

**IN THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF ILLINOIS  
EASTERN DIVISION**

<b>IP INNOVATION LLC et al,</b>	)	
	)	
<b>Plaintiffs,</b>	)	
	)	
<b>v.</b>	)	<b>No. 08 C 393</b>
	)	
<b>mitsubishi electric corporation, et al.,</b>	)	
	)	
<b>Defendants.</b>	)	

**MEMORANDUM OPINION**

SAMUEL DER-YEGHIAYAN, District Judge

This matter is before the court on the claim construction of certain disputed claims in United States Patents No. 6,870,964 ('964 Patent) and No. 7,382,929 ('929 Patent). We construe the disputed claims as stated below.

**BACKGROUND**

Plaintiff IP Innovation LLC (IPI) and Plaintiff Technology Licensing Corporation contend that they have the exclusive right, title and interest in the '964 Patent and the '929 Patent. Plaintiffs contend that Defendant Vizio, Inc. (Vizio) and Defendant Microsoft Corporation (Microsoft) infringed upon the '964 and '929 Patents "by making, using, importing selling or offering to sell, and/or by inducing, aiding and abetting, encouraging or contributing to others' use of, among other

products, video game consoles, television products, DVD products, and projector products that fall within the scope of one or more claims of the patents.” (SA Compl. Par. 9). Plaintiffs brought the instant action and included in the second amended complaint a patent infringement claim against Defendants, seeking damages and injunctive relief.

### **LEGAL STANDARD**

Patent claims are construed as a matter of law. *See Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 372 (1996). In construing claims, a court must first consider the intrinsic record. *Goldenberg v. Cytogen, Inc.*, 373 F.3d 1158, 1164 (Fed. Cir. 2004). The Federal Circuit has stated that “[w]hen interpreting claims, [a court should] inquire into how a person of ordinary skill in the art would have understood claim terms at the time of the invention.” *Pfizer, Inc. v. Teva Pharmaceuticals, USA, Inc.*, 429 F.3d 1364, 1372-73 (Fed. Cir. 2005)(citing *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005)). In applying this standard, “the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification” as well as the prosecution history. *Id.*; *Phillips*, 415 F.3d at 1313-14, 1317; *see also Edward Lifesciences LLC v. Cook Inc.*, 2009 WL 2998543, at \*4 (Fed. Cir. 2009)(stating that court’s initial inquiry for claim construction includes a consideration of prosecution history). In addition, in certain instances, “the ordinary meaning of claim language as understood

by a person of skill in the art may be readily apparent . . . , and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words . . . [in which case] general purpose dictionaries may be helpful.” *Phillips*, 415 F.3d at 1314 (internal citations omitted).

## DISCUSSION

Plaintiffs contend that Microsoft is infringing upon claims 1 and 4 of the '964 Patent and claims 1, 16, 32, and 48 of the '929 Patent. Plaintiffs contend that Vizio is infringing upon all of the same claims except claim 4 of the '964 Patent.

### I. Prior Claim Constructions

The '964 and '929 Patents are divisions of United States Patent No. 6,529,637 (the '637 Patent). In turn, the '637 Patent is itself a continuation-in-part of United States Patent No. 5,424,780 (the '780 Patent). Together, the '929 Patent, the '964 Patent, the '637 Patent, and the '780 Patent constitute the '780 Patent family. In accordance with the “Supreme Court’s guidance on stare decisis in *Markman*,” a court should adopt the constructions of previously construed claim terms in a disputed patent. *Miken Composites v. Wilson Sporting Goods*, 515 F.3d 1331, 1338 n. \* (Fed. Cir. 2008).

In *IP Innovation L.L.C. v. Sony Electronics, Inc.*, 2005 WL 2035578 (N.D. Ill. 2005) the court previously construed certain claims in the '964 Patent, the '637 Patent, and the '780 Patent. *Id.* at \*1. In *IP Innovation L.L.C. v. Lexmark Intern.*,

*Inc.*, 424 F.Supp.2d 1078 (N.D. Ill. 2006) the court previously construed certain claims in the '637 Patent, and the '780 Patent. *Id.* at 1083. Thus, in *Sony* and *Lexmark*, the courts previously construed claims in the '780 Patent family. There is a presumption that “a claim term carries the same meaning throughout a particular patent and related patents, including a continuation-in-part.” *Sony*, 2005 WL 2035578, at \*7 (N.D. Ill. 2005)(citing *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1334 (Fed. Cir. 2003)). In general, Defendants have not shown that the '964 and '929 Patents at issue in the instant action, which are divisions of the '637 Patent, which is a continuation-in-part of the '780 Patent, should have claims with different constructions. There is every indication that the synonymous claims in the '780 Patent family should be construed the same. Thus, in regard to the instant claim constructions, the court must take into consideration the prior constructions made in *Sony* and *Lexmark*. In addition, even if such prior rulings concerning the '780 Patent family were not presumptively binding in this case, the rulings would form part of the prosecution history and the intrinsic record for the court's primary consideration. The respective prosecution histories of the '964 and '929 Patents include the prosecution history of the '637 Patent and, by extension, that of the '780 Patent. *See Goldenberg*, 373 F.3d at 1167 (stating that the intrinsic record, in turn, includes both the prosecution history of the disputed patent and, if available, the prosecution history of a parent of the disputed patent); *Miken Composites*, 515 F.3d at 1338 n.\* (indicating that prior claim constructions of related patents become a part of the intrinsic record). We note that, having considered the record in this case, the claim

constructions provided below would remain the same whether we consider the prior constructions as presumptively binding or merely part of the intrinsic record.

## II. Video Display Device and Display Means

Plaintiffs propose to construe the terms “video display device” (’964 Patent, claim 1) and “display means” (’964 Patent, claim 4) broadly as a device for providing an image which may be viewed by a viewer, where the device is capable of displaying a moving image. Defendants propose to limit the terms to mean a raster scan device. In the alternative, Defendants propose to define the terms to mean a camera, scanner, television, laser printer, fax machine, or the like that is coupled to the video fill circuit and displays the enhanced image. Where one claim in a patent does not contain a certain limitation, but another claim in the patent does contain the limitation, “that limitation cannot be read into the former claim in determining either validity or infringement.” *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1325-26 (Fed. Cir. 2003)(stating that “[t]here is a rebuttable presumption that different claims are of different scope” and that “courts must take extreme care when ascertaining the proper scope of the claims, lest they simultaneously import into the claims limitations that were unintended by the patentee”). In the instant action, the words “raster” and “scan” are absent from claims 1 and 4, but are present elsewhere in such patents, such as in claim 5 of the ’964 Patent, which depends from and further limits claim 4. Defendants have not provided sufficient justification to read into claims 1 or 4 as limitations the words

“raster” and “scan.” Thus, the limiting construction “raster scan” cannot be read into claim 1 or 4.

In regard to Defendants’ alternative proposed construction, Defendants propose to graft the *Sony* construction of “display means” onto the entire term “video display device.” Plaintiffs, on the other hand, seek to preserve the relationship between the construction and the terms “display means” and “display device,” accounting separately for the modifier “video.” The court in *Sony* indicated that a display device should be construed broadly to encompass matrix and hard copy display devices as well as raster type displays, which is what Plaintiffs propose. 2005 WL 2035578, at \*3-\*4. Defendants have not provided sufficient justification to reach a different construction in regard to the claims before this court. Therefore, we construe the terms “video display device” (’964 Patent, claim 1) and “display means” (’964 Patent, claim 4) in a manner consistent with Plaintiffs’ proposed construction.

### III. Pixel and Image Element

Plaintiffs propose to construe the term “pixel” (’964 Patent, claim 1; ’929 Patent, claims 1, 16, 32, 48) broadly, as the smallest complete element of an image and propose to construe the term “image element” (’964 Patent, claim 1) as encompassing pixels and pels as well as sub pixels and sub pels, noting that an element of an image may be something other than a pixel. Defendants propose to construe both terms more narrowly, defining, “pixel” as the smallest independently

addressable location capable of being displayed on a display device and “image element” as one or more pixels.

Plaintiffs point out, and Defendants agree, that in *Sony* and *Lexmark* Plaintiffs’ proposed claim construction prevailed. 2005 WL 2035578, at \*3-\*4; 424 F.Supp.2d at 1087-88. Defendants contend, however, that these prior constructions addressed the ’780 and ’637 Patents and that, in *Sony*, the court’s constructions extended to the ’964 Patent only to the extent that both parties agreed that the term should be construed consistently among the three patents involved in that case. Defendants contend that the parties have not agreed to such a construction in this case. However, as discussed above, the claim constructions in *Sony* and *Lexmark* are applicable to the instant claim construction, and in accordance with *Miken*, the prior constructions are part of the prosecution history in this case. Thus, it is unnecessary for the parties to have a prior agreement for adopting constructions since the prior constructions in this case are part of the intrinsic record.

Defendants also argue that although the terms “pixel” and “image element” appear in both prior patents and the current ones, we should disregard the claim constructions in *Sony* and *Lexmark* since the ’780 Patent contains a different specification, and the language of the claims in the ’637 Patent is not identical to the language in the claims in this case. In regard to differences in specification and claim language, both the *Sony* and *Lexmark* courts construed the ’637 Patent consistently even though it was a continuation-in-part of the ’780 Patent, meaning that it necessarily added material not disclosed in the ’780 Patent, its parent patent.

The '964 and '929 Patents, as divisional patents, disclose and claim the same subject matter as their parent, the '637 Patent. If the *Sony* and *Lexmark* courts construed a continuation-in-part, with new material consistently, then it necessarily follows that a court also construe divisional patents, with no new material, consistently.

Defendants also argue that the '780 and '637 Patents “are not at issue here and were held unenforceable.” (D CL C 10). Defendants indicate early in the main body of their opening claim construction brief, that a prior judge “ruled unenforceable the '780 and '637 patents because of inventor Carl Cooper’s inequitable conduct in prosecuting those patents.” (D CL C 1). In addition, Defendants present arguments later in their opening claim construction brief concerning the unenforceability of the patents. (D CL C 10, 15). Plaintiffs contend that Defendants’ statements and arguments are misleading, since the judge who made the unenforceability ruling subsequently vacated that ruling. Despite the fact that Defendants present various arguments regarding unenforceability premised on the prior ruling, Defendants in fact concede in a footnote on page 1 of their opening brief that the ruling was vacated. *New Medium LLC v. Barco N.V.*, 2009 WL 2385890 (N.D. Ill. 2009)(vacating a prior order, 582 F.Supp.2d 991 (N.D. Ill. 2008), which had declared the '780 and '637 Patents unenforceable). Therefore, we construe the terms “pixel” ('964 Patent, claim 1; '929 Patent, claims 1, 16, 32, 48) and “image element” ('964 Patent, claim 1) in a manner consistent with Plaintiffs’ proposed construction.



#### IV. Void

Plaintiffs propose to construe the term “void” (’964 Patent, claim 1) as a space or spaces in the image carried by the input video signal where a change or illumination may be made to cause an improvement of the perceived quality of the image. Defendants argue that the court should construe the term void more narrowly, to be an off pixel or a space between two pixels, but specifically not a defective pixel such as that corrected by United States Patent No. 4,573,070 (’070 Patent), nor part of a jagged edge in an image. Defendants also argue that Plaintiffs’ proposed construction is estopped by the prosecution history of the ’964 Patent. In addition, Defendants contend that their proposed construction should be adopted since it parallels the PTO’s definition of “void” as excluding jagged edges.

##### A. Scope of Construction

Defendants argue that the term “void” should not include defective pixels. The intrinsic record, which includes the prosecution history and prior claim constructions of the ’780 Patent family supports Plaintiffs’ proposed construction. The ’964 Patent specification provides a range of examples consistent with this construction:

Examples of voids would include such things as *defects*, unwanted elements, *improper elements*, *corrupted elements*, valid but replaceable elements, locations with no image information, and/or other locations or elements *which may be in question or need for improvement*. The term void is used to cover all these and similar situations for uniformity.

(’964 Patent, col. 3, lns. 38-52, emphasis added). Plaintiffs’ construction was also previously accepted by the court in *Lexmark*. 424 F.Supp.2d at 1089-90. Thus, the specification in the ’964 Patent indicates that voids can be defects. This rebuts Defendants’ proposal that voids are not defective pixels and supports Plaintiffs’ proposal that voids are spaces in the image where a change may be made to cause an improvement.

### B. Estoppel

Defendants also contend that Plaintiffs’ proposed construction is estopped by the prosecution history of the ’964 Patent. Defendants assert that J. Carl Cooper (Cooper), the inventor of the ’964 Patent, distinguished another of his patents, the ’070 Patent, from the ’964 Patent by claiming in a response to a Patent and Trademark Office (PTO) Action that “a defective pixel, such as that corrected by the ’070 Patent, is not the same as ‘voids’ as in the presently rejected claims.” (9/5/03 Resp. to 4/8/03 Off Act, 2)(emphasis in original). The court in *Lexmark* rejected this same estoppel argument. 424 F.Supp.2d at 1089-90. Defendants contend that *Lexmark* concerned only the ’780 and ’637 Patents, not the ’964 Patent.

The Defendants selectively quote the office action response in support of their argument. It is clear from a more complete reading of the prosecution history that Cooper was not distinguishing the ’070 Patent for present purposes, but was instead

referring to his earlier use of that argument in prosecuting the '780 Patent. The office action response cited by Defendants reads as follows.

In fact, the '070 patent was used as the basis for a rejection in claims in United States Patent Application 07/355,461 which is the first grandparent application to the present case. (See paper no. 7 to that application, at p. 9, and paper no. 11, at p. 4). *In response to that rejection, the applicant overcame his own '070 patent*, noting that a defective pixel, such as that corrected by the '070 invention is not the same as "voids" as in the presently rejected claims.

*Id.* (first emphasis added). In fact, Cooper went on in the cited office action response to reiterate the distinction between the '070 and '780 Patents, characterizing the latter as more comprehensive than the former. *Id.* at 3 (noting that “the present invention, as called for in claim 61, *further* allows for filling a void . . . , while the cited portion of the Cooper '070 patent deals with . . .”) (emphasis added). Cooper also invoked the expansive dictionary meaning of “void” as an empty space, opening, gap, or the quality of being without something, noting that such a definition “would preclude the filling of voids from being obvious in view of . . . the '070 patent.” *Id.* In addition, we note that Cooper invoked the expansive dictionary meaning of the word “void” in order to characterize the '780 Patent as a more comprehensive version of the '070 Patent and the same is true for the '964 Patent. *See Golight, Inc. v. Wal-Mart Stores, Inc.*, 355 F.3d 1327, 1332 (Fed. Cir. 2004)(stating that although a patentee may have intended to use a term in a manner other than its ordinary and customary meaning,

prosecution history may prove this conclusion only by a “clear and unmistakable departure” from the common meaning).

### C. Effect of PTO’s Definition

Defendants argue that their proposed construction parallels the PTO’s definition of “void” as excluding jagged edges. The PTO noted in its reexamination decisions for the ’780 and ’637 Patents that “smoothing the jagged edges does not fill in voids” and that “eliminating the jaggies is smoothing the edges of an image, and not filling voids.” D RE of ’637 Patent (Apr. 11, 2008), at 8, 10; D RE of ’780 Patent (Apr. 17, 2008), at 13. However, the cited PTO decisions do not support Defendants’ position as to reexamination of the ’780 and ’637 Patents. The PTO’s post-issuance statements imposed no obligation on Plaintiffs to reply, and Plaintiffs’ decision not to reply did not create a surrender of patent rights. *Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1347 (Fed. Cir. 2005)(noting that an “examiner’s unilateral remarks alone do not affect the scope of the claim, let alone show a surrender of claimed subject matter”). Defendants argue that the PTO’s understanding of “void” in the ’780 and ’637 Patents is significant to construing claims. However, *Salazar* governs the underlying weight accorded to unilateral remarks by the PTO. Thus, based on the above, we construe the term “void” (’964 Patent, claim 1) in a manner consistent with Plaintiffs’ proposed construction.

## V. Central element, Central pixel, Neighboring element and Neighboring pixel

Plaintiffs have presented a proposed construction of the terms “Central element” (’964 Patent, claim 4); “Central pixel” (’929 Patent, claims 1, 16, 32, and 48); “Neighboring element” (’964 Patent, claim 4); “Neighboring pixel” (’964 Patent, claim 1; ’929 Patent, claims 1, 16, 32, and 48). The parties substantially agree as to the construction of the terms “central element,” “central pixel,” “neighboring element,” and “neighboring pixel,” except as to the nature and magnitude of the relationship between central and neighboring elements.

### A. Nature of Proximity

The parties disagree as to whether the relationship between central elements and neighboring elements may only be spatial or may be temporal as well.

Defendants’ position is based upon selective quotations from the ’964 and ’929 Patent claims language. A more complete reading of the claim language undercuts Defendants’ position. For example, in the ’964 and ’929 Patents:

Element X may well be replicated from any direction, including those of the third dimension, which would represent a frame to frame or time dimension, or a *combination of time and spatial dimensions*. Replication in the time dimension is useful in improving motions artifacts.

’964 Patent, col. 11, lns. 45-49 (emphasis added); ’929 Patent, col. 11, lns. 35-39 (emphasis added). In addition, the ’929 Patent claim language cited by Defendants

with regard to “spatially positioned” pixels does not refer to the central or neighboring pixels to which they are being compared. Rather, all four claims employing the central-neighboring relationship refer to “spatially positioned” pixels in the *improved* image produced as a result of the comparison. ’929 Patent, col. 18, lns. 23-24 (“said *additional* pixels [generated at least in part in response to said comparison] are spatially positioned”); ’929 Patent, col. 19, lns. 11-12 (“said *one or more* pixels [illuminated to create increased resolution at least in part in response to said comparison] are spatially positioned”); ’929 Patent, col. 20, lns. 1-2 (“said *turned on* pixels [turned on to create increased resolution at least in part in response to said comparison] are spatially positioned”). Thus, in regard to the original comparison, it is clear from the specification that the relationship between central and neighboring elements contains both a spatial and a temporal dimension.

#### B. Magnitude of Proximity

The parties also disagree as to whether neighboring elements must be immediately adjacent to a central element or may have intervening elements as well. Our construction of the term “void,” as indicated above, as well as prior construction of the ’780 Patent in *Lexmark* require that intervening elements may, in fact, exist between neighboring elements and the central element that they neighbor. 424 F.Supp.2d at 1089-90. We note that Defendants’ claim construction brief contains

no direct argument as to neighboring elements or pixels, only as to central elements or pixels. Thus, based on the above, we construe the terms Central element ('964 Patent, claim 4); Central pixel ('929 Patent, claims 1, 16, 32, and 48); Neighboring element ('964 Patent, claim 4); and Neighboring pixel ('964 Patent, claim 1; '929 Patent, claims 1, 16, 32, and 48) in a manner consistent with Plaintiffs' proposed construction.

## VI. Altering Voids

Plaintiffs propose a construction for the term Altering voids ('964 Patent, claim 1). Defendants seek to add the requirement that Altering voids be limited to the filling of voids, that this be done by varying the input signal, and that this exclude the smoothing of jagged edges in the image. In regard to varying the input signal, Plaintiffs identify the deflection of an electron beam as a way to alter a void. '780 Patent, col. 5, ln. 13. This refutes Defendants' position that varying the input signal is the only way to alter a void. In regard to whether Altering voids should be limited to filling voids, the '780 Patent contains several other examples of altering voids. These include changing the size, shape, and position of the elements of an image in order to improve it. '780 Patent, col. 2, lns. 18-23; '780 Patent, col. 2, lns. 37-38. These objectives establish a definition of "altering" broader than merely filling a void as proposed by Defendants, and refute Defendants' position that varying the

input signal is the only way to alter a void. In regard to the exclusion of the smoothing of jagged edges in the image, our construction of void above has already rejected Defendants' reliance on unilateral post-issuance remarks by the PTO to exclude jagged edges from the definition of void. For the same reason, we reject Defendants' argument that "altering voids" should exclude smoothing jagged edges in the image. Thus, based on the above, we construe the term Altering voids ('964 Patent, claim 1) in a manner consistent with Plaintiffs' proposed construction.

## VII. Means Plus Function Limitations

The parties have provided proposed constructions for the terms "fill calculator means" ('964 Patent, claim 1), "fill calculator circuit" ('964 Patent, claim 4), "neighboring pixel means" ('964 Patent, claim 1), "neighboring element circuit" ('964 Patent, claim 4), and Video fill circuit ('964 Patent, claim 4). The parties disagree as to whether these terms are means plus function limitations under 35 U.S.C. § 112, ¶ 6 (§ 112, ¶ 6). Even if they are means plus function limitations, the parties also disagree as to function claimed by each term and the structural means corresponding to each function.

### A. Whether Terms are Means Plus Function Limitations

Plaintiffs contend that the above five terms are not means plus function limitations and Defendants contend that the terms are means plus function limitations. Pursuant to 35 U.S.C. § 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; *see also, e.g., Fresenius USA, Inc. v. Baxter Intern., Inc.*, 2009 WL 2881629, at \*9 (Fed. Cir. 2009)(stating that “[i]t is firmly established in [the Court’s] precedent that a structural analysis is required when means-plus-function limitations are at issue; a functional analysis alone will not suffice”); *Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 1371 (Fed. Cir. 2003)(explaining that “[t]hrough use of means-plus-function limitations, patent applicants are allowed to claim an element of a combination functionally, without reciting structures for performing those functions”).

The use of term “means” in a claim raises a presumption that a term is a means plus function limitation. *Apex Inc.*, 325 F.3d at 1371. The party challenging the application of § 112, ¶ 6 bears the burden of rebutting that presumption with regard to all terms within the scope of the statute. *Id.* at 1372. The Federal Circuit has also indicated that for a claim term to be a means plus function, “the alleged means-plus-function claim element must not recite a definite structure which performs the described function.” *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 531 (Fed. Cir. 1996).

In regard to the “fill calculator means” and “neighboring pixel means,” both use the word “means.” ’964 Patent, cls. 1, 4. Thus, there is a presumption that the terms are means plus function limitations. Plaintiffs contend that the terms

themselves indicate sufficient structure to one of ordinary skill to perform the functions identified by the limitation and thus are not means plus function limitations. Plaintiffs fail to show that § 112, ¶ 6 applies to the terms and fail to rebut the presumption to the extent that it is applicable to the terms. All the terms recite corresponding function, but none recite structure sufficient to perform the function. Plaintiffs provide only conclusory assertions that the terms indicate structure to persons having ordinary skill in the art. Thus, the terms “fill calculator means” and “neighboring pixel” are means plus functions limitations. The *Lexmark* and *Sony* courts similarly found the terms “fill calculator means” and “neighboring pixel means” to be means plus function limitations. 2005 WL 2035578, at \*11-14; 424 F.Supp.2d at 1093-94.

Though the terms “fill calculator circuit” and “neighboring element circuit” do not use the word “means,” they are similarly argued by Defendants to be functional language within the scope of § 112, ¶ 6. ’964 Patent, cl. 4. Neither the “fill calculator circuit” and “neighboring element circuit,” nor the language after the claim term describes sufficiently definite structure to take the claims beyond the scope of § 112, ¶ 6. These two claims are also somewhat related to the terms “fill calculator means” and “neighboring pixel,” which do include the term “means.” Defendants point out that the term “fill calculator means” and “fill calculator circuit” are used interchangeably in certain claims. The use of the word “circuit” in the terms “fill calculator circuit” and “neighboring element circuit” is not adequate to connote sufficient structure. *Apex Inc.*, 325 F.3d at 1373. We also agree with Defendants

that the term “video fill circuit” does not include details to connote sufficient structure. Thus, we conclude that the terms “fill calculator circuit,” “neighboring element circuit,” and “video fill circuit” are means plus function limitations.

### B. Function and Structure

If a term is deemed to be a means plus function limitations, the court must then: (1) “identify the particular claimed function, and then (2) “look to the specification and identify the corresponding structure for that function.” *Medical Instrumentation and Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1210 (Fed. Cir. 2003)(stating that “[u]nder this second step, structure disclosed in the specification is ‘corresponding’ structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim”)(internal quotations omitted)(quoting in part *B. Braun Med. Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997)). Plaintiffs have put forth proposed definitions of the functions and structure for the terms “fill calculator means”, “fill calculator circuit,” “neighboring pixel means,” “neighboring element circuit,” and “video fill circuit.” We conclude that Plaintiffs have put forth the proper definition of function and structure for such terms and we adopt Plaintiffs’ proposed definitions.

### VIII. Generate a fill signal indicating where said display device may alter voids

Plaintiffs propose to construe the term “generate a fill signal indicating where said display device may alter voids” (’964 Patent, claim 1) as generating a signal that

fills voids in an image carried by a video signal by altering the input signal without solely modifying the on and off times of the signal carrying the image. Defendants propose to limit the term as generating a signal to identify where voids between image elements may be filled. The *Lexmark* court previously construed a term, from the '780 Patent, similar to the term presently at issue. Although Defendants are correct that the claim terms are not identical, both refer to the generation of a fill signal and to the identification of voids to be filled. Defendants assert that the difference between the two terms is significant. Yet the term construed in *Lexmark* was not materially different. (D CL C 17). Thus, the *Lexmark* construction remains applicable, and Defendants provide no compelling reason to reach a different conclusion. Thus, based on the above, we construe the terms “generate a fill signal indicating where said display device may alter voids” ('964 Patent, claim 1) in a manner consistent with Plaintiffs' proposed construction.

#### IX. Recover and temporarily store known ones of picture elements

Plaintiffs propose to construe the term “recover and temporarily store known ones of picture elements” ('964 Patent, claim 4) as a function of the neighboring element circuit for providing a group or neighborhood of image elements in response to the signal carrying the image.” Defendants seek a limited construction of the term as recovering from the image-bearing signal and temporarily storing only pixels already existing in the image-bearing signal. Defendants add that this must be performed in response to the signal conveying the image.

Both proposed constructions depend on the language of claim 4 that the claimed display apparatus be “responsive to said signal and operable to recover and temporarily store known ones of picture elements of said image *so as to provide a group of neighboring elements including a central element.*” ’964 Patent, col. 18, lns. 41-45 (emphasis added). Defendants’ argument that elements must exist in order to be known is in conflict with the ’964 Patent specification which indicates that the group of central and neighboring elements may include newly created as well as modified elements. *Id.*, col. 3, lns. 53-58. Moreover, Plaintiffs’ argument accounts for the temporal dimension of the central-neighboring element relationship which we have recognized above. Thus, based on the above, we construe the term “recover and temporarily store known ones of picture elements” (’964 Patent, claim 4) in a manner consistent with Plaintiffs’ proposed construction.

X. Provide a group of neighboring elements including a central element

Plaintiffs propose to construe the term “provide a group of neighboring elements including a central element” (’964 Patent, claim 4) by its plain and ordinary meaning, as providing a group of neighboring elements at least one of which is centrally located in respect to the rest of the neighboring elements. By contrast, Defendants seek to require that neighboring elements be from among the known elements, which already exist in the image bearing signal. Defendants propose further to require that there be elements above, below, and adjacent to the central element. Defendants agree with Plaintiffs’ construction as it was advanced in the

Joint Claim Construction. (D CL C 18) (“provide a group of neighboring elements at least one of which is centrally located in respect to the rest of the neighboring elements”). This construction also addresses Plaintiffs’ argument for temporal as well as spatial relationships. As discussed above, we have construed “central” and “neighboring” elements and pixels as having a temporal dimension in addition to a spatial dimension. Thus, based on the above, we construe the term “provide a group of neighboring elements including a central element” (’964 Patent, claim 4) in a manner consistent with Plaintiffs’ proposed construction.

XI. Determining if said neighboring elements, including said central element, match known patterns of elements

Plaintiffs propose to construe the term “determining if said neighboring elements, including said central element, match known patterns of elements” (’964 Patent, claim 4) by its plain and ordinary meaning, as comparing neighboring elements, including a central element, with known patterns of values of elements, such as through the use of digital logic or stored patterns. Defendants seek to restrict the phrase “known patterns of elements” as patterns of picture elements, each pattern comprising a plurality of pixels, which exist in an image bearing signal.

Plaintiffs’ proposed construction accounts for the function of the fill calculator circuit, as to what the known patterns of elements specifically are. With respect to the determination of a match, Defendants’ argument for a definitional limitation on “known patterns of elements” is inappropriate. Defendants contend that Plaintiffs

improperly replace “match” with “compare.” Yet it is necessary, in determining whether a match exists between two things, to compare them. Thus, Plaintiffs’ construction does not replace “match” with “compare,” but instead properly equates “determine” with “compare.” Thus, based on the above, we construe the term “determining if said neighboring elements, including said central element, match known patterns of elements” (’964 Patent, claim 4) in a manner consistent with Plaintiffs’ proposed construction.

## XII. Modifying the value of said central element in response thereto

Plaintiffs propose to construe the term “modifying the value of said central element in response thereto” (’964 Patent, claim 4) as “changing the value of the central element to be different from its previous value” by its plain and ordinary meaning, as changing a value in the central element to be different from its previous value. Defendants seek to limit the term to changing a numerical quantity that is assigned to the central element, in order to enhance said image. Plaintiffs’ proposed construction properly leaves out the additional limitation proposed by Defendants, that the value of the central element necessarily be numerical. Also, Plaintiffs correctly note that the language of claim 4 refers to “modifying *the value of* said central element,” not “modifying *a value in* said central element.” Thus, based on the above, we construe the term “modifying the value of said central element in response thereto” (’964 Patent, claim 4) in a manner consistent with Plaintiffs’ proposed construction.

### XIII. First image

Plaintiffs propose to construe the term “first image” (’929 Patent, claims 1, 16, 32, and 48) by its plain and ordinary meaning, as the image input to the claimed method or system. Defendants seek to qualify the term as referring to an original, unmodified static image. Plaintiffs’ proposed construction tracks with the plain and ordinary meaning and properly accounts for the temporal dimension of image elements that we recognized above. For their part, Defendants agree that the parties’ constructions “are not meaningfully different.” (D CL C 20). Thus, based on the above, we construe the term “first image” (’929 Patent, claims 1, 16, 32, and 48) in a manner consistent with Plaintiffs’ proposed construction.

### XIV. Improved image with increased resolution

Plaintiffs propose to construe the term “improved image with increased resolution” (’929 Patent, claims 1, 16, 32, and 48) by its plain and ordinary meaning, as the image provided to the display which has been improved, insofar as increased resolution, when compared to the “first image.” Defendants again seek to qualify the term as a “modified, static image created from the first image with increased resolution.” The parties disagree essentially as to whether the improved image created from the first image is static or not. As with the term “first image,” Plaintiffs’ proposed construction properly accounts for the temporal dimension of image elements that we recognized above. Thus, based on the above, we construe



the term “improved image with increased resolution” (’929 Patent, claims 1, 16, 32, and 48) in a manner consistent with Plaintiffs’ proposed construction.

#### XV. Increased resolution

The parties agree that “increased resolution” (’929 Patent, claims 1, 16, 32, and 48) may be the result of having a larger number of pixels than did the original image. Yet a larger number of pixels is merely sufficient, not necessary, to achieving increased resolution. Plaintiffs point out other ways described in the specification, such as modifying existing pixels or replacing defective pixels, that result in increased resolution. Moreover, any combination of these may also result in increased resolution. Thus, increased resolution is properly understood by its plain and ordinary meaning, as “a higher level of detail.” Based on the above, we construe the term “increased resolution” (’929 Patent, claims 1, 16, 32, and 48) in a manner consistent with Plaintiffs’ proposed construction.

#### XVI. Comparing said central pixel and said one or more neighboring pixels

The parties have proposed a construction for the term “comparing said central pixel and said one or more neighboring pixels.” (’929 Patent, claims 1, 16, 32, and 48). The parties agree that comparing a central pixel with one or more neighboring pixels may reveal differences, but only Plaintiffs’ proposed construction goes further and correctly embraces the possibility that there may be similarities and that the two pixels under comparison may be identical. Thus, based on the above, we construe

the term “comparing said central pixel and said one or more neighboring pixels” (’929 Patent, claims 1, 16, 32, and 48) in a manner consistent with Plaintiffs’ proposed construction.

XVII. Spatially positioned in said improved image in one or more directions, including a diagonal direction from said central pixel and/or positions along a sinusoidal path

The parties have proposed a construction for the term “Spatially positioned in said improved image in one or more directions, including a diagonal direction from said central pixel and/or positions along a sinusoidal path.” (’929 Patent, claim 1). The parties disagree as to whether a diagonal direction from the central pixel is necessary to spatial positioning within the image. Plaintiffs’ argument accurately reflects the language of the claim, generally that the location within the improved image may be in one or more directions. The inclusion of a possible diagonal direction or positions along a sinusoidal path further elaborate the possible directions, departing from the obvious cardinal directions of “up,” “down,” “left,” and “right.” Defendants’ argument improperly restricts the possible directions by requiring that a diagonal direction must be present. Thus, based on the above, we construe the term “Spatially positioned in said improved image in one or more directions, including a diagonal direction from said central pixel and/or positions along a sinusoidal path” (’929 Patent, claim 1) in a manner consistent with Plaintiffs’ proposed construction.

XVIII. Spatially positioned and modulated in said improved image in one or more directions from said central pixel

The parties have proposed a construction for the term “Spatially positioned and modulated in said improved image in one or more directions from said central pixel” (’929 Patent, claims 16, 32, and 48). Plaintiffs construe the term as “pixels which are positioned and changed in the image to be displayed in one or more directions from the ‘central pixel.’” (J CL C 10.) Defendants contend that the claim term at issue is indefinite under 35 U.S.C. § 112, ¶ 2. Yet Defendants fail to account for the difference between the “spatially positioned . . .” term in claim 1 of the ’929 Patent and the “spatially positioned . . .” term in claims 16, 32, and 48 of the ’929 Patent. That material difference is the term “modulated” which Defendants agree has a well-defined meaning in the art. To the extent the term in claim 1 is not indefinite, the parallel term in claims 16, 32, and 48 are not indefinite, either. Thus, based on the above, we construe the term “Spatially positioned and modulated in said improved image in one or more directions from said central pixel.” (’929 Patent, claims 16, 32, and 48) in a manner consistent with Plaintiffs’ proposed construction.

XIX. Generating one or more additional pixels

The parties have proposed a construction for the term “Generating one or more additional pixels” (’929 Patent, claim 1). The parties disagree as to whether the one or more created pixels would be present in the first image. Plaintiffs properly

account for the multiple ways in which an image may be improved, by correcting elements, improving elements, or substituting for existing elements. '929 Patent, col. 4, lns. 14-18. Some of these methods of improvement require, and certainly allow, contrary to Defendants' contention, that the additional pixels have existed in the first image. Thus, based on the above, we construe the term "Generating one or more additional pixels" ('929 Patent, claim 1) in a manner consistent with Plaintiffs' proposed construction.

#### XX. Illuminating one or more pixels

The parties have proposed a construction for the term "Illuminating one or more pixels" ('929 Patent, claim 16). Although the parties agree that illumination includes turning one or more pixels from the off state to an on state, Plaintiffs further contend that it may also include increasing or decreasing the brightness value for pixels not currently in the off state. This interpretation finds support in the '929 Patent specification as follows:

Illumination may be caused to occur in the absence of a signal generated illumination, *or may cause the signal generated illumination to be modified, such as by being increased or decreased.*

'929 Patent, col. 8, lns. 3-6 (emphasis added). By contrast, Defendants improperly limit their construction to a binary off/on switch, in conflict with the specification. Thus, based on the above, we construe the term "Illuminating one or more pixels" ('929 Patent, claim 16) in a manner consistent with Plaintiffs' proposed construction.

### XXI. Turning on one or more pixels

The parties have proposed a construction for the term “Turning on one or more pixels” (’929 Patent, claim 32). Although the parties agree that turning on includes changing one or more pixels from the off state to an on state, Plaintiffs further contend that it may also include assigning values other than brightness. To the extent that the ’929 Patent specification indicates that the pixel features used for comparison and processing include, the color, hue, and saturation of a pixel in addition to its brightness, Defendants’ construction is improperly narrow. Thus, based on the above, we construe the term “Turning on one or more pixels” (’929 Patent, claim 32) in a manner consistent with Plaintiffs’ proposed construction.

### XXII. Changing the value of one or more pixels

The parties have proposed a construction for the term “Changing the value of one or more pixels” (’929 Patent, claim 48). Although the parties agree that changing the value includes altering a numerical quantity assigned to one or more pixels, Plaintiffs further contend that it may also include assigning non-numerical values. As discussed above, pixels may carry various attributes not all of which lend themselves to numerical values. Thus, based on the above, we construe the term

“Changing the value of one or more pixels” (’929 Patent, claim 48) in a manner consistent with Plaintiffs’ proposed construction.

### CONCLUSION

Based on the foregoing analysis, the disputed patent claims are construed as indicated above.

  
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Samuel Der-Yeghiayan  
United States District Court Judge

Dated: October 29, 2009