United States Court of Appeals for the Federal Circuit

KANEKA CORPORATION,
a Japanese Corporation,
Plaintiff-Appellant

v.

XIAMEN KINGDOMWAY GROUP COMPANY,
a Chinese Corporation,
PACIFIC RAINBOW INTERNATIONAL INC.,
a California Corporation,
SHENZHOU BIOLOGY AND TECHNOLOGY CO., LTD., a Chinese Corporation,
Defendants-Appellees

2014-1373, -1399

Appeals from the United States District Court for the Central District of California in No. 2:11-cv-02389-MRP-SS, Senior Judge Mariana R. Pfaelzer.

Decided: June 10, 2015

KEITH D. NOWAK, Carter Ledyard & Milburn, LLP, New York, NY, argued for plaintiff-appellant. Also represented by ROBERT MCGEE BOWICK, JR., Raley & Bowick, LLP, Houston, TX.

REECE WERNER NIENSTADT, Mei & Mark LLP, Washington, DC, argued for defendants-appellees Xiamen

Kingdomway Group Company, Pacific Rainbow International Inc. Also represented by XIANG LONG, LEI MEI.

TIMOTHY PAAR WALKER, K&L Gates LLP, San Francisco, CA, argued for defendant-appellee Shenzhou Biology and Technology Co., Ltd. Also represented by LEI HOWARD CHEN, HAROLD H. DAVIS, JR., JAS SINGH DHILLON

GARY HNATH, Mayer Brown LLP, Washington, DC, for amici curiae, Zhejiang Medicine Co., Ltd, ZMC-USA, LLC. Also represented by PAUL WHITFIELD HUGHES; TRENTON MENNING, HENRY M. GRIFFIN IV, CHARLES STEPHEN KELLEY, Houston, TX.

Before NEWMAN, REYNA, and HUGHES, *Circuit Judges.*

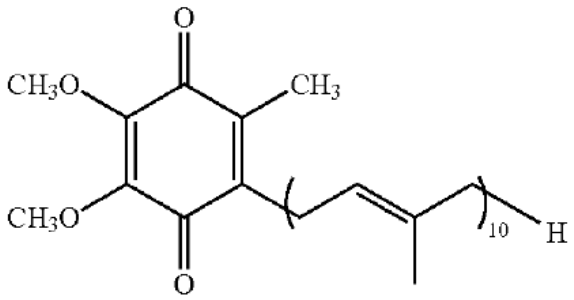
REYNA, *Circuit Judge.*

Kaneka Corporation sued Defendants Xiamen Kingdomway Group Company, Pacific Rainbow International Inc., and Shenzhou Biology and Technology Co., Ltd., in the Central District of California, alleging infringement of U.S. Patent No. 7,910,340 (the '340 Patent). The district court granted summary judgment of noninfringement based on the district court's claim construction. Kaneka appealed. For the reasons that follow, we affirm-in-part, vacate-in-part, and remand.

BACKGROUND

Coenzyme Q_{10} exists in animal cells. Cells use coenzyme Q_{10} to produce adenosine triphosphate, which aids cellular respiration. Coenzyme Q_{10} assists adenosine triphosphate production through redox reactions, in which the coenzyme gives up and gains electrons. Both oxidized and reduced coenzyme Q_{10} are sold as dietary supplements.

Kaneka owns the '340 Patent, which describes processes for producing oxidized and reduced coenzyme Q_{10}. The claims at issue in this appeal describe processes for producing oxidized coenzyme Q_{10}. Independent claim 1 recites:

> 1. A process for producing on an industrial scale the oxidized coenzyme Q_{10} represented by the following formula:
>
> 
>
>
> which comprises culturing reduced coenzyme Q_{10}-producing microorganisms in a culture medium containing a carbon source, a nitrogen source, a phosphorus source and a micronutrient to obtain microbial cells containing reduced coenzyme Q_{10} at a ratio of not less than 70 mole % among the entire coenzymes Q_{10},
>
> disrupting the microbial cells to obtain reduced coenzyme Q_{10}; and
>
> oxidizing thus-obtained reduced coenzyme Q_{10} to oxidized coenzyme Q_{10} and then extracting the oxidized coenzyme Q_{10} by an organic solvent under an *inert gas atmosphere*.

'340 Patent col. 23 l. 56–col. 24 l. 25; J.A. 80 (certificate of correction) (emphasis added to disputed language).

Claim 11 is identical to claim 1 except the extraction step is recited before the oxidation step. '340 Patent col. 24 l. 50–col. 25 l. 6 ("extracting the reduced coenzyme Q_{10} by an organic solvent under an inert gas atmosphere, and oxidizing the extracted reduced coenzyme Q_{10} to oxidized coenzyme Q_{10}").

Independent claims 22 and 33 are identical to claims 1 and 11, respectively, except that the extraction step recited in claims 22 and 33 is carried out in a "sealed tank." Claim 22, like claim 1, recites the oxidation step before the extraction step. *Id.* col. 25 ll. 32–54 ("*oxidizing* thus-obtained reduced coenzyme Q_{10} to oxidized coenzyme Q_{10} *and then* extracting the oxidized coenzyme Q_{10} by an organic solvent in a *sealed tank*") (emphasis added to disputed language). Claim 33 is identical to claim 22 except the extraction step is recited before the oxidation step. *Id.* col. 26 ll. 13–36 ("extracting the reduced coenzyme Q_{10} by an organic solvent in a *sealed tank*, and *oxidizing the extracted* reduced coenzyme Q_{10} to oxidized coenzyme Q_{10}") (emphasis added to disputed language).

On March 22, 2011, Kaneka filed suit in the Central District of California, asserting independent claims 1, 11, 22, and 33, along with respective dependent claims. In June, Kaneka filed a Section 337 Petition in the U.S. International Trade Commission ("Commission") involving the same claims. The district court stayed the lawsuit pending resolution of the Commission proceeding. The Commission issued a decision finding no infringement by any of the respondents.

Following the conclusion of the Commission proceeding, the district court lifted the stay and construed the asserted claims. The court construed the term "inert gas atmosphere" to mean "a gas atmosphere that is free or substantially free of oxygen and reactive gases." J.A. 3578. The "culturing" step was construed such that the mole ratio of reduced coenzyme Q_{10} relative to all the

coenzyme Q_{10} in the process would be measured at a certain point in the process according to a particular assay described in the '340 Patent. J.A. 14051. The court construed the term "sealed tank" to mean "a tank that is closed to prevent the entry or exit of materials." J.A. 3579. The "oxidizing" step of claims 1 and 22 was construed to mean "actively converting all or substantially all of the reduced coenzyme Q_{10} obtained from the disruption step to oxidized coenzyme Q_{10} in a step before beginning the extraction step," while the "oxidizing" step of claims 11 and 33 was construed to mean "actively converting all or substantially all of the extracted reduced coenzyme Q_{10} obtained from the disruption step to oxidized coenzyme Q_{10} in a separate step after the extraction step has been performed." J.A. 3585–86.

Based on the district court's claim construction, Defendants moved for summary judgment of noninfringement with respect to claims 1, 11, 22, 33, and associated dependent claims. The district court found an absence of a genuine issue of material fact that Defendants' accused process does not infringe on the basis of the court's construction of three claim terms: "inert gas atmosphere," "sealed tank," and the "oxidizing" step. Kaneka appealed from the district court's summary judgment, challenging the district court's claim construction. We have jurisdiction under 28 U.S.C. § 1295(a)(1).

DISCUSSION

We first address whether Kaneka waived the right to challenge certain arguments regarding the district court's grant of summary judgment. Shenzhou contends that although Kaneka argued claim construction in its opening brief, Kaneka failed to identify a genuine issue of material fact as to whether Appellees would infringe the asserted claims under Kaneka's proposed construction.

We disagree. For the reasons that follow, the district court's grant of summary judgment of noninfringement

rests on an erroneous claim construction. Hence, a genuine issue of material fact concerning infringement may exist under the proper construction. *See Wilson Sporting Goods Co. v. Hillerich & Bradsby Co.*, 442 F.3d 1322, 1326 (Fed. Cir. 2006) ("[T]he legal function of giving meaning to claim terms always takes place in the context of a specific accused infringing device or process."). Summary judgment should ordinarily be vacated or reversed if the district court bases summary judgment on an erroneous claim construction. *Innovad Inc. v. Microsoft Corp.*, 260 F.3d 1326, 1335 (Fed. Cir. 2001).

We review a district court's grant of summary judgment according to the law of the regional circuit, here the Ninth Circuit, where summary judgment is reviewed de novo. *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 769 F.3d 1371, 1377 (Fed. Cir. 2014) (citing *Humane Soc'y of U.S. v. Locke*, 626 F.3d 1040, 1047 (9th Cir. 2010)). Accordingly, we reapply the standard applied by the district court. *See Bos. Scientific Corp. v. Johnson & Johnson*, 647 F.3d 1353, 1361 (Fed. Cir. 2011). In the Ninth Circuit, summary judgment is appropriate when, drawing reasonable inferences in favor of the non-moving party, there is no genuine issue of material fact. *Comite de Jornaleros de Redondo Beach v. City of Redondo Beach*, 657 F.3d 936, 942 (9th Cir. 2011). We review claim construction de novo except for subsidiary facts that are based on the extrinsic record, which we review for clear error. *Teva Pharm. U.S.A. Inc. v. Sandoz, Inc.* 135 S. Ct. 831, 841–42 (2015); *Info-Hold, Inc. v. Applied Media Techs. Corp.*, No. 2013-1528, 2015 WL 1865680, at *3 (Fed. Cir. Apr. 24, 2015).

I. "Inert Gas Atmosphere"

The district court construed the term "inert gas atmosphere" to mean "a gas atmosphere that is free or substantially free of oxygen and reactive gases." J.A. 3578. While Kaneka made claim construction arguments challenging the district court's construction of this claim

term in its opening brief, Kaneka later withdrew its arguments in light of another unfavorable claim construction of this term in a related case pending in the Southern District of Texas. Letter of Appellant Kaneka at 2, *Kaneka Corp. v. Xiamen Kingdomway*, Nos. 14-1373, -1399 (Fed. Cir. Oct. 16, 2014), ECF No. 103. As a result, we affirm the district court's grant of summary judgment of noninfringement of independent claims 1 and 11 and dependent claims 8-9 and 19-20.

II. "Sealed Tank"

In construing the term "sealed tank," the district court adopted "in its entirety" the reasoning of the Commission in the related proceeding that involved the same claim term. In that proceeding, the Commission consulted a dictionary definition that defined "seal" as "a tight and perfect closure (as against the passage of gas or water)" because the term "sealed" is not defined in the specification. J.A. 5347 (citing Merriam-Webster's Collegiate Dictionary, 10th ed. (2001)). An expert testifying before the Commission agreed with this meaning, explaining that the plain meaning of "sealed" is "airtight." *Id.* On that basis, the district court construed the term "sealed tank" to mean "a tank that is closed to prevent the entry or exit of materials." J.A. 3579.

Kaneka argues that the district court's construction conflicts with the intrinsic record because the specification suggests that the "sealed tank" is not closed to prevent entry and exit of all materials. Defendants respond that the district court's construction is consistent with the only plain and ordinary meaning of the term "sealed," that is not otherwise defined by the specification.

We agree with Kaneka that the district court's construction is inconsistent with the intrinsic record. Claim construction begins with the language of the claims. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc); *Vitronics Corp. v. Conceptronic, Inc.*, 90

F.3d 1576, 1582 (Fed. Cir. 1996). When interpreting claim language, courts consult the intrinsic record, which includes the specification and prosecution history. *Phillips*, 415 F.3d at 1315–17. The specification is "the single best guide to the meaning of a disputed term." *Id.* at 1315 (citation omitted). Extrinsic evidence, such as dictionary definitions, for example, may be useful when construing claim terms, "so long as the dictionary definition does not contradict any definition found in or *ascertained by* a reading of the patent documents." *Id.* at 1322–23 (internal quotation marks omitted and emphasis added).

The district court's reliance on the Commission's dictionary definition and related testimony conflicts with the intrinsic record. Figure 1 and Example 8 suggest that the "sealed tank" should be sealed to the atmosphere, but not necessarily to other materials, such as solvents. *See* '340 Patent col. 23 ll. 17–44. In the industrial scale process of Example 8, a solution of disrupted (ruptured) cells containing reduced coenzyme Q_{10} is "sealed with nitrogen gas," i.e., sealed under an inert gas atmosphere such that solution contents are not exposed to the atmosphere, and continuously extracted in a manner that allows solvent to flow into and out of the extraction tanks depicted in Figure 1. Though Example 8 refers to extracting *reduced* coenzyme Q_{10}, the specification describes how to similarly extract *oxidized* coenzyme Q_{10}. *See, e.g.*, *id.* col. 17 ll. 1–5. By depicting solvent flowing into and out of the extraction tanks, the specification indicates that the "sealed tank" is not sealed to prevent entry or exit of all materials.

In addition, the district court's construction of "sealed tank" excludes Figure 1 and Example 8, which are the only examples of an industrial scale process, as the other examples describe lab-scale processes. A claim construction that excludes a preferred embodiment is "rarely, if ever, correct." *MBO Labs., Inc. v. Becton, Dickinson & Co.*, 474 F.3d 1323, 1333 (Fed. Cir. 2007) (citation omitted). A construction that excludes *all* disclosed embodi-

ments, such as the district court's construction of the term "sealed tank," is especially disfavored. *See id.*

Defendants argue that because the patentee did not define the term "sealed," the term must have one plain and ordinary meaning that governs. We disagree. An adjective such as "sealed" may have more than one plain and ordinary meaning. *See, e.g.*, *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1361 (Fed. Cir. 2008) (recognizing that a term may have more than one "ordinary" meaning). Although the specification does not specifically define the term "sealed," the appropriate definition can be ascertained from the specification. *See Phillips*, 415 F.3d at 1322–23.

Defendants argue that "sealed" must be construed according to the dictionary definition because the written description never uses the term "sealed"—the patentee added the term "sealed" to the claims during prosecution. Defendants also highlight that Figure 1 does not label the tanks as "sealed." We disagree that "sealed" must be construed using a dictionary. As in the written description context, word-for-word alignment of disclosed embodiments (such as the extraction tanks depicted in Figure 1) with claim language is unnecessary when the meaning of a claim term can be ascertained from the intrinsic record. *See Fujikawa v. Wattanasin*, 93 F.3d 1559, 1570 (Fed. Cir. 1996); *Phillips*, 415 F.3d at 1322–23. Accordingly, we hold that the term "sealed tank," means "a tank that prevents exposure of the tank's contents to the atmosphere."

III. "Oxidizing" Step

The district court construed "oxidizing" in claims 1 and 22 to mean "actively converting all or substantially all of the reduced coenzyme Q_{10} obtained from the disruption step to oxidized coenzyme Q_{10} in a step before beginning the extraction step," while "oxidizing" in claims 11 and 33 was construed to mean "actively converting all or

substantially all of the extracted reduced coenzyme Q_{10} obtained from the disruption step to oxidized coenzyme Q_{10} in a separate step after the extraction step has been performed." J.A. 3585–86. The district court concluded that this construction has four limitations. First, oxidation "must be an active, not a passive, process." J.A. 14059. Second, "all or substantially all" of the reduced coenzyme Q_{10} must be converted during the oxidation step. *Id.* Third, oxidation must occur either before the extraction step in claim 22 or after the extraction step in claim 33. *Id.* Fourth, oxidation must occur separately from the culturing, disruption, and extraction steps. *Id.*

Kaneka argues that the district erred for two reasons. First, the claims do not require *active* conversion of reduced coenzyme Q_{10} to oxidized coenzyme Q_{10}. Second, the claims do not require that "all or substantially all" of the reduced coenzyme Q_{10} be oxidized in a single step.

Defendants counter that the claim language requires that the recited steps be performed in order. Defendants contend that the order necessarily requires that "all or substantially all" of the coenzyme Q_{10} be oxidized during the oxidation step, and that no oxidation can occur during other steps.

We agree that oxidation requires an active step. A process is defined as "an act, or a series of acts." *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *In re Kollar*, 286 F.3d 1326, 1332 (Fed. Cir. 2002) ("[A] process . . . consists of a series of acts or steps . . . . It consists of doing something, and therefore has to be carried out or performed."). Here, because the claims affirmatively recite the step of "oxidizing," "oxidizing" cannot be interpreted as doing nothing, or to simply allow oxidation to occur on its own. Nor can the other recited claim steps, such as culturing or disrupting, suffice as the active step resulting in oxidation. If those other steps qualify as the

oxidation step, the patentee's inclusion of a separate oxidation step would have no significance.

The oxidation step requires action, but it does not require the use of an oxidizing agent. Though the preferred embodiment uses an oxidizing agent, *see, e.g.,* '340 Patent col. 17 l. 13., we must be cautious not to import preferred limitations into the claims. *See Laitram Corp. v. Cambridge Wire Cloth Co.*, 863 F.2d 855, 865 (Fed. Cir. 1998). Dependent claims 25, 26, 37, and 38 also recite an oxidizing agent, '340 Patent col. 25 ll. 61–64; col. 26 ll. 44–47, but it would be improper to import a claim limitation from a dependent claim into an independent claim, *see InterDigital Commc'ns, LLC v. Int'l Trade Comm'n*, 690 F.3d 1318, 1324 (Fed. Cir. 2012) (quoting *Liebel–Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004) ("The doctrine of claim differentiation is at its strongest . . . 'where the limitation that is sought to be 'read into' an independent claim already appears in a dependent claim.'")). Thus, an oxidizing agent is not required to carry out the "oxidizing" step.

We also agree that *some* oxidation must occur before the extraction step in claim 22 or after the extraction step in claim 33. Where the steps of a method claim actually recite an order, we ordinarily construe the claim to require order. *See Interactive Gift Exp., Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1342 (Fed. Cir. 2001). A method claim can also be construed to require that steps be performed in order where the claim implicitly requires order, for example, if the language of a claimed step refers to the completed results of the prior step. *E-Pass Techs., Inc. v. 3Com Corp.*, 473 F.3d 1213, 1222 (Fed. Cir. 2007). We hold that the oxidation step in claims 22 and 33 refers to the product of the previous step, and, therefore, at least some action resulting in oxidation must be applied to the product of the disruption step in claim 22, and the product of the extraction step in claim 33.

We disagree that the claimed order excludes passive oxidation during other process steps. *See, e.g.*, '340 Patent col. 16 ll. 16–34 (discussing passive oxidation). The claims' preamble term "comprises" indicates that additional oxidation steps or results are not excluded. *See, e.g.*, *Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp.*, 320 F.3d 1339, 1350 (Fed. Cir. 2003). Requiring active oxidation during the oxidation step preserves the claimed order, but does not exclude passive oxidation during other steps.

We also disagree with the district court's conclusion and Defendants' arguments on appeal suggesting that the claimed order requires that each step occur independently or separately. In claim 22, some action resulting in oxidization must be applied to the product of the disruption step. *See* '340 Patent col. 25 ll. 32–54 ("disrupting . . . to obtain reduced coenzyme Q_{10}; and oxidizing *thus-obtained* reduced coenzyme Q_{10} to oxidized coenzyme Q_{10} . . . ."") (emphasis added). This does not necessarily mean that the disruption step has to be complete before the oxidation step begins. The claims do not exclude a continuous process, in which later steps are initiated as soon as at least some product from the previous step forms, while previous steps are still ongoing. The written description contemplates continuous process steps. *See, e.g.*, '340 Patent col. 8 l. 50 (continuous nutrient feed); col. 16 ll. 7–8 (continuous extraction).[1] The claims do not

[1] Kaneka admitted at oral argument that the extraction step recited in claim 22 occurs after the disrupting and oxidation steps. Oral argument at 11:55–12:07 (available at http://www.cafc.uscourts.gov/oral-argument-recordings/all/kaneka.html) ("I think it's pretty clear that when you use the term 'and then' the patent holder was saying that extraction here in claim 22 is coming after disruption and oxidizing."). Kaneka's admission implies

exclude a process in which every claim step is occurring simultaneously. By the same logic, the extraction step recited in claim 33 does not have to be complete before the oxidation step begins as long as the oxidation step is applied to at least *some* extracted product. In other words, the claims require order but do not require discrete steps.

The district court concluded that "all or substantially all" of the reduced coenzyme Q_{10} must be oxidized during the oxidation step. We disagree. There is no mention in the specification of a yield requirement. Nor is yield relevant to the order of the claimed steps.

To summarize, the oxidation step requires some action that results in oxidation but does not require oxidation of "all or substantially all" of the coenzyme Q_{10}. Because the oxidation step indicates that oxidation is carried out on the product from the previous disruption step in claim 22, some action resulting in oxidation must occur after some product from the disruption step forms and before the extraction step in claim 22 begins. Similarly, some action resulting in oxidation must occur after at least some reduced coenzyme Q_{10} has been extracted in claim 33. Because the claims read on a continuous process, a process step does not need to be complete before another step begins. Thus, it is not required that any one step be carried out separately or independently of any other step.

CONCLUSION

We affirm the district court's grant of summary judgment of noninfringement of independent claims 1 and 11 and dependent claims 8-9 and 19-20. We vacate summary

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that some extraction must occur after some disruption and oxidation, but not necessarily that disruption and oxidation must be complete before extraction begins.

judgment of noninfringement of independent claims 22 and 33 and associated dependent claims, and remand to the district court for proceedings consistent with this opinion.

AFFIRMED IN PART, VACATED IN PART, and REMANDED

COSTS

No costs.