UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

NETWORK-1 TECHNOLOGIES, INC.,

Plaintiff,

v.

GOOGLE LLC and YOUTUBE, LLC,

Defendants.

14 Civ. 2396 (PGG)

14 Civ. 9558 (PGG)

DECLARATION OF PROFESSOR MICHAEL D. MITZENMACHER IN SUPPORT OF PLAINTIFF NETWORK-1 TECHNOLOGIES, INC.'S REPLY CLAIM CONSTRUCTION BRIEF

I. INTRODUCTION

1. I provide this declaration in support of Plaintiff Network-1 Technologies, Inc.'s Reply Claim Construction Brief. My qualifications are detailed in the declaration I submitted in this case in support of Network-1's Opening Claim Construction Brief, and in the curriculum vitae attached to that declaration.

2. I provide this declaration in response to several points concerning "non-exhaustive search" raised by Defendants in their Response Claim Construction Brief, and by Dr. Storer in his declaration in support of that brief.

II. MATERIALS CONSIDERED

3. In forming my opinions set forth in this declaration, in addition to the materials I reviewed in preparing my first declaration, I have also reviewed Defendants' Responsive Claim Construction Brief, Dr. Storer and Samuel Davidoff's declarations in support of that brief and the exhibits thereto, the transcript of my June 24, 2019 deposition, and the transcript of the July 10, 2019 deposition of Dr. Storer.

4. As with my first declaration, I have also considered the parties' respective proposed claim constructions. In addition, I have relied upon my professional and academic experience, as well as a number of references identified in the body of this declaration and the prior submissions. I reserve the right to consider additional materials or information as I become aware of them and to revise my opinions accordingly in light of such additional information.

III. "NON-EXHAUSTIVE [. . .] SEARCH"

5. In my opinion, the term "non-exhaustive search" is a term that is well understood by skilled artisans in the field of the patents, was well understood at the time of the invention, is not indefinite, and under the claim construction standard I understand to apply here, should be

construed as "a search designed to locate a [near] neighbor without comparing to all possible matches (*i.e.*, all records in the reference data set), even if the search does not locate a [near] neighbor."

6. The Federal Circuit's opinion discussed by Dr. Storer does not compel any different conclusions. I understand that the Federal Circuit applied a claim construction standard called the broadest reasonable interpretation ("BRI"), which is different from the *Phillips* ordinary and customary meaning standard that I understand applies here. The only difference between the Federal Circuit's construction and Network-1's proposed construction is whether searches that compare against all records, but not necessarily all data within all records, are exhaustive or non-exhaustive. A comparison of the Federal Circuit's and Network-1's formulation of "exhaustive" is instructive:

	Federal Circuit's BRI Construction	**Network-1's Proposed Construction**
Comparison of all possible matches using sufficient data to determine whether a given record is a match;	✓	✓
AND any additional data in a record, even though not necessary to determine if a record is a match.	✓	NO

Both the Federal Circuit's BRI construction and Network-1's proposed construction define an exhaustive search as one that is designed to compare to all records. Under both, any search that does not compare to all records is "non-exhaustive." The only instance in which a search would be non-exhaustive under the Federal Circuit's construction but exhaustive under Network-1's proposed construction is when the search compares the query to all of the records in the data set, but does not compare that query to all of the data in each record. This would only arise where comparison of the query to a particular record could determine that the record either does or does

not match the query without comparing to all of the data in that record. If there is no extraneous data in the records used in a search, the definitions merge and there is no difference between the Federal Circuit's BRI construction and Network-1's construction.

7. As an oversimplified example, if the reference set has a record for each of 100 pieces of music and includes 10 characteristics about each piece, but a query is seeking to determine only which records match a specific five of those characteristics, that search would only need to compare the query to the relevant five characteristics, and not to the other five, irrelevant (to this search) characteristics. This search would be exhaustive under Network-1's proposed definition because it would compare the query to all of the records, but would not compare the query to the extraneous and unnecessary data in the records that was not needed to determine if a record was or was not a match to the query. If there is no extraneous data in the records, then the Federal Circuit's definition of "exhaustive" merges with Network-1's definition. The only type of search that would be "exhaustive" under the narrower understanding of that term applied by the Federal Circuit, but not under Network-1's definition is one that is forced to compare against extraneous data in one or more records (i.e., data that is not needed to determine or is irrelevant in determining whether or not a record is a match). The use of a definition that would define non-exhaustive searches based on whether or not they perform comparisons to unnecessary and extraneous portions of the data in a record is not consistent with the understanding that a person skilled in the art would have based on the usage in the art, and based on the intrinsic record of the patents, including the references that are incorporated by reference in the patents, as discussed further below and in my prior declaration. As a general matter, I do not agree that there are multiple, equally possible definitions of "non-exhaustive . . . search" to persons skilled in the art understanding that term in light of the intrinsic evidence of

the Network-1 patents and their file histories, nor do I agree that the term is unclear or somehow renders the claims of the patens-in-suit uncertain. Put simply, a skilled artisan would not design a search that unnecessarily compares against extraneous or irrelevant data, as it would be a wasteful use of computing resources, nor would such a skilled artisan use the term "exhaustive search" only to refer to such searches that may perform unnecessary work.

8. In particular, the patent specification indicates the term "non-exhaustive search" does not render the claims indefinite, and supports Network-1's construction. As explained in detail in my first declaration, a skilled artisan would have understood with reasonable certainty what searches were within the scope of the claims based on the specification's focus on efficient searching as well as the exemplary searches it provides—all of which are algorithms that examine a data set by comparing a query to less than all of the records in the data set.

9. The specification does not explicitly address how much data within each record must be compared to a query in any of the searches it describes. However, as I explain above in the context of evaluating the Federal Circuit's construction, a person of skill in the art would have recognized there is no reason the specification should do so—he or she would have known it may not be necessary to examine all data in a given record to determine whether or not that record is a match. In particular, a skilled artisan would have known to design a search, including those that compare all records to a query, so that the search compares against only sufficient data in the record to the query to determine whether or not a given record is a match. To avoid examining unnecessary data and using more computer resources than necessary, the skilled artisan would have known to not compare against extraneous, irrelevant, or any data beyond what is sufficient to reach a conclusion about the record—such searches are simply not conducted and therefore are of course not described in the literature. A person of skill in the art

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