IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TYLER DIVISION

| | | |
|---|---|---|
| IP INNOVATION L.L.C. and TECHNOLOGY LICENSING CORP., | ) | |
| Plaintiffs/Counterclaim Defendants, | ) | |
| v. | ) | Civil Action No. 2:07-cv-503 (LED) |
| | ) | Jury Trial Demanded |
| GOOGLE, INC. | ) | |
| Defendant. | ) | |

**PLAINTIFFS' CLAIM CONSTRUCTION BRIEF PURSUANT TO P.R. 4-5(a)**

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## I. INTRODUCTION

This case involves patents asserted by IP Innovation, LLC and Technology Licensing Corporation (collectively "IPI" or "plaintiffs") against Google, Inc. ("Google;" or "defendant"). The patents are United States Patent Nos. 5,675,819 ("the '819 patent," Exh. A) and 5,276,785 ("the '785 patent", Exh. B). Both are assigned to IPI. Shortly before IPI was to file its claim construction brief, Plaintiffs learned that Google filed requests to reexamine both the patents-in-suit with the United States Patent and Trademark Office. Neither request has been acted on by the USPTO.

The '819 patent claims a method and an apparatus for accessing relevant documents based on a query. The relevant documents are determined by looking at the lexical co-occurrence patterns and relationships between word neighbors. The original application of the '819 patent was filed on June 16, 1994, naming Hinrich Schuetze as inventor. The '819 patent issued on October 7, 1997. The '819 patent has 47 claims; 5 are asserted in IPI's infringement contentions.

The '785 patent claims a method and system for presenting images on a display to produce the perception of viewpoint motion. The perceived motion of the images on the display can be radial (toward or away) and/or lateral with respect to a point of interest. IPI has accused the Google Earth and Google Maps with Streetview of infringing the '785 patent. The original application for the '785 patent was filed on August 2, 1990, naming Jock Mackinlay, George Robertson and Stuart Card as inventors. The '785 patent issued on January 4, 1994. Claims 1-4 9, 28-30, 41, 42, 52, and 55 of the '785 patent are asserted in IPI's infringement contentions against Google.

## II. THE LAW OF CLAIM CONSTRUCTION

This Court is familiar with the law governing claims construction, so a detailed recitation of the canons of claim construction is unnecessary. To the extent that IPI relies upon a particular rule of claim construction, it will be addressed in the context of the argument.

IPI's position is that to resolve the issues in this instance, the Court needs to go no further than to apply the most fundamental tenet of claims construction by following the plain meaning of the asserted claims. Technical terms are to be given their ordinary and customary meanings as understood by one skilled in the art, unless the inventor used such terms with another meaning. *Hoescht Celanese Corp. v. BP Chems. Ltd.*, 78 F.3d 1575, 1578 (Fed. Cir. 1996).

IPI's constructions adhere to the plain meaning of the claims and, only when necessary, interpret disputed claim terms, phrases, and clauses in view of the intrinsic evidence. IPI respectfully submits that the claims of the patents-in-suit are clear on their face and certainly clear in view of the patents' specification and prosecution history. See, *Phillips v. AWH Corp., et al.*, 415 F. 3d 1303, 1312 (Fed. Cir. 2005); *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576 (Fed. Cir. 1996).

Although extrinsic evidence can be useful, it is "less significant than the intrinsic record in determining the legally operative meaning of claim language." *Phillips*, 415 F.3d at 1317 (citations omitted). As this Court has noted: "[t]echnical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent."*Individual Network, LLC v. Apple, Inc.* 2009 U.S. Dist. LEXIS 1645 at *7 (Jan. 12, 2009, E.D. Tex.)(Davis, J.)(*citing Philips*, 415 F.3d at 1318). Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id.*

There is a strong presumption that claim terms have their ordinary meaning. See, *Interactive Gift Exp., Inc. v. CompuServe Inc.,* 256 F.3d 1323, 1331 (Fed. Cir. 2001). Despite that presumption, Google has nonetheless proposed that the Court give special constructions to terms and phrases which are very common, either based on their plain meanings or ordinary and customary meanings that are clear to persons of ordinary skill in the art.

IPI does not believe that such common terms and phrases proposed by the defendant need construction; IPI asserts that in the case of many of these terms, the Court should simply adopt a plain or common meaning for the same. *Orion IP, LLC v. Mercedes-Benz USA, LLC*, 516 F. Supp. 2d 720, 740-41(E.D. Tex. 2007) (Davis, J.) (holding that for 9 of 11 terms addressed there was "[n]o need for construction; plain meaning"). As this Court noted in *Orion*: "[o]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy." 516 F. Supp. 2d at 725 and 740-41(citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.,* 200 F.3d 795, 803 (Fed. Cir. 1999) and *U.S. Surgical Corp. v. Ethicon, Inc.,* 103 F.3d 1554, 1568 (Fed. Cir. 1997)) ("The *Markman* decisions do not hold that the trial judge must repeat or restate every claim term in order to comply with the ruling that claim construction is for the court. Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy.").

## III. THE DISPUTED TERMS

As an initial matter, many of these terms do not require construction because they have plain meanings or ordinary and customary meanings (e.g., "memory") that are generally understood by persons skilled in the art. Through the everyday use of personal computers, the Court may be familiar with many of the terms and phrases used in the patents-in-suit. Because the principal terms and phrases used in the claims of the patents-in-suit were, and are, known and understood by those skilled in the art, the plain intrinsic meaning of those terms should inform and guide the Court's constructions. IPI respectfully submits that the Court should generally adopt claim constructions for many of these terms based upon the plain meaning and ordinary and customary meanings intended.

However, should a construction beyond the "plain meaning of a term" be necessary, IPI respectfully submits the following proposed definitions, along with the intrinsic evidence supporting

such constructions. The parties' respective positions shown on the charts below are taken from the Plaintiffs' and Defendant's previously submitted claim construction contentions (Docket No. 57, '785 Patent at Exh. A and '819 Patent at Exh. B).

There are no common terms between the patents so each will be addressed in turn, beginning with the '819 patent.

## IV. THE '819 PATENT

There are currently five claims at issue with respect to the '819 patent : 1, 25, 27, 28, and 31. The '819 patent is directed to document information retrieval systems. A common example is the Google Search Appliance, which allows companies and organizations to search among the thousands or millions of documents at their disposal. The Google Search Appliance is an on-premise search solution that provides universal search for businesses - i.e., the ability to search all content through one search box, providing document indexing functionality. This includes content within a business' web servers, intranets, file servers, databases, content management systems, and business applications. An engine that operates in the same manner can be seen, by way of example, at www.google.com. Where entering the search "~tank" will return results corresponding to aquariums (one thesaurus value for "tank"), as well as Abrams armored vehicles (another thesaurus value).

The document retrieval system of the '819 patent builds a thesaurus from the available "corpus" of documents to help assist with the search process. Word vectors are also created which consist of co-occurrence patterns of the words in a document. A word vector, in its most basic form, simply represents the occurrence of words in a document. A document retrieval system, such as Google's, indentifies words in a document and stores these in an index. In addition, a context vector represents contextually similar words (synonyms). The document retrieval system of the '819

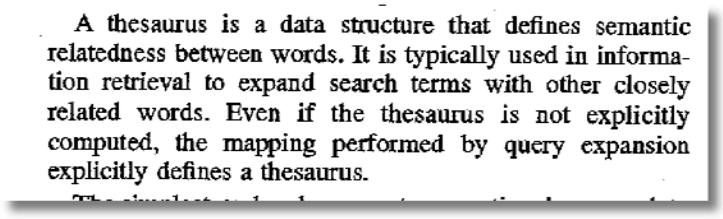
patent uses information gleaned from the word vectors and context vectors to choose and rank the documents in a response to a search.

The parties exchanged proposed constructions for eight terms within the five asserted claims of the '819 patent: thesaurus, word vector, lexical co-occurrence, corpus of documents, range, context vector, co-occurrence of words, and correlation coefficient:

**A. "thesaurus"**

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "thesaurus" | 1, 25, 27, 28, and 31 | A data structure that defines semantic relatedness between words. It is typically used in information retrieval to expand search terms with other closely related words. Even if the thesaurus is not explicitly computed, the mapping performed by query expansion explicitly defines a thesaurus. | a data structure that defines semantic relatedness between words |

This term is found in all of the asserted claims. The parties' offered constructions for "thesaurus" are close; both include "a data structure that defines semantic relatedness between words." IPI believes the inclusion of the next two sentences from the '819 patent's specification is important to the construction of this term; IPI's construction for "thesaurus" includes this full definition of "thesaurus" and comes verbatim from '819 patent's specification:


A thesaurus is a data structure that defines semantic relatedness between words. It is typically used in information retrieval to expand search terms with other closely related words. Even if the thesaurus is not explicitly computed, the mapping performed by query expansion explicitly defines a thesaurus.

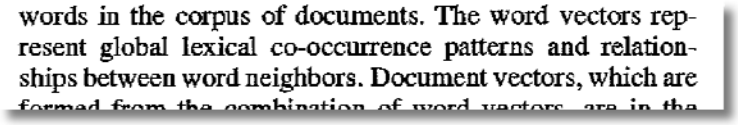
(Exh. A, '819 Patent, at Col. 1, Lines 51-56). As shown by the specification, the '819 patent teaches a thesaurus both explicitly, and implicitly. In other words, the fact that there is mapping performed by query expansion indicates that a thesaurus has been generated even if there is not an additional step to explicitly generate a thesaurus. Google's offered construction is overly limited, and

overlooks these important aspects of the thesaurus taught by the '819 patent. IPI's proposed construction more properly defines the term "thesaurus" and should be adopted.

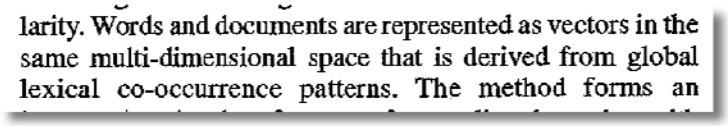
**B. "word vector"**

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "word vector" | 1, 25, 27, 28, and 31 | A representation corresponding to lexical co-occurrence patterns and relationships between words. The word vectors represent lexical co-occurrence patterns and relationships between word neighbors. | a column or row of numbers with each number representing the number of times a particular word co-occurs with each other word within a range of words in a corpus of documents; also known as a "thesaurus vector" |

This term is found in all the asserted claims. Again, IPI's definition for "word vector" comes straight from the '819 patent:


words in the corpus of documents. The word vectors represent global lexical co-occurrence patterns and relationships between word neighbors. Document vectors, which are

(Exh. A, '819 patent, at Abstract). In addition, the specification later adds more detail to the abstract definition:

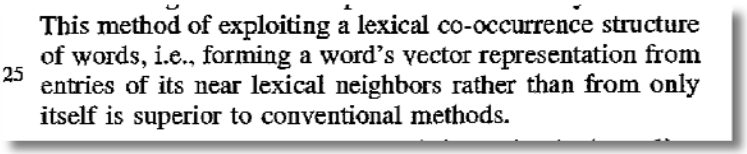

larity. Words and documents are represented as vectors in the same multi-dimensional space that is derived from global lexical co-occurrence patterns. The method forms an

(Exh. A, '819 patent, at Col. 4, Lines 11-13).

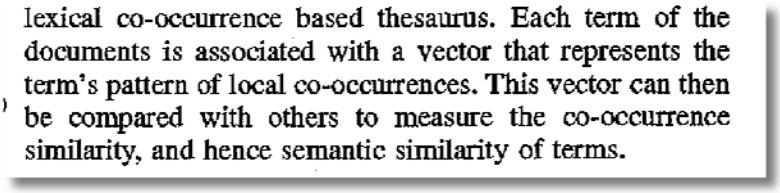
A "word vector" is simply a representation of the co-occurrence patterns of the words in a document. This is more than the counting to which Google limits its construction, and can instead include simply identifying the use or placement of a word. For example, all that is required is an identification of the word "social" next to the word "security" to know that the use of "security" is changed; it does not matter how many times this occurs, only that it does occur. Indeed, once generated, a word vector can be used for many different things, and can be constructed to show any

representation of the lexical co-occurrence patterns between word neighbors.

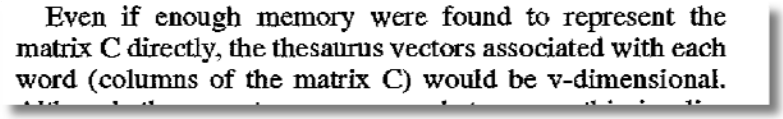
In contrast, Google's definition for word vector unnecessarily limits word vectors to "a column or row of numbers" representing "the number of times a word co-occurs". There is nothing in the specification of the '819 patent that requires a word vector to be a number representing "the number of times a word co-occurs." Moreover, Google's additional citations to the '819 specification are devoid of any such requirement:


This method of exploiting a lexical co-occurrence structure of words, i.e., forming a word's vector representation from entries of its near lexical neighbors rather than from only itself is superior to conventional methods.

(Exh. A, '819 patent, at Col. 4, Lines 23-26).


lexical co-occurrence based thesaurus. Each term of the documents is associated with a vector that represents the term's pattern of local co-occurrences. This vector can then be compared with others to measure the co-occurrence similarity, and hence semantic similarity of terms.

(Exh. A, '819 patent, at Col. 6, Lines 27-31).


Even if enough memory were found to represent the matrix C directly, the thesaurus vectors associated with each word (columns of the matrix C) would be v-dimensional.

(Exh, A, '819 patent, at Col. 14, Lines 55-57).

Contrary to Google's assertions, these references to the '819's specification shows that the word vector could, in fact, be any representation that indicates the co-occurrence patterns between words. There is simply no support in the specification to ***limit*** the representation to a number or the number of times a particular word co-occurs.

Google's own extrinsic evidence, which IPI feels is not necessary for the proper construction of this term, confirms that a vector is not limited to a number. Google's cited McGraw-Hill dictionary defines "array" as "**a collection of data items** with each identified by a

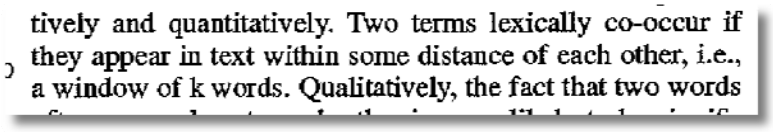
subscript or key and arranged in such a way that a computer can examine the collection and retrieve data from these items associated with a particular subscript or key." (See Docket No. 57, at Exh. B, McGraw-Hill Dictionary of Scientific and Technical Terms, Fifth Edition, 1994)(emphasis added). The same dictionary defines "column" as "a vertical expression of **characters or other expressions**." (Id.)(emphasis added). Several of Google's other cited definitions define "vector" as "in computer data structures, a one-dimensional array—a set of items arranged in a single column or row." (See Docket No. 57, at Exh. B, Microsoft Press Computer Dictionary, 1991). It is unclear why Google has cited these definitions (along with definitions for column vector, matrix, and range) as support for its definition of "word vector," but none of them dictate limiting "word vector" in the manner Google does here.

Google's proposed definition ignores and is not supported by the specification of the '819 patent, but instead seeks out unnecessary extrinsic evidence in order to support its position. IPI's proposed construction relies upon the specification of the '819 patent and more properly defines the term "word vector;" IPI's proposed construction should be adopted.

### C. "lexical co-occurrence"

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "lexical co-occurrence" | 1 | Two or more words or terms which appear in text within some distance of each other. Two terms lexically co-occur if they appear in text within some distance of each other. | the appearance of two words within a specified range of each other |

This term appears only in the preamble to claim 1. IPI does not believe that the preamble to claim 1 is limiting because it does not "give life, meaning, and vitality" to what is a detailed claim and therefore does not require construction. *Inirtool, Ltd. v. Texar Corp.*, 369 F.3d 1289, 1295-96 (Fed. Cir. 2004). In the event that the Court should find that the preamble to claim 1 is a limitation, IPI's proposed definition for "lexical co-occurrence" comes straight from the '819 patent:


tively and quantitatively. Two terms lexically co-occur if they appear in text within some distance of each other, i.e., a window of k words. Qualitatively, the fact that two words

(Exh. A, '819 patent, at Col. 4, Lines 29-31).

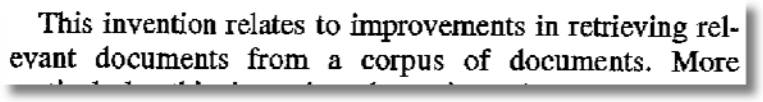
The parties' proposed definitions for this term are largely the same. The only difference is Google's attempt to improperly limit its proposed definition to two words appearing within a "specified range," rather than the "some distance" language actually used in the specification (cited above). The distinction is small but important. The distance between two words can, but need not, be a specified range of words. This is shown, by way of example, in inventor Hinrich Schuetze's Dimensions of Meaning article, which is part of the File History. There, Mr. Schuetze states that "co-occurrence can be defined with respect to windows of a given size or on the basis of sentence boundaries." (Exh, C, Schuetze, Hinrich, Dimensions of Meaning, IEEE Computer Society Press, p. 787, section 1, col. 2, 1992) (emphasis added). This is not the "specified range" of Google's limited definition. Thus, two words lexically co-occur if they appear in text within "some distance" of each other and not necessarily a specified range.

Moreover, Google's construction for "lexical co-occurrence" improperly reads in limitations from other portions of claim 1. Specifically, the relevant portion of claim 1 states, "recording a number of times a co-occurring word co-occurs in a same document *within a predetermined range* of the retrieved word." (Exh. A, '819 patent, at Col. 24, Lines 45-47). Logically, words could co-occur within some distance outside of the predetermined range. The claim itself governs which co-occurring words are recorded, i.e., those within a predetermined range. However this alone, and Google relies upon nothing else, should not mandate that the predetermined range limitation should be read as a limitation for lexical co-occurrence. IPI's proposed construction more properly defines the term "lexical co-occurrence" and should be adopted.

### D. "corpus of documents"

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "corpus of documents" | 1, 25, 27, 28, and 31 | A collection of documents which are available to an information retrieval system | a collection of documents on a particular subject matter or from a particular source |

This term appears in all asserted claims. "Corpus of documents" does not require any definition beyond its plain and ordinary meaning, which is a collection of documents available to an information retrieval system. As the first sentence of the '819 patent succinctly states:


This invention relates to improvements in retrieving relevant documents from a corpus of documents. More

(Exh. A, '819 patent, at Col. 1, Lines 8-9).

The parties' offered constructions appear similar. The main difference between the parties' positions is Google's insistence upon improperly *limiting* the phrase "corpus of documents" to a collection of documents "on a particular subject matter or from a particular source." There is no such language in either the claims or the specification of the '819 patent which justifies limiting the term "corpus of documents" to a particular source or a particular subject matter. The "corpus of documents" is simply the collection of documents available to an information retrieval system, regardless of whether the documents are from a particular source or on a particular subject matter.

For example, if someone were to implement an information retrieval system for the Eastern District of Texas website, the corpus of documents available to search could (and likely would) contain documents from numerous sources and on numerous subject matters.

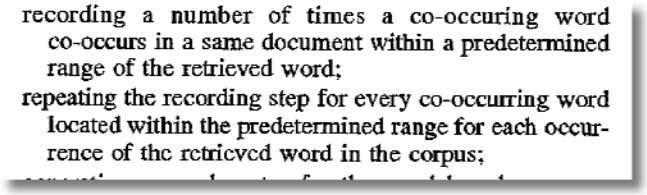
Google's citation to two examples in the '819 patent where the "corpus of documents" is from a particular source, including one example where the corpus of documents includes documents from the New York Times (Exh. A, '819 patent, at Col. 13, Lines 35-37), and another example where the corpus includes documents from Tipster (*Id.*, at Col. 16, Lines 44-46), are merely

examples of embodiments. It is impermissible to read these examples into the claims; they do not compel limiting "corpus of documents" to those from a particular source, and Google's attempt to read such language into the claims should be rejected. IPI's proposed construction more properly defines the term "corpus of documents" and should be adopted.

### E. "range"

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "range" | 1 | The distance of text around a retrieved word | a window of contiguous words |

The term "range" only appears in claim 1 of the '819 patent, which states:


recording a number of times a co-occuring word co-occurs in a same document within a predetermined range of the retrieved word;
repeating the recording step for every co-occurring word located within the predetermined range for each occurrence of the retrieved word in the corpus;

(Exh. A, '819 Patent, at Col. 24, Lines 44-50).

"Range" as used in the '819 patent, refers to the distance around a retrieved word for which the system will record the number of co-occurring words. The distance can be measured in the number of words, or the number of text characters, or in the number of sentences or paragraphs. In inventor Hinrich Schuetze's Dimensions of Meaning article, which is part of the '819 patent's File History, Mr. Schuetze states that "co-occurrence can be defined with respect to windows of a given size or on the basis of sentence boundaries." (Exh. C, Schuetze, Hinrich, Dimensions of Meaning, IEEE Computer Society Press, p. 787, section 1, col. 2, 1992)(emphasis added). In addition, the '819 patent teaches eliminating so-called "stop words" from the process. A "stop word" is simply a common word such as "the" or "an" which is often skipped because of its high frequency and low qualitative value to the document information retrieval process. A long phrase of stop words, e.g., "to be or not to be," will not be skipped.

Once again, IPI's and Google's constructions are largely similar. The only difference is that Google improperly seeks to read in the limitation that the predetermined range must be a window of "contiguous" words. By importing a limitation such as "contiguous," Google seeks a construction that would preclude the presence of anything in between the words of a window, such as a period or a comma, or any type of punctuation.

Google is forced to offer extrinsic evidence to make its case. Google's reliance upon spreadsheet and civil engineering references reveals how thin Google's support for "contiguous" is; neither have any bearing upon the inventions of the '819 patent. IPI's proposed construction more properly defines the term "range" and should be adopted.

### F. "context vector"

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "context vector" | 25, 27, 28, and 31 | A value corresponding to a combination of the sums of thesaurus vectors of words used | a combination of all word vectors for each word in a document or in a query |

This term appears in asserted claims 25, 27, 28, and 31. A context vector is used to "retrieve relevant documents for a query" by using the sum of the thesaurus vectors. (Exh. A, '819 patent, at Col. 18, Lines 14-25). This concept is set forth in Figure 10 of the '819 patent:

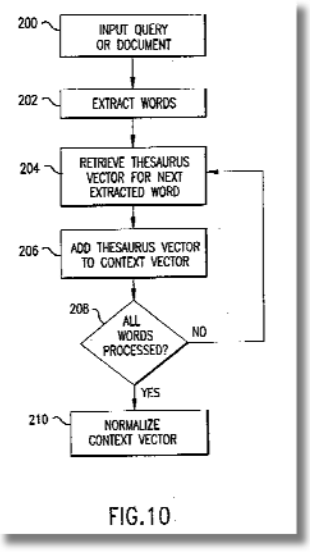



FIG.10

Once again, IPI takes its proposed definition for "context vector" verbatim from the '819 patent. In fact, "context vector" is specifically defined twice in the '819 patent:

each document is computed. The context vector is a combination of the weighted sums of the thesaurus vectors of all the words contained in the document. These context vectors

(Exh. A, '819 patent, at Col. 5, Lines 5-7).

similar representation for documents is needed. The document vectors that are computed are called "context vectors." The simplest approach is to represent each document by a vector, which is the sum of the thesaurus vectors for the words in its text. Formally,

(Exh. A, '819 patent, at Col. 17, Lines 16-20).

In contrast, Google's definition eliminates the concept that a context vector is a "sum" of "thesaurus vectors." It is unclear from Google's construction exactly why these omissions were made, especially because Google cites as support from the '819 patent the same two sections (along with Figure 10) that are represented above. None of these sections support Google's offered definition; these definitions and figures from the '819 patent specification clearly indicate that "context vector" is defined as the sum of the thesaurus vectors.

Once again, Google's extrinsic hodgepodge of "support" has no bearing upon the

inventions of the '819 patent. IPI's proposed construction more properly defines the term "context vector" and should be adopted.

### G. "co-occurrence of words"

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "co-occurrence of words" | 1, 25, 27, 28, and 31 | Two or more words or terms which appear in text within some distance of each other. Two terms co-occur if they appear in text within some distance of each other. | the appearance of two words within a specified range of each other |

This term appears in all asserted claims. Due to the overlap with 'lexical co-occurrence," IPI has chosen to seek the same construction for "co-occurrence of words." IPI likewise relies upon its arguments made in paragraph C as support for this construction. IPI's construction here is different from its originally proposed construction set forth in the parties' Joint Claim Construction Chart, but it is not proposing a new construction, rather IPI believes consolidating these two terms ("lexical co-occurrence" and "co-occurrence of words") will streamline the claim construction process. Google will not be prejudiced by IPI's reliance upon this overlap of terms as its proposed definition for both terms is likewise the same.

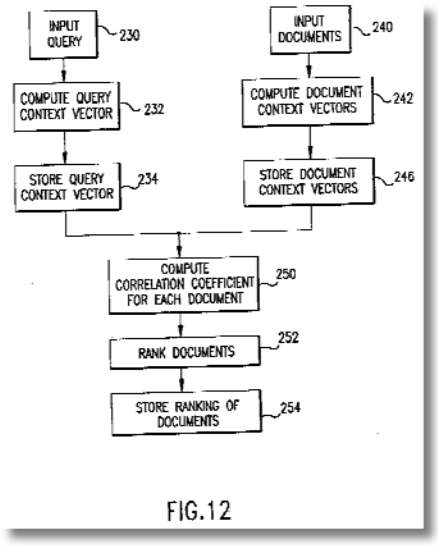
For this reason, set forth in Section C, *supra*, IPI believes that its proposed construction, and not Google's, more properly defines the terms "lexical co-occurrence" and "co-occurrence of words" and should be adopted.

### H. "correlation coefficient"

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "correlation coefficient" | 25, 27, 28, and 31 | A value representing or corresponding to the degree to which two variables are similar, e.g., the degree of difference or similarity between a query context vector and a context vector for a given document | a calculated number using a cosine function comparing the context vector of the words in a query and the context vector of the words in a document in the corpus of documents |

This term appears in asserted claims 25, 27, 28, and 31. A "correlation coefficient" uses the

computed context vectors to rank documents in a document retrieval system. This concept is set forth in Figure 12 of the '819 patent:




(Exh. A, '819 Patent, at Figure 12)

The correlation coefficient is simply a determination of the relative similarity and difference between the query or document context vectors. This allows a ranking of documents.

The definitions offered by Google for this claim terms are too narrow. Specifically, (1) Google improperly seeks to limit the output of the correlation coefficient to a number, and (2) Google improperly seeks to limit the correlation coefficient to calculations using a cosine function. Neither of Google's proposed definitions are required by the '819 patent.

First, nowhere in the '819 patent is the correlation coefficient limited to outputting a number. The only requirement is for the correlation coefficient to output a value that can be used to rank each document. (See Exh. A, '819 Patent, at Fig. 12). This value can certainly be a number, but limiting it solely to this, as Google urges, is improper. Those of ordinary skill in the art understand that there are other ways to represent the words, such as a Boolean condition, a logic statement, or a log. Using the social security example set forth above, the presence of both words together could each register a binary "1," a "true," or a "yes" result. The lack of one word next to

the other could register a binary "0," a "false," or a "no" result. All are values and all meet the requirements of the claim; not all are a number as Google urges.

Google likewise offers an overly limited construction when it insists that a cosine function is required to calculate the "correlation coefficient." Google's offered construction violates a fundamental tenet of claim construction, and also ignores other ways those of ordinary skill understand such ranking can be determined. Claim 25 does not require a cosine function; this is what is claimed by dependent claims 26 and 35.

**26.** The method of claim **25**, wherein computing the correlation coefficient uses the following formula:

$$corr(d_i, d_j) = \sum_{k=1}^{p} \psi(d_i)_k \psi(d_j)_k$$

where $\psi(d_i)$ is the query vector and $\psi(d_j)$ is the document vector.

(Exh. A, '819 patent, at Col. 27, Lines 13-20).

**35.** The method of claim **32**, wherein computing the correlation coefficient for each document uses the following formula:

$$corr(f_m, d_j) = \sum_{k=1}^{p} \psi(f_m)_k \psi(d_j)_k$$

where $\psi(f_m)$ is the factor vector for factor cluster $f_m$ and $\psi(d_j)$ is the context vector for document $d_j$.

(Exh. A, '819 patent, at Col. 28, Lines 9-17). Independent claim 25 merely states that the system must determine a correlation coefficient and use the correlation coefficient to rank each document.

Pursuant to the doctrine of claim differentiation therefore, independent claim 25 must be broader and cannot be limited to the cosine function claimed by dependent claims 26 and 35. In other words, the correlation coefficient referred to in independent claim 25 cannot be limited to the specific embodiments found in claims 26 and 35 of the '819 patent. And by extension, there is no requirement that the correlation coefficient be computed using the cosine function. Google's attempts to read limitations from the preferred embodiments into claim 25 are improper.

Persons of ordinary skill in the art would recognize that there are numerous ways to

accomplish this task of calculating the "correlation coefficient." One such method of calculating the correlation coefficient is through the use of the Pearson Product Moment Correlation Coefficient ("PMCC"), widely used in the sciences as a measure of the strength of linear dependence between two variables. (Exh. D). The PMCC represents the angular separation between two normalized data vectors measured from the mean, while the cosine similarity measures the angular separation of two data vectors shifter to the origin. The Binary Dot Product coefficient is another similarity measurement. (Exh. E). With this measurement the number of times terms appear are not counted, but instead a 1 ("yes") or 0 ("no") are inserted if a term does or does not appear. A vector dot product is computed with the vectors. Neither the PMCC nor the Binary Dot Product requires the use of a cosine function.

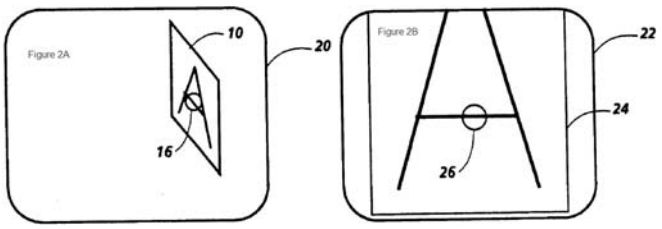
IPI's proposed construction for the term "correlation coefficient" is the correct construction for this term. Moreover, IPI's proposed construction does not violate fundamental tenets of claim construction, as does Google's offered definition. IPI's construction should be adopted.

## V. THE '785 PATENT

Google is accused of infringing twelve claims of the '785 patent in this case: 1-4 9, 28-30, 41, 42, 52, and 55. (Exh. B, '785 Patent). For these twelve asserted claims, the parties have identified and proposed constructions for 8 disputed terms. Each of these will be addressed in turn.

### A. Background of the '785 Patent

The '785 Patent is directed towards a system and methods for presenting images which are perceived as presenting a moving viewpoint in a three-dimensional space on a display. The '785 Patent allows user to identify a point of interest and request motion of the viewpoint toward, away from, and laterally to the point of interest. In addition, the location of the point of interest can also be displaced based on signals received from the user. An example from the figures of the '785 patent demonstrates viewpoint motion with respect to a point of interest:




(Exh. B, '785 Patent at Figures 2A and 2B). The image of Figure 2A includes surface 10 and point of interest 16, which are perceptible as the same as image in Figure 2B including surface 24 and point of interest 26, only shown from a different viewpoint. In addition, Figure 2B also demonstrates radial motion towards point of interest 26. This is just one example of an embodiment of some of the inventions of the '785 Patent.

## B. Agreed Constructions for the '785 Patent

### 1. Point of Interest

The parties have agreed on the construction for "point of interest." The parties propose that "point of interest" be construed as "a point indicated by the user and relative to which the viewpoint can move." (Docket 57-2, Proposed Constructions, '785 Patent at Exh. A). The parties' agreed construction for "point of interest" comes straight from the specification of the '785 patent.

as continuations. Viewpoint motion is "relative" to a point or other region of the image if the viewpoint is perceived as moving with respect to the point or other region. A "point of interest" or "POI" is a point indicated by the user and relative to which the viewpoint can move. 50

(Exh. B, '785 patent, at Col. 7, Lines 49-51). Accordingly, the parties respectfully request that the Court construe "point of interest" as "a point indicated by the user and relative to which the viewpoint can move."

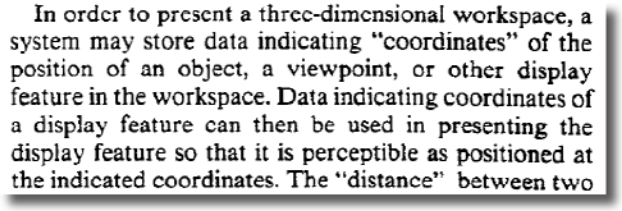
## C. Disputed Constructions for the '785 Patent

### 1. Viewpoint Coordinate Data

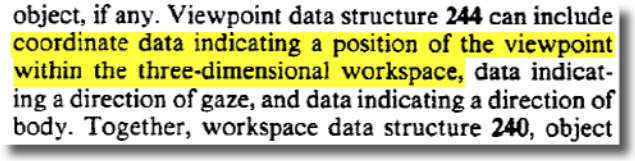
| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "viewpoint coordinate data" | 1 and 52 | Information representing the position of the viewpoint in a three dimensional workspace | The position on the x-axis, the y-axis, and the z-axis in a three-dimensional workspace from which the workspace is viewed |

The claim element "viewpoint coordinate data" appears in claims 1 and 52 of the '785 patent. IPI proposes that "viewpoint coordinate data" be construed as "information representing the position of the viewpoint in a three dimensional workspace." The inventors did not provide an express definition of "viewpoint coordinate data," but IPI's construction is supported by the specification of the '785 Patent:


In order to present a three-dimensional workspace, a system may store data indicating "coordinates" of the position of an object, a viewpoint, or other display feature in the workspace. Data indicating coordinates of a display feature can then be used in presenting the display feature so that it is perceptible as positioned at the indicated coordinates. The "distance" between two

(Exh. B, '785 Patent, at Col. 6, Lines 56-62).


object, if any. Viewpoint data structure **244** can include coordinate data indicating a position of the viewpoint within the three-dimensional workspace, data indicating a direction of gaze, and data indicating a direction of body. Together, workspace data structure **240**, object

(Exh. B, '785 Patent, at Col. 14, Lines 9-15). Google's proposed construction seeks to add unnecessary, extraneous limitations regarding the position on the x-axis, y-axis and z-axis of the viewpoint. The Court should construe "viewpoint coordinate data" as "information representing the position of the viewpoint in a three dimensional workspace."

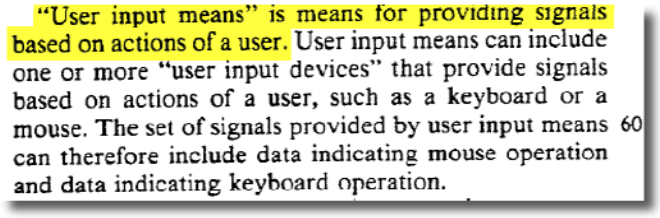
### 2. User Input Means for Providing Signals

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "user input means for providing signals" | 52 | **Function**: providing signals based on actions of a user | **Function**: providing signals |

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| | | **Corresponding structure**: one or more user input devices that provide signals based on actions of a user, such as a keyboard, a mouse, a multidimensional input device such as a VPL glove or other input device and each of their equivalents | **Corresponding structure**: any two of a computer keyboard or its equivalent, a computer mouse or its equivalent, or a VPL glove or its equivalent |

The claim element "user input means for providing signals" appears only in claim 52 of the '785 patent. The parties agree that "user input means for providing signals" is a means plus function element that should be construed pursuant to 35 U.S.C. § 112 ¶ 6. The parties have provided their respective positions regarding the function and corresponding structures for this claim element.

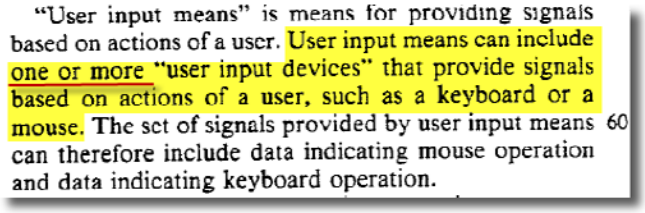
As to the construction for the function of the "user input means for providing signals," the parties are largely in agreement. Both parties agree that the function of the "user input means for providing signals" should be construed to mean "providing signals." However, IPI proposes that the definition of the function also include "based on actions of a user." IPI's proposed construction comes right from the specification of the '785 patent which states as follows:


"User input means" is means for providing signals based on actions of a user. User input means can include one or more "user input devices" that provide signals based on actions of a user, such as a keyboard or a mouse. The set of signals provided by user input means 60 can therefore include data indicating mouse operation and data indicating keyboard operation.

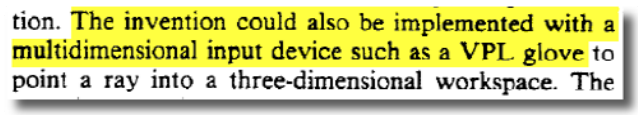
(Exh. B, '785 Patent, at Col. 5, Lines 56-57). Where, as here, the inventors have acted as their own lexicographers in defining the meaning of a claim element, the definition provided by the inventors should control. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) ("our cases recognize that 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***.") (emphasis added); *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir.

2002) ("A claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history."). Accordingly, the function for "user input means" should be construed as "for providing signals based on actions of a user."

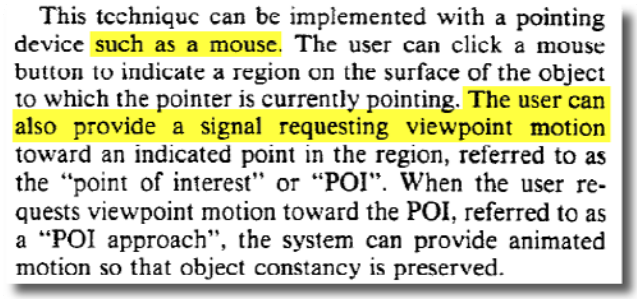
As to an identification of the corresponding structure, the parties' proposed constructions have subtle yet significant differences. IPI proposes that the corresponding structure be construed as "one or more user input devices that provide signals based on actions of a user, such as a keyboard, a mouse, a multidimensional input device such as a VPL glove or other input device and each of their equivalents." IPI's proposed construction closely tracks the specification:


"User input means" is means for providing signals based on actions of a user. User input means can include one or more "user input devices" that provide signals based on actions of a user, such as a keyboard or a mouse. The set of signals provided by user input means 60 can therefore include data indicating mouse operation and data indicating keyboard operation.

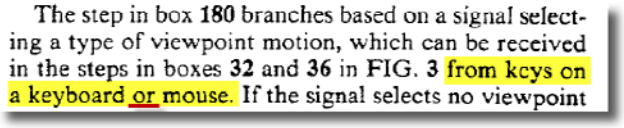
(Exh. B, '785 Patent, at Col. 5, Lines 57-60). This language from the specification indicates that the inventors intended that the inventions could be practiced with "one or more" devices. They gave examples such as a keyboard, mouse, VPL glove, or other multidimensional input devices.


tion. The invention could also be implemented with a multidimensional input device such as a VPL glove to point a ray into a three-dimensional workspace. The

(Exh. B, '785 Patent, at Col 20, Lines 8-9). There are other examples in the preferred embodiments in which the inventors described practicing the invention with ***one or more*** input devices:


This technique can be implemented with a pointing device such as a mouse. The user can click a mouse button to indicate a region on the surface of the object to which the pointer is currently pointing. The user can also provide a signal requesting viewpoint motion toward an indicated point in the region, referred to as the "point of interest" or "POI". When the user requests viewpoint motion toward the POI, referred to as a "POI approach", the system can provide animated motion so that object constancy is preserved.

(Exh. B, '785 Patent, at Col. 2, Lines 37-44).


The step in box **180** branches based on a signal selecting a type of viewpoint motion, which can be received in the steps in boxes **32** and **36** in FIG. **3** from keys on a keyboard or mouse. If the signal selects no viewpoint

(Exh. B, '785 Patent, at Col. 12, Lines 46-49).

Accordingly, the corresponding structure should be construed as the specification states and IPI proposes: "one or more user input devices that provide signals based on actions of a user, such as a keyboard, a mouse, a multidimensional input device such as a VPL glove or other input device and each of their equivalents."

Google's proposed construction seeks to add a limitation that the "user input means" must include ***at least two*** user input devices. This argument is contrary to the teachings of the specification of the '785 patent which plainly states that a "user input means" can include "one or more" devices. (Exh. B, '785 Patent, at Col. 5, Lines 57-60). The inventors described the invention as being carried out with "one or more" user input devices, and not "any two" user input devices as Google suggests. To try to avoid the plain language of the specification, Google has indicated it will rely upon unnecessary and unreliable extrinsic evidence. *Philips v. AWH Corp.*, 415 F.3d 1305, 1317 (Fed. Cir. 2005) (explaining that extrinsic evidence is "less significant than the intrinsic record in determining the legally operative meaning of claim language.") (citations omitted). Worse yet, Google bases its proposed construction for this, and other disputed terms, on inventor testimony. *Bell & Howell Document Management Products Co. v. Altek Systems, Inc.*, 132 F.3d 701, 706 (Fed. Cir. 1997) ("The testimony of an inventor and his attorney concerning claim construction is thus entitled to little or no consideration."); *Roton Barrier, Inc. v. Stanley Works*, 79 F.3d 1112, 1126 (Fed. Cir. 1996) ("We have previously stated that an inventor's after-the-fact testimony is of little weight compared to the clear import of the patent disclosure itself."); *Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1379 (Fed. Cir. 2000) (inventor testimony about claim construction is "of little or no probative

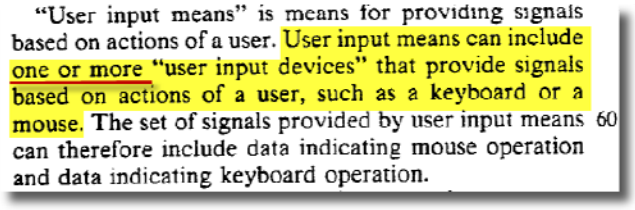
weight in determining the scope of a claim."); *Howmedica Osteonics Corp. v. Wright Med. Tech., Inc.*, 540 F.3d 1337, 1347 (Fed. Cir. 2009) ("We hold that inventor testimony as to the inventor's subjective intent is irrelevant to the issue of claim construction.").

For the foregoing reasons, "user input means for providing signals" should be construed as proposed by IPI with a function of "providing signals based on action of a user" and corresponding structure of "one or more user input devices that provide signals based on actions of a user, such as a keyboard, a mouse, a multidimensional input device such as a VPL glove or other input device and each of their equivalents."

### 3. The User Can Request Viewpoint Motion and Point of Interest Motion Independently

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "the user can request viewpoint motion and point of interest motion independently" | 52 | The user can request viewpoint motion and/or point of interest motion separately or simultaneously | A user can request viewpoint and point of interest motion separately through different user input devices |

The claim element "the user can request viewpoint motion and point of interest motion independently" appears only in claim 52 of the '785 patent. IPI proposes that "the user can request viewpoint motion and point of interest motion independently" be construed as "the user can request viewpoint motion and/or point of interest motion separately or simultaneously." IPI's construction is supported by the specification of the '785 Patent:



"User input means" is means for providing signals based on actions of a user. User input means can include one or more "user input devices" that provide signals based on actions of a user, such as a keyboard or a mouse. The set of signals provided by user input means can therefore include data indicating mouse operation and data indicating keyboard operation.

(Exh. B, '785 Patent, at Col. 5, Lines 57-60).

> Signals from user input means can request motion of the viewpoint and motion of the POI. If the user can request viewpoint and POI motion separately and can request both types of motion simultaneously, the user input means is structured so that the use can request viewpoint motion and POI motion "independently."

(Exh. B, '785 Patent, at Col. 8, Lines 5-10). What this claim element intended to convey was the ability to request viewpoint and point of interest motion both separately and simultaneously. In other words the user could request viewpoint motion, point of interest motion, or viewpoint motion and point of interest motion. The request for viewpoint motion and/or point of interest motion is received from the "user input means" and, as set forth above in Section V(c)(3), the inventions of the '785 patent can be practiced with one input device. Accordingly, the construction of this element does not require more than one user input device as Google requires.

Google's proposed construction seeks to add an improper limitation that the viewpoint motion and point of interest motion must occur through different user input devices. As with Google's proposed construction for "user input means" in Section V(c)(3) above, this construction adds improper limitations about the number of devices necessary to practice the invention. Here, Google is explicitly stating that two different user input devices are required. As explained with regards to "user input device," the specification of the '785 patent is to the contrary and Google's proposed construction is likely motivated by its non-infringement arguments. Moreover, Google ignores the teachings of the specification that the user can make the request for viewpoint motion and point of interest motion independently of each other. Instead, Google focuses on the input device for making the motion requests. Google's attempt to import a limitation regarding the "user input device" into the construction of this element should be rejected. Accordingly, "the user can request viewpoint motion and point of interest motion independently" should be construed as "the user can request viewpoint motion and/or point of interest motion separately or simultaneously."

### 4. Motion Requesting Signal Set

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "motion requesting signal set" | 52 | Signals representative of data for viewpoint motion and/or point of interest motion in a three-dimensional workspace | A group of commands indicating a point of interest and requesting viewpoint motion relative to the indicated point of interest |

The claim element "motion requesting signal set" appears only in claim 52 of the '785 patent. IPI proposes that "motion requesting signal set" be construed as "signals representative of data for viewpoint motion and/or point of interest motion in a three-dimensional workspace." IPI's construction is supported by the specification:

is perceptible in a three-dimensional workspace. The step in box **32** receives a signal set from a user input device indicating a POI on the surface and requesting viewpoint motion relative to the POI. In response, the step in box **34** presents an image that is perceptible as a view with the viewpoint moved relative to the POI. The image presented in box **34** includes a surface that is perceptible as a continuation of the surface presented in box **30**. The step in box **36** receives another signal set, this time requesting both POI and viewpoint motion.

(Exh. B, '785 Patent, at Col. 9, Lines 27-37).

Signals from user input means can request motion of the viewpoint and motion of the POI. If the user can request viewpoint and POI motion separately and can request both types of motion simultaneously, the user input means is structured so that the use can request viewpoint motion and POI motion "independently."

(Exh. B, '785 Patent, at Col. 8, Lines 5-10). As can be seen from these passages, a preferred embodiment of the inventions of the '785 patent includes at least two different types of signal sets received from the user input device: one signal set requesting viewpoint motion relative to a point of interest and another signal set requesting both point of interest motion and viewpoint motion. These signals can be received independent of one another. IPI's proposed construction is also supported by other passages in the specification of the '785 Patent. (Exh. B, '785 Patent at Col. 12,

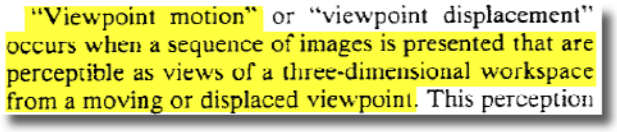
Lines 22-26; at Col. 12, Lines 46-61; at Col. 4, Lines 26-47; and at Col. 2, Lines 40-43).

Google's proposed construction is improper because it completely ignores the possibility of a signal set for point of interest motion. Google's construction also requires "a group of commands" which is a deviation from the plain language of the claims and specification which describes the requests as "signals" or "signal sets." This is an improper and unnecessary re-writing of the claim language that adds no value or clarity to the meaning of this claim element. Accordingly, "motion requesting signal set" should be construed as "signals representative of data for viewpoint motion and/or point of interest motion in a three-dimensional workspace."

### 5. Viewpoint Motion

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "viewpoint motion" | 1, 28, 42, 52 and 55 | A sequence of images that are perceptible as views of a three-dimensional workspace from a moving or displaced viewpoint | A sequence of images that causes the viewpoint to appear to move from an initial position to other positions |

The claim element "viewpoint motion" appears in claims 1, 28, 42, 52 and 55 of the '785 patent. IPI proposes that "viewpoint motion" be construed as "a sequence of images that are perceptible as views of a three-dimensional workspace from a moving or displaced viewpoint." IPI's construction is taken directly from the explicit definition given to "viewpoint motion" in the specification of the '785 Patent:


"Viewpoint motion" or "viewpoint displacement" occurs when a sequence of images is presented that are perceptible as views of a three-dimensional workspace from a moving or displaced viewpoint. This perception

(Exh. B, '785 Patent, at Col. 7, Lines 41-44). Where the inventors have acted as their own lexicographers, that definition should be adopted as the construction for the disputed term. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002). There are other portions of the specification of the '785 Patent that support IPI's reliance on the inventors' express definition of

this claim element. (Exh. B, '785 Patent, at Col. 7, lines 41-49; at Col. 2, Lines 14-24; at Col. 9, Lines 11-23; at Col. 9, Line 47 – Col. 10, Line 42; at Col. 9, Lines 14-18; at Col. 3, Lines 14-29; at Col. 3, Line 64 – Col. 4, Line 15; Figures 2A and 2B, and Figures 4A and 4B).

Google has ignored the inventors' definition and suggested one of its own creation. Tellingly, Google agreed with the inventors' definition of "point of interest" as discussed above in Section V(B)(1), but has rejected the inventors' definition of "viewpoint motion." Accordingly, "viewpoint motion" should be construed as "a sequence of images that are perceptible as views of a three-dimensional workspace from a moving or displaced viewpoint."

**6. Point of Interest Motion**

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "point of interest motion" | 52 | A sequence of images that are perceptible as views of a three-dimensional workspace including a moving or displaced point of interest | A change in location of the point of interest as indicated by a user |

The claim element "point of interest motion" appears only in claim 52 of the '785 patent. IPI proposes that "point of interest motion" be construed as "a sequence of images that are perceptible as views of a three-dimensional workspace including a moving or displaced point of interest." IPI's construction is supported by Figure 7 (and accompanying text) from the '785 Patent:

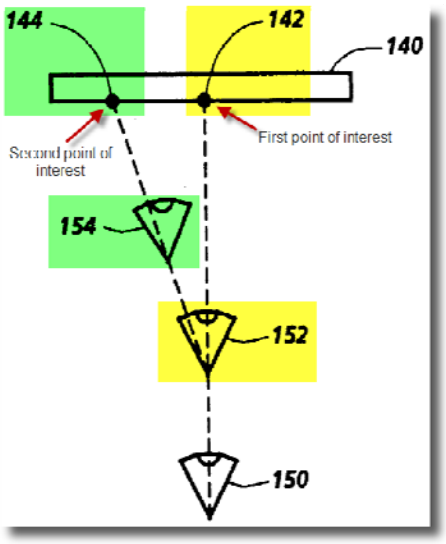


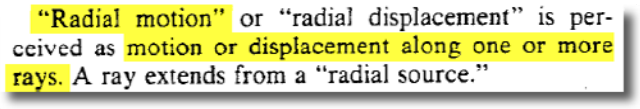

FIG. 7 illustrates viewpoint motion together with point of interest motion. Surface 140 is perceptible in a three-dimensional workspace, and includes POI 142 and POI 144. From initial viewpoint 150, radial motion is requested toward POI 142, so that an image is presented from viewpoint 152 on the ray from POI 142 through viewpoint 150. Then, while the request for radial motion toward the POI continues, a request to move to POI 144 is also received, so that an image is presented from viewpoint 154 on the ray from POI 144 through viewpoint 152.

(Exh. B, '785 Patent, at Col. 12, Lines 9-19). As can be seen from Figure 7, and the corresponding text, point of interest motion is presented by a sequence of images (viewpoints 150, 152, and 154) along with a displacement of the point of interest from 142 and 144 which give the perception of a moving or displaced point of interest. There are other portions of the specification of the '785 Patent that support Plaintiffs' proposed construction of this element as well. (See, e.g., Exh. B, '785 Patent, at Col. 4, Lines 18-45; and at Col. 9, Lines 36-46). Accordingly, "point of interest motion" should be construed as "a sequence of images that are perceptible as views of a three-dimensional workspace including a moving or displaced point of interest."

### 7. Radial Motion

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "radial motion" | 55 | Motion or displacement along one or more rays | Perceived movement along a ray |

The claim element "radial motion" appears only in claim 55 of the '785 patent. IPI proposes that "radial motion" be construed as 'motion or displacement along one or more rays." IPI's construction is taken directly from the definition given to "radial motion" by the inventors in the specification of the '785 Patent:


"Radial motion" or "radial displacement" is perceived as motion or displacement along one or more rays. A ray extends from a "radial source."

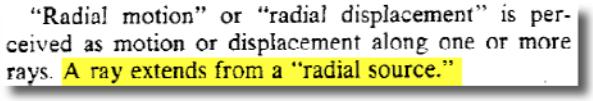
(Exh. B, '785 Patent, at Col. 7, Lines 55-57). Other portions of the specification of the '785 Patent also support IPI's proposed construction for this element. (See, e.g. Exh. B, '785 Patent, at Col. 8, Lines 56-59; at Col. 9, Line 47 – Col. 10, Line 42; at Col. 11, lines 13-15; at Col. 12, Lines 9-15; Figures 4A and 4B, and Figure 7).

As with "viewpoint motion," Google has again chosen to ignore the express definition given to "radial motion" in the specification of the '785 Patent in favor of a definition of its own creation. Google's definition should be rejected in light of the inventors' decision to act as their own lexicographers with regards to this claim element. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002). Accordingly, "radial motion" should be construed as "motion or displacement along one or more rays."

**8. Ray**

| Element | Claims | Plaintiffs' Proposed Construction | Defendant's Proposed Construction |
|---|---|---|---|
| "ray" | 55 | Extending from a radial source | A straight line extending from a radial source or point in a three-dimensional space |

The claim element "ray" appears only in claim 55 of the '785 patent. IPI proposes that "ray" be construed as "extending from a radial source." IPI's construction is taken directly from the specification of the '785 Patent:


"Radial motion" or "radial displacement" is perceived as motion or displacement along one or more rays. A ray extends from a "radial source."

(Exh. B, '785 Patent, At. Col. 7, Line 57). Other portions of the specification also support IPI's proposed construction of "ray." (Exh. B, '785 Patent, at Col. 9, Lines 52-54; and Figure 4A).

As with many of its proposed constructions, Google seeks to add extraneous limitations to

this term. For this element, Google tries to read into the claim language limitations requiring "a straight line" and "a point in three-dimensional space." Both of these limitations are unnecessary and contrary to a plain reading of the specification. Google is improperly trying to construe "radial source" which is not a claim limitation, but part of the definition of "ray" as given by the inventors. Accordingly, "ray" should be construed as "extending from a radial source."

## VI. CONCLUSION

IPI requests that the Court adopt its proposed constructions set forth above. These constructions are consistent with the intrinsic evidence, do not limit the claims to preferred embodiments, do not add limitations, and are not circular or confusing to a jury.

Respectfully submitted,

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## CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing **PLAINTIFFS' CLAIM CONSTRUCTION BRIEF PURSUANT TO P.R. 4-5(a)** was served upon opposing counsel via the Court's ECF system, with a copy via Federal Express on August 24, 2009:

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