

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

EMC CORPORATION, EMC
INTERNATIONAL COMPANY, and EMC
INFORMATION SYSTEMS
INTERNATIONAL,

Plaintiffs,

v.

PURE STORAGE, INC.,

Defendant.

Civil Action No. 13-1985-RGA

MEMORANDUM OPINION

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February 2, 2016


ANDREWS, U.S. DISTRICT JUDGE:

Presently before the Court is the issue of supplemental claim construction of two terms in U.S. Patent No. 7,434,015 (“the ’015 patent”) and U.S. Patent No. 7,373,464 (“the ’464 patent”) and two terms in U.S. Patent No. 6,904,556 (“the ’556 patent”). The Court has considered the parties’ supplemental claim construction briefs (D.I. 332, 333, 334, 335) and requested letters (D.I. 346 and 348). The Court heard oral argument on January 8, 2016. (D.I. 353).

I. BACKGROUND

EMC Corporation filed a complaint on November 26, 2013 alleging that Pure infringed U.S. Patent Nos. 6,915,475 and 8,375,187; the ’556 patent; the ’464 patent; and the ’015 patent. (D.I. 1). On June 6, 2014, EMC filed an amended complaint, joining EMC International Company and EMC Information Systems International as plaintiffs (Plaintiffs are collectively referred to herein as “EMC”). (D.I. 37). The Court held a *Markman* hearing on December 16, 2014 (D.I. 108) and subsequently issued a claim construction ruling (D.I. 115, 121). The parties’ respective motions for summary judgment and exclusion of expert testimony are pending before the Court. (D.I. 198, 204, 206, 211, 214, 302, 317). The December 14, 2015 summary judgment hearing highlighted the parties’ disputes regarding the plain and ordinary meaning of several claim terms. (D.I. 327 at 125–37). The parties thereafter submitted the supplemental claim construction briefing and made the oral arguments presently under consideration. (D.I. 327 at 136–37). At the Court’s request, the parties also submitted letters regarding Pure’s proposals for two of the claim terms. (D.I. 346, 348).

Two of the disputed claim terms appear in the ’015 and ’464 patents. (D.I. 332 at 5, 17; D.I. 333 at 9, 15). The ’015 and ’464 patents share a specification and disclose systems and methods for efficient data storage involving eliminating redundancy. (’015 patent, 1:19–20; ’464

patent, 1:21–22). The other two disputed claim terms appear in the '556 patent. (D.I. 332 at 21, 23; D.I. 333 at 24, 25). The '556 patent discloses systems and methods of data storage involving parity-based fault tolerance techniques. ('556 patent, 1:6–8).

II. LEGAL STANDARD

“It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (internal quotation marks omitted). “[T]here is no magic formula or catechism for conducting claim construction.’ Instead, the court is free to attach the appropriate weight to appropriate sources ‘in light of the statutes and policies that inform patent law.’” *SoftView LLC v. Apple Inc.*, 2013 WL 4758195, at *1 (D. Del. Sept. 4, 2013) (quoting *Phillips*, 415 F.3d at 1324). When construing patent claims, a court considers the literal language of the claim, the patent specification, and the prosecution history. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 977–80 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996). Of these sources, “the specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Phillips*, 415 F.3d at 1315 (internal quotation marks and citations omitted).

“[T]he words of a claim are generally given their ordinary and customary meaning. . . . [The ordinary and customary meaning is] the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.”

Id. at 1312–13 (internal quotation marks and citations omitted). “[T]he ordinary meaning of a claim term is its meaning to [an] ordinary artisan after reading the entire patent.” *Id.* at 1321 (internal quotation marks omitted). “In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim

construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.” *Id.* at 1314 (internal citations omitted).

When a court relies solely upon the intrinsic evidence—the patent claims, the specification, and the prosecution history—the court’s construction is a determination of law. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015). The court may also make factual findings based upon consideration of extrinsic evidence, which “consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” *Phillips*, 415 F.3d at 1317–19 (internal quotation marks and citations omitted). Extrinsic evidence may assist the court in understanding the underlying technology, the meaning of terms to one skilled in the art, and how the invention works. *Id.* Extrinsic evidence, however, is less reliable and less useful in claim construction than the patent and its prosecution history. *Id.*

“A claim construction is persuasive, not because it follows a certain rule, but because it defines terms in the context of the whole patent.” *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998). It follows that “a claim interpretation that would exclude the inventor’s device is rarely the correct interpretation.” *Osram GmbH v. Int’l Trade Comm’n*, 505 F.3d 1351, 1358 (Fed. Cir. 2007) (internal quotation marks and citation omitted).

III. PATENTS AT ISSUE

For purposes of this supplemental claim construction, claim 1 of the ’015 patent is representative of the asserted ’015 and ’464 patent claims. It reads:

1. A method for storing data comprising:
receiving a data stream comprising a plurality of data segments;
assigning an identifier to one of the plurality of data segments; and

determining whether one of the plurality of data segments has been stored previously using a summary, wherein the summary is a space efficient, probabilistic summary of segment information.

(’015 patent, 9:53–61).

For purposes of this supplemental claim construction, claim 6 of the asserted ’556 patent is representative. It reads:

6. A memory system, comprising:
 - a plurality of semiconductor memory segments, the segments being grouped into groups, each of the groups including N respective semiconductor memory segments, the number N being an integer, the N respective segments in each respective group comprising respective data segments and a respective parity segment; and
 - in each of the groups:
 - the respective parity segment stores a respective data value P that may be calculated by a logical exclusive-or of respective data values stored in the respective data segments, wherein:
 - the segments reside in memory regions of a memory board, and
 - each of the segments included in a respective memory region may be assigned a respective base memory address different from other respective base memory addresses that may be assigned to other segments included in the respective memory region.

(’556 patent, 15:16–35).

IV. CONSTRUCTION OF DISPUTED TERMS

A. ’015 and ’464 Patent Disputed Terms

1. summary
 - a. *Plaintiffs’ proposed construction:* No further construction needed.
 - b. *Defendant’s proposed construction:* a data structure, different from a subset of identifiers, that indicates, with possible uncertainty, whether a data segment is already stored, and indicates, with certainty, whether a data segment is not already stored in the segment database
 - c. *Court’s construction:* No further construction needed.

Pure requests that the Court construe the disputed ’015 and ’464 patent claim term “summary.” (D.I. 332 at 5; D.I. 346 at 1). At *Markman*, the Court construed the term

“probabilistic summary” as “[a] data structure that indicates, with possible uncertainty, whether a data segment is already stored.” (D.I. 115 at 6). EMC argues that the Court should not disturb its previous construction of “probabilistic summary” and that construction of the term “summary” is unnecessary. (D.I. 333 at 15). The parties agree that the terms “summary” and “probabilistic summary” should be construed consistently with one another in the asserted claims. (*Id.*; D.I. 346 at 1 (suggesting that the Court adopt Pure’s proposed construction of “summary” and read only the meaning of “summary,” not the meaning of “probabilistic summary,” to the jury)).

Pure’s proposed construction of “summary” includes two limitations to which EMC objects. (D.I. 332 at 7; D.I. 333 at 15–16). First, Pure argues that a “summary” is “different from a subset of identifiers.” (D.I. 332 at 7). Second, Pure argues that a “summary” must be able to “determine that a segment is not in the entire segment database.” (*Id.* at 13). The limitation that a summary must be able to “determine that a segment is not in the entire segment database” is equivalent to the limitation that a summary must be able to “indicate[, with certainty, whether a data segment is not already stored in the segment database.” (D.I. 333 at 16 n.6; *see* D.I. 346 at 1 (proposing substituting “indicates, with certainty, whether a data segment is not already stored in the segment database” for the “can determine a segment is not in the entire segment database” limitation proposed at D.I. 332 at 5)). The Court previously rejected Pure’s proposal to construe “probabilistic summary” as a data structure that “can conclusively determine that a received data segment has not already been stored.” (D.I. 115 at 6).

First, Pure argues that the claimed “summary” is a different data structure than the “subset of identifiers” or “cache.” (D.I. 332 at 7–13). Pure argues that a summary is different from a subset of identifiers because certain claims of the ’464 and ’015 patents recite both a

summary and a subset of identifiers or cache and require that they perform different steps. (*Id.* at 8; D.I. 335 at 11 (citing *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254–57 (Fed. Cir. 2010), for the proposition that “[s]eparately named elements in the same claim are presumed to be separate and distinct”). For example, claim 16 of the ’464 patent provides: “A method for storing data as recited in claim 1 [. . . determining using a subset of identifiers that are stored in a low latency memory whether a data segment has been previously stored . . .] further including: . . . using a summary to positively determine if the data has not been stored previously.” (’464 patent, 10:63–11:2). Claim 16 of the ’464 patent is nonsensical, according to Pure, if the summary is the same data structure as the claimed subset or cache of identifiers. (D.I. 332 at 8–9). Pure also points to disclosures in the specification that describe the summary as different from a subset of identifiers. (*E.g., id.* at 7 (citing ’015 patent, 5:38–59); 11 (citing ’015 patent, FIG. 2; 3:45–59)).

Separately described claim limitations must be satisfied by distinct structures in the accused product. *Becton, Dickinson & Co.*, 616 F.3d at 1254. Distinct structures, however, do not necessarily need to be “different” from one another in the way Pure suggests. (*See* D.I. 332 at 7–13). Consider EMC’s helpful example, a claim to a bicycle that recites “a brake” on the rear wheel and “a hand brake” on the front wheel, where “a brake” could be either a hand brake or a foot brake. (*See* D.I. 334 at 15). Consider a bicycle with two hand brakes, one on the front wheel and one on the rear wheel. Such a bicycle would infringe the claim under *Becton* because it contains two distinct structures, each satisfying a separately described claim limitation. The bicycle would infringe the claim even though the distinct structures are not “different” in that they are both hand brakes. Further, the specification disclosures on which Pure relies describe particular embodiments of the claimed invention and therefore do not limit the claim scope. For

the reasons above, I reject Pure’s proposal to limit “summary” to a data structure “different from a subset of identifiers.”

Second, the Court has already considered and rejected Pure’s argument that a probabilistic summary “can conclusively determine that a received data segment has not already been stored.” (D.I. 115 at 6). The Court is not inclined to revise its previous decision that the doctrine of claim differentiation, applied to ’015 patent claims 1 and 6, and the rule against importing limitations from the specification into the claims absent express disavowal of claim scope both militate against adopting Pure’s proposed construction. (*See id.*). Further, the language of asserted claim 1 of the ’015 patent belies Pure’s position that the summary must be a summary of the entire segment database. Although the specification discloses a summary of the “segment database” (’015 patent, 7:54–57), the patent claims a summary of “segment information” (*id.* at 9:61). Thus, I reject Pure’s proposal to limit “summary” to a data structure that determines that a segment is not in the entire segment database.

For the reasons stated above, I reject Pure’s proposed limitations and decline to construe the claim term “summary” at this time. The existing construction of “probabilistic summary” remains undisturbed.

2. receiving a data stream

- a. *Plaintiffs’ proposed construction:* No construction needed. If the Court decides to construe: “receiving a flow of data.”
- b. *Defendant’s proposed construction:* receiving a series of segments that are related to each other by some characteristic that distinguishes them from other received data streams
- c. *Court’s construction:* No construction needed. “Receiving a data stream” does not require receiving a series of segments that are related to each other by some characteristic that distinguishes them from other received data streams.

The parties previously agreed, and the Court ordered, that the term “receiving a data stream” has its plain and ordinary meaning. (D.I. 92 at 12; D.I. 121 at 2). Pure now argues that the plain and ordinary meaning of “data stream” to a person of ordinary skill is “a series of segments that are related to each other by some characteristic; one that allows them to be differentiated from segments from some other stream.” (D.I. 332 at 17 (quoting D.I. 336-2 at 78) (internal quotation marks omitted)). Pure argues that the fact that the ’015 and ’464 patents “clearly demonstrate the importance to the invention of being able to discern which data stream particular segments belong to” supports its proposed construction. (*Id.* at 18).

EMC responds that the Court should reject Pure’s proposed construction because the patent explicitly discloses a preferred embodiment in which received data segments are not related. (D.I. 333 at 10). The ’015 patent specification teaches that “[i]n many systems, the incoming data stream may include segments from a number of sources that are interleaved.” (’015 patent, 6:31–33). Pure argues that the patents’ disclosure of interleaved streams is consistent with its proposed construction because the patent discloses that segments of a substream are identifiable and separable from other substreams. (D.I. 332 at 18 (citing ’015 patent, 6:28–44)). However, that the specification discloses an embodiment in which interleaved data segments are assigned identifiers to group the segments by substream suggests that segments in an interleaved stream do not necessarily have a distinguishing characteristic in common. Additionally, although Pure’s expert relies on a number of dictionary definitions, none of them limit a “data stream” to data segments related by some distinguishing characteristic. (*See* D.I. 254-2 at 31–32).

For the reasons above, I reject Pure’s proposed construction. Further construction of “receiving a data stream” is unnecessary.¹ I therefore conclude that the term has its plain and ordinary meaning, which does not require receiving a series of segments that are related to each other by some characteristic that distinguishes them from other received data streams.

B. ’556 Patent Disputed Terms

1. a respective parity segment
 - a. *Plaintiffs’ proposed construction:* one or more respective parity segments
 - b. *Defendant’s proposed construction:* one respective parity segment
 - c. *Court’s construction:* one or more respective parity segments

The claim term “a” in open-ended claims is construed to mean “one or more” unless the patent’s claims and specification “evinced a clear intent” to limit “a” to “one.” *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008) (internal quotation marks and alteration omitted); *see also Harari v. Lee*, 656 F.3d 1331, 1341 (Fed. Cir. 2011). “The subsequent use of definite articles ‘the’ or ‘said’ in a claim to refer back to the same claim term does not change the general plural rule, but simply reinvokes that non-singular meaning.” *Baldwin Graphic Sys., Inc.*, 512 F.3d at 1342.

Pure argues that claim 1, which states, “the N respective segments in each respective parity set including a respective parity segment and N-1 respective data segments,” demonstrates that “a” means “one.” (D.I. 332 at 21 (quoting ’556 patent, 14:27–43)). The “N-1” limitation does not appear, however, in asserted claims 6 and 16. (’556 patent, 15:16–35; 17:3–7). Pure acknowledges that there is no technical reason that a parity set must be limited to no more than

¹ Pure’s remaining non-infringement argument with respect to this term on EMC’s motion for summary judgment is that, assuming that “receiving a data stream” has its plain and ordinary meaning, EMC has failed to prove that FlashArray meets that limitation. (*See* D.I. 252 at 16–17; D.I. 353 at 5–6). This failure of proof argument does not implicate the meaning of the claim term such that further construction would be helpful.

one parity segment. (D.I. 353 at 138). Therefore, that the “N-1” limitation appears in some claims, but not others, suggests that the patentees did not intend it to limit all of the claims. Further, where the patentees intended to specify exactly one segment, they did so explicitly by claiming or disclosing “one” segment. (E.g., ’556 patent, 3:10–11; 3:40; 14:57–58; 15:38–40; 15:51–53). Finally, that the specification’s preferred embodiments describe one parity segment per parity set “does not, without more, disclaim a plural embodiment.” See *Epistar Corp. v. Int’l Trade Comm’n*, 566 F.3d 1321, 1337 (Fed. Cir. 2009).

For the reasons above, I adopt EMC’s proposed construction.

2. each of the groups including N respective semiconductor memory segments
 - a. *Plaintiffs’ proposed construction*: No construction needed. If the Court construes this term, it should be construed so that each group that contains some of the claimed “plurality of semiconductor memory segments” must include at least N segments but other groups in the memory system need not include N segments.
 - b. *Defendant’s proposed construction*: each and every group in the memory system has the same number (N) of respective semiconductor memory segments
 - c. *Court’s construction*: Each of the claimed “plurality of semiconductor memory segments, the segments being grouped into groups . . .” must be grouped into groups of exactly N respective semiconductor memory segments. Other groups in the memory system need not include N segments.

The parties dispute two interconnected features of this claim term. The parties dispute whether all of the groups in the memory system are grouped into groups including N semiconductor memory segments. (D.I. 332 at 23; D.I. 333 at 25; D.I. 353 at 146–47, 161–62). The parties also dispute whether the claimed “groups including N respective semiconductor memory segments” can comprise semiconductor memory segments in addition to the N respective semiconductor memory segments. (D.I. 333 at 27; D.I. 335 at 18).

First, Pure argues that “the patent clearly describes dividing the whole memory system into segments and grouping those segments according to the claims.” (D.I. 335 at 18; see D.I.

353 at 146). Pure contends that “EMC cannot identify any contrary disclosure suggesting that the inventors contemplated or claimed that the value of N can vary between different parity groups in a given memory system.” (D.I. 332 at 24; D.I. 335 at 18). The claimed memory system open-endedly “compris[es] a plurality of semiconductor memory segments” that are grouped into groups. (’556 patent, 15:16–18; 16:49–50). The asserted claims thus do not foreclose the possibility of additional, unclaimed groups in the memory system that do not include N respective semiconductor memory segments. See *SanDisk Corp. v. Memorex Prods., Inc.*, 415 F.3d 1278, 1285 (Fed. Cir. 2005) (holding that a memory system claimed using non-restrictive language did not “exclude[] other configurations of memory cells on a physical device that, in some part, practices the claimed [invention]”). “[E]ach of the groups” in the claim phrase “each of the groups including N respective semiconductor memory segments” refers back to “the segments being grouped into groups,” which refers back to “a plurality of semiconductor memory segments.” (’556 patent, 15:16–20; 16:49–54). I therefore conclude that, although each of the claimed “plurality of semiconductor memory segments, the segments being grouped into groups . . .” must be grouped into groups of N respective semiconductor memory segments, there may be other groups in the memory system that do not include N respective semiconductor memory segments.

Second, the parties dispute whether the claimed “groups including N respective semiconductor memory segments” can comprise semiconductor memory segments in addition to the N respective semiconductor memory segments. (D.I. 333 at 27; D.I. 335 at 18). Pure argues that the claimed groups must have exactly N respective semiconductor memory segments, otherwise the patentees’ use of “N” in the claims would be meaningless. (D.I. 335 at 18). EMC argues that, because the claimed groups open-endedly “includ[e]” N respective semiconductor

memory segments, each of the claimed groups may include N respective semiconductor memory segments and also one or more additional semiconductor memory segments. (D.I. 333 at 27). Notwithstanding that the claimed groups “includ[e]” N respective semiconductor memory segments, construing the term to cover groups of more than N respective semiconductor memory segments would render “N” meaningless. *See Barnes & Noble, Inc. v. LSI Corp.*, 2014 WL 1365422, at *23 (N.D. Cal. Apr. 7, 2014) (“It would be highly unusual for a writer to use the term ‘comprise’ as open-ended in this context given this express numerical limitation [“K”].”). Thus, each of the claimed “plurality of semiconductor memory segments, the segments being grouped into groups . . .” must be grouped into groups of exactly N respective semiconductor memory segments.

For the reasons stated above, I construe the term “each of the groups including N respective semiconductor memory segments” to mean that each of the claimed “plurality of semiconductor memory segments, the segments being grouped into groups . . .” must be grouped into groups of exactly N respective semiconductor memory segments but that other groups in the memory system need not include N respective semiconductor memory segments.

V. CONCLUSION

Within five days the parties shall submit a proposed order consistent with this Memorandum Opinion and suitable for submission to the jury.