**IN THE UNITED STATES DISTRICT COURT**
**FOR THE DISTRICT OF DELAWARE**

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| IMMERVISION, INC.,<br><br>Plaintiff,<br><br>v.<br><br>LG ELECTRONICS U.S.A., INC. and LG ELECTRONICS, INC.,<br><br>Defendants. | ) | Civil Action No. 18-1630-MN-CJB |
| IMMERVISION, INC.,<br><br>Plaintiff,<br><br>v.<br><br>LG ELECTRONICS U.S.A., INC. and LG ELECTRONICS, INC.,<br><br>Defendants. | ) | Civil Action No. 18-1631-MN-CJB |

**REPORT AND RECOMMENDATION**

In these related patent infringement actions filed by Plaintiff Immervision, Inc. ("Plaintiff") against Defendants LG Electronics U.S.A., Inc. ("LG USA") and LG Electronics, Inc. ("LG Korea" and collectively with LG USA, "Defendants"), presently before the Court is the matter of claim construction. (D.I. 125; D.I. 126; Civil Action No. 18-1631-MN-CJB, D.I. 123, D.I. 124)[1] The Court recommends that the District Court adopt the constructions set forth below.

## I. BACKGROUND

### A. Procedural Background

[1] Unless otherwise noted below, citations will be to the docket in Civil Action No. 18-1630-MN-CJB.

On October 19, 2018, Plaintiff filed the instant actions against Defendants in this Court. (D.I. 1) There is one patent-in-suit: United States Patent No. 6,844,990 (the "'990 patent"). (*See, e.g.*, D.I. 83) United States District Judge Maryellen Noreika has referred these cases to the Court to resolve all pre-trial matters, up to and including the end of fact discovery (including the resolution of claim construction proceedings). (D.I. 12; Civil Action No. 18-1631-MN-CJB, D.I. 12)

The parties submitted a Joint Claim Construction Brief on July 30, 2021. (D.I. 115) The Court conducted a *Markman* hearing by video conference on October 1, 2021 (hereinafter, "Tr.").

**B. Factual Background**

Plaintiff is a Canadian corporation with its principal place of business in Montreal, Quebec, Canada, (D.I. 83 at ¶ 2), and it owns the rights to the '990 patent, (*id.* at ¶ 18). Defendant LG USA is a Delaware corporation with its principal place of business in Englewood Cliffs, New Jersey, while Defendant LG Korea is a Korean company with its principal place of business in Seoul, South Korea. (*Id*. at ¶¶ 3-4) Defendants allegedly make, use, sell or offer to sell various smartphone or other phone products that infringe the patent-in-suit. (*Id*. at ¶¶ 19, 56)

The '990 patent is entitled "Method for Capturing and Displaying a Variable Resolution Digital Panoramic Image" and it issued on January 18, 2005. (D.I. 116, ex. A (hereinafter, "'990 patent") at 1) The '990 patent relates to "obtaining digital panoramic images and displaying panoramic images on computer screens." (*Id*., col. 1:12-14) In essence, the '990 patent captures methods and structures for obtaining a digital panoramic image that has one or more expanded zones (which create a higher resolution in that area of the image) and one or more compressed

zones (which create a lesser resolution in that area of the image). (*Id*., cols. 19:28-36, 20:51-61; *see also* Tr. at 14-15)

In this case, Plaintiff is asserting only dependent claims 5 and 21 of the patent. (D.I. 115 at 2) Claim 5 depends from independent claim 1 and claim 21 depends from independent claim 17.[2] Those claims are all reproduced below (with the disputed claim terms identified in italics):

> **1.** A method for capturing a digital panoramic image, by projecting a panorama onto an image sensor by means of a *panoramic objective lens*, the *panoramic objective lens* having an image point distribution function that is not linear relative to the field angle of object points of the panorama, the distribution function having a maximum divergence of at least ±10% compared to a linear distribution function, such that the panoramic image obtained has at least one substantially expanded zone and at least one substantially compressed zone.
>
> **5.** The method according to claim **1**, wherein the *objective lens* compresses the center of the image and the edges of the image and expands an intermediate zone of the image located between the center and the edges of the image.
>
> **17.** A *panoramic objective lens* comprising:
>
> *optical means for projecting a panorama into an image plane of the objective lens*, the optical means having an image point distribution function that is not linear relative to the field angle of object points of the panorama, the distribution function having a maximum divergence of at least ±10% compared to a linear distribution function, such that a panoramic image obtained by means of the *objective lens* comprises at least one substantially expanded zone and at least one substantially compressed zone.
>
> **21.** The *panoramic objective lens* according to claim **17**, wherein *the lens* compresses the center of the image and the edges of the image, and expands an intermediate zone of the image located between the center and the edges of the image.

('990 patent, cols. 19:28-36, 19:49-52, 20:51-62, 21:7-11 (emphasis added))

[2] Claims 1 and 17 were later cancelled in an *ex parte* reexamination proceeding. (D.I. 115 at 2)

Further details concerning the patents-in-suit will be addressed below in Section III.

## II. STANDARD OF REVIEW

The Court has frequently set out the basic legal principles that inform the claim construction process, including in *Vytacera Bio, LLC v. CytomX Therapeutics, Inc.*, Civil Action No. 20-333-LPS-CJB, 2021 WL 4621866, at *2-3 (D. Del. Oct. 7, 2021). The Court incorporates by reference that discussion of the relevant law into the instant Report and Recommendation.

## III. DISCUSSION

In their briefing, the parties raised disputes about five different claim terms. (D.I. 115; D.I. 123, ex. 1) But by the time of the *Markman* hearing, they had reduced the number of disputed terms to two. (*Id.*) Below, the Court will address the two remaining disputed terms, in the order in which they were presented at the hearing.

### A. "panoramic objective lens"/"objective lens"/"the lens"

The parties' proposed constructions for the first disputed term ("panoramic objective lens"/"objective lens"/"the lens") are below:

| Term | Plaintiff's Proposal | Defendants' Proposal |
|---|---|---|
| "panoramic objective lens"/"objective lens"/"the lens" | "wide-angle objective lens" | "a super-wide or ultra-wide angle objective lens, *e.g.*, a fish-eye lens" or "alternatively, no construction required" |

(D.I. 115 at 11, 14; Defendants' Hearing Presentation, Slide 4)

The parties agree that the term should be defined by the field of view of the lens, but they disagree over the breadth of that field of view. Plaintiff's position is that the term refers to a "wide-angle" objective lens—by which Plaintiff means an optical lens having an angular field of "'greater than 80°'" (D.I. 115 at 19 (quoting D.I. 116, ex. 6); *see also* Tr. at 21, 29) Defendants,

by contrast, assert that a "panoramic objective lens" is a "super-wide" or "ultra-wide" objective lens such as a "fish-eye lens."[3]

This term is admittedly a challenging one. But for reasons the Court will explain below, although it will moderately change the phraseology of Defendants' proposed construction, the Court believes that Defendants have the better of the argument.

That said, the Court will start off by explaining why it is not adopting Defendants' proposed construction verbatim. In short, the Court is hesitant to do so when the patent itself does not use the terms "super-wide" or "ultra-wide." (D.I. 115 at 13)[4] But though it declines to include these words in its construction, the Court's approach here should be of little moment to Defendants. That is because although Defendants' proposal uses terms like "super-wide" or

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[3] Although they originally proffered only this construction ("a super-wide or ultra-wide angle objective lens, *e.g.*, a fish-eye lens") in their briefing, (D.I. 115 at 14), by the time of the *Markman* hearing, Defendants were alternatively suggesting that this term need not be construed at all, (Defendants' Hearing Presentation, Slide 4; Tr. at 41). The Court agrees with Plaintiff, however, that the parties have a real dispute about the meaning of this term—one reflected in their differing proposed constructions—and that the Court must resolve that dispute. (Tr. at 16, 47) The best way to do so is to construe the term in a manner that reflects which party is correct as to the term's meaning.

[4] The Court notes that in its briefing, many of Plaintiff's arguments against Defendants' position had to do with the inappropriateness of using words like "super-wide" or "ultra-wide" in a construction (i.e., because those words do not appear in the intrinsic record, or because the words would purportedly introduce uncertainty or ambiguity into the claims, or because it is not clear how the two words relate to each other, or because certain dictionary definitions cited by Defendants regarding those words are problematic, or because the words are not defined in optics textbooks). (D.I. 115 at 13-14, 19-22) As the Court's recommended construction does not use these words, it thus accounts for these criticisms.

Relatedly, Plaintiff also asserted that Defendants' proposed construction was problematic because the patent "discloses its concepts in terms of angular measurements *in degrees*, such as when discussing the field angle of various objects . . . and lenses having field of view measured *in degrees*"; in other words, Plaintiff was faulting Defendants' proposal for failing to confine itself to "particular fields of view[.]" (*Id.* at 20 (citing '990 patent, col. 8:13-43, FIGS. 4A-9) (emphasis added)) The Court's recommendation addresses this criticism too, as it utilizes "angular measurements in degrees" and does confine the term to "particular fields of view."

"ultra-wide," in doing so, it seems Defendants mean to be referring to a lens "capable of capturing on the order of 180° of view," such as a fish-eye lens. (D.I. 115 at 14; Defendants' Hearing Presentation, Slide 15; Tr. at 56, 82) This type of articulation is in fact referenced in the first column of the patent's specification, which describes a "panoramic objective lens" included in an embodiment of the invention:

> FIG. **1** represents a classical device allowing a digital panoramic image to be produced and presented on a computer screen. The device comprises a digital camera **1** equipped with a *panoramic objective lens* **2** of *the "fish-eye" type, having an angular aperture on the order of 180°*.

('990 patent, col. 1:15-20 (emphasis added)) And below, the Court will explain why its recommended construction for this term similarly reads: "lens having an angular aperture on the order of 180°, such as a fish-eye lens."[5]

Why is this construction appropriate (and Plaintiff's competing construction inappropriate)? The Court sets out three primary reasons below.

First, in addition to the above block-quoted portion of the specification, every other reference in the patent to a panoramic objective lens describes such a lens as one with about a 180° field of view. ('990 patent, col. 1:61-64 (describing Figure 3 and explaining that the image

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[5] A "fish-eye" lens refers to a photographic lens that "'has a highly curved protruding front, enabling it to cover an angle of about 180°.'" (D.I. 116 at Chipman Decl. at ¶ 44 (quoting *Fish-eye lens*, *McGraw-Hill Dictionary of Scientific and Technical Terms* (5th ed. 1994)) Indeed, a reference provided by Plaintiff explained that a "'fish-eye lens'" is a term "applied more recently to a class of extreme wide-angle lenses having enough barrel distortion to image a complete 180° in the object space on a finite circle of film" and that "[t]oday, fish-eye pictures are common in magazines and elsewhere when a full 180° of a scene is desired." (D.I. 116, ex. B at 274)

The Court also notes that its recommended construction is not necessarily meant to be exclusive to fish-eye lenses. (Tr. at 23) As Defendants' stated, "[i]f there are other lenses within [the claimed] class that are able to image [about] a complete 180 degree[s], that would also be encompassed by the [Court's] construction[.]" (*Id.* at 61-62)

points depicted therein form "a hemisphere **11** when the *panoramic objective lens* used *has an aperture of 180°*") (emphasis added); *id*., col. 2:22-23 (describing Figure 4A and explaining that the "field angle of an object point can be between 8 and 90° for an *objective lens having an aperture of 180°*") (emphasis added); *id*., col. 8:33-34 ("for an *objective lens having an aperture of 180°*") (emphasis added); *id.*, col. 11:49-52 ("with an *objective lens having an angular aperture of 180°*") (emphasis added); *id*., col. 13:6-9 ("[t]he example considered until now was of a *panoramic objective lens having an aperture of 180°*") (emphasis added); *id*., col. 16:31-32 (describing the "*objective lens* **30**" in Figure 16 as having a "field angle . . . of *180°*") (emphasis added); *see also id*., FIGS. 5-6) The Court is of course mindful that the scope of a claim is not necessarily limited by examples disclosed in a specification. But where all of the examples of a panoramic objective lens in the patent align with the Court's proposed construction, that can be at least one helpful clue indicating that the Court's recommended construction is the correct one.

Second, it is important to note, as Defendants do, that the patent "never describes a panoramic lens as a mere 'wide angle lens.'" (D.I. 115 at 17; *see also id.* at 19 (Plaintiff asserting that "[n]either side's construction is explicitly set forth in the specification")) And while "wide angle lens" appears nowhere in the patent, the Court's recommended construction comes directly from many, many different places in the patent (as noted above)—basically, from every part of the patent in which the field of view of a "panoramic objective lens" is more fully described. If the Court is to choose between a construction that has no tether to the patent-in-suit on the one hand, and one that is deeply founded in the patent's wording on the other, the latter construction surely seems the stronger one. After all, the Court's focus here is on understanding how the patent describes a panoramic objective lens—not on how the patent does not describe the term.

Third, Plaintiff repeatedly argued that there *is* one place where the specification "expressly contemplate[s panoramic objective] lenses having a field of view of less than 180°[,]" (D.I. 115 at 23)—but the Court did not find Plaintiff's argument to be convincing. Here, Plaintiff cited to a portion of column 1 of the patent, which discusses Figure 3. (*Id.*) Figure 3 is depicted below:

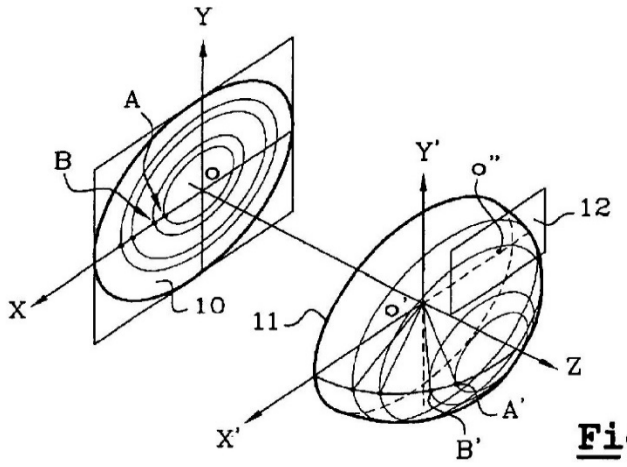


Fig. 3

('990 patent, FIG. 3) The referenced portion of the specification is discussing certain "image points" on a microcomputer, which "form a hemisphere **11** when the panoramic objective lens used has an aperture of 180°, *otherwise a portion of a hemisphere*." ('990 patent, col. 1:61-64 (emphasis added)) Plaintiff argued that the words "otherwise a portion of a hemisphere" suggest that the invention can utilize a lens having a less-than-180° view. (D.I. 115 at 23; Tr. at 26, 28, 31, 34) However, the Court agrees with Defendants that Plaintiff is misreading the patent here. (Tr. at 64-66) Instead, the next sentence of column 1 indicates that the phrase "portion of a hemisphere" is meant to refer to just that—to a portion of the hemisphere that is created by the panoramic objective lens and that is called out as sector 12 in Figure 3. (*Id.*; *see also* '990 patent,

cols. 1:64-2:3 ("The microcomputer thus has a virtual image in the shape of a hemisphere one sector **12** of which, corresponding to the display window **7**, is presented on the screen. . .")).[6]

For the above reasons, the term "panoramic objective lens"/"the objective lens"/"the lens" should be construed to mean "a lens having an angular aperture on the order of 180°, such as a fish-eye lens."

### B. "optical means for projecting a panorama into an image plane of the objective lens"

The second disputed term, "optical means for projecting a panorama into an image plane of the objective lens" appears, as was noted above, in claim 17. The parties agree that the term is governed by 35 U.S.C. § 112(6) ("Section 112, paragraph 6"), but they disagree on the recited function and the disclosed structure that performs the function. (D.I. 115 at 55, 56) The parties' proposed constructions are below:

| Term | Plaintiff's Proposal | Defendants' Proposal |
|---|---|---|

[6] The Court also briefly takes up two other of Plaintiff's arguments.

Plaintiff pointed to a scientific dictionary that contains the following definition of "panoramic": "[p]ertaining to a lens or optical instrument that has a *wide field of view*." (D.I. 116, ex. D (cited in D.I. 115 at 19) (emphasis added)) However, the Court's task here is to determine the meaning of "panoramic objective lens" as it is described in the patent-in-suit, not the meaning of a *different* term ("panoramic") as it is referenced in an external dictionary. (Tr. at 43, 45-46) In any case, the Court's recommended construction does have a "wide field of view"—a particularly wide field of view, which is on the order of 180°.

Additionally, Plaintiff cited to a treatise and argued that it referred to a panoramic objective lens with a "120 degree field of view." (Tr. at 73) However, as Defendants rightly noted, (Tr. at 79), the sentence in that treatise referencing a "'Panoramic' lens" says only that the lens was "constructed by T. Sutton in 1859[,]" (D.I. 116, ex. B at 275). It is in the next sentence—referring to a different "ball lens" that was designed by "James Baker" in "1944"—where the treatise states that the lens in question is said to have been "covering a 120 degree field of view." (*Id.*) This all just underscores that Plaintiff has pointed to no portion of the record where a "panoramic objective lens" is clearly referring to anything but a lens having an angular aperture of on the order of 180°.

| | | |
|---|---|---|
| "optical means for projecting a panorama into an image plane of the objective lens" | Function:<br><br>"projecting a panorama into an image plane of the objective lens"<br><br>Structure:<br><br>"a series of optical elements, as disclosed: in the specification at Col. 4, ll. 39-48; Col. 5, ll. 56-67; Col. 15, l. 42 – Col. 18, l. 15; and Figs 15-18; and equivalents thereof" | Function:<br><br>"projecting a panorama into an image plane of the objective lens, the optical means having an image point distribution function that is not linear relative to the field angle of object points of the panorama, the distribution function having a maximum divergence of at least ±10% compared to a linear distribution function, such that a panoramic image obtained by means of the objective lens comprises at least one substantially expanded zone and at least one substantially compressed zone"<br><br>Structure:<br><br>"[a] series of optical elements, as shown in Figs. 15, 16, and 18, and equivalents thereof, for performing the recited function" |

(D.I. 115 at 57, 63; Defendant's Hearing Presentation, Slide 29)

### 1. Principles for Construction of Means-Plus-Function Limitations

The Court first sets out the principles for construing means-plus-function limitations. Section 112, paragraph 6[7] provided as follows:

[7] The Court herein refers to the version of Section 112 as it existed prior to the passage of the Leahy-Smith America Invents Act ("AIA"). Although the structure of Section 112 changed after the AIA's passage, those changes are applicable only to any patent application filed on or after September 16, 2012. *See Alcon Research Ltd. v. Barr Labs., Inc.*, 745 F.3d 1180, 1183 n.1 (Fed. Cir. 2014). Because the application at issue here was filed before that date, the Court refers to the pre-AIA version of Section 112.

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

35 U.S.C. § 112, ¶ 6. The "means-plus-function" technique of claim drafting is a "convenience" that allows a patentee to express a claim limitation in functional terms "without requiring the patentee to recite in the claims all possible structures" that could perform that function. *Med. Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1211 (Fed. Cir. 2003) (internal quotation marks and citation omitted). In exchange for getting the benefit of this drafting convenience, however, patentees must disclose, in the written description of the patent, a corresponding structure for performing the claimed function. *Noah Sys, Inc. v. Intuit Inc.*, 675 F.3d 1302, 1318 (Fed. Cir. 2012); *see also Elekta*, 344 F.3d at 1211 ("[T]he price that must be paid for use of that convenience is limitation of the claim to the means specified in the written description and equivalents thereof.") (internal quotation marks and citation omitted). A patentee satisfies this requirement "'only if the specification or prosecution history *clearly links or associates* that structure to the function recited in the claim.'" *In re Aoyama*, 656 F.3d 1293, 1297 (Fed. Cir. 2011) (emphasis added) (quoting *Elekta*, 344 F.3d at 1210); *see also Elekta*, 344 F.3d at 1220 ("The public should not be required to guess as to the structure for which the patentee enjoys the right to exclude. The public instead is entitled to know precisely what kind of structure the patentee has selected for the claimed functions, when claims are written according to section 112, paragraph 6."). "If the specification does not contain an adequate disclosure of the structure that corresponds to the claimed function, the patentee will have failed to particularly point out and distinctly claim the invention as required by . . . section 112 [paragraph 2], which renders the claim invalid for indefiniteness." *Blackboard, Inc. v.*

*Desire2Learn Inc.*, 574 F.3d 1371, 1382 (Fed. Cir. 2009) (internal quotation marks and citation omitted).

Construing a means-plus-function limitation is a two-step process. The first step is determining the claimed function of the limitation. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1351 (Fed. Cir. 2015); *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1311 (Fed. Cir. 2001). The second step is identifying the corresponding structure disclosed in the specification and equivalents thereof. *Williamson*, 792 F.3d at 1351; *Medtronic, Inc.*, 248 F.3d at 1311.

**2. Discussion**

**a. Function**

The parties first dispute what is the claimed function. Plaintiff argues that the function begins and ends with the wording of the disputed term itself—i.e., that the function is "projecting a panorama into an image plane of the objective lens." (D.I. 115 at 57-58) Defendants, in contrast, assert that the entirety of the remainder of claim 17 is relevant to the function—i.e., that the function is "projecting a panorama into an image plane of the objective lens, the optical means having an image point distribution function that is not linear relative to the field angle of object points of the panorama, the distribution function having a maximum divergence of at least ±10% compared to a linear distribution function, such that a panoramic image obtained by means of the objective lens comprises at least one substantially expanded zone and at least one substantially compressed zone." (*Id.*) Here, the Court agrees with Plaintiff.

It is undisputed that a function of the optical means is "projecting a panorama into an image plane of the objective lens." And that make sense, because this phrase is pretty clearly describing something that the optical means at issue *does*.

But the disputed language (i.e., the additional language that Defendants believe should be included in the claimed function) is different. It begins with the words "the optical means *having* an image point distribution function. . . ." The use of the word "having" seems to indicate that what is being referred to thereafter—"an image point distribution function . . ."—is a *characteristic or property* of a thing, not something that a thing (i.e., the optical means) *does*.[8] *Cf. Transclean Corp. v. Bridgewood Servs., Inc*., 290 F.3d 1364, 1368, 1375 (Fed. Cir. 2002) (concluding that, with regard to a claim to "[t]he apparatus of claim 1 in which the means for equalizing the flow is comprised of means disposed intermediate the fluid receiver and source, said means exhibiting resilient characteristics for exerting a force . . .[,]" the "only function performed by th[e] 'means' is 'equalizing the flow'" and that the "phrase 'exhibiting resilient characteristics' is not a second function performed by that 'means'; rather, the phrase further defines characteristics of that 'means'").

During the *Markman* hearing, counsel for both sides appeared to acknowledge as much. For example, Defendants' counsel stated that the "image point distribution function" is a "mathematical relationship between [] two things that are not the optical means . . . [t]hey are [(1)] the things being photographed and [(2)] the image that is projected by the optical means." (Tr. at 110; *see also id.* at 112 (counsel adding that the "image point distribution function" is "not a characteristic of the objective lens, it is something obtained by the objective lens")) And although Plaintiff's counsel had originally argued that the "image point distribution function" was a "characteristic of the optical means[,]" (*id*. at 85), later, counsel stated that the phrase "the

[8] The additional challenge here, of course, is that the phrase "image point distribution function" itself includes the word "function." Defendants suggest that this is proof that the remainder of the claim language is about a function. (D.I. 115 at 59-60) But the Court is not convinced, for the reasons set out herein.

optical means having an image point distribution function . . .” is “really a characteristic of the image obtained by the lens . . . [i]t’s a result or an output of it[,]” such that the “distribution function is something that’s obtained from the image that the optical means projected[,]” (*id.* at 140-141). In the Court’s view, the fact that the disputed language is not referring to something that an objective means does—but instead to a characteristic or property of an image obtained or projected by the lens—indicates that this language is not rightly characterized as the function of the objective means.

Indeed, the last portion of the disputed language further underscores this point. That portion (“such that a panoramic image obtained by a means of the objective lens comprises at least one substantially expanded zone and at least one substantially compressed zone”) is describing characteristics of the “panoramic image” obtained via the work of the objective lens—not what is the function of the objective means. (Tr. at 88, 141)

For these reasons, the Court recommends that the function at issue is “projecting a panorama into an image plane of the objective lens.”

**b. Structure**

The parties also have a few different disputes about what is the corresponding structure. Plaintiff proposes that the structure includes: (1) column 4, lines 39-48 and column 5, lines 56-67; (2) column 15, line 42 to column 18, line 15; and (3) Figure 17.[9] (D.I. 115 at 65)

[9] As is indicated by their respective proposals, the parties agree that the structure should include a “series of optical elements” as disclosed in Figures 15, 16 and 18, and equivalents thereof. During the *Markman* hearing, Defendants’ counsel explained how it is that the patent clearly links Figures 15, 16 and 18 with performance of the claimed function. (Tr. at 118-20; Defendants’ Hearing Presentation, Slides 25-28)

Defendants disagree. The Court will take up these three disputed portions of the specification in turn.

The Court first addresses column 4, lines 39-48 and column 5, lines 56-67. The cited portion of column 5 reads:

> According to one embodiment, the panoramic objective lens comprises a set of lenses forming an apodizer. According to one embodiment, the set of lenses forming an apodizer comprises at least one aspherical lens. According to one embodiment, the set of lenses forming an apodizer comprises at least one diffractive lens. According to one embodiment, the panoramic objective lens comprises polymethacrylate lenses. According to one embodiment, the panoramic objective lens comprises a set of mirrors comprising at least one distorting mirror.

('990 patent, col. 5:56-67) The cited portion of column 4 is nearly identical, except that the reference to "polymethacrylate lenses" is not included there, and at times that portion of the specification simply uses the phrase "objective lens" instead of "panoramic objective lens." (*Id.*, col. 4:39-48)

Defendants assert that Plaintiff is wrong to include these portions of columns 4 and 5, arguing that: (1) these citations are simply to "generic" terms (like "apodizer" or "aspherical lens" or "diffractive lens" or "polymethacrylate lenses" or "distorting mirror") that "do not describe a particular structure used to perform the recited function"; and (2) in contrast, it is Figures 15, 16 and 18 that disclose "particular" structural embodiments relating to these terms (i.e., particular apodizers, or aspherical lenses, or diffractive lenses or polymethacrylate lenses, or distorting mirrors),[10] which are depicted as working together to perform the recited function. (D.I. 115 at 65-66 (citing D.I. 116 at Chipman Decl. at ¶ 87))

[10] The specification explains, for example, that components L4, L5, L6 and L7 depicted in Figures 15 and 16 "form[] an apodizer within the meaning of the present invention[.]" ('990 patent, col. 16:44-45; FIGS. 15-16) It notes that components L1 and L4

There are times when a *general class* of structures can amount to corresponding structure in the context of a means-plus-function claim. As the United States Court of Appeals for the Federal Circuit has explained, "[i]n past cases, we have been generous in finding something to be a corresponding structure when the specification contained a generic reference to structure that would be known to those in the art and that structure was clearly associated with performance of the claimed function." *Elekta*, 344 F.3d at 1213-14; *see also Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1322 (Fed. Cir. 2004). The problem for Plaintiff here is that even if an "apodizer" or "aspherical lens" or "diffractive lens" or "polymethacrylate lenses" or "distorting mirror" are general structures that were well known in the art, Plaintiff has not sufficiently demonstrated that the patent *clearly associates* those general structures with the performance of the claimed function. That is, the Court does not see (and Plaintiff has not explained) how these individually-referenced, generic structures mentioned in columns 4 and 5 amount to the type of "assembly or series of optical elements" that the patent clearly links with "projecting a panorama into an image plane of the objective lens." (D.I. 115 at 70-71 (emphasis omitted); Tr. at 129)

Next, the Court takes up column 15, line 42 to column 18, line 15. This is part of a section of the patent entitled "Examples of Embodiments of a Non-linear Panoramic Objective Lens According to the Present Invention." ('990 patent, col. 15:42-44) As to this disputed content, the Court concludes as follows:

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depicted in Figures 15, 16 and 18 are "aspherical" lenses. (*Id.*, col. 16:32-34, 16:49-50; FIGS. 15-16, 18) It describes component L6 in Figures 15-16 as having a "diffractive convex back[.]" (*Id.*, col. 16:52-54; FIGS. 15-16) It notes that a "polymethacrylate" lens is represented by component L1 and is "organic glass with a low cost price, belonging to the category of plastics." (*Id.*, col. 16:34-36) And it explains that a particular "distorting mirror" is depicted as component M2 in Figure 18. (*Id.*, col. 17:37-44; FIG. 18)

- The first section of this portion of the specification (from column 15, line 42 to column 16, line 4) appears to be comprised of: (1) a general discussion of the present invention and (2) a general discussion of what apodizers are and what they do. (*Id*.) The Court is not convinced that this broadly-worded section amounts to a description of structure that is clearly linked to the function at issue. If anything, these passages seem more like introductory wording that *precedes or leads up to* a description of specific structure that is to be further disclosed thereafter. So the Court will not include this in its construction.

- The second section of this portion (from column 16, line 5 to column 17, line 54), really is not in dispute. This is a description of what is depicted in Figures 15, 16 and 18—figures that Defendants agree depict the requisite structure. During the *Markman* hearing, Defendants' counsel confirmed that Defendants did not object to this portion being considered in the articulation of corresponding structure. (Tr. at 122) The Court will do so.

- The third and final section of this portion of the specification (from column 17, line 55 to column 18, line 15), describes two "alternative[s]" to the embodiment of a non-linear objective lens 40 that is depicted in Figure 18. ('990 patent, col. 17:56, 17:61) This text indicates that the two "alternative[s]" can in fact accomplish the same functions as non-linear objective lens 40. And since there is no dispute that non-linear objective lens 40 amounts to corresponding structure for the function described in claim 17, (*id*., col. 17:49-51; Tr. at 120), these two alternatives are thus also clearly linked to performance of that same function.

Lastly, with regard to Figure 17, the Court agrees with Plaintiff that it should be designated as part of the requisite structure. This is because Figure 17 simply "shows an enlarged version of lens L6, shown in Figures 15 and 16." (D.I. 115 at 65; *see also* '990 patent, col. 6:57-58 (noting that Figure 17 is "a side view of a lens present in the panoramic objective lens in FIG. **15**")) And even Defendants agree that Figures 15 and 16 are part of the corresponding structure at issue. (*Id*.) In their briefing, Defendants suggested that Figure 17 is not needed because it is "redundant." (D.I. 115 at 65) But the figure appears to disclose some

additional detail about the specific lens that makes up a part of the corresponding structure. ('990 patent, FIG. 17) So the Court will include it.

For the above reasons, then, the Court recommends that the corresponding structure be referred to as "a series of optical elements, as disclosed in the specification at column 16, line 5 through column 18, line 15 and Figures 15-18, and equivalents thereof."

## IV. CONCLUSION

The Court recommends that the District Court adopt the following constructions:

1. "panoramic objective lens"/"objective lens"/"the lens" should be construed to mean "a lens having an angular aperture on the order of 180°, such as a fish-eye lens."
2. For the term "optical means for projecting a panorama into an image plane of the objective lens" the function is "projecting a panorama into an image plane of the objective lens." The corresponding structure is "a series of optical elements, as disclosed in the specification at column 16, line 5 through column 18, line 15 and Figures 15-18, and equivalents thereof."

This Report and Recommendation is filed pursuant to 28 U.S.C. § 636(b)(1)(B), Fed. R. Civ. P. 72(b)(1), and D. Del. LR 72.1. The parties may serve and file specific written objections within fourteen (14) days after being served with a copy of this Report and Recommendation. Fed. R. Civ. P. 72(b)(2). The failure of a party to object to legal conclusions may result in the loss of the right to *de novo* review in the district court. *See Sincavage v. Barnhart*, 171 F. App'x 924, 925 n.1 (3d Cir. 2006); *Henderson v. Carlson*, 812 F.2d 874, 878-79 (3d Cir. 1987).

The parties are directed to the Court's Standing Order for Objections Filed Under Fed. R. Civ. P. 72, dated October 9, 2013, a copy of which is available on the District Court's website, located at http://www.ded.uscourts.gov.

Dated: December 14, 2021

Christopher J. Burke
Christopher J. Burke
UNITED STATES MAGISTRATE JUDGE