United States District Court,
W.D. Texas, San Antonio Division.

BOARD OF REGENTS OF THE UNIVERSITY OF TEXAS SYSTEM, An Agency of the State of Texas, and Radworks Corporation,
Plaintiffs.
v.
EASTMAN KODAK COMPANY, Practiceworks, Inc., Practiceworks Systems, L.L.C., Practicewares, Inc., and John Does 1 thru 10,
Defendants.

No. Civ.A. SA04CA912-XR

Jan. 26, 2006.

Ted D. Lee, Gunn, Lee & Keeling, San Antonio, TX, for Plaintiffs.

William Paul Schuck, Claire A. Ebey, Paul Previde, Jeffrey R. Williams, Stephen M. Hankins, Morgenstein & Jubelirer LLP, San Francisco, CA, Jeffrey R. Parsons, Bruce C. Morris, Beirne, Maynard & Parsons, LLP, Houston, TX, for Defendants.

ORDER CONSTRUING CLAIMS

XAVIER RODRIGUEZ**, J.**

The Court issues this order to construe the claims of the patent in suit. The Court conducted a *Markman* hearing on November 2, 2005. The Court has considered the parties' briefs and arguments, the applicable law, and the intrinsic record, and concludes that the claim terms should be construed as set forth in this order.

Background/Prosecution History

The University of Texas System owns the patent, U.S. Patent No. 5,179,579, currently at issue in this case. Plaintiff Rad Works is the exclusive licensee of the patent. RadWorks consists of three individuals, Dr. Brent Dove, Dr. Doss McDavid, and Dr. Donald Wilcox, who are the named inventors of the patent. The patent, entitled "Radiograph Display System with Anatomical Icon for Selecting Digitized Stored Images," was issued January 12, 1993, and relates generally to a software program and device for storing and displaying dental x-rays. Plaintiffs filed this suit accusing Defendants Eastman Kodak Company and Practiceworks, Inc. of infringing the patent.

The Court will set forth the prosecution history and relevant information from the patent specification at this time to provide context.

Specification

The abstract of the patent states that radiographs are captured, digitized, and displayed along with an icon of a portion of the anatomy from which the radiograph was taken. It further states that the icon takes the form "of a dental film holder, with the positions of the film holder corresponding to anatomical sites readily recognized by dentists, each position of the film holder being arranged in anatomical relation to other positions of the film holder." The background section of the patent specification states:

It is well known in the field of oral radiology to mount dental radiographs in a film holder. Use of such film holders minimizes the possibility of misinterpretation of radiographs which, when loose and unmounted, can appear to be quite similar to one another. Such film holders can hold as few as one dental radiograph, or as many as 20 or more radiographs. Interpretation of such mounted radiographs is facilitated by mounting each film in normal anatomic relation to each other. In other words, each mounting position in a dental film holder corresponds to a particular anatomical site or anatomical region.

Column 1, lines 19-30. It continues: "[T]he mounting of dental radiographs in film holders in normal anatomic relation allows a dentist, having knowledge of normal radiologic anatomy and knowledge of anatomical landmarks, to quickly and easily interpret a set of mounted dental radiographs." Column 1, lines 35-39. It then lists anatomical landmarks used by dentists and states "[f]ilm holders present films taken of these anatomical landmark sites in positions that are consistent from holder to holder." Column 1, lines 40-55. The background section further notes that recent advances in dental radiology allow one to store x-ray images in a computer system and display sets of related images with miniature versions of the images, but that these miniature representations of the images are in no particular order. Column 1, line 56-Column 2, line 2.

The summary of the invention notes that it solves the drawbacks of the prior art by providing a method and apparatus for displaying stored radiographic images that take advantage of dentists' knowledge of normal radiologic anatomy and knowledge of anatomical landmarks. Column 2, lines 11-15. It further states that "the display of the stored images is facilitated by use of a representation or icon of anatomical sites ... from which the images were taken. The system user selects the image to be displayed by selecting the appropriate anatomical site from the representation of anatomical sites...." Column 2, lines 20-25. It also states that the preferred application for the invention is in intra-oral radiology, and in such an application, "sets of stored radiographs are displayed by using a representation of a dental film holder...." Column 2, lines 27-30. The system user "selects the portion of the representation corresponding to the desired image to be displayed, and the desired image is then retrieved and displayed. Use of a representation of a dental film holder permits a dentist to use his or her knowledge of the anatomical significance of the positions of the mounting positions in the film holder." Column 2, lines 34-37. Thus, it summarizes, "the present invention combines the organizational and interpretational advantages of film holders, with the advantages of digital x-ray imaging techniques." Column 2, lines 38-40.

In its "detailed description of the preferred embodiments," the specification states that, after a particular patient examination has been selected for review, a screen (shown in Figure 3) is displayed to the system user, including "icon or representation field 53." Column 4, lines 18-21. Icon field 53 "comprises an image of a full mouth examination film holder" and within the icon are film positions, "each of which relate to a specific anatomical site." Column 4, lines 26-29. The specification then lists the specific anatomical sites that correspond to each position in the film holder icon (e.g. "position 58 is a bitewing view of the right maxillary and mandibular molars"). Column 4, lines 29-55. However, the next paragraph states that "[i]t

should be emphasized that other anatomical connotations can be applied to the various portions of the icon appearing in icon field 53, without departing from the spirit and scope of the present invention, as long as the anatomical sites represented by the icon in icon field 53 appear in normal anatomical relation to one another." Column 4, lines 56-61. "In addition, although the icon illustrated in FIG. 3 comprises an image of a full mouth examination 20-film holder, different examinations may require different icons. For example, the icon appearing in icon field 53 for a 2-film bitewing examination would be that of a 2-film holder, for example as shown in FIGS. 5A, 5B or 5C, described in more detail below." Column 4, lines 62-68. To store images, a "system user uses the icon in field 53 to select the anatomical site within icon 53 that is to be associated with the x-ray image captured." Column 5, lines 21-23. The image is then stored along with indicia of the associated location in the icon. Column 5, lines 27-29. This is repeated until images have been captured and associated with each of the anatomical sites represented by the icon in field 53. Column 5, lines 29-32. To retrieve images, the system user selects an image to be displayed by selecting the appropriate anatomical site of the icon in icon field 53. Column 5, lines 45-47.

Referring again to the filmholders, the specification states that Figures 5A through 5S present "various icons of film holders that can be used in the present invention for displaying in icon field 53 (FIG.3) to facilitate user selection of images to be displayed based on desired anatomical site." Column 6, lines 8-12. "FIGS. 5A, 5B and 5C are known as 2-film bitewings, FIGS. 5D and 5F are examples of 3-film bitewings, FIG. 5E is a 4-film bitewing, and FIGS. 5G-S are examples of full mouth surveys having various numbers of films. For each of the film holders depicted in FIGS. 5A-S, each of the film positions corresponds to a particular anatomical site within the dental arch." Column 6, lines 13-19. Figures 5A through 5S depict nineteen representations of dental film holders, which appear to be copied from a catalog of film holders available at the time of the patent application. FN1

FN1. Defendants have submitted a page from a Flow X-ray catalog that appears strikingly similar to the depiction of Figures 5A through 5S. Exhibit G to Affidavit of Paul Previde. Plaintiffs' objection to this exhibit is overruled. Defendants have also submitted an excerpt of a product brochure published by Densply Rinn, which depicts over 75 individual examples of film holders/mounts available to dentists. Exhibit H to Affidavit of Paul Previde. Plaintiffs' objection to this exhibit is overruled.

Prosecution History

The original application, entitled "Method and Apparatus for Displaying Stored Radiographs," was filed on June 17, 1991, and included nine claims. The abstract of the disclosure stated:

Radiographs are captured, digitized, and displayed along with an icon of a portion of the anatomy from which the radiograph was taken. The anatomical sites represented by the icon are arranged according to their normal anatomical relationship. The icon is used by the system user to select a portion of the anatomy corresponding to the displayed radiograph, and the radiograph is stored along with indicia of the selected anatomical site. Then, when the stored radiograph is desired to be viewed, the icon is again displayed, and the appropriate anatomical site is selected, which causes the corresponding radiograph to be retrieved from storage and displayed. When processing intra-oral radiographs, the icon can take the form of a dental film holder, with the positions of the film holder corresponding to anatomical sites readily recognized by dentists, each position of the film holder being arranged in anatomical relation to other positions of the film holder icon. An image of dentition, for example, a dental arch, can also be used as an icon to facilitate the storage and display of intra-oral radiographs.

The claims included were:

1. A method of selectively displaying at least one of a plurality of stored radiographs of anatomical sites, comprising: displaying a representation of target anatomical sites arranged in normal anatomical relation to one another; selecting one of said target anatomical sites using said representation; and displaying a stored radiographic image corresponding to said selected target anatomical site.

2. A method of selectively displaying stored radiographs of anatomical sites, comprising: displaying a representation of target radiological sites arranged according to anatomical location of said sites; selecting one of said target radiological sites; and displaying a stored radiographic image corresponding to said selected target radiological site.

3. A method of displaying stored intra-oral radiographs, comprising: displaying a representation of target intra-oral radiological sites arranged according to anatomical location of said sites; selecting one of said target intra-oral radiological sites; and displaying a stored intra-oral radiograph corresponding to said selected target intra-oral radiological site.

4. The method of claim 3, wherein said representation is an image of an intra-oral radiograph holder.

5. The method of claim 3, wherein said representation is an image of dentition.

6. A method for storing and displaying intra-oral radiographs, comprising: generating and displaying intra-oral radiographs of dentition; generating and displaying a representation of selectable intra-oral radiological sites arranged according to anatomical location of said sites; storing said intra-oral radiograph images responsive to selection of intra-oral radiological sites in said representation along with indicia of respective selected intra-oral radiological sites; and subsequently retrieving and displaying said intra-oral radiographs responsive to selection of respective intra-oral radiological sites in said representation.

7. A program storage device readable by a machine and tangibly embodying a representation of a program of instructions adaptable to be executed by said machine to perform the method of any one of claims 1 thought 6.

8. A device for storing and displaying intra-oral radiographs, comprising: an x-ray source; a sensor for producing x-ray images of dentition placed between said source and said sensor; a memory in which said x-ray images are stored; a display; means for generating and displaying on said display a representation of selectable intra-oral radiological sites arranged according to anatomical location of said sites; and means, responsive to selection of said selectable sites, for displaying corresponding stored x-ray images.

9. The device of claim 8, further comprising: an image digitizer for digitizing x-ray images produced by said sensor before storage in said memory.

The United States Patent and Trademark Office ("PTO") rejected all nine claims. The PTO stated that a new title was required that would be clearly indicative of the invention to which the claims were directed and suggested "radiograph display system with anatomical icon for selecting digitized stored images." The notice further stated that claims one through nine were rejected as obvious under 35 U.S.C. s. 103. Specifically, it stated that the claims were "unpatentable over Aisaka et al.," which "teaches an image

display system having most [of] the means and steps to that of the instant invention." It continued, "[f]or instance, Aisaka teaches the following: (a) an image display system for medical X-ray imaging; (b) memories in which X-ray images are stored; (c) a display; (d) means for generating and displaying on said display a representation of selectable X-ray image; (e) means, responsive to selection of said selectable image for displaying corresponding X-ray images." (citations omitted.) The PTO noted, however, that "Aisaka does not teach that his system [is] to be used for storing and displaying intra-oral radiographs. [A][m]edical X-ray storing and displaying system such as Aisaka's is not only limited to computer tomography. In [the] case of intra-oral radiographs of dentition, it would have been obvious to one of ordinary skill in the art to utilize an imaging and displaying system similar to Aisaka's, because a number of images of specific portions of the patient's dentition which giving [*sic*] specific ID codes are selected from among a multitude of X-ray images."

In response, Plaintiff canceled claims 1, 2, 4, and 5 and amended claims 3, 6, and 8 by adding "an intra-oral radiograph holder including" after "representation of." The applicant also adopted the PTO's suggested title. FN2 With regard to the obviousness objection, the applicant responded:

FN2. The title now listed on the patent is handwritten and states "Radiograph Display System with Anatomical Icon for Selecting Digitized Stored Images."

Each independent claim remaining in this application (claims 3, 6, and 8) has been amended to incorporate the limitations of original claim 4. Thus, all claims remaining in this application require the display of a representation of "an intra-oral radiograph holder." Referring to the Specification, exemplary intra-oral radiograph holders are shown in Fig. 3 (item 53), and in Figs. 5A-5S. As explained in the Specification, dentists are familiar with such radiograph holders, and are trained to associate certain positions in the holder with specific portions of dentition.
While the Aisaka et al. reference contemplates the display of a representation of anatomy (for example, a stomach in Fig. 2A or a lung in Fig. 7C), there is no suggestion in Aisaka et al., or in any of the art of record, to display a representation of an intra-oral radiograph holder, and the use of that representation to store and retrieve dental radiographs. Such a suggestion is only found in Applicants' disclosure.

The patent as amended was allowed. The "Notice of Allowability" states that Claims 3 and 6-9 are allowable over the prior art of record and gave a statement of reasons as follows:

Recent advances in computerized dental imaging systems allow intra-oral X-ray images to be created, stored, recalled and displayed. However, the displayed dental images are not particular in order which gives rise to a problem of intra-oral radiographs of different anatomical sites appearing to be quite similar.

In one embodiment, applicant claims a method of displaying stored radiographs and representations of target sites of an intra-oral radiograph holder. Applicant claims the stored radiographs can be selected and displayed. The displayed radiographs corresponding to said selected target sites are arranged according to the anatomical location of said sites.

In another embodiment, applicant claims an apparatus to accomplish the above claimed method of storing and displaying intra-oral radiographs arranged according to the anatomical location taken by an intra-oral radiograph holder.

Thus, the original patent application was for a method of displaying stored intra-oral radiographs comprising displaying a representation of target intra-oral radiological sites arranged according to anatomical location of said sites. This representation could be either "an image of an intra-oral radiograph holder" or "an image of dentition." *See* original application claims 4 & 5. The amended and approved application eliminated the "image of dentition" method of original claim 5 and incorporated original claim 4's limitation of "an image of an intra-oral radiograph holder" directly into the other claims.

General Claim Construction Principles

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude." ' Phillips v. AWH Corp., 415 F.3d 1303, 1312 (Fed.Cir.2005). The claims are "of primary importance, in the effort to ascertain precisely what it is that is patented." Merrill v. Yeomans, 94 U.S. 568, 570, 24 L.Ed. 235 (1876). The words of a claim "are generally given their ordinary and customary meaning." Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996). The "ordinary and customary meaning" is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, *i.e.,* as of the effective filing date of the patent application. Phillips, 415 F.3d at 1313. This inquiry provides an objective baseline from which to begin claim construction. *Id*. The person of ordinary skill in the art is deemed to read a 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. *Id*. Further, such person is deemed to read the words used in the patent documents with an understanding of their meaning in the field, and to have knowledge of any special meaning and usage in the field. Multiform Desiccants, Inc. v. Medzam, Ltd., 133 F.3d 1473, 1477 (Fed.Cir.1998). Thus, the Court starts the decision making process by reviewing the same resources as would that person, by reviewing the patent specification and the prosecution history. *Id*.

In many cases, "determining the ordinary and customary meaning of the claim requires examination of terms that have a particular meaning in a field of art. Because the meaning of a claim term as understood by persons of skill in the art is often not immediately apparent, and because patentees frequently use terms idiosyncratically, the Court looks to 'those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean." ' Phillips, 415 F.3d at 1314 (quoting Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc., 381 F.3d 1111, 1116 (Fed.Cir.2004)). Those sources include "the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." Phillips, 415 F.3d at 1314 (quoting Innova, 381 F.3d at 1116).

The claims themselves provide substantial guidance as to the meaning of particular claim terms. Phillips, 415 F.3d at 1314. The context in which a term is used in the asserted claim can be highly instructive. *Id*. And, other claims of the patent in question, both asserted and unasserted, can be valuable sources of information regarding the meaning of a claim term because claim terms are normally used consistently throughout the patent. *Id*. Or, the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation is not present in the independent claim. *Id*.

Claims, however, are not read in isolation, and "must be read in view of the specification, of which they are a part." Phillips, 415 F.3d at 1315 (quoting Markman v. Westview Instruments, 52 F.3d 967, 978 (Fed.Cir.1995)). The specification is "always highly relevant to the claim construction analysis," "is the single best guide to the meaning of a disputed term," and is usually dispositive. Phillips, 415 F.3d at 1315 (quoting Vitronics, 90 F.3d at 1582); *see also* 35 U.S.C. s. 112, para. 1 (requiring that the specification

describe the claimed invention in "full, clear, concise, and exact terms"). Thus, "the construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." Renishaw PLC v. Marposs Societa per Azioni, 158 F.3d 1243, 1250 (Fed.Cir.1998). The specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs. Phillips, 415 F.3d at 1316. In other cases, the specification may reveal an intentional disclaimer or disavowal of claim scope by the inventor, and in that instance the inventor has dictated the correct claim scope and the specification is regarded as dispositive. *Id.*

In addition to consulting the specification, the Court "should also consider the patent's prosecution history, if it is in evidence." Phillips, 415 F.3d at 1317 (quoting Markman, 52 F.3d at 980). The prosecution history, which is part of the intrinsic evidence, consists of the complete record of the proceedings before the PTO and includes the prior art cited during the examination of the patent. Phillips, 415 F.3d at 1317. Like the specification, the prosecution history provides evidence of how the PTO and the inventor understood the patent. *Id.* However, because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it is often lacks the clarity of the specification, and thus is less useful for claim construction purposes. *Id.* Nevertheless, the prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be. *Id.* Thus, consulting the prosecution history may result in exclusion of an interpretation that was disclaimed during prosecution. Chimie v. PPG Industr., Inc., 402 F.3d 1371, 1384 (Fed.Cir.2005).

When construing claim language, it is appropriate to read the term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent. Phillips, 415 F.3d at 1313. Thus, the inventor's words that are used to describe the invention-the inventor's lexicography-must be understood and interpreted by the court as they would be understood and interpreted by a person in that field of technology. *Id.* (quoting Multiform Dessicants, Inc. v. Medzam, Ltd., 133 F.3d 1473, 1477 (Fed.Cir.1998). Further, "[i]t is entirely proper to use the specification to interpret what the patentee meant by a word or phrase in the claim," so long as one does not read a limitation into the claim from the specification wholly apart from any need to interpret what the patentee meant by particular words or phrases in the claim. E.I. DuPont de Nemours & Co. v. Phillips Petroleum Co., 849 F.2d 1430, 1433 (Fed.Cir.1988). "Properly viewed, the 'ordinary meaning' of a claim term is its meaning to the ordinary artisan after reading the entire patent." Phillips, 415 F.3d at 1321. The Court recognizes that it must not read limitations from the specification into the claim and that "the distinction between using the specification to interpret the meaning of a claim and importing limitations from the specification into the claim can be a difficult one to apply in practice." Id. at 1323. However, the Court is mindful that, "[t]o avoid importing limitations from the specification into the claims, it is important to keep in mind that the purposes of the specification are to teach and enable those of skill in the art to make and use the invention and to provide a best mode for doing so." *Id.* Thus, "[m]uch of the time, upon reading the specification in that context, it will become clear whether the patentee is setting out specific examples of the invention to accomplish those goals, or whether the patentee instead intends for the claims and the embodiments in the specification to be strictly coextensive." *Id.* "The manner in which the patentee uses a term within the specification and claims usually will make the distinction apparent." *Id.*

Though the claim, the specification, and the prosecution history, which together form the intrinsic evidence, are of primary importance in claim construction, the Court may also rely on extrinsic evidence, which

comprises "all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." Phillips, 415 F.3d at 1317 (quoting Markman, 52 F.3d at 980). Though useful, the extrinsic evidence is less reliable and less significant than the intrinsic record in determining the legally operative meaning of claim language and is unlikely to result in a reliable interpretation of the patent claim scope unless considered in the context of the intrinsic evidence. Phillips, 415 F.3d at 1317-19. Thus, the Court should avoid "undue reliance" on extrinsic evidence because it poses the risk of changing the meaning of claims "in derogation of the 'indisputable public records consisting of the claims, the specification and the prosecution history,' thereby undermining the public notice function of patents." Phillips, 415 F.3d at 1319 (quoting *Southwall Techs v. Cardinal IG Co.,* 54 F.3d 1370, 1578 (Fed.Cir.1995)).

The sequence of steps used by a court in consulting various sources is not important; what matters is for the court to attach the appropriate weight to each source in light of the statutes and policies that inform patent law. Phillips, 415 F.3d at 1324.

Construction of Disputed Claim Terms

A. "a representation of an intra-oral radiograph **holder"**

This terms appears in Claims 1, 2, and 4 of the patent as follows:

1. A method of displaying stored intra-oral radiographs, comprising:

displaying *a representation of an intra-oral* radiograph *holder* including target intra-oral radiological sites arranged according to anatomical location of said sites;....

2. A method for storing and displaying intra-oral radiographs, comprising:

generating and displaying intra-oral radiographs of dentition;

generating and displaying *a representation of an intra-oral* radiograph *holder* including selectable intra-oral radiological sites arranged according to anatomical location of said sites;....

4. A device for storing and displaying intra-oral radiographs, comprising:

...

a display;

means for generating and displaying on said display *a representation of an intra-oral* radiograph *holder* including selectable intra-oral radiological site arranged according to anatomical location of said sites;....

The parties agree that a radiograph is an image produced by x-rays and that "intra-oral radiographs" are images produced by x-rays captured by a film or sensor placed within the mouth. Plaintiffs contend that "a representation of an intra-oral radiograph holder" should be construed as "a representation of a device having a plurality of windows or image placeholders, arranged in anatomical order, for displaying intra-oral dental x-ray images." Plaintiffs assert that the invention appropriates the organizational and interpretational advantages of film holders, but does not incorporate their aesthetic or non-functional characteristics, and

thus a representation of an intra-oral radiograph holder is simply a representation of a device having a plurality of windows or image placeholders, arranged in anatomical order, for displaying intra-oral dental x-ray images.

Defendants argue that "a representation of an intra-oral radiograph holder" should be construed as "a representation of what those skilled in the art would recognize as a collection of one or more positions organized in the format of a conventional intra-oral radiograph holder." Defendants rely primarily on the prosecution history to support their position, claiming that Plaintiffs' proposed construction is inconsistent with the prosecution history by side-stepping the addition of the "representation of an intra-oral radiograph holder" language and returning to the anatomical arrangement rejected by the PTO. Defendants argue that the prosecution history contains a substantive narrowing amendment and the Court must reject Plaintiffs' efforts to reclaim surrendered rights. Defendants argue that Plaintiffs seek to isolate one attribute of an intra-oral radiograph holder-anatomical arrangement-as its entire definition. Defendants assert that the original patent application claimed all anatomical arrangements of radiographs and was deemed unpatentable due to prior art. In response, Plaintiffs amended the claims to include "a representation of an intra-oral radiograph holder," and this critical limitation was an explicit disavowal of claim scope and prohibits Plaintiffs from asserting any construction that excludes an intra-oral radiograph holder. Defendants further argue that Plaintiffs' proposed construction would expand the scope of the claims to include arrangements that are not film holders, such as the dental arch representations displayed in Figures 6 and 7 of the patent, but this cannot be correct because the specification clearly distinguishes dental arches from intra-oral radiograph holders. *See* '579 patent, col. 2, lines 27-31 ("The preferred application for the present invention is in intra-oral radiology. In such an application, sets of stored radiographs are displayed by using a representation of a dental film holder, *or* of dentition such as a dental arch.").

The Court finds that both sides have strong arguments regarding the proper construction of this term. Defendants argue that what was patented was a representation of a film holder familiar to dentists. There is some language in the specification and prosecution history to support this view. On the other hand, Plaintiffs point to the specification, noting that it emphasizes the organizational and interpretational characteristics of a film holder, and contend that the language of column 4, lines 56-61, which "emphasize[s] that other anatomical connotations can be applied to the various portions of the [intra-oral radiograph holder] icon, ... so long as the anatomical sites represented by the icon ... appear in normal anatomical relation to one another" means that the patent is broad enough to encompass all kinds of representations, not just conventional film holders, provided that the anatomical locations that are designated by the sites in the icon are arranged in anatomical order. Plaintiffs also contend that their construction is consistent with the prosecution history, and that when amending the claims, the applicant's incorporation of claim 4 into claim 3 expressed the patent attorney's understanding that claim 3, as amended, was the same as original claim 4, which noted that an image of an intra-oral radiograph holder was one method of displaying "a representation of target intra-oral radiological sites arranged according to anatomical location of said sites."

The claim refers to "a representation of an intra-oral radiograph holder" three times. Each time, the phrase is followed by "including selectable intra-oral radiograph sites arranged according to anatomical location of said sites." Thus, the claim itself makes clear that the holder representation includes selectable "intra-oral radiological sites" arranged according to their anatomical location. In addition, because the intra-oral radiological sites are arranged according to their anatomical location, the sites must have an "anatomical location." These limitations contained in the claim language itself are consistent with the description in the specification, which states that (1) film holder positions ("selectable intra-oral radiological sites") correspond to particular anatomical sites within the dental arch, Col. 6, lines 18-20, (2) each mounting

position in a dental film holder corresponds to a particular anatomical site or anatomical region, Col. 1, lines 27-30, (3) mounting positions in the film holder have anatomical significance, Col. 2, lines 36-37, and (4) the anatomical sites ("selectable intra-oral radiological sites") in the holder representation appear in normal anatomical relation to one another, Col.4, lines 60-61. Plaintiffs' proposed construction of "intra-oral radiograph holder" expressly incorporates the anatomical arrangement limitation contained in the claim language, but does not expressly incorporate the feature that each position in the film holder representation correspond to an anatomical location. This may be implicit, however, in the fact that windows can only be arranged in anatomical order if they have anatomical significance. Further, this limitation is incorporated into their definition of "intra-oral radiological sites" as "icons or sites included in a representation of an intra-oral radiograph holder designating respective anatomical regions of the dental arch," which is discussed in the next section.

The specification makes clear that the term used in the claim, "an intra-oral radiograph holder," is a film holder, or film mount, and that it is "well known" in the field of oral radiology to mount dental radiographs in a film holder. The specification does not expressly equate a representation of an intra-oral radiograph holder to a "conventional" film holder. Rather, the background of the invention describes film holders by stating that (1) "[s]uch film holders can hold as few as one dental radiograph,FN3 or as many as 20 or more radiographs," (2) "each mounting position in a dental film holder corresponds to a particular anatomical site or anatomical region," (3) and "[f]ilm holders present films taken of these anatomical landmark sites in positions that are consistent from holder to holder." The "summary of the invention" states that "[u]se of a representation of a dental film holder permits a dentist to use his or her knowledge of the anatomical significance of the positions of the mounting positions in the film holder." Thus, these portions of the specification indicate that the relation between positions in a film holder and anatomical locations is consistent and that dentists would know them. However, though the specification describes the use of a representation of "a full mouth examination 20-film holder" in the detailed description of the preferred embodiment and specifies which film positions contained in the representation relate to which anatomical site, it "emphasize[s] that other anatomical connotations can be applied to the various portions of the icon appearing in icon field 53 [the representation of the film holder], without departing from the spirit and scope of the present invention, as long as the anatomical sites represented by the icon in icon field 53 appear in normal anatomical relation to one another." Thus, this language supports Plaintiffs' position that the only mandatory characteristics of a representation of an intra-oral radiograph holder, or film holder icon, are that the positions within the icon/representation represent anatomical sites and appear in normal anatomical relation to one another.

FN3. The Court notes that, while the description of film holders states that they can hold as few as one dental radiograph, the invention does not include representations of intra-oral radiograph holders with only one position. The claim language requires that the film holder representation include intra-oral radiological sites, a plural term requiring there to be more than one position. Further, positions in the holder representation may only be arranged according to anatomical location if there is more than one. This limitation is supported by the specification as well, which states that "sets of stored radiographs are displayed by using a representation of a dental film holder." Column 2, lines 28-30. Thus, while the specification describes attributes of film holders, not all of those attributes are necessarily true of a representation of an intra-oral radiograph holder.

Turning to the prosecution history, the original patent application demonstrates that the patentee believed that displaying "an image of an intra-oral radiograph holder" was one method for displaying a representation

of target-intra-oral radiological sites according to anatomical location of said sites, while displaying an image of dentition was a second method. In its amendment, the patentee removed the image of dentition and retained the image of an intra-oral radiograph holder, noting that "all claims remaining in this application require the display of 'an intra-oral radiograph holder." ' The patentee further noted in its letter of explanation accompanying the amended claims that, "[a]s explained in the Specification, dentists are familiar with such radiograph holders, and are trained to associate certain positions in the holder with specific portions of dentition." This language is consistent with the specification's statement that "[u]se of a representation of a dental film holder permits a dentist to use his or her knowledge of the anatomical significance of the positions of the mounting positions in the film holder." The Court must thus consider whether this language limits the term intra-oral radiograph holders to "conventional" film holders (those with which dentists are familiar and for which dentists are trained to associate certain positions in the holder with specific portions of dentition), as Defendants urge.

As noted, the language in the specification seems to be somewhat contradictory, noting that film holders present films taken of anatomical landmark sites in positions that are consistent from holder to holder and that dentists have knowledge of the anatomical significance of the positions of the film holder, while simultaneously stating that "other anatomical connotations" can be applied to the icon positions, as long as the anatomical sites represented by the positions appear in normal anatomical relation to one another. However, the specification's "emphasis" that other anatomical connotations may be applied to the positions in the representation of the film holder can only be construed as the patentee's disavowal of a limitation that would require the positions of the film holder representation to correspond to particular anatomical locations in the mouth. In other words, though the positions must correspond to anatomical locations in the mouth, they do not necessarily have to correspond to the anatomical locations conventionally assigned to them. Thus, although dentists are trained to associate film holder positions with specific anatomical locations and the invention purports to take advantage of this training and knowledge, it is not strictly limited to use of representations of conventional film holders. To be sure, the patentee's language in the amended patent application correspondence with the PTO is consistent with the notion that a representation of an intra-oral radiograph holder is a representation of a film holder with which dentists are familiar and for which they have been trained to associate the mounting positions with specific anatomical locations. However, the Federal Circuit has instructed that the prosecution history, though useful, is less reliable than the specification, which appears to disavow such a strict limitation.FN4 Further, when distinguishing Aisaka, the patentee's use of more circumscribed language in describing the use of film holders did not expressly disavow the language of the specification that other anatomical connotations could apply to the positions in the holder representation. Rather, the only thing the patentee clearly disavowed was a representation of anatomy: "While the Aisaka et al. reference contemplates the display of a representation of anatomy (for example, a stomach in Fig. 2A or a lung in Fig. 7C), there is no suggestion in Aisaka et al., or in any of the art of record, to display a representation of an intra-oral radiograph holder, and the use of that representation to store and retrieve dental radiographs." Thus, the prosecution history does not limit the invention to representations of conventional film holders.

FN4. The Court notes, however, that in this case the specification seems less reliable because it is a description of the originally submitted invention, which included a representation of dentition, and thus some of the language in the specification either does not apply or was written broadly enough to cover both the image of an intra-oral radiograph holder and image of dentition originally included as methods for displaying target intra-oral radiological sites arranged according to anatomical location of said sites.

The extrinsic evidence does not contradict this construction. Defendants read testimony from David Bahler into the record during the *Markman* hearing:

Q: What do you recall generally about the technology that is at issue at the patent in suit?

A: Generally, it is a method and perhaps an apparatus for displaying intraoral radiographs on a computer display-actually, dental x-rays on a computer display in a way that is recognizable to dentists, generally.

Defendants argue that this testimony establishes that the film holders must be recognizable to dentists as conventional film holders. However, the testimony states only that the invention involves displaying x-rays in a way that is recognizable to dentists. Use of a representation of a film holder would be recognizable to dentists, regardless of whether they recognized the specific representation as a "conventional" film holder.

The Court finds that Plaintiffs' proposed construction is more consistent with the claim and specification, though it unnecessarily incorporates limitations that are already contained in the claim language. Were the Court to use Plaintiffs' proposed construction, claim 2, for example, would read "generating and displaying [a representation of a device having a plurality of windows or image placeholders, arranged in anatomical order, for displaying intra-oral dental x-ray images] including selectable intra-oral radiological sites arranged according to anatomical location of said sites." Thus, Plaintiffs' construction would create redundancy. The specification (and prosecution history) makes clear that "a representation of an intra-oral radiograph holder" is simply "a representation or image of a dental film holder." And, a dental film holder is a device for mounting dental x-rays.

The Court has attempted to follow the applicable claim construction guidelines from the Federal Circuit, and finds that, based on the claim language, the specification, and the prosecution history, an ordinary artisan (a dentist) would construe the term "representation of an intra-oral radiograph holder" in claims 1, 2, and 4 as "a representation or image of a dental film holder (a device for mounting two or more dental x-rays)."

B. "intra-oral radiological site(s)"

This term is used in Claims 1, 2, and 4 as follows:

1. A method of displaying stored intra-oral radiographs, comprising:

displaying a representation of an intra-oral radiograph holder including target *intra-oral radiological sites* arranged according to anatomical location of said sites;

selecting one of said target *intra-oral radiological sites;* and

displaying a stored intra-oral radiograph corresponding to said selected target *intra-oral radiological site*.

2. A method for storing and displaying intra-oral radiographs, comprising:

generating and displaying intra-oral radiographs of dentition;

generating and displaying a representation of an intra-oral radiograph holder including selectable *intra-oral radiological sites* arranged according to anatomical location of *said sites;*

storing said intra-oral radiograph images responsive to selection of *intra-oral radiological sites* in said representation along with indicia of respective selected *intra-oral radiological sites;* and

subsequently retrieving and displaying said intra-oral radiographs responsive to selection of respective *intra-oral radiological sites* in said representation.

4. A device for storing and displaying intra-oral radiographs, comprising:

...

a display;

means for generating and displaying on said display a representation of an intral-oral radiograph holder including selectable *intra-oral radiological sites* arranged according to anatomical location of *said sites;*

means, responsive to selection of *said selectable sites,* for displaying corresponding stored x-ray images.

Plaintiffs argue that "intra-oral radiological sites" are "icons or sites included in a representation of an intra-oral radiograph holder designating respective anatomical regions of the dental arch." Defendants contend that it means "intra-oral anatomical sites or regions which may correspond to positions within a radiograph holder."

Defendants argue that the patent requires intra-oral anatomical sites to be arranged "according to anatomical location of said sites," but locations on a display monitor do not have an anatomical relationship to one another, only locations within a patient's anatomy do. Defendants concede that Plaintiffs' construction "appears to be the plain meaning of this claim phrase," but argue that "the specification clearly sets forth a meaning different from the apparent meaning of the claim language." Defendants' Claim Construction Brief at 18. Defendants assert that the specification defines "sites" as "anatomical sites or regions," not positions on the film holder representation. In support of its position, Defendants note that the specification states that "[e]ach mounting position in a dental film holder corresponds to a particular anatomical site or anatomical region" and that the abstract "confirms this definition" by stating that "the positions of the film holder correspond[ ] to anatomical sites readily recognized by dentists." *Id.* at 19. Further, Defendants argue, the specification discusses how the user can use the film holder representation to select an anatomical site associated with a recently taken x-ray ("[T]he system user uses [the film holder representation] to select the anatomical site ... to be associated with [an x-ray taken by the dentist] ....") and explains how the user can select positions within the film holder representation to display an x-ray of an anatomical location, such as a tooth or teeth ("[T]he system user selects an image to be displayed by selecting the appropriate anatomical site ..."). Thus, Defendants assert, the patentee has acted "as his own lexicographer" and has provided a definition of "intra-oral radiological sites" that means "intra-oral anatomical sites or regions." Last, Defendants argue that Plaintiffs' proposed construction is so broad that, if accepted in conjunction with Plaintiffs' proposed broad construction of radiograph holder, it would include a depiction of a dental arch, a limitation surrendered by Plaintiffs during the patent's prosecution.

Looking to the claim language, in Claims 1, 2, and 4, the "intra-oral radiological sites" must be "arranged according to anatomical location of said sites." Since sites within the mouth have anatomical locations but icons do not, this language lends some support to Defendant's construction. However, the patent's

background section explains that "[i]nterpretation of ... mounted radiographs is facilitated by mounting each film in normal anatomic relation to each other." This language indicates that the patentee regarded the films as being arrangeable by anatomical relation, and this functionality in the representation of the film holder was a key feature of the patent. Moreover, the balance of the claim language supports Plaintiffs' construction. The clearest support for Plaintiffs' construction lies in Claim 2. Claim 2 encompasses a method for storing and displaying intra-oral radiographs, comprising "generating and displaying a *representation* of an intra-oral radiograph holder including selectable intra-oral radiological sites arranged according to anatomical location of said sites," "storing said intra-oral radiograph images responsive to selection of intra-oral radiological sites *in said representation* along with indicia of respective selected intra-oral radiological sites" FN5 and "subsequently retrieving and displaying said intra-oral radiographs responsive to selection of respective intra-oral radiological sites *in said representation*." Thus, Claim 2 teaches that the intra-oral radiological sites are in the representation of an intra-oral radiograph holder, not within the mouth as Defendants urge. Further, Claims 2 and 4 make clear that the "intra-oral radiological sites" are "selectable" and that images are stored, retrieved, and displayed "responsive to" selection of "intra-oral radiological sites." Because icons on the computer screen are selectable (by keyboard, mouse click, etc.), and images are stored, retrieved, and displayed in response to selection of the icon, whereas the same cannot be said regarding anatomical sites or regions, this claim language further supports Plaintiffs' construction.

FN5. The Court recognizes that there is some ambiguity and inconsistency within the specification regarding use of this term. For example, in column 5, line 27, the specification states that the captured image is stored along with indicia of the associated location in the icon, suggesting that "selected intra-oral radiological sites" is a location in the icon. However, in the abstract, it states that the radiograph is stored "along with indicia of the selected anatomical site," suggesting that an intra-oral radiological site is an anatomical site. However, the balance of the claim and specification support the construction that an intra-oral radiological site is a site within the film holder representation, not a site within the mouth. This construction is consistent with the claim language, while Defendants' construction is not, and thus Plaintiffs' construction is the preferred construction. Vitronics, 90 F.3d at 1582. Moreover, part of the confusion may be due to the fact that the specification describes the original patent application, which included an image of dentition/anatomy as the representation, whereas the final patent does not include these, and thus some of the language was broad enough to cover the patentee's original intention that intra-oral radiological sites would include positions within a film holder that correspond to anatomical sites and positions within a representation of anatomy/dentition.

The Court agrees with Plaintiffs that other language in the specification also generally supports Plaintiffs' construction. The specification states "[T]he display of the stored images is facilitated by use of *a representation or icon of anatomical sites,* or of the portion of the anatomy, from which the images were taken. The system user selects the image to be displayed by selecting the appropriate *anatomical site from the representation of anatomical sites or portion of anatomy*...." Column 2, lines 20-26 (emphasis added). Thus, when the specification refers to anatomical site, it means the anatomical site within the representation or icon, not within the mouth.

Thus, when the claim uses the term "intra-oral radiological sites" it refers to the icons in the representation of an intra-oral radiograph holder, and those icons correspond to anatomical sites within the mouth and are arranged according to their anatomical relation to each other. Accordingly, the Court construes "intra-oral radiological sites" as "icons or sites, included in the representation of an intra-oral radiograph holder, that designate respective anatomical regions of the dental arch."

C. "Responsive to"

This term appears in Claims 2 and 4 as follows:

2. A method for storing and displaying intra-oral radiographs, comprising:

generating and displaying intra-oral radiographs of dentition;

generating and displaying a representation of an intra-oral radiograph holder including selectable intra-oral radiological sites arranged according to anatomical location of said sites;

storing said intra-oral radiograph images *responsive to* selection of intra-oral radiological sites in said representation along with indicia of respective selected intra-oral radiological sites; and

subsequently retrieving and displaying said intra-oral radiographs *responsive to* selection of respective intra-oral radiological sites in said representation.

4. A device for storing and displaying intra-oral radiographs, comprising:

...

a display;

means for generating and displaying on said display a representation of an intral-oral radiograph holder including selectable intra-oral radiological sites arranged according to anatomical location of said sites;

means, *responsive to* selection of said selectable sites, for displaying corresponding stored x-ray images.

Plaintiffs argue that "responsive to" should be construed as "in response to," while Defendants contend that the term needs no construction. Defendants' briefing repeatedly asserts primarily that there is no reason to replace the simple phrase "responsive to" with Plaintiffs' proposed language. In their response to Plaintiffs' Opening Claim Construction Brief and in their presentation to the Court at the *Markman* hearing, Defendants also asserted that, as used in the '579 patent, "responsive to" is a phrase that modifies the term radiographs (radiographic images), whereas Plaintiffs propose that "responsive to" modifies the claimed acts of storing and displaying. Defendants argue that "the [radiographic] images are 'responsive to selection' of sites within the film holder representation." Defendants' Response to Plaintiffs' Opening Brief at 19.

Though the Court would generally conclude that this term is plain and requires no construction, the fact that Defendants offer a construction at odds with Plaintiffs' construction leads the Court to conclude that construction of the term is appropriate. The Court finds that a plain reading of the claim language indicates that "responsive to" means "in response to." The Court finds Defendants' construction to be nonsensical, as it does not understand how images can be responsive to selection as Defendants urge. Plaintiffs' construction is further supported by the use of the term in claim 4: "means, responsive to selection of said selectable sites, for displaying corresponding stored x-ray images." There is no term "images" in claim 4 as there is in claim 2, and in claim 4, "responsive to" clearly means "in response to." Because claim terms are normally used consistently throughout the patent, the usage of a term in one claim can illuminate the meaning of the

same term in other claims. Phillips, 415 F.3d at 1314. Because "responsive to" in claim 4 means "in response to," it supports Plaintiffs' construction of the term in claim 2 as well. Plaintiffs' construction is further supported by the description of the invention in the specification, which makes clear that images are stored after selection, or in other words, in response to selection of the icon in the film holder representation, and that they are similarly retrieved and displayed after selection, or in other words, in response to selection, of positions in the representation.

Accordingly, the Court adopts Plaintiffs' construction of "responsive to" as "in response to."

D. "means for generating and displaying on said display a representation of an intra-oral radiograph **holder including selectable intra-oral radiological sites arranged according to anatomical location of said sites" and "means, responsive to selection of said selectable sites, for displaying corresponding stored x-ray images"**

This language appears in Claim 4 as follows:

4. A device for storing and displaying intra-oral radiographs, comprising:

an x-ray source;

a sensor for producing x-ray images of dentition placed between said source and said sensor;

a memory in which said x-ray images are stored;

a display;

means for generating and displaying on said display a representation of an intral-oral radiograph *holder including selectable intra-oral radiological sites arranged according to anatomical location of said sites;*

means, responsive to selection of said selectable sites, for displaying corresponding stored x-ray images.

The parties agree that these claim limitations are governed by 35 U.S.C. s. 112, paragraph six: "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."

The construction of a means-plus-function limitation includes two steps. First, the Court determines the claimed function. Omega Eng'g, Inc. v. Raytek Corp., 334 F.3d 1314, 1321 (Fed.Cir.2003). The function of a means-plus-function limitation must come from the claim language itself. Second, the Court identifies the corresponding structure in the written description that performs that function. *Id*. The written description may disclose distinct and alternative structures for performing the claimed function. Creo Prods. v. Presstek, 305 F.3d 1337, 1345 (Fed.Cir.2002). In order to qualify as corresponding structure, "the structure must not only perform the claimed function, but the specification must clearly associate the structure with performance of the function." JVW Enters., Inc. v. Interact Accessories, Inc., 424 F.3d 1324, 1332 (Fed.Cir.2005).

"means for generating and displaying on said display a representation of an intra-oral radiograph holder including selectable intra-oral radiological sites arranged according to anatomical location of said sites" The parties agree that the function of the first means-plus-function element is "generating and displaying on said display a representation of an intra-oral radiograph holder including selectable intra-oral radiological sites arranged according to anatomical location of said sites." They disagree, however, on the corresponding structure. Plaintiffs assert that the corresponding structure is "a software program running on a computer connected to the display." Plaintiffs cite column 2, line 64 through column 3, line 1, which identifies a general embodiment of the corresponding structure as a "computer-based system" with "software embodying the present invention" and column 3, lines 1-3, which sate that "[t]he software of the present invention is presented in flow chart form in FIGS 4A and 4B," which include function blocks 78 and 87 that recite the function "display anatomical site icon." Further, the specification states that "[t]he computer system can be any computer and hardware display." Thus, Plaintiffs argue, the means-plus-function limitation is not restricted to the specified types of program storage devices (system memory, CPU, and monitor), but is simply "a software program running on a computer connected to a display" that carries out the recited function.

Defendants argue that the structures necessary to carry out the function are set forth in portions of the written description and in Figures 1, 4A, and 4B, including a "central processing unit (CPU)" that loads software embodying the present invention into memory from program storage medium (any machine readable storage medium such as a floppy or hard magnetic or optical disk, or a programmable read-only memory) and a display. Thus, Defendants argue, "the specified types of program storage devices, system memory, CPU [a central processing unit that loads software], and monitor are required to carry out the function of 'generating and displaying' the recited representation ... and Claims 4 and 5 should be limited to these structures."

The specification states:

Referring to FIG. 1, a computer-based system is presented embodying the present invention.

The computer-based system includes central processing unit (CPU) 21, which, in operation, first loads software embodying the present invention into memory 22 from program storage medium 23. The software of the present invention is presented in flow chart form in FIGS. 4A and 4B, and is shown in detail in the program listing of the Appendix hereto.FN6 Program storage medium 23 can be any machine readable storage medium such as, for example, a floppy or hard magnetic or optical disk, or a programmable read-only memory. The computer system further includes display 24 which is connected in a known manner through display control bus 26, display interface 27, and internal data/address bus 28 to CPU 21. The computer-based system also includes an x-ray sensor 29 which is connected through sensor cable 31, digitizer 32, and internal data/address bus 28 to CPU 21. To acquire x-ray images, sensor 29 is used with x-ray source 33 to produce two-dimensional x-ray images of dentition 34.

FN6. Apparently, the Appendix contains code that does not actually perform the functions stated and is not the software code of the invention.

The computer system can be any computer and hardware display. In the preferred embodiment, an IBM AT compatible PC computer, available from Jameco Electronics is used. This preferred computer system includes an Intel 33 MHz 80386 CPU with 8 megabytes of system RAM, 40 megabytes of hard disk drive,

5.25 and 3.5 inch floppy disk drives, a SuperVGA noninterlaced 1024X768 pixel display adapter, a noninterlaced SuperVGA monitor, and an AT key style keyboard. However, other combinations of commercially available components can also be used without departing from the scope of the invention. As noted above, the structure must not only perform the claimed function, but the specification must clearly associate the structure with performance of the function. Thus, we are looking for the structure that performs the function of generating and displaying a representation of an intra-oral radiograph holder. Corresponding structure need not include all things necessary to enable the claimed invention to work, but must include all structure that actually performs the recited function. Asyst Techs., Inc. v. Empak, Inc., 268 F.3d 1364, 1371 (Fed.Cir.2001). Following these principles, Defendants' inclusion of program storage devices in the corresponding structure cannot be correct, because the program storage devices, as described in the specification, simply store the software that is to be loaded onto the computer, but do not perform any of the functions described in the claim. The structure also does not include a monitor or display, because the display is already explicitly included in the claim, and the structure must generate and/or display "on said display." Thus, all that remains as possible structure from the specification's listing of items included in the computer-based system is a CPU with software "embodying the present invention" loaded into memory and devices connecting the CPU to the display, namely a display control bus, display interface, and internal data/address bus. While the display control bus, display interface, and internal data/address bus may be necessary to the act of displaying, they are not actually performing the displaying but are merely devices that allow data transmission, as is the display adapter listed in the preferred embodiment. Thus, what remains is the CPU with software "embodying the present invention," which is "presented in flow chart form in FIGS. 4A and 4B."

In WMS Gaming, Inc. v. International Game Technology, 184 F.3d 1339 (Fed.Cir.1999), the Federal Circuit construed a means-plus-function limitation in a claim involving a slot machine. The Court noted that the parties stipulated that the patent discloses a microprocessor, or computer, to control the operation of the slot machine, and the algorithm that controlled the assignment of numbers to stop positions was disclosed in figure 6 of the patent. The Court noted that the structure of a microprocessor programmed to carry out an algorithm is limited by the disclosed algorithm. Thus, "a general purpose computer or microprocessor programmed to carry out an algorithm creates 'a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software." ' Id. at 1348. "The instructions of the software program that carry out the algorithm electrically change the general purpose computer by creating electrical paths within the device. These electrical paths create a special purpose machine for carrying out the particular algorithm." *Id.* The Court then held that, "[i]n a means-plus-function claim in which the disclosed structure is a computer, or microprocessor, the disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm." *Id.* at 1349. Thus, the disclosed structure was "a microprocessor programmed to perform the algorithm illustrated in Figure 6." *Id.*

Recently, the Federal Circuit reaffirmed that *WMS Gaming* restricts computer-implemented means-plus-function terms to the algorithm disclosed in the specification. Harris Corp. v. Ericsson, Inc., 417 F.3d 1241, 1253 (Fed.Cir.2005). In other words, "[a] computer-implemented means-plus-function term is limited to the corresponding structure disclosed in the specification and equivalents thereof, and the corresponding structure is the algorithm." *Id.* In that case, the Court held that the corresponding structure for the "time domain processing means" was "a microprocessor programmed to carry out a two-step algorithm in which the processor calculates generally nondiscrete estimates and then selects the discrete value closest to each estimate."

Based on these precedents, the Court concludes that Plaintiffs' proposed construction of "a software program running on a computer connected to the display" is too broad, since the structure is not just any software program, but the one referred to in the specification that carries out the function.

The Court adopts the parties' construction of the function as "generating and displaying a representation of an intra-oral radiograph holder including selectable intra-oral radiological sites arranged according to anatomical location of said sides." The Court finds that the structure associated with this function is a CPU, connected to the display, programmed with software that performs the steps illustrated in Figures 4A and 4B.

B

means, responsive to selection of said selectable sites, for displaying corresponding stored x-ray images Plaintiffs appear to advance two functions for this element. On page 9 of their opening claim construction brief, they state that the function of the last element of claim 4 is "displaying corresponding stored x-ray images in response to selection of said selectable sites." However, on page 35, they state that the function is "displaying stored x-ray images of anatomical regions designated by selected radiological sites." Plaintiffs argue that the corresponding structure is "a computer-based system" having a monitor (or other computer display device) and software, or, in other words, "a software program running on a computer connected to the display."

Defendants argue that the second means-plus-function limitation recites the function of "displaying corresponding stored x-ray images," with a further qualification that the structure is "responsive to selection of said selectable sites." They argue that the structures are the same as above, with the addition of a keyboard, mouse, touch-sensitive screen, or other functionally equivalent user input device for selection of sites. Thus, Defendants request that the means-plus-function claims be construed as covering the devices disclosed in the specification for program storage and execution connected to a display and the equivalents of those structures. Plaintiffs argue that the function is directed to structures that are responsive to selection, not to structures that do the selecting and thus the structures corresponding to the function of displaying need not include all the particular devices identified in the specification for performing the function of selecting. Defendants assert that Plaintiffs' proposed construction is misleading by its omission of structures referenced in the specification that are necessary to carry out the functions. Further, Defendants argue, by referring simply to a "computer," Plaintiffs introduce elements that are not required to carry out the functions because computers may consist of many components that are unnecessary and irrelevant to the claimed functions, and the Court should neither include structures that are not necessary to perform the recited function nor omit structures that are necessary. Plaintiffs argue that even if the construction must include structures that do the selecting, the specification identifies a keyboard, mouse, touch-sensitive screen *or* other functionally equivalent user input device, and thus an accused structure would not need to include all of these particular devices.

The Court finds that the function of this element is "displaying stored x-ray images corresponding to selectable sites in response to selection of those sites." The Court finds that the structure associated with this function is a CPU, connected to the display, programmed with software that perform the steps illustrated in Figure 4B. The Court agrees with Plaintiffs' that the function is displaying in response to selection, not selecting, and thus it need not include structures that do the selecting.

E. "Stored," "Storing," "Storage," and "Memory"

These terms appear in the claim language as follows:

1. A method of displaying *stored* intra-oral radiographs, comprising:

...

displaying a *stored* intra-oral radiograph corresponding to said selected target intra-oral radiological site.

2. A method for *storing* and displaying intra-oral radiographs, comprising:

generating and displaying intra-oral radiographs of dentition;

...

storing said intra-oral radiograph images responsive to selection of intra-oral radiological sites in said representation along with indicia of respective selected intra-oral radiological sites; and

subsequently retrieving and displaying said intra-oral radiographs responsive to selection of respective intra-oral radiological sites in said representation.

3. A program *storage* device readable by a machine and tangibly embodying a representation of a program of instructions adaptable to be executed by said machine to perform the method of any one of claims 1 or 2.

4. A device for *storing* and displaying intra-oral radiographs, comprising:

...

a *memory* in which said x-ray images are *stored;*

...

means, responsive to selection of said selectable sites, for displaying corresponding *stored* x-ray images.

5. The device of claim 4, further comprising:

an image digitizer for digitizing x-ray images produced by said sensor before *storage* in said memory.

The parties originally submitted an agreed construction of "stored, storage, and memory" as referring to "any form of volatile or non-volatile data storage, including but not limited to hard disk drives, random access memory ["RAM"], floppy disks, and optical media, in addition to any other data storage devices or means." However, Plaintiffs later withdrew their agreement to this construction.

Defendants argue that the Court should order that these terms include any means or device for data storage, including but not limited to random access memory ("RAM"). Otherwise, Defendants assert, jurors might incorrectly draw a distinction between easily recognizable and dedicated devices for data storage, such as floppy disks and hard drives, and RAM. However, Defendants argue, the specification clearly includes RAM as a means for storing information in conjunction with the claimed invention, and thus the jury should

have clear guidance that RAM is one possible form of memory and carries out the function of storage.

Plaintiffs agree that "memory," "storage," and "stored," encompass all types of computer memory, but take issue with Defendants' request for clear guidance that RAM carries out the function of storing because it would conflate the media on which the action of storing may be done with the action of storing. Plaintiffs assert that whether the RAM in an accused device or an alleged prior art device is being used to perform the function of recording, retaining, or preserving radiographic images and whether that function is being done "responsive to selection" is a fact issue that should be reserved to the jury. Thus, whether the RVG performed the function of "storing" is a fact issue for the jury. Plaintiffs contend that the terms are plain and ordinary on their face and need no construction. Plaintiffs argue that construing these terms could be confusing to the jury. Plaintiffs are also opposed to a jury instruction stating or suggesting that the mere existence of data in volatile memory or RAM necessarily and always establishes that the data has been stored there.

"Storage" is used in claim 3 in the context of a "program storage device." Program storage devices are defined in claim 3 as being readable by a machine and tangibly embodying a representation of instructions adaptable to be executed by said machine, and thus program storage device refers to a device for storing the software that performs the methods of claims 1 and 2, which is loaded onto a computer. The specification states that "[p]rogram storage medium can be any machine readable storage medium such as, for example, a floppy or hard magnetic or optical disk, or a programmable read-only memory." Column 3, lines 4-7. Contrary to Defendants' argument, *see* Joint Claim Construction Statement (docket no. 75) at 11, this portion of the specification does not describe the memory onto which x-ray images are stored, but describes only the program storage medium, *i.e.,* the media on which the software to be loaded onto the computer memory can be stored. The program storage medium (item 23 on Figure 1) and the memory (item 22) are clearly distinct, and thus the listing of program storage media does not apply to the memory.

Claims 4 and 5 refer to a memory in which x-ray images are stored and to x-ray images being digitized before storage in said memory. The summary of the invention also states that, "[t]he images are then stored, preferably after digitization, in a computer memory." Column 2, lines 18-20. Figure 1 depicts the memory, and the specification also states that the CPU loads software embodying the present invention into memory. However, neither Figure 1 nor the specification describe the memory. The only possible description can be in the preferred embodiment, which describes a computer with 8 megabytes of system RAM and 40 megabytes of hard disk drive. The claim language also makes clear that stored x-ray images correspond to selectable sites and are stored in response to selection of those sites. Further, the images are "subsequently" retrieved and displayed in response to selection of the sites, indicating that they are stored for subsequent retrieval. Thus, "storing" means "placing in memory for subsequent retrieval," and "stored" means "placed in memory for subsequent retrieval." "Storage" as used in claim 5 means "placement in memory for subsequent retrieval." The real dispute centers on what is meant by the term "memory" and whether it includes random-access memory ("RAM").FN7

FN7. This is relevant because the parties dispute whether the RVG 32000, which apparently utilized RAM but not long-term storage media, "stored" the radiographs or merely displayed them.

As noted, Plaintiffs originally stipulated that "memory" could include RAM, but now oppose a construction stating that placement of x-rays in RAM would constitute the act of storing. Plaintiffs argue that placement of the x-rays in RAM or volatile memory "does not *necessarily* establish that the action of 'storing' has

occurred-at least not in the sense of saving the information long-term for later retrieval, as described on columns 5-6 of the '579 specification." Further, Plaintiffs argue, though the specification describes a preferred embodiment of a computer system that includes RAM, it never describes RAM as a storage device, and the specification indicates that a radiographic image can reside on display memory (RAM) before it is stored.

Defendants argue that Plaintiffs should be held to their prior agreed construction, which is consistent with the specification's description of the preferred embodiment and is consistent with the extrinsic evidence. Defendants point to Dr. Dove's deposition testimony in a related case over the same patent, in which he testified that "stored" means "it resides somewhere ... [i]t can be in computer RAM memory, on memory. It could be stored on the hard drive, CD-ROM. It could be stored somewhere. There are more storage devices in computers." He also agreed that "both volatile [RAM] and nonvolatile memory is what the patent was referring to in terms of retrieving images that were stored." Defendants further point to Plaintiffs' argued construction in the recently filed and settled patent infringement suit (involving this same patent) against Planmeca U.S.A., in which they stated that "[t]he '579 specification supports a broad construction of these computer memory and storage terms. The '579 specification describes both volatile and non-volatile types of computer memory. The preferred computer at that time included '8 megabytes of RAM,' which is a type of volatile memory, and '40 megabytes of hard disk drive,' which is a type of non-volatile memory."

The Court agrees with Defendants that "memory" is not limited by the specification to any particular type of memory, but could include RAM or hard disk space as described in the specification. Plaintiffs argue that placement in RAM is not storage "in the sense of saving the information long-term for later retrieval, as described on columns 5-6 of the '579 specification." However, while the specification indicates that various exams corresponding to different dates and times can be stored, *see* Column 3, line 59-60, Column 4, lines 3-5, and Figure 2 (displaying four intra-oral examinations conducted over sixteen months), tending to indicate a long-term storage, a close reading of the specification reveals that there is no indication that the invention relates *only* to such long-term storage. It does not even state that the x-rays will continue to be stored after the computer or program is shut down. Thus, the Court construes the term "memory" as "any form of volatile or non-volatile computer memory, including random-access memory (RAM) and hard disk drive space."

F. Agreed terms

The parties have agreed to constructions of several claim terms and urge the Court to adopt their constructions. The Court adopts the constructions as follows:

"Radiographs" is construed as "images produced by x-rays."

"Radiograph images" is construed as "images produced by x-rays."

"Intra-oral radiographs" is construed as "images produced by x-rays captured by a film or sensor placed within the mouth.

"Dentition" is construed as "tooth or teeth."

"Indicia" is construed as "referential information."

"Retrieving" is construed as "accessing."

"Selecting" is construed as "any act of selecting, including but not limited to cursor movement or keystroke."

"Selectable" is construed as "selectable by any act of selecting, including but not limited to cursor movement or keystroke."

"Selected" is construed as "selected by any act of selecting, including but not limited to cursor movement or keystroke."

"Tangibly embodying a representation of" is construed as "containing or storing for execution."

"Generating" in the context of "generating and displaying intra-oral radiographs of dentition" is construed as "acquiring."

"Generating" in the context of "generating and displaying a representation of an intra-oral radiograph holder" is construed as "creating."

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