In re Geisler*, 116 F.3d at 1470–71 (finding a 26 percent improvement in wear resistance insufficient to constitute proof of “substantially improved results”); *In re Soni*, 54 F.3d 746, 751 (Fed. Cir. 1995) (finding “substantially improved results” to overcome obviousness when the 50-fold improvement in tensile strength was much greater than would have been predicted). Furthermore, whether an applicant has shown unexpected results is a question of fact on which we defer to the PTAB. Therefore, we conclude that substantial evidence supports the PTAB’s finding that Appellants failed to show unexpected results.

Even if the single point of 0.915 g/cm<sup>3</sup> exhibited unexpected results, Appellants did not disclose sufficient evidence of unexpected results over the *entire* claimed range. See *In re Peterson*, 315 F.3d at 1330; *In re Geisler*, 116 F.3d at 1469–70. As such, Appellants cannot rely on a single point within a large range to prove unexpected results for the entire range.<sup>6</sup> Based on the differences between the examples for 0.913 and 0.915 g/cm<sup>3</sup>, Appellants assert that higher densities “would be *expected* to lead to an even more pronounced advantage with regards to abrasion resistance properties.” Appellants’ Br. 20 (emphasis added). While Appellants allege that the advantages at the higher densities would be *expected* to be more pronounced, Appellants did not establish unexpected results through factual evidence for the entire claimed range. See *In re Geisler*, 116 F.3d at 1470 (requiring unexpected results for the claimed range to be established by factual evidence). Appellants’ conclusory statement is insufficient without further supporting factual evidence.

Finally, Appellants assert that they did not need to show unexpected results for the entire range. We disagree. Appellants do not seek to claim only a single point that happens to fall in a prior art range; they claim a range. This court has stated that, for an applicant to overcome a prima facie case of obviousness through unexpected results in a range that overlaps with a range disclosed in the prior art, the applicant must “show that the [claimed] range is *critical*, generally by showing that the claimed range achieves unexpected results relative to the prior art range.” *In re Woodruff*, 919 F.2d at 1578; see

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<sup>6</sup> Appellants did not provide even a single point exhibiting unexpected results for the range listed in independent claim 37, which requires a density of 0.921 to 0.950 g/cm<sup>3</sup>. See J.A. 94.

also *In re Geisler*, 116 F.3d at 1469–70. In a prima facie case of obviousness, the burden shifts to the applicant to overcome the examiner’s initial rejection. See *In re Kumar*, 418 F.3d at 1366. If Appellants want to claim a range, they need to show unexpected results for the entire claimed range, here of 0.915 g/cm<sup>3</sup> to 0.950 g/cm<sup>3</sup>, to overcome the prima facie case of obviousness established by the examiner. Therefore, substantial evidence supports the PTAB’s finding that Appellants failed to provide sufficient evidence of unexpected results to overcome the obviousness rejection.

#### CONCLUSION

For the abovementioned reasons, we affirm-in-part the PTAB’s decision affirming the examiner’s obviousness rejection for claims 37 and 44. We also find that, in the absence of a prima facie case of obviousness regarding the weight percent amount, the PTAB erred in affirming the examiner’s rejection under 35 U.S.C. § 103 for independent claims 1 and 36. Consequently, we vacate-in-part the PTAB’s decision for claims 1–8, 30–36, 38, 40–43, 45, 46, 49, and 50, and remand for further proceedings.

**AFFIRMED-IN-PART, VACATED-IN-PART, AND  
REMANDED**