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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September 1 , 2016

Richard G. Andrews
ANDREWS, U.S. DISTRICT JUDGE:

Presently before the Court are EMC's Motion for a Permanent Injunction (D.I. 491) and

Pure Storage's renewed Motion for Judgment as a Matter of Law ("JMOL") or, in the

Alternative, for a New Trial (D.I. 484). The motions have been fully briefed. (D.I. 492, 496,

509, 511, 523, 524). The Court has jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a). For

the reasons that follow, the Court will deny Pure Storage's motion with respect to JMOL, grant

in part and deny in part Pure Storage's motion with respect to a new trial, and dismiss as moot

EMC's motion for a permanent injunction.

I. BACKGROUND

Plaintiff EMC Corporation initiated this litigation on November 26, 2013, alleging that

Defendant Pure Storage, Inc. ("Pure") infringed U.S. Patent Nos. 6,904,556 ("the '556 patent");

7,373,464 ("the '464 patent"); 7,434,015 ("the '015 patent"); and 8,375,187 ("the '187 patent").[1]

(D.I. 1). On June 6, 2014, EMC Corporation filed an amended complaint, joining EMC

International Company, and EMC Information Systems International as plaintiffs (Plaintiffs

collectively, "EMC"). (D.I. 37). Pure answered the amended complaint on June 13, 2014. (D.I.

38). The Court resolved the parties' claim construction disputes in two opinions issued January

9, 2015 and February 2, 2016. (D.I. 115, 362). On February 11, 2016, the Court granted

summary judgment of noninfringement of the '187 patent and summary judgment of

infringement of certain claims of the '015 patent. (D.I. 381, 388). The parties proceeded to trial

on the '556, '464, and '015 patents beginning on March 7, 2016. (D.I. 461–67). On March 15,

2016, the jury rendered a verdict for EMC on the '015 patent, finding the asserted claims of the

'015 patent (claims 1, 2, 7, 15, and 16) valid. (D.I. 453). The jury found that the asserted claims

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[1] EMC also alleged infringement of U.S. Patent No. 6,915,475, but subsequently withdrew the '475 patent from the litigation.

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of the '556 and '464 patents were not infringed. (*Id.*). The jury awarded reasonable royalty damages in the amount of $14 million to EMC and found that EMC was not entitled to lost profits. (*Id.*). At trial, Pure moved for judgment as a matter of law pursuant to Rule 50(a) of the Federal Rules of Civil Procedure. (D.I. 445). The Court denied that motion. (D.I. 455). The Court entered judgment consistent with the jury's verdict on March 17, 2016. (D.I. 456).

The motions presently before the Court relate to the '015 patent. (D.I. 484, 491). The '015 patent is entitled "Efficient Data Storage System" and discloses systems and methods for providing efficient data storage. ('015 patent, (54), 1:18–20). The '015 patent systems and methods eliminate data redundancy using deduplication techniques. (*See id.*; D.I. 461 at 149–50). Deduplication reduces the demand for storage space in a data storage system by eliminating duplicate copies of data. (D.I. 215 at 10; D.I. 461 at 149–50; D.I. 464 at 97–100).

II. LEGAL STANDARDS

A. Judgment as a Matter of Law

Judgment as a matter of law is appropriate if "the court finds that a reasonable jury would not have a legally sufficient evidentiary basis to find for [a] party" on an issue. FED. R. CIV. P. 50(a)(1). "Entry of judgment as a matter of law is a 'sparingly' invoked remedy, granted only if, viewing the evidence in the light most favorable to the nonmovant and giving it the advantage of every fair and reasonable inference, there is insufficient evidence from which a jury reasonably could find liability." *Marra v. Phila. Hous. Auth.*, 497 F.3d 286, 300 (3d Cir. 2007) (citation and internal quotation marks omitted).

In assessing the sufficiency of the evidence, the Court must give the nonmovant, "as [the] verdict winner, the benefit of all logical inferences that could be drawn from the evidence presented, resolve all conflicts in the evidence in his favor and, in general, view the record in the light most favorable to him." *Williamson v. Consol. Rail Corp.*, 926 F.2d 1344, 1348 (3d Cir.

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1991). The Court may "not determine the credibility of the witnesses [nor] substitute its choice for that of the jury between conflicting elements in the evidence." *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 893 (Fed. Cir. 1984). Rather, the Court must determine whether the evidence reasonably supports the jury's verdict. *See Gomez v. Allegheny Health Servs. Inc.*, 71 F.3d 1079, 1083 (3d Cir. 1995); 9B *Charles Alan Wright & Arthur R. Miller, Federal Practice and Procedure* § 2524 (3d ed. 2008) ("The question is not whether there is literally no evidence supporting the party against whom the motion is directed but whether there is evidence upon which the jury might reasonably find a verdict for that party.").

Where the movant bears the burden of proof, the Third Circuit applies a stricter standard. *Fireman's Fund Ins. Co. v. Videfreeze Corp.*, 540 F.2d 1171, 1177 (3d Cir. 1976) (internal quotation marks omitted). To grant judgment as a matter of law in favor of a party that bears the burden of proof on an issue, the Court "must be able to say not only that there is sufficient evidence to support the [movant's proposed] finding, even though other evidence could support as well a contrary finding, but additionally that there is insufficient evidence for permitting any different finding." *Id.* (internal quotation marks omitted).

B. Motion for a New Trial

Federal Rule of Civil Procedure 59(a)(1)(A) provides, in pertinent part: "The court may, on motion, grant a new trial on all or some of the issues—and to any party— . . . after a jury trial, for any reason for which a new trial has heretofore been granted in an action at law in federal court . . . ." Among the most common reasons for granting a new trial are: (1) the jury's verdict is against the clear weight of the evidence, and a new trial must be granted to prevent a miscarriage of justice; (2) newly discovered evidence exists that would likely alter the outcome of the trial; (3) improper conduct by an attorney or the court unfairly influenced the verdict; or

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(4) the jury's verdict was facially inconsistent. *See Zarow-Smith v. N.J. Transit Rail Operations, Inc.*, 953 F. Supp. 581, 584–85 (D.N.J. 1997).

The decision to grant or deny a new trial is committed to the sound discretion of the district court. *Allied Chem. Corp. v. Daiflon, Inc.*, 449 U.S. 33, 36 (1980); *Olefins Trading, Inc. v. Han Yang Chem Corp.*, 9 F.3d 282, 289 (3d Cir. 1993). Although the standard for granting a new trial is less rigorous than the standard for granting judgment as a matter of law—in that the Court need not view the evidence in the light most favorable to the verdict winner—a new trial should only be granted where "a miscarriage of justice would result if the verdict were to stand" or where the verdict "cries out to be overturned" or "shocks [the] conscience." *Williamson*, 926 F.2d at 1352–53.

III. ANALYSIS

A. Venti Reference and Moulton Patent

1. JMOL—Venti Reference

Pure argues that it is entitled to JMOL that the Venti reference anticipates the asserted claims of the '015 patent. (D.I. 496 at 19–22; D.I. 524 at 12–14). At trial, EMC disputed that the Venti reference discloses the "determining" step of the asserted independent claims and the "confirming" step of dependent claim 7.[2] (D.I. 466 at 156–60). Specifically, EMC argues that there are three reasons why Venti does not anticipate. First, EMC argues that Venti does not disclose the determining step because it does not disclose a space-efficient, probabilistic summary that is used in data writes. (*Id.* at 157–58, 207, 209–10; D.I. 509 at 25–26). Second, EMC argues that Venti does not disclose a determination made with "possible uncertainty"

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[2] The "determining" step of the asserted claims of the '015 patent is: "determin[ing/e] 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, 9:58–61, 10:64–67, 12:1–4). The "confirming" step is: "confirming whether the one of the plurality of data segments has been stored previously using a relatively high latency memory." (*Id.* at 10:13–15).

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because it discloses a determination using SHA-1 hash identifiers, for which the probability of a collision is "vanishingly small."[3] (DTX560 at p. 3315; D.I. 464 at 361–62; D.I. 465 at 140–42; D.I. 466 at 159–60, 202–03; D.I. 509 at 24–25). Third, EMC argues that Venti does not disclose the confirming step of claim 7 because, even if Venti discloses a space-efficient, probabilistic summary that is used in data writes, that summary is used only in an initial determining step and not in a confirming step. (D.I. 466 at 159–60, 221; D.I. 509 at 26).

EMC's first argument fails. No reasonable jury could have found that the "Index Cache" described in Venti, identified by Pure as the claimed "space efficient, probabilistic summary," is not used in data writes. (*See* D.I. 464 at 368–75). Pure's expert testified that the data structure disclosed in Venti that holds the claimed space efficient, probabilistic summary is the Index Cache. (*Id.* at 368). EMC's expert testified that the Index Cache does not perform the determining step because it is not used for write operations and therefore is not a part of storing new data to the device. (D.I. 466 at 157–58, 207–10; *see also* D.I. 464 at 371). However, a reasonable jury could not have credited EMC's expert's opinion testimony that the Index Cache is "actually not used in writes." (D.I. 466 at 210). EMC's expert offered no support for his opinion, and it is contradicted by Table 1 of Venti, which gives performance information on "Duplicate Writes" involving the Index Cache. (*See id.* at 209–10; DTX560 at Table 1, p. 3320 ("Table 1 gives the preliminary performance results for read and write operations in a variety of situations.")); *see also Brooke Grp. Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 242 (1993) ("When an expert opinion is not supported by sufficient facts to validate it in the eyes of the law, or when indisputable record facts contradict or otherwise render the opinion unreasonable, it cannot support a jury's verdict.").

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[3] A "collision" occurs when the hashing algorithm generates identical identifiers for different data. (*See* D.I. 465 at 126).

EMC's second argument is more persuasive. The jury could have reasonably concluded that Pure failed to prove by clear and convincing evidence that Venti discloses the "probabilistic summary" recited in the determining step of the asserted claims. A reasonable jury could have concluded that Venti does not disclose the claimed "probabilistic summary" because "Venti assumes that each hash function is unique, and thus would treat a hit as a conclusive determination that the block is already stored." (D.I. 509 at 25 (emphasis omitted); *see* D.I. 466 at 159–60). There is no dispute that the SHA-1 hash identifiers disclosed in Venti are mathematically probabilistic, but that the probability of a collision is less than 10^{-20}. (DTX560 at p. 3315; D.I. 464 at 60–62; D.I. 465 at 140–42). Pure argues, "EMC wrongly interprets the Court's construction allowing for possible uncertainty to instead require uncertainty." (D.I. 524 at 13 n.13 (emphasis omitted)). Pure argues, further, that even if the claims were interpreted to require uncertainty, "Venti still anticipates—because [EMC's expert] admitted that Venti discloses mathematically uncertain hashes with a non-zero collision probability." (*Id.* at 13).

EMC's position that the determining step of the asserted claims requires the possibility of some uncertainty is consistent with the Court's construction of "determine" and "probabilistic summary." (*See* D.I. 115 at 4–7). As the Court noted, the patent "contemplate[s] both conclusive and inconclusive determinations." (*Id.* at 6). The Court further explained that "the specification and claims demonstrate that determinations are qualified with 'positively' when decided conclusively. A determination that is not 'positive,' therefore, must have some independent meaning—a determination cannot be conclusive both when it is, and is not, described as 'positive.'" (*Id.* at 5–6). The asserted claims' determining steps do not specify "positively determining." (*See* '015 patent, 9:58–61, 10:64–67, 12:1–4). Thus, a reference that

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discloses only determinations made with certainty does not disclose the full scope of the asserted claims, which demand the possibility of uncertainty in the determining step.

Regarding Pure's argument that the SHA-1 hashes used in Venti are mathematically probabilistic, EMC's expert testified, and the Venti reference itself explains, that "the probability of a collision is vanishingly small." (DTX560 at p. 3315; D.I. 464 at 360–62; D.I. 465 at 140–42; D.I. 466 at 202–04). Indeed, even Pure's expert described the hashes calculated by the SHA-1 algorithm as "unique." (D.I. 464 at 361; *see also* D.I. 465 at 125–26 (Pure's expert agreeing that what makes the claimed summary "probabilistic" is "the likelihood that there might be a collision, that the match is actually not duplicate data, and that we can't discard it because we might then be throwing out nonduplicate data")). The jury reasonably could have found that SHA-1 hashes do not yield determinations made with possible uncertainty and therefore do not satisfy the determining step. Thus, a reasonable jury could have found that Pure failed to meet its burden to prove that the Venti reference anticipates the asserted claims of the '015 patent.

EMC's third argument fails. A reasonable jury would have had to find that Pure proved by clear and convincing evidence that Venti discloses the confirming step of claim 7. EMC's expert testified that the system disclosed in Venti does not do a confirming step. (D.I. 466 at 159–60, 221). Pure argues, however, that EMC's expert "only discusses Venti's disclosed operation when a matching hash is *found* in the system," in which case there is no dispute that no further check is done to confirm that the data is duplicate. (D.I. 496 at 22). Pure maintains that the Venti reference discloses a confirming step after the system determines that data is *new*. (*Id.*). Pure's expert testified that the system disclosed in Venti does a preliminary check in the Index Cache to determine whether a block is new, followed by a confirmatory check in the full index. (D.I. 465 at 10–13). EMC's expert did not rebut that testimony. (*See* D.I. 466 at 159–

60). That Venti does not disclose a confirming step when it determines that data is duplicate does not imply that it does not disclose a confirming step when it determines that data is new. As Pure's expert testified, Venti does disclose the claimed confirming step. (D.I. 465 at 10–13; *see* DTX560 at pp. 3318, 3320). Thus, there was insufficient evidence to support a finding that Venti does not disclose the confirming step of claim 7.

For the reasons discussed above, a reasonable jury would have had to find that the "Index Cache" described in Venti is used in data writes and that Venti discloses the confirming step of claim 7. The jury reasonably could have concluded, however, that Pure had not proven by clear and convincing evidence that Venti discloses the "probabilistic summary" recited in the determining step of the asserted claims. Thus, Pure is not entitled to JMOL that the Venti reference anticipates.

2. JMOL—Moulton Patent

Pure argues that it is entitled to JMOL that the Moulton patent anticipates the asserted claims of the '015 patent. (D.I. 496 at 23–24; D.I. 524 at 14). EMC argues that, like Venti, Moulton does not disclose a determination made with possible uncertainty because it discloses (1) using hash identifiers with very small collision probabilities and (2) discarding data without a confirming step when identifiers match. (D.I. 509 at 26–27; *see* DTX556 at 14:24–30; D.I. 465 at 130–34; D.I. 466 at 162–63). EMC also argues that Moulton does not disclose a "space-efficient" probabilistic summary. (D.I. 509 at 27 (citing D.I. 466 at 162)).

A reasonable jury would have had to conclude that Pure met its burden to prove that Moulton discloses a summary that is space efficient. Pure's expert testified that the "Existing Hashes 214" in Moulton was a space efficient data structure that satisfied the "space efficient, probabilistic summary" claimed in the '015 patent. (D.I. 465 at 27–31; *see* DTX556 at Fig. 5).

EMC's expert testified that the "Database of Hash Values and Corresponding Data 212" in Moulton is not space efficient. (D.I. 466 at 162; *see* DTX556 at Fig. 5). EMC's expert did not rebut Pure's expert's testimony regarding "Existing Hashes 214." (*See* D.I. 466 at 162). The jury therefore could not have reasonably concluded that Moulton does not disclose a space efficient summary.

The jury could have reasonably concluded that Pure did not prove by clear and convincing evidence that the Moulton patent discloses the "probabilistic summary" recited in the determining step of the asserted claims because Moulton does not disclose making a determination with possible uncertainty. Moulton discloses using hash identifiers calculated using a variety of algorithms including MD4, MD5, SHA and SHA-1. (DTX556 at (57)). The Moulton patent describes hashing functions as

> inherently probabilistic and any hashing function might possibly produce incorrect results when two different data objects happen to have the same hash value. However, the system and method herein disclosed mitigates this problem by using well known and researched hashing functions that reduce the probability of a collision down to levels acceptable for reliable use (i.e. one chance in a trillion trillion), far less than error rates otherwise tolerated in conventional computer hardware operations.

(*Id.* at 14:21–30). In light of this description in the Moulton patent and EMC's expert's testimony, the jury could have concluded that the Moulton patent does not disclose making a determination with possible uncertainty. (*See* D.I. 466 at 160–64; *see also* D.I. 465 at 131–32). The jury was not compelled to credit Pure's expert's contrary testimony that the hashing functions identified in the Moulton patent are inherently probabilistic. (D.I. 465 at 29). Thus, the jury could have reasonably concluded that Pure did not prove by clear and convincing evidence that the Moulton patent discloses the claimed probabilistic summary.

For the reasons stated above, a reasonable jury could have found that Pure failed to meet its burden to prove that the Moulton patent anticipates the asserted claims of the '015 patent. Pure is therefore not entitled to JMOL that the Moulton patent anticipates the asserted claims of the '015 patent.

3. New Trial—Venti Reference and Moulton Patent

Pure argues that it is entitled to a new trial on anticipation by the Venti reference and the Moulton patent because "the Court erred in refusing to admit Dr. Li's, Dr. Patterson's, and Dr. Miller's testimony about their understanding of Venti—and in the case of Dr. Patterson, also Moulton—as skilled artisans who were familiar with the reference at the time." (D.I. 496 at 24 n.25 (citing D.I. 462 at 90, 106, 107)). Specifically, Pure maintains that Drs. Li, Patterson, and Miller "would have testified, for example, to disclosure of another kind of probabilistic uncertainty—arising from the use of a subset of identifiers." (*Id.*). At trial, however, Pure argued that the point of its objected-to questioning of Dr. Li regarding the Venti reference would be to show that the Venti reference "was well-known . . . and it was out there and even the inventor saw it a month before he said he conceived his invention." (D.I. 462 at 88). Pure maintained that Dr. Miller's testimony would not "go into the elements of Venti." (D.I. 464 at 10). The scope of Dr. Patterson's testimony before the jury was agreed-upon by the parties without input from the Court. (*See* D.I. 465 at 3). Pure is therefore not entitled to a new trial on anticipation by the Venti reference and the Moulton patent on the ground that Drs. Li, Patterson, and Miller did not testify about their understanding of the disclosures of the Venti reference and the Moulton patent.

B. Sun Patent

Pure argues that it is entitled to JMOL that the Sun patent anticipates the asserted claims of the '015 patent. (D.I. 496 at 6–18). Alternatively, Pure argues that it is entitled to a new trial

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on the issue of whether the Sun patent is prior art to the '015 patent. (*Id.* at 18–19). Pure contends that there was no legally sufficient evidence based on which the jury could have found that the Sun patent is not prior art to the '015 patent. (*Id.* at 7). EMC argues that the jury reasonably and correctly concluded that the Sun patent is not prior art to the '015 patent because the '015 inventors conceived of their inventions prior to the filing date of the Sun patent application. (D.I. 509 at 9). EMC argues that even if the Sun patent were prior art, it would not anticipate. (*Id.*).

1. Prior Art

The date of invention of a patent in suit is presumed to be the filing date of the patent application unless an earlier date of invention is proved. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 449 (Fed. Cir. 1986). When a defendant challenging a patent's validity introduces alleged prior art dated before the filing date of the patent in suit, the patentee may present evidence of an earlier priority date. *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1576–78 (Fed. Cir. 1996). The patentee may establish an earlier priority date by producing evidence that the inventor conceived his invention prior to the filing date of the alleged prior art and that the inventor exercised reasonable diligence in later reducing that invention to practice. *Price v. Symsek*, 988 F.2d 1187, 1190 (Fed. Cir. 1993). "Though the patentee has the burden of production in antedating a reference, the burden of persuasion, by clear and convincing evidence, remains with the party that challenges an issued patent's validity." *Stamps.com Inc. v. Endicia, Inc.*, 437 F. App'x 897, 907–08 (Fed. Cir. 2011) (citing *Mahurkar*, 79 F.3d at 1576).

An inventor is considered to have conceived an invention when he has formed in his mind "a definite and permanent idea of the complete and operative invention, as it is hereafter to

be applied in practice." *Burroughs Wellcome Co. v. Barr Labs., Inc.,* 40 F.3d 1223, 1228 (Fed. Cir. 1994) (internal quotation marks omitted). "The idea must be so clearly defined in the inventor's mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation." *Mahurkar,* 79 F.3d at 1577 (internal quotation marks omitted).

Where "a party seeks to prove conception via the oral testimony of a[n] . . . inventor, the party must proffer evidence corroborating that testimony." *Shu-Hui Chen v. Bouchard,* 347 F.3d 1299, 1309 (Fed. Cir. 2003); *Mahurkar,* 79 F.3d at 1577; *Price,* 988 F.2d at 1195. Specifically, "the inventor must provide independent corroborating evidence in addition to his own statements and documents." *Brown v. Barbacid,* 276 F.3d 1327, 1335 (Fed. Cir. 2002) (alterations omitted). "Independent corroboration may consist of testimony of a witness, other than the inventor, . . . or it may consist of evidence of surrounding facts and circumstances independent of information received from the inventor." *Medichem S.A. v. Rolabo, S.L.,* 437 F.3d 1157, 1171 (Fed. Cir. 2006). An inventor's own unwitnessed documents cannot corroborate his testimony about inventive facts. *See Brown,* 276 F.3d at 1335. Once it has been established that proffered evidence is independently corroborative, the sufficiency of that evidence is determined under the "rule of reason." *Id.; Kridl v. McCormick,* 105 F.3d 1446, 1450 (Fed. Cir. 1997). Corroboration is not required "where a party seeks to prove conception through the use of physical exhibits. The trier of fact can conclude for itself what documents show, aided by testimony as to what the exhibit would mean to one skilled in the art." *Mahurkar,* 79 F.3d at 1577–78 (citation omitted).

Pure argues that it is entitled to JMOL that the Sun patent is prior art to the '015 patent. (D.I. 496 at 6–7; D.I. 453 at 3). The application that resulted in the Sun patent was filed on March 22, 2002. (DTX557 at 2). The application that resulted in the '015 patent was filed on

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December 20, 2002. ('015 patent, (63)). EMC maintains, however, that the Sun patent is not

prior art to the '015 patent because the '015 patent is entitled to a priority date no later than

March 16, 2002. (D.I. 509 at 10; *see also* D.I. 467 at 70–71). At trial, EMC presented the

following as evidence of a date of conception prior to the filing date of the Sun patent

application: (1) the testimony of Dr. Li, a co-inventor of the '015 patent; (2) three whiteboard

photographs and their associated metadata; and (3) an architecture specification.[4] (D.I. 462 at

35–131; PTX8–PTX11). Pure argues that it is entitled to JMOL because EMC failed to meet its

burden of production with respect to independent corroborating evidence of Dr. Li's testimony of

the date of conception. Pure maintains that EMC's evidence is therefore insufficient as a matter

of law to establish the date of conception. (D.I. 496 at 6–12). Alternatively, Pure argues that it

is entitled to a new trial on the issue of whether the Sun patent is prior art because the jury's

verdict in this regard is against the clear weight of the evidence. (*Id.* at 18–19).

EMC argues, first, that the jury was entitled to rely on Dr. Li's corroborated testimony to

conclude that the '015 patent antedates the Sun patent. (D.I. 509 at 13). In particular, EMC

maintains that, under the rule of reason, the whiteboard photographs and Architecture

Specification provide sufficient independent corroboration of Dr. Li's testimony that he

conceived the invention claimed in the '015 patent no later than March 16, 2002. (*Id.* at 15–18).

EMC contends that the whiteboard photographs are independently corroborative of the date of

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[4] EMC introduced several architecture specifications at trial. (*See* D.I. 462 at 83–84). Of the admitted architecture specifications, EMC's argument concerning the date of conception depends most on a "global" architecture specification (the "Architecture Specification") labeled "v0.11" and bearing a date of April 3, 2002. (*See id.* at 78, 81; PTX8). The date on the cover page of the Architecture Specification is later than the March 22, 2002 filing date of the Sun patent. (PTX8 at 1). The cover page of the Architecture Specification, however, lists March 16, 2002 as the date of v0.1 of that specification. (*Id.*). Dr. Li testified that he looked for and could not find the March 16, 2002 v0.1 document. (D.I. 462 at 80, 109–10). The other architecture specifications that EMC introduced at trial were specific to individual modules described in the Architecture Specification and were dated after the filing date of the Sun patent. (*Id.* at 83–84; PTX49, PTX50, PTX51, PTX55, PTX57, PTX59, PTX62, PTX63, PTX65, PTX66, PTX67, PTX68).

conception because the metadata associated with each photograph indicates that it was taken before the filing date of the Sun patent application. (*Id.* at 16–17; D.I. 462 at 74–76). EMC further contends that "the jury reasonably concluded that the date on Dr. Li's camera was set correctly, especially since Pure did not present any evidence whatsoever that the metadata for those native files was not accurate." (D.I. 509 at 17 (citation omitted)). EMC maintains that the Architecture Specification is also independently corroborative of the date of conception because, "although it was authored by Dr. Li, [it] is a contemporaneous EMC business record," was maintained on Data Domain's company servers, and was produced by EMC independently of Dr. Li. (*Id.* at 15 (citing the fact that the Architecture Specification bears EMC Bates numbers)). EMC argues, second, that the jury was entitled to conclude that the '015 patent antedates the Sun patent on the basis of the whiteboard photographs and Architecture Specification alone. (*Id.* at 18). EMC maintains that the whiteboard photographs and Architecture Specification do not require independent corroboration because they are contemporaneous documentary evidence of the date of conception of the '015 patent. (*Id.*).

Pure argues that Dr. Li's testimony is legally insufficient evidence of the date of conception of the '015 patent because it not corroborated by any independent evidence. (D.I. 496 at 9). Pure argues that the whiteboard photographs, their associated metadata, and the Architecture Specification do not independently corroborate Dr. Li's testimony because they were "created and dated by Dr. Li himself." (*Id.* at 10). Pure argues, therefore, that "[t]he inventor testimony and inventor-created evidence offered by EMC at trial is insufficient as a matter of law to antedate the Sun patent." (*Id.*). Pure argues, further, that even if there were sufficient evidence of the date of the whiteboard photographs and Architecture Specification, the

evidence does not establish that every element of the asserted claims was conceived prior to the filing date of the Sun patent. (*Id.* at 12).

EMC failed to meet its burden of production with respect to an earlier date of conception. *See Mahurkar*, 79 F.3d at 1576–77; *see also Stamps.com Inc.*, 437 F. App'x at 907–08. EMC did not produce independent corroborating evidence of Dr. Li's testimony. The whiteboard photographs are not independently corroborative of Dr. Li's testimony because Dr. Li took the photographs and had control of the camera, the photograph file names, and the metadata. (*See* D.I. 462 at 64, 73–74, 77, 116–23); *see also Brown*, 276 F.3d at 1335 ("[T]he inventor must provide independent corroborating evidence in addition to his own statements and documents." (alterations and internal quotation marks omitted)). Dr. Li first uncovered the photographs in 2015. (*See* D.I. 263 at 5 (declaration dated October 23, 2015 in which Dr. Li states that he "ha[s] searched his files from the early 2002 time period and located three photos" that depict the whiteboard markings)). Further, there is no evidence that Dr. Li showed the whiteboard markings or photographs of them to anyone other than his co-inventors around the time the markings were made. (*See* D.I. 462 at 70–77, 115–31); *Medichem S.A.*, 437 F.3d at 1172 (holding that unwitnessed inventor notebooks had "minimum corroborative value" because they did "not provide an 'independent' source of authority"); *Transocean Offshore Deepwater Drilling, Inc. v. GlobalSantaFe Corp.*, 443 F. Supp. 2d 836, 856 (S.D. Tex. 2006) (holding that an inventor's testimony that he made electronic drawings of an invention before the "Last Modified Date" of the files required corroboration and that his testimony that "[e]ach of the drawing files on the disks have a 'Last Modified Date' in the electronic directory showing the last time the drawing was changed" was insufficient to corroborate the date because of the lack of "evidence that the drawings were contemporaneously disclosed to or witnessed by anyone

else"). In light of the fact that Dr. Li testified that he wrote the Architecture Specification (D.I. 462 at 77–78), the Architecture Specification is also not independently corroborative of Dr. Li's testimony.[5] The fact that someone other than Dr. Li, that is, the successor of Dr. Li's company, was the source of the document in this litigation does not make the Architecture Specification independent. Because EMC did not present independent corroborative evidence of Dr. Li's testimony regarding the date of conception, Dr. Li's testimony regarding inventive facts must be disregarded.

Considered as stand-alone documentary evidence, the whiteboard photographs, associated metadata, and Architecture Specification are also insufficient to meet EMC's burden to produce evidence of the date of conception of the '015 patent. (*See* PTX8–PTX11). There are no dates handwritten onto the whiteboards themselves. (PTX9–PTX11). The photograph metadata and file name dates are insufficient evidence of the date of conception. *See Kenexa Brassring, Inc. v. Taleo Corp.*, 751 F. Supp. 2d 735, 760–61 (D. Del. 2010) ("timestamps can be easily modified, even accidentally"); (*see also* D.I. 462 at 118–19 (Dr. Li's testimony that he did not know whether the date settings on his camera were accurate when he took the photographs)). The Architecture Specification post-dates the filing date of the Sun patent. (PTX8 at 1; DTX557 at 2). The v0.1 architecture specification was not admitted and Dr. Li's testimony was the only evidence presented regarding what it would have contained. (*See* D.I. 462 at 77–81, 108–113); *see Medichem S.A.*, 437 F.3d at 1172–73 (holding that non-inventor's notebook did not

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[5] In denying Pure's motion for summary judgment, the Court considered the Architecture Specification to be independently corroborating. (D.I. 381 at 30). At that time, Dr. Li had filed a sworn statement regarding the fact that "[i]t was the regular practice of Data Domain to create and maintain specifications such as these during the research and development process. It was also the regular practice of Data Domain to accurately date specification documents by applying the date at or near the time the document was written." (D.I. 263 at 4). At trial, however, Dr. Li did not testify as a custodian of the Architecture Specification that it was a contemporaneously witnessed business record of Data Domain. (*See* D.I. 462 at 77–78, 82). Even if he had, he would still have been corroborating his own testimony.

corroborate reduction to practice because the non-inventor "did not testify regarding the notebook or the genuineness of its contents" and the district court was therefore "clearly reliant on the inventor to help identify the author of specific entries made in [the non-inventor's] notebook"); *Intellectual Ventures I, LLC v. Motorola Mobility, LLC*, 13 F. Supp. 3d 369, 411 (D. Del. 2014) (holding that evidence of "the date [a design] presentation was started, without any evidence as to the content of the presentation at that time, is not sufficient to demonstrate" conception as of that date). Thus, the whiteboard photographs, associated metadata, and the Architecture Specification are insufficient to meet EMC's burden of production when considered as stand-alone evidence of the date of conception.

For the reasons stated above, both Dr. Li's testimony and the documentary evidence are legally insufficient to prove a date of conception prior to the filing date of the '015 patent.[6] EMC has therefore failed to meet its burden of production regarding whether the invention claimed in the '015 patent was conceived prior to the filing date of the Sun patent. It was error to submit the issue whether the Sun patent was prior art to the '015 patent to the jury. The jury should have been instructed that the Sun patent is prior art to the '015 patent.[7]

2. Anticipation

Pure argues that it is entitled to JMOL that the Sun patent anticipates the asserted claims of the '015 patent. (D.I. 496 at 14–18). EMC argues that, even if the Sun patent were prior art, the jury's verdict would be supported by substantial evidence that the Sun patent does not disclose all of the elements of the asserted claims. (D.I. 509 at 21–23). Specifically, EMC

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[6] It should be emphasized that the Court is not commenting on Dr. Li's credibility. The Court is ruling as a matter of law that Dr. Li's testimony cannot be considered, no matter how credible it was, because it was not independently corroborated.

[7] Because EMC has failed to meet its burden of production with respect to the date of conception, there is no need to evaluate whether every element of the asserted claims is disclosed in the photographs and Architecture Specification.

argues that the Sun patent does not disclose: (1) the "space efficient, probabilistic summary" limitation of all of the asserted claims; (2) the "determining" step of all of the asserted claims; and (3) the "confirming" step of dependent claim 7. (D.I. 509 at 22–23 & n.12).

The jury did not make a finding regarding whether the Sun patent discloses each and every limitation of the asserted claims of the '015 patent. (*See* D.I. 453 at 3 (directing the jury to check "no" to whether each asserted claim is anticipated by the Sun patent if it finds that the Sun patent is not prior art to the '015 patent)). Thus, unless Pure or EMC is entitled to judgment as a matter of law with respect to whether the Sun patent anticipates the asserted claims, Pure is entitled to a new trial on anticipation of the '015 patent by the Sun patent. *See* FED. R. CIV. P. 49(b); *cf.* 9B C. Wright and A. Miller, FED. PRACTICE AND PROCEDURE, § 2511 (3d ed. 1998) ("If some legal error requires setting aside the general verdict and the answer to some of the interrogatories, there is no need to relitigate other issues already decided under properly submitted interrogatories.").

EMC argues that the jury's verdict should be sustained because the Sun patent does not disclose the "space efficient, probabilistic summary" limitation of all of the asserted claims. (*Id.* at 21). Pure's expert identified "data structure 150," depicted in Figure 2 of the Sun patent, as corresponding to the claimed probabilistic summary. (D.I. 464 at 322–23). "[D]ata structure 150" contains (1) a reference to a data block and (2) a data block identifier. (DTX557 at Fig. 2, 7:66–8:11; D.I. 464 at 325–26). EMC argues that "data structure 150" is not necessarily "space efficient." (D.I. 509 at 21–22). The Court construed the term "space[]efficient" to mean "taking up less memory space than the stored data segments." (D.I. 121 at 2). EMC maintains that the evidence shows, at most, that "data structure 150" will typically take up less space than the stored data segments. (D.I. 509 at 22). EMC contends, however, that anticipation requires that a

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claim element be necessarily present in the prior art device. (D.I. 509 at 22 (citing *In re Omeprazole Patent Litig.*, 483 F.3d 1364, 1378 (Fed. Cir. 2007)).

Reasonable fact finders could disagree regarding whether the Sun patent discloses the "space efficient, probabilistic summary" of the asserted claims. A jury could reasonably conclude that the Sun patent discloses the claimed space efficient, probabilistic summary. *In re Omeprazole* is inapposite because it discusses anticipation by inherent disclosure, a doctrine on which Pure's expert did not rely. (D.I. 464 at 325–27). Pure's expert testified that the reference and identifier are "typically much smaller and, therefore, take[] up less space than the actual data itself." (*Id.* at 326). EMC's expert agreed with Pure's expert to the extent that "the identifier is going to be smaller than the entirety of the set of data in most cases." (D.I. 466 at 175). The Sun patent states that replacing a data block with a reference to the data block could reduce the amount of memory space required by the system. (*See* DTX557 at 11:65–12:3, 14:8–13). Thus, a reasonable jury could conclude that the Sun patent discloses a space efficient, probabilistic summary. On the other hand, Pure is not entitled to JMOL that the Sun patent discloses the space efficient, probabilistic summary of the asserted claims. There is no evidence to support Pure's claim that it would be "nonsensical" for an identifier for a data block or a reference to that block's location to be larger than the data block itself. (*See* D.I. 524 at 10). A reasonable jury therefore could find either that the Sun patent discloses or does not disclose the claimed space efficient, probabilistic summary.

Pure is entitled to JMOL that the Sun patent discloses the determining step of the asserted claims. Pure's expert testified that the Sun patent discloses the determining step. (D.I. 464 at 316–20; *see, e.g.*, DTX557 at 10:53–57 ("[I]f the determination result indicates that the data block is not redundant, i.e., was not already identified, the computer program can effect the

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storage of the current data block on a computer-readable medium . . . ."), 11:30–39 ("The sequence of method steps depicted in the embodiment shown in FIG. 5a may advantageously be used to generate a collection of non-redundant data blocks, e.g., for storage on a computer-readable medium . . . . Thus, if a data block is not redundant, the data block is identified, e.g., stored or transmitted. . . . [T]he embodiments of the present invention can be used as a filter to store or transmit data blocks that were not received at an earlier point in time.")). EMC's expert testified that the Sun patent does not disclose the determining step because the Sun patent "says it's to do with creating a new data block containing new data, not storing data, which is what's in the '015 patent." (D.I. 466 at 151). Specifically, he testified that the Sun patent does not satisfy the "stored" portion of the limitation "determining whether one of the plurality of data segments has been stored previously." (*Id.*). EMC's expert also testified, however, that the Sun patent discloses "storing a data block that has not been redundant." (*Id.* at 171). In light of the disclosures of the Sun patent and EMC's expert's acknowledgement that the Sun patent discloses determining whether a data block is redundant prior to storing it, Pure is entitled to JMOL that the Sun patent discloses the determining step of the asserted claims.

Pure is entitled to JMOL that the Sun patent discloses the confirming step of claim 7. Pure's expert testified that the Sun patent discloses the confirming step. (D.I. 464 at 335–47; DTX557 at Fig. 8, 8:11–18, 14:19–25). EMC argues that Pure's expert improperly combined separate embodiments in the Sun patent to show that it discloses the confirming step. (D.I. 509 at 22–23). Pure's expert points to the embodiment represented in Figure 8 of the Sun patent to show that it confirms whether data blocks have been stored previously and to text describing Figure 1 as disclosure of the claimed "relatively high latency memory." (D.I. 464 at 341–45; *see* D.I. 509 at 23). The Sun patent states, however, that "[t]he steps of FIG. 8 may be carried out

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using the system shown, for example, in FIG. 1 or 6." (DTX557 at 14:21–25). The Sun patent therefore describes that the embodiments in Figures 1 and 8 may have overlapping features. As a result, a reasonable jury would have to find that the Sun patent discloses the confirming step of claim 7.

The jury did not specifically find whether the Sun patent discloses every limitation of the asserted claims of the '015 patent. The question whether the Sun patent discloses the "space efficient, probabilistic summary" of the asserted claims cannot be determined as a matter of law and is therefore a fact question for the jury. Pure is thus entitled to a new trial on anticipation of the '015 patent by the Sun patent.[8]

For the reasons stated above, Pure is entitled to a new trial on the issue of anticipation by the Sun patent. Pure is not entitled to a new trial on the issues of anticipation by the Venti reference or the Moulton patent. Pure is not entitled to JMOL with respect to the Venti reference, the Moulton patent, or the Sun patent. EMC's motion for a permanent injunction precluding Pure from using the deduplication technology of the asserted claims of the '015 patent (D.I. 491) is dismissed as moot.

IV. CONCLUSION

For the reasons stated above, the Court denies Pure Storage's JMOL motion, grants in part and denies in part Pure Storage's motion for a new trial, and dismisses as moot EMC's motion for a permanent injunction. An appropriate order will follow.

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[8] Consequently, I do not reach Pure's alternative arguments that it is entitled to a new trial on anticipation by the Sun patent. (*See* D.I. 496 at 18–19).

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

ORDER

For the reasons discussed in the accompanying Memorandum Opinion, **IT IS HEREBY**

ORDERED:

Defendant's renewed Motion for Judgment as a Matter of Law and, in the Alternative, for

a New Trial (D.I. 484) is **DENIED IN PART** with respect to Pure Storage's motion for JMOL

and **GRANTED IN PART** and **DENIED IN PART** with respect to Pure Storage's motion for a

new trial.

Plaintiffs' Motion for a Permanent Injunction (D.I. 491) is **DISMISSED** as moot.

Entered this __1__ day of September, 2016.

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United States District Judge