

EXHIBIT 2051

Challenged Claims of '494 Patent (numerical)	Evidence of Infringement – Google’s Search Engine that uses
<p>18. A method of analyzing a database having objects and a first numerical representation of direct relationships in the database, comprising the steps of:</p>	<p>Google’s Software includes methods of analyzing databases (or databases) related to the World Wide Web and other hypermedia. Google obtains and stores information concerning the link structure of the Web.</p> <p>Google uses its database of links to create an adapted adjacency matrix for the calculation of the PageRank algorithm. These matrices map the relationships between each web page on the Web. Ex. 2099: Langville, Amy and Meyer, <i>PageRank and Beyond: The Science of Search Engine Rankings</i>, MIT Press, Cambridge University Press 2006). Google’s adapted adjacency matrices (or matrices) constitute a first numerical representation of direct relationships in the database.</p> <p>Google’s Software includes methods of analyzing databases to determine the structure of direct relationships between objects. Google obtains and stores information concerning the hyperlink structure of the Web in a links database.</p> <p>To implement PageRank, the web crawler simply needs to build a graph of links as it crawls.”</p> <p>Ex. 2054: <i>The PageRank Citation Ranking: Bringing Order to the Web</i>.</p> <p>The citation (link) graph of the web is an important resource that has gone unused in existing web search engines. We have created a graph of as many as 518 million of these hyperlinks, a significant sample of the Web. Ex. 2053: <i>The Anatomy of a Large-Scale Hypertextual Web</i> Section 2.1.</p>

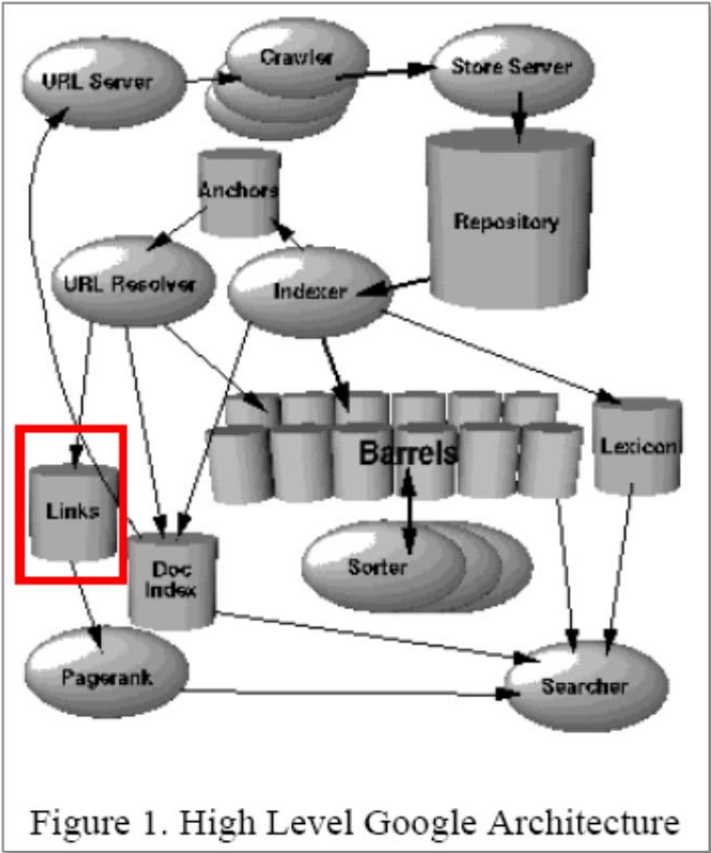
EXHIBIT 2051
 Facebook, Inc. et al.
 v.
 Software Rights Archive, LLC
 CASE IPR2013-00480

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<p>18. A method of analyzing a database having objects and a first numerical representation of direct relationships in the database, comprising the steps of:</p>	<p>Google’s Software includes methods of analyzing databases (or a copy of such databases) related to the World Wide Web and other hypermedia databases. Google obtains and stores information concerning the link structure of the web:</p> <p>Google uses its database of links to create an adapted adjacency matrix for use in the calculation of the PageRank algorithm. These matrices map the direct links between each web page on the Web. Ex. 2099: Langville, Amy and Meyer, Carl D, <i>Google's PageRank and Beyond: The Science of Search Engine Rankings</i>, at 31-52 (Princeton University Press 2006). Google’s adapted adjacency matrices (or derived databases) constitute a first numerical representation of direct relationships in the database.</p> <p>Google’s Software includes methods of analyzing databases to build representations of direct relationships between objects. Google obtains and stores information concerning the hyperlink structure of the Web in a links database.</p> <p>To implement PageRank, the web crawler simply needs to build an index of links as it crawls.”</p> <p>Ex. 2054: <i>The PageRank Citation Ranking: Bringing Order to the Web</i> at 6.</p> <p>The citation (link) graph of the web is an important resource that has largely gone unused in existing web search engines. We have created maps containing as many as 518 million of these hyperlinks, a significant sample of the total.</p> <p>Ex. 2053: <i>The Anatomy of a Large-Scale Hypertextual Web Search Engine</i>, at 2.1.</p>

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	<p>The indexer performs another important function. It parses out all the links in every web page and stores important information about them in an anchors file. This file contains enough information to determine where each link points from and to, and the text of the link.</p> <p>Ex. 2053: <i>The Anatomy of a Large-Scale Hypertextual Web Search Engine</i>, at 4.1 (emphasis added)</p> <p>It also generates a database of links which are pairs of docIDs. The links database is used to compute PageRanks for all the documents.</p> <p>Ex. 2053: <i>The Anatomy of a Large-Scale Hypertextual Web Search Engine</i>, at 4.1.</p> <p><i>See also id.</i> at 4.1 fig.1 (red box added) below:</p>

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The first numerical representation is stored.

“The indexer performs another important function. It parses out all the links in every web page and **stores** important information about them in an anchors file.

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... The URLresolver reads the anchors file ... It also generates a database of links which are pairs of docIDs. The links database is used to compute PageRanks for all the documents.”
The Anatomy of a Large-Scale Hypertextual Web Search Engine, at 4.1 (emphasis added).

Storage Statistics	
Total Size of Fetched Pages	147.8 GB
Compressed Repository	53.5 GB
Short Inverted Index	4.1 GB
Full Inverted Index	37.2 GB
Lexicon	293 MB
Temporary Anchor Data (not in total)	6.6 GB
Document Index Incl. Variable Width Data	9.7 GB
Links Database	3.9 GB
Total Without Repository	55.2 GB
Total With Repository	108.7 GB

Ex. 2053: *The Anatomy of a Large-Scale Hypertextual Web Search Engine*, at

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