

United States Court of Appeals for the Federal Circuit

IN RE: GREGORY E. URBANSKI, KEVIN W. LANG,
Appellants

2015-1272

Appeal from the United States Patent and Trademark
Office, Patent Trial and Appeal Board in No. 11/170,614.

Decided: January 8, 2016

JONATHAN D. BALL, Greenberg Traurig LLP, New
York, NY, argued for appellants. Also represented by
JENNIFER R. MOORE.

AMY J. NELSON, Office of the Solicitor, United States
Patent and Trademark Office, Alexandria, VA, argued for
appellee Michelle K. Lee. Also represented by NATHAN K.
KELLEY, THOMAS W. KRAUSE, COKE STEWART.

Before LOURIE, BRYSON, and CHEN, *Circuit Judges*.

LOURIE, *Circuit Judge*.

Gregory E. Urbanski and Kevin W. Lang (collectively,
“Urbanski”) appeal from the decision of the United States
Patent and Trademark Office (“PTO”) Patent Trial and
Appeal Board (the “Board”) affirming the Examiner’s
rejection of claims 43–50 and 52–68 of U.S. Patent Appli-

cation 11/170,614 (the “ ’614 application”) as unpatentable under 35 U.S.C. § 103(a) (2006).¹ *See Ex Parte Urbanski*, No. 2013-002044, slip op. at 3, 11 (P.T.A.B. Oct. 9, 2014) (“*Board Decision*”); Joint App. (“J.A.”) 2–15. Because the Board did not err in concluding that the claims of the ’614 application would have been obvious over the cited references, we *affirm*.

BACKGROUND

In 2005, Urbanski filed the ’614 application, which is entitled “Protein and Fiber Hydrolysates” and is directed to a method of enzymatic hydrolysis of soy fiber, such that the product has a reduced water holding capacity suitable for use as food additives. J.A. 33. Claim 43 is representative of the claims on appeal and reads as follows:²

43. A method for making an enzymatic hydrolysate of a soy fiber comprising:
- (a) mixing water and a soy fiber to form a substantially homogenous aqueous dispersion of hydrated unhydrolyzed soy fiber, wherein the unhydrolyzed soy fiber and water are present in a weight ratio of between about 1:1.5 and about 1:8;
 - (b) adjusting the pH of the mixture to between about 4.5 and about 5.5;

¹ Because the ’614 application was filed before the enactment of the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284 (2011), we apply the pre-AIA version of 35 U.S.C. § 103.

² Urbanski relies only on limitations in claim 43 to challenge the obviousness rejections and submits that all of the rejected claims stand or fall together. Appellants’ Br. 5; *see also In re Kaslow*, 707 F.2d 1366, 1376 (Fed. Cir. 1983).

(c) heating to at least about 200°F for a time sufficient to substantially swell the unhydrolyzed soy fiber;

(d) cooling the mixture to between about 115°F and about 135°F;

(e) contacting the mixture with one or more endoglucanase enzymes in the absence of exohydrolytic enzymes, said one or more endoglucanase enzymes comprising an enzyme capable of catalyzing the hydrolysis of 1,4-β-D-glycosidic linkages in cellulose, the one or more endoglucanase enzymes being present in a weight ratio to the unhydrolyzed soy fiber of about 1:1,000 to about 1:25;

(f) mixing under high speed *for about 60 minutes to about 120 minutes to hydrolyze between about 0.5% and about 5% of the glycosidic bonds* present in the unhydrolyzed soy fiber;

(g) inactivating the one or more endoglucanase enzymes; and

(h) drying the resulting enzymatic hydrolysate by spray drying;

to provide a hydrolysate of soy fiber having *an average degree of hydrolysis of between about 0.5% and about 5%; a water holding capacity which is reduced by about 10% to about 35% as compared to the water holding capacity of the unhydrolyzed soy fiber; a free simple sugar content of less than about 1%;* and which is suitable for human consumption.

Board Decision at 2 (emphases added).

Claim 43 thus requires that the soy fiber and enzyme be mixed in water for 60 to 120 minutes to provide a fiber

product having a claimed degree of hydrolysis, water holding capacity, and free simple sugar content. According to the '614 application, “[t]he skilled artisan will be able to control the duration of the hydrolysis reaction to achieve any desired [degree of hydrolysis].” J.A. 47.

The Examiner rejected claims 43–50 and 52–68 under 35 U.S.C. § 103(a) as obvious over PCT Application Publication WO96/32852 of Gross *et al.* (“Gross”) in view of U.S. Patent 5,508,172 of Wong *et al.* (“Wong”) and other references. *Board Decision* at 3. Both Gross and Wong disclose methods of enzymatic hydrolysis of dietary fibers. Gross teaches a method that converts dietary fibers into “stable, homogeneous colloidal dispersions or gels,” which uses a relatively longer hydrolysis time, *e.g.*, 5 to 72 hours. Gross p. 2 ll. 28–30; *id.* p. 7 ll. 13–15, 27–29. Wong’s method produces a soy fiber product of improved sensory properties, including smoothness and mouthfeel, without substantially reducing the fiber content, and uses a shorter hydrolysis time, *e.g.*, 100 to 240 minutes, preferably, 120 minutes, Wong, at [57]; *id.* col. 3 ll. 51–58.

The Examiner found that Gross and Wong, both relating to enzymatic hydrolysis of dietary fibers, are readily combinable, and that “both recognize that the degree of hydrolysis of the fiber is a result effective variable.” J.A. 288. The Examiner acknowledged that Gross teaches a longer reaction time, J.A. 288, but found that a skilled artisan seeking to produce soy fiber with improved palatability and high fiber content, as taught by Wong, would have modified the Gross process to use a shorter reaction time to achieve a lower degree of hydrolysis, J.A. 288, 293. The Examiner also found that one of ordinary skill in the art would have expected that modifying the Gross process to use a shorter reaction time would have resulted in the claimed water holding capacity and free simple sugar content. J.A. 289.

During prosecution, Gregory Urbanski submitted a declaration, in which he asserted that “the methods and products of Gross are significantly different [from] those claimed in the ’614 application and that Gross teaches away from the modification that would have been necessary to arrive at the claimed methods and products.” J.A. 240. He presented evidence that hydrolyzed soy fiber prepared according to the ’614 application failed to form a stable, homogeneous dispersion as disclosed in Gross. J.A. 241–42. Urbanski thus argued that reducing the hydrolysis time would have rendered the fiber product unsatisfactory for Gross’s intended purpose of forming stable dispersions. J.A. 237, 329. The Examiner, however, found Urbanski’s argument and declaration unpersuasive. J.A. 254, 386–87.

Urbanski appealed to the Board, which affirmed the Examiner’s obviousness rejections. The Board rejected Urbanski’s teaching-away argument, finding that the declaration, viewed together with Gross and Wong, at best shows that the benefits of the prior art processes can be “mutually exclusive,” *viz.*, that the Gross process, which involves a longer reaction time, results in a stable dispersion; whereas the Wong process, which involves a shorter reaction time, improves the sensory properties of soy fiber without substantially reducing the fiber content. *Board Decision* at 5–6. In the Board’s opinion, that Wong’s benefit “may come at the expense of Gross’s benefit” does not outweigh the evidence of obviousness. *Id.* at 5–8.

The Board also found that “both Gross and Wong recognize reaction time and degree of hydrolysis as result-effective variables that can be varied in order to adjust the properties of the hydrolyzed fiber in a predictable manner.” *Id.* at 6. The Board observed that Urbanski failed to present evidence of unpredictability or identify anything in the prior art teaching away from the claimed method. *Id.* at 9. The Board, moreover, agreed with the

Examiner that the claimed water holding capacity and free simple sugar content would have been obvious in view of the combined teachings of Gross and Wong. *Id.* at 9–11.

Urbanski timely appealed to this court. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(4)(A).

DISCUSSION

We review the Board's legal determinations *de novo*, *In re Elsner*, 381 F.3d 1125, 1127 (Fed. Cir. 2004), and the Board's factual findings underlying those determinations for substantial evidence, *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). A finding is supported by substantial evidence if a reasonable mind might accept the evidence to support the finding. *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938). Obviousness is a question of law based on underlying factual findings, *In re Baxter*, 678 F.3d 1357, 1361 (Fed. Cir. 2012), including what a reference teaches, *In re Beattie*, 974 F.2d 1309, 1311 (Fed. Cir. 1992), the existence of a reason to combine references, *In re Hyon*, 679 F.3d 1363, 1365–66 (Fed. Cir. 2012), and whether the prior art teaches away from the claimed invention, *In re Mouttet*, 686 F.3d 1322, 1330 (Fed. Cir. 2012).

Urbanski argues that the Board failed to articulate a sufficient reason why one of ordinary skill would have been motivated to combine the processes of Gross and Wong. According to Urbanski, the declaration establishes that modifying the Gross process by shortening the reaction time, as taught by Wong, would render the modified process unsatisfactory for Gross's intended purpose, and thus that Gross teaches away from the modification. Urbanski faults the Examiner for failing to address, and the Board for failing to properly consider, the declaration. Additionally, Urbanski asserts that neither the Board nor the Examiner established that the cited references teach

or suggest the claimed degree of hydrolysis, water holding capacity, or free simple sugar content.

The Director responds that substantial evidence supports the Board's factual findings that Gross and Wong both recognize that reaction time and degree of hydrolysis are result-effective variables; that varying the reaction time would have a predictable effect on the degree of hydrolysis, which in turn affect the attributes of the fiber product; that Gross does not teach away from a shorter reaction time; and that one of ordinary skill would have been motivated to modify the Gross process by shortening the reaction time. The Director maintains that both the Board and the Examiner properly considered Urbanski's declaration. The Director also responds that the claimed water holding capacity and free simple sugar content are expected properties of the product of the claimed method.

We agree with the Director that substantial evidence supports the Board's finding that one of ordinary skill in the art would have been motivated to modify the Gross process in view of Wong to use a shorter reaction time, and that the claimed degree of hydrolysis, water holding capacity, and free simple sugar content would be expected properties of the hydrolysis product.

Both Gross and Wong relate to enzymatic hydrolysis of dietary fibers. Gross teaches a longer reaction time, whereas Wong teaches a shorter reaction time that overlaps with, or falls within, Urbanski's claimed range. Wong also teaches that its method produces soy fiber with improved sensory properties without substantially reducing the fiber content. It is undisputed that the properties disclosed in Wong would be favorable properties of dietary fibers. Substantial evidence thus supports the Board's finding that a person of ordinary skill would have been motivated to modify the Gross process by using a shorter reaction time, in order to obtain the favorable properties disclosed in Wong.

Additionally, the Board properly found that both Gross and Wong recognize that reaction time and degree of hydrolysis are result-effective variables that can be varied in order to adjust the properties of the hydrolyzed fiber in a predictable manner. *See In re Applied Materials, Inc.*, 692 F.3d 1289, 1297 (Fed. Cir. 2012) (“A recognition in the prior art that a property is affected by the variable is sufficient to find the variable result-effective.”). The degree of hydrolysis is dependent on the reaction time because the longer the fiber is in contact with the enzyme, the greater the extent of hydrolysis. The degree of hydrolysis in turn affects the attributes of the resulting fiber product. Wong suggests that a shorter reaction time and a lower degree of hydrolysis improves soy fiber’s sensory properties without substantially reducing the fiber content; whereas Gross suggests that a longer reaction time and a higher degree of hydrolysis results in fibers capable of forming a stable dispersion. Substantial evidence thus supports the Board’s finding that a person of ordinary skill would have expected that, by adjusting the reaction time, the degree of hydrolysis and the properties of the fiber would be altered.

As the Board observed, Gross teaches that hydrolyzed fiber absorbs less water as compared with unhydrolyzed fiber and discloses one example in which the water holding capacity was reduced by 40% after hydrolysis. *Board Decision* at 9. One of ordinary skill thus would have expected that modifying the Gross process by shortening the reaction time would have resulted in a *lesser* change in water holding capacity. Likewise, substantial evidence supports the Board’s finding that shortening the reaction time and lowering the degree of hydrolysis would result in a lower free simple sugar content. We therefore agree with the Director that the PTO established a *prima facie* case of obviousness.

That *prima facie* case has not been rebutted. There is no evidence, and Urbanski does not suggest, that the

claimed ranges of degree of hydrolysis, water holding capacity, and free simple sugar content are “critical” or “produce a new and unexpected result” as compared to the prior art. *Applied Materials*, 692 F.3d at 1297. There is also no evidence that the “variables interacted in an unpredictable or unexpected way,” which could render the claims nonobvious. *Id.* at 1298 (citing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007)).

Moreover, we agree with the Director that both the Examiner and the Board properly considered and weighed Urbanski’s declaration. We are unpersuaded by Urbanski’s argument that, because modifying the Gross process by shortening the hydrolysis time, as taught by Wong, would have rendered the modified process inoperable for Gross’s intended purpose, *viz.*, forming stable dispersions, Gross teaches away from the claimed method of making a hydrolysate of a soy fiber.

In cases involving mechanical device or apparatus claims, we have held that “[i]f references taken in combination would produce a ‘seemingly inoperative device,’ . . . such references teach away from the combination and thus cannot serve as predicates for a prima facie case of obviousness.” *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1354 (Fed. Cir. 2001) (quoting *In re Sponnoble*, 405 F.2d 578, 587 (CCPA 1969); *see also In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984)). But in this case, Urbanski’s reliance on *Gordon* and its progeny is misplaced.

As indicated, the Board correctly found that Gross and Wong are combinable, as both references concern the enzymatic hydrolysis of dietary fibers and recognize that reaction time and degree of hydrolysis can be varied in order to adjust the fiber’s properties. Although Gross teaches the benefit of stable dispersions, Wong teaches other desirable properties, *viz.*, improved sensory properties without substantially reducing the fiber content. On this record, the Board properly found that one of ordinary

skill would have been motivated to pursue the desirable properties taught by Wong, even at the expense of foregoing the benefit taught by Gross.

This case is therefore distinguishable from *Gordon*, which Urbanski relies on. In *Gordon*, the Board affirmed the Examiner's rejection of a claim directed to a blood filter with an inlet and outlet on the *bottom* over the prior art, French, which taught a gasoline filter with the inlet and outlet on the *top*. 733 F.2d at 901. The Board reasoned that "it would have been obvious to turn the French device upside down to have both the inlet and outlet at the bottom, rather than at the top." *Id.* at 902. This court reversed, noting that French teaches a liquid strainer which relied, at least in part, upon the assistance of gravity to separate undesired particles from gasoline. We reasoned:

Therefore, it is not seen that French would have provided any motivation to one of ordinary skill in the art to employ the French apparatus in an upside down orientation. The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification. . . . Indeed, if the French apparatus were turned upside down, it would be rendered *inoperable* for its *intended purpose*. . . . In effect, French *teaches away* from the board's proposed modification.

Id. (emphases added).

Here, the cited references do not teach away from the claimed method. The obviousness rejections are based on Gross in view of Wong. As indicated earlier, Wong teaches that its method produces soy fiber with improved sensory properties without substantially reducing the fiber content. Wong thus provides the motivation to modify the Gross process and suggests the desirability of such modification. Moreover, both Gross and Wong

suggest that hydrolysis time may be adjusted to achieve *different* fiber properties. Nothing in the prior art teaches that the proposed modification would have resulted in an “inoperable” process or a dietary fiber product with undesirable properties. As the Board properly found, one of ordinary skill would have been motivated to pursue the desirable properties taught by Wong, even if that meant foregoing the benefit taught by Gross. And Urbanski’s claims do not require Gross’s benefit that is arguably lost by combination with Wong. The Board therefore did not err in rejecting Urbanski’s inoperability argument.

Substantial evidence, moreover, supports the Board’s finding that Gross does not otherwise teach away from the claimed method. “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.” *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). Although Gross generally discloses a relatively longer reaction time that results in fiber capable of forming stable dispersions, Gross does not criticize or discredit the use of a shorter reaction time. Accordingly, we conclude that the Board did not err in affirming the Examiner’s decision that claims 43–50 and 52–68 of the ’614 application would have been obvious over the cited references.

CONCLUSION

We have considered Urbanski’s remaining arguments, but find them unpersuasive. For the foregoing reasons, we conclude that claims 43–50 and 52–68 of the ’614 application would have been obvious in view of the prior art, and therefore affirm the decision of the Board.

AFFIRMED