UNITED STATES DISTRICT COURT
MIDDLE DISTRICT OF FLORIDA
TAMPA DIVISION

LEXMARK INTERNATIONAL
INC.,

      Plaintiff,

v.   Case No. 8:18-cv-1047-WFJ-AEP

UNIVERSAL IMAGING
INDUSTRIES, LLC,

      Defendant.

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ORDER

Before the Court are Plaintiff Lexmark International Inc. ("Lexmark") and Defendant Universal Imaging Industries, LLC's ("UII") motions for summary judgment (Dkts. 242/S-247 & 239/S-244). Both parties have provided responses (Dkts. 260/S-262 & 253/S-256) and replies (Dkts. 271/S-272 & 269). On September 19, 2023, the Court held a hearing on these matters (Dkt. S-280). With the benefit of full briefing, the Court grants-in-part and denies-in-part both motions.

BACKGROUND

Lexmark develops and sells toner cartridges that utilize patented microchip technology for printer-to-cartridge authentication purposes. UII develops and sells devices that allow third parties to make aftermarket toner cartridges which work with Lexmark printers. Lexmark maintains that UII's devices infringe its patents.

I.   Factual Background

Lexmark's business strategy focuses on building an installed base of printers that will generate demand for Lexmark's toner cartridges and services. Dkt. 36 at 3. To protect this demand, Lexmark developed microchip technology that allows authorized toner cartridges and Lexmark printers to record information and communicate with one another in novel ways. *Id.* at 6. The implementation of this technology is supposed to prevent unauthorized toner cartridges from being used in Lexmark printers while also improving the general processing capabilities of Lexmark products. *Id.*

Lexmark owns a number of patents that cover key features of its microchip technology. Eight are at issue here: U.S. Patent Nos. 9,839,136 ("the '136 Patent"); 9,400,764 ("the '764 Patent"); 7,844,786 ("the '786 Patent"); 8,966,193 ("the '193 Patent"); 8,225,021 ("the '021 Patent"); 8,386,657 ("the '657 Patent"); 8,850,079 ("the '079 Patent"); and 9,176,921 ("the '921 Patent).[1] The parties agree that these patents fit into four categories: the "Voltage Clamping Patents" (the '136 and '764 Patents); the "Punch Out Bit Patents" (the '786 and '193 Patents); the "First Family of Address Change Patents" (the '021 and '657 Patents); and the "Second Family of Address Change Patents" (the '079 and '921 Patents).

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[1] Lexmark's asserted patents can be found at Dkts. 36-3 (the '021 Patent), 36-4 (the '657 Patent), 36-5 (the '079 Patent), 36-6 (the '921 Patent), 36-8 (the '786 Patent), 36-9 (the '193 Patent), 36-11 (the '764 Patent), and 36-12 (the '136 Patent).

The Voltage Clamping Patents describe memory modules, electrical interfaces, addressing schemes, and command protocols that facilitate communication between computing devices and memory modules. *See generally* Dkts. 36-11 & 36-12. These patents seek to overcome issues with both the untimely updating of non-volatile memory modules and their general use-based degradation. Dkt. 36-11 at 15; Dkt. 36-12 at 18. They teach that these issues can be diminished by utilizing an intermediate signal wire voltage that allows a controlling computer system to continue sending data and clock signals to subject memory modules while also tracking individual memory modules. Dkt. 36-11 at 15–16; Dkt. 36-12 at 18–19; *see* Dkt. S-247-6 at 16–18.

The Punch Out Bit Patents describe electrical interfaces, addressing schemes, and command protocols that allow for single signal communications with multiple memory modules in computing devices. *See generally* Dkts. 36-8 & 36-9. These patents largely seek to overcome the same issues that the Voltage Clamping Patents are directed towards. Dkt. 36-8 at 13; Dkt. 36-9 at 15. They teach that these issues can be further diminished by utilizing command protocols to send "punch out" commands concerning specified bits in one or more non-volatile memory modules. Dkt. 36-8 at 13–14; Dkt. 36-9 at 15–16. These commands effectively enable each subject memory module to change a particular bit field in order to record/signify data such as toner cartridge depletion. *Id.*

The First Family of Address Change Patents describe master/slave communication systems in which a master device communicates with a slave device by uniquely addressing each of the slave devices for security-authentication purposes. *See generally* Dkts. 36-3 & 36-4. These patents seek to provide more security in bus systems shared by master and slave devices (such as printers and toner cartridges) by periodically changing a slave device's unique address through master command without having the slave device communicate its new address back to the master. Dkt. 36-3 at 11; Dkt. 36-4 at 11. They teach that these goals can be achieved through a pseudorandom address-changing method in which, by master command, a slave changes its address according to a secret algorithm. Dkt. 36-3 at 11–12; Dkt. 36-4 at 11–12. Knowing the algorithm itself, the master can then generate the same changed address without the slave translating it back across the shared communication bus. *Id.* This purportedly prevents imposter slave devices from intercepting or detecting an authentic slave device's new address.

The Second Family of Address Change Patents describe methods of setting a slave device's address that include determining a characterization value associated with a consumable, calculating number of address change operations based upon the characterization value, and setting a last address generated from the number of address change operations as the new address of the slave device, wherein the characterization value is determined based upon a usage of the consumable. *See*

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generally Dkt. 36-5 & 36-6. In other words, these patents describe a more variable and dynamic address-changing method that is meant to alleviate vulnerabilities inherent in the security techniques disclosed by the First Family of Address Change Patents (i.e., the possibility of an imposter device that can mimic basic pseudorandom address-changing sequences). Dkt. 36-5 at 10; Dkt. 36-6 at 9. The Second Family of Address Change patents teach that these vulnerabilities can be diminished by a command protocol in which a master device transmits a number of address-change requests, and a slave device undertakes the same number of address-change operations. Dkt. 36-5 at 10–11; Dkt. 36-6 at 9–10. Once the slave acknowledges completion of all requested operations, the final address generated by the slave is set as its new address. *Id.* This is supposed to make it more difficult for a person to produce imposter devices that can predict correct addresses.

Notwithstanding the aforementioned authentication technology—which Lexmark claims to have implemented in its products—UII has created devices that allow unauthorized toner cartridges to work in Lexmark printers. These devices are (or were) sold by UII[2] to third party cartridge remanufacturers and include UII's E260 Family, T650 Family, and Color Printer Devices, (collectively, "the UII Pensive Devices") as well as UII's MS/MX 310 Family, MS/MX 710/810 Family, and BSD M/XM Family (collectively, "the UII Arwen Devices"). Dkt. 36 at 10–11.

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[2] *See generally* Dkt. 36-14 (screenshots from www.uiiindustries.com taken on April 5, 2018).

Each UII device generally utilizes two integrated circuit chips to achieve communication and processing goals similar to those discussed above. *Id.* They nevertheless correspond to different Lexmark products[3] and vary in functionality by group (i.e., UII Pensive Devices versus UII Arwen Devices).

Lexmark claims that UII was able to produce these devices only by disassembling and reverse engineering the microchips in Lexmark's toner cartridges. *Id.* at 17–19. Lexmark seeks to prove that, in so doing, UII created devices that infringe multiple claims contained within the patents asserted above.

II. Procedural Background

On April 30, 2018, Lexmark brought the instant patent infringement suit against UII. Dkt. 1. After multiple years of motion practice, the following issues remain: (I) whether the UII Pensive Devices infringe claims 1 and 9 of the '136 Patent; (II) whether the UII Pensive Devices infringe claims 15 and 24 of the '764 Patent; (III) whether the UII Pensive Devices infringe claims 2 and 6 of the '786 Patent; (IV) whether the UII Pensive Devices infringe claims 10 and 33 of the '193 Patent; (V) whether the UII Arwen Devices infringe claims 1 and 3 of the '021

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[3] According to Lexmark, and UII's website, UII's devices correspond to Lexmark's products in the following way: the E260 Family corresponds to Lexmark's E26cx/36x/46x Family; the T650 Family corresponds to Lexmark's T65x Family; the Color Printer Devices correspond to Lexmark's C54x Family; the MS/MX 310 Family corresponds to Lexmark's MS31x/41x/51x/61x Family; the MS/MX 710/810 Family corresponds to Lexmark's MS71x/81x Family; and the BSD M/XM Family corresponds to certain models in Lexmark's MS31x/41x/61x and MS71x/81x Families. Dkt. 36 at 11; Dkt. 36-14 at 4–5.

Patent; (VI) whether the UII Arwen Devices infringe claims 2 and 9 of the '657 Patent; (VII) whether the UII Arwen Devices infringe claims 7 and 14 of the '079 Patent; (VIII) whether the UII Arwen Devices infringe claims 1 and 15 of the '921 Patent; (IX) whether Lexmark's products practice at least one claim of each of the asserted patents; and (X) whether any claims at issue in the asserted patents are invalid.

On August 7, 2023, the parties submitted opposing motions for summary judgment. Dkts. 239/S-244 & 242/S-247. Lexmark requests: (I) a finding of validity as to all asserted claims of the Voltage Clamping Patents; (II) a finding of validity as to claim 33 of the '193 Patent; (III) a finding of infringement concerning the UII Arwen Devices' alleged infringement of claim 1 of the '021 Patent and claim 7 of the '079 Patent; (IV) a finding of infringement concerning the UII Pensive Devices' alleged infringement of claim 15 of the '764 Patent; and (V) a finding that Lexmark's products practice at least one claim of each of the patents at issue. *See generally* Dkt. S-247. UII requests: (I) a finding of non-infringement as to each asserted patent; (II) a finding of invalidity as to the Punch Out Bit Patents; (III) a finding that Lexmark has failed to establish lost profits damages; and (IV) a finding precluding Lexmark from recovering any pre-suit damages. *See generally* Dkt. S-244. The Court now turns to address these issues.

LEGAL STANDARD

Under Federal Rule of Civil Procedure 56, "[t]he court shall grant summary judgment if the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(a); *see also Mize v. Jefferson City Bd. of Educ.*, 93 F.3d 739, 742 (11th Cir. 1996). An issue of fact is "genuine" only if "a reasonable jury could return a verdict for the nonmoving party." *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). A fact is "material" if the fact could affect the outcome of the lawsuit under the governing law. *Id.*

The moving party bears the initial burden of identifying those portions of the record demonstrating the lack of a genuinely disputed issue of material fact. *Celotex Corp. v. Catrett*, 477 U.S. 317, 323 (1986). If met, the burden shifts to the non-moving party to "come forward with specific facts showing that there is a genuine issue for trial." *Shaw v. City of Selma*, 884 F.3d 1093, 1098 (11th Cir. 2018) (citation omitted). To satisfy its burden, the non-moving party "must do more than simply show that there is some metaphysical doubt as to the material facts." *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 586 (1986). The non-moving party must go beyond the pleadings and "identify affirmative evidence" that creates a genuine factual dispute. *Crawford-El v. Britton*, 523 U.S. 574, 600 (1998).

In determining whether a genuine dispute of material fact exists, the Court must view the evidence and draw all factual inferences therefrom in a light most favorable to the non-moving party. *Skop v. City of Atlanta*, 485 F.3d 1130, 1136 (11th Cir. 2007). In addition, the Court must resolve any reasonable doubts in the non-moving party's favor. *Id.* Summary judgment should only be granted "[w]here the record taken as a whole could not lead a rational trier of fact to find for the non-moving party[.]" *Matsushita*, 475 U.S. at 587.

DISCUSSION

The instant dispute revolves around invalidity, infringement, damages, and whether Lexmark's products practice at least one claim of each of the patents asserted above. The Court will address each below.

I.   Non-Invalidity

Patents are presumed valid under 35 U.S.C. § 282. To overcome this presumption on summary judgment, UII must establish invalidity by clear and convincing evidence. *See Norian Corp. v. Stryker Corp.*, 363 F.3d 1321, 1326 (Fed. Cir. 2004). To retain this presumption, Lexmark need only demonstrate that UII failed to meet its evidentiary burden of establishing invalidity. *See Eli Lilly & Co. v. Barr Lab'ys, Inc.*, 251 F.3d 955, 962 (Fed. Cir. 2001) (finding that "a moving party seeking to have a patent held not invalid at summary judgment must show that the

nonmoving party . . . failed to produce clear and convincing evidence on an essential

element of a defense upon which a reasonable jury could invalidate the patent").

Here, Lexmark has adequately demonstrated that UII failed to present clear

and convincing evidence concerning the invalidity of Claims 15 and 24 of the '764

Patent, Claims 1 and 9 of the '136 Patent, and Claim 33 of the '193 Patent. Indeed,

beyond the fact that "UII chose not to contest the validity of these specific claims"

on summary judgment, Dkt. S-256 at 13, UII's technical expert, Joseph

McAlexander, admitted that he has no invalidity opinions about them:

> **Lexmark's counsel**: Okay, Mr. McAlexander, I reviewed your
> invalidity reports. And there are two patents that we've been discussing
> at length here regarding voltage clamping and voltage limiting [the '764
> and '136 Patents (the Voltage Clamping Patents)]. And also Claim 33
> of the '193 Patent which includes a voltage limiting limitation. I did not
> see any invalidity arguments that you presented for any of those -- those
> claims. Do you have any invalidity arguments with respect to Claim 33
> of the '193 Patent or the other two voltage clamping patents?
>
> **Mr. McAlexander**: The -- of the eight patents, my invalidity positions
> are addressing six of those -- or eight of those -- excuse me -- six of
> those patents. I did not present any addition -- any invalidity positions
> for the other two. That answers the first part of your question. And with
> regard to Claim 33 on the '193, I believe I did not offer any invalidity
> position on that as well.

Dkt. 247-5 at 23–24. Summary judgment of non-invalidity is therefore appropriate

as to these claims.[4] *See Biotec Biologische Naturverpackungen GmbH & Co. KG v.*

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[4] There appears to be some dispute concerning Lexmark's entitlement to summary judgment on
this issue due to UII's decision not to affirmatively challenge validity at the summary judgment
stage. *See* Dkt. S-256 at 13; Dkt. S-272 at 12. The Court notes that UII challenged the validity of

Biocorp, Inc., 249 F.3d 1341, 1352–55 (Fed. Cir. 2001) (upholding summary judgment finding of non-invalidity where the moving party "presented deposition testimony of the defendants' primary witness wherein they admitted knowing no facts that implied the invalidity of the patents").

II.   Invalidity

UII challenges the validity of: (1) Claims 2 and 6 of the '786 Patent, and (2) Claim 10 of the '193 Patent. Specifically, UII maintains that prior art both anticipates and renders obvious each of these claims. Dkt. S-244 at 19–45.

"The first step in any invalidity analysis is claim construction[.]" *SIBIA Neurosciences, Inc. v. Cadus Pharm. Corp.*, 225 F.3d 1349, 1355 (Fed. Cir. 2000) (citation omitted). "Claim scope or construction is a question of law and the existence of a dispute as to that legal issue does not preclude summary judgment." *Tillotson, Ltd. v. Walbro Corp.*, 831 F.2d 1033, 1037 (Fed. Cir. 1987) (citation omitted). If "a claim is in dispute, however, it is necessary to look at certain extrinsic evidence, including the specification, the prosecution history, and other claims." *Id.* Where that extrinsic evidence includes "expert testimony needed to explain a disputed term . . . an underlying factual question may arise which makes summary

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the '764, '136, and '193 Patents in its affirmative defenses. Dkt. 67 at 61–62. This makes non-invalidity an appropriate subject of summary judgment. *See* Fed. R. Civ. P. 56(a) ("A party may move for summary judgment, identifying each claim or defense—or the part of each claim or defense—on which summary judgment is sought.").

judgment improper." *Howes v. Med. Components, Inc.*, 814 F.2d 638, 643 (Fed. Cir.

1987) (cleaned up) (citation omitted).

The Punch Out Bit Field Patent claims challenged by UII read as follows:

1. A method of updating memory modules, comprising: receiving, at one or more memory modules, a command transmitted from a processing device, wherein the command comprises a) an increment counter command operable to instruct the one or more memory modules to increment a counter within the one or more memory modules and b) a punch out bit field command operable to instruct the one or more memory modules to punch out a specified bit field within the one or more memory modules; and processing the command at the one or more memory modules [Claim 1, '786].

2. The method of claim **1**, wherein processing the command comprises incrementing, in each of the one or more memory modules, at least one counter [Claim 2 of '786].

6. The method of claim **1**, wherein receiving further comprises receiving, at the one or more memory modules, the command from the processing device transmitted to the one or more memory modules via an asynchronous data channel [Claim 6, '786].

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10. A memory module, comprising: a plurality of memory bits, wherein the memory module receives at least one command indicative of usage of toner or ink in a consumable item for an imaging device and instructs the memory module to punch out at least one bit in at least one specified bit field within the memory module indicative of the usage of toner or ink, and processes the at least one command [Claim 10, '193].

Dkt. 36-8 at 20 (the '786 Patent); Dkt. 36-9 at 23 (the '193 Patent).

Thus far, the Court has construed the following limitations in the following

ways:

Claim Term	Claim Term Construction
"processing the command at the one or more memory modules"	"executing instructions to perform the command described in this claim at the one or more memory modules"
"punch out bit field command"	"command to change at least one bit, in a specific bit field in the one or more non-volatile memory modules"
"punch out a specified bit field"	"changing a specified bit or specified group of bits in a non-volatile memory module"
"punch out at least one bit"	"change at least one bit, in the non-volatile memory module"

Dkt. 117 at 10, 23. The Court will address additional claim construction issues, such

as scope, in the specific contexts of anticipation and obviousness.

i.   **Anticipation**

35 U.S.C. § 102 provides that a claim is anticipated only "'if each and every

limitation is found either expressly or inherently in a single prior art reference.'"

IPXL Holdings, L.L.C. v. Amazon.com, Inc., 430 F.3d 1377, 1380 (Fed. Cir. 2005)

(citation omitted). Ultimately, this is a question of fact. *Id.* (citation omitted).

Summary judgment is therefore inappropriate unless no reasonable jury applying the

clear and convincing evidence standard could find that prior art fails to anticipate all

of the subject claim's limitations. *Telemac Cellular Corp. v. Topp Telecom, Inc.*,

247 F.3d 1316, 1327 (Fed. Cir. 2001).

UII argues that three sources of prior art anticipate the subject claims: (1)

certain Inter Solution Ventures, Ltd. coding ("the ISV Code"); (2) certain Static

Control Components, Inc. coding ("the SCC Code"); and (3) U.S. Patent No. 6,984, 012 ("Asauchi"). Dkt. S-244 at 19–34. As a preliminary matter, Lexmark responds that the ISV Code cannot qualify as prior art. The Court disagrees.

For patents having a filing date prior to March 16, 2013, prior art can include disclosures of the claimed invention in patents or publications anywhere in the world, as well as public use or sale of the claimed invention the United States—as long as the disclosure, sale, or use occurred more than one year before the subject patent application was domestically filed. *See U.S. Water Servs., Inc. v. Novozymes A/S*, 843 F.3d 1345, 1350 n.5 (Fed. Cir. 2016); 35 U.S.C. § 102(b). To prevail on the "on-sale bar[,]" a party must show that the invention in question "was both (1) the subject of a commercial offer for sale and (2) ready for patenting." *Sunoco Partners Mktg. & Terminals L.P. v. U.S. Venture, Inc.*, 32 F.4th 1161, 1168 (Fed. Cir. 2022) (citations and internal quotations omitted). "Application of the on-sale bar . . . is ultimately a question of law." *Id.* at 1169 (citations and internal quotations omitted).

Given this, there is no question that the ISV Code qualifies as prior art. The '786 Patent claims priority back to June 16, 2005, Dkt. 36-8 at 2, and the '193 Patent claims priority back to April 19, 2006, Dkt. 36-9 at 2. Accordingly, the earliest critical date for either patent is June 16, 2004. UII has presented unrebutted evidence that the ISV Code was included in ISV chips that were advertised and sold prior to this date. Dkt. 241-9 at 4–14. Whether the purchaser was ignorant of the ISV chips'

internal coding is irrelevant for determining whether this qualified as a sale of the invention itself. *See Abbott Lab'ys v. Geneva Pharms., Inc.*, 182 F.3d 1315, 1318 (Fed. Cir. 1999) (agreeing with defendants that "it is irrelevant that the parties to the sales did not know [the precise subject matter with which they were dealing]"). Lexmark, moreover, cannot plausibly contest that the ISV Code was ready for patenting at this time. It was reduced to practice prior to sale. *See Pfaff v. Wells Elecs., Inc.*, 525 U.S. 55, 61 (1998) ("It is well settled than an invention may be patented [even] before it is reduced to practice.").

Anticipating these issues, Lexmark argues that the on-sale provision of section 102(b) precludes only patentees from commercializing their own inventions prior to patenting them. Dkt. S-262 at 17. This, however, is a misunderstanding of Federal Circuit caselaw. Although preventing patentees from unduly extending their monopoly over a later patented subject-matter is a strong policy behind the on-sale bar, it is not section 102(b)'s only goal. What is more, the Federal Circuit has made clear that "the statutory on-sale bar is not subject to exceptions for sales made by third parties." *Abbott*, 182 F.3d at 1318 (citation omitted). The fact that ISV sales "were not made by [Lexmark] is therefore irrelevant." *Id.* The ISV Code is prior art that UII can rely on for invalidity purposes.

Notwithstanding, the Court finds that a material issue of fact precludes summary judgment regarding the ultimate issue of anticipation. On one hand, Mr.

McAlexander presents extensive opinions regarding why the ISV Code, the SCC Code, and Asauchi each disclose all of the limitations of Claims 2 and 6 of the '786 Patent or Claim 10 of the '193 Patent. Dkt. 241-10 at 351–67, 415–25, 437–50, 481–86. On the other hand, Lexmark's technical expert, Dr. Martin Walker, presents similarly extensive rebuttal opinions to the contrary. S-Dkt. 262-10 at 114–21, 127–32, 143–45. A reasonable jury could find for either party based on these reports and the material facts contested therein. It follows that a "classic 'battle of the experts'" exists "which renders summary judgment improper." *Edwards Sys. Tech., Inc. v. Digital Control Sys., Inc.*, 99 F. App'x 911, 921 (Fed. Cir. 2004); *see also Crown Packaging Tech., Inc. v. Ball Metal Beverage Container Corp.*, 635 F.3d 1373, 1384 (Fed. Cir. 2011) (finding that, "[w]here there is a material dispute as to the credibility and weight that should be afforded to conflicting expert reports, summary judgment is usually inappropriate"); *TriMed, Inc. v. Stryker Corp.*, 608 F.3d 1333, 1343 (Fed. Cir. 2010) (reversing summary judgment where genuine issues of material fact surrounded anticipation). UII may present their anticipation case at trial. It is up to the jury to weigh materially disputed expert testimony on this subject, not the Court. *See Med. Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1220 (Fed. Cir. 2003) ("The question of what a reference teaches and whether it describes every element of a claim is a question for the finder of fact.").

ii. Obviousness

35 U.S.C. § 103 provides that a claim is invalid due to obviousness where:

> the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.

"Whether the claimed subject matter would have been obvious to an ordinarily skilled artisan at the time of the invention 'is a question of law based on underlying questions of fact.'" *Plantronics, Inc. v. Aliph, Inc.*, 724 F.3d 1343, 1353 (Fed. Cir. 2013) (citation omitted). These facts include: "(1) the scope and content of the prior art; (2) differences between the prior art and the claims at issue; (3) the level of ordinary skill in the pertinent art; and (4) relevant objective considerations, including commercial success, long felt but unsolved needs, and failure of others[.]" *Id.* (internal quotations and citations omitted) (cleaned up). Obviousness must be proved by clear and convincing evidence. *See Procter & Gamble Co. v. Teva Pharms. USA, Inc.*, 566 F.3d 989, 993–94 (Fed. Cir. 2009).

Unlike anticipation, "[o]bviousness can be proven by combining existing prior art references[.]" *Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1364 (Fed. Cir. 2008). This means that it will sometimes "be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to [the relevant field]; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent

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reason to combine" known prior art elements in the way claimed by the subject patent. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* at 416.

Here, UII argues that the combination of U.S. Patent No. 5,995,744 ("Applegate") and the Dallas Semiconductor DS1982 Specification Sheet ("DS1982") render the '786 and '193 Patents obvious. Dkt. S-244 at 34–45. Lexmark responds that underlying issues of material fact preclude summary judgment on these issues. Dkt. S-262 at 19–21.

The Court begins its analysis by noting that Applegate and DS1982 qualify as prior art that a skilled artisan would have had reason to combine. Applegate, a "method and apparatus for storing data in a non-volatile memory circuit mounted on a printer's process cartridge," was issued on November 30, 1999. Dkt. 241-5 at 2. DS1982, a "secure microchip" specification sheet, is published in Appendix A of U.S. Patent No. 5,760,385 ("Curry"), which was itself issued on June 2, 1998. Dkt. 241-6 at 2, 12–33. These prior art references consequently predate the earliest critical date for the subject patents by years. *See* Dkt. 36-8 at 2; Dkt. 36-9 at 2. Further, Applegate expressly references DS1982 on multiple occasions and states that its preferred EPROM "comprises a [DS1982 integrated circuit memory device]." Dkt. 241-5 at 21. Such a reference provides express motivation to combine Applegate and

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DS1982. *See Bayer Healthcare Pharms., Inc. v. Watson Pharms., Inc.*, 713 F.3d 1369, 1374–75 (Fed. Cir. 2013) (finding motivation to combine two pieces of prior art where one expressly referenced the other).

With this much established, a comparison of Applegate/DS1982 and the Punch Out Bit Field Patents is appropriate.

a. The '786 Patent and Applegate/DS1982

Both Claim 1 of the '786 Patent and Applegate/DS1982 disclose a method of updating non-volatile memory modules. Dkt. 36-8 at 20; Dkt. 241-5 at 30; Dkt. 241-10 at 368–375. The first issue to consider is whether, like Claim 1, Applegate/DS1982 disclose a method that involves "receiving, at one or more memory modules, a command transmitted from a processing device wherein the command comprises: a) an increment counter command operable to instruct the one or more memory modules to increment a counter within the one or more memory modules[.]" Dkt. 36-8 at 20. While the parties agree that DS1982 does disclose an operation for updating a value in non-volatile memory, they disagree about whether this operation specifically involves an increment counter command from a processing device. Dkt. S-262-10 at 133. Dr. Walker posits, and UII does not dispute, that "[t]here are multiple ways that a memory value can be updated, most of which involve the processor writing an updated value to the memory module." *Id.* at 132. Dr. Walker consequently maintains that "[s]ending an updated value to the

memory module is different from sending an increment counter command" and there

is "no reason to infer that" DS1982 discloses an increment counter command where

Applegate/DS1982 are "silent about *how* the count is incremented[.]" *Id.* at 133

(emphasis in original).

The Court largely agrees with Dr. Walker. Mr. McAlexander's strongest

source of evidence concerning Applegate/DS1982's disclosure of an increment

counter command comes from the DS1982 demonstratives included below:
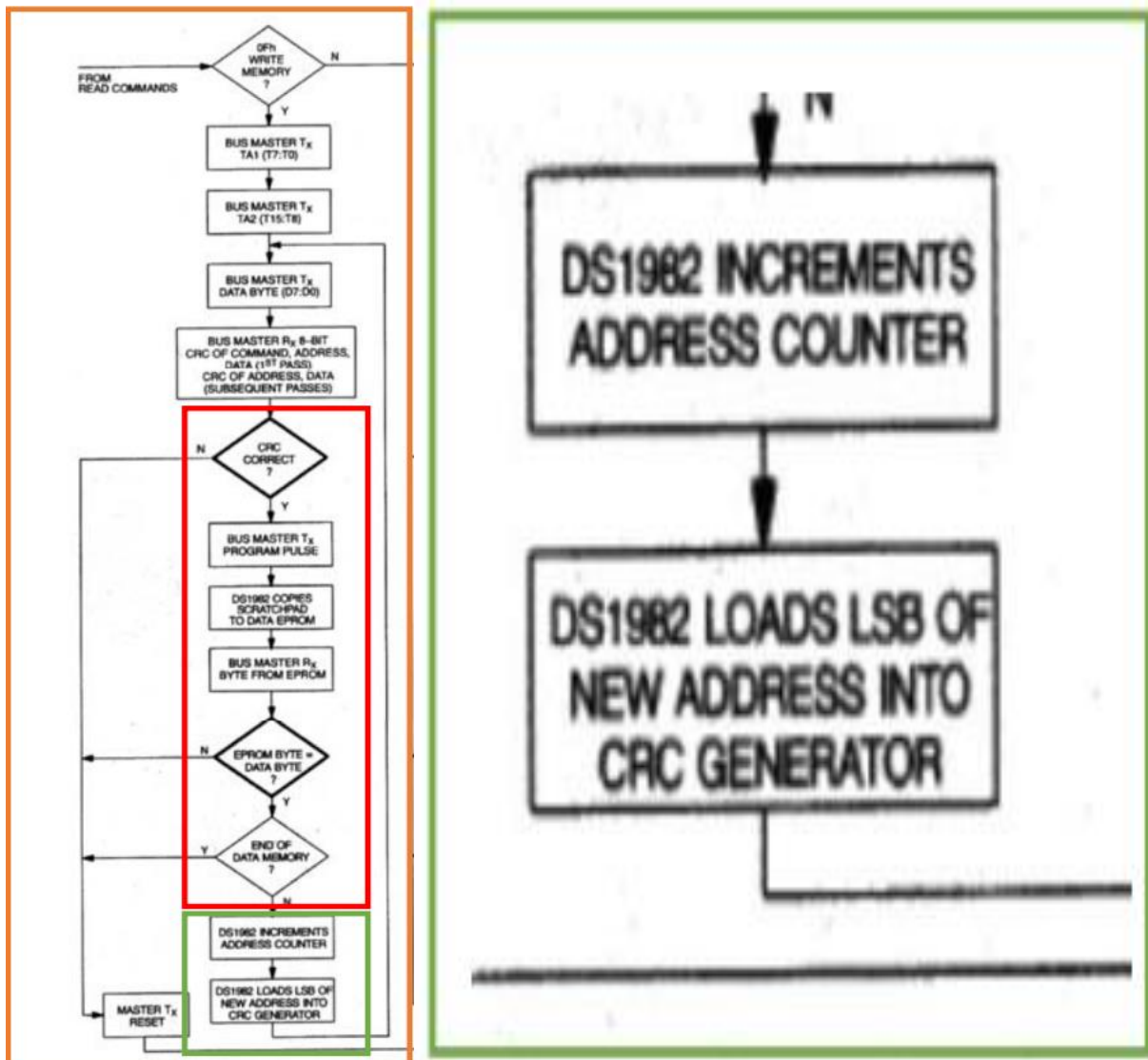
See Dkt. 241-10 at 381–86. These demonstratives nevertheless fail to show how the count is incremented, and they certainly show no specific increment counter command from a processing device. More importantly, though, DS1982 itself provides that DS1982 chips "will automatically increment [their] address counter to select the next byte in the EPROM Status data field" when certain "bit position" conditions are met. Dkt. 241-6 at 23. This reasonably suggests that DS1982 incrementation is not a product of specific increment counter commands transmitted from processing devices interacting with DS1982 chips.

Mr. McAlexander attempts to close this gap by pointing to Applegate, but the same issue arises. Consider the following Applegate background reference upon which Mr. McAlexander relies:

> A concept found in some conventional printer/copiers is the ability to limit the service life of a process cartridge based on information being stored in the process cartridge. An example of this is U.S. Pat. No. 5,276,461 (owned by Tokyo Electric) which discloses a laser printer having a replaceable photosensitive cartridge and also having a non-volatile memory mounted to a card base plate. The non-volatile memory comprises an EEPROM integrated circuit, which has a new count value incremented every time the printer produces a new printed sheet of print media.

Dkt. 241-5 at 16. Once again, this does not suggest that any new count value is being reached through a specific increment counter command sent from a processing device that is then processed by the memory module. It is just as likely that one skilled in the art would understand this to be a reference to a processor writing an

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updated value to a memory module. The combination of Applegate and DS1982 fail

to clearly disclose a method of updating non-volatile memory modules that includes

increment counter commands.

The second disputed issue to consider is whether, like Claim 1,

Applegate/DS1982 disclose a method that involves a command comprising both a)

an increment counter command *and* "b) a punch out bit field command [(i.e., a

command to change at least one bit, in a specific bit field in the one or more non-

volatile memory modules)] operable to instruct the one or more memory modules to

punch out a specified bit field within the one or more memory modules[.]" Dkt. 36-

8 at 20. Based on the foregoing, it is clear that this is not the case. Applegate/DS1982

do not disclose an increment counter command—let alone a command frame that

includes both a specific increment counter command and a punch out bit field

command. Mr. McAlexander's assertions to the contrary strike the court as *ipse dixit*.

Moreover, even if it were true that "each [DS1982] memory module [disclosed by

Applegate] includes at least a command to increment a counter and instruct the

memory module to punch out at least one bit[,]" Mr. McAlexander does not

adequately explain where Applegate/DS1982 disclose such a multi-pronged

command that comes from a processing device such as a printer. *See* Dkt. 241-10 at

376. The prior art cited by UII can be reasonably interpreted as disclosing a method

of updating non-volatile memory modules that is different from that disclosed by the '786 Patent. Material issues of fact exist.

That said, UII has failed to meet its burden of showing by clear and convincing evidence that the '786 Patent was obvious. "Obviousness requires more than a mere showing that the prior art includes separate references covering each separate limitation in a claim under examination." *Unigene Lab'ys, Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011) (citation omitted). It "requires the additional showing that a person of ordinary skill at the time of the invention would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention." *Id.* Here, UII has shown a motivation to combine Applegate and DS1982, but it has not shown that this prior art covers the limitations of the '786 Patent or that an artisan would have reached the novelties of the '786 Patent through a normal course of research and development. The "primary object of" Applegate, after all, is "to provide an image forming apparatus such as a printer that is capable of irreversibly storing information on a memory device that is attached to a process cartridge." Dkt. 241-5 at 17. In such a device, "the EPROM memory device [DS1982] acts as a 'write once read often' memory device, because the EPROM cannot be erased by ultraviolet light, since the window through which this normally occurs is permanently sealed[.]" *Id.* at 18. The '786 Patent discloses no such apparatus and does not envision treating non-volatile memory devices in

this specific way. It therefore makes little sense to suppose, without more, that an artisan on the path set forth by Applegate/DS1982 would ever arrive at the method claimed by the '786 Patent. The Court denies UII summary judgment on this issue.

### b. The '193 Patent and Applegate/DS1982

The parties' obviousness dispute as to the '193 Patent revolves around Claim 10, an independent claim which, as noted above, discloses:

> A memory module, comprising: a plurality of memory bits, wherein the memory module receives at least one command indicative of usage of toner or ink in a consumable item for an imaging device and instructs the memory module to punch out at least one bit in at least one specified bit field within the memory module indicative of the usage of toner or ink, and processes the at least one command.

Dkt. 36-9 at 23. At this point, there is no question that Applegate/DS192 disclose a non-volatile memory module that is comprised of a plurality of bits. Applegate expressly discloses DS1982 as its preferred EPROM embodiment, and DS1982 chips provide at least 1024 bits of data memory. Dkt. 241-5 at 21; Dkt. 241-6 at 12. Instead, the issue is whether this prior art discloses a memory module that also "receives at least one command indicative of usage of toner or ink in a consumable item for an imaging device and instructs the memory module to punch out at least one bit in at least one specified bit field within the memory module indicative of the usage of toner or ink." Dkt. 36-9 at 23.

The Court finds that it does not. In the context of literal infringement, UII relies on the notion that there is a material difference between (a) changing specific

bits in a non-volatile memory bit field in response to a command and (b) copying

and storing information (bytes), without any changes, from volatile memory into

non-volatile memory. Dkt. S-244 at 13. Because the subject limitation requires the

disclosed non-volatile memory module, through specific command, to "change at

least one bit, [in at least one specified bit field,] in the [disclosed] non-volatile

memory module," *see* Dkt. 117 at 10, 23, the Court agrees that the former would

satisfy the subject limitation, while the latter would not. The later method is simply

too generalized. As Dr. Walker himself testified, it involves no reception of a

command to punch out a specific bit, in a specific bit field, *in* non-volatile memory.

See Dkt. S-246-3 at 152–53. The problem for UII, then, is that DS1982 only

discloses this later method. Indeed, its own demonstrative shows that, in response to

a Write Memory OFh command, "DS1982 COPIES SCRATCHPAD [(volatile

memory)] TO DATA EPROM [(non-volatile memory)]" before "DS1982

INCREMENTS ADDRESS COUNTER[.]"
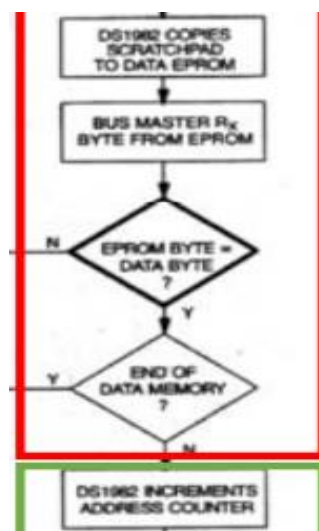
Dkt. 241-6 at 20.

Of course, the Court recognizes that UII's infringement construction is partly a product of Dr. Walker's alleged flip-flopping on the issue of whether the distinction addressed above is material. But UII cannot have it both ways any more than Dr. Walker can. *See CommScope Techs. LLC v. Dali Wireless Inc.*, 10 F.4th 1289, 1299 (Fed. Cir. 2021) (finding that a party cannot simultaneously rely on inconsistent claim requirements for invalidity and infringement). And, either way, as will be further explained in the context of infringement, this is the scope-construction most compatible with the common limitations found in other claims of the Punch Out Bit Field Patents. Receiving a command to punch "out a specified bit field" results in directly changing a *specified bit* or *specified group of bits in* a non-volatile memory module. Applegate/DS1982 do not disclose a non-volatile memory module that does anything more than copy and store entire bytes (the bits of which are apparently unspecified by command) from volatile memory into an unspecified bit field. This means that they do not cover the subject limitation.

The Court consequently finds that UII has failed to meet its burden of showing by clear and convincing evidence that the '193 Patent was obvious. UII has not clearly shown that Applegate/DS1982 covers the limitations of Claim 10. Nor has it convincingly shown that an artisan would have reached the novelties of the '193 Patent through a normal course of research and development. *See Unigene*, 655 F.3d

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at 1360. The memory module disclosed by the '193 Patent arguably takes a novel step in processing highly specified commands indicative of usage of toner or ink in a consumable item for printers that does not naturally follow from Applegate/DS1982. UII is denied summary judgment on this issue.

III. Infringement

Like invalidity, a "determination as to infringement involves a two-step analysis." *WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1346 (Fed. Cir. 1999). "First, the claims are construed, a question of law in which the scope of the asserted claims is defined. Second, the claims, as construed, are compared to the accused device. This is a question of fact." *Advanced Cardiovascular Sys., Inc. v. Scimed Life Sys., Inc.*, 261 F.3d 1329, 1336 (Fed. Cir. 2001) (citation omitted). To ultimately prove infringement, the patentee must show by a preponderance of the evidence that the accused device meets each claim limitation either literally or under the doctrine of equivalents. *Id.* Summary judgment is appropriate where "it is shown that the infringement issue can be reasonably decided only in favor of the movant, when all reasonable factual inferences are drawn in favor of the non-movant." *Voice Techs. Grp., Inc. v. VMC Sys., Inc.*, 164 F.3d 605, 612 (Fed. Cir. 1999).

Here, both parties request summary judgment on various infringement issues. Lexmark requests findings that: (1) the UII Arwen Devices literally infringe Claim 1 of the '021 Patent as well as Claim 7 of the '079 Patent, and (2) the UII Pensive

Devices literally infringe Claim 15 of the '764 Patent. Dkt. S-247 at 6–7. UII requests findings that its devices do not infringe any of the claims asserted by Lexmark. Dkt. S-244 at 7, 13, 15.

i. The Address Change Patents ('021, ''657, '079, '921)

Because the parties largely agree on how the UII Arwen Devices operate, literal infringement of the Address Change Patents turns on claim construction. *See Athletic Alternatives, Inc. v. Prince Mfg., Inc.*, 73 F.3d 1573, 1578 (Fed. Cir. 1996) (finding that where "the parties do not dispute any relevant facts regarding the accused product but disagree over which of two possible meanings [of a claim] is the proper one, the question of literal infringement collapses to one of claim construction").

The Court begins by noting that at least one of the following limitations is found within each asserted claim of the Address Change Patents:

Claim Term	Claim Term Construction
"address generator"	"software or electronic circuitry implementing an algorithm to generate address values by performing the specified algorithm"
"address generator generating plural addresses"	"software or electronic circuitry capable of implementing an algorithm to generate more than one address value by performing the specified algorithm"
"dynamic address generator"	"software or electronic circuitry capable of implementing an algorithm that generates a new component address"

"dynamic address generator generates a new component address"	"software or electronic circuitry capable of implementing an algorithm that generates a new component address"
"pseudorandom address generator"	*not defined during claim construction*

Dkt. 117 at 14, 18–19.[5] It follows that, for the UII Arwen Devices to infringe the Address Change Patents, they must, at the very least, contain an "address generator." *See Advanced Cardiovascular Sys., Inc.*, 261 F.3d at 1336. The question is what qualifies as "software or electronic circuity implementing an algorithm to generate address values by performing the specified algorithm."

Lexmark argues that software or electronic circuitry qualifies as such as long as it takes multiple steps to provide an address. *See* Dkt. 247 at 31–32. Under this view, providing an address by implementing a finite sequence of steps to retrieve a value from a preprogramed table of address values would qualify as performing an algorithm that generates address values. *Id.* UII, on the other hand, maintains that it is not enough to merely provide a predetermined address through implementation of a series of steps. Dkt. S-244 at 8–9. The steps must themselves generate the address value that is ultimately provided. *Id.* In other words, UII argues that the subject

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[5] "[A]ddress generator" is found in Claim 1 of the '021 Patent. Dkt. 36-3 at 16. "[P]seudorandom address generator" is found in Claim 3 of the '021 Patent through Claim 3's dependence on Claim 2, which is itself dependent on Claim 1. *Id.* "[A]ddress generator" is also found in Claims 2 and 9 of the '657 Patent through their dependence on Claim 1. Dkt. 36-4 at 16. "[D]ynamic address generator" is found in Claim 7 of the '079 Patent as well as Claim 14 through its dependence on Claim 12. Dkt. 36-5 at 14. Finally, "dynamic address generator" is also found in Claims 1 and 15 of the '921 Patent. Dkt. 36-6 at 13.

algorithm within the software or electronic circuitry must do the address generating work in order for said software or circuitry to qualify as an "address generator." *Id.*

The Court agrees with UII. It is axiomatic that an address generator generates addresses. And, contrary to Lexmark's suggestions, "to generate" is not "to provide." To provide is "to supply or make available." *Provide*, Merriam-Webster, https://www.merriam-webster.com/dictionary/provide (last visited Oct. 11, 2023). To generate is "to bring into existence: such as, to create by means of a defined process." *Generate*, Merriam-Webster, https://www.merriam-webster.com/dictionary/generate (last visited Oct. 11, 2023). It is therefore clear that the "software or electronic circuitry implementing an algorithm to generate address values by performing the specified algorithm" must perform an algorithm that actually brings address values into existence (in some form) in order to qualify as an "address generator." It must do the work of generation, not just providing. *See Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 981 (Fed. Cir. 1995), *aff'd,* 517 U.S. 370 (1996) (finding that "[e]xtrinsic evidence is to be used for the court's understanding of the patent, not for the purpose of varying or contradicting the terms of the claims").

Lexmark offers a number of reasons to reject this approach. First, Lexmark argues, it "wrongly excludes the preferred embodiments disclosed in the '021 Patent where the address generator 'provides' a new address." Dkt. S-272 at 7. While the

Court recognizes that it is "rarely, if ever, correct" to interpret a claim so as to exclude preferred embodiments, *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996), that is not what is happening here. An address generator can both generate *and* provide an address. The two are not mutually exclusive. For instance, consider the following portions of the '021 Patent cited by Lexmark:

> **2:29-37**: In one or more disclosed embodiments, each slave device incorporates therein a pseudorandom address generator which can be incremented in response to a change address command from the master device. When an address change is requested by the master, the slave receives the request and increments the pseudorandom address generator to provide a new slave address. The master device, running the same address change algorithm, also increments the address in the algorithm and thus predicts the new slave address.

> **6:5-13**: When the slave device, for example slave device **14***a*, receives the command and the old slave address matches the address currently provided by the dynamic address generator **32***a*, then the command is processed by the I^{2}C circuit **26***a*. When decoded, the address change command causes the dynamic address generator **32***a*, to be incremented, whereupon a new random address is generated and self-assigned to the slave device **14***a*.

> **7:20-25**: FIG. **4** illustrates an embodiment of a slave address generator according to another embodiment of the invention. Here, the pseudorandom address generator **50** described above provides the least significant bits of the slave device address, and a fixed address circuit **62** provides a fixed address that is unique to each slave device **14**.

> **8:2-6**: If the address received on the shared bus **16** matches the 10-bit address provided by the slave address generator **64**, then the particular slave device **14** can respond according to the command.

Dkt. 36-3 at 11–14. To begin with, none of these references is excluded by the Court's construction. The above embodiments, moreover, do not suggest that

address generation is mere address provision. They instead suggest that where an address generator is "incremented . . . a new random address is generated and self-assigned." And because a new address is never actually communicated or provided back to a master device under the Address Change Patents, this in turn suggests that address generators are envisioned to both generate and provide themselves with new addresses. Lexmark cannot plausibly claim otherwise simply by citing passages that contain the word "provide."

Lexmark subsequently argues that UII's current construction, which the Court has now largely adopted, is based on a previous construction that the Court considered and rejected. Dkt. S-272 at 7. This is somewhat true, but not surprising or problematic. Since the original claim construction in this case, the parties have been fighting about whether "*generate*" in "software or electronic circuitry implementing an algorithm to *generate* address values by performing the specified algorithm" should be understood as "provide" or "create." Dkt. 117 at 14–21 (emphasis added). The Court rejected both terms and stuck with "generate" because it was most true to the subject claim language; indeed, "generate" is found in a plethora of claims and references. In so doing, however, the Court implicitly recognized that "create" is a synonym of "generate." *Id.* at 16. Thus, in adopting "generate," the Court did not wholly depart from UII's original construction—it adopted the construction originally offered by UII and replaced one word therein

with a closely related synonym. It would therefore make little sense for UII to significantly abandon its original construction. Lexmark's suggestion that UII is attempting to relitigate claim construction falls flat.

Moving forward, the Court now turns to whether the UII Arwen Devices utilize an "address generator" as that term has been constructed above. The parties agree that source code in the UII Arwen Devices contains "a precomputed table of 6-bit partial I^2C addresses . . . "referred to as AddrChgTable[.]" Dkt. S-247-6 at 73. These addresses are never "generated" by the chips; they are prepopulated in the code to match data utilized by Lexmark products. And in order to provide, change, or self-assign these addresses, the UII Arwen Devices perform the following steps:

Steps to Provide Address
(1) Initialize the ASIC by copying I^2C address-change using the "InitAddrTable" function;
(2) Receive an I^2C address-change request at the MCU from the ASIC by looping in "ASIC_IO" to repeatedly invoke "jNewRd," which requests sub-commands from the ASIC. The MCU is configured to respond to a "NewAddr" with the address parameter 0x0170 to request its next I^2C address.
(3) Generate the next I^2C address at the MCU by performing the following steps: a) access the table of I^2C address bytes by using the pointer "I2CAddrPtr"; b) load the next address byte into the low-order byte of a 16-bit register while zeroing the top byte; and c) update "I2CAddrPtr" to prepare the next address-change request.
(4) Transmit the new I^2C address from the MCU to the ASIC, by performing the following steps: a) load three copies of the new address into the first three 2-byte words of the array "I2CShadow" and' b) write all four words of "I2CShadow" in ASIC RAM starting at RAM address 0x0420.

Dkt. S-247 at 12; Dkt. S-247-5 at 29–31.

This being the case, the Court finds that the UII Arwen Devices do not utilize an "address generator" and consequently do not literally infringe the Address Change Patents. The series of steps employed by the UII Arwen devices (the algorithm) involves accessing a list of static, predetermined addresses, selecting the next available predetermined address, and making it available. *See* Dkt. S-247 at 32 (Lexmark itself stating that the "UII Arwen Devices select addresses from a table and provide that selected, new address to the ASIC"). This means that the software or electronic circuitry therein implements an algorithm to *provide* address values, not to generate them. The Address Change Patents require implementing an algorithm that itself generates addresses. Accordingly, "every limitation recited" in the Address Change Patent claims is not found in the UII Arwen Devices. *See Strattec Sec. Corp. v. Gen. Auto. Specialty Co.*, 126 F.3d 1411, 1418 (Fed. Cir. 1997) (finding that "every limitation recited in the claim is found in the accused device" when "the properly construed claim reads on the accused device exactly"). Summary judgment in favor of UII is appropriate on the issue of literal infringement. *See Athletic Alternatives*, 73 F.3d at 1578 (Fed. Cir. 1996) (finding that the question of literal infringement is "amenable to summary judgment" where "the question of literal infringement collapses to one of claim construction").

Whether the UII Arwen Devices infringe under the doctrine of equivalents is a related but different question. In this context, the essential inquiry is whether "the accused product or process contain[s] elements identical or equivalent to each claimed element of the patented invention[.]" *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 40 (1997). "The function-way-result test provides that 'an element in the accused device is equivalent to a claim limitation if it performs substantially the same function in substantially the same way to obtain substantially the same result.'" *Tomita Tech. USA, LLC v. Nintendo Co.*, 681 F. App'x 967, 972 (Fed. Cir. 2017) (citation omitted). In assessing the "way" prong, the only prong truly at issue here, the Court must determine whether "the way the accused product performs the function . . . is 'substantially different' from the way . . . of the subject patent." *Id.* "The determination of equivalency is a question of fact[.]" *Upjohn Co. v. Mova Pharm. Corp.*, 225 F.3d 1306, 1309 (Fed. Cir. 2000). Hence, to prevail on this issue on summary judgment, UII must show that there is a lack of genuinely disputed material facts. *See Celotex Corp*, 477 U.S. at 323.

UII attempts to show that no genuine issue of material fact exists as to equivalency by pointing to Dr. Walker's equivalency analysis. Specifically, UII argues that "[n]either Lexmark nor its expert provide any meaningful explanation or evidence to establish the same function-way-result test as to each element(s) Lexmark contends it met under the [doctrine of equivalents]." Dkt. 269 at 3.

"Instead," UII argues, "Dr. Walker states generically that the accused devices perform the same function, in the same way, to achieve the same result." *Id.*

The Court largely agrees. Concerning the UII Arwen Devices and the "address generator" limitation, Dr. Walker states that:

> [W]hen UII Arwen Devices change to a next address among a list of predetermined addresses, UII Arwen Devices, nonetheless, implement an algorithm to change an address by performing the algorithm to look up and change the address. In this way, UII Arwen Devices perform substantially the same function as claimed, that is, to generate a new address. Moreover, UII Arwen Devices generate the addresses in substantially the same way, that is, by performance of a specified algorithm. Finally, the result is substantially the same in that an address is changed from an old address to a new address in a manner that is coordinated between a master printer device and a slave toner device such that the system continues to operate seamlessly after the new address is implemented. It is my opinion that UII's source code is written with a full understanding of the manner in which microchips on original Lexmark toner cartridges change addresses such that the manner in which UII Arwen Devices change addresses is done to achieve substantially the same function (i.e., change addresses), in substantially the same way (i.e., implementation of an algorithm), to achieve substantially the same result (i.e., implement a new address that is coordinated between a printer and a toner cartridge).

Dkt. S-247-6 at 183. As an initial matter, it is fair to characterize Dr. Walker's one sentence "way" analysis as a conclusory expert assertion. Such assertions do not raise issues of material fact. *Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 1001 (Fed. Cir. 2008) ("Conclusory expert assertions cannot raise triable issues of material fact on summary judgment."). Beyond that, Dr. Walker's analysis—if it can be called that—is based on an erroneous construction of "address generator" that directly

contradicts the proper construction. The UII Arwen Devices do not generate addresses by performance of a specified algorithm, as Dr. Walker states. They provide static, prepopulated addresses by performing an algorithm that amounts to selecting and adopting the next value in a predetermined table. By solely relying on Dr. Walker's inadequate and conclusory opinions, Lexmark has failed to "come forward with specific facts showing that there is a genuine issue for trial." *Shaw*, 884 F.3d at 1098 (citation omitted). The UII Arwen Devices do not infringe the Address Change Patents either literally or under the doctrine of equivalents.

ii.   **The Punch Out Bit Field Patents ('786, '193)**

UII alone requests summary judgment concerning infringement of the Punch Out Bit Field Patents. UII argues that the UII Pensive devices do not meet at least one element of Claims 2 and 6 of the '786 Patent or Claims 10 and 33 of the '193 Patent. Dkt. S-244 at 12–15.

While the disclosures of Claims 2 and 6 of the '786 Patent and Claim 10 of the '193 Patent are provided in the Court's invalidity analysis, *see supra* pp. 12–13, Claim 33 of the '193 Patent (a dependent claim) has yet to be considered. It claims:

> **30**. A memory module, comprising: memory cells for storing information therein; and a plurality of signal lines for communicating with a processing device, the memory module configured such that following reception of a command on the signal lines and during processing thereof, a voltage on a first signal line of the plurality of signal lines is limited for a period of time by the memory module to be no more than an intermediate voltage greater than voltages corresponding to a binary zero value and less than voltages

corresponding to a binary one value, for indicating by the memory module one of a busy condition and an error condition; wherein the command pertains to usage of toner or ink in a consumable item for an imaging device for instructing the memory module to punch out at least one bit of at least one specified bit field within the memory module to indicate the usage of toner or ink, and wherein the memory module processes the command following the reception thereof.

32. The memory module of claim **30**, further comprising at least one electrical component coupled between the first signal line and a ground potential such that the memory module passes current through the at least one electrical component for limiting the voltage on the first signal line to be no more than the intermediate voltage.

33. The memory module of claim **32**, wherein the intermediate voltage is based at least in part upon a resistance corresponding to the at least one electrical component.

Dkt. 36-9 at 24. In light of this, and what has been discussed above, one dispositive issue pertaining to literal infringement is whether the UII Pensive Devices receive a command to change at least one specified bit, in a specific bit field, in one or more non-volatile memory modules.[6] Although construction of this limitation was addressed in the context of invalidity, its importance for infringement necessitates a more detailed discussion here. *See WMS Gaming, Inc.*, 184 F.3d at 1346.

The parties' disagreement over the meaning of "receiving a command to change at least one specified bit, in a specific bit field, in one or more non-volatile memory modules" ultimately boils down to whether this limitation encompasses

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[6] This limitation is found in Claim 10 of the '193 Patent as well as Claim 33 through its dependence on Claim 32, which is itself dependent on Claim 30. Dkt. 36-9 at 23–24. This limitation is also found in Claims 2 and 6 of the '786 Patent through their reliance on Claim 1. Dkt. 36-8 at 20.

reception of a command to copy RAM data (volatile memory) to EEPROM (non-volatile memory). *See* Dkt. S-244 at 13; Dkt. S-262 at 13. Lexmark argues that it does because a byte (what is copied from RAM by the UII device) is simply 8 bits, and copying entire bytes comprised of punched out bits from RAM to EEPROM "necessarily changes each punched out bit in each byte that is copied." Dkt. S-262 at 13. UII argues that "there is no specified bit 'punched out'" under this UII method. Dkt. S-269 at 5.

As previously mentioned, Dr. Walker appears to waiver on this issue depending on whether infringement or invalidity is at issue:

> **Q**: Okay. And you change bits in this field – right? – as part of this function, is changing bits in the field?
>
> **A**: You can change bits in the field, but that doesn't – doesn't explain that it is punching out a bit, and it doesn't explain – so – and it doesn't explain how – that it's – how that there's a command to – that it receives a command to punch out a specific bit in a bit field.
>
> **Q**: Well, the Court's construction was changing a – changing a bit is punching out a bit, right?
>
> [objection to the form of the question]
>
> **Q**: Is –
>
> **A**: I can't remember. I don't – the – the – the – you can only – let's see. So the claim requirements – the claim itself requires that you receive a – that you receive a command to punch out a particular bit in a bit field. And what this is showing is that you can write a – and this – this shows that you write to a particular address, and I think that the two are distinct for the reasons that I discussed in my report.

Q: Okay well, the Court said that "punch out at least one bit" means "change at least one bit in nonvolatile memory," right?

A: Yes . . .

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A: And it doesn't explain that it also means that you – that you need to receive a – that the rest of the claim requires that you receive a command, not that – and the command is distinct from a[n] address and a value.

Q: Okay. Well, this – this – the 1982 spec talks about receiving this write memory command, right?

A: And the write memory command is comprised of an address and a value.

Dkt. S-246-3 at 152–54 (Dr. Walker discussing DS1982 in the context of invalidity).

Ultimately, the Court once again finds that reception of a command to copy RAM data to EEPROM in a UII device does not qualify as receiving a command to change at least one specified bit, in a specific bit field, in one or more non-volatile memory modules. Throughout the claims of the '786 and '193 Patents, the received command itself specifies bits to be changed in a specified non-volatile memory bit field.[7] The description of the '193' Patent further provides that, "[a]ccording to one

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[7] *See* '193 Claim 1 ("a command indicative of usage of toner or ink in a consumable item for an imaging device for instructing the memory module to punch out at least one bit of at least one specified bit field within the memory module"); '193 Claim 3 ("The method of claim 1, wherein the at least one bit comprises a plurality of bits and the at least one specified bit field comprises a plurality of separately specified bit fields such that each bit corresponds to a distinct specified bit field"); '193 Claim 10 ("instructs the memory module to punch out at least one bit in at least one specified bit field"); '786 Claim 1 ("a punch out bit field command operable to instruct the one or more memory modules to punch out a specified bit field"); '786 Claim 9 (same).

aspect of the invention, each memory module in the imaging or printing device may be directed to increment one or more page counts by *a specified value or to punch out a resource bit field*." Dkt. 36-9 at 17. The description of the '786 Patent provides the exact same. Dkt. 36-8 at 15. The Court therefore agrees with Dr. Walker when he says that "the claim itself requires that you . . . receive a command to punch out a particular bit in a bit field." Dkt. S-246-3 at 154. A command to copy data from RAM to EEPROM, however, does not involve this level of specification. At least one bit is inevitably changed in one or more non-volatile memory modules through such a command, but those bits are only specified by the volatile memory data—the command is generalized to copy whatever is contained therein. Finally, although the Federal Circuit has not endorsed "a regime in which validity analysis is a regular component of claim construction[,]" the Court notes that, under the construction Lexmark advances in the infringement context, it is unclear how multiple claims of the Punch Out Bit Field Patents are not rendered obvious by prior art. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1327 (Fed. Cir. 2005). DS1982 receives commands pertaining to usage of toner or ink in a consumable item for an imaging device and processes them by copying data from volatile to non-volatile memory. *See* Dkt. 241-6 at 20.

It follows that the UII Pensive Devices do not literally infringe the Punch Out Bit Field Patents. The parties agree that that the UII Pensive Devices receive

"PunchBit" commands that are processed by "copy[ing] [an entire] bitfield's current value from [the subject printer's] EEPROM to temporary storage" and then "stor[ing] the punched-out bitfield in the [subject device's] EEPROM[.]" Dkt. S-247-6 at 59–61. This means that the UII Pensive Devices do not receive commands that direct them to punch out at least one bit in a specified bitfield in non-volatile memory—they receive commands that direct them to punch out specified bits in specified bitfields in volatile memory and then eventually copy the entire volatile memory bitfield to non-volatile memory. Accordingly, the subject limitation does not read on the UII Pensive Devices in exact fashion. *See Strattec Sec. Corp*, 126 F.3d at 1418 (Fed. Cir. 1997).

Lexmark argues that "UII cannot avoid infringement by utilizing an extra step of changing at least one bit, in a specific bit field in RAM prior to making the same change in EEPROM[,]" Dkt. S-262 at 13, but this argument misses the mark. The principle that "[i]infringement arises when all of the steps of a claimed method are performed, whether or not the infringer also performs additional steps[,]" *Smith & Nephew, Inc. v. Ethicon, Inc.*, 276 F.3d 1304, 1311 (Fed. Cir. 2001), is not a means by which patent litigants can bring the function-way-result test into literal infringement analysis. In method claims using the signal word "comprising," "infringement is not avoided by the presence of elements or steps *in addition to those specifically recited in the claim." Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200

F.3d 795, 811 (Fed. Cir. 1999) (emphasis added). The UII Pensive devices are missing the element of receiving a command that instructs them to change at least one specified bit, in a specific bit field, *in* one or more non-volatile memory modules. UII devices simply do not do that. Additionally, the Court did not find Lexmark's ice cream analogy persuasive. *See* Dkt. S-285 at 8. UII never punches out at least one bit in non-volatile memory through specified command. Even if the ultimate result might be similar in some instances, the methods are different. There is no literal infringement here.

The Court concludes this section by noting that, with regard to the Punch Out Bit Field Patents, UII has made no averments concerning its entitlement to summary judgment of non-infringement under the doctrine of equivalents. Lexmark may argue this issue to the jury.

iii. The Voltage Clamping Patents ('136, '764)

The Voltage Clamping Patents have yet to be covered. On summary judgment, Lexmark argues that the UII Pensive Devices infringe Claim 15 of the '764 Patent. Dkt. S-247 at 36. UII argues that its devices do not infringe any of the asserted Voltage Clamping Patent claims (Claims 1 and 9 of the '136 Patent and Claims 15 and 25 of the '764 Patent). Dkt. S-244 at 15.

These patent claims disclose:

1. A memory module, comprising: a plurality of memory cells; and a plurality of signal lines for communicating with a processing device,

the memory module configured such that upon encountering a busy condition while processing a command received by the memory module, the memory module limits a voltage on a first signal line of the plurality of signal lines for a period of time to be no more than an intermediate voltage greater than voltage levels corresponding to a binary zero state and less than voltage levels corresponding to a binary one state when voltages on the first signal line is not limited by the memory module, for indicating an occurrence of the busy condition, wherein the memory module is configured to receive a clock signal on the first signal line, and during the period of time in which the memory modules limits a voltage on the first signal line of the plurality of signal lines to be no more than the intermediate voltage, the memory module 1) receives the clock signal on the first signal line and 2) at the same time indicates to the processing device the occurrence of the busy condition by limiting the voltage on the first signal line to be no more than the intermediate voltage [Claim 1, '136].

9. A memory device, comprising: a first signal line for receiving, by the memory device, a clock input signal; a second signal line for communicating address and data information; and a plurality of memory cells and circuitry coupled to the first signal line and the second signal line, the circuitry limiting a voltage level on the first signal line for a first period of time to be no more than a first voltage level in response to encountering a busy condition by the memory device during processing of a command, the first voltage level being less than voltage levels corresponding to a binary one state when voltages on the first signal line are not limited by the circuitry and greater than voltage levels corresponding to a binary zero state, wherein during the first period of time, the memory device receives the clock input signal on the first signal line from a processing device while at the same time the memory device communicates to the processing device an occurrence of the busy condition by limiting the voltage of the clock input signal to be no more than the first voltage level [Claim 9, '136].

<center>*****</center>

15. A memory module, comprising: memory cells for storing information therein; and a plurality of signal lines for communicating with a processing device, the memory module configured such that

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during processing of a command received on at least one of the plurality of signal lines, a voltage on a first signal line of the plurality of signal lines is clamped for a period of time by the memory module to be no more than an intermediate voltage greater than voltages corresponding to a binary zero value and less than voltages corresponding to a binary one value, the voltage clamping for communicating by the memory module to the processing device an occurrence of one of a busy condition and an error condition; wherein the memory module is configured to concurrently 1) receive a first binary input signal on the first signal line and 2) clamp the voltage of the first binary input signal to be no more than the intermediate voltage such that the voltage-clamped first binary input signal being at the intermediate voltage instead of one of the voltages corresponding to the binary one value communicates the occurrence of the one of the busy condition and the error condition by the memory module [Claim 15, '764].

24. A memory module, comprising: a plurality of memory cells; and a plurality of signal lines for communicating with a processing device, the memory module configured such that in response to encountering a busy condition while processing a command, the memory module clamps a voltage on a first signal line of the plurality of signal lines to be no more than an intermediate voltage greater than voltage levels corresponding to a binary zero state and less than voltage levels corresponding to a binary one state for a period of time to communicate to the processing device an occurrence of the busy condition; wherein the memory module is configured to receive a first binary input signal on the first signal line during the period of time the memory module clamps the voltage on the first signal line to be no more than the intermediate voltage such that the voltage-clamped first binary input signal being at the intermediate voltage instead of one of the voltage levels corresponding to the binary one state communicates by the memory module to the processing device the occurrence of the busy condition, the first binary input signal comprising an input clock signal [Claim 24, '764].

Dkt. 36-12 at 27–28 (the '136 Patent); Dkt. 36-11 at 23–24 (the '764 Patent).

Thus far, the parties have agreed to the following constructions:

Claim Term[8]	Agreed Construction
"busy condition"	"the memory module is busy processing a previous command"
"voltage on a first signal line of the plurality of signal lines to be no more than an intermediate voltage greater than voltage levels corresponding to a binary zero state and less than voltage levels corresponding to a binary one state"	"a voltage on a first signal line of the plurality of signal lines is limited to be no more than an intermediate voltage which is greater than a voltage level representing a logical '0' and is less than a voltage level representing a logical '1'"

Dkt. 117 at 11. At this point, the parties do not appear to have any claim construction-specific disagreements; rather, they disagree about whether the particular "command preamble" received by UII Pensive Devices as part of a "command frame" functions as a separate, "previous command." *See* Dkt. S-256 at 8–9 (UII arguing that the "command preamble is a single byte that contains no command to be processed . . . it is a signal sent to identify the address of the specific device to which the command data packet will be sent"); Dkt. S-262 at 14 (Lexmark arguing that "the command preamble is, in fact, a command").[9]

Before turning to this issue, however, the Court must address the admissibility of Herman Schnell's testimony. It is undisputed that Mr. Schnell is a member of UII

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[8] These claim terms were agreed upon in the context of the '764 Patent.

[9] Whether or not this can be considered a matter of claim construction is immaterial. As the Court will explain below, it is an underlying issue of material fact. And, although claim construction is itself ultimately a matter of law, where claim construction requires extrinsic evidence such as expert testimony to explain a disputed term "an underlying factual question may arise which makes summary judgment improper." *Howes*, 814 F.2d at 643 (Fed. Cir. 1987) (citation omitted).

and that he personally helped create the source code for the UII Arwen and Pensive devices. Mr. Schnell was also deposed by Lexmark, and Dr. Walker referenced his testimony dozens of times in his report on infringement. *See generally* Dkt. S-247-10 (excerpts from Mr. Schnell's deposition); Dkt. S-247-6 (Dr. Walker's infringement report). Lexmark nevertheless now argues that the Court "should disregard Mr. Schnell's opinions because he was not disclosed as an 'expert' . . . did not issue a report . . . and did not make a [Rule 26] disclosure[.]" Dkt. S-262 at 7.

The Court will not disregard Mr. Schnell's opinions. It is well established that lay witnesses may testify "based on particularized knowledge gained from their own personal experiences." *United States v. Hill*, 643 F.3d 807, 841 (11th Cir. 2011). As a result:

> most courts have permitted [owners and officers] to testify . . . without the necessity of qualifying the witness as an . . . expert. Such opinion testimony is admitted not because of experience, training, or specialized knowledge within the realm of an expert, but because of *the particularized knowledge that the witness has by virtue of his or her position in the business.*

Tampa Bay Shipbuilding & Repair Co. v. Cedar Shipping Co., 320 F.3d 1213, 1222 (11th Cir. 2003) (emphasis and alterations in original) (citation omitted). Here, Mr. Schnell has particularized knowledge of the UII Arwen and Pensive Devices—he wrote the source code that makes them work. This is why Lexmark deposed him, and also why Dr. Walker cites Mr. Schnell's opinions throughout his report. Dr. Schnell may therefore testify as to the UII Arwen and Pensive Devices' source code.

Still, "the fact that [Dr. Schnell] may have particularized knowledge and experience as a co-inventor of the [accused devices] does not necessarily mean he also has particularized knowledge and experience in [anything else]." *Air Turbine Tech., Inc. v. Atlas Copco AB*, 410 F.3d 701, 714 (Fed. Cir. 2005). The admissibility of his opinions is consequently limited. Mr. Schnell may not opine in expert fashion on issues beyond his purview. *Id.*

Moving back to the Voltage Clamping Patents, however, the Court finds that a material issue of fact precludes summary judgment for either party. Each of the asserted claims of the Voltage Clamping Patents contain at least one "busy condition" limitation. Whether this limitation reads on the UII Pensive Devices turns on which expert is right about the nature of the "command preamble" that UII Pensive Devices receive prior to voltage reduction. While Dr. Walker treats the "command preamble" as a separate and unitary command, *see* Dkt. S-247-8 at 13, Mr. McAlexander claims that:

> Dr. Walker's analysis uses the correct Court claim construction for the term "busy condition." However, as explained in more detail later in this Supplemental Rebuttal Report, Dr. Walker incorrectly applies this construction to include a condition that occurs while a command is being received rather than while a previous command is being processed, as required by the Court's claim construction. In essence, Dr. Walker breaks up a command received into two parts, the preamble and the data packet. He then labels the preamble as a previous command such that, while receiving the remainder of the same command data packet portion, Dr. Walker unbelievably concludes that a previous command is being processed. Nothing is further from the fact. The preamble address sets up the module to receive the command data

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packet. This type of command packet handling methodology has been a standard in packet processing for multiple decades. Command packet composition structure has been and still is a combination of, e.g., source and destination addresses, type of command, configuration/command specific information, and associated command data. To arbitrarily segregate the preamble as its own command is completely outside the understanding of an ordinarily skilled artisan and is inconsistent with the teachings of, and not supported by, the '193 Patent.

Dkt. D-247-7 at 46–47. This dispute is not clearly resolved by the testimony of Mr. Schnell or the Lexmark Pensive Specification UII largely addresses through attorney argument. A classic battle of the experts therefore exists. And this renders "summary judgment improper." *Edwards Sys. Tech., Inc.*, 99 F. App'x at 921; *see also Crown Packaging Tech., Inc.*, 635 F.3d at 1384; *TriMed, Inc.*, 608 F.3d at 1343. The parties may argue their respective positions to the jury along with any other Voltage Clamping Patent infringement issues.

IV. Whether Lexmark Products Practice the Asserted Claims

As Lexmark notes, whether a patentee practices the asserted claims of its patents can be relevant to a number of issues in any given patent infringement case. Lexmark requests such a finding here—presumably for purposes of damages. Dkt. S-247 at 41–42. UII, on the other hand, argues that Lexmark has not established that its products practice all of the asserted claims. Dkt. S-256 at 12.

The Court finds that issues of material fact preclude summary judgment on this issue as it relates to the Voltage Clamping Patents and the Punch Out Bit Field

Patents.[10] Although Dr. Walker is the only expert to examine Lexmark's products, his resulting opinions rest on factually contested issues or overly broad constructions. For instance, Dr. Walker's view that Lexmark's Pensive microchips practice the Voltage Clamping Patents wholly depends on his understanding that the command preamble received by said microchips is in fact a "previous command." *See* Dkt. S-247-6 at 253. Dr. Walker nevertheless fails to differentiate the command preamble received in Lexmark's Pensive chips from those received in UII's. And, as the Court explained above with reference to Mr. McAlexander's opinions, it is not clear that a single byte of an entire command frame sent to identify the address of the specific device to which the command data packet will be sent can itself be understood as a unitary command by one with ordinary skill in the art. If the evidence at trial shows this to be true (or Lexmark's command preamble to be of a different, qualifying nature), Lexmark will be entitled to a finding that its Pensive microchips practice the Voltage Clamping Patents. If not, such a finding does not necessarily follow from Dr. Walker's report despite the fact that UII's expert did not directly examine Lexmark's products. Additionally, as to the Punch Out Bit Field Patents, Dr. Walker "applied the same constructions" that the Court previously found to be erroneous in scope. *Id.* at 258–59. It would therefore be questionable to rely solely

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[10] The Court has found that the UII Arwen Devices do not infringe the Address Change Patents literally or under the doctrine of equivalents. Whether Lexmark's products practice them is therefore irrelevant.

on his opinion, as written, to grant summary judgment on the issue of whether Lexmark's products practice the Punch Out Bit Field Patents. Further clarification is necessary to determine the impact of the Court's findings on Dr. Walker's opinions.

V.   Damages

The final issue to consider is the availability of lost profits.[11] UII argues that, even if infringement is proven, Lexmark cannot establish them. Dkt. S-244 at 46–47. Lexmark responds that, at the very least, there is an issue of material fact that precludes summary judgment on this issue. Dkt. S-262 at 21–24.

The Court agrees with Lexmark. 35 U.S.C. § 284 provides that "[u]pon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer[.]" As the Federal Circuit has explained, this opens the door to compensatory damages, such as lost profits, based on "but for" causation. *See Mentor Graphics Corp. v. EVE-USA, Inc.*, 851 F.3d 1275, 1284 (Fed. Cir. 2017). It is ultimately "the fact finder's job" to determine what a patent holder's profits would have been but for an infringer's actions. *Id.* at 1285.

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[11] While the parties initially disputed the propriety of pre-suit damages, they have apparently stipulated that "Lexmark is entitled to recover pre-suit damages with respect to the UII Pensive Devices that [allegedly] infringe the '786 Patent." *See* Dkt. S-262 at 25; Dkt. 269 at 8.

Nothing presented here precludes the jury from considering this issue. UII's argument to the contrary primarily revolves around whether Lexmark can demonstrate but for causation and satisfy apportionment principles under the *Panduit*[12] test. *See* Dkt. S-244 at 46–47. The Court need not answer these questions, though, because "[t]here is no particular method required to prove but for causation." *Mentor Graphics Corp.*, 851 F.3d at 1284. To be sure, the *Panduit* test is only one "useful, but non-exclusive" means of doing so. *Id.* And given the particularities of this case, it is not clear that the *Panduit* test is appropriate. Regardless of the fact that UII was selling its products to remanufactures while Lexmark was selling to end users—an apparent issue for treating the demand for UII's products and Lexmark's products as interchangeable—a material issue of fact exists as to whether each of UII's sales directly caused Lexmark to lose a customer. This is because Lexmark plausibly argues that (1) UII's devices would not allow aftermarket toner cartridges to work in Lexmark printers without certain aspects of Lexmark's patented technology, and (2) customers would be forced to buy Lexmark products if UII was not helping remanufacturers produce infringing substitutes. These factual issues may be addressed at trial though expert testimony. If Lexmark fails to establish but for

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[12] *See Panduit Corp. v. Stahlin Bros. Fibre Works*, 575 F.2d 1152, 1164 (6th Cir. 1978); *Mentor Graphics Corp.*, 851 F.3d at 1285 (listing the *Panduit* factors as: "(1) demand for the patented product; (2) absence of acceptable non-infringing alternatives; (3) manufacturing and marketing capability to exploit the demand; and (4) the amount of profit it would have made").

causation or properly apportion damages under Federal Circuit precedent, UII may reassert its position on a motion for judgment as a matter of law or directed verdict.

CONCLUSION

Lexmark is granted summary judgment finding that Claims 15 and 24 of the '764 Patent, Claims 1 and 9 of the '136 Patent, and Claim 33 of the '193 Patent are not invalid. UII is granted summary judgment finding that the UII Arwen Devices do not infringe the Address Change Patents either literally or under the doctrine of equivalents, and that the UII Pensive Devices do not literally infringe the Punch Out Bit Field Patents. The parties may argue unresolved issues to the jury.

Accordingly, it is hereby **ORDERED** and **ADJUDGED**:

(1) Lexmark's Motion for Partial Summary Judgment (Dkts. 242/S-247) is **GRANTED-IN-PART** and **DENIED-IN-PART**.

(2) UII's Motion for Summary Judgment (Dkts. 239/S-244) is **GRANTED-IN-PART** and **DENIED-IN-PART**.

DONE AND ORDERED at Tampa, Florida, on October 12, 2023.

/s/ William F. Jung
WILLIAM F. JUNG
UNITED STATES DISTRICT JUDGE

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Counsel of Record