UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte GREGORY E. URBANSKI and KEVIN W. LANG

Appeal 2013-002044
Application 11/170,614[1]
Technology Center 1700

Before PETER F. KRATZ, BEVERLY A. FRANKLIN, and ELIZABETH M. ROESEL, *Administrative Patent Judges*.

Opinion for the Board filed by *Administrative Patent Judge* ROESEL.

Opinion Dissenting filed by *Administrative Patent Judge* KRATZ.

ROESEL, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from the Examiner's rejection of claims 43–50 and 52–68. We have jurisdiction under 35 U.S.C. § 6.

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[1] According to Appellants, the Real Party in Interest is Delavau LLC. App. Br. 1.

STATEMENT OF THE CASE

Claim 43 is representative of the subject matter on appeal and is set forth below:

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;

(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.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Berger et al. (hereinafter "Berger")	US 4,006,253	Feb. 1, 1977

Wong et al. (hereinafter "Wong")	US 5,508,172	Apr. 16, 1996
Dalboege et al. (hereinafter "Dalboege")	US 5,723,328	Mar. 3, 1998
Gross et al. (hereinafter "Gross")	WO 96/32852	Oct. 24, 1996

Danuta Ciechańska et al., *Enzymatic Treatment of Viscose Fibres Based Woven Fabric*, Fibres & Textiles in Eastern Europe 60-63 (Oct./Dec. 2002) (hereinafter "Ciechańska").

THE REJECTIONS[2]

1. Claims 43, 44, 47–50, 52, 53, and 55–69 are rejected under 35 U.S.C. § 103(a) as unpatentable over Gross in view of Berger and Wong with evidence provided by Ciechańska.

2. Claims 45, 46, and 54–68 are rejected under 35 U.S.C. § 103(a) as unpatentable over Gross in view of Berger and Wong with evidence provided by Ciechańska and further in view of Dalboege.

ANALYSIS

In challenging the first rejection, Appellants argue claims 43, 44, 47–50, 52, 53, and 55–69 as a group, relying on limitations in independent claim 43 and presenting no argument for separate patentability of the dependent claims. App. Br. 6–11. Therefore, claims 43, 44, 47–50, 52, 53, and 55–69 stand or fall together, and we need not address any of them separately from claim 43. 37 C.F.R. § 41.37(c)(iv). In challenging the second rejection,

[2] The rejection of claims 43–50 and 52–69 under 35 U.S.C. § 112, first paragraph, is withdrawn. Ans. 9.

Appellants merely refer back to their arguments in opposition to the first rejection, arguing that the deficiencies in the cited prior art are not cured by the additional reference (Dalboege) and presenting no argument for separate patentability of claims 45, 46, and 54–68. App. Br. 11–12. Appellants have thereby waived any argument for patentability of claims 45, 46, and 54–68 separate from claim 43. Therefore, all appealed claims stand or fall together, and we need not address any of the claims separately from claim 43. Furthermore, Appellants focus their arguments on Gross and Wong and do not contest the Examiner's findings or conclusions with respect to the other references. We therefore do not need to address the other references in making our determinations herein.

Both the claimed subject matter and the cited prior art relate to methods for enzymatic hydrolysis of dietary fiber, such as soy fiber, for purposes of preparing a food additive. *See* Spec. 1; Gross, Abstract; Wong, Abstract. Appellants argue that the cited references fail to teach or suggest two limitations of the claimed method: the degree of hydrolysis and the reduction in water holding capacity. App. Br. 7. We are not convinced by Appellants' arguments relating to either claim limitation.

Regarding the claimed degree of hydrolysis, the Examiner acknowledges that the primary reference, Gross, teaches a longer reaction time and a higher degree of hydrolysis than is claimed by Appellants. Ans. 5 (citing Gross, 7:10–16). The Examiner relies on Wong to conclude that a lower degree of hydrolysis would have been obvious. *Id.* (citing Wong, Abstract.) Appellants argue that Gross teaches away from the Examiner's suggested modification because the proposed modifications would have rendered the material unsatisfactory for Gross's intended purpose of forming

a stable dispersion of the fiber hydrolysate. App. Br. at 8–9; Reply 3–4. As support for their teaching away argument, Appellants submit a declaration of a co-inventor asserting that a hydrolysate prepared according to Appellants' claimed method does not form a stable dispersion as defined by Gross. Urbanski Decl.[3] ¶¶ 3–7.

Although we accept as true the facts stated in the co-inventor's declaration, we disagree with Appellants' conclusion that Gross teaches away from Appellants' claimed degree of hydrolysis. At most, Appellants' declaration shows that the benefits of the processes as taught by Gross and Wong may be mutually exclusive and that the benefits of using a shorter reaction time and lower degree of hydrolysis, as taught by Wong, may come at the expense of Gross's benefit of forming a stable dispersion of hydrolysate after shearing. But as discussed below, these facts are not sufficient to negate prima facie obviousness of performing Gross's process using a shorter reaction time and lower degree of hydrolysis.

"A reference may be said to teach away when a person of ordinary skill, upon reading the reference, . . . 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). However, "[t]he prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives . . . ." *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004).

Here, Gross discloses that the hydrolysis is conducted at 95°F to 167°F, preferably 104°F to 140°F, Gross, 7:4–6 (after converting Celsius to Fahrenheit), that an appropriate degree of hydrolysis can be achieved in 5 to

[3] Declaration of Dr. Gregory E. Urbanski, submitted Feb. 23, 2010.

72 hours, *id.* at 7:13–15, and that the degree of hydrolysis is considered appropriate when the hydrolyzed material forms a stable dispersion following high shear, *id.* at 7:27–29. Wong, on the other hand, teaches a similar reaction temperature, but a shorter reaction time and a lower degree of hydrolysis. Specifically, Wong teaches conducting the hydrolysis at 110°F to 140°F for 100 to 240 minutes, preferably 120°F for 120 minutes. Wong, 3:51–53. According to Wong, "this degree of hydrolysis . . . is sufficient to smooth the surfaces of the soy fiber material and improve its sensory properties including mouthfeel characteristics and smoothness but without substantially reducing the dietary fiber content of the material itself." *Id.* at 3:54–58.

Viewing the prior art as a whole, one of ordinary skill in the art would have at least two alternatives: a relatively long reaction time and high degree of hydrolysis, as taught by Gross, or a relatively short reaction time and low degree of hydrolysis, as taught by Wong. Each alternative provides certain benefits. According to Gross, a high degree of hydrolysis enables the hydrolysate to form a stable dispersion after shearing. Gross, 7:10–28, 8:33–35 (preferred dispersions are stable for at least a week.) According to Wong, a lower degree of hydrolysis is sufficient to improve the sensory properties of the fiber material without substantially reducing its total dietary fiber content. Wong, Abstract, 2:23–26, 3:47–61. Thus, 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. *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."). Accordingly, the suggestion is that the applied art teachings are broader than the particular application since the applied art recognizes reaction time and degree of hydrolysis as result-effective variables. Also, Appellants do not contend that optimization of the reaction time and degree of hydrolysis requires anything more than the exercise of ordinary skill in the art. *Id.* (affirming obviousness where "[n]othing indicates that the optimization of the variables was anything other than the exercise of ordinary skill in the art.").

Appellants have not pointed to any teaching in Gross or elsewhere in the prior art that would have discouraged one skilled in the art from practicing the hydrolysis process of Gross using a shorter reaction time and a lower degree of hydrolysis, as taught by Wong. Nor have Appellants directed us to any teaching in Gross or elsewhere in the prior art that Gross's objective of providing a stable dispersion cannot be achieved with a shorter reaction time and a lower degree of hydrolysis. Instead, Gross teaches that "in general an appropriate degree of hydrolysis can be achieved in from about 5 to about 72 hours." Gross, 7:13–15. "A reference does not teach away, . . . if it merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into the invention claimed." *Galderma Labs., L.P. v. Tolmar, Inc.*, 737 F.3d 731, 738 (Fed. Cir. 2013), *cert. denied*, 134 S. Ct. 2740 (U.S. 2014).

We are not persuaded by Appellants' teaching away argument, even if it would have been apparent to one of ordinary skill in the art that Gross's objective of producing a stable dispersion could not be achieved using a shorter reaction time and lower degree of hydrolysis, as taught by Wong. In

other words, even if one skilled in the art would have recognized that, in order to obtain the benefit taught by Wong, one may need to forego the benefit taught by Gross, such does not amount to a teaching away sufficient to negate the obviousness of modifying Gross's hydrolysis process to shorten the reaction time and lower the degree of hydrolysis, as taught by Wong, to gain the benefits taught by Wong, in combination with the fact that the applied art recognizes such variables as result effective. Nor does it nullify the existence of a motivation to modify Gross's process in order to obtain the benefits of a shorter reaction time and lower degree of hydrolysis, as taught by Wong. The fact that Wong's benefit—improving the sensory properties of the fiber material without substantially reducing its total dietary fiber content—comes at the expense of Gross's benefit of obtaining a stable dispersion does not outweigh the Examiner's evidence of obviousness. *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) ("[O]bviousness must be determined in light of all the facts, and there is no rule that a single reference that teaches away will mandate a finding of nonobviousness. Likewise, a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine."); *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) ("The fact that the motivating benefit comes at the expense of another benefit, however, should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another.")

The facts presented in this case differ from *In re Sebek* cited by the dissent. 465 F.2d 904 (CCPA 1972). In that case, both the cited reference

and other prior art taught that values greater than Appellant's claimed minimum would produce a lower yield and other disadvantages for the claimed process, and there was evidence demonstrating the unpredictability of determining optimum values for the process parameters. *Id.* at 906-907. Here, in contrast, Appellants have not identified any teaching in Gross or elsewhere in the prior art that teaches away from the shorter reaction time and lower degree of hydrolysis claimed by Appellants, nor have Appellants pointed to any evidence of unpredictability. We therefore agree with the Examiner that Appellants' claimed degree of hydrolysis would have been obvious in view of the combined teachings of Gross and Wong. Ans. 10–11.

Appellants' subsidiary arguments are similarly unconvincing. First, for the reasons just discussed, Gross's teaching that an appropriate degree of hydrolysis is one that converts 11 to 15% of the starting material to glucose, Gross, 7:15–17, does not negate the obviousness of shortening the reaction time and reducing the degree of hydrolysis, as taught by Wong, which would undisputedly result in a lower free simple sugar content.

Second, one of ordinary skill in the art would have a reasonable expectation that Gross's process, as modified by Wong, would succeed in reducing the water holding capacity of the fiber, as claimed by Appellants. Gross teaches that hydrolyzed fiber has reduced water absorption compared to the starting material, Gross, 4:4–7, and discloses one example in which the water absorption of oat fiber was reduced by 40%, *id.* at 16, Table 2. These disclosures provide a sufficient basis for one of ordinary skill in the art to predict that a reduction in water holding capacity within Appellants' claimed range could likely be achieved. *Medichem*, 437 F.3d at 1165 ("*certainty* of success" is not required); *In re O'Farrell*, 853 F.2d 894, 903-

04 (Fed. Cir. 1988) ("Obviousness does not require absolute predictability of success. . . . [A]ll that is required is a reasonable expectation of success.").

Regarding the claimed reduction in water holding capacity, the Examiner relies upon the teachings of Gross, as just discussed. Ans. 6, citing Gross, 4:6–7, 16, Table 2. Appellants argue that Gross's 40% reduction in water holding capacity is significantly above the claimed range of about 10% to about 35% and that there is no motivation to obtain a reduction within the claimed range. App. Br. 11. We agree with the Examiner, however, that Gross's disclosure of a reduction in water holding capacity of 40% is sufficiently close to Appellants' claimed upper limit of "'about 35%'" that one of ordinary skill would have reasonably expected that the claimed process steps would have resulted in similar properties. Ans. 14. We supplement the Examiner's reasoning with the following:

Gross teaches that the hydrolysis process results in a reduction of the water holding capacity of the hydrolyzed fiber as compared to the unhydrolyzed fiber. Gross, 4:4–7. Implicit in that teaching is the recognition that a higher degree of hydrolysis results in a greater reduction in water holding capacity. *In re Preda*, 401 F.2d 825, 826 (CCPA 1968) ("in considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom"). One of ordinary skill in the art would therefore reasonably expect that, when Gross's process is modified to have a lower degree of hydrolysis, as taught by Wong, the reduction in water holding capacity would be less than the 40% reduction taught by Gross. Gross 16, Table 2. The motivation to modify Gross's process is the same as that discussed

above: to obtain the benefits of a lower degree of hydrolysis as taught by Wong. Wong, Abstract, 2:23–26, 3:47–61. Appellants make no argument that substituting Wong's lower degree of hydrolysis for the higher degree of hydrolysis taught by Gross would not result in a smaller reduction in water holding capacity than is taught by Gross or that this result would have been unpredictable. We therefore agree with the Examiner that Appellants' claimed range of water holding capacity would have been obvious in view of the combined teachings of Gross and Wong. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007) ("when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result"); *In re Skoner*, 517 F.2d 947, 950 (CCPA 1975) ("Appellants have chosen to describe their invention in terms of certain physical characteristics . . . . Merely choosing to describe their invention in this manner does not render patentable their method which is clearly obvious in view of" the prior art).

CONCLUSION OF LAW AND DECISION

The rejections are affirmed.

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

AFFIRMED

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