## UNITED STATES DISTRICT COURT NORTHERN DISTRICT OF CALIFORNIA

NATURE SIMULATION SYSTEMS INC.,

Plaintiff,

v.

AUTODESK, INC.,

Defendant.

### Case No. 19-cv-03192-SK

#### ORDER REGARDING CLAIM CONSTRUCTION

On June 7, 2019, Plaintiff Nature Simulation Systems, Inc. ("NSS") filed a complaint alleging that Defendant Autodesk, Inc. ("Autodesk") infringes two of its patents, U.S. Patent No. 10,120,961 (the "'961 patent") and U.S. Patent No. 10,109,105 (the "'105 patent"). (Dkt. 1.) Both parties have consented to the jurisdiction of the undersigned pursuant to 28 U.S.C. § 636(c). (Dkts. 11, 13.) The Court entered a stipulated protective order on March 18, 2020. (Dkt. 32.) NSS filed its opening claim construction brief on April 27, 2020. (Dkt. 35.) Autodesk filed its brief in opposition on May 11, 2020. (Dkt. 36.) NSS replied on May 18, 2020. (Dkt. 37.) The Court held a tutorial hearing via Zoom on May 26, 2020. (Dkt. 43.) Autodesk's expert Daniel Aliaga, Ph.D., appeared and testified at the tutorial hearing. (*Id.*) NSS presented no expert witness testimony at the tutorial hearing. (*Id.*)

On June 4, 2020, the Court held a claim construction hearing via Zoom. (Dkt. 49.) The parties dispute the construction of eight terms contained in the two patents at issue. (Dkt. 48-1.) At the claim construction hearing, the Court heard oral argument regarding the first two disputed claim terms and took construction of those terms under submission, with further hearing on the remaining terms to be set if necessary. (*Id.*) Having reviewed the submissions of the parties, the relevant legal authority, and the record in the case, and having had the benefit of expert testimony and oral argument, the Court HEREBY CONCLUDES that the first two disputed terms are

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indefinite, rendering the patents-in-suit invalid.

#### BACKGROUND

The patents in dispute here disclose methods of packing data for computer aided design ("CAD"). In essence, like all CAD, the asserted patents allegedly infringed by Autodesk's software program Autodesk 3ds Max create a representation of a three-dimensional object or objects. Specifically, the patents "relate to computer-implemented methods for performing Boolean operations on three-dimensional, geometric objects." (Dkt. 36.) The '961 patent is a continuation-in-part of the application that led to the '105 patent. NSS asserts claim 1 of the '105 patent and claims 1 and 8 of the '961 patents against Autodesk. The claims are very similar.

NSS concedes that the general idea of performing Boolean operations in this area was well known before the patents in dispute, as the asserted patents cite to prior art disclosing this concept.

NSS describes the asserted patents as "strik[ing] a balance" between constructive solid geometry and boundary representation, in which the asserted patents use some of the best features of both methods of packaging data. (Dkt. 35.) NSS describes that: (1) "each three-dimensional object exists in a virtual box," (2) this "object bounded in the box is triangulated, meaning that the object is decomposed into more triangles," and (3) a "triangle in a three-dimensional space has three neighboring triangles." (*Id.*)

There are two methods from prior art that are cited in the asserted patents. The Delaunay method is a known method of triangulation (known as "Delaunay triangulation"), and the Watson method is a known algorithm for computing a Delaunay triangulation that is described in a paper written in 1981 by D.F. Watson. ('961 patent at 6:64-66, '105 patent, 6:42-44.)

#### DISCUSSION

#### A. Legal Standards.

The Constitution provides that "[t]he Congress shall have Power... To promote the Progress of Science and the useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." Art. 1, § 8, cl. 8. Pursuant to this provision, the United States issues patents protecting "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. §

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101. To safeguard its subject matter, "a patent must describe the exact scope of an invention and its manufacture." *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 373 (1996). A patent's exacting description must contain two parts: a specification describing the invention "in such full, clear, concise, and exact terms as to enable any person skilled in the art ... to make and use the same" and "one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention." 35 U.S.C. § 112. The claim "functions to forbid not only exact copies of an invention" but also competing "products that go to 'the heart of an invention but avoi[d] the literal language of the claim by making a noncritical change." *Markman*, 517 U.S. at 373-74 (citation omitted).

The owner of a patent may seek to enforce it by alleging infringement, *i.e.*, that the defendant "without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor." 35 U.S.C. § 271(a). "Victory in in infringement suit requires a finding that the patent claim 'covers the alleged infringer's product or process,' which in turn necessitates a determination of 'what the words in the claim mean." *Markman*, 517 U.S. at 374 (citing H. Schwartz, Patent Law and Practice 1, 80 (2d ed. 1995)). Indeed, "[i]t is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude." *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004) (collecting cases). Infringement actions therefore "requir[e] a two-step analysis;" first, construction of the claims, which is a matter of law, and second, determination of infringement, which is a matter of fact. *Wright Med. Tech., Inc. v. Osteonics Corp.*, 122 F.3d 1440, 1443 (Fed. Cir. 1997).

#### 1. Claim Construction.

"The construction of a patent, including terms of art within its claim, is exclusively within
the province of the court" as a matter of law. *Markman*, 517 U.S. at 372. "It is well-settled that,
in interpreting an asserted claim, the court should look first to the intrinsic evidence of record, *i.e.*,
the patent itself, including the claims, the specification and, if in evidence, the prosecution history. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). "Such intrinsic

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evidence is the most significant source of the legally operative meaning of the disputed claim language." Id. Because of the "bedrock principle" that the claims define the invention subject to the patent, "a claim construction analysis must begin and remain centered on the claim language itself, for that is the language the patentee has chosen to 'particularly poin[t] out and distinctly clai[m] the subject matter which the patentee regards as his invention." Innova/Pure Water, 381 F.3d at 1116 (citing Interactive Gift Express, Inc. v. Compuserve, Inc., 256 F.3d 1323, 1331 (Fed. Cir. 2001) (quoting 35 U.S.C. § 112)).

Claim construction analysis proceeds in three steps. First, courts "look to the words of the claims themselves, both asserted and nonasserted, to define the scope of the patented invention." Vitronics, 90 F.3d at 1582. "[W]ords in a claim are generally given their ordinary and customary meaning." Id. "[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person or ordinary skill in the art in question at the time of the invention, *i.e.*, as of the effective filing date of the patent application." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005). As a second step, "it is always necessary to review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning." Vitronics, 90 F.3d at 1582. Claims are to be read in light of the specification, which "acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication." Id. Because of this imbrication of claims and specification, "the 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." *Id.* Third and finally, "the court may also consider the prosecution history of the patent, if in evidence." Id.

Typically, analysis of these three sources of intrinsic evidence is sufficient to clarify "any 22 23 ambiguity in a disputed claim term." Id. at 1583. Extrinsic evidence is customarily considered only if necessary to assist in evaluating the meaning or scope of technical terms in the claims. 24 Pall Corp. v. Micron Separations, Inc., 66 F.3d 1211, 1216 (Fed. Cir. 1995). "[E]xtrinsic 25 evidence in the form of expert testimony can be useful to a court for a variety of purposes, such as 26 to provide background on the technology at issue, to explain how an invention works, to ensure 27 28 that the court's understanding of the technical aspects of the patent is consistent with that of a

person of skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field." Phillips, 415 F.3d at 1318. Simultaneously, a court need not credit an expert's "conclusory, unsupported assertions" or testimony that conflicts with the intrinsic evidence. Id. When "considered in the context of the intrinsic evidence," "extrinsic evidence may be useful to the court" because it "can help educate the court regarding the field of the invention and can help the court determine what a person of ordinary skill in the art would understand claim terms to mean." Id. at 1319.

#### 2. Indefiniteness.

Section 112's provision that the specification must conclude with "one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint 10 inventor regards as the invention" is also known as the definiteness requirement. Acacia Media Techs. Corp. v. New Destiny Internet Group, 405 F. Supp. 2d 1127, 1131 (N.D. Cal. 2005). Patents must be definite "for the protection of the patentee, the encouragement of the inventive genius of others, and the assurance that the subject of the patent will be dedicated ultimately to the public." Gen. Elec. Co. v. Wabash Appliance Corp., 304 U.S. 364, 369 (1938). To that end, "[t]he inventor must 'inform the public during the life of the patent of the limits of the monopoly 16 asserted, so that it may be known which features may be safely used or manufactured and which may not;" crucially, "[i]n a limited field the variant must be clearly defined." Id. Accordingly, "[a] patent claim which fails to meet the definiteness requirement is invalid." Acacia, 405 F. Supp. 2d at 1132 (citing Wabash, 304 U.S. at 364). Like the claim construction of which it forms a part, the court's finding that a patent claim is invalid for failure to meet the definiteness requirement is a question of law. Bancorp Servs., LLC v. Hartford Life Ins. Co., 359 F.3d 1367, 1371 (Fed. Cir. 2004).

Once issued, a patent is presumed to be valid. 35 U.S.C. § 282. When a party alleges that 24 25 a patent is invalid as indefinite, the court must make a determination of definiteness based on the understanding of a person of ordinary skill in the art at issue. To determine whether a claim is 26 definite, a court must analyze whether a person ordinarily skilled in the art would understand what 27 28 is claimed when the claim is read in light of the specification. Personalized Media

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Communications, LLC v. Int'l Trade Comm'n, 161 F.3d 696, 705 (Fed. Cir. 1998). "[A] claim is not indefinite merely because it poses a difficult issue of claim construction; if the claim is subject to construction, *i.e.*, it is not insolubly ambiguous, it is not invalid for indefiniteness." *Bancorp*, 359 F.3d at 1371. Courts must find "claims indefinite only if reasonable efforts at claim construction prove futile," and close questions of indefiniteness must be resolved in favor of the patentee. Id.

A court employs the canons of claim construction to determine definiteness. Oakley, Inc. v. Sunglass Hut Int'l, 316 F.3d 1331, 1340-41 (Fed. Cir. 2003). As discussed above, the three primary sources of intrinsic evidence are consulted, followed by extrinsic evidence if necessary. Vitronics, 90 F.3d at 1582; Pall, 66 F.3d at 1216. Terms are given their ordinary meaning, and technical terms included in a patent claim should be given the meaning a person experienced in the field of the invention would give them. Verve, LLC v. Crane Cams, Inc., 311 F.3d 1116, 1119 (Fed. Cir. 2002) ("While reference to intrinsic evidence is primary in interpreting claims, the criterion is the meaning of words as they would be understood by persons in the field of the invention."). "Testimony by a witness, who is recognized by the Court as an expert in the field of the invention, about the common meaning of a technical term at the time the application was filed, is instructive in ascertaining its meaning" for purposes of a definiteness analysis. Acacia, 405 F. Supp. 2d at 1132 (citing Glaxo Wellcome, Inc. v. Andrx Pharm., Inc., 344 F.3d 1226, 1229 (Fed. Cir. 2003)).

20If there is an amendment to a patent, as there is here, by the United States Patent and Trademark Office ("PTO"), the PTO's amendment is presumed valid, and the party challenging 21 22 the patent must present clear and convincing evidence to overcome the presumption. *Microsoft* 23 Corp. v. i4i Ltd. P'ship, 564 U.S. 91, 95-96 (2011) (PTO must make various factual determinations" which can be set aside only for clear and convincing evidence). However, even if 24 25 there is an amendment, the claim may still be found to be indefinite. See, e.g., Dealertrack, Inc. v. Huber, 674 F.3d 1315, 1321-23 (Fed. Cir. 2012); Sigram Schindler Beteiligungsgesellschaft mbH 26 v. Cisco Sys., Inc., 726 F. Supp. 2d 396, 424-26 (D. Del. 2010). 27

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#### B. Analysis.

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Although the parties dispute seven claims in the asserted patents (Dkts. 35, 36), the Court considered the first two disputed claims, which are dispositive. The disputed claim language from both asserted patents are as follows: (1) "modified Watson method" and (2) "search neighboring triangles of the last triangle pair that holds the last intersection point."

#### 1. "modified Watson method."

NSS proposes that the first claim ("modified Watson method") be given its "ordinary meaning." Autodesk argues that it is indefinite. The Watson method is an algorithm for computing a Delaunay triangulation that is described in a 1981 paper by D.F. Watson cited in the asserted patents. ('961 patent at 6:64-66; '105 patent, 6:42-44.) NSS and Autodesk seemingly agree on a common understanding of the Watson method. The distinction arises in the manner in which the asserted patents attempt to modify the Watson method.

To support its argument that "modified Watson method" is ambiguous, Autodesk provides the declaration of expert witness Daniel Aliaga, Ph.D. ("Aliaga"), who opined that the term "modified Watson method" does not have and did not have at the time the patents were issued an ordinary and customary meaning to a person of ordinary skill in the art ("POSITA"). (Dkt. 36-1.) Aliaga opines that a POSITA is a person with at least a master's degree in computer science or a related field, or a bachelor's degree in computer science or a related filed plus two years of relevant experience, with experience in computer graphics, computer-aided design, solid modeling, or geometric modeling. (Dkt. 36-1 ¶ 14.)

The PTO rejected the '961 patent partially because the term "modified Watson method" was not adequately defined. (Dkt. 37-1 (Ex. A (File History) at 1).) Later, the PTO amended the '961 patent to add language regarding removing duplicate intersection points, identifying positions of end intersection points, and splitting portions of each triangle. (*Id.* at 2-3.)

NSS argues, with no citation to an expert or any other evidence, that a POSITA would understand the limitations of the claim based on the intrinsic evidence of the patents. However, in the face of the undisputed opinion evidence by Aliaga, the Court cannot simply accept NSS's unsupported opinion.

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Thus, the question is thus: if the PTO issues a patent after amendment to clarify an indefinite term, but an expert later opines that a POSITA would not understand the term, how does the Court determine whether the term is indefinite? The only way to do so here is to look at each argument to see if Autodesk raises any unanswered questions. Here, Autodesk does.

NSS does not provide any expert testimony to rebut Aliaga's opinion. NSS instead cites to the intrinsic evidence of the patents, specifically Fig. 13, reproduced below.



i.

The language of the asserted patents describes the modified Watson method as including "removing duplicate intersection points, identifying positions of end intersection points, and splitting portion of each triangle including an upper portion, a lower portion and a middle portion." ('961 patent at 9:35-40; '105 patent, 8:64-9:3.)

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#### "removing duplicate intersection points."

Autodesk claims that "removing duplicate intersection points" is ambiguous because the patent does not provide information telling a POSITA how to identify or how to remove duplicate intersection points. NSS points to specific language in the patents that teaches how "an intersection line passes through a set of triangles and divides each triangle into multiple partitions," with deletion of duplicate points. ('961 patent at 6:28-58.) The claim language leaves unanswered the following questions: (1) What is a neighboring point of intersection (referred to as "PET" in the patents)?; (2) What is the meaning of an "identical" point of intersection?; (3) What is the meaning of removing a point of intersection?; (4) From what is the point of intersection being removed? NSS does not respond to these specific questions, which highlight the ambiguity of the claim language.

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# ii. "splitting portion of each triangle including an upper portion, a lower portion and middle portion."

Autodesk argues that this language is ambiguous because there are several ways to split a triangle into an upper, lower, and middle portion and provides a visual example, reproduced below.



19 (Dkt. 36-1 (Aliaga Dec. ¶ 16) (explanation); Dkt. 51 (illustration).) NSS suggests in its reply brief 20 that it is not necessary to split the triangle into an upper, lower, and middle portion. (Dkt. 37 at 21 page 6.) However, the claim language includes the word: "and." ('961 patent at 9:35-40.) In 22 other words, the splitting of the triangle into the upper portion, middle portion, and lower portion 23 is not optional, based on the language of the claim. In support of its assertion that splitting into the 24 three portions is optional, NSS points to the specification's discussion of optional splitting of 25 partitions. (Dkt. 37 at page 6.) This argument does not enable NSS to succeed in re-writing the 26 language of the claim itself.

NSS points to Figure 13, *supra*, as the explanation of the modified Watson method.
However, the language of Figure 13 does not match the claim language, as it does not describe in

any manner the removing of duplicate intersection points, identifying positions of end intersection points, and splitting portion of each triangle including an upper portion, a lower portion and a middle portion.

NSS points to column 7 of the specification and relies on step 5(a) of column 7 to show the modification of the Watson method. ('961 patent at 7:17-23). This language adds an additional condition: "or last segment passes through the triangle." Again, this language is not contained in the claim language and does not explain the challenged claim language.

Autodesk points to a comparison between that language of column 7: 17-23 with dependent claim 6. Column 7: 17-23 states: "For every point, check every triangle whether its circumcircle contains the point or the last segment passes through the triangle. (Dkt. No. 31-2 ('961 Patent), col. 7:19-23.) Dependent claim 6 states: "checking every triangle in the triangle set whether its circumcircle contains the point or the last segment passes through the triangle[.]" Under the doctrine of claim differentiation, the presence of a limitation in a dependent claim gives rise to the proposition that it is not the independent claim. *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1251 n.3 (Fed. Cir. 2008). Thus, the references in dependent claim 6 do not define the term "modified Watson claim" in the manner that NSS suggests.

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Figure 13, the flowchart, results in Figure 12. Figures 12A through 12F are labeled as "prior art" in the '961 patent but not in the '105 patent. However, if one assumes that 12G shows the "modified Watson method," as in the progression from prior art of Figure 12F to the modified Watson method of Figure 12G, an examination shows that Figure 12 does not follow the conditions of the modified Watson method as described in the patents. First, the progression from Figure 12F to Figure 12G shows that a polygon, not a triangle, is split, as demonstrated by the following depictions in color:

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intersection line" when in some cases it is not possible, as Aliaga demonstrates. (Dkt. 36-1 (Aliaga Dec. ¶ 26).)

In response, NSS argues that the language of the patents is clear and simply points to the patent language. NSS argues that the Figure 4 does not show an iterative process as Autodesk claims and points out that the threshold requirement for building the intersection line is to "search for the first not-traveled intersection point." (Dkt. 31-2 ('961 Patent, Figure 4).) In Figure 4, the method proceeds to the "extend intersection line" step only so long as "the first intersection line is found" and the method is search "for the first not-traveled intersection point." Figure 4 and the language are clear on this first issue regarding whether the process is iterative or not.

However, NSS has no response to the other specific questions that Aliaga poses other than to argue that the language is clear. Given Aliaga's uncontroverted opinion and specific questions raising ambiguity, NSS cannot prevail. NSS argues that the PTO amended the claim in such a way that clarified the term, and thus the Court should give deference to the PTO. 35 U.S.C. § 285(a); *see also Microsoft Corp.*, 564 U.S. at 95-96. However, as Autodesk points out, NSS raises this argument for the first time in its reply and did not cite this claim history in the joint claim construction pleading, both in violation of the Local Rules. *See* Civ. L.R. 7-3 (describing appropriate contents of reply); *California Sportfishing Prot. All. v. Pac. States Indus., Inc.*, 2015 WL 5569073, at \*2 (N.D. Cal. Sept. 22, 2015) (finding that "reply brief improperly raises brand new arguments not stated in the opening brief" and refusing to consider those arguments for purposes of deciding the motion); Pat. L.R. 4-5 (describing appropriate contents of claim construction briefs and reply); *Ericsson Inc. v. Intellectual Ventures I LLC*, 901 F.3d 1374, 1380 (Fed. Cir. 2018) (discussing and approving general patent law practice of "reject[ing] arguments raised for the first time in a reply.").

NSS argues that Autodesk should not be able to weaponize the Local Rules. However, the
Local Rules exist for a reason – to provide parties with adequate notice to prepare a response.
Even though NSS did not comply with the Local Rules in this regard, the Court nonetheless
considers NSS's arguments on the merits and finds that the claim history does not provide the
clarification suggested. The prosecution history does not show how or why the amendment

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answered the unanswered questions. The prosecution history does not provide a clear reason for the amendment that clarifies the underlying ambiguity. The PTO initially rejected Claim 1 as indefinite: "The nexus between 'extending the intersection lines' and 'searching neighboring triangles' is also not clearly set forth. The examiner is not able to ascertain the scope of the claimed invention." (Dkt. 37-1 (Ex. A at page 4).) In response, NSS added the following language: "building intersection lines starting with and ending with . . . calculations for locating an 6 intersection point, then searching neighboring triangles of the last triangle pair that holds the last intersection point to extend the intersection line until the first intersection point is identical to the last intersection point of the intersection line ensuring that the intersection line gets closed or until all triangles are traversed." (Id.) This added language does not answer the questions posed by Aliaga.

#### CONCLUSION

For the reasons set forth above, the Court finds that the claim language (1) "modified Watson method" and (2) "search neighboring triangles of the last triangle pair that holds the last intersection point" are indefinite.

#### IT IS SO ORDERED.

Dated: July 31, 2020

Aarie Kami

SALLIE KIM United States Magistrate Judge

Northern District of California United States District Court