UNITED STATES DISTRICT COURT
DISTRICT OF MINNESOTA

Oxygenator Water Technologies, Inc.,

Plaintiff,

v.

Tennant Company,

Defendant.

File No. 20-cv-358 (ECT/HB)

OPINION AND ORDER

Nathan Louwagie, Aaron W. Pederson, Hannah Mosby O'Brien, J. Derek Vandenburgh, Philip P. Caspers, and Todd S. Werner, Carlson Caspers Vandenburgh & Lindquist, P.A., Minneapolis, MN, for Plaintiff Oxygenator Water Technologies, Inc.

Lora M. Friedemann, Adam R. Steinert, and Timothy O'Shea, Fredrikson & Byron, P.A., Minneapolis, MN; Cara S. Donels, R. Scott Johnson, and Thomas M. Patton, Fredrikson & Byron, P.A., Des Moines, IA, for Defendant Tennant Company.

Plaintiff Oxygenator Water Technologies, Inc. owns three patents on an invention that generates tiny oxygen bubbles in water in order to increase the water's oxygen content. Defendant Tennant Company manufactures and sells commercial floor scrubbers that use a similar process to oxygenate water. Oxygenator believes that Tennant's floor scrubbers infringe its patents.

The Parties seek construction of numerous claim terms in Oxygenator's patents. *See Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996). The Parties agree on constructions for seven claim terms. Those agreed constructions, which are shown in the

following table, will be adopted because they are consistent with the claims and the intrinsic record, and nothing more will be said about them in this opinion.

Agreed Constructions		
Term(s)/Phrase(s)	**Patent Claim(s)**	**Construction**
"a suspension comprising oxygen microbubbles and nanobubbles"	'415 Patent, Claim 13	*A mixture including microbubbles and nanobubbles that are dispersed within but undissolved in the water.*
"microbubble"	'415 Patent, Claims 13, 19, 20, 21, 22, 25; '092 Patent, Claim 23	*A bubble with a diameter less than 50 microns.*
"critical distance"	'415 Patent, Claim 13	*The distance separating the anode and cathode at which evolved oxygen forms microbubbles and nanobubbles.*
"aquarium reservoir container"	'415 Patent, Claim 20	*A container designed for keeping fish or other live aquatic creatures.*
"supersaturate"	'415 Patent, Claim 21	*Causing water to have oxygen at a higher concentration than normal calculated oxygen solubility at a particular temperature and pressure.*
"concave"	'092 Patent, Claim 64	*Curved inward.*
"radial direction relative to the longitudinal center axis"	'092 Patent, Claim 65	*A direction perpendicular to the longitudinal center axis.*

The Parties dispute the meaning of seventeen claim terms. For the reasons discussed below, those disputed terms will be construed as follows:

Constructions of Disputed Terms		
Claim Term	**Claim**	**Recommendation**
"water"	'415 Patent, Claims 13, 18, 19, 20, 21, 25, 29; '092 Patent, Claims 13, 27, 60; '665 Patent, Claims 13, 55	*Any aqueous medium that can support the electrolysis of water*
"conductivity produced by the presence of dissolved solids such that the water supports plant or animal life"	'415 Patent, Claim 13	No construction
"aqueous medium"	'665 Patent, Claim 55	No construction
"oxygenated aqueous composition"	'415 Patent, Claim 13	No construction
"tubular housing"	'415 Patent, Claims 13 and 26	*An enclosure shaped like a cylinder, hose, or tube*
"flowing water . . . through an electrolysis emitter"	'415 Patent, Claim 13	*Moving water through an electrolysis emitter by means other than electrolysis*
"a flow-through oxygenator"	'092 Patent, Claim 13	*A device that oxygenates water as the water passes through it*
"deliver electrical current to the electrodes while water flows through the tubular housing"	'665 Patent, Claim 13	*Deliver electrical current to the electrodes while moving water through the electrolysis emitter by means other than electrolysis*

"passing water through the tubular housing"	'092 Patent, Claim 13	*Moving water through an electrolysis emitter by means other than electrolysis.*
"an electrical power source" and "a power source"	'415 Patent, Claim 13; '092 Patent, Claims 13 and 27; '665 Patent, Claim 13	*Electrical and mechanical equipment and their interconnections used to generate and/or convert power*
"nanobubble"	'415 Patent, Claims 13, 19, 20, 21, 22, 25; '092 Patent, Claim 26	*A bubble with a diameter less than that necessary to break the surface tension of water*
"incapable of breaking the surface tension of the water"	'415 Patent, Claim 25	No construction
"the water temperature is a factor for formation of the suspension"	'415 Patent, Claim 18	*The method uses water temperature as a factor in forming the suspension*
"the microbubbles and nanobubbles remain in the water at least in part for a period up to several hours"	'415 Patent, Claim 19	No construction.
"wherein the period for which microbubbles and nanobubbles at least in part remain in the water is determined by containing the water with microbubbles in a two and one half gallon aquarium reservoir container"	'415 Patent, Claim 20	*Wherein the water with microbubbles and nanobubbles is contained in a two and one half gallon aquarium reservoir container to determine the period for which the microbubbles and nanobubbles at least in part remain in the water*

"a first anode electrode portion that is non parallel to a second anode electrode portion"	'665 Patent, Claim 61	No construction
"tubular flow axis from the inlet to the outlet"	'415 Patent, Claim 13	*A main line of flow through the tubular housing from the inlet to the outlet*

I

This case involves three patents owned by Oxygenator: U.S. Patent Nos. RE45,415 ("the '415 patent"), RE47,092 ("the '092 patent"), and RE47,665 ("the '665 patent") (collectively, "the patents-in-suit"). All three patents-in-suit are part of the same lineage. The '092 patent is a continuation of the '665 patent, which is itself a continuation of the '415 patent. The '415 patent began as a reissue application for U.S. Patent No. 7,670, 495 ("the '495 patent"). The '495 patent issued from a divisional application of U.S. Patent No. 7,396,441 ("the '441 patent"). The '441 patent was a continuation-in-part of U.S. Patent No. 6,689,262 ("the '262 patent"). And the '262 patent claims priority to U.S. Provisional Application 60/358,534, which was filed by a man named James A. Senkiw in 2002. *See* Donels Decl. ¶ 2, Ex. A [ECF Nos. 77, 77-1]. The upshot is that the patents-in-suit share the same parent patent and the same specification.[1]

The patents-in-suit disclose devices and methods for using a process known as electrolysis to form tiny bubbles of oxygen gas in water. Joint Appendix ("JA") 11 at 1:23–30, 2:66–3:3 [ECF Nos. 74, 74-1]. Essentially, this works by situating two electrodes with

[1] Citations to the specification in this opinion will refer to the pages of the '415 patent.

opposite charges at a "critical distance" from (*i.e.*, very close to) one another and surrounding them with water. JA12 at 3:13–16. The resulting electrical charge breaks apart some of the water molecules, leaving behind hydrogen gas and oxygen gas. JA11 at 2:3–18. The hydrogen immediately forms large bubbles and escapes into the atmosphere. JA12 at 4:38–41. But if the oxygen bubbles are small enough, they will remain suspended in the water for some period of time instead of floating up and breaking the water's surface tension. JA12 at 4:27–37. This leaves water that is "supersaturated with oxygen." JA12 at 4:38.

The record shows several potential applications for oxygenated water. A heightened concentration of oxygen can be beneficial to aquatic creatures living in aquariums or bait buckets. *See* JA13 at 5:24–25. It can aid the hydroponic growth of plants. *See* JA14 at 7:48–67. And it can be used for other agricultural purposes like watering hoses and irrigation systems. JA15 at 9:9–67. Tennant uses electrolysis to oxygenate water in commercial floor scrubbers. Am. Compl. ¶ 13 [ECF No. 9]. According to its advertisements, oxygenated water can be used to clean floors without using potentially harmful chemicals. *Id.* Oxygenator believes that Tennant's floor scrubbers infringe the patents-in-suit.

II

The basic standards governing claim construction are easy to recite, if sometimes difficult to apply. Courts, not juries, construe patent claims. *Markman*, 517 U.S. at 391. In general, claim language means whatever it would have meant to a person of ordinary skill in the relevant art at the time the patent application was filed. *Phillips v. AWH Corp.*,

415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). Construction is most necessary when a claim uses "technical terms for which the jury may not appreciate an 'ordinary' meaning." Fed. Judicial Ctr., *Patent Case Management Judicial Guide* § 5.1.4.3 (3d ed. 2016); *accord Eli Lilly & Co. v. Aradigm Corp.*, 376 F.3d 1352, 1360 (Fed. Cir. 2004) (citing *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997)). Sometimes, however, the ordinary and customary meaning of claim language to a person of ordinary skill in the art may be identical to the meaning of that language to a lay person who is not skilled in the art. *See Phillips*, 415 F.3d at 1314 (acknowledging that claim construction sometimes "involves little more than the application of widely accepted meaning of commonly understood words"). When the meaning of a claim term is clear and there is no genuine dispute as to its scope, a court may decline to issue a construction. *See O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008); *Patent Case Management Judicial Guide* § 5.1.4.3 (explaining that construing a term under such circumstances "could well encroach upon the fact-finder's domain"); *see also, e.g.*, *QXMédical, LLC v. Vascular Sols., LLC*, No. 17-cv-1969 (PJS/TNL), 2018 WL 5617568, at *6 (D. Minn. Oct. 30, 2018). Courts depart from the plain and ordinary meaning of a claim term only "when a patentee acts as his own lexicographer" or "when the patentee disavows the full scope of the claim term in the specification or during prosecution." *Poly-Am., L.P. v. API Indus., Inc.*, 839 F.3d 1131, 1136 (Fed. Cir. 2016).

"The intrinsic record in a patent case is the primary tool to supply the context for interpretation of disputed claim terms." *V-Formation, Inc. v. Benetton Grp. SpA*, 401 F.3d 1307, 1310 (Fed. Cir. 2005) (citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576,

1582 (Fed. Cir. 1996)). Such intrinsic evidence includes "the words of the claims themselves, the remainder of the specification, [and] the prosecution history," which "consists of the complete record of the proceedings before the [Patent and Trademark Office ("PTO")] and includes the prior art cited during the examination of the patent." *Phillips*, 415 F.3d at 1314, 1317 (citations omitted). The prosecution history of a parent application also constitutes intrinsic evidence that may be useful in construing claim terms. *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 980 (Fed. Cir. 1999). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp.*, 90 F.3d at 1582).

Courts also may rely on "extrinsic evidence"—that is, "all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Phillips*, 415 F.3d at 1317 (citations omitted). Extrinsic evidence "can shed useful light on the relevant art," but it "is less significant than the intrinsic record in determining the legally operative meaning of disputed claim language." *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 862 (Fed. Cir. 2004) (internal quotation marks and citation omitted); *see Phillips*, 415 F.3d at 1317. Extrinsic evidence is "less reliable" than intrinsic evidence and may not be used to contradict intrinsic evidence. *Phillips*, 415 F.3d at 1318; *see Mantech Env't Corp. v. Hudson Env't Servs., Inc.*, 152 F.3d 1368, 1373 (Fed. Cir. 1998).

III

The Parties dispute the meaning of seventeen claim terms. *See* Joint Claim Construction Statement at 2–5 [ECF No. 75]. Most of these disputed terms appear in one of four independent claims in the patents-in-suit.

The first independent claim is Claim 13 of the '415 patent, which provides in its entirety:

> 13. A method for producing an oxygenated aqueous composition comprising:
>
> flowing water at a flow rate no greater than 12 gallons per minute through an electrolysis emitter comprising an electrical power source electrically connected to an anode electrode and a cathode electrode contained in a tubular housing,
>
> causing electricity to flow from the power source to the electrodes, and,
>
> producing the composition comprising a suspension comprising oxygen microbubbles and nanobubbles having a bubble diameter of less than 50 microns, wherein:
>
> the anode electrode is separated at a critical distance from the cathode such that the critical distance is from 0.005 inches to 0.140 inches;
>
> the power source produces a voltage no greater than about 28.3 volts and an amperage no greater than about 13 amps,
>
> the tubular housing has an inlet and an outlet and a tubular flow axis from the inlet to the outlet;
>
> the water flows in the inlet, out the outlet, is in fluid connection with the electrodes, and the water flowing into the inlet has a conductivity

> produced by the presence of dissolved solids such that the water supports plant or animal life.

JA16 at 11:20–45. The next is Claim 13 of the '092 patent, which provides as follows:

> 13. A method for treating water comprising:
>
> providing a flow-through oxygenator comprising an emitter for electrolytic generation of bubbles of oxygen, the emitter including:
>
> a tubular housing having a water inlet, a water outlet, and a longitudinal water flow axis from the inlet to the outlet;
>
> at least two electrodes comprising a first electrode and a second electrode, the first and second electrodes being positioned in the tubular housing, the first electrode opposing and separated from the second electrode by a distance of between 0.005 inches to 0.140 inches within the tubular housing;
>
> each electrode of the emitter is positioned so that substantially all points midway between all opposing electrodes are closer to a surface of the tubular housing than to a center point within the tubular housing and so that at least some water may flow from the water inlet to the water outlet without passing through a space between electrodes of opposite polarity separated by a distance of between 0.005 inches to 0.140 inches;
>
> a power source in electrical communication with the electrodes, the power source configured to deliver a voltage to the electrodes, the voltage being less than or equal to 28.3 volts, the power source being configured to deliver a current to the electrodes, the current being less than or equal to 12.8 amps;

> passing water through the tubular housing while electrical current is applied to the electrodes producing oxygen in said water via electrolysis.

JA33 at 11:53–12:17. The third is Claim 13 of the '665 patent, which discloses:

> 13. An emitter for electrolytic generation of bubbles of oxygen in water, the emitter comprising:
>
> a tubular housing having a water inlet, a water outlet, and a longitudinal water flow axis from the inlet to the outlet;
>
> at least two electrodes comprising a first electrode and a second electrode, the first and second electrodes being positioned in the tubular housing, the first electrode opposing and separated from the second electrode by a distance of between 0.005 inches to 0.140 inches within the tubular housing;
>
> each electrode of the emitter is positioned so that all points midway between all opposing electrodes are closer to a surface of the tubular housing than to a center point within the tubular housing and so that at least some water may flow from the water inlet to the water outlet without passing through a space between electrodes of opposite polarity separated by a distance of between 0.005 inches to 0.140 inches;
>
> a power source in electrical communication with the electrodes, the power source configured to deliver a voltage to the electrodes, the voltage being less than or equal to 28.3 volts, the power source being configured to deliver a current to the electrodes, the current being less than or equal to 12.8 amps;
>
> the power source being operable to deliver electrical current to the electrodes while water flows through the tubular housing and is in contact with the electrodes to produce oxygen in said water via electrolysis.

JA54 at 11:39–67. The fourth independent claim is Claim 27 of the '092 patent, which discloses:

> 27. An emitter for electrolytic generation of bubbles of oxygen in water, the emitter comprising:
>
> a tubular housing defining an oxygenation chamber and having a water inlet, a water outlet, a longitudinal water flow axis from the inlet to the outlet, and an inward-facing surface that runs parallel to the water flow axis and defines at least in part the oxygenation chamber;
>
> at least two electrodes comprising an outside electrode and an inside electrode, the outside and inside electrodes being positioned in the oxygenation chamber, said outside and inside electrodes extending in a direction that is parallel to the longitudinal axis, the outside electrode opposing and separated from the inside electrode by a distance of between 0.005 inches and 0.140 inches within the chamber,
>
> wherein the position and size of each electrode within the chamber defines a cross-section of the chamber that has a water flow area within the oxygenation chamber through which water may flow without passing between electrodes of opposite polarity that are separated by a distance of between 0.005 inches to 0.140 inches, wherein the water flow area is greater than an area at the cross-section equal to the total area between electrodes of opposite polarity that are separated by a distance of between 0.005 inches to 0.140 inches,
>
> wherein at least a portion of the outside electrode positioned in the chamber is closer to the inward-facing surface of the oxygenation chamber than to a longitudinal center axis of the oxygenation chamber; and
>
> a power source in electrical communication with the outside and inside electrodes, the power source configured to deliver a voltage to the outside and inside electrodes, the voltage being less than or equal to 28.3

> volts, the power source being configured to deliver a current to the outside and inside electrodes, the current being less than or equal to 12.8 amps.

JA34 at 13:40–14:9. Shorter dependent claims will be introduced below in connection with the relevant disputed term.

A[2]

The first two disputed claim terms are "water" and "nanobubble." Although the Parties' arguments surrounding these terms do not overlap completely, the terms have

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[2] Several times throughout its briefing, Oxygenator argues that Tennant's claim-construction positions are inconsistent with the positions Tennant has raised in two petitions for *inter partes* review ("IPR") it has filed with respect to the patents-in-suit. *See* Louwagie Decl., Exs. 1, 2 [ECF Nos. 80-1, 80-2]. Oxygenator does not cite authority for these arguments or explain why the positions Tennant is taking before the PTAB should affect claim construction at this time.

Although Oxygenator never uses the phrases, these arguments seem meant to invoke the concept of judicial estoppel. "[W]here a party assumes a certain position in a legal proceeding, and succeeds in maintaining that position, he may not thereafter, simply because his interests have changed, assume a contrary position, especially if it be to the prejudice of the party who has acquiesced in the position formerly taken by him." *Trs. in Bankr. of N. Am. Rubber Thread Co. v. United States*, 593 F.3d 1346, 1353 (Fed. Cir. 2010) (*quoting New Hampshire v. Maine*, 532 U.S. 742, 749 (2001)). The decision whether to estop a party from asserting an argument depends on three non-exclusive factors: "(1) whether the party's position is clearly inconsistent with its earlier position; (2) whether the party has succeeded in persuading a court to accept that party's earlier position, so that judicial acceptance of an inconsistent position in a later proceeding would create the perception that either the first or the second court was misled; and (3) whether the party seeking to assert an inconsistent position would derive an unfair advantage or impose an unfair detriment on the opposing party if not estopped." *Id.* at 1354 (internal quotation marks and citation omitted).

These factors do not favor estoppel here. To be sure, Oxygenator has identified tension between some of Tennant's IPR positions and some of its proposed constructions. Oxygenator points out that, instead of pressing its claim-construction positions in the IPR proceeding, Tennant raised validity arguments that seem more consistent with Oxygenator's preferred constructions. *See, e.g.*, Oxygenator Br. at 4–5 [ECF No. 78].

something important in common: the specification purports to define both under the heading, "Definitions":

> For the purpose of describing the present invention the following terms have these meanings:
> . . .
> "Nanobubble" means a bubble with a diameter less than that necessary to break the surface tension of water. Nanobubbles remain suspended in the water, giving the water an opalescent or milky appearance.
> . . .
> "Water" means any aqueous medium with resistance less than one ohm per square centimeter; that is, a medium that can support the electrolysis of water. In general, the lower limit of resistance for a medium that can support electrolysis is water containing more than 2000 ppm total dissolved solids.

JA12 at 3:66–67, 4:12–14, 22–26.

1

Start with "water." Oxygenator argues that the construction of this term should be a shorter, simpler version of the specification's definition: "an aqueous medium that can support the electrolysis of water." Joint Claim Construction Statement at 2 [ECF No. 75]; Oxygenator Br. at 7–17. It asserts that the reference in the definition's first sentence to a "resistance less than one ohm per square centimeter" is "not strictly accurate" because, if

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Whether or not this amounts to "clear[]" inconsistency, as opposed to just legitimate strategy, is beside the point. The record does not show that Tennant has prevailed in IPR based on any of these positions, and because it has not, it is hard to see how it could derive any unfair advantage if it were to prevail on its claim construction positions here. *See Trs. of Columbia Univ. v. NortonLifeLock, Inc.*, No. 3:13cv808, 2019 WL 7040931, at *4–6 (E.D. Va. Dec. 20, 2019) (applying judicial estoppel when litigant prevailed on one claim construction in IPR proceedings before raising a contrary proposed construction in district court). For these reasons, it is unnecessary to address Oxygenator's estoppel arguments with any greater specificity.

taken literally, that limitation would exclude "ordinary tap water"—an "absurd result" that is inconsistent with the rest of the intrinsic record. *Id.* at 7–9. Oxygenator argues that the second sentence of the specification's definition has no place in the construction of "water" because it is "not definitional." *Id.* at 15–16.

Tennant's primary position is based on the principle that "[w]hen a patentee defines a claim term, the patentee's definition governs, even if it is contrary to the conventional meaning of the term." *Honeywell Int'l v. Universal Avionics Sys. Corp.*, 493 F.3d 1358, 1361 (Fed. Cir. 2007). According to Tennant, Oxygenator's decision to locate its definition of "water" under the "Definitions" heading means that Oxygenator is stuck with its chosen definition no matter what. Tennant Br. at 10–11 [ECF No. 76]; *see* Joint Claim Construction Statement at 2, 4. At the claim-construction hearing, Tennant seemed to characterize this rule as nearly absolute.

Tennant has cited, and research has disclosed, no case or other authority expressing the rule as Tennant advances it. The better understanding is that the law is not so rigid and that, when a patentee's chosen definition (even if it appears under the heading "Definitions") is, to a person of ordinary skill in the art, ambiguous, vague, or perhaps even indecipherable, a court must look beyond the chosen definition to construe the term. This is because a patentee must "define the specific terms used to describe his or her invention . . . with reasonable clarity, deliberateness, and precision." *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994); *see also Typhoon Touch Techs., Inc. v. Dell, Inc.*, 659 F.3d 1376, 1383 (Fed. Cir. 2011). Courts have rejected a patentee's definition for failing to meet this standard when the definition is "ambiguous," *Merck & Co. v. Teva Pharm. USA, Inc.*, 395

F.3d 1364, 1370–71 (Fed. Cir. 2005), or internally inconsistent, *Abbott Labs. v. Syntron Bioresearch, Inc.*, 334 F.3d 1343, 1354–55 (Fed. Cir. 2003); *see also, e.g.*, *Taro Pharm. Indus. Ltd. v. Novitium Pharma, LLC*, No. 19-01028 (FLW), 2020 WL 1673045, at *9 (D.N.J. Apr. 6, 2020).

Deciding whether the patentee defined "water" with "reasonable clarity, deliberateness, and precision" requires the consideration of some extrinsic evidence for context. *See Phillips*, 415 F.3d at 1317–18. The ability of an aqueous medium to support electrolysis depends on two related features of the medium: conductivity and resistivity. "Conductivity is a measure of how easily electrical current can flow through" the medium. White Decl. ¶ 29 [ECF No. 88]. "Resistivity is the inverse of conductivity and is a measure of the resisting power of" the medium "to the flow of an electrical current." *Id.* It is easy for a medium with a high conductivity and a low resistivity to support electrolysis. Conversely, it is difficult for a medium with a low conductivity and a high resistivity to support electrolysis. *See id.*

A medium's conductivity and resistivity depend, at least in part, on the level of dissolved solids in the medium. More dissolved solids means a higher conductivity (and a lower resistivity). *Id.* For electrolysis to work, however, there must be a Goldilocks-like level of dissolved solids. Too few dissolved solids, and the resistivity will be too high to support electrolysis; too many, and the resistivity will be too low. *Id.* ¶¶ 31–32. Although these background facts come from Oxygenator's expert, the Parties do not seem to dispute them.

With that background, it becomes clear that a person of ordinary skill in the art would understand the first sentence of the specification's definition of "water" to contain a mistake and a potential inconsistency. To recap, that sentence reads as follows: "'Water' means any aqueous medium with resistance less than one ohm per square centimeter; that is, a medium that can support the electrolysis of water." JA12 at 4:22–23. There are a couple of problems with this clause. First, there is a difference between "resistance" and "resistivity." White Decl. ¶ 35 n.4. Tennant does not dispute that resistivity, not resistance, is the relevant measure in determining water's utility for electrolysis. Second, "ohms per square centimeter" are not the units used to express resistivity or resistance; instead, an appropriate unit would be "ohms-centimeters." *Id.* ¶ 35; Suppl. Donels Decl., Ex. B at 66:18–25 [ECF No. 144-1]. These discrepancies at best introduce a degree of ambiguity—and at worst, meaninglessness—to the first clause.

Tennant suggests "correcting" the mistakes as follows:

> Water means any aqueous medium with *resistivity* less than one *ohm-centimeter*, that is, a medium that can support the electrolysis of water.

Tennant Resp. Br. at 4 [ECF No. 143]. Tennant's proposal introduces an internal inconsistency in the first sentence. Extrinsic evidence shows that an aqueous medium with a resistivity below 1 ohm-centimeter could not support the electrolysis of water, and it would exclude most everyday forms of water, including lake, river, tap, and ocean water. *See* Oxygenator Resp. Br. at 4 [ECF No. 145]. In other words, under Tennant's proposal, the first and second clauses of the first sentence would contradict each other.

Given this context, the specification and prosecution history support leaving the first clause out of the construction of "water." The examples in the specification contemplate increasing the oxygen content of water used to water plants and support aquatic life. *See* JA12–JA15. A person of ordinary skill in the art would not understand the word "water" as used therein to exclude tap water and other forms of natural freshwater in favor of a specialized form of water with extremely low resistivity. Indeed, at least one example in the specification describes the use of "plain tap water" as a control used to test the effectiveness of "oxygenated water." JA14 at 8:21. The patentee's statements during the prosecution of the '415 patent are consistent with this understanding. When discussing the phrase "water[] having a conductivity produced by dissolved solids so that the . . . water[] is capable of supporting plant or animal life"—logically, a subset of the general term "water"—the applicant stated that the phrase was meant to "cover[] potable water delivered by a municipal water treatment plant in addition to well water, lake water and irrigation water," as well as "[w]ater used to clean clothes, wash floors and water plants[.]" JA 1142–43.

The remaining question is whether the construction of "water" should include the second sentence of the specification's definition: "In general, the lower limit of resistance[3] for a medium that can support electrolysis is water containing more than 2000 ppm total dissolved solids." JA12 at 4:24–26. The correct answer is not obvious. After all, the patentee included the sentence in a set-off section of definitions under the heading,

[3] If the second sentence were included, then it would seem appropriate to change the word "resistance" to "resistivity" for the reasons discussed above.

"Definitions"—choices that suggest a clear intent to define a term. Plus, providing a clear upper limit on the amount of dissolved solids could serve a useful definitional purpose.[4] But the use of a qualifying phrase like "In general" tends to negate the clarity of the patentee's intent to define a claim term. *See, e.g.*, *Iscar Ltd. v. Sandvik AB*, No. 99-1577, 2000 WL 1225457, at *4 (Fed. Cir. Aug. 25, 2000); *Aguayo v. Universal Instruments Corp.*, 356 F. Supp. 2d 699, 722 n.49 (S.D. Tex. 2005).

On the whole, the better answer is to leave the second sentence out of the construction. The qualifying phrase "In general" makes the patentee's intent to include this sentence in the definition at least ambiguous. Absent a clear intent to include this language, doing so runs the risk of improperly reading a limitation from the specification into the claim. *See Phillips*, 415 F.3d at 1323. Moreover, including an upper limit of dissolved solids raises an obvious question: is there a lower limit, and if so, what is it? It seems clear from the record that an aqueous medium containing *no* dissolved solids would not support electrolysis. *See* White Decl. ¶ 31. Arguably, the most useful practical outcome would be to construe the term "water" to cover only a specific, closed range of dissolved-solids amounts. But no evidence reliably establishing a lower limit for dissolved solids has been cited. Under these circumstances, leaving the second sentence out entirely results in a more concise, simple definition that focuses on the key characteristic of "water" as used in the relevant claims: that it be able to support electrolysis. The Parties will be

[4] To be clear, this would be an upper limit for dissolved solids because of the inverse relationship between resistivity and the level of dissolved solids. Adding more than 2000 ppm in dissolved solids would lead to a resistivity below the "lower limit" necessary to support electrolysis.

free to introduce evidence down the road to help the jury determine what amounts of dissolved solids achieve that function. Oxygenator's proposal will accordingly be adopted and "water" will be construed to mean *any aqueous medium that can support the electrolysis of water*.[5]

2

Just as they did for "water," the Parties agree that the construction of "nanobubble" should include part of the specification's definition—that is, they agree that a nanobubble is "a bubble with a diameter less than that necessary to break the surface tension of water." Joint Claim Construction Statement at 4. They dispute whether the term's construction should include the second sentence of the specification's definition: "Nanobubbles remain suspended in the water, giving the water an opalescent or milky appearance." JA12 at 4:14–15. Tennant believes the second sentence is part of the patentee's lexicography and may not be abandoned. According to Oxygenator, the second sentence is not "definitional" but instead just "describes a result that can occur if there are enough nanobubbles in the water[.]" Oxygenator Br. at 37–39.

This is a somewhat close call, but Oxygenator has the better answer. Once again, the specification's definition controls if it "clearly express[es] an intent to redefine the term" beyond its plain and ordinary meaning. *Thorner v. Sony Comput. Ent. Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (internal quotation marks and citation omitted). When a purported definition spans multiple clauses or sentences, courts do not uniformly

[5] Neither Party has addressed whether it is circular or otherwise problematic for the word "water" to appear in the construction of "water."

incorporate the whole thing into their constructions. This is because one sentence might clearly be meant as a definition while the next might serve some other purpose, like identifying examples of the defined term or explaining how the defined term works in practice. Under such circumstances, it sometimes makes sense to omit the latter sentence from the construction. *See PACT XPP Techs., AG v. Xilinx, Inc.*, No. 2-07cv563-CE, 2011 WL 2469909, at *8 (E.D. Tex. June 17, 2011); *Prism Techs. LLC v. Verisign, Inc.*, 512 F. Supp. 2d 174, 184 (D. Del. 2007); *Noven Pharms. v. Watson Labs., Inc.*, No. 11-cv-5997 (DMC)(MF), 2012 U.S. Dist. LEXIS 182486, at *9–12 (D.N.J. Dec. 27, 2012).

That approach seems appropriate here. The first sentence of the specification's definition of "nanobubble" is clearly definitional. It says what the word "means" and identifies a verifiable characteristic: "a diameter less than that necessary to break the surface tension of water." JA12 at 4:12–13. The second sentence describes a consequence of that characteristic in the natural world. Because nanobubbles cannot break the surface tension of water, they "remain suspended" and eventually "giv[e] the water an opalescent or milky appearance." *Id.* at 4:14–15. In other words, "the second sentence explains how [a nanobubble] acts . . ., while the first sentence contains the patentee's definition of the term." *Prism Techs.*, 512 F. Supp. 2d at 184.

This understanding is consistent with the rest of the specification. The background section makes clear that bubble size was the crucial factor limiting prior efforts to oxygenate water. The "most common method" of oxygenating water to that point had produced "large bubbles" that would "simply break the surface and [be] discharged into the atmosphere." JA11 at 1:57–61. The disclosed invention, by contrast, would

"generate[] very small" bubbles that would be "too small to break the surface tension of the medium." JA11 at 2:66–JA12 at 3:1–3. The paragraph immediately following the specification's definitions reiterates the point that the invention would produce "bubbles which are too small to break the surface tension of the fluid." JA12 at 4:30–33. It then goes on to explain why this matters: because the bubbles are so small, they would remain "suspended indefinitely," resulting in water that is "supersaturated with oxygen." JA12 at 4:33–38. Both here and in the definition section, context suggests that the bubble's size is its crucial definitional characteristic. The additional information about the bubbles' behavior and the oxygenated water's appearance does not add to that definition; it simply explains its significance.[6]

Tennant has reasonable arguments, but they do not affect the appropriate construction. Its primary, and perhaps strongest, argument is that both the first and second sentence are set off together under the "Definitions" heading, which could indicate an intent to include both sentences in the definition. This formatting does not seem to overcome the different purposes served by each sentence and their context within the specification. Tennant also argues that Oxygenator should be estopped from advocating for a construction that omits the second sentence because the patentee used that sentence to distinguish the invention from the prior art in the prosecution history. *See, e.g.*, *Comput. Docking Station Corp. v. Dell, Inc.*, 519 F.3d 1366, 1377–78 (Fed. Cir. 2008). But the

[6] One of the examples in the specification reinforces this understanding. It describes efforts "to measure the diameter of the O_2 bubbles emitted by" a particular embodiment of the invention without saying anything about observing or measuring the time that the bubbles remained suspended or the appearance of the water. JA13 at 5:40–6:2.

cited portion of the prosecution history follows the same script described above. The patentee first stated that the relevant prior art "produce[d] large bubbles which immediately rise to the surface," whereas the present invention would generate "microbubbles and nanobubbles" with "a diameter of less than 50 microns" that would generally "not immediately rise to the surface." JA1147. Then, the patentee went on to describe observable consequences of the bubbles' size. They would "form an opalescent or milky fluid and [be] suspended in the water." *Id.* For the reasons given above, this statement does not show an intent to define the term to require an "opalescent or milky" appearance. Once again, the clear focus is on bubble size. "Nanobubble" will therefore be construed as *a bubble with a diameter less than that necessary to break the surface tension of water*.

B

Next, the Parties dispute the meaning of three other "water"-related terms: (1) "oxygenated aqueous composition," (2) "aqueous medium," and (3) "conductivity produced by the presence of dissolved solids such that the water supports plant or animal life." For the most part, the Parties' arguments on all three of these terms simply repeat their arguments concerning the construction of "water." Tennant believes that the construction for all three terms must incorporate its proposed construction of "water." Tennant Br. at 12–16. Accordingly, rejecting Tennant's proposed construction of "water" resolves many of its arguments concerning these terms. Oxygenator argues that none of

the three terms require construction and that all should be given their plain and ordinary meaning. Oxygenator Br. at 17–22.

1

First, Tennant argues that an "aqueous medium" is "a mixture made with water." Joint Claim Construction Statement at 3. Oxygenator seems to agree that this generally captures the term's commonly understood meaning, but it argues that any construction of the term should not incorporate the "specific conductivity and dissolved solids limitations" that Tennant wants to include in the construction of "water." Oxygenator Br. at 21–22.

No matter how "water" is construed, however, there is a problem with Tennant's proposed construction of "aqueous medium." Under Tennant's construction (combined with the construction of "water"), an "aqueous medium" would be "a mixture made from [any aqueous medium that can support the electrolysis of water]." This construction seems circular because it never answers the question what an aqueous medium is in the first place. *See Harris Corp. v. IXYS Corp.*, 114 F.3d 1149, 1152 (Fed. Cir. 1997). Tennant argues that this is not a problem because the intrinsic record uses the terms "water" and "aqueous medium" synonymously. Tennant Br. at 13. But this is inconsistent with the very definition of "water" that Tennant promotes. If "water" is an aqueous medium with certain characteristics (*i.e.*, the ability to support electrolysis), then it must be narrower than the term "aqueous medium" generally.

The best way to avoid this confusion is to decline to issue a construction, as Oxygenator suggests. The ordinary meaning of the word "aqueous" refers to something "made from, with or by water"—but water as it is commonly understood, not as it is

construed in this case. *Aqueous*, Merriam-Webster, https://www.merriam-webster.com/dictionary/aqueous (last visited Aug. 18, 2021). And a "medium" is generally just a "surrounding or enveloping substance" or, perhaps more relevant here, "a substance regarded as the means of transmission of a force or effect." *Medium*, Merriam-Webster, https://www.merriam-webster.com/dictionary/medium (last visited Aug. 18, 2021). No evidence has been cited suggesting that a person of ordinary skill in the art would have understood these words any differently from their everyday dictionary definitions. Adopting a construction that incorporates the technical construction of "water" would likely disrupt a jury's understanding of "aqueous medium" for no clear purpose. The term "aqueous medium" therefore will not be construed.

2

Tennant proposes construing "oxygenated aqueous composition" as a "composition of oxygen and water." Joint Claim Construction Statement at 3. Once again, the Parties primarily dispute whether the construction of this term should incorporate the construction of "water." Just like before, those arguments fall away with the rejection of Tennant's proposed construction of "water."

Either way, there is a flaw in Tennant's proposed construction. First, as Oxygenator points out, Tennant's proposed construction requires only a composition containing oxygen and water, not a composition that has had "oxygen added to it." Oxygenator Br. at 22.[7] In other words, it could encompass even compositions that have had their oxygen

[7] Tennant says that Oxygenator waived this argument by failing to raise it early enough in the claim construction phase of the litigation. In the case it cites to support this

content decreased. But the claim says that an oxygenated aqueous composition is something that the invention "produc[es]." JA16 at 11:20. The specification makes clear that the whole purpose of the invention is to use electrolysis to increase the oxygen content of water. JA11 at 2:66–3:3. It stands to reason that the product of a process that increases oxygen content is a substance that has had oxygen added to it. This is consistent with the term's plain meaning. The word "oxygenated" is the past participle of the verb "oxygenate," which means "to impregnate, combine, or supply . . . with oxygen." *Oxygenate*, Merriam-Webster, https://www.merriam-webster.com/dictionary/oxygenate (last visited Aug. 18, 2021). This definition seems to require a positive change in the amount of oxygen.

Second, Tennant has not identified a persuasive reason to incorporate the word "water." To be sure, doing so would not create the same circularity problem present in Tennant's construction of "aqueous medium," but it risks confusion for other reasons. As discussed above, the word "aqueous" connotes a substance containing water as it is commonly understood. If the patentee intended the word "aqueous" to mean "water" as it would be construed under the patent, there would have been far simpler claim terms available—*e.g.*, "oxygenated water." This is especially true given that the word "water" appears in multiple other parts of the claim. *See Applied Med. Res. Corp. v. U.S. Surgical*

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assertion, however, the Federal Circuit affirmed a district court's decision finding waiver of an argument that a party had failed to raise "during the claim construction phase." *Cent. Admixture Pharm. Servs., Inc. v. Advanced Cardiac Sols., P.C.*, 482 F.3d 1347, 1356 (Fed. Cir. 2007). Oxygenator raised this argument in its opening claim construction memorandum, and Tennant had an opportunity to respond to it.

Corp., 448 F.3d 1324, 1333 n.3 (Fed. Cir. 2006) (explaining that, "[i]n the absence of any evidence to the contrary," courts construe different claim terms to have different meanings).

Given these concerns, the best approach is not to construe "oxygenated aqueous composition." As discussed above, the patent's usage of "oxygenated" is consistent with the lay dictionary definition of that word. The word "aqueous" has a commonly understood meaning, and the Parties seem to agree that "composition" requires no construction. Construing the term would therefore add little or nothing to the jury's understanding. *See Ethicon*, 103 F.3d at 1568 (explaining that claim construction "is not an obligatory exercise in redundancy").

3

Tennant argues the term "conductivity produced by the presence of dissolved solids such that the water supports plant or animal life" should be construed as "water containing more than 2000 ppm total dissolved solids"—another reference to the specification's definition of "water." Joint Claim Construction Statement at 2–3.[8] Oxygenator asks that the term be given its plain meaning because a person of ordinary skill in the art would understand "that the term encompasses regular fresh water such as tap water, well water, lake water, and irrigation water." Oxygenator Resp. Br. at 8.

[8] Tennant suggests that this term will be indefinite unless its proposed construction is adopted. It repeats this argument for several other terms. But Tennant has explicitly decided not to pursue indefiniteness arguments at the claim-construction stage, reserving the right to do so at summary judgment. ECF No. 64 at 3 n.1. Indefiniteness, which focuses on the validity of the patents rather than their meaning, will accordingly not be addressed now.

The record does not support Tennant's proposed construction. First, as Oxygenator points out, setting 2000 ppm as the minimum level of dissolved solids seems to conflate the concepts of resistivity and conductivity, discussed above in conjunction with the construction of "water." *See* White Decl. ¶¶ 29, 38. Extrinsic evidence shows that a 2000-ppm minimum would encompass water that poses health risks to many species. *Id.* ¶ 41; Louwagie Decl., Ex. 6 [ECF No. 80-6]. So, if Tennant is right that a numerical limit should be imposed through construction, then 2000 ppm should be the maximum for dissolved solids, not the minimum.

Second, there is a good reason *not* to impose a 2000-ppm maximum. An earlier version of the claim included this precise limitation, but it was removed during prosecution. *See* JA1087, JA1134. "In general, if a claim limitation was removed during prosecution, it is improper to read that limitation back into the claim during litigation." *Aylus Networks, Inc. v. Apple, Inc.*, No. C-13-4700 EMC, 2015 WL 355174, at *11 (N.D. Cal. Jan. 27, 2015); *see 3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1372–73 (Fed. Cir. 2003). Tennant argues that the limitation from the specification's definition should apply because the words "dissolved solids" do not appear anywhere else in the specification. Tennant Resp. Br. at 12. But in light of the claim language, the prosecution history, and the specification's use of the qualifying phrase "In general" in its discussion of the 2000-ppm cutoff, it would be inappropriate to read the limitation into the claim.

All of this does not mean Oxygenator has a flawless understanding of the term's plain language. Relying on its expert's declaration, Oxygenator argues that a person of ordinary skill in the art would understand the term to refer to "water that pets can drink or

that can be used to water plants." White Decl. ¶ 40. The implication is that saltwater would not work. *See id.* ¶ 41 (stating that "brine" would not support plant or animal life). But as Tennant points out, it is common knowledge that plenty of plant and animal life exists in seawater. Oxygenator does not adequately explain why a person of ordinary skill in the art would understand the term "water [that] supports plant or animal life"—viewed in isolation—not to encompass some saltwater

Nonetheless, in view of the specification and prosecution history, it is clear that the patentee intended to disavow the inclusion of saltwater in this claim term. *See Norian Corp. v. Stryker Corp.*, 432 F.3d 1356, 1362 (Fed. Cir. 2005) (explaining that the specification and prosecution history can sometimes limit the meaning of claim language that might otherwise have a broader meaning to a person of skill in the art). The patentee originally sought a claim directed to "tap water" and understood this term to cover "potable water delivered by a municipal water treatment plant in addition to well water, lake water and irrigation water," as well as "water used to clean clothes, wash floors and water plants[.]" JA1112, JA1143. When the Examiner rejected the phrase "tap water" as overly broad and non-descriptive,[9] the patentee replaced it with the phrase "having a conductivity produced by dissolved solids so that the aqueous medium is capable of supporting plant or animal life." JA1132. Consistent with this understanding, the specification seems to describe only applications that would use fresh water. *See* JA12, 14–15. All of this is

[9] The Examiner reasoned that "tap water" would be "any water capable of flowing through a tap, essentially any water." JA1112.

enough to conclude that the disputed term does not refer to water that would support saltwater life. Because this conclusion would have been clear to a person of ordinary skill in the art, and no other words in the disputed term seem to have a technical or specialized meaning, no construction will be issued.

C

The next group of disputed terms all concern "flowing" or "passing" water. These terms, and the Parties' proposed constructions, are shown in the following table:

Term/Phrase	**Patent Claim(s)**	**Tennant's Construction**	**Oxygenator's Construction**
"Flowing water . . . through an electrolysis emitter"	'415 Patent, Claim 13	Placing the emitting device in the fluid to be treated as opposed to using a pipe system.	Moving water through an electrolysis emitter by means other than electrolysis.
"Deliver electrical current to the electrodes while water flows through the tubular housing"	'665 Patent, Claim 13	Delivering electrical current to the electrodes while the emitting device is in the fluid to be treated as opposed to being used with a pipe system.	Deliver electrical current to the electrodes while moving water through the electrolysis emitter by means other than electrolysis.
"A flow-through oxygenator"	'092 Patent, Claim 13	Placing the emitting device in the fluid to be treated as opposed to using a pipe system.	An oxygenator configured to connect to a source of flowing water.
"Passing water through the tubular housing"	'092 Patent, Claim 13	Placing the emitting device in the fluid to be treated as opposed to using a pipe system.	Moving water through an electrolysis emitter by means other than electrolysis.

Joint Claim Construction Statement at 3. The Parties' arguments on these terms essentially boil down to one dispute, and it makes sense to address that broader dispute before turning

to the specific terms. According to Tennant, these terms "encompass both moving water through an emitter and placing the emitter in water without a separate water propulsion mechanism." Tennant Br. at 19. In other words, because the electrolysis process itself causes water to move, the water can start out either in motion or at rest. Oxygenator responds that the water must be independently flowing at the time it is oxygenated using electrolysis. Oxygenator Br. at 27–31; Oxygenator Resp. Br. at 16–21.

On its face, the claim language at issue supports Oxygenator. The first step in Claim 13 of the '415 patent, which discloses a "method for producing an oxygenated aqueous composition," is "*[f]lowing* water at a flow rate no greater than 12 gallons per minute through an electrolysis emitter . . . contained in a tubular housing." JA16 at 11:22–23 (emphasis added). Claim 13 of the '092 patent discloses a "method for treating water" that consists, among other things, of "*passing* water through the tubular housing" of a "flow-through oxygenator" "*while* electrical current is applied to . . . electrodes" on an emitter contained within the tubular housing. JA33 at 11:53–12:17 (emphasis added). And Claim 13 of the '665 patent, which discloses an "emitter for electrolytic generation of bubbles of oxygen in water," requires that a power source "deliver electrical current to" the emitter's electrodes "*while* water *flows through*" the emitter's "tubular housing." JA54 at 11:39–66. The use of the active verbs "pass" and "flow," and the fact that water must pass "through" the tubular housing—*i.e.*, must enter and exit the housing—suggests that the motion of the water is independent of the application of electrical current. Put another way, these claims, on their face, seem to contemplate that the water is already moving by the time the electrical current starts.

Tennant does not dispute this reading of the claims in isolation, but it argues that the patentee disclaimed any use of a "pipe system" to move water (which it appears to equate with all types of independently flowing water) by failing to contest comments made by the Examiner during prosecution of the '415 patent. Specifically, in a statement of reasons for allowing Claim 1 of the '415 patent, the Examiner stated the following: "The prior are [sic] does not disclose the method step of placing the emitting device in the fluid to be treated. It discloses flowing the fluid through the device using a pie [sic] system." JA1070. This same language appears three other times. JA1119, JA1197, JA1278. The first two times, the Examiner stated that Claim 1 and Claim 55 (which would later become Claim 13 of the '415 patent), among others, were allowable, and repeated the above-quoted statement without specifying to which claim or claims the statement applied. JA 1119, 1197. Then, in the Final Notice of Allowance, the Examiner repeated that the prior art "discloses flowing the fluid through the device using a pie [sic] system," but made clear that this statement applied "with respect to claim 1." JA1278. In a separate, preceding paragraph, the Examiner noted that Claim 13, among others, was allowed because the prior art did not disclose the particular combination of critical distance, voltage, amperage, and flow rate. *Id.*

For two reasons, Tennant's construction will not be adopted. First, as Oxygenator points out, the Examiner's comments appear to concern two method steps of Claim 1 of the '415 patent, which discloses "[a] method for treating waste water." JA15 at 10:25. Those steps are: (1) "placing the emitter within a conduit" and (2) "passing waste water through the conduit." *Id.* at 10:31–32. The disputed terms at issue appear in different

claims, none of which contain these method steps. For that reason alone, it seems unwise to place too much emphasis on the Examiner's statements about the prior art and whether it discloses using a "pipe system."

Second, "an applicant's silence regarding statements made by the examiner during prosecution, without more, cannot amount to a 'clear and unmistakable disavowal' of claim scope." *Salazar v. Proctor & Gamble Co.*, 414 F.3d 1342, 1345 (Fed. Cir. 2005). That the patentee did not respond to the Examiner's comments about Claim 1 by taking a position on the necessity of flowing water in Claim 13 does not show anything "clear and unmistakable" about the scope of Claim 13.

Oxygenator's constructions are generally more consistent with the text of the specification and claims. As noted above, the plain meaning of the words "flow" and "pass," taken in context in the claims, connotes water in motion by means other than the electrolysis process. And the specification clearly describes embodiments that require flowing water. *See* JA15.

Tennant argues that requiring independently flowing water would improperly exclude many other embodiments in the specification. *See MBO Labs., Inc. v. Becton, Dickinson & Co.*, 474 F.3d 1323, 1333 (Fed. Cir. 2007). Considering the patents as a whole, this argument is not persuasive. The invention encompasses two broad categories of devices. The first are "button emitter[s]" that Oxygenator admits can be effective when placed in water that is "at rest." JA4 at Fig. 2A; JA12 at 4:44–45; *id.* at 4:60–5:25. The second are "flow-through emitters," which seem to require independently flowing water. JA9, Figs. 7A & 7B; JA15 at 9:5–10:5. The language in the claims at issue seems directed

to the latter category, and the specification clearly describes embodiments that require flowing water. *See* JA15. "[W]here the patent describes multiple embodiments, every claim does not need to cover every embodiment. . . . This is particularly true where the plain language of a limitation of the claim does not appear to cover that embodiment." *Pacing Techs., LLC v. Garmin Int'l, Inc.*, 778 F.3d 1021, 1026 (Fed. Cir. 2015); *see also August Tech. Corp. v. Camtek, Ltd.*, 655 F.3d 1278, 1285 (Fed. Cir. 2011).

With that general discussion out of the way, there is little left to say about the construction of each individual term. Oxygenator's constructions of "flowing water . . . through an electrolysis emitter," "deliver electrical current to the electrodes while water flows through the tubular housing," and "passing water through the tubular housing" are all consistent with the claim language and the above discussion, and they will be adopted.

The construction of "a flow-through oxygenator" is a bit more complicated. First, the title of each patent-in-suit as a whole is "Flow-Through Oxygenator," so it seems logical that the term would cover all embodiments disclosed by the patents, including button emitters that sit in water at rest. Second, Claim 1 of the '415 patent, which Oxygenator implicitly argues discloses a button emitter, uses the term "flow-through oxygenator." JA15 at 10:26. These two factors suggest that the term may not be limited to devices "connect[ed] to a source of flowing water," as Oxygenator asserts. Joint Claim Construction Statement at 3. Nonetheless, the word "flow-through" does suggest that

water must at least pass through the device. For this reason, the term will be construed as *a device that oxygenates water as the water passes through it*.

D

The next disputed term is "tubular housing." This term appears in a number of different claims spanning all three patents-in-suit, but the Parties are primarily concerned with its usage in Claims 13, 14,[10] and 26 of the '415 patent. Claim 13 was introduced in its entirety above. Claim 14, a dependent claim of Claim 13, discloses

> [a] method according to claim 13 wherein the housing contains at least one anode and at least one cathode, the electrodes are of a grid or solid design and are relatively positioned in cross section along the radius of the tubular housing with their long axes substantially parallel to the tubular water flow axis of the housing.

JA16 at 11:46–12:4. Claim 26, a dependent claim of Claim 13, discloses "[a] method according to claim 13 wherein each anode and cathode electrode of the emitter is positioned so that substantially all points midway between opposing anode and cathode electrodes are closer to a surface of the tubular housing than to a center point within the tubular housing." JA16 at 12:38–42.

The Parties do not seem to dispute anything about the word "housing"; rather, their arguments concern the meaning of "tubular," and specifically, what that word means for the shape of the housing's cross-section. Does the cross-section need to be circular, or does the term encompass other shapes, too? Tennant's proposed construction is "an

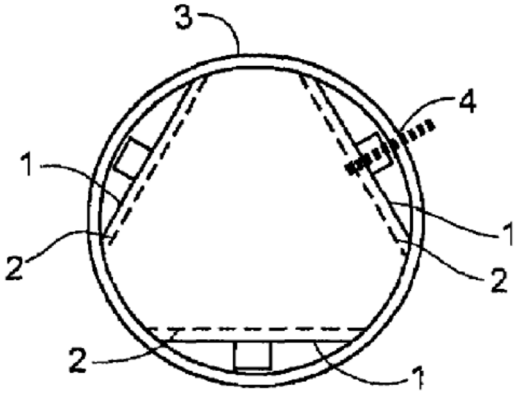
[10] Although the Parties do not identify Claim 14 in this portion of their Joint Claim Construction Statement, Claim 14 does use the term "tubular housing," and the claim is central to the Parties' arguments.

enclosure shaped like a cylinder, hose, or tube." Joint Claim Construction Statement at 3. Oxygenator says that the term should be given its plain and ordinary meaning but argues that meaning "does not require a circular cross section." *Id.*

This is a close call, but Tennant has the better understanding of the term for two reasons. First, dependent Claims 14, 26, and 27 of the '415 patent surround the phrase "tubular housing" with words that are associated with circles. Claim 14 requires electrodes to be positioned "in cross section along the *radius* of the tubular housing," JA16 at 12:2–3 (emphasis added), and Claims 26 and 27 refer to the tubular housing's "center" and "center point." JA16 at 12:42, 46. These context clues support the conclusion that a tubular housing must have a circular cross-section. *See Schindler Elevator Corp. v. Otis Elevator Co.*, 593 F.3d 1275, 1283 (Fed. Cir. 2010).

Second, the specification and prosecution history continue the trend of evoking circles. The specification's only apparent embodiment of tubular housing—Figure 7A—depicts a circular cross-section:

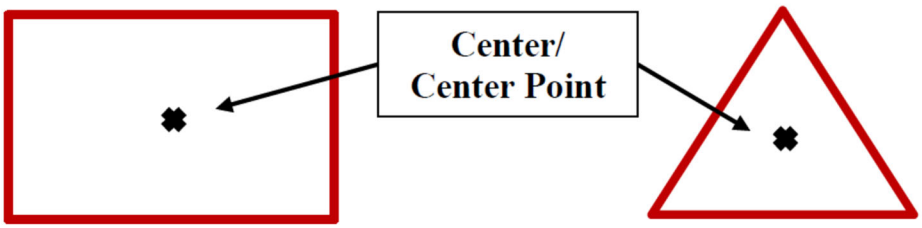
Fig. 7A



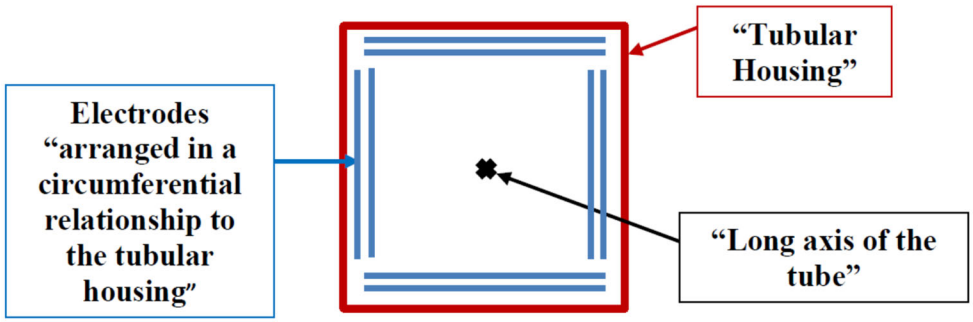
JA9. When submitting amended claims in response to a prior rejection by the Examiner, the patentee added a requirement (now reflected in Claim 14) that electrodes be "relatively positioned in cross section along the *radius* of the tubular housing[.] JA16 at 12:1–3 (emphasis added); JA1144. The patentee argued that the specification supported the term "tubular" to describe the housing because it teaches that "multiple pairs" of electrodes "may be present as plates parallel to the long *axis* of the tube" and "arranged in a *circumferential relationship* in the tubular housing." JA1144 (emphasis added). Considered together, the claim language and prosecution history make it sufficiently clear that the patentee intended the word "tubular" to require a circular cross-section.

Oxygenator has reasonable arguments that ultimately do not change this conclusion. It points first to a statement in the specification that a "flow-through model" of the invention can be "formed into a tube with triangular cross-section." JA12 at 3:27–28. According to Oxygenator, this statement shows that the specification contemplated an embodiment of tubular housing with a non-circular cross-section. Oxygenator Br. at 23–24. Taken in context, however, the phrase "triangular cross-section" is best understood as an imprecise reference to the triangular configuration of the electrodes shown in Figure 7A above, not the shape of the tube itself. Nowhere else does the specification or the intrinsic record suggest that the invention could be housed within a triangular tube.

Next, Oxygenator argues that some of the circle-related terms Tennant identifies in other claims and in the prosecution history do not necessarily evoke circles. For example, it provides the following plausible depictions of "center points" in non-circular geometric shapes:



Oxygenator Resp. Br. at 12. In a similar vein, it argues that electrodes could be arranged in a "circumferential relationship" even if the tubular housing has a non-circular cross-section. JA 1144. It offers the following visual example:



Oxygenator Resp. Br. at 14.

These arguments may be consistent with the commonly understood meanings of "center" and "circumferential,"[11] but they are outweighed by Claim 14's reference to the "radius" of the tubular housing. Oxygenator does not seem to dispute that the plain meaning of "radius" connotes a circular cross-section. *See Radius*, Merriam-Webster, https://www.merriam-webster.com/dictionary/radius (last visited Aug. 18, 2021) (defining

[11] For example, according to one lay dictionary, the definition of "circumference" includes "the external boundary or surface of a figure or object," not just the distance around a circle. *Circumference*, Merriam-Webster, https://www.merriam-webster.com/dictionary/circumference (last visited Aug. 18, 2021).

the word as "a line segment extending from the center of a circle or sphere to the circumference or bounding surface"). Instead, Oxygenator asserts that the meaning of Claim 14 is largely irrelevant. Specifically, it argues that it is logical for Claim 14—a dependent claim—to be narrower in scope than Claim 13. *See Eli Lilly & Co. v. Teva Parenteral Meds., Inc.*, 845 F.3d 1357, 1371 (Fed. Cir. 2017). In other words, even if the tubular housing in Claim 14 requires a circular cross-section, that doesn't mean Claim 13 is so limited. *See* Oxygenator Resp. Br. at 12. There are two reasons to reject this argument. First, Claim 14 refers simply to "the housing" and "the tubular housing," JA16 at 11:46, 12:2–3, suggesting that the phrase has the same meaning it has in Claim 13. *See Phillips*, 415 F.3d at 1314 ("[C]laim terms are normally used consistently throughout the patent[.]"); *Robotic Vision Sys., Inc. v. View Eng'g, Inc.*, 189 F.3d 1370, 1376 (Fed. Cir. 1999) (explaining that a dependent claim is "construed to incorporate by reference all the limitations of" its independent claim). Second, if the patentee had intended to impose a new circular-cross-section limitation in Claim 14 that had not applied to Claim 13, there would be much clearer and more direct ways to do it than merely using the word "radius."

In sum, the claims, specification, and prosecution history all support the conclusion that a "tubular housing" must have a circular cross-section. Tennant's proposed construction will accordingly be adopted, and the term will be construed to mean *an enclosure shaped like a cylinder, hose, or tube*.

E

The next disputed term also appears in Claim 13 of the '415 patent: "tubular flow axis from the inlet to the outlet." JA16 at 11:40. Tennant proposes construing this term as

"a straight line defining a path through which water flows through the tubular housing and extending from the inlet to the outlet." Joint Claim Construction Statement at 5. Oxygenator again argues the term should be given its plain and ordinary meaning, which it says is "a main line of flow through the tubular housing from the inlet to the outlet." *Id.* Again, the Parties' dispute boils down to one question. When water flows through the tubular housing from the inlet to the outlet, does it need to go in a straight line?

The intrinsic record does not contain any useful clues on the meaning of "tubular flow axis." Tennant points to a statement by the patentee, made during the prosecution of the '665 patent, that describes the tube depicted in Figure 7A of the specification as having a "center axis." JA2222. Based on that statement and its prior arguments that a "tubular housing" must be shaped like a cylinder, Tennant asserts that the term "tubular flow axis" must "refer[] to a straight path through the tubular housing." Tennant Br. at 25.

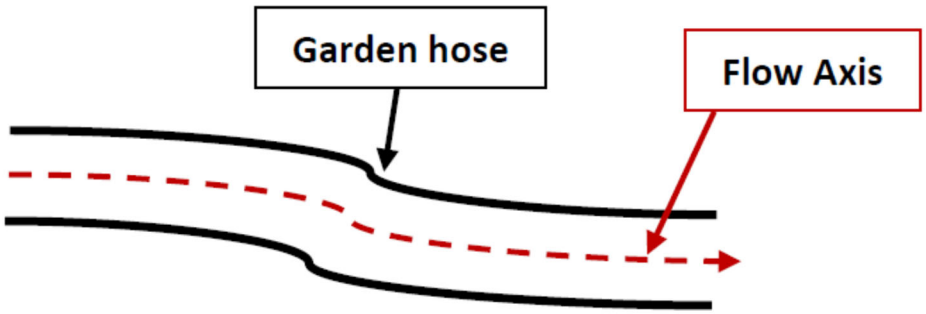
The Parties also argue about dictionary definitions. Oxygenator says that it derived its proposed plain meaning of the term from a 2003 dictionary, previously disclosed by Tennant, that defined "axis" as "a main line of direction, motion, growth, or extension." Oxygenator Br. at 25. Tennant responds to this with the following alternative definitions from the same dictionary:

> axial-flow \ *adj.*: having the fluid or gas flowing parallel to the axis.
>
> axis of rotation: the straight line through all fixed points of a rotating rigid bod[y] around which all other points of the body move in circles

> axis of symmetry: the line about which a geometrical figure or drawing is symmetric.

Tennant Resp. Br. at 18.

There seems to be an implicit disagreement underlying these arguments: Oxygenator thinks a "tubular housing" can be flexible, like a garden hose. Tennant thinks a "tubular housing" must be rigid. This disagreement matters because, if the tubular housing can be flexible, then the water would not need to go in a "straight line," even if it must flow along a path defined by the center of the tube. Consider the example Oxygenator offers in its brief:



Oxygenator Resp. Br. at 15. In this example, there seems to be a "flow axis" defined by the center of the "tube," but it does not maintain a straight line. On the other hand, if the tubular housing must be rigid, then it is hard to see how a flow line defined by the tube's center axis could be anything other than straight.

Based on the embodiment described in Example 6 and Figures 7A and 7B of the specification, it appears that there is room for some flexibility in the tubular housing. JA9, JA15. The example describes fashioning the emitter by placing electrodes "inside a tube *or hose*." JA15 at 9:9–15 (emphasis added). It contemplates that the electrodes will be

"positioned with stabilizing hardware" that is "preferably formed from stainless steel," JA15 at 9:15–18, but it does not describe the material that makes up the hose itself. Oxygenator's understanding of "tubular flow axis" is therefore more consistent with the intrinsic record. Although Oxygenator argues that the term needs no construction, a construction will resolve the Parties' genuine dispute concerning the term's scope. *See O2 Micro Int'l Ltd.*, 521 F.3d at 1361. "[T]ubular flow axis from the inlet to the outlet" will therefore be construed as *a main line of flow through the tubular housing from the inlet to the outlet*.

F

The next disputed term is really two terms—"a power source" and "an electrical power source"—but the Parties treat them as interchangeable, and there is no apparent reason to do anything different here. The term appears in Claim 13 of each of the patents-in-suit, as well as in Claim 27 of the '092 patent, all of which were introduced above. Tennant argues that the terms require no construction and should be given their plain and ordinary meaning, but it says that meaning is limited to "the actual ***source*** of power, such as a battery," and does not include "the components that connect the power source to the electrolysis unit[.]" Tennant Br. at 26–27. Oxygenator proposes that the terms be construed as "electrical and mechanical equipment and their interconnections used to generate and/or convert power." Joint Claim Construction Statement at 4. In other words, the term should include "both the equipment that generates power and the equipment that converts that power." Oxygenator Br. at 32–34.

The term "power source" may have a readily understood meaning in some contexts, but the Parties clearly dispute the scope of the term in the context of the patents-in-suit, and it is appropriate to construe it. *See O2 Micro Int'l Ltd.*, 521 F.3d at 1361 (reversing a district court's decision not to construe the term "only if"). The dispute: is the "source" of power just the thing that generates the power, or does it also include components that convert and deliver the power to its destination?

Tennant bases its argument primarily on references in the specification and the original provisional application to batteries as a power source that can be used in the claimed inventions. According to Tennant, "when the patents discuss the voltage or current of the 'power source,' they are referring to the voltage and current measured at the actual source of power, *e.g.*, the battery." Tennant Resp. Br. at 21–22.

The claims, specification, and extrinsic evidence all suggest that Oxygenator has the better answer. To be sure, Claim 13 of the '415 patent requires a "power source" that "produces" a certain voltage and amperage. JA16 at 11:36–38. This lends some support to Tennant's theory that the term focuses on the generation of power, as opposed to its conversion or transportation. But the language in the '092 and '665 patents is different. The claims in those patents require a "power source" that is "configured to deliver" a certain voltage and amperage "to the electrodes." JA33 at 12:8–13; JA34 at 14:3–9; JA54 at 11:58–67. The best way to reconcile these different usages of "power source" is to understand the term as encompassing the means of delivering power to the electrodes, not just the means of generating power.

This reading is consistent with the specification. Although Tennant is correct that the specification refers to batteries as potential power sources, it also refers to an "AC/DC converter," JA11 at 2:9, a device that "converts AC power (like that provided by a wall outlet) into a DC current," but does not itself "generate electrical power," White Decl. ¶ 50. The specification therefore contemplates that the electrical current could come from something other than a "direct current from a battery." JA11 at 2:8–9.

Finally, extrinsic evidence supports this understanding. First and most persuasively, The New IEEE Standard Dictionary of Electrical and Electronics Terms defines "power sources" as "[t]he electrical and mechanical equipment *and its interconnections* necessary to generate *or convert* power." Louwagie Decl., Ex. 15 [ECF No. 80-13] (emphasis added).[12] Second, Oxygenator's expert has testified that a person of ordinary skill in the art "would understand the claimed 'power source' to include equipment that converts power to the form used by the end device," relying in part on the IEEE dictionary definition. White Decl. ¶¶ 49, 52. Courts must treat expert testimony prepared for litigation with due skepticism, but the expert testimony here is persuasive because it is consistent with the intrinsic record. Because Oxygenator's proposed construction closely tracks the IEEE dictionary definition and is otherwise consistent with the record, it will be adopted and the terms "a power source" and "an electrical power source" will be construed to mean

[12] For the first time at the claim-construction hearing, Tennant argued that the IEEE definition should not apply because the dictionary entry includes parenthetical references to "nuclear power generating station[s]" and "accident monitoring instrumentation." Louwagie Decl., Ex. 15. In context, the references appear to mean only that the term "power sources" comes up in those real-word applications, not that the dictionary's definition is limited to them.

electrical and mechanical equipment and their interconnections used to generate and/or convert power.

G

Tennant argues that the term "incapable of breaking the surface tension of the water" means "containing nanobubbles." Joint Claim Construction Statement at 4. The disputed term appears in Claim 25 of the '415 patent, which discloses "[a] method according to claim 13 wherein the microbubbles and nanobubbles are substantially incapable of breaking the surface tension of the water." JA16 at 12:35–37. Oxygenator believes the term should be given its plain and ordinary meaning. It argues that Tennant's proposed construction improperly presumes that "all bubbles that are incapable of breaking the surface tension of water are nanobubbles." Oxygenator Resp. Br. at 24.

Tennant's argument rests on the premise that a bubble's ability to break the surface tension of water is an all-or-nothing proposition: either it can or it can't. Under the patent's definitions, says Tennant, "any bubble 'incapable of breaking the surface tension of the water' is a nanobubble, and any bubble capable of breaking the surface tension is not a 'nanobubble.'" Tennant Resp. Br. at 24.

The problem with Tennant's proposed construction is that Claim 25 is not written in such absolute terms. It requires only that the bubbles be "*substantially* incapable of breaking the surface tension of the water." JA16 at 12:35–37 (emphasis added). The Parties seem to agree that a bubble could be "substantially incapable of breaking the surface tension of the water" even if it is not "absolutely incapable" of doing so. This distinction is significant because it leaves open the possibility that a microbubble could meet the

"substantially incapable" limitation—for example, by remaining suspended in the water for a long time—even if it eventually does break the water's surface tension.

The prosecution history that Tennant cites supports this possibility. In the course of distinguishing prior art, the patentee wrote that the invention would result in both "microbubbles and nanobubbles" that would not "immediately break the surface tension of the water" due "at least in part [to] their small size." JA1145. The specification, too, refers to both "microbubbles and nanobubbles" that "remain in suspension" in the water. JA1, JA12 at 4:27–41. In light of this claim language and intrinsic evidence, Tennant's proposed construction makes little sense. It would construe the claim to mean, essentially, "the microbubbles and nanobubbles substantially contain nanobubbles."

The remaining question is whether the term requires a construction at all. Tennant argues that a construction would be helpful because "the concept of bubbles breaking the surface tension of water is not within the knowledge of the average lay person." Tennant Br. at 29. But it does not cite any intrinsic or extrinsic evidence suggesting that the concept encompasses anything beyond the familiar concept of a bubble rising to the surface of water and escaping. Indeed, the specification's definition of "nanobubble" also incorporates the idea of surface tension, and Tennant never argued that a jury would be unable to understand that definition. Under these circumstances, the better answer is not to issue a construction.

H

The next term is "the microbubbles and nanobubbles remain in the water at least in part for a period of up to several hours." Joint Claim Construction Statement at 4. This

term appears in Claim 19 of the '415 patent, which covers "[a] method according to claim 13 wherein the microbubbles and nanobubbles remain in the water at least in part for a period of up to several hours." JA16 at 12:18–20. Tennant proposes the following construction: "where the microbubbles and the nanobubbles remain in water for any period of time up to several hours." Joint Claim Construction Statement at 4. Oxygenator argues that this construction "would not require that the bubbles remain in water for more than a few seconds—or even milliseconds," even though the prosecution history contemplates "bubbles that had the beneficial quality of remaining in water for several hours after they were created." Oxygenator Br. at 43. For Tennant, the problem is one of common sense: Oxygenator's proposed construction unjustifiably changes the words "up to" to "at least." Tennant Br. at 29–30.

Tennant has the better argument here. "In some cases, the ordinary meaning of claim language as understood by a person of skill in the art [is] readily apparent even to lay judges[.]" *Phillips*, 415 F.3d at 1314. This is one of those cases. The phrase "up to" has a commonly understood meaning indicating a maximum amount. *See Up To*, Merriam-Webster, https://www.merriam-webster.com/dictionary/up%20to (last visited Aug. 18, 2021). Oxygenator's preferred phrase, "at least," has a commonly understood meaning indicating a minimum amount. To adopt Oxygenator's construction would be to fundamentally change the meaning of the claim term.

Oxygenator argues that this construction would render Claim 19 meaningless because it would have an identical scope to Claim 13. Oxygenator Br. at 43. But the two claims address two different features of the oxygenated water. Claim 13 is concerned with

the size of the bubbles. *See* JA16 at 11:31–32 (referring to bubbles with a diameter less than 50 microns). Claim 19, on the other hand, is concerned with the amount of time those bubbles remain suspended in the water. *See* JA16 at 12:18–20. No doubt the specification strongly suggests that the two features are related—*i.e.*, the smaller the bubble, the longer it will remain suspended. *See, e.g.*, JA11 at 1:57–61, 2:66 through JA12 at 3:3. But the limitations in the two claims are nonetheless different. It is also true, as Oxygenator notes, that the specification and prosecution history emphasize that a key feature of the invention is small bubbles that will remain suspended in the water for an extended period of time. In light of the unavoidably clear claim language, however, requiring a minimum suspension time of "a few hours" would improperly import a limitation from the specification.

This is not to say Tennant's proposed construction is perfect. It changes the claim's language in subtle ways. For example, it removes the phrase "at least in part," which could suggest that the claim requires all microbubbles and nanobubbles to remain suspended for the same period of time. It also changes "a period" of time to "any period of time." Tennant does not explain or justify these changes in its briefs. Because the Parties' only dispute on this claim concerns the phrase "up to"—words with an unspecialized, readily understood meaning—no construction will be issued.

I

The next term is "the water temperature is a factor for formation of the suspension." This term appears in Claim 18 of the '415 patent, which discloses "[a] method according to claim 13 wherein the water has a temperature no greater than about ambient temperature at the inlet and the water temperature is a factor for formation of the suspension." JA16 at

12:14–17. Tennant proposes the following construction: "The method uses water temperature to determine whether or not a suspension can be formed." Joint Claim Construction Statement at 4. Oxygenator responds that the term should be given its plain and ordinary meaning but that "[t]he term does not require the temperature [to] be measured or evaluated." *Id.* Instead, it argues, the term "merely refers to the physical phenomenon of the water temperature being 'a factor for formation of the suspension.'" Oxygenator Br. at 41.

Tennant offers two persuasive reasons to conclude that use of water temperature is a required step in the method that Claim 18 describes. First, the specification's only mention of temperature playing a role in the invention occurs in its description of an embodiment that uses a temperature-sensing device to start and stop the electrolysis process. *See* JA13 at 5:26–38. This is not to say that Claim 18 *only* encompasses methods that use water temperature in such an active way, particularly because the specification only says that is "convenient" to use a temperature sensor. JA13 at 5:26. But if there were some way for water temperature to play a role in the process without the temperature being measured or evaluated at all, there does not seem to be any written support for it in the specification. *See* 35 U.S.C. § 112(a); *Idenix Pharm. LLC v. Gilead Scis. Inc.*, 941 F.3d 1149, 1163 (Fed. Cir. 2019). Second, if, as Oxygenator suggests, Claim 18 does not require the actual measurement or evaluation of temperature because temperature is always a factor in electrolysis, then the claim appears to state a "[l]aw of nature" that is not entitled to patent protection. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014).

Nonetheless, Tennant's proposed construction seems overly limiting. It would require that temperature be used to "determine whether or not a suspension can be formed" at all. Joint Claim Construction Statement at 4. This does not align with the plain meaning of "factor," which is generally just something that "actively contributes to an accomplishment, result, or process[.]" *Factor*, American Heritage Dictionary of the English Language, https://www.ahdictionary.com/word/search.html?q=factor (last visited Aug. 18, 2021). Tennant does not identify any persuasive reason to believe the claim requires temperature to be the *determinative* factor in the formation of the suspension. Its proposal will therefore be modified slightly and "the water temperature is a factor for formation of the suspension" will be construed as *the method uses water temperature as a factor in forming the suspension*.

J

The next term is "wherein the period for which the microbubbles and nanobubbles at least in part remain in the water is determined by containing the water with microbubbles and nanobubbles in a two and one half gallon aquarium reservoir container." This term appears in Claim 20 of the '415 patent. *See* JA16 at 12:21–25. According to Tennant, this "[c]laim requires an alleged infringer [to] contain the water with microbubbles and nanobubbles in a two and one half gallon aquarium reservoir container." Joint Claim Construction Statement at 4–5. Oxygenator thinks the term should be given its plain and ordinary meaning but that the claim does not require actually putting water into an aquarium reservoir container. Instead, it simply "identifies physical properties of the

microbubbles and nanobubbles and identifies a test methodology for determining whether the microbubbles and nanobubbles have that physical property." *Id.*

The Parties' arguments on this term are somewhat cursory. In addition to the language of the claim itself, Oxygenator cites a statement by the patentee during the prosecution of the '415 patent that the bubbles generated by the invention would be "capable of remaining for several hours when the suspension is contained in an appropriate container" and that "a two and one-half gallon aquarium reservoir is appropriate." JA1145. In making that statement, the patentee cited an example in the specification of the parent '495 patent, which described using a "2 ½ gallon water reservoir" to grow hydroponic tomato plants. JA1035. Oxygenator argues these references show that the contemplated use of the container is hypothetical, not literal. Oxygenator Br. at 45.

All things considered, the record marginally tilts toward Tennant. Although Oxygenator's argument that the term simply provides a method that may be used to determine how long bubbles remain suspended has some intuitive appeal, Oxygenator does not point to anything in the record making this understanding explicit. Moreover, the claim itself says that the length of time "is determined" in this way, not that it "may be determined" or "could be determined" in this way. Oxygenator's main point seems to be that it just wouldn't make sense to require a would-be infringer to use a certain container of a certain size in order to practice the method described in Claim 20. It is worth noting, however, that this is just one dependent claim of many. Dependent claims are narrower than their corresponding independent claims, *see Alcon Res., Ltd. v. Apotex Inc.*, 687 F.3d 1362, 1367 (Fed. Cir. 2012), so it is logical to read Claim 20 to impose such a specific

limitation. Tennant's position will therefore largely be adopted. But because Tennant's proposed construction does not fit grammatically in the context of the claim, it will be modified slightly and the disputed term will be construed as *wherein the water with microbubbles and nanobubbles is contained in a two and one half gallon aquarium reservoir container to determine the period for which the microbubbles and nanobubbles at least in part remain in the water*.

K

The final disputed term is "a first anode electrode portion that is nonparallel to a second anode electrode portion." This term appears in Claim 61 of the '665 patent, which discloses "[t]he emitter of claim 55 wherein the at least two electrodes includes a first anode electrode portion that is nonparallel to a second anode electrode portion, the first and second anode electrode portions each being parallel to respective opposing cathode electrode portions." JA57 at 18:19–23. Tennant's proposed construction is "[a] first anode and a second anode with planar surfaces, that are not oriented in the same direction." Joint Claim Construction Statement at 5. In other words, there must be two physically separate anodes. Oxygenator disagrees, arguing that only one anode is required and that this "claim limitation simply describes the physical relationship of two portions of [the] anode relative to one another[.]" Oxygenator Br. at 46. It believes that no construction is required.

The plain language of the claim appears to preclude Tennant's proposed construction. It refers to two nonparallel electrode "portion[s]." The ordinary lay meaning of this word is clear: "a part of a whole." *Portion*, American Heritage Dictionary of the English Language, https://www.ahdictionary.com/word/search.html?q=portion (last

visited Aug. 18, 2021). Tennant does not identify any evidence—intrinsic or extrinsic—that a person of ordinary skill in the art would have understood the word differently. Its proposed construction would essentially substitute the phrase "planar surfaces" for the word "portion," but it offers no persuasive justification for doing so. In other words, based solely on the text, the claim seems to encompass electrode portions that are not physically separate from one another.

Tennant does not meaningfully dispute this understanding of the claim's plain language. Instead, it points to a spot in the prosecution history where the patentee identified Figure 7A and the text describing it as written description support for the language in Claim 61. *See* JA1764–65. Figure 7A, which is reproduced above, appears to depict three physically separate anode electrodes. *See* JA9. On this basis, Tennant argues that the disputed term in Claim 61 only encompasses embodiments with physically separate electrodes. It adds in its response brief that rejecting its proposed construction would render the claim invalid for lack of written description support. *See* 35 U.S.C. § 112; *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc).

Tennant's arguments do not overcome the plain language of claim. The inclusion of Figure 7A in the specification and prosecution history does not appear to represent a "clear disavowal of claim scope," which is required before a specification can "reveal a special definition given to a claim term . . . that differs from the meaning it would otherwise possess." *Cont'l Circuits LLC v. Intel Corp.*, 915 F.3d 788, 796–97 (Fed. Cir. 2019) (citations omitted). Indeed, limiting the claim scope in the way Tennant suggests runs the risk of improperly importing a limitation from a preferred embodiment of the invention.

See SanDisk Corp. v. Memorex Prods., Inc., 415 F.3d 1278, 1286 (Fed. Cir. 2005). Finally, although a court should generally attempt to construe a claim term so as to avoid invalidating the claim, this canon cannot does not allow a court to adopt a construction that "conflict[s] with the explicit language of the claim." *Rhine v. Casio, Inc.*, 183 F.3d 1342, 1345 (Fed. Cir. 1999).[13] Because the primary dispute seems to be over the effect of the word "portion," which has a commonly understood meaning that is consistent with the claim language, no construction will be issued.

ORDER

Based on the foregoing, and on all the files, records, and proceedings in this case, **IT IS ORDERED THAT** the terms of U.S. Patent Nos. RE45,415, RE47,092, and RE47,665 be construed as set forth above.

Dated: August 18, 2021

s/ Eric C. Tostrud
Eric C. Tostrud
United States District Court

[13] This opinion does not address whether the claim term actually is invalid for lack of written description support. Tennant is free to pursue its invalidity arguments later in the litigation if it elects to do so.