

NOTE: This disposition is nonprecedential.

**United States Court of Appeals
for the Federal Circuit**

**KNAUF INSULATION, INC., KNAUF INSULATION
SPRL,**
Appellants

v.

ROCKWOOL INTERNATIONAL A/S,
Cross-Appellant

2018-1810, 2018-1811, 2018-1891

Appeals from the United States Patent and Trademark
Office, Patent Trial and Appeal Board in Nos. 95/000,672,
95/000,675.

Decided: October 15, 2019

JOSHUA PAUL LARSEN, Barnes & Thornburg LLP, Indi-
anapolis, IN, argued for appellants.

DAVID CLAY HOLLOWAY, Kilpatrick Townsend & Stock-
ton LLP, Atlanta, GA, argued for cross-appellant. Also rep-
resented by COURTNEY DABBIERE, DEAN W. RUSSELL,
TIFFANY L. WILLIAMS.

Before DYK, LINN, and TARANTO, *Circuit Judges*.

LINN, *Circuit Judge*

In this inter partes reexamination (“reexamination”) the Patent Trial and Appeal Board (“Board”) held that claims 16–22 of Knauf’s U.S. Pat. No. 7,888,445 and claims 29–32 of Knauf’s U.S. Pat. No. 7,772,347 (collectively, “appealed claims”) were obvious, and that claims 1–15 of the ’445 patent and claims 1, 2, 4, 5, 7–12, 14–18, and 22–28 of the ’347 patent (collectively, “cross-appealed claims”) are not unpatentable as obvious. *Rockwool Int’l A/S v. Knauf Insulation LLC*, App. No. 2015-001313 (P.T.A.B. May 1, 2015) (“’445 Board Op. I”); *Rockwool Int’l A/S v. Knauf Insulation LLC*, App. No. 2015-004826 (P.T.A.B. Sept. 8, 2017) (“’445 Board Op. II”); *Rockwool Int’l A/S v. Knauf Insulation LLC*, App. No. 2015-004826 (P.T.A.B. Feb. 12, 2018) (“’445 Reh’g Op.”); *Rockwool Int’l A/S v. Knauf Insulation LLC*, App. No. 2015-001256 (P.T.A.B. May 1, 2015) (“’347 Board Op. I”); *Rockwool Int’l A/S v. Knauf Insulation LLC*, App. No. 2015-004910 (P.T.A.B. Sept. 8, 2017) (“’347 Board Op. II”); *Rockwool Int’l A/S v. Knauf Insulation LLC*, App. No. 2015-004910 (P.T.A.B. Feb. 12, 2018) (“’347 Reh’g Op.”).

On direct appeal, Knauf contests the Board’s conclusion of obviousness of the appealed claims. Because substantial evidence does not support the combination of references relied on by the Board solely based on the similarity of their disclosed reactions, we vacate the Board’s determination that the appealed claims were obvious and remand for further consideration. On cross-appeal, Rockwool contests the Board’s conclusions of non-obviousness of the cross-appealed claims. Because Rockwool lacks standing to assert a cross-appeal, we dismiss the cross-appeal.

I

A

Turning first to the direct appeal. The Board held that the appealed claims were obvious, inter alia, because an ordinary artisan would have combined the Wallace (U.S. Pat. No. 2,215,825), Worthington (U.S. Pat. No. 3,513,001), and Helbing (U.S. Pat. Pub. No. 2005/020224) references because of the similarity of their disclosed chemical reactions. *'445 Board Op. I* at 28–32.

None of the three references explicitly teach that the disclosed reactions are Maillard reaction or disclose that the result of the reactions are melanoidin products. Moreover, Knauf contends that Worthington and Wallace do not inherently teach a Maillard reaction because Worthington does not teach all the necessary components in a solution, *Knauf Br.* at 39, and both Wallace and Worthington indicate that the reactions occurring are between different reactants than the Maillard reaction. We conclude that the Board's determination that Worthington and Wallace inherently teach Maillard reactions is supported by substantial evidence. As the '445 patent explains, the essentials for a Maillard reaction are an amine component and a reducing sugar (or a non-sugar carbonyl reactant), *see* '445 patent, Fig. 1; *id.* at col. 2, ll. 42–44; *id.* at col. 2, ll. 60–64; *id.* at col. 10, ll. 32–43, both of which are indisputably taught in Wallace and Worthington. As the Board correctly noted, “the presence of all reactants recited in the claims and in substantial amounts [make it] reasonable to conclude that the Maillard reaction took place” in Wallace and Worthington. *'445 Board Op. II* at 18.

As the Board noted, however, Wallace and Worthington do not teach the use of their reactions as binders for “mineral fibers and/or glass fibers,” a “silicon-containing

coupling agent,”¹ or “an initially alkaline [] solution,” as required by the claims, and for which the Board relied on Helbing. Knauf does not contest that Helbing teaches a binding for fiberglass, using a silicon-containing coupling agent, in an initially alkaline solution, and teaches that one of the reactants can be an ammonium salt of a polycarboxylic acid. The Board reasoned that selecting “a reducing sugar as a polyhydroxy component would have been suggested by Worthington and Wallace which have similar reactants to Helbing (i.e. polycarboxylic acid and ammonia.)” *'445 Board Op. I* at 27. *See also id.* at 31 (“Each of Worthington and Wallace describe using a carbohydrate in a reaction similar to the reaction of Helbing. Consequently, it would have been obvious [to have] utilized a carbohydrate in Helbing as an exemplification of a polyhydroxy compound.”). We conclude that a finding of a motivation to combine based on similarity of the references in this case is unsupported by substantial evidence.

Helbing only explicitly teaches reactions in which a polyhydroxy component interacts with a polyacid component to form a polyester resin. *Helbing*, Abstract; *id.* at ¶ 11 (“Thus, a polyacid component has been found to be capable of reacting with a polyhydroxy component, under alkaline, aqueous conditions in the absence of a catalyst, to form a polyester resin.”); *id.* at ¶ 17 (“In one aspect, the polyacid component is sufficiently nonvolatile to maximize its ability to remain available for reaction with the polyhydroxy component. The polyacid component may be substituted with other chemical functional groups. It is appreciated that other functional groups are selected to minimize their interference with the preparation or formation of the polyester resin.”); *id.* at ¶ 19 (“In one aspect, the polyhydroxy component is sufficiently nonvolatile to maximize its

¹ The “silicon-containing coupling agent” limitation is not included in claims 29–32 of the '347 patent.

ability to remain available for reaction with the polyacid component.”). The only guidance provided in Helbing for selecting the polyhydroxy component is that it retain its ability to react with the polyacid component; Helbing does not teach any reaction between the polyhydroxy and an amine, much less between a carbonyl containing component and an amine, as required for the Maillard reaction. Rather, Helbing teaches the use of ammonia only as a carrier for the polyacid, to neutralize the polyacid component, or to act as a catalyst; Helbing does not indicate that the ammonia itself is important as a reactant. *See id.* at ¶ 8, 20, 27.

In other words, Helbing teaches a reaction with the general form:

Polyhydroxy + Polyacid → Polyester Resin

[under certain conditions, including in the presence of ammonia]

The Maillard reaction, as described in the '445 and '347 patents and as held to be inherently disclosed in Wallace and Worthington, is:

Reducing Sugar (or other carbonyl containing component) + Ammonia → Melanoidins

The Maillard reaction in the '445 and '347 patents also includes a polyacid component, but that acts primarily as a carrier for the ammonia, rather than as a discrete reactant. *See* '445 patent, col. 2, ll. 42-59 (describing basics of the Maillard reaction and noting an option to use the ammonium salt of a polycarboxylic acid); *id.*, col. 10, ll. 32-43 (describing Maillard reactions, and noting that “the carbohydrate reactant and the amine reactant are the melanoidin reactants for a Maillard reaction”). The reactions taught in Worthington and Wallace similarly emphasize the importance of the amine in creating the binding. *See Worthington* at col. 2, ll. 47-61; *Wallace* at col. 1, ll. 42-49.

These reactions are not similar enough to constitute the sole reason to combine a mosaic of disclosures from each reference to reach the claimed invention. The fact that both Wallace/Worthington and Helbing teach a reaction with ammonia and a polycarboxylic acid in some form on the left side of the reaction equation does not alone suggest to an ordinary artisan that the various *other* components in the reactions would be interchangeable. The Board engaged in no analysis of the functional role played by each component in the reactions. Nor did the Board find any suggestion that a reducing sugar could or should take the place of the polyhydroxy in Helbing's reaction. Replacing Helbing's polyhydroxy component with a reducing sugar to engage a Maillard reaction would fundamentally change the nature of the reaction taught in Helbing. The key reaction in such a combination would no longer be the polyhydroxy compound interacting with the polyacid compound to create a polyester resin—it would be the reducing sugar interacting with the ammonia. The ammonia taught in Helbing as a catalyst or carrier for the polyacid would thus become a key reactant—there is no reason that an ordinary artisan would make such a fundamental change based on “similarity.”

The references only appear similar if a reducing sugar is first selected as the polyhydroxy component in Helbing. But the similarity between Helbing and Worthington/Wallace cannot itself lead an ordinary artisan to see the similarity. This is classic hindsight bias in light of the claimed invention. *See W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1552–53 (Fed. Cir. 1983) (exclaiming that that using the claims “as a frame,” and taking the “naked parts of separate prior art references [] as a mosaic to recreate a facsimile of the claimed invention” without a finding of why ordinary artisans would have found that mosaic obvious, improperly employs hindsight bias). Helbing critically lacks any disclosure of using a reducing sugar as the disclosed “polyhydroxy component.” As noted above, the

reason for the polyhydroxy component in Helbing was *not* as a reducing agent, but to dedicate the hydroxy group as a reactant with polyvinyl alcohol—a reaction that indisputably does not lead to a Maillard reaction nor melanoidin products. Indeed, the Board relied on the hydroxy as the reactive group in Helbing in support of the similarity of the references. '445 *Board Op. II* at 16 (explaining that Helbing's characterization of the reactant as a "polyhydroxy" compound implied that the reactive group was the hydroxy group, "providing evidence that the same chemical reactions in Worthington and Wallace using the hydroxy group of a reducing sugar would take place in Helbing because the remaining reactants are the same."). But this reasoning is inconsistent with the Board's finding that the reaction in Helbing is similar to the Maillard reaction taught in Wallace/Worthington. The Maillard reaction reactive group is *not* the hydroxy group, but the carbonyl group (i.e. a ketone or aldehyde). '445 patent, col. 9, ll. 58–62. If Helbing's disclosure implies that the reactive group is a hydroxy, then Helbing's teaching is directed to a reaction other than a Maillard reaction.

Although a reference may be used for everything it teaches, e.g. using a polyhydroxy component, the Board did not identify any suggestion in Helbing to use a reducing sugar as the polyhydroxy component. That genus includes any compound with two or more hydroxy components—an enormous genus with compounds having many distinct chemical properties and potential types of reactions. Indeed, the only guidance in Helbing for selecting the polyhydroxy component is that it is "sufficiently nonvolatile to maximize its ability to remain available for reaction with the polyacid component." *Helbing* at ¶ 19.

That a reducing sugar is a member of that genus does not render Helbing sufficiently similar to Wallace/Worthington to provide an ordinary artisan with a reason to cherry-pick components from each reaction to lead to the claimed invention. It is not enough, even after *KSR*,

to support a determination of obviousness that a reference includes a broad generic disclosure and a common utility to that in the claims and other prior art references—there must be some reason to select a species from the genus. See *In re Jones*, 958 F.3d 347, 350–51 (Fed. Cir. 1992); *Takeda Chem. Indus., Ltd. V. Alphapharm Pty., Ltd.*, 492 F.3d 1350, 1356–57 (Fed. Cir. 2007) (noting that *KSR* “acknowledged the importance of identifying ‘a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does’” (discussing and quoting *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007))). The key reactants, nature of the reactions, and products of the reactions taught in Helbing and Wallace/Worthington are distinct. The alleged similarity of the references does not support the conclusion that an ordinary artisan would find it obvious to replace the polyhydroxy component in Helbing with a reducing sugar (thus changing the fundamental teaching of Helbing). The apparent similarity between the prior art references, upon which the Board relied to motivate their combination, is an illusion built upon hindsight bias. In this case, the references are not so similar such that an ordinary artisan would read from their shared purpose and two common reactants that they could be combined to create the claimed invention.

The lack of similarity between the references undermines the Board’s finding that an ordinary artisan would combine their teachings to use the alkaline solution, use of the binder with fiberglass, and use the silicon-containing coupling agent of Helbing with the Maillard reaction inherently taught in Worthington/Wallace. Because the similarity of the references was the Board’s only reason for combining the references, we vacate the Board’s determination of obviousness based solely on the similarity of the cited references and remand for further proceedings.

B

Knauf also contests the Board's finding that the combination inherently discloses the quantity limitations found in several of the appealed claims.

All of the appealed claims have a quantity limitation for the amount of binder that is melanoidin. For example, claim 16 of the '445 patent requires that "substantially all of the polymer that binds the mat of mineral fibers and/or glass fibers is melanoidin products." J. App'x 2191 (Amended Claims).² In concluding that this limitation was inherently disclosed by the combination of Worthington, Wallace, and Helbing, the Board: (1) noted that "Patent Owner has not explained what amount of non-melanoidin is permitted by these claims," *'445 Patent Bd. Op. II* at 52, and therefore that any amount above a trace or impurity amount would satisfy the claim limitation; (2) found that "Patent Owner has not established with adequate evidence that the amounts of melanoidin produced in Worthington, Wallace, and Helbing are only trace amounts," *id.* at 17; and (3) explained that because "Worthington describes the recited amounts of carbohydrate, as well as ammonium (and other amine) and polycarboxylic acid" in the claims, *'445 Patent Bd. Op. II* at 18, the combination with Helbing and Wallace would necessarily meet the same quantity limitations as claimed. The Board erred.

First, the term "substantially all" in claim 16 (and the quantity limitations in the other claims) means what it says. The Board may not ignore this limitation or rewrite it to mean "at greater than impurity levels." *See id.* at 17 ("The evidence in this record . . . is sufficient to find, for example, that 'the melanoidin products are present at greater than impurity levels in the polymer.'").

² Other appealed claims include different quantity limitations, which the Board should consider on remand.

It is inapposite that the “’445 patent is silent as to the amounts, if any, of permitted side-reactants,” *id.* at 17, because the claims *do* require a particular amount of melanoidin products in the binder. Even if the Board were correct that the combination of Wallace, Worthington, and Helbing inherently taught “greater than impurity levels” of melanoidin as claimed in claim 19, this would *not* support a conclusion that the significantly narrower “substantially all” limitation of claim 16 was inherently satisfied.

Second, it was not Patent Owner’s burden to establish that the inherent result of the reaction in the combination of Worthington, Wallace, and Helbing was *not* “substantially all” melanoidin—it was Petitioner’s burden to prove that every limitation in the claim was found in the prior art, either inherently or explicitly.

Finally, the Board did not point to substantial evidence showing that executing the reaction in Worthington would produce a binder comprising “substantially all . . . melanoidin products.” Worthington nowhere indicates the composition of the resulting binder. This lack is not cured merely because, like the claims, Worthington “describes the recited amounts of carbohydrate,” greater than trace amounts of ammonium, and polycarboxylic acid. *Id.* at 18. That a prior art reference satisfies these limitations in the reactants is not enough to allow the Board to find inherency in the products of the reaction, unless there is evidence that *any* reaction meeting these quantity of reactant limitations would result in the quantity of product limitation. *See Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.3d 1264, 1269 (Fed. Cir. 1991) (*quoting In re Oelrich*, 666 F.2d 578, 581 (C.C.P.A. 1981)) (“Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.”).

We therefore vacate the Board’s holding that claims 16-22 of Knauf’s ’445 patent and claims 29-32 of Knauf’s ’347

patent are obvious, and remand for further proceedings consistent with this opinion.

II

On cross-appeal, we turn first to the preliminary matter of Rockwool's standing to invoke the jurisdiction of this court to challenge the Board's holding of no invalidity with respect to the cross-appealed claims. It is uncontested that Rockwool properly participated in the reexamination under 35 U.S.C. § 311 (pre-AIA). However, "once a party seeks review in a federal court, 'the Constitutional requirement that it have standing kicks in.'" *Consumer Watchdog v. Alumni Res. Found'n*, 753 F.3d 1258, 1261 (Fed. Cir. 2014) (quoting *Sierra Club v. E.P.A.*, 292 F.3d 895, 899 (D.C. Cir. 2002)). The "requirement of injury in fact is a hard floor of Article III jurisdiction that cannot be removed by statute." *Summers v. Earth Island Inst.*, 555 U.S. 488, 497 (2009); *Consumer Watchdog*, 753 F.3d at 1261. "The party invoking federal jurisdiction must have 'a personal stake in the outcome.'" *Consumer Watchdog*, 753 F.3d at 1261 (quoting *Los Angeles v. Lyons*, 461 U.S. 95, 101 (1983)).

Rockwool has not pointed to any evidence showing a case or controversy between the parties with respect to the cross-appealed claims. Rather, Rockwool asserts that we have jurisdiction over Rockwool's cross-appeal because: (1) Rockwool was involved in the reexamination process and if we affirm the cross-appealed claims, "the parties will be forced to return to the Patent Office and participate in further proceedings"; (2) our jurisdictional statute, 28 U.S.C. § 1295(a)(4)(A), gives this Court exclusive jurisdiction over appeals from the Board "at the instance of a party who exercised that party's right to participate in the applicable proceeding before or appeal to the Board"; and (3) a cross-appeal is proper under *Bailey v. Dart Container Corp. of Mich.*, 292 F.3d 1360, 1362 (Fed. Cir. 2002) whenever "a party seeks to enlarge its own rights under the judgment

or to lessen the rights of its adversary under the judgment,” which allegedly occurred here. Rockwool also notes that “the Court generally finds jurisdiction in appeals and cross-appeals from Board decisions.” *Rockwool Reply Br.* at 4.

Although Rockwool has standing to participate in the direct appeal to defend the Board’s decision with respect to the directly appealed claims, *see Personal Audio, LLC v. Elec. Frontier Found.*, 867 F.3d 1246, 1249–50 (Fed. Cir. 2017), Rockwool has failed to establish that it has suffered an injury in fact for purposes of maintaining a cross-appeal. This conclusion is dictated by the straightforward application of this Court’s holding in *Consumer Watchdog*, 753 F.3d 1258. There, Consumer Watchdog requested reexamination of a patent generally directed to human embryonic stem cell cultures. *Id.* at 1260. After the Board affirmed the patentability of the claims, Consumer Watchdog appealed. Consumer Watchdog did not allege any involvement in research or commercial activities in the stem cell field, nor that it was or intended to be a competitor of the patentee or licensee of the patent; instead, Consumer Watchdog relied on “the Board’s denial of Consumer Watchdog’s requested administrative action—namely, the Board’s refusal to cancel” the claims at issue. *Id.* at 1261. We held that a party’s interest in a desired outcome on reexamination did not confer standing because Consumer Watchdog was afforded everything to which it was entitled—an opportunity to request reexamination and participate—and that Congress’s grant of the procedural right to appeal the Board’s findings to the Federal Circuit did not eliminate the requirement that appellant have standing to exercise that procedural right. *Id.* at 1262.

Like *Consumer Watchdog*, Rockwool does not allege that it is a current or prospective competitor of Knauf,³ or assert anything apart from its past and future involvement in the reexamination at the PTO. Rockwool also does not allege any action by Knauf that would create standing for Rockwool beyond the continued presence of the patent after reexamination. Just as in *Consumer Watchdog*, this is not enough to satisfy the standing requirement. Moreover, just as the procedural right to appeal a Board decision under 35 U.S.C. § 315(b) did not confer standing on *Consumer Watchdog*, so to this Court's jurisdictional grant under 28 U.S.C. § 1295(a)(4)(A) does not eliminate the standing requirement. There is no inconsistency between this Court having exclusive jurisdiction over appeals from the Board and this Court's refusal to exercise its jurisdiction to provide an advisory opinion at the behest of a third-party without standing.

In this context, the grant of a reexamination certificate is similar to the initial grant of a patent. It is well-established that having an issued patent does not itself confer jurisdiction on anyone wishing to challenge its validity. See *Consumer Watchdog*, 753 F.3d at 1262. Cf. *Hewlett-Packard Co. v. Acceleron LLC*, 587 F.3d 1358, 1362 (Fed. Cir. 2009) (noting that even after *MedImmune, Inc. v. Genentech, Inc.*, 549 U.S. 118, 127 (2007), a declaratory judgment plaintiff must still show that the dispute is “definite and concrete, touching the legal relations of parties having adverse legal interests” and holding that a patent owner's communication to another party “merely identifying its patent and the other party's product line, without more, cannot establish adverse legal interests between the parties” sufficient to support declaratory judgment

³ We need not and do not make any determination about whether such an allegation would be sufficient in and of itself to confer Article III standing on Rockwool.

jurisdiction). The grant of a reexamination certificate, similarly, without more, cannot alone satisfy the standing requirement.

Rockwool attempts to distinguish *Consumer Watchdog* because “it has indicated its intent to continue proceedings seeking to cancel the Cross-Appeal Claims at the Patent Office,” *Rockwool Reply Br.* at 3, which renders its position more than “a general grievance.” *See Consumer Watchdog*, 753 F.3d at 1263. Just as Rockwool’s current engagement with the PTO cannot itself create standing, its future pressing of its claims also cannot itself create standing here. The burden of participating in a hypothetical future inter partes reexamination does not itself constitute an injury-in-fact sufficient to confer standing here.

Rockwool is also incorrect that its Cross-Appeal is proper under *Bailey v. Dart Container Corp. of Mich.*, 292 F.3d 1360, 1362 (Fed. Cir. 2002). In *Bailey*, this Court stated that “[i]t is only necessary and appropriate to file a cross-appeal when a party seeks to enlarge its own rights under the judgment or to lessen the rights of its adversary under the judgment.” *Id.* That statement was made in the context of determining when a cross-appeal, as contrasted with an alternative ground for affirmance, is proper. *Bailey* could not and did not create a rule disregarding Constitutional standing requirements for cross-appeals.

Rockwool’s cross-appeal is therefore dismissed for lack of standing.

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

COSTS

No costs.