

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA**

3SHAPE A/S,

Plaintiff,

v.

CARESTREAM DENTAL, LLC,
DENTAL IMAGING
TECHNOLOGIES CORP., and
DENTAL IMAGING
TECHNOLOGIES CORP. d/b/a
DEXIS

Defendants.

C.A. No. 1:22-cv-01829-WMR

**COUNTERCLAIM DEFENDANT 3SHAPE A/S'
OPENING BRIEF ON CLAIM CONSTRUCTION**

TABLE OF CONTENTS

I.	Introduction	1
II.	Claim Construction Standard	1
III.	Overview of the Patents	3
IV.	Agreed Upon Terms	4
V.	U.S. Patent No. 11,234,798	4
A.	“occlusal surface” (cls. 1-4, 6, 8-12, 14-15, 18, 20)	4
B.	“a contiguous scan of an occlusal surface” / “the contiguous scan” / “the contiguous scan of the occlusal surface” (cls. 1-3, 6, 8-11, 14-15, 18-20) and “a scan of at least one additional surface” / “the at least one additional surface” (cls. 1, 3, 10, 14)	4
C.	“image frames” (cls. 1, 3, 10, 14)	7
D.	“analyzing the scan data to identify a portion of the scan of the at least one additional surface that overlaps with a portion of the contiguous scan of the occlusal surface” (cls. 1, 10)	9
E.	“image data” (cls. 1, 9-10, 18-20)	10
VI.	U.S. Patent No. 10,076,391	11
A.	“Successful” is an Indefinite Relative Term of Degree	11
1.	“displaying...if the alignment is successful” (cls. 1, 13, 18, 20- 21)	11
2.	“successful bite registration” (cls. 1, 13, 18, 20-21)	15
3.	“means for displaying the bite surface together with the 3D teeth models of the upper jaw and the lower jaw aligned with the bite surface if alignment is successful” (claim 13)	17
4.	“means for obtaining at least two successful bite registrations corresponding to different displayed bite surface by repeating” (claim 13)	19
5.	“selecting said two or more of the displayed successful bite registrations” (cls. 1, 13, 21)	21
6.	“means for selecting two or more successful bite registrations by evaluating at least two successful bite registrations and selecting said two or more of the displayed successful bite registrations” (claim 13)	22
B.	The ’391 Patent’s Process of “Evaluating” is Subjective and Fails as Indefinite	23

1.	“selecting two or more successful bite registrations by evaluating (the) at least two successful bite registrations” (Cls. 1, 13, 18, 21) and “selecting one or more successful bite registrations by evaluating at least two successful bite registrations” (Claim 20)	25
2.	“means for... evaluating at least two successful bite registrations” (claim 13)	26
C.	Claims 13 and 18 are Indefinite Mixed Method and Apparatus Claims	27
1.	Claim 13.....	28
2.	Claim 18.....	29
D.	“Best metric” (claim 8) is a Subjective Term that Fails as Indefinite.	30
VII.	Conclusion.....	30

TABLE OF AUTHORITIES**Page(s)****Cases**

<i>AFG Indus., Inc. v. Cardinal IG Co.</i> , 239 F.3d 1239 (Fed. Cir. 2001)	4
<i>Amag Pharm., Inc. v. Sandoz, Inc.</i> , No. 16-cv-1508, 2017 WL 3076974 (D.N.J., July 19, 2017)	29
<i>Aristocrat Techs. Australia Pty Ltd. v. Int’l Game Tech.</i> , 521 F.3d 1328 (Fed. Cir. 2008)	18, 19
<i>Atmel Corp. v. Information Storage Devices, Inc.</i> , 198 F.3d 1374 (Fed. Cir. 1999)	3
<i>Barkan Wireless Access Techs., L.P. v. Cellco P’ship</i> , 748 Fed. Appx. 987 (Fed. Cir. 2018)	7
<i>Core Wireless Licensing S.A.R.L. v. Apple Inc.</i> , No. 15-cv-05008, 2016 WL 6427850 (N.D. Cal. Oct. 31, 2016)	29
<i>GE Lighting Solutions, LLC v. Lights of America Inc. et al.</i> , 663 Fed. Appx. 938 (Fed. Cir. 2016)	2
<i>Halliburton Energy Servs., Inc. v. M-I LLC</i> , 514 F.3d 1244 (Fed. Cir. 2008)	9, 16
<i>Harris Corp. v. Fed. Express Corp.</i> , 502 Fed. Appx. 957 (Fed. Cir. 2013)	7
<i>Intellectual Ventures I LLC v. T-Mobile USA, Inc.</i> , 902 F.3d 1372 (Fed. Cir. 2018)	14, 26
<i>Interval Licensing LLC v. AOL, Inc.</i> , 766 F.3d 1364 (Fed. Cir. 2014)	<i>passim</i>
<i>IPXL Holdings, L.L.C. v. Amazon.com, Inc.</i> , 430 F.3d 1377 (Fed. Cir. 2005)	28
<i>Liberty Ammunition, Inc. v. U.S.</i> , 835 F.3d 1388 (Fed. Cir. 2016)	2, 12

<i>Markman v. Westview Instruments, Inc.</i> , 52 F.3d 967 (Fed. Cir. 1995)	1
<i>Nautilus Inc. v. Biosig Instruments, Inc.</i> , 572 U.S. 898 (2014)	1, 2, 14, 26
<i>Niazi Licensing Corp. v. St. Jude Med. S.C., Inc.</i> , 30 F.4th 1339 (Fed. Cir. 2022)	11
<i>Noah Sys. Inc. v. Intuit Inc.</i> , 675 F.3d 1302 (Fed. Cir. 2012)	18, 20, 24, 27
<i>Parkervision, Inc. v. Apple Inc.</i> , No. 3:15-CV-1477-J-39JRK, 2019 WL 4385673 (M.D. Fla. July 15, 2019)	28, 29
<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005)	1, 2
<i>Robert Bosch, LLC v. Snap-On Inc.</i> , 769 F.3d 1094 (Fed. Cir. 2014)	19, 24, 27
<i>Seattle Box Co., Inc. v. Indus. Crating & Packing, Inc.</i> , 731 F.2d 818 (Fed. Cir. 1984)	2
<i>Sensor Electronic Technology, Inc. v. Bolb, Inc.</i> , No. 1:18-cv-05194-LHK, 2019 WL 4645338 (N.D. Cal., Sept. 24, 2019) ...	6, 16
<i>SFA Sys., LLC v. 1-800-Flowers.com, Inc.</i> , 940 F. Supp. 2d 433 (E.D. Tex. 2013)	30
<i>Sonix Tech. Co. v. Publ'ns Int'l, Ltd.</i> , 844 F.3d 1370 (Fed. Cir. 2017)	15, 16, 30
<i>Uniloc 2017 LLC v. Samsung Elecs. Co.</i> , Case No. 2:18-cv-00506-JRG, 2020 WL 24880 (E.D. Tex. Jan. 16, 2020)	24
<i>WMS Gaming, Inc. v. Int'l Game Tech.</i> , 184 F.3d 1339 (Fed. Cir. 1999)	18
Statutes	
35 U.S.C. 112	28
35 U.S.C. § 112(6)	17, 27

35 U.S.C. § 112, ¶ 6.....	17, 19, 22, 27
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Other Authorities

Local Rule 5.1 (B)	32
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Local Rule 7.1(D)	32
-------------------------	----

EXHIBITS

<u>Exhibit</u>	<u>Description</u>
A	2023-10-27 Declaration of J.P. Mellor in Support of Counterclaim Defendant 3Shape A/S' Opening Claim Construction Brief
B	JayPee's Dental Dictionary (Excerpt)
C	Stedman's Medical Dictionary for the Dental Professions (Excerpt)
D	Oxford Dictionary of Dentistry (Excerpt)
E	Excerpt of Prosecution History for U.S. Patent No. 11,234,798
F	Excerpt of Prosecution History for U.S. Patent No. 10,076,391

TABLE OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Description</u>
'798 patent	U.S. Patent No. 11,234,798
'391 patent	U.S. Patent No. 10,076,391
Asserted Patents	U.S. Patent Nos. 11,234,798 and 10,076,391
2D	Two-dimensional
3D	Three-dimensional
POSITA	Person of Ordinary Skill in the Art

TABLE 1: AGREED UPON CONSTRUCTIONS

Claim Term	Agreed Construction
“means for generating 3D teeth models of the upper jaw and the lower jaw” (’391 patent, Cl. 13)	Subject to 35 U.S.C. § 112 ¶ 6 <u>Function</u>: generating 3D teeth models of the upper jaw and the lower jaw <u>Structure</u>: ’391 patent at 3:45-4:5, 4:18-47, Fig. 1, Fig. 2 (S110), Fig. 3, Fig. 4, and equivalents thereof.
“means for acquiring a bite surface containing a portion of at least one tooth of the upper jaw and a portion of at least one opposing tooth of the lower jaw simultaneously” (’391 patent, Cl. 13)	Subject to 35 U.S.C. § 112 ¶ 6 <u>Function</u>: acquiring a bite surface containing a portion of at least one tooth of the upper jaw and a portion of at least one opposing tooth of the lower jaw simultaneously. <u>Structure</u>: ’391 patent at 4:41-47, 4:48-5:18, Fig. 2 (S120), Fig. 5, and equivalents thereof.
“means for attempting to align the 3D teeth models of the upper jaw and the lower jaw with the bite surface” (’391 patent, Cl. 13)	Subject to 35 U.S.C. § 112 ¶ 6 <u>Function</u>: attempting to align the teeth models of the upper jaw and the lower jaw with the bite surface <u>Structure</u>: ’391 patent at 5:18-62, Fig. 2 (S130), Fig. 6, and equivalents thereof.
“occlusal backbone” (’798 patent, Cls. 6, 15, 17, 18)	“three dimensional representation of the occlusal surface”

I. INTRODUCTION

3Shape’s proposed claim constructions for DITC’s patents are rooted in the intrinsic evidence: the claim language itself, the patent specification, and the prosecution history before the Patent Office. DITC, on the other hand, seeks to rewrite its claims under the guise of “plain and ordinary” constructions to try to cover all methods of intraoral scanning (’798 patent) and digitized bite registration (’391 patent). DITC’s asserted claims and proposed constructions contradict the fundamental requirement of patents: “to be precise enough to afford clear notice of what is claimed, thereby ‘appris[ing] the public of what is still open to them.’” *Nautilus Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 909 (2014).

Claim construction is not an opportunity for a patent holder to expand its monopoly. The Court should reject DITC’s constructions and construe the claims consistent with the patents.

II. CLAIM CONSTRUCTION STANDARD

Claim interpretation is a matter of law. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 990 (Fed. Cir. 1995). In construing claims, “the words of a claim are generally given their ordinary and customary meaning.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (citing *Vitrionics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576 (Fed. Cir. 1996)). While “the claims of a patent define the invention,” the patent specification “is always highly relevant to the claim

construction analysis” and “is the single best guide to the meaning of a disputed term.” *Id.* at 1312, 1315 (citations omitted). Claims “must be read in view of the specification, of which they are a part.” *Id.* at 1315 (citation omitted).

The Court may also consider “extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” *Id.* at 1314 (citation omitted). Such evidence includes “expert and inventor testimony, dictionaries, and learned treatises.” *Id.*, 1317 (citations omitted).

“A patent is invalid for indefiniteness if its claims, read in light of the patent’s specification and prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). When a claim includes a term of degree, it “necessarily calls for a comparison against some baseline.” *Liberty Ammunition, Inc. v. U.S.*, 835 F.3d 1388, 1395 (Fed. Cir. 2016). “When a word of degree is used the district court must determine whether the patent’s specification provides some standard for measuring that degree.” *Seattle Box Co., Inc. v. Indus. Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984). Where clear guidance about the bounds of a term of degree are lacking in the intrinsic evidence, courts have found those terms of degree indefinite.” *See, e.g., Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371-72 (Fed. Cir. 2014) (“unobtrusive manner” found indefinite”); *GE Lighting Solutions, LLC v. Lights of America Inc. et al.*, 663 Fed.

Appx. 938, 939 (Fed. Cir. 2016) (affirming the term “elongated,” a term of degree, was indefinite because the specification failed to provide objective guidance as to when something was deemed to be “elongated”). Where the specification fails to disclose sufficient corresponding structure, means-plus-function terms are indefinite. *Atmel Corp. v. Information Storage Devices, Inc.*, 198 F.3d 1374, 1382, 1230 (Fed. Cir. 1999).

III. OVERVIEW OF THE PATENTS

'798 Patent

The '798 patent purportedly discloses a system for generating a 3D model of a patient's teeth by first generating a scan of the occlusal surface of a patient's teeth, and subsequently, by generating an additional scan of an additional surface (*e.g.*, the labial or lingual surface of the patient's teeth). '798 patent, Abs. The additional scan(s) are stitched to the scan of the occlusal surface. *Id.* Each scan is generated by capturing a series of images of the patient's teeth, from which 3D data is derived. *See, e.g.*, '798 patent, 7:36-45.

'391 Patent

The '391 patent discloses a method and system for generating a bite registration. '391 patent, Abs. 3D models of the upper and lower jaw teeth must be generated first, followed by a reading of the bite surface of the teeth. *Id.* Then, the system aligns the 3D teeth models with the bite surface, displaying the result for

the user to view. *Id.* This process purportedly improves accuracy of bite registration for dental treatment, “reduces cost and simplifies the workflow of dental registration.” *See id.*, 1:11-18.

IV. AGREED UPON TERMS

3Shape respectfully requests the Court adopt the agreed upon constructions set forth in Table 1.

V. U.S. PATENT NO. 11,234,798

A. “occlusal surface” (cls. 1-4, 6, 8-12, 14-15, 18, 20)

DITC’s Construction	3Shape’s Construction
Plain and ordinary meaning	“the biting surface of a patient’s teeth”

The plain and ordinary meaning of this term, as reflected in the entire specification of the ’798 patent, the prosecution history of the ’798 patent, and the extrinsic evidence cited by both parties, is “the biting surface of a patient’s teeth.” Ex. A, ¶¶18-20; *see also* Exs. B, C, D; *see, e.g.*, ’798 patent; *see generally* Ex. E.

“Occlusal surface” is a technical term within the field of dentistry that is present in nearly every claim of the ’798 patent. Construction of this term is needed to provide guidance to the jury. *See AFG Indus., Inc. v. Cardinal IG Co.*, 239 F.3d 1239, 1247 (Fed. Cir. 2001) (stating construction of disputed terms is “critical” to help the jury understand its instructions). Thus, this Court should adopt 3Shape’s proposed construction, “the biting surface of a patient’s teeth.”

B. “a contiguous scan of an occlusal surface” / “the contiguous scan” / “the contiguous scan of the occlusal surface” (cls. 1-3, 6, 8-11, 14-

15, 18-20) and “a scan of at least one additional surface” / “the at least one additional surface” (cls. 1, 3, 10, 14)

DITC’s Construction	3Shape’s Construction
“a contiguous scan of an occlusal surface” / “the contiguous scan” / “the contiguous scan of the occlusal surface”	
Plain and ordinary meaning	“a scan of an/the occlusal surface made in a single, uninterrupted motion of the scanning wand”
“a scan of at least one additional surface” / “the at least one additional surface”	
Plain and ordinary meaning	“a subsequent additional scan of a surface (e.g. labial, lingual surface) to the contiguous scan of the occlusal surface”

3Shape’s constructions reflect meaning of the terms as understood by a POSITA¹, whereas DITC’s “plain and ordinary meaning” proposal fails to resolve the parties’ dispute and improperly attempts to enlarge the scope of the claims.

The scan terms claim distinct scans. The scan terms have distinct antecedent bases and thus refer to distinct scans. Specifically, the independent claims first recite “a contiguous scan of an occlusal surface;” separately, the claims recite “a scan of at least one additional surface.” These distinct scans are each introduced with the indefinite article “a.” Thus, there is no antecedent basis relationship between the scan terms, evidencing that the claims recite at least two

¹ The standard for a POSITA and related analysis applied to the Asserted Patents is set forth in the Declaration of Dr. J.P. Mellor, attached hereto as Ex. A.

separate scans. *See, e.g., Sensor Electronic Technology, Inc. v. Bolb, Inc.*, No. 1:18-cv-05194-LHK, 2019 WL 4645338, at *55 (N.D. Cal., Sept. 24, 2019). DITC’s proposed interpretation risks confusion by conflating the two scans.

3Shape’s proposed construction is consistent with a POSITA’s understanding of the plain language of the claims and the specification’s disclosure of the “contiguous scan” and “scan of at least one additional surface.” Ex. A, ¶¶22-25. The disclosure describes a contiguous scan followed by an additional, separate scan of an additional surface.

[T]he dental practitioner first acquires an occlusal scan of the patient's teeth in a single segment via an uninterrupted motion of the wand over the occlusal surface of the teeth ... [s]ubsequent to performing the occlusal scan, the dental practitioner may use the wand to acquire images of each of the lingual and labial surfaces of the dental arch in a plurality of segments.

’798 patent, 4:5-15.

The prosecution history supports 3Shape’s construction. There, to overcome a rejection, the patentee argued the cited prior art “does not teach capturing *multiple* scans” and “does not teach or suggest a *second* scan.” Ex. E-1, 8-9, 11. The patentee characterized “mechanisms that receive/capture a contiguous scan of an occlusal surface, *then* receive one or more *additional* scans” as the novelty of the claims. Ex. E-2, 8. The plain language of the claims and the intrinsic evidence all confirm that the independent claims recite at least two distinct scans.

The contiguous scan is taken in a single, uninterrupted motion. The specification defines the term “contiguous scan,” stating “[a] contiguous scan is a scan that scans a part or the entirety of the dental arch in a single uninterrupted motion of the wand.” ’798 patent, 6:23-25; *see also, id.*, 4:6-8, 5:34-35.

Accordingly, because the patentee defined “a contiguous scan,” the Court should construe it consistent this definition. *See, Barkan Wireless Access Techs., L.P. v. Cellco P’ship*, 748 Fed. Appx. 987, 990 (Fed. Cir. 2018) (a patentee’s definition “is the single best guide to the meaning of a disputed term”) *citing Jack Guttman, Inc. v. Kopykake Enterprises, Inc.*, 302 F.3d 1352, 1360 (Fed. Cir. 2002).

C. “image frames” (cls. 1, 3, 10, 14)

DITC’s Construction	3Shape’s Construction
Plain and ordinary meaning	Indefinite

The term “image frames” cannot be given its plain and ordinary meaning because the term must be interpreted in two different ways for the claims to function. As such, a POSITA would not have understood the meaning and scope of “image frames” with reasonable certainty; thus, the term is indefinite.

The same claim terms, repeated in the same claims, should be construed to have the same meaning. *See, e.g., Harris Corp. v. Fed. Express Corp.*, 502 Fed. Appx. 957, 963 (Fed. Cir. 2013) (“When identical language is found in multiple steps within the same claim, it is reasonable to assume that all references relate to the same subject matter”). Here, because “image frames” must mean different

things in different clauses of the same claims, the contradictory and inconsistent use of the term “image frames” renders the claims indefinite.

Throughout the specification, a POSITA would have understood the term “image frames” to refer to 2D images. *See, e.g.*, ’798 patent, 7:36-41 (“a series of three *two dimensional* fringe images are acquired”), 6:33-38; *see also* Ex. A, ¶¶28-32. Consistent with the specification, a POSITA would have understood “image frames” to be 2D in the following clauses: “capturing a plurality of partially overlapping image frames,” “a sequence of image frames including a plurality of image frames,” “partially overlapping image frames,” and “removing the image data of the soft tissue from the overlapping image frames.” Ex. A, ¶33

A problem arises, however, with respect to the claimed “image frames” in two clauses: “stitching the overlapping image frames together to form a 3D model” and “restitching the overlapping image frames ... to form an updated 3D model.” Ex. A, ¶34. For these “stitching” clauses to function, “image frames” must be interpreted as 3D. Ex. A, ¶34. This is inconsistent with the use of that term throughout the remainder of the specification and claims. *See* Ex. A, ¶¶28-32 .

As reflected in Fig. 8, stitching does not involve aligning image frames, as that term is consistently used throughout the specification; rather, stitching (and restitching) involves aligning 3D point clouds. *See* ’798 patent, Fig. 8, 8:53-9:13; Ex. A, ¶¶35-38. Accordingly, the use of “image frames” in the claims is internally

inconsistent such that a POSITA could not discern the metes and bounds of the term with reasonable certainty. Ex. A, ¶¶27-38. Thus, this term is indefinite.

D. “analyzing the scan data to identify a portion of the scan of the at least one additional surface that overlaps with a portion of the contiguous scan of the occlusal surface” (cls. 1, 10)

DITC’s Construction	3Shape’s Construction
Plain and ordinary meaning	Indefinite

This term is indefinite at least because “the scan data” lacks antecedent basis. Where a term lacks antecedent basis and the term’s meaning is “not otherwise present by implication,” the term could be indefinite. *See, e.g., Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1249 (Fed. Cir. 2008).

The claims’ previous recitation of “image data” and “3D data” compounds the confusion created by the antecedent basis issue; a POSITA would not have known how, if at all, “scan data” relates to the prior claimed “data.” Ex. A, ¶45.

Neither the plain language of the claims nor the specification provides context as to what “scan data,” “image data,” and “3D data,” are, or the distinction between those terms. In fact, “scan data” does not appear in the specification at all; it was added to the claims during prosecution, and the accompanying remarks conflate “scan data” with “image frames.” *See* Ex. A, ¶¶41-44.

Given the prosecution history’s confusion of “scan data” with “image frames” – another indefinite term – a POSITA would not have been able to determine what any of these data types *are* with reasonable certainty, much less be

able to discern how those types of data are distinguishable from one another. Ex. A, ¶¶41-44. While a POSITA would have understood the claims and specification to generally attempt to describe systems that relate to a scanner with the goal of creating a 3D model, it is unclear what constitutes “scan data” within that process. Ex. A, ¶47. A POSITA, reading the terms “scan data” in the context of the specification, would not have been able to reasonably understand the metes and bounds of “scan data” or how it relates, if at all, to “image data” and “3D data.” Ex. A, ¶¶40-47. Without this understanding, a POSITA would not have understood how to “analyz[e] the scan data to identify a portion of the scan of the at least one additional surface that overlaps with a portion of the contiguous scan of the occlusal surface.” Ex. A, ¶46. Accordingly, this term is indefinite.

E. “image data” (cls. 1, 9-10, 18-20)

DITC’s Construction	3Shape’s Construction
Plain and ordinary meaning	Indefinite

What “image data” is, and how it differs from “scan data” and “3D data” is not evident from the plain language of the claims. Ex. A, ¶¶49-52. As with “scan data,” “image data” was added by amendment, does not appear in the specification, and remarks concerning “image data” in the prosecution history conflate the term with “image frames.” *See* Ex. E-1, 13; Ex. A, ¶¶50-52.

The claim language itself does not provide further guidance. Ex. A, ¶51. The prosecution history uses image data as interchangeable with “image frames,”

compounding this confusion. Ex. A, ¶¶49-53. While a POSITA would have understood that the claimed “image data” is different than the claimed “scan data” and “3D data,” the intrinsic evidence does not explain what these data types *are* or how they relate to each other. Ex. A, ¶50. Accordingly, this term is indefinite. Ex. A, ¶53.

VI. U.S. PATENT NO. 10,076,391

A. “Successful” is an Indefinite Relative Term of Degree

At least because neither the claims nor the intrinsic record provides “boundaries for those of skill in the art” such that the scope of the “successful” limitations in the claims can be determined with reasonable certainty, these claims are indefinite. *See* Ex. A, ¶¶57-61; *Interval Licensing*, 766 F.3d at 1371 (“The claims, when read in light of the specification and the prosecution history, must provide objective boundaries for those of skill in the art.”); *Niazi Licensing Corp. v. St. Jude Med. S.C., Inc.*, 30 F.4th 1339, 1348 (Fed. Cir. 2022) (“terms of degree render a claim indefinite. . . where the claims are ‘purely subjective’ such that their scope cannot be determined with reasonable certainty.”)

1. “displaying...if the alignment is successful” (cls. 1, 13, 18, 20-21)

DITC’s Construction	3Shape’s Construction
Plain and ordinary meaning	Indefinite

The phrase “if alignment is successful” is a relative term directed to the notion that there is some threshold separating “successful” alignment from

“unsuccessful” alignment, yet the ’391 patent neither provides objective guidance on how to determine whether alignment is “successful” nor indicates what to analyze to make such a determination. *See*, Ex. A, ¶¶63-72; *Interval Licensing*, 766 F.3d at 1371 (the patent “must provide objective boundaries for those of skill in the art”); *see also Liberty Ammunition*, 835 F.3d at 1397-98.

The ’391 patent refers to Fig. 2 as a workflow for a method of bite registration. Ex. A, ¶¶65-67. The specification explains that Fig. 2 includes a step S140 of “judging whether the alignment in S130 is successful or not,” without providing any explanation as to how to judge the success of that alignment. Ex. A, ¶¶66-68; ’391 patent, 5:56-62.

Outside of the brief discussion of step S140, the only other discussion of “successful” and “unsuccessful” alignment addresses Figs. 7 and 8, each of which show end results of alignment attempts. Ex. A ¶76; ’391 patent, figs. 7, 8, 5:63-6:24. These figures and descriptions do not explain how successful alignment would be determined. Ex. A ¶76. A POSITA would have been unable to ascertain any baseline against which to judge an alignment’s “success” or any parameters which could guide that judgment. Ex. A ¶76; *see also* ’391 patent, 6:8-12; 6:19-24.

DITC points to a description of Fig. 6, which corresponds to step S130 to allegedly support its “plain and ordinary” proposal for this claim term. ’391 patent, fig. 6, 5:28-55. Step S130 is described as “attempting to align the 3D teeth models

of the upper jaw and the lower jaw with the bite registration” of Fig. 2. ’391 patent, fig. 2, 5:19-21. The patent discusses using a “stitching process” that “can be completed in a manual way, a semi-automatic way or automatic way.” Ex. A, ¶¶75, 69; ’391 patent, 5:28-32, 5:45-47.

This description relating to attempted alignment in the ’391 patent identified by DITC does not provide any information for determining whether alignment is “successful;” rather, it discusses whether a 3D rigid transformation is accepted or rejected as part of a stitching process. Ex. A, ¶¶71. A POSITA would not have understood the specification to equate the acceptance of a corresponding 3D rigid transformation with a successful alignment. Ex. A, ¶¶71-72.

Moreover, the stitching process described in the specification is depends on undisclosed, undefined parameters from which a POSITA would have been unable to evaluate when stitching does or does not occur, much less how, if at all, such a process yields “successful” alignment. *See*, Ex. A, ¶¶65-76; *see, e.g.*, ’391 patent, 5:28-44; 6:18-24, Fig. 6. For example, steps S131-137 require “*candidate* rigid 3D transformations,” “evaluating *a metric* of the candidate 3D rigid transformations using the *relative* placement of the 3D surface *relative* to the 3D teeth model,” “choosing the *best* 3D rigid transformation which corresponds to a *best metric*” and “judging whether the *best metric* exceeds a *predetermined threshold*.” Ex. A, ¶¶71; ’391 patent, 5:28-44. The patent fails to explain or provide any examples of

what constitutes a “candidate,” “best metric,” or “threshold” – each of which are themselves terms of degree. Ex. A, ¶¶71-73. The patent similarly fails to explain or provide examples of a “metric,” “relative placement,” or “predetermined threshold” such that a POSITA could understand those terms with any reasonable degree of certainty. *Id.*

The test for indefiniteness is whether a POSITA would have understood the bounds of the claims with “reasonable certainty.” *Nautilus*, 572 U.S. at 910. This limitation fails that test. It requires a displaying step conditioned upon determining “if alignment is successful” but provides no objective bounds as to how to evaluate whether an attempted alignment is “successful.”

The patent leaves open the possibility of any criteria being considered to determine “successful” alignment and fails to identify a perspective from which “successful” alignment should be assessed (*e.g.*, a software engineer, an orthodontist, a prosthodontist). Ex. A, ¶74. Because the factors that may be considered in making such a determination are unbounded and the standard for judging “success” is subjective, the specification fails to provide objective boundaries from which a POSITA could determine the scope of the claims. *See Intellectual Ventures I LLC v. T-Mobile USA, Inc.*, 902 F.3d 1372, 1381 (Fed. Cir. 2018) (“a term of degree that is ‘purely subjective’ and depends ‘on the unpredictable vagaries of any one person’s opinion’ is indefinite”) (quoting

Datamize, LLC v. Plumtree Software, Inc., 417 F.3d 1342, 1350-51 (Fed. Cir. 2005)). For at least these reasons, this term is indefinite. Ex. A, ¶¶62-76.

2. “successful bite registration” (cls. 1, 13, 18, 20-21)

DITC’s Construction	3Shape’s Construction
Plain and ordinary meaning	Indefinite

Because the ’391 patent fails to provide an objective standard such that a POSITA could determine what bite registrations are “successful,” the term “successful bite registrations” and all claims that recite it are indefinite. *See Sonix Tech. Co. v. Publ’ns Int’l, Ltd.*, 844 F.3d 1370, 1367-77 (Fed. Cir. 2017); Ex. A, ¶¶77-91.

The term “successful bite registrations” appears numerous times in the claims (*e.g.*, five times in independent claim 1 alone), yet neither the claims nor the specification provide any guidance as to what constitutes a “successful bite registration” as opposed to one which is unsuccessful. Ex. A, ¶¶81, 86.

The term “successful bite registration” first appears in claim 1I: “repeating step b to step d so as to obtain at least two successful bite registrations.” But it is unclear from the language of the claims how these “successful bite registrations” are related to what is displayed “if alignment is successful” in step 1(d), how a “successful bite registration” is obtained from a “successful alignment,” whether what constitutes “successful” for a bite registration is distinct from what constitutes “successful alignment,” or whether “successful bite registration” is something else

entirely. Ex. A, ¶¶78-86. Regardless, no objective bounds are provided in the specification that would have informed a POSITA of how to determine the bounds of a “successful bite registration.” *Id.*

Claim 1 again refers to “successful bite registrations” in step 1(f): “selecting two or more successful bite registrations by evaluating the at least two successful bite registrations.” The lack of antecedent basis further confuses the “successful bite registration” term. Ex. A, ¶89. While “the at least two successful bite registrations” that are evaluated appear to relate back to the “at least two successful bite registrations” of step 1(e), it is unclear how, if at all, the selected “two or more successful bite registrations” relate to the “at least two successful bite registrations.” *Id.* Further confusing this claim term, step 1(f) additionally states “selecting *said* two or more of the *displayed* successful bite registrations,” yet “the *displayed* successful bite registrations” also lacks antecedent basis. *See, e.g., Sensor Electronic Tech.*, 2019 WL 4645338, at *55. Each of claims 13, 18, 20 and 21 suffer from antecedent basis issues with respect to the term “successful bite registration.” *Id.* Ex. A, ¶89.

Moreover, claims 18 and 20 appear to confirm “two or more displayed successful bite registrations” and “two or more successful bite registrations” are distinct – further muddling the analysis of what a successful bite registration *is*. *See Halliburton Energy Servs.*, 514 F.3d at 1249; Ex. A, ¶¶90-91.

As is the case with “successful” alignment, no objective standards are set forth in the patent for determining whether a bite registration is “successful” and the viewpoint from which “successful bite registrations” are determined is undefined and subjective. *See* Section VI.A.1, *supra*; Ex. A, ¶¶78-88. And, the antecedent basis issues throughout the claims further compounds the lack of clarity as to the term’s meaning. Ex. A, ¶¶89-91. Thus, “successful bite registrations” fails as indefinite.

3. “means for displaying the bite surface together with the 3D teeth models of the upper jaw and the lower jaw aligned with the bite surface if alignment is successful” (claim 13)

DITC’s Construction	3Shape’s Construction
Subject to 35 U.S.C. § 112, ¶ 6 Function: display the bite surface together with the 3D teeth models of the upper jaw and the lower jaw aligned with the bite surface if alignment is successful Structure: ’391 patent at 5:56-6:24 and accompanying figures thereto, and equivalents thereof.	Subject to 35 U.S.C. § 112, ¶ 6 Function: displaying the bite surface together with the 3D teeth models of the upper jaw and the lower jaw aligned with the bite surface if alignment is successful Structure: The specification fails to provide adequate disclosure of corresponding structure for performing the claimed function, therefore rendering the term indefinite.

This term is indefinite at least for the reasons set forth in Section VI.A.1.

The parties additionally dispute whether the specification provides structure for performing the claimed function.

In “addressing computer-implemented means-plus-function limitations,” the Federal Circuit “consistently require[s] that the structure disclosed in the

specification be more than simply a general purpose computer or microprocessor,” rather, the specification must, in a manner cognizable by a POSITA, “disclose an algorithm for performing the claimed function.” *Noah Sys. Inc. v. Intuit Inc.*, 675 F.3d 1302, 1312 (Fed. Cir. 2012) (cleaned up); *see also WMS Gaming, Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999). Thus, the specification must do more than simply repeat or restate the function recited in the claim; it must describe the step-by-step process for performing the claimed function – *i.e.*, the “algorithm” – to implement the recited function. *See, e.g., Aristocrat Techs. Australia Pty Ltd. v. Int’l Game Tech.*, 521 F.3d 1328, 1332 (Fed. Cir. 2008).

DITC points to three paragraphs in the specification to allegedly support its identified structure. The first paragraph merely parrots the indefinite functional language in the claims (and it appears in the flow chart of Fig. 2). Ex. A, ¶96; ’391 patent, 5:56-62. The second paragraph discusses Fig. 7, which the patent indicates is a display of a user interface “when the alignment is successful,” but fails to provide any information as to how the successful alignment would be determined. Ex. A, ¶96; ’391 patent, 5:53-6:12. The third paragraph discusses Fig. 8, which the patent explains “shows a display of the user interface when the alignment is not successful.” Ex. A, ¶96; ’391 patent, 6:13-24. This paragraph mentions an “algorithm quality criterion of alignment” without specifying what that algorithm is, any steps of the algorithm, or the meaning of “algorithm quality criterion.” Ex.

A, ¶¶96; '391 patent, 6:19-24. Thus, DITC's purported "structure" results in improper functional claiming that places no meaningful limitations on the manner in which the function is accomplished and, if adopted, would render the claim invalid as indefinite. *Aristocrat Techs.*, 521 F.3d at 1334 (finding a purported algorithm insufficient where it "simply describes the function to be performed" rather than "how the function is performed"). DITC's construction should be rejected, and the Court should find this limitation indefinite. *See Robert Bosch, LLC v. Snap-On Inc.*, 769 F.3d 1094, 1097 (Fed. Cir. 2014) (claim terms are indefinite if there is no identifiable corresponding structure in the specification); Ex. A, ¶¶92-99.

4. "means for obtaining at least two successful bite registrations corresponding to different displayed bite surface by repeating" (claim 13)

DITC's Construction	3Shape's Construction
Subject to 35 U.S.C. § 112, ¶ 6 Function: obtain at least two successful bite registrations corresponding to different displayed bite surface by repeating Structure: '391 patent at 6:25-38, description of steps S120-S150, and accompanying figures thereto, and equivalents thereof.	Subject to 35 U.S.C. § 112, ¶ 6 Function: obtaining two successful bite registrations corresponding to different displayed bite surface by repeating Structure: The specification fails to provide adequate disclosure of corresponding structure for performing the claimed function, therefore rendering the term indefinite.

This term is indefinite at least for the reasons set forth in Section VI.A.2.

The parties also dispute whether the specification provides structure for performing the claimed function.

DITC’s purported identification of structure fails to identify any algorithm that could be understood by a POSITA by which “obtaining two successful bite registrations corresponding to different displayed bite surfaces” could be achieved. Ex. A, ¶¶102-105; ’391 patent, 6:25-38. The “structure” identified points to various steps illustrated in flow charts in the ’391 patent figures; however, nowhere are any steps provided which explain *how* successful bite registrations can be achieved or *what* successful bite registrations are. Ex. A, ¶104. This computer-implemented means-plus-function term requires disclosure of structure, *i.e.*, an algorithm for performing the claimed function. Ex. A, ¶103; *see Noah Sys.*, 675 F.3d at 1312. But the specification, including the portions DITC points to for structure, fails to disclose any algorithm at all. Ex. A, ¶¶104-105; ’391 patent, 6:25-38. To the extent DITC argues that Steps S120-S150 referenced in the cited paragraph and depicted in Fig. 2 provide “structure” for this limitation, those steps are purely functional in nature and the specification provides no objective description as to how the “obtaining at least two successful bite registrations” could be performed. Ex. A, ¶¶104-106. That is, *what* constitutes a “successful bite registration” is never objectively defined nor does the specification explain *how* a successful bite

registration is obtained. Ex. A, ¶¶101-107. Thus, this limitation is invalid as indefinite. *Id.*

5. “selecting said two or more of the displayed successful bite registrations” (cls. 1, 13, 21)

DITC’s Construction	3Shape’s Construction
Plain and ordinary meaning	Indefinite

This term is indefinite at least for the reasons set forth in Section VI.A.2.

Additionally, it is unclear from the claims whether this selecting step is part of or distinct from the “selecting two or more successful bite registrations by evaluating the at least two successful bite registrations.” VI.A.2. Additionally, it is unclear from the claims whether this selecting step is part of or distinct from the “selecting two or more successful bite registrations by evaluating the at least two successful bite registrations.”

During prosecution, the disputed claim phrase was added to limitations which already themselves included a “selecting” step. Ex. A, ¶¶112-113; *see e.g.* Ex. F-1. For example, in claim 1, the disputed claim phrase was added to the limitation of “selecting two or more successful bite registrations by evaluating at least two successful bite registrations.” The addition of the disputed “selecting” clause during prosecution along with the use of the phrase “*said* two or more” suggests that it was intended to be separate and apart from (and refer back to) the originally claimed “selecting clause,” although the remainder of the clause makes

that intent unclear. *See* Section VI.A.2, *supra*; Ex. A, ¶114. It would have been unclear to a POSITA how, if at all, “selecting two or more successful bite registrations by evaluating the at least two successful bite registrations” relates to the added step of “selecting said two or more of the displayed successful bite registrations.” Ex. A, ¶114. The intrinsic record does not clarify the proper interpretation. Ex. A, ¶¶111-114. Because a POSITA would have been unable to discern the meaning of the “selecting” clause such that the POSITA could have discerned how to determine whether or not infringement of this limitation would occur, this limitation renders the claim indefinite. Ex. A, ¶¶108-115.

6. “means for selecting two or more successful bite registrations by evaluating at least two successful bite registrations and selecting said two or more of the displayed successful bite registrations” (claim 13)

DITC’s Construction	3Shape’s Construction
Subject to 35 U.S.C. § 112, ¶ 6 Function: Select two or more successful bite registrations by evaluating at least two successful bite registrations and selecting said two or more of the displayed successful bite registrations Structure: ’391 patent at 6:39-7:11 and accompanying figures thereto, and equivalents thereof.	Subject to 35 U.S.C. § 112, ¶ 6 Function: Selecting two or more successful bite registrations by evaluating at least two successful bite registrations and selecting said two or more of the displayed successful bite registrations Structure: The specification fails to provide adequate disclosure of corresponding structure for performing the claimed function, therefore rendering the term indefinite.

This term is indefinite at least for the reasons set forth in Sections VI.A.2 and VI.A.5. Additionally, the parties dispute whether the specification provides adequate structure for performing the claimed function. Regarding manual implementations of this means-plus-function term, DITC’s proposed structure is inadequate for the reason discussed in the prior term – the specification fails to inform a POSITA of whether the “selecting” instructions comprise a single “selecting” step or two, distinct “selecting” steps. Further, regarding automatic or semi-automatic implementations, there is no algorithm disclosed in the portion of the specification cited by DITC, nor would one have been understood by a POSITA from this passage. Ex. A, ¶¶119-121. Because the structure of this means-plus-function limitation relies upon the ambiguous “selecting” instructions and does not have an algorithm disclosed or described in the specification, there is inadequate disclosure of corresponding structure for performing the claimed function, rendering this limitation indefinite. Ex. A, ¶¶116-122.

B. The ’391 Patent’s Process of “Evaluating” is Subjective and Fails as Indefinite

The “evaluating” phrases in claims 1, 13, 18, 20 and 21 are indefinite. The ’391 patent provides that the “selecting...by evaluating” may be performed by an end user or “in an automatic way.” Ex. A, ¶123; ’391 patent, 6:39-63, 7:6-11. A POSITA would not have understood the scope of the “evaluating” limitations of the claims with reasonable certainty. There is no guidance in the intrinsic record

about what “evaluating” a “successful bite registration” entails such that the “selecting” can be performed – from either the viewpoint of a human or automatically. Ex. A, ¶122. As such, a POSITA would not have been able to understand the parameters for “selecting” and “evaluating” successful bite registrations. *See* Ex. A, ¶¶123-125; *see also* Section VI.A.2, *supra*.

These claim terms call for a human to exercise judgment to perform an evaluation of “successful bite registrations” for the purpose of “selecting.” Ex. A, ¶¶123-125; *see* ’391 patent, 6:39-63. Like terms of degree, subjective terms used in claims must be supported by guidance from the specification or prosecution history to be definite. *See Interval Licensing*, 766 F.3d at 1371 (“Where, as here, we are faced with a ‘purely subjective’ claim phrase, we must look to the written description for guidance.”); *see also Uniloc 2017 LLC v. Samsung Elecs. Co.*, Case No. 2:18-cv-00506-JRG, 2020 WL 24880, at *19 (E.D. Tex. Jan. 16, 2020) (holding that “important subject matter” was indefinite because “what subject matter a broadcaster might deem to be ‘important’ will inevitably vary from person to person”). But the intrinsic record of the ’391 patent provides neither an algorithm to facilitate performance by software nor guidance for a POSITA to perform the required evaluation or ensure that it is able to be performed by an end user. *See Noah Sys.*, 675 F.3d at 1312; *Robert Bosch*, 769 F.3d at 1097. Thus, each term that requires performance of this evaluation fails as indefinite.

1. **“selecting two or more successful bite registrations by evaluating (the) at least two successful bite registrations” (Cls. 1, 13, 18, 21) and “selecting one or more successful bite registrations by evaluating at least two successful bite registrations” (Claim 20)**

DITC’s Construction	3Shape’s Construction
Plain and ordinary meaning	Indefinite

Regardless of how the process of “evaluating” is performed, the ’391 patent does not inform a POSITA with reasonable certainty as to the scope of the claims (*i.e.*, what action or algorithm would infringe the claims). Ex. A, ¶¶126-137.

The ’391 patent discloses that models “can be evaluated by the user” and that “by comparatively evaluating at least two successful bite registrations . . . evaluation results can be easily selected out by the user.” ’391 patent, 6:39-63. In some instances, the evaluation is described as being performed “by the user so as to judge whether the bite surface is suitable or not.” *Id.* at 6:46-49. The specification further provides:

If the mismatch corresponding to the distant end of the bite surface exceeds desired value, the bite surface and its corresponding bite registration are not suitable to be used in the next steps of computation of the final bite registration. For example, when the bite surface is selected from right side of molars, the user can observe the mismatch in the location of the left side of molars.

Id. at 6:49-56. The ’391 patent’s specification also states that “[i]n another embodiment, the selection of the successful bite registration can be completed in an automatic way.” *Id.* at 7:6-8. But the specification fails entirely to disclose what

renders a “successful bite registration” to be “suitable” (an entirely subjective term). *See Interval Licensing*, 766 F.3d at 1371; Ex. A, ¶¶132-134. Nor does the specification set forth any algorithm such that a POSITA would have understood how to automate “evaluating” “successful bite registrations.” Ex. A, ¶¶134-135.

The specification fails to provide any objective boundaries such that a POSITA would have been able to understand the scope of the claims with reasonable certainty. Nothing in the specification provides any details or algorithm from which a POSITA could understand the objective boundaries of “evaluating” or how such an evaluation could be automatically performed so as to automate an undisclosed human evaluation process. Ex. A, ¶¶136-137. Thus, the ’391 patent fails to provide sufficient information for a POSITA to understand the scope of the subjective process of “evaluating,” with reasonable certainty, rendering this term indefinite. *See Intellectual Ventures*, 902 F.3d at 1381; *Nautilus, Inc.* at 901 (a patent is invalid for indefiniteness if its claims, read in light of the intrinsic record, “fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention”). Ex. A, ¶¶126-137.

2. “means for... evaluating at least two successful bite registrations” (claim 13)

DITC’s Construction	3Shape’s Proposed Construction
This and the next identified phrase should be combined to be: “means for selecting two or more successful bite registrations	Subject to 35 U.S.C. § 112, ¶ 6 <u>Function</u> : selecting two or more successful bite registrations by

by evaluating at least two successful bite registrations and selecting said two or more of the displayed successful bite registrations” Subject to 35 U.S.C. § 112, ¶ 6 <u>Function:</u> select two or more successful bite registrations by evaluating at least two successful bite registrations and selecting said two or more of the displayed successful bite registrations <u>Structure:</u> ’391 patent at 6:39-7:11 and accompanying figures thereto, and equivalents thereof.	evaluating at least two successful bite registrations and selecting said two or more of the displayed successful bite registrations” <u>Structure:</u> The specification fails to provide adequate disclosure of corresponding structure for performing the claimed function, therefore rendering the term indefinite.
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There is inadequate disclosure of corresponding structure for performing the claimed function, rendering this limitation indefinite.

DITC’s purported structure for this claim suggests human, semi-automatic, and automatic implementations of an evaluation. Ex. A, ¶¶141. As discussed above, the process of “evaluating” claimed by this patent is supported by neither sufficient guidance for a POSITA to understand the bounds of the subjective “evaluating” nor an algorithm for automatic implementation of an evaluating step. *Id.* Thus, the specification fails to provide adequate disclosure of corresponding structure for performing the claimed function, and this term is indefinite. *See Noah Sys.*, 675 F.3d at 1312; *Robert Bosch*, 769 F.3d at 1097. Ex. A, ¶¶138-145.

C. Claims 13 and 18 are Indefinite Mixed Method and Apparatus Claims

“A single claim which claims both an apparatus and the method steps of using the apparatus is indefinite under 35 U.S.C. 112” because such claims fail to distinguish “whether infringement would occur when one creates a system that allows the user to [perform the step] ... or ... when the user actually [performs the step].” *IPXL Holdings, L.L.C. v. Amazon.com, Inc.*, 430 F.3d 1377, 1384 (Fed. Cir. 2005). Thus, both claims 13 and 18 fail as indefinite.

1. Claim 13

DITC’s Construction	3Shape’s Construction
The last limitation of claim 13 is an obvious patent drafting error and should be omitted from claim 13.	Indefinite

Claim 13 is an improper mixed method and apparatus claim. The preamble and first seven limitations of claim 13 refer to the patented system, such as “means for generating” and “means for acquiring;” the final limitation recites a method of “computing a final bite registration.”

DITC does not contend otherwise, instead arguing that the entirety of the “computing” limitation is a drafting error. A court may correct an error during claim construction ““only if (1) the correction is not subject to reasonable debate based on consideration of the claim language and the specification and (2) the prosecution history does not suggest a different interpretation of the claims.””

Parkervision, Inc. v. Apple Inc., No. 3:15-CV-1477-J-39JRK, 2019 WL 4385673,

at *12 (M.D. Fla. July 15, 2019) (quoting *Ultimax Cement Mfg. Corp. v. CTS Cement Mfg. Corp.*, 587 F.3d 1339, 1353 (Fed. Cir. 2009)).

The correction that DITC seeks is at least subject to reasonable debate, and the prosecution history suggests that the limitation DITC seeks to correct could be the basis for eligibility. *See* Ex. F-1 at 5; Ex. F-2 at 5. *See Parkervision, Inc.* at *12. This Court should reject DITC’s attempt to rewrite the claim.

2. Claim 18

DITC’s Construction	3Shape’s Construction
Plain and ordinary meaning	Indefinite

Claim 18 recites both an apparatus and the method steps of using that apparatus and is therefore indefinite. *See HTC Corp.*, 667 F.3d at 1277.

The preamble recites the hallmark language of an apparatus claim – “[a] system for bite registration.” The remainder of the claim includes a series of limitations beginning with a gerund, *e.g.*, “obtaining,” “acquiring,” “attempting,” and so on. *Id.* Gerunds are the signpost for the steps of a method claim. *See Amag Pharm., Inc. v. Sandoz, Inc.*, No. 16-cv-1508, 2017 WL 3076974, at *25 (D.N.J., July 19, 2017) (“the elements, or the body, of a method claim are method steps, which should usually be verbal (gerundial) phrase, introduced by a gerund or verbal noun (the ‘-ing’ form of a verb)”); *Core Wireless Licensing S.A.R.L. v. Apple Inc.*, No. 15-cv-05008, 2016 WL 6427850, at *5 (N.D. Cal. Oct. 31, 2016) (discussing that gerunds demonstrate how a method should be performed). The

claim therefore proposes a system and describes that system using method steps. It is impossible to determine “whether infringement would occur when one creates a system that allows the user to [perform the steps] ... or ... when the user actually [performs the steps].” Thus, claim 18 is indefinite. *SFA Sys., LLC v. 1-800-Flowers.com, Inc.*, 940 F. Supp. 2d 433, 455 (E.D. Tex. 2013).

D. “Best metric” (claim 8) is a Subjective Term that Fails as Indefinite.

DITC’s Construction	3Shape’s Construction
Plain and ordinary meaning	Indefinite

The ’391 patent fails to provide a POSITA with objective means to determine a “best metric” or how that “best metric” could be used, *e.g.*, as part of an algorithm or score” to choose a “best 3D rigid transformation.” Ex. A, ¶¶149-151; *see also* Section VI.A.1, *supra*. No information or examples are provided of the claimed “metric” nor is any “predetermined threshold” provided by which the claimed “metric” could be judged. *Id.* There is not enough guidance in the ’391 patent for a POSITA to understand the scope of “best metric” with reasonable certainty, and the term must therefore fail as indefinite. *See Sonix Tech. Co.*, 844 F.3d at 1367-77; Ex. A, ¶¶146-151.

VII. CONCLUSION

For the reasons stated above, the Court should adopt 3Shape’s constructions.

Date: October 27, 2023

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CERTIFICATE OF COMPLIANCE

Pursuant to Local Rule 7.1(D), the foregoing complies with the font and point selection approved by this Court in Local Rule 5.1 (B). This paper was prepared on a computer using Times New Roman fourteen-point font, double-spaced.

/s/ Eric M. Pettis
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**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA**

3SHAPE A/S,

Plaintiff,

v.

CARESTREAM DENTAL, LLC,
DENTAL IMAGING
TECHNOLOGIES CORP., and
DENTAL IMAGING
TECHNOLOGIES CORP. d/b/a
DEXIS

Defendants.

Civil Action No. 1:22-cv-01829-
WMR

CERTIFICATE OF SERVICE

I hereby certify on this 27th day of October, 2023, the foregoing was electronically filed with the Clerk of the Court using the CM/ECF System, which will send a notification of such filing (NEFF) to all counsel of record.

/s/ Eric M. Pettis

Eric M. Pettis