

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ROQUETTE FRERES, S.A.,
Petitioner,

v.

TATE & LYLE INGREDIENTS AMERICAS LLC,
Patent Owner.

Case IPR2017-01506
Patent 7,608,436 B2

Before LORA M. GREEN, GRACE KARAFFA OBERMANN,
and JACQUELINE T. HARLOW, *Administrative Patent Judges*.

OBERMANN, *Administrative Patent Judge*.

DECISION

Institution of *Inter Partes* Review
35 U.S.C. § 314; 37 C.F.R. § 42.108

I. INTRODUCTION

Petitioner filed a Petition for *inter partes* review of claims 1–36 of U.S. Patent No. 7,608,436 B2 (Ex. 1001, “the ’436 patent”). Paper 1 (“Pet.”). Patent Owner filed a Preliminary Response. Paper 7 (“Prelim. Resp.”). Applying the standard set forth in 35 U.S.C. § 314(a), which requires demonstration of a reasonable likelihood that Petitioner would prevail at trial with respect to at least one challenged patent claim, we institute review of claims 1–4, 15–29, 31, and 32 of the ’436 patent.

The following findings of fact and conclusions of law are not final, but are made for the sole purpose of determining whether Petitioner meets the threshold for initiating review. Any final decision shall be based on the full trial record, including any response timely filed by Patent Owner. Any arguments not raised by Patent Owner in a timely-filed response shall be deemed waived, even if they were presented in the Preliminary Response.

Taking account of the information provided at this stage of the proceeding, we determine that Petitioner shows sufficiently the following facts for the purposes of trial institution.

A. *Related Proceedings*

Petitioner submits that there are no related proceedings. Pet. 1. Petitioner states that it filed, concurrently with the instant Petition, a petition for *inter partes* review of a related patent, U.S. Patent No. 8,057,840 B2. *Id.*; see Case IPR2017-01507 (“IPR1507”). Concurrently herewith, we issue a decision in IPR1507.

B. *The ’436 Patent (Ex. 1001)*

The ’436 patent is entitled “Process for Producing Saccharide Oligomers.” Ex. 1001, Title. The specification discloses “a need for edible

materials which have a reduced content of easily digestible carbohydrates, and which can be used in place of, or in addition to, conventional carbohydrate products in foods,” such as candy and yogurt. Ex. 1001, 1:17–20, 18:60–19:38 (Examples 11, 12, and 13).

The specification further discloses a process for making a slowly digestible saccharide oligomer composition that is suitable for use in foods. *Id.* at 2:33–35. The process may be performed on a feed composition that includes monosaccharides and oligosaccharides in a dry solids concentration of up to at least about 70% by weight. *Id.* at 2:62–64. Suitable starting materials for the feed composition include dextrose syrups, corn syrup, and maltodextrose solutions. *Id.* at 3: 11–15. The feed composition may be subjected to a heating step and a contacting step. *Id.* at 3:42–60, 4:20–38, 19:41–58 (claim 1). During the contacting step, the feed composition may be contacted with a catalyst, such as an enzyme or acid, for a period of time sufficient to accelerate the rate of cleavage or formation of glucosyl bonds to cause formation of non-linear oligosaccharides. *Id.* at 15:23–60 (Example 6), 16:29–66 (Example 8), 19:48–51 (claim 1).

According to the specification, “[t]he product composition produced by the treatment with acid, enzyme, or both, has an increased concentration on a dry solids basis of non-linear saccharide oligomers.” *Id.* at 5:28–30. The “product composition” has “a higher concentration of non-linear oligosaccharides than linear oligosaccharides” and is characterized by “non-linear saccharide oligomers having a degree of polymerization of at least three in a concentration of at least about 20% by weight on a dry solids basis.” *Id.* at 19:51–58 (claim 1).

C. Illustrative Claim

Claim 1, the only independent claim, is reproduced below:

1. A process for preparing saccharide oligomers, comprising:

heating an aqueous feed composition that comprises at least one monosaccharide or linear saccharide oligomer, and that has a solids concentration of at least about 70% by weight, to a temperature of at least about 40° C; and

contacting the feed composition with at least one catalyst that accelerates the rate of cleavage or formation of glucosyl bonds for a time sufficient to cause formation of non-linear saccharide oligomers, wherein a product composition is produced that contains a higher concentration of non-linear saccharide oligomers than linear saccharide oligomers; wherein the product composition comprises non-linear saccharide oligomers having a degree of polymerization of at least three in a concentration of at least about 20% by weight on a dry solids basis.

D. Evidence Relied Upon

The Petition asserts the following prior art references in the grounds of unpatentability:

(1) US Pat. No. 4,518,581, issued to Toshio Miyake et al. on May 21, 1985 (Ex. 1005, “Miyake”);

(2) US Pat. No. 5,424,418, issued to Pierrick Dufлот on June 13, 1995 (Ex. 1006, “Dufлот”);

(3) WO 98/41545 patent application to Pankaj Shah et al., published September 24, 1998 (Ex. 1008, “Shah”);

(4) S.A.S. Craig et al., *Polydextrose as Soluble Fiber and Complex Carbohydrate*, in *Complex Carbohydrates in Foods* 229–247 (Susan Sungsoo Cho et al. eds. 1999) (Ex. 1009, “Craig”);

(5) US Pat. No. 2,610,930, issued to James E. Cleland on September 16, 1952 (Ex. 1007, “Cleland”);

(6) US Pat. No. 7,638,151 B2, issued to Gang Duan et al. on December 29, 2009 (Ex. 1010, “Duan”).

The Petition is supported by the Declaration of Dr. Alexei Demchenko, which the Petition identifies as Exhibit 1002 (Pet. v), but which appears in the record as Paper 4. For the purposes of this decision, we determine that Dr. Demchenko is qualified to opine from the perspective of a person of ordinary skill in the art at the time of the invention. Ex. 1003 (Dr. Demchenko’s curriculum vitae).

E. The Asserted Grounds of Unpatentability

Petitioner challenges the patentability of claims 1–36 of the ’436 patent on the following grounds (Pet. 5):

Claims	Basis	References
1, 3, 4, 7–9, 11, 15, 25–30, 32	§ 102(b)	Mikaye
1–13, 15, 16, 23–30, 32	§ 103	Miyake ¹
1, 3–9, 11, 13–17, 23–29, 31–33	§ 102(b)	Duflot
1–9, 11, 13–29, 31–33	§ 103	Duflot and Cleland
1–4, 15–18, 23–29, 31, 32	§ 102(b)	Shah
1–4, 15–18, 23–29, 31, 32	§ 103	Shah and Craig
1–4, 15–29, 31, 32	§ 102(b)	Shah, Craig, and Cleland
1–8, 11–16, 23–31, 34–36	§ 102(b)	Duan

¹ The Petition identifies “a POSA’s knowledge” as prior art evidence in the grounds based on obviousness. Pet. 5. We consider evidence, reflecting the

II. ANALYSIS

A. *Level of Ordinary Skill in the Art*

We consider the grounds of unpatentability in view of the understanding of a person of ordinary skill in the art at the time of the invention. Petitioner submits that an ordinary artisan would typically have had at least a Master's Degree in the chemical arts and two or three years of experience in carbohydrate synthesis, analysis, or process development. Pet. 6. Petitioner's definition, which is not challenged in the Preliminary Response, is comparable to the level of skill reflected in the asserted prior art. For purposes of this decision, we find that the prior art itself is sufficient to demonstrate the level of ordinary skill in the art at the time of the invention. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art itself can reflect appropriate level of ordinary skill in the art).

B. *Claim Construction*

The Board interprets claims in an unexpired patent using the "broadest reasonable construction in light of the specification of the patent." 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). Under that standard, claim terms are given their ordinary and customary meaning in view of the specification, as understood by a person of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

We resolve disputed claim terms only to the extent necessary to our decision. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*,

background knowledge of a person of ordinary skill in the art, to the extent that it is identified and analyzed in the briefs.

868 F.3d 1013, 1017 (Fed. Cir. 2017) (“we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))). We determine that only one claim term requires express construction at this stage of the proceeding—namely, the term “product composition” that appears in claim 1. Ex. 1001, 19:51–52, 54. Although Petitioner does not propose an express definition for that term (Pet. 22–28), the Petition assumes that a “product composition” (falling within the scope of claim 1) can be the product of any multi-step process that includes, as several of its steps, heating and “contacting” a feed composition with a catalyst. *See* Pet. 32–33 (discussing Miyake), 43–44 (discussing Duflot).

Stated somewhat differently, the Petition assumes that claim 1 can be met by a prior art process that includes additional manipulation or processing of the direct product of the “contacting” step to produce a “product composition” that exhibits the properties and characteristics set forth in the claim (including the limitation that requires the “product composition” to have “a higher concentration of non-linear saccharide oligomers than linear saccharide oligomers”). Ex. 1001, 19:51–58; *see* Pet. 32–33 (acknowledging that the product obtained directly from the contacting step in Miyake does not meet the specified characteristics of the claimed “product composition”); 43–44 (asserting that Duflot’s product, derived from a fractionation step that follows a contacting step, is a “product composition” within the meaning of claim 1). Patent Owner, for its part, counters that the term “product composition” cannot reasonably be

construed to capture compositions that are not “the direct reaction product of the contacting step.” Prelim. Resp. 14.

We agree with Patent Owner that the “the broadest reasonable interpretation of the claimed ‘product composition’ is the direct reaction product of the contacting step.” *Id.* Petitioner’s contrary assumption results in an unreasonably broad claim scope that would embrace, for example, “fractioning off only a minor non-linear oligosaccharide fraction from a complex mixture, or even dumping non-linear oligosaccharides into a mostly linear oligosaccharide mixture.” *Id.* at 14 n.4.

Our construction is the broadest reasonable interpretation that comports with the intrinsic evidence. The “wherein” clause of claim 1 is part of an indented paragraph that sets forth the “contacting” limitation; it does not appear as a distinct limitation in a separate paragraph. Ex. 1001, 19:51–58; Prelim. Resp. 11. The phrase “is produced,” which directly follows the term “product composition” in claim 1, further signals that the composition is produced from the contacting step. Ex. 1001, 19:52. Our conclusion, moreover, is consistent with the specification, which informs that “[t]he product composition *produced by* the treatment with acid, enzyme, or both, has an increased concentration on a dry solids basis of non-linear saccharide oligomers.” *Id.* at 5:28–30 (emphasis added); Prelim. Resp. 12. On this record, we agree with Patent Owner that the “comprising” transitional phrase does not compel a different result. Prelim. Resp. 12–13; Ex. 1001, 19:41–42.

C. Anticipation by Shah (Ground 5)

Petitioner challenges claims 1–4, 15–18, 23–29, 31, and 32 based on anticipation by Shah. Pet. 5 (Ground 5). Our analysis focuses on claim 1, the only independent claim.

(1) Claim 1

We first address whether the Petition identifies information sufficient to show that Shah anticipates the process of claim 1. This ground is based on Shah’s disclosure of two embodiments—Example 10 (first row, “Embodiment A”) and Example 11 (second row, “Embodiment B”). Pet. 52. According to Petitioner, those embodiments relate to a process of heating a feed composition to at least about 40°C (150–160°C in Embodiment A; 150–166°C in Embodiment B), and contacting the composition with a catalyst (phosphoric acid in Embodiment A; a combination of citric acid and hydrochloric acid in Embodiment B) to produce a product composition that meets the limitations of claim 1. *Id.* at 51–52, 54–58. Based on the information presented at this stage of the proceeding, we find that Petitioner demonstrates a reasonable likelihood of prevailing at trial in showing that claim 1 is anticipated by Shah. *Id.*; Ex. 1008, 21:28–23:41.

On that point, the Petition acknowledges that “Shah discloses the preparation of polydextrose.” Pet. 54; *see id.* at 55 (“The product composition is a polydextrose that is a non-linear saccharide oligomer.”). Patent Owner, for its part, comes forward with information that “polydextrose is not a ‘saccharide oligomer’ as properly interpreted in the context of the ’436 [p]atent.” Prelim. Resp. 37. We decline to draw any conclusions about that disputed issue on this preliminary record, except to observe that the Petition is supported by argument and evidence (including

opinion testimony) that is sufficient to demonstrate a reasonable likelihood of prevailing at trial. *See* Pet. 54 (citing Paper 4 ¶ 268). We will resolve that dispute, if necessary, in any final written decision based on the full trial record, including information presented in a timely-filed patent owner's response. As a reminder, any arguments not raised in a response are deemed waived, even if they were presented in a preliminary response.

On this record, we are persuaded that Petitioner demonstrates a reasonable likelihood of prevailing at trial in showing that Shah anticipates the process of claim 1.

(2) Claims 2–4, 15–18, 23–29, 31, and 32

The Petition asserts that certain dependent claims (Claims 2–4, 15–18, 23–29, 31 and 32) are anticipated by Shah. Pet. 5, 58–63. Based on our review of the information presented at this stage of the proceeding, and without reaching any preliminary findings or conclusions on the merits, we determine that inclusion of these independent claims will not unduly complicate the trial. Inclusion, moreover, will advance our overarching goal of securing the just, speedy, and efficient resolution of the parties' dispute. *See* 37 C.F.R. §§ 42.1(b), 42.108 (reflecting the Board's mission of securing "the just, speedy, and inexpensive resolution" of patentability disputes).

Accordingly, having determined that Petitioner satisfies the threshold showing for institution under 35 U.S.C. § 314(a) with respect to claim 1, we exercise our discretion under 37 C.F.R. § 42.108(a) and order that the trial shall proceed on all other claims challenged as anticipated by Shah.

D. Obviousness Challenges Asserting Shah (Grounds 6 and 7)

Petitioner asserts two obviousness challenges based on Shah; one in combination with Craig, and another in combination with Craig and Cleland.

Pet. 5, 51–63. Those challenges involve issues that overlap, or are closely related to, the issues raised in connection with the ground based on anticipation by Shah. *See id.* at 51–63 (Petition, intertwining the argument and evidence pertaining to the ground based on anticipation by Shah and the grounds based on obviousness over Shah and one or more other references). Based on our review of the information presented at this stage of the proceeding, we determine that inclusion of the obviousness challenges based on Shah will not unduly complicate the trial. Inclusion, moreover, will advance our overarching goal of securing the just, speedy, and efficient resolution of the parties’ dispute. *See* 37 C.F.R. §§ 42.1(b), 42.108 (reflecting the Board’s mission of securing “the just, speedy, and inexpensive resolution” of patentability disputes).

Further, “anticipation is the epitome of obviousness.” *Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1363–64 (Fed. Cir. 2008) (quoting *In re Kalm*, 378 F.2d 959, 962 (CCPA 1967)). Having determined that the Petition makes out the threshold showing for review of claim 1 based on anticipation by Shah, we conclude that the Petition shows sufficiently that the subject matter of claim 1 would have been obvious over the combined disclosures of Shah and Craig, or over the combined disclosures of Shah, Craig, and Cleland. *See* Pet. 5, 51–63 (intertwining the analysis of those grounds).

Accordingly, the trial shall proceed on all grounds that raise Shah and with respect to all claims asserted in those grounds. *See* Pet. 5 (Grounds 5–7); *see* 35 U.S.C. § 314 (a) (authorizing institution of an *inter partes* review where a petitioner shows a reasonable likelihood of prevailing with respect to at least one challenged patent claim).

E. Other Challenges (Grounds 1–4 and 8)

The Petition asserts additional challenges that are based on Miyake, Dufлот (alone and with Cleland), and Duan. Pet. 5 (Grounds 1–4, 8). As explained above, on this record, we determine that claim 1 requires that “a product composition is produced” by the contacting step. Ex. 1001, 19:47–58. In view of that determination, we deny institution of trial on the challenges that assert Miyake and Dufлот. Those challenges rest on Petitioner’s erroneous claim construction that claim 1 is met if an intervening step, performed after the contacting step, results in “a product composition.” *Id.*; Pet. 32–33 (acknowledging that the reaction product obtained directly from the contacting step in Miyake has an “isomaltotriose content of 10.2%”) (quoting Ex. 1005, 9:10–14); Pet. 44–43 (directing us to a reaction product in Dufлот that is derived after a fractionation step, which follows a contacting step); *see* Ex. 1006, 13:49–55 (Dufлот, describing the fractionation step). For reasons stated in the Preliminary Response, we decline to institute trial on the grounds based on Miyake or Dufлот because Petitioner fails to show sufficiently that either reference discloses or suggests a “product composition” that “is produced” by a contacting step as required by each challenged claim as construed above. Prelim. Resp. 16–17 (discussing the grounds based on Miyake); 25–28 (discussing the grounds based on Dufлот).

As for the ground based on Duan, the Petition fails to direct us to evidence sufficient to show that the reference discloses an aqueous feed composition “that has a solids concentration of at least about 70% by weight” as required by claim 1. Ex. 1001, 19:46–47; Pet. 65 (acknowledging that Duan begins with “a 28% slurry of rye flour”). Patent

Owner persuasively shows that the Petition conflates the sugar content and the solids content in the aqueous feed composition disclosed by Duan. Prelim. Resp. 43–47. On that point, the Petition directs us to a disclosure in Duan that describes “syrups containing greater than 50% maltose,” and states without citation to any objective proof that such a syrup “encompasses feed compositions containing greater than 70% solids” as required by claim 1. Pet. 65 (emphasis omitted). As Patent Owner points out, the Petition ignores Duan’s further disclosure that the percentage is reported as a fraction “of the total sugar content” and not as a solids concentration of the slurry. Prelim. Resp. 44–45 (quoting Duan, Ex. 1010, 3:44–52. On this record, the Petition fails to direct us to persuasive information tending to establish that Duan’s aqueous feed composition meets the requirements of claim 1. Ex. 1001, 19:44–47 (specifying “an aqueous feed composition” having “a solids concentration of at least about 70% by weight”).

III. CONCLUSION

Accordingly, we institute an *inter partes* review as set forth in the Order below. Trial shall commence on the entry date of this decision.

IV. ORDER

It is

ORDERED that an *inter partes* review is instituted on the following grounds:

(1) Whether claims 1–4, 15–18, 23–29, 31, and 32 of the ’436 patent are anticipated under 35 U.S.C. § 102(b) by Shah;

(2) Whether claims 1–4, 15–18, 23–29, 31, and 32 of the '436 patent are obvious under 35 U.S.C. § 103 over the combined disclosures of Shah and Craig; and

(3) Whether claims 1–4, 15–18, 23–29, 31, and 32 of the '436 patent are obvious under 35 U.S.C. § 103 over the combined disclosures of Shah, Craig, and Cleland;

FURTHER ORDERED that no other grounds of unpatentability are authorized during the trial; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which will commence on the entry date of this decision.

PETITIONER:

David L. Glandorf
Joseph Evall
Daniel J. Thomasch
GIBSON, DUNN & CRUTCHER LLP
dglandorf@gibsondunn.com
jevall@gibsondunn.com
dthomasch@gibsondunn.com

PATENT OWNER:

Paul H. Berghoff
James V. Suggs
S. Richard Carden
MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP
Berghoff@mbhb.com
Suggs@mbhb.com
Carden@mbhb.com