NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

SOFTWARE RIGHTS ARCHIVE, LLC,
Appellant

v.

FACEBOOK, INC., LINKEDIN CORPORATION, TWITTER, INC.,
Cross-Appellants

2015-1649, 2015-1650, 2015-1651

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2013-00479, IPR2013-00480.

SOFTWARE RIGHTS ARCHIVE, LLC,
Appellant

v.

FACEBOOK, INC., LINKEDIN CORPORATION, TWITTER, INC.,
Cross-Appellants

2015-1652, 2015-1653

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. IPR2013-00481.

Decided: September 9, 2016

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Before NEWMAN, MAYER, and CHEN, *Circuit Judges.*

Opinion for the court filed PER CURIAM.

Opinion dissenting-in-part filed by *Circuit Judge* CHEN.

PER CURIAM.

Software Rights Archive, LLC ("Software Rights") appeals *inter partes* review ("IPR") decisions of the Patent Trial and Appeal Board ("board") of the United States Patent and Trademark Office ("PTO") holding that claims 18 and 45 of U.S. Patent No. 5,832,494 (the "'494 patent") and claims 12 and 22 of U.S. Patent No. 6,233,571 (the "'571 patent") are unpatentable over the prior art.[1] *See Facebook, Inc. v. Software Rights Archive, LLC*, IPR No. 2013-00479, 2015 WL 470598, at *7–13, *16–17 (PTAB Feb. 2, 2015) ("*Board Decision I*"); *Facebook, Inc. v. Software Rights Archive, LLC*, IPR No. 2013-00481, 2015 WL 429750, at *12–16, *18–20 (PTAB Jan. 29, 2015) ("*Board Decision II*"). Facebook, Inc., LinkedIn Corporation, and Twitter, Inc. (collectively "Facebook") cross-appeal, challenging the board's determinations that claims 1, 5, 15, and 16 of the '494 patent are not anticipated, *see Facebook, Inc. v. Software Rights Archive, LLC*, IPR No. 2013-00480, 2015 WL 456539, at *8–13 (PTAB Jan. 30, 2015) ("*Board Decision III*"), and that claim 21 of the '571 patent is not obvious over the prior art, *see Board Decision II*, 2015 WL 429750, at *16–18. For the reasons discussed below, we affirm in part and reverse in part.

BACKGROUND

The '494 and '571 patents are continuations-in-part of U.S. Patent No. 5,544,352 (the "'352 patent"). We recently affirmed the board's determination that claims 26, 28–30, 32, 34, and 39 of the '352 patent are unpatentable as obvious. *See Facebook, Inc. v. Software Rights Archive, LLC*, IPR No. 2013-00478, 2015 WL 470597 (PTAB Feb. 2, 2015), *aff'd without opinion*, 640 F. App'x 995 (Fed. Cir. 2016).

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[1] Software Rights also advances a cursory argument that the board erred in concluding that certain claims that depend from claims 18 and 45 of the '494 patent (i.e., claims 19, 20, 48, 49, 51, and 54) are unpatentable as obvious. It does not, however, identify any specific limitations in those dependent claims that would render them non-obvious if the board's determination that claims 18 and 45 are unpatentable as obvious is affirmed.

The ’494 and ’571 patents, which relate to computerized research on a database, are both entitled “Method and Apparatus for Indexing, Searching and Displaying Data.” Joint Appendix (“J.A.”) I 5057; J.A. II 5058.[2] The patents purport to improve upon traditional Boolean search methods by analyzing non-semantic relationships between documents. *See* J.A. I 5057–59; J.A. II 5058–60. They describe a process for organizing and searching for data using a technique called “proximity indexing.” ’494 patent, col. 3 l. 28; ’571 patent, col. 3 l. 33. Proximity indexing is used to search for data, including textual objects, by “generat[ing] a quick-reference of the relations, patterns, and similarity found among the data in the database.” ’494 patent, col. 3 ll. 30–31; ’571 patent, col. 3 ll. 34–36. The claimed inventions are designed to provide a “user friendly computerized research tool” which “emulates human methods of research.” ’494 patent, col. 3 ll. 11–14; ’571 patent, col. 3 ll. 15–18.

I. The ’494 Patent

The ’494 patent describes using non-semantic relationships to search for objects in a database. J.A. I 5057–58. A citation relationship between two documents is non-semantic because it is not based on words (or “terms”) common to both documents, but is instead based on one document’s reference to the other document. *See* J.A. I 5058, 5063. Two documents have a direct citation relationship when one document cites to the other document. *See* J.A. I 5063. Two documents can also have an indirect citation relationship, such as when they both cite to a

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[2] The appendix related to the ’494 patent and the appendix related to the ’571 patent contain many of the same documents. For the sake of convenience, the appendix related to the ’494 patent will be referred to as “J.A. I” and the appendix related to the ’571 patent will be referred to as “J.A. II.”

third document (bibliographic coupling ("*bc*")) or when they are both cited by a third document (co-citation ("*cc*")). J.A. I 5063–64.[3] These relationships, as well as other relationships between documents, can be used to create clusters of similar documents, thereby enhancing search and retrieval. J.A. I 5058–64.

The '494 patent explains that data in the database to be searched may be represented as a "node." '494 patent, col. 12 ll. 34–41. A node can be "an object in a database, a portion of an object in a database, a document, a section of a document[] [or] a World Wide Web page." *Id.* col. 12 ll. 36–39 (diagram numbering omitted). The '494 patent further states that a cluster link generator can be used to generate candidate cluster links between nodes. *Id.* col. 21 ll. 54–67. It explains that "[c]andidate cluster links are the set of all possible cluster links between a search node and a target node." *Id.* col. 21 l. 66–col. 22 l. 1 (diagram numbering omitted). Actual cluster links, which are "a subset of the candidate cluster links . . . which meet a certain criteria," can be "used to locate nodes for display." *Id.* col. 22 ll. 1–4 (diagram numbering omitted).

Independent claim 1 of the '494 patent recites:

> A method of analyzing a database with indirect relationships, using links and nodes, comprising the steps of:
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> selecting a node for analysis;

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[3] The board construed the term "direct relationships" to mean "relationships where one object cites to another object" and the term "indirect relationships" to mean "relationships where at least one intermediate object exists between two objects and where the intermediate object(s) connect the two objects through a chain of citations." *Board Decision I*, 2015 WL 470598, at *5 (citations and internal quotation marks omitted).

> generating candidate cluster links for the selected node, wherein the step of generating comprises an analysis of one or more indirect relationships in the database;
>
> deriving actual cluster links from the candidate cluster links;
>
> identifying one or more nodes for display; and
>
> displaying the identity of one or more nodes using the actual cluster links.

Id. col. 51 ll. 38–49.

Claim 5, which depends from claim 1, provides that "the step of generating the candidate cluster links comprises the step of[] eliminating candidate cluster links, wherein the number of candidate cluster links are limited and the closest candidate cluster links are chosen over the remaining links." *Id.* col. 51 l. 66–col. 52 l. 4. Claim 15 recites: "The method of claim 14 further comprising the step of deriving the actual cluster links wherein the actual cluster links are a subset of the candidate cluster links." *Id.* col. 52 ll. 65–67 (emphasis omitted). Similarly, claim 16 recites: "The method of claim 15 wherein the step of deriving comprises the step of choosing the top rated candidate cluster links." *Id.* col. 53 ll. 1–3 (emphasis omitted).

Claims 18 and 45 of the '494 patent describe search methods which use numerical representations of relationships between documents. Independent claim 18 recites:

> A method of analyzing a database having objects and a first numerical representation of direct relationships in the database, comprising the steps of:
>
> generating a second numerical representation using the first numerical representation, wherein the second numerical representation accounts for indirect relationships in the database;

> storing the second numerical representation;
>
> identifying at least one object in the database, wherein the stored numerical representation is used to identify objects; and
>
> displaying one or more identified objects from the database.

Id. col. 53 ll. 28–40.

Claim 45 depends from claim 19, which in turn depends from claim 18. It recites:

> The method of claim 19, wherein the direct relationships are hyperlink relationships between objects on the world wide web and the second numerical representation of direct and indirect relationships is a value that is generated by analyzing direct link weights in a set of paths between two indirectly related objects, and wherein the step of identifying uses at least the value to determine an object's importance for ranking.

J.A. I 5092 (reexamination certificate) (emphasis omitted).

The board held that claim 18 of the '494 patent is unpatentable over three prior art publications by Dr. Edward A. Fox (collectively the "Fox Papers"). *See Board Decision I*, 2015 WL 470598, at *7–13. These publications were originally part of one document but were eventually split into three separate documents: (1) Edward A. Fox, Characterization of Two New Experimental Collections in Computer and Information Science Containing Textual and Bibliographic Concepts (Sept. 1983) (Ph.D. dissertation, Cornell University) ("Fox Collection"); (2) Edward A. Fox, Some Considerations for Implementing the SMART Information Retrieval System under UNIX (Sept. 1983) (Ph.D. dissertation, Cornell University) ("Fox SMART"); and (3) Edward A. Fox, Extending the Boolean and Vector

Space Models of Information Retrieval with P-Norm Queries and Multiple Concept Types (Aug. 1983) (Ph.D. thesis, Cornell University) ("Fox Thesis"). The Fox Papers describe clustering documents based on concepts (which are referred to as "vectors" or "subvectors") as well as terms. J.A. I 5629–40. In the Fox system, a query will not only "retrieve clusters containing documents whose terms match its terms," but will also retrieve "documents which have little in common with the query terms but are highly correlated through other components of the extended vectors." J.A. I 5659. Fox Thesis explains that "bibliographic measures," such as *bc* and *cc*, are "useful in both retrieval and clustering applications." J.A. I 5635.

Although Software Rights argued that the Fox Papers do not teach claim 18's limitation requiring "a database having objects and a first numerical representation of direct relationships in the database," '494 patent, col. 53 ll. 27–29, the board rejected this contention. *See Board Decision I*, 2015 WL 470598, at *10–11. According to the board, "it would have been obvious to modify the databases of the Fox Papers to contain full text documents." *Id.* at *10. In support, the board noted that the Fox Papers specifically state that "some [information retrieval] systems store the full text of the various documents." *Id.* (citations and internal quotation marks omitted).

The board further concluded that the Fox Papers, when combined with Edward A. Fox et al., *Users, User Interfaces, and Objects: Envision, a Digital Library*, 44 J. Am. Soc'y Info. Sci. 480 (1993) ("Fox Envision"), rendered claim 45 of the '494 patent obvious. *See Board Decision I*, 2015 WL 470598, at *16–17. According to the board, Fox Envision teaches analyzing web-based links, as claim 45 requires, because it specifically describes "applying citation analysis to hypertext systems, including the World Wide Web." *Id.* at *17.

The board determined, however, that the prior art failed to teach the limitation of claims 1, 5, 15, and 16 that requires "deriving" actual cluster links from the set of candidate cluster links. *See Board Decision III*, 2015 WL 456539, at *8–13. The board noted that "Fox SMART describes the clustering process as initializing a new tree as empty, adding documents to the tree, and recursively splitting overly large nodes of the tree." *Id.* at *9. In the board's view, however, because Fox SMART does not disclose "deleting clusters other than those that simply overlap, or duplicate, other clusters," it does not teach "deriving a subset of the already generated candidate cluster links." *Id.* at *10; *see also id.* at *13 (concluding that Fox Thesis does not anticipate claims 15 and 16 because it does not teach "deriving" a subset of actual cluster links).

II. The '571 Patent

The '571 patent is focused on search techniques for use in hypertext networks. Claim 12 describes "cluster analyzing" universal resource locators ("URLs"):

> A method for visually displaying data related to a web having identifiable web pages and Universal Resource Locators with pointers, comprising:
>
> choosing an identifiable web page;
>
> identifying Universal Resource Locators for the web pages, wherein the identified Universal Resource Locators either point to or point away from the chosen web page;
>
> analyzing Universal Resource Locators, including the identified Universal Resource Locators, wherein Universal Resource Locators which have an indirect relationship to the chosen web page are located, wherein the step of analyzing further

> comprises cluster analyzing the Universal Resource Locators for indirect relationships; and
>
> displaying identities of web pages, wherein the located Universal Resource Locators are used to identify web pages.

’571 patent, col. 52 ll. 38–56.

Claim 22 describes retrieving hyperjump data which “has an indirect reference to [a] chosen node.” J.A. II 5090. It recites:

> A method for displaying information about a network that has hyperjump data, comprising:
>
> choosing a node;
>
> accessing the hyperjump data;
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> identifying hyperjump data from within the accessed hyperjump data that has a direct reference to the chosen node;
>
> determining hyperjump data from within the accessed hyperjump data that has an indirect reference to the chosen node *by proximity indexing* the identified hyperjump data; and
>
> displaying one or more determined hyperjump data, wherein the nodes are nodes in the network that may be accessed, the *hyperjump* data includes hyperjump links between nodes in the network, and the step of displaying comprises:
>
> generating a source map using one or more of the determined hyperjump data, wherein the source map represents hyperjump links that identify the chosen node as a destination of a link, and wherein the method further comprises activating a link represented on the source map, wherein a user

> may hyperjump to a node represented as a node of the link.

J.A. II 5090–91 (reexamination certificate).

Claim 21 of the ’571 patent describes deriving actual cluster links from a set of candidate cluster links in a hypertext network:

> A method of displaying information about a network that has hyperjump data, comprising:
>
> choosing a node;
>
> accessing the hyperjump data;
>
> identifying hyperjump data from within the accessed hyperjump data that has a direct reference to the chosen node;
>
> determining hyperjump data from within the accessed hyperjump data that has an indirect reference to the chosen node using the identified hyperjump data, wherein the step of determining comprises *non-semantically generating a set of candidate cluster links for nodes indirectly related to the chosen node using the hyperjump data, assigning weights to the candidate cluster links and deriving actual cluster links from the set of candidate cluster links based on the assigned weights;* and
>
> displaying one or more determined hyperjump data.

J.A. II 5090 (reexamination certificate).

The board determined that claims 12 and 22 of the ’571 patent are obvious over a combination of Fox Thesis, Fox SMART, and Fox Envision. *See Board Decision II*, 2015 WL 429750, at *12–16, *18–20. Specifically, the board concluded that Fox SMART and Fox Thesis taught all of the elements of claims 12 and 22—other than the hypertext limitations—and that Fox Envision taught applying the teachings of Fox SMART and Fox Thesis to hypertext networks. *See id.* Furthermore, although Software Rights contended that the commercial success of Google's PageRank algorithm provided objective evidence of non-obviousness, the board determined that Software Rights had failed to establish any nexus between the success of Google's algorithm and the "features recited in the claims of the '571 patent." *Id.* at *15.

The board concluded, however, that Facebook had not established that claim 21 of the '571 patent is unpatentable as obvious. *See id.* at *16–18. In the board's view, since Fox SMART's clustering algorithm does not delete documents from the cluster tree, it does not teach "deriving" a subset of actual cluster links from the set of candidate cluster links. *Id.* at *18.

The parties then timely appealed. This court has jurisdiction under 28 U.S.C. § 1295(a)(4)(A) and 35 U.S.C. § 141(c).

DISCUSSION

I. Standard of Review

We review the board's legal conclusions de novo, but review for substantial evidence any underlying factual determinations. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 836–38 (2015); *see also Nike, Inc. v. Adidas AG*, 812 F.3d 1326, 1332 (Fed. Cir. 2016); *In re Giannelli*, 739 F.3d 1375, 1378–79 (Fed. Cir. 2014). Substantial evidence is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938); *see In re Applied Materials, Inc.*, 692 F.3d 1289, 1294 (Fed. Cir. 2012).

II. Claim 18 of the '494 Patent

Software Rights argues that the board erred in concluding that claim 18 of the '494 patent is obvious in view of the Fox Papers. In support, it contends that claim 18 operates on a full-text database containing documents with textual citations to each other, whereas the test collections used by Fox contained only limited information—such as abstracts, authors, titles of articles, and bibliographic records—instead of the full text of documents.

This argument fails. Even assuming *arguendo* that claim 18 requires a database containing full-text documents, the Fox Papers explicitly suggest the use of such a database. Fox Thesis states that some information retrieval "systems store the full text of the various documents . . . being manipulated," and that this approach is advantageous because it allows users "to locate documents of interest" and "examine paragraphs, passages, sentences, or single word occurrences (in context)." J.A. I 5482.[4] It explains, moreover, that storing the full text of documents is a "straightforward generalization[] of document retrieval methods." J.A. I 5482. Given that Fox Thesis specifically states that storing the full text of documents is both beneficial and "straightforward," the board had ample support for its conclusion that "the Fox Papers suggested to one of ordinary skill in the art at the time of the invention the modification of the Fox databases to include full text documents." *Board Decision I*, 2015 WL 470598, at *11.

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[4] Fox SMART likewise suggests the use of full-text retrieval applications. It states that "vectors could be computed for smaller items than just documents" and that "[t]his would be of particular value in *full text retrieval applications*." J.A. I 5443 (emphasis added).

III. Claim 45 of the '494 Patent

The board also had ample support for its determination that claim 45 of the '494 patent is obvious over a combination of the Fox Papers and Fox Envision. *See id.* at *15–17. Claim 45 recites that "the direct relationships are hyperlink relationships between objects on the world wide web." J.A. I 5092 (emphasis omitted). Although Software Rights argues that "Fox Envision does not teach the idea that one should analyze hyperlinks as opposed to bibliographic citations to enhance search," the board properly rejected this contention, concluding that Fox Envision explicitly teaches the application of citation analysis in hypertext systems. *See Board Decision I*, 2015 WL 470598, at *17.

Fox Envision, which was published ten years after Fox Thesis and Fox SMART, was designed to "reconceptualize the idea of digital libraries" in order to "envision their next generation." J.A. I 5844 (emphasis omitted). Its objective was "to harmonize and integrate concepts from a variety of interrelated fields," including "hypertext[,] hypermedia[,] . . . [and] information storage and retrieval." J.A. I 5844. Fox Envision explicitly teaches analyzing the links between objects in a hypertext system:

> *Links should be recorded, preserved, organized, and generalized.* As we integrate documents into very large collections covering an entire scientific domain or professional area, links among those documents become increasingly important to help with search and browsing. Groupings of those links into paths, threads, tours, and webs are essential for organizing, personalizing, sharing, and preserving the structural, interpretational, and evolutionary connections that develop. We are beginning to see the emergence of wide area hyperext systems (Yankelovich, 1990) like the

> WorldWideWeb . . . that carry this concept forward into a distributed environment. Clearly, we must coordinate hypertext and hypermedia linking with the various approaches to search and retrieval (Fox et al., 1991b). One approach is the idea of information graphs (including hypergraphs), where objects of all types are interrelated by links or arcs that capture not only citation (reference) but also inheritance, inclusion, association, synchronization, sequencing, and other relationships.

J.A. I 5845.

As the board correctly determined, "[t]he approach taught in Fox Envision interrelates 'objects of all types,' including objects on the World Wide Web, so as to capture citation relationships." *Board Decision I*, 2015 WL 470598, at *17 (quoting J.A. I 5845). Indeed, Fox Envision explains that as the overall size of a document collection increases, the "links among . . . documents become increasingly important to help with search and browsing." J.A. I 5845. It further explains that one approach to "coordinat[ing] hypertext and hypermedia linking" with known search and retrieval methods is to create "information graphs (including hypergraphs), where objects of all types are interrelated by links or arcs that capture . . . *citation* . . . *relationships*." J.A. I 5845 (emphasis added); *see also* J.A. I 7084–88. Thus, as the board correctly concluded, Fox Envision teaches analyzing citation relationships in hypertext systems. *See Board Decision I*, 2015 WL 470598, at *17.

Software Rights contends that because the Fox Papers predated the widespread use of the web and hyperlinks, their teachings are limited to bibliographic citations between paper documents. We are unpersuaded. In assessing obviousness, references are not read in isolation. *See, e.g., In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) ("Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references."). Although the Fox Papers do not describe analyzing hyperlink relationships, they must be read in view of Fox Envision, which, as discussed above, provides express motivation to apply citation analysis to the links between objects found on the web. *See, e.g.*, *Applied Materials*, 692 F.3d at 1298 (emphasizing that "[o]ne of ordinary skill in the art is not foreclosed from combining" relevant related references). As the board correctly determined, moreover, a skilled artisan would readily have combined the teachings of Fox Envision with those of Fox Thesis and Fox SMART given that Fox Envision is a follow-on work to Fox's earlier publications. *See Board Decision I*, 2015 WL 470598, at *16; *see also Board Decision II*, 2015 WL 429750, at *12 ("Dr. Fox states it would have been obvious to one of ordinary skill in the art to combine the techniques of [Fox] Envision, Fox Thesis, and Fox SMART because [Fox] Envision was built on, and was itself[] a follow-on work to Fox Thesis and Fox SMART."). In short, Fox Thesis and Fox SMART teach the use of citation analysis in databases storing information related to paper documents, while Fox Envision extends that teaching to hypertext networks. We conclude, therefore, that substantial evidence supports the board's determination that claim 45 of the '494 patent is obvious over a combination of Fox Envision and the Fox Papers.[5] *See In*

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[5] For similar reasons, we affirm the board's determination that claims 12 and 22 of the '571 patent are obvious in view of Fox Thesis, Fox SMART, and Fox Envision. *See Board Decision II*, 2015 WL 429750, at *10–16. As the board correctly determined, Fox Thesis and Fox SMART teach each of the elements of claims 12 and 22, other than the hypertext limitations, and Fox Envision teaches applying citation analysis to hypertext

re Gartside, 203 F.3d 1305, 1316 (Fed. Cir. 2000) ("The presence or absence of a motivation to combine references in an obviousness determination is a pure question of fact."); *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 (Fed. Cir. 2000) ("What a reference teaches and whether it teaches toward or away from the claimed invention are questions of fact." (citations and internal quotation marks omitted)).

IV. Alleged Teaching Away

"A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the

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networks. *Id.* Software Rights argues that claim 12 is not obvious because Fox Thesis describes the use of document identifiers, which it refers to as "dids," *see* J.A. II 5738, 5766, rather than URLs. We do not agree. As noted previously, Fox Thesis teaches using citation data, including bibliographic relationships, to improve search and retrieval. *See* J.A. II 5694–5725. Although Fox Thesis does not discuss the use of URLs, it must be read in view of Fox Envision, which explicitly teaches using citation analysis in hypertext systems. *See* J.A. II 5845. Given that Fox Envision is a follow-on work to Fox Thesis, a skilled artisan "would have combined the retrieval systems taught in Fox Thesis . . . with documents stored as web pages and linked by hypertext and hypermedia linking taught in [Fox] Envision." *Board Decision II*, 2015 WL 429750, at *12. As this court has previously recognized, moreover, taking well-known methods and applying them via the Internet is insufficient, standing alone, to render claims non-obvious. *See, e.g.*, *Muniauction, Inc. v. Thomson Corp.*, 532 F.3d 1318, 1327 (Fed. Cir. 2008) (concluding that "the incorporation of web browser functionality" did not establish non-obviousness).

path that was taken by the applicant." *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). According to Software Rights, the board erred in finding its claims obvious because the Fox Papers teach away from using indirect relationships, such as *bc* and *cc*, to enhance search and retrieval. In support, it argues that "when all of the Fox Papers' teachings are fairly considered, they overwhelmingly demonstrate that use of *bc* and *cc* harms search results for the vast majority of queries."

We disagree. One of the central teachings of the Fox Papers is that using indirect citation relationships, such as *bc* and *cc*, can improve search results. For example, Fox Thesis, after describing the results of one experiment, concludes that using a combination of *bc* and *cc* for clustering "seemed rather good" and that the "simpler" combination of *bc* and *cc* produced better clusters than a "mixture" of more subvectors. J.A. I 5693. Describing another experiment, Fox Thesis states that "[o]verall, the best behavior seemed to come when [*bc*] and [*cc*] were combined with equal weighting." J.A. I 5745. Discussing yet another experiment, Fox Thesis concludes that "[o]f all the subvectors, terms are best, though co-citations are not much worse. . . . Using regression or guessed at coefficients, the [term vector] and [*cc*] combination yields a 5–6% improvement over the performance when terms alone are used." J.A. I 5723. Fox SMART echoes the conclusions reached in Fox Thesis. It states that "[t]he extended vector model was introduced whereby various types of bibliographic data were utilized to supplement the standard term vectors" and explains that "[o]ne motivation for [this] model was *the success of clustering studies considering bibliographic data* instead of or in addition to terms." J.A. I 5406 (emphasis added).

Although the Fox Papers indicate that certain subvectors will perform worse than others under differing conditions and with the use of particular data sets, *see, e.g.*, J.A. I 5733–34, those references unequivocally convey that analysis of indirect citation relationships—such as *bc* and *cc*—can improve search and retrieval. *See, e.g.*, *Dome Patent L.P. v. Lee*, 799 F.3d 1372, 1381 (Fed. Cir. 2015) (concluding that there was no teaching away even where a prior art reference "disclose[d] potential disadvantages associated" with a claimed compound). Accordingly, substantial evidence supports the board's determination that the Fox Papers do not teach away from using indirect relationships to improve search and retrieval. *See In re Mouttet*, 686 F.3d 1322, 1334 (Fed. Cir. 2012) (emphasizing that the board's determination as to whether a particular reference teaches away from a claimed invention must be upheld if supported by substantial evidence).

We reject, moreover, Software Rights' assertion that the board failed to give proper consideration to objective indicia of non-obviousness. "Commercial success is relevant to obviousness only if there is a nexus . . . between the sales and the merits of the claimed invention." *Applied Materials*, 692 F.3d at 1299 (citations and internal quotation marks omitted). Although Software Rights argues that the success of Google's search engine using the PageRank algorithm provides objective evidence of non-obviousness, it fails to provide any credible evidence that Google's search engine practices any inventive elements recited in its claims. *See Board Decision I*, 2015 WL 470598, at *13 (noting that Software Rights "failed to provide the source code of PageRank, or any other detailed information beyond publicly-available, generalized hearsay statements about Google's search"). As we have previously made clear, "[w]here the offered secondary consideration actually results from something other than what is both claimed and *novel* in the claim, there is no nexus to the merits of the claimed invention." *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011); *see also Tokai Corp. v. Easton Enters., Inc.*, 632 F.3d 1358, 1369–70 (Fed. Cir. 2011) ("If commercial success is due to an element in the prior art, no nexus exists.").

V. The Deriving Actual Cluster Links Limitation

We conclude, however, that the board erred when it determined that Facebook failed to establish that claims 1 and 5 of the '494 patent are unpatentable over Fox SMART. *See Board Decision III*, 2015 WL 456539, at *8–11. In determining that Fox SMART does not teach deriving actual cluster links from the set of candidate cluster links, the board failed to consider fully Fox SMART's procedure for splitting overly large clusters. *See* J.A. I 10272–81; *see also Smith & Nephew, Inc. v. Rea*, 721 F.3d 1371, 1378 (Fed. Cir. 2013) (emphasizing that the board is obliged to "read[] the prior art for all that it teaches").

As an initial matter, we note that the specification of the '494 patent describes the step of deriving actual cluster links as "simple" or routine. '494 patent, col. 24 l. 2. It explains that "[o]nce the candidate cluster link set has been generated, deriving the actual cluster links is a simple matter of selecting or choosing the . . . top rated candidate links, and eliminating the rest." *Id.* col. 24 ll. 1–4 (diagram numbering omitted). Nothing in the specification suggests that deriving actual cluster links from the set of candidate cluster links is a novel or inventive aspect of the claimed invention.

Even more fundamentally, Fox SMART provides explicit instructions both on: (1) how to generate a set of candidate cluster links using indirect relationships such as *bc* and *cc*; and (2) how to derive a subset of actual cluster links from that candidate cluster link set. *See* J.A. I 10270–81. As discussed previously, a key teaching of Fox SMART is that search and retrieval can be improved by clustering documents based upon indirect bibliographic relationships such as *bc* and *cc*. J.A. I 10255–82. The Fox SMART algorithm analyzes direct relationships between documents and then identifies and assigns weights to indirect relationships between documents. *See* J.A. I

10257–60. Both the direct and indirect relationships can be represented as vectors in a table or matrix. *See* J.A. I 10257–60, 10274.

In the Fox SMART system, clustering proceeds by determining the "overall similarity between documents" which is calculated "based on available subvectors," J.A. I 10274, such as *bc* and *cc*, *see* J.A. I 10257–60. If a cluster exceeds a preset size limit, *see* J.A. I 10273, an algorithm splits the cluster and re-groups its constituent documents into smaller clusters, J.A. I 10275–79. Splitting overly large clusters is accomplished by creating a "complete similarity matrix" that compares the "pairwise combined similarity values" for each potential pair of documents in the original cluster. J.A. I 10277; *see also* J.A. I 10257–60, 10271–76. Because the similarity values calculated during cluster-splitting provide a set of possible cluster links between each document and every other document in the original cluster, they qualify as "candidate cluster links." *See Board Decision III*, 2015 WL 456539, at *5 (explaining that "candidate cluster links" are the "set of possible cluster links between a search node and a target node" (citations and internal quotation marks omitted)); *see also* '494 patent, col. 13 ll. 25–26 (defining a "cluster link" as "a relationship between two nodes").

Fox SMART then describes the process for deriving a subset of actual cluster links from the set of candidate links. Fox SMART's cluster-splitting procedure identifies "highly correlated pairs" of documents from the original cluster by "comparing the similarity of a pair of children to the average off diagonal similarity value and seeing if it is a sufficient number of standard deviations away from the mean." J.A. I 10278. Next, Fox SMART forms new, smaller clusters which contain "highly correlated pairs," J.A. I 10278, and which also pass other tests for similarity and overlap, J.A. I 10277–79. Simply put, when splitting an oversized cluster, Fox SMART first generates candidate cluster links between all of the documents in the original cluster and then derives a subset of those links—the actual cluster links—in order to create new, smaller clusters.

Indeed, Fox SMART and the preferred embodiment of the ’494 patent perform the relatively straightforward step of deriving actual cluster links from the set of candidate links in exactly the same way. The preferred embodiment, like Fox SMART, generates a set of candidate cluster links based on direct and indirect relationships and then represents those candidate cluster links as vectors in a matrix. *Compare* ’494 patent, col. 21 ll. 60–64 (“[T]he cluster link generator . . . generates a set of cluster links based upon both the direct links and on the indirect paths. The cluster links may be represented by a table or a series of vectors.” (diagram numbering omitted)), *with* J.A. I 10275–80 (describing Fox SMART’s procedure for creating a complete similarity matrix that compares the similarity values for each possible pair of documents in a cluster). Next, the preferred embodiment, like Fox SMART, selects a subset of the candidate cluster links to become actual cluster links. *Compare* ’494 patent, col. 21 l. 66–col. 22 l. 4 (“Candidate cluster links are the set of all possible cluster links between a search node and a target node. . . . [T]he actual cluster links which meet a certain criteria are used to locate nodes for display.” (diagram numbering omitted)), *with* J.A. I 10277–80 (describing Fox SMART’s splitting procedure which generates candidate cluster links between pairs of documents in an oversized cluster and then selects a subset of those links, based on the strength of their similarity, to become the actual cluster links in new, smaller clusters). The board erred, therefore, in concluding that Fox SMART does not teach deriving actual cluster links from the set of candidate links as required by claims 1 and 5. *See Board Decision III*, 2015 WL 456539, at *8–11.

The dissent contends that Fox SMART does not teach deriving actual cluster links because its cluster-splitting algorithm does not eliminate candidate cluster links, but instead "simply redistributes the candidate cluster links among two or more clusters." Dissent at 4. This argument fails. When it splits oversize clusters, the Fox system calculates pairwise similarity values between each document and every other document in the original cluster. *See* J.A. I 10275–79. The algorithm thus calculates the similarity value between document one and document two, document one and document three, document one and document four, etc., until it has obtained similarity values for every pair of documents in the original, oversized cluster. *See* J.A. I 10277–79. These similarity values are the candidate cluster links. The Fox system then chooses the best candidate cluster links to become actual cluster links. If, for example, document one is much more similar to document two than it is to document three, then documents one and two will likely be placed together in one cluster while document three will likely be placed in a different cluster. *See* J.A. I 10278 (explaining that when an oversize cluster is split, the new, smaller clusters will contain "highly correlated pairs" of documents). The candidate cluster link between documents one and three will be eliminated when document one is placed in a separate cluster from document three. There is no merit, therefore, to the dissent's assertion that Fox SMART does not teach eliminating candidate cluster links.

On appeal, Software Rights contends that Facebook waived the right to argue that Fox SMART's cluster-splitting procedure teaches the deriving actual cluster links limitation by failing to properly present that argument to the board. We disagree. Facebook's original IPR petition identified Fox SMART's cluster-splitting procedure as teaching the "deriving" step. *See* J.A. I 2022–23. In his declaration submitted with Facebook's IPR petition, moreover, Fox specifically stated that the process of "recursively splitting overly large nodes" in both Fox

SMART and Fox Thesis teaches the deriving actual cluster links limitation. J.A. I 10851 (citations and internal quotation marks omitted). Likewise, when Fox was cross-examined by counsel for Software Rights, he explained in detail how the cluster-splitting procedure satisfies the deriving actual cluster links limitation. *See* J.A. I 20758–59; *see also* J.A. I 20695, 20770, 20772–75. We reject, therefore, Software Rights' contention that Facebook waived the right to rely on Fox SMART's cluster-splitting procedure to meet the requirement of deriving a subset of actual cluster links.

We also reject Software Rights' argument that Fox SMART does not teach claim 1's limitation reciting "displaying the identity of one or more nodes using the actual cluster links," '494 patent, col. 51 ll. 47–48. Fox SMART specifically states that "clustered search allows retrieval of groups in response to query submission," J.A. I 10270, and that "most of the documents in a retrieved cluster are presented to the user," J.A. I 10282. Because Fox SMART retrieves and displays whole clusters of documents, it necessarily "us[es] the actual cluster links" that form those clusters when displaying documents or "nodes" as required by claim 1.[6]

We are likewise unpersuaded by Software Rights' argument that Fox SMART does not anticipate because it teaches retrieving all documents and ranking multiple clusters of documents for display. As the board correctly determined, ranking documents from multiple clusters is not the same as deriving a subset of those documents. *See Board Decision III*, 2015 WL 456539, at *10 (explaining that "a set of ranked documents provides an indication of an order of presentation, but is not a subset"). Signifi-

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[6] The '494 patent explains that a "node" can be a document, a concept, or a web page. *See* '494 patent, col. 12 ll. 36–38.

cantly, however, claim 1 does not require deriving or displaying a subset of *documents*. Instead, it requires deriving a subset of cluster links. *See* ’494 patent, col. 51 ll. 44–45 (reciting “deriving actual cluster links from the candidate cluster links”). Likewise, claim 5 does not require eliminating *documents*, but instead only requires eliminating candidate cluster links. *See id.* col. 52 ll. 1–4 (reciting “eliminating candidate cluster links, wherein the number of candidate cluster links are limited and the closest candidate cluster links are chosen over the remaining links”). As discussed above, Fox SMART’s cluster-splitting procedure teaches deriving a subset of actual cluster links from the set of candidate links when it describes the procedure for splitting overly large clusters. Software Rights points to nothing in claims 1 and 5 that additionally requires deriving a subset of documents for display. We conclude, therefore, that the board erred in confirming the patentability of claims 1 and 5 over Fox SMART. *See Board Decision III*, 2015 WL 456539, at *8–11.

VI. Claims 15 and 16 of the ’494 Patent

For similar reasons, we conclude that the board erred in confirming the patentability of claims 15 and 16 of the ’494 patent over Fox Thesis. *See id.* at *13. The only limitation in claims 15 and 16 that the board found missing from Fox Thesis was the step of deriving a subset of actual cluster links from the set of candidate cluster links. *Id.* Because the process for splitting overly large clusters in Fox Thesis is essentially the same as that described in Fox SMART, the board erred in concluding that Fox Thesis fails to teach the step of deriving actual cluster links from the set of candidate cluster links.

Fox Thesis and Fox SMART arose from the same thesis project and were originally part of one document. *See Board Decision I*, 2015 WL 470598, at *9. It is unsurprising, therefore, that the clustering process described in Fox

Thesis tracks that described in Fox SMART. Indeed, Fox SMART specifically refers to Fox Thesis when it describes its clustering algorithm. *See* J.A. I 10271. Like Fox SMART, Fox Thesis describes a procedure in which overly large clusters are split and new clusters are formed based on high pairwise similarity values. *See* J.A. I 10607, 10613–14; *see also* J.A. I 10619 (explaining that a cluster will be split when "the splitting limit of 20 [documents] is reached"). As Fox Thesis explains, its algorithm will continually split and reform clusters so that "the tree stays relatively balanced and all documents are the same distance from the root." J.A. I 10613. In Fox Thesis, each new, smaller cluster contains a derived set of actual cluster links. *See* J.A. I 10614–21 (providing an example of the procedure for splitting an overly large cluster and forming smaller clusters of closely linked documents).

Software Rights contends that Fox Thesis does not teach clustering with *bc* and *cc* because it does not require the use of *bc* and *cc* when forming clusters. This argument is unavailing. As discussed previously, Fox Thesis and Fox SMART are both replete with statements encouraging the use of indirect relationships, such as *bc* and *cc*, to cluster documents and search databases. *See, e.g.*, J.A. I 10584–89, 10633–38 (Fox Thesis); J.A. I 10255–82 (Fox SMART). The fact that they do not in all cases mandate the use of indirect relationships during the clustering process does not mean that they do not teach the use of *bc* and *cc* for clustering. *See Hewlett–Packard Co. v. Mustek Sys., Inc.*, 340 F.3d 1314, 1326 (Fed. Cir. 2003) (explaining that "a prior art product that sometimes, but not always, embodies a claimed method nonetheless teaches that aspect of the invention"); *see also Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1376 (Fed. Cir. 2005) (concluding that a prior art reference anticipated notwithstanding the fact that it disclosed a claimed compound in a list with other suitable "skin benefit ingredients").

Software Rights attempts to salvage the board's decision upholding the patentability of claims 1, 5, 15, and 16 by seeking affirmance on grounds not raised before the board. As a general rule, however, arguments not raised before the board are waived on appeal. *See Redline Detection, LLC v. Star Envirotech, Inc.*, 811 F.3d 435, 450 (Fed. Cir. 2015); *see also Camp v. Pitts*, 411 U.S. 138, 142 (1973) (per curiam) (emphasizing that "the focal point for judicial review should be the administrative record already in existence, not some new record made initially in the reviewing court"); *In re Lee*, 277 F.3d 1338, 1345 (Fed. Cir. 2002) (explaining that "review of an administrative decision must be made on the grounds relied on by the agency").

VII. Claim 21 of the '571 Patent

Finally, we conclude that the board erred when it determined that claim 21 of the '571 patent is patentable over a combination of Fox Thesis, Fox SMART, and Fox Envision. *See Board Decision II*, 2015 WL 429750, at *16–18. The board found that the prior art failed to teach a specific feature of claim 21, the limitation requiring "deriving actual cluster links from the set of candidate cluster links." J.A. II 5090 (emphasis omitted); *see Board Decision II*, 2015 WL 429750, at *17–18. As discussed above, however, the cluster-splitting procedure disclosed in both Fox SMART and Fox Thesis teaches deriving actual cluster links from a set of candidate cluster links. Furthermore, the actual cluster links in Fox SMART are selected "based on the assigned weights," as claim 21 requires, J.A. II 5090 (emphasis omitted), because the final clusters are defined by pairs of documents that have been assigned high similarity values. *See* J.A. II 5961–62.

Software Rights argues that the Fox Papers do not teach "determining . . . hyperjump data that has an indirect reference to the chosen node," J.A. II 5090, because "[t]he clusters produced from Fox's clustering process contain documents that do not have any indirect relationships between them." This argument fails. Fox Thesis and Fox SMART teach clustering using *bc* and *cc*, even if some clusters contain documents that are assigned to that cluster based upon relationships other than *bc* and *cc*. *See, e.g.*, *Merck & Co. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) (explaining that the fact that the prior art discloses a "multitude of effective combinations" does not mean that any particular combination is not obvious). We therefore reverse the board's decision concluding that Facebook failed to establish that claim 21 of the '571 patent is obvious over the prior art.

CONCLUSION

We have considered Software Rights' remaining arguments but do not find them persuasive. Accordingly, we affirm the determinations of the Patent Trial and Appeal Board that claims 18–20, 45, 48–49, 51, and 54 of the '494 patent and claims 12 and 22 of the '571 patent are unpatentable on the ground of obviousness, but reverse its determinations that claims 1, 5, 15, and 16 of the '494 patent and claim 21 of the '571 patent are patentable over the prior art.

AFFIRMED-IN-PART AND REVERSED-IN-PART

COSTS

The cross-appellants shall have their costs.

NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

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SOFTWARE RIGHTS ARCHIVE, LLC,
Appellant

v.

FACEBOOK, INC., LINKEDIN CORPORATION, TWITTER, INC.,
Cross-Appellants

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2015-1649, 2015-1650, 2015-1651

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Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2013-00479, IPR2013-00480.

SOFTWARE RIGHTS ARCHIVE, LLC,
Appellant

v.

FACEBOOK, INC., LINKEDIN CORPORATION, TWITTER, INC.,
Cross-Appellants

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2015-1652, 2015-1653

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. IPR2013-00481.

CHEN, *Circuit Judge*, dissenting in part.

I join the court's opinion with the exception of parts V, VI, and VII, which all relate to the cross-appeals filed by Facebook, Inc., LinkedIn Corporation, and Twitter, Inc. (collectively "Cross-Appellants"). In those parts of the opinion, the majority reverses the Patent Trial and Appeal Board's decisions, which found that claims 1 and 5 of U.S. Patent No. 5,832,494 were not anticipated by Fox SMART; claims 15 and 16 of the '494 patent were not anticipated by Fox Thesis; and claim 21 of U.S. Patent No. 6,233,571 would not have been obvious in view of Fox SMART, Fox Thesis, and Fox Envision. I would hold that the Board's findings that the prior art references failed to disclose "deriving actual cluster links from the candidate cluster links"[1] were supported by substantial evidence. I

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[1] Claims 1 and 5 of the '494 patent explicitly include the limitation "deriving actual cluster links from the candidate cluster links." '494 patent, 51:44–45. The parties do not dispute that claims 15 and 16 of the '494 patent and claim 21 of the '571 patent include this same limitation, albeit using slightly different words. *See id.* at 52:65–67 ("The method of claim 14 further comprising the step of deriving the actual cluster links wherein the actual cluster links are a subset of the candidate cluster links."); '571 patent (Reexamination Certificate), 2:53–54 ("deriving actual cluster links from the set of candidate cluster links based on the assigned weights").

would therefore affirm the Board's Final Written Decisions in full.

In support of its unpatentability holding, the majority identifies the cluster-splitting process disclosed in Fox SMART and Fox Thesis as disclosing the "deriving" limitation. The majority describes the steps in this process as involving (1) the creation of a "similarity matrix" representing the calculated similarity between individual pairs of documents in a cluster; (2) the identification of "highly correlated pairs" of documents within the cluster based on the calculated similarity values found in the similarity matrix; and (3) the formation of new, smaller clusters containing those "highly correlated pairs" of documents. Op. at 21–22 (citations omitted). The majority equates these new, smaller clusters with the "actual cluster links" described in the claims and contends that they are derived from "candidate cluster links" in the form of the calculated similarity values. *Id.* at 22.

The Board found to the contrary. It first construed "actual cluster links" to mean "a subset of the candidate cluster links, which meet certain criteria." *Board Decision III*, 2015 WL 456539, at *5. It then reasoned that under the construction—which Cross-Appellants did not challenge on appeal—derivation of actual cluster links required deletion of at least some candidate cluster links. *Id.* at *9–10. The Board reviewed the Fox references and found that the only cluster links deleted in the cluster-splitting process are "those that simply overlap, or duplicate, other clusters," which means that, in fact, no candidate cluster links are deleted at all. *Id.* at *10. As a result, Fox SMART and Fox Thesis failed to disclose the "deriving" step.

I believe the Board's conclusion is based on a reasonable reading of those references. The '494 patent's description of deriving candidate cluster links is clear:

> Once the candidate cluster link set has been generated, deriving the actual cluster links is a simple matter of selecting or choosing the T top rated candidate links, *and eliminating the rest*.

’494 patent, 24:1–4 (emphasis added) (diagram numbering omitted); *see also* Op. at 20. That description is consistent with the Board’s construction of “actual cluster links.” The cluster-splitting process disclosed in Fox SMART and Fox Thesis, in contrast, uses a qualitatively different approach. As the Board found, that process does not involve eliminating any candidate cluster links. Instead, cluster-splitting simply redistributes the candidate cluster links among two or more clusters. Such redistribution cannot result in a “subset of the candidate cluster links” as required by the claims.

Further, the majority, in my view, conflates two different aspects of information retrieval to reach its conclusion: creating a database and searching a database.

The Fox references use cluster-splitting in database creation. Fox describes adding documents to a database as akin to placing leaves on a tree. J.A. I 10272 (“The clustering algorithm produces a hierarchy where all *N* documents in a collection end up as leaves of a multilevel tree.”). One by one each document is placed on the particular branch of the tree (i.e., the “cluster”) containing other documents with which it is most similar. *Id.* When a branch is assigned more documents than it can bear, that branch splits in two. *Id.* It is at this step that the cluster-splitting process occurs. Documents continue to be added to the tree—and branches/clusters are split as necessary—until no documents remain. J.A. I 10275 (“Adding documents . . . simply involves finding the proper place to insert, attaching the incoming entry appropriately, and recursively splitting overly large nodes from that point up the tree as needed.”).

In contrast to creating the database, the claims at issue are directed to analyzing (i.e., searching) an already populated database. Claims 1 and 5 of the '494 patent are exemplary. They expressly claim a "method of analyzing a database." '494 patent, 51:38. The claimed method begins with the selection of a document (i.e., a "node") for analysis and results in the display of other, similar documents as determined by the "actual cluster links." *Id.* at 51:38–49. During oral argument, counsel for Cross-Appellants LinkedIn and Twitter compared the claimed methods to a Lexis search for "more cases that are like this case."[2] Oral Argument Tr., No. 2015-1652, 19:13–20:30.

Fox SMART confirms that, while the process used to search a database is similar to the process used to create the database, the processes are different. J.A. I 10281 ("Searching a clustered tree is very much like finding the correct place to add a new document . . . . However, searching has a different objective; instead of finding the single twig where insertion should follow[,] one would like to retrieve and rank documents so that all relevant documents, regardless of what cluster they appear in, are

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[2] Though claims 15 and 16 of the '494 patent are directed to "method[s] of representing the relationships between nodes," '494 patent, 52:51–52, Cross-Appellants make no argument that this difference impacts the unpatentability analysis. Cross-Appellants' Br. 75 ("For the same reasons explained above with respect to claim 1, the Board's decision [with respect to claims 15 and 16] was erroneous and should be reversed."). And, like claims 1 and 5 of the '494 patent, claim 21 of the '571 patent involves a method that begins with the selection of a node for analysis and results in the display of data as determined by "actual cluster links." '571 patent (Reexamination Certificate), 2:38–55.

retrieved as soon as possible.”). Neither Fox SMART nor Fox Thesis suggests that the cluster-splitting process used in database creation is part of search. Cross-Appellants’ reliance on Fox’s cluster-splitting in support of their unpatentability arguments is therefore misplaced.

Moreover, the search process described in Fox SMART and Fox Thesis necessarily follows database creation. *See* J.A. I 10270 (“Clustering is simply a process for creating groupings, and clustered search allows retrieval of groups in response to query submission.”). By the time a user searches the database, the document tree is already full. It is thus the links within this fully formed tree that must serve as the claimed “candidate cluster links,” a proposition that counsel for Cross-Appellants LinkedIn and Twitter admitted at oral argument results in a “dead end.” Oral Argument Tr., No. 2015-1652, 22:34–22:42. This is because Fox SMART makes clear that a search returns *all* documents in the database. As the Board explained, “Fox SMART states that ‘one would like to retrieve and rank documents so that all relevant documents, *regardless of what cluster they appear in*, are retrieved as soon as possible.’” *Board Decision III*, 2015 WL 456539, at *10 (emphasis added) (quoting J.A. I 10281). No documents are deleted or otherwise removed before presentation to the user. As such, the Board was correct to find that Fox SMART’s search process cannot satisfy the unchallenged construction of “actual cluster links.” *Id.* at *10 (“We are not persuaded that Fox SMART’s description of ranking documents discloses deriving a subset because a set of ranked documents provides an indication of an order of presentation, but is not a subset. . . . Because Petitioner does not point to disclosure of deriving a subset, Petitioner has not shown by a preponderance of the evidence display using links of that subset.”). I therefore would find that substantial evidence supports the Board’s decision that the Fox references do not disclose a key limitation of claims 1, 5, 15, and 16 of the ’494 patent and claim 21 of the ’571 patent and, as a result, do not render those claims unpatentable.