United States Court of Appeals for the Federal Circuit

SANDISK CORPORATION,
Plaintiff-Appellant,

v.

KINGSTON TECHNOLOGY CO., INC.
AND **KINGSTON TECHNOLOGY CORP.,**
Defendants-Appellees.

2011-1346

Appeal from the United States District Court for the Western District of Wisconsin in consolidated case nos. 07-CV-0605 and 07-CV-0607, Senior Judge Barbara B. Crabb.

Decided: October 9, 2012

GREGORY A. CASTANIAS, Jones Day, of Washington, DC, argued for plaintiff-appellant. With him on the brief was DOUGLAS R. COLE, of Columbus, Ohio. Of counsel were VICTORIA DORFMAN, of New York, New York, and THARAN G. LANIER, of Palo Alto, California.

DAVID M. BARKAN, Fish & Richardson P.C. of Redwood City, California, argued for defendants-appellees.

With him on the brief was DAVID HOFFMAN, of Austin, Texas. Of counsel on the brief was CHRISTINE YANG, Law Offices of S. J. CHRISTINE YANG, of Fountain Valley, California. Of counsel was ALAN D. SMITH, of Boston, Massachusetts.

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Before PROST, REYNA, and WALLACH, *Circuit Judges*.

Opinion for the court filed by *Circuit Judge* PROST.
Opinion concurring-in-part and dissenting-in-part filed by *Circuit Judge* REYNA.

PROST, *Circuit Judge*.

SanDisk Corporation ("Sandisk") sued Kingston Technology Co., Inc. and Kingston Technology Corp. (collectively "Kingston") for infringement of U.S. Patent Nos. 5,719,808 ("'808 patent"), 6,149,316 ("'316 Patent"), 6,426,893 ("'893 patent"), 6,757,842 ("'842 patent"), and 6,763,424 ("'424 patent"). After the district court issued its claim construction opinion, SanDisk withdrew its infringement claims with respect to the '808 and '893 patents and claims 1, 6, 7, 10, 12, 15, 18, and 20 of the '842 patent. The district court granted Kingston's motion for summary judgment of non-infringement with respect to certain asserted claims of the '842, '316, and '424 patents. SanDisk dismissed its remaining infringement claims and has appealed the district court's judgment. For the reasons set forth below, we affirm in part, vacate in part, and remand for further proceedings.

I. BACKGROUND

The patents-in-suit all relate to various aspects of flash memory, which is the type of Electrically Erasable Programmable Read-Only Memory ("EEPROM") used, for

example, in USB "thumb drives," computers, smart phones, and mp3 players. A benefit of flash memory is that it is "non-volatile"; in other words, it continues to store data even after the power source is removed. A thumb drive, for example, retains its saved data after being removed from a host computer and can be used to transport data from one computer to another.

A typical flash memory device includes one or more flash memory integrated circuit chips and a controller. Each flash memory chip contains memory cells for storing data. The cells are arranged as "pages" with multiple pages comprising a "block" of cells.

The flash memory device's controller accepts commands from the "host" device (e.g., the computer to which the USB thumb drive is attached) and then writes data to, or retrieves data from, the memory chip depending on the host device's command. To write and retrieve data, the controller must be able to identify where each piece of data is located in the system. This tracking of data is accomplished through "addressing." In general, the system uses two types of addresses: "physical" and "logical." The physical address refers to the physical location in the system where particular data is stored. The logical address is the identifier for a specific piece of data; it describes the data without regard to the data's physical location. Because a particular piece of data can change its physical location, a logical address may be associated with one physical address at one time and another physical address at a different time. The controller maps the logical address to the correct physical address, allowing the flash memory system to provide the correct data to the host device.

Unlike typical computer memory, the old data on the flash memory cell must be erased every time new data is written to the cell. The memory cells are erased an entire block at a time, while data is written to the cell one page at a time; the erasure of data, therefore, occurs in larger segments than the writing of data. These erase/write cycles wear down the memory cell until the cell eventually no longer reliably stores information. The patents-in-suit relate to various methods and systems for managing the data in the flash memory system, including methods for reducing the wear and tear on the flash memory cells.

SanDisk filed two complaints in the U.S. District Court for the Western District of Wisconsin against Kingston for patent infringement, and the district court consolidated the two actions on January 28, 2008. After the district court issued its claim construction order, SanDisk withdrew its infringement allegations with respect to claims 1, 6, 7, 10, 12, 15, 18, and 20 of the '842 patent and all asserted claims of the '893 and '808 patents. Both parties moved for summary judgment. The district court granted SanDisk's motion as to SanDisk's claim that Kingston was contributorily infringing claims 20, 24, 28, and 30 of the '424 patent by selling products containing a Phison PS3006 controller. With respect to all remaining asserted claims, the court found that Kingston was not infringing as a matter of law and ultimately entered judgment in favor of Kingston on those claims. After the district court's summary judgment order, the parties entered into a Stipulation and Order Dismissing Remaining Claims for Relief ("Stipulation"), whereby SanDisk dismissed without prejudice its remaining infringement claims involving the '424 patent, and Kingston dismissed without prejudice its related invalidity and enforceability counterclaims. J.A. 17754-55. SanDisk

timely appealed, and we have jurisdiction under 28 U.S.C. § 1295(a)(1).

II. DISCUSSION

On appeal, SanDisk argues that the district court erred in its construction of the following claim terms: "recording a relative time of programming . . ." in claims 1 and 3 of the '424 patent; "user data portion" and "overhead portion" in claims 1, 10, and 61 of the '842 patent and claim 67 of the '316 patent; "block characteristic information" in claims 1 and 65 of the '893 patent; and "designating a combination[] . . ." in claim 16 of the '808 patent. In addition to its claim construction arguments, SanDisk further contends that the district court legally erred in entering summary judgment of non-infringement in favor of Kingston as to claim 20 of the '424 patent and claim 79 of the '316 patent.

Claim construction is a question of law reviewed de novo. *Cybor Corp v. FAS Techs., Inc.*, 138 F.3d 1448, 1454-55 (Fed. Cir. 1998) (en banc). Claim terms generally are construed in accordance with the ordinary and customary meaning they would have to one of ordinary skill in the art in light of the specification and the prosecution history. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-14 (Fed. Cir. 2005) (en banc).

We review the district court's grant of summary judgment de novo, drawing all reasonable inferences in favor of the nonmovant. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986). Summary judgment is appropriate "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).

A. Claim Construction

As an initial matter, Kingston argues that we should not address certain claim construction issues presented by SanDisk because either we lack jurisdiction to review the district court's construction or SanDisk waived its right to advance its proposed construction on appeal. First, Kingston contends that we lack jurisdiction to review the district court's claim constructions related to claims 1 and 65 of the '893 patent, claim 16 of the '808 patent, and claims 1 and 10 of the '842 patent because SanDisk voluntarily withdrew those claims from the litigation without the parties stipulating to a judgment of non-infringement; thus, Kingston argues, there is no judgment for this court to review. We agree.

After the district court entered its claim construction order, SanDisk informed Kingston that it was no longer pursuing these claims. The district court never entered a separate order dismissing these claims, but it acknowledged in its summary judgment opinion that SanDisk had withdrawn them. J.A. 40. We, therefore, treat SanDisk's withdrawal of the claims as being akin to either a Federal Rule of Civil Procedure 15 amendment to the complaint, *see Gronholz v. Sears, Roebuck & Co.*, 836 F.2d 515, 518 (Fed. Cir. 1987) ("[A] plaintiff's motion to dismiss a single claim of a multi-count complaint is properly treated as an amendment under . . . [Rule] 15."), or a Rule 41(a) voluntary dismissal of claims without prejudice, *see Nilssen v. Motorola, Inc.*, 203 F.3d 782, 784 (Fed. Cir. 2000) ("In many instances the procedure for, and effect of, an amendment will be the same as a voluntary dismissal because of the similarities between the governing rules.") (internal quotations and citations omitted). Regardless of how we characterize the withdrawal, these claims are no

longer at issue, and we accordingly have no final judg-
ment before us with respect to these claims to review.

Our jurisdiction, however, is generally limited to final
judgments: "Under the 'final judgment rule,' parties may
only appeal a 'final decision of a district court.'" *Spread
Spectrum Screening L.L.C. v. Eastman Kodak Co.*, 657
F.3d 1349, 1354 (Fed. Cir. 2011) (quoting 28 U.S.C.
§ 1295(a)(1)).   Here, SanDisk voluntarily withdrew the
'893 and '808 patents and claims 1 and 10 of the '842
patent from this action, and it does not dispute that the
district court never entered a stipulated judgment of non-
infringement with respect to these claims.   Thus, these
claims do not present a current infringement controversy
before this court.   Without such a controversy, we lack
Article III jurisdiction to decide these issues. *See Streck,
Inc. v. Research & Diagnostics Sys., Inc.*, 665 F.3d 1269,
1281 (Fed. Cir. 2012) ("It is well-established that, in
patent cases, the existence of a 'case or controversy must
be evaluated on a claim-by-claim basis.'"); *Jang v. Boston
Sci. Corp.*, 532 F.3d 1330, 1336 (Fed. Cir. 2008) (resolving
claim construction issues "that do not actually affect the
infringement controversy between the parties" would
result in impermissible advisory opinion because "[t]he
Supreme Court has explicitly held that Article III does
not permit the courts to resolve issues when it is not clear
that the resolution of the question will resolve a concrete
controversy between interested parties").

As a result, we reject SanDisk's contention that the
district court's ultimate entry of a final judgment confers
appellate jurisdiction over these withdrawn claims.   To
the contrary, where, as here, a party's claim construction
arguments do not affect the final judgment entered by the
court, they are not reviewable. *See Mass. Inst. of Tech. v.
Abacus Software*, 462 F.3d 1344, 1350 (Fed. Cir. 2006)

(refusing to address claim construction arguments "perti-
nent only to dismissed claims of invalidity" because "[a]n
appeal is not an opportunity to bring before the appellate
court every ruling with which one or more of the parties
disagrees without regard to whether the ruling has in any
way impacted the final judgment").

Nor does the parties' Stipulation, relied upon by San-
Disk, establish our jurisdiction. After the district court
ruled on the summary judgment motions (and after
SanDisk withdrew these claims), the parties entered into
the Stipulation, whereby SanDisk dismissed its "remain-
ing" infringement claims and Kingston dismissed its
related validity and unenforceability counterclaims.
According to SanDisk, the Stipulation's recognition that
this court might "reverse[] remand[], or vacate[], in whole
or in part, the Court's September 22, 2010 Claim Con-
struction Order" and that the parties agreed that the
"Stipulation shall not in any way prejudice any parties'
[sic] right to appeal this matter in whole or in part, in-
cluding, but not limited, to an appeal of the Court's Sep-
tember 22, 2010 Claim Construction Order," J.A. 17754-
55, evinces SanDisk's "intent to pursue, on appeal, argu-
ments that those claim-construction rulings were legally
incorrect," including any arguments related to the with-
drawn claims, SanDisk's Reply Br. 2.

We are not persuaded. First, the Stipulation does not
change the fact that there is no final judgment with
respect to the withdrawn claims for us to review. Without
a final judgment as to the infringement or validity of
these claims, the court's claim constructions that impact
only these withdrawn claims are not properly before us.
Second, the parties' agreement that the Stipulation would
not affect their right to appeal the entire claim construc-
tion order cannot create a right to appeal where one

otherwise does not exist. *See Bender v. Williamsport Area School Dist.*, 475 U.S. 534, 541 (1986) ("[E]very federal appellate court has a special obligation to satisfy itself . . . of its own jurisdiction . . . even though the parties are prepared to concede it.") (internal quotation marks and citations omitted). Consequently, we conclude that we lack jurisdiction to resolve SanDisk's claim construction arguments that impact only the withdrawn claims.

Second, Kingston argues that SanDisk waived its right to challenge the district court's construction of "user data portion" and "overhead data portion" in claim 61 of the '842 patent and claim 67 of the '316 patent because (1) the parties never presented these terms to the court for a construction, and (2) SanDisk never disputed the court's construction of these terms during summary judgment. SanDisk, however, maintains that it did not waive these arguments because the district court construed the related terms "user data" and "overhead information" in claims 1 and 10 of the '842 patent, and the parties accepted that this construction also applied to claim 61 of the '842 patent and claim 67 of the '316 patent. According to Sandisk, Kingston confirmed this understanding when it made the following representation to the district court in its memorandum in support of its motion for summary judgment:

> Neither SanDisk nor Defendants presented the issue of whether claims 61 and 67 were limited to only one user data portion and one overhead data portion during the claim construction process. *But as explained below, both parties understood those claims to have the same scope as claims 1 and 10 of the '842 patent.* Indeed, Defendants were quite surprised when SanDisk indicated it would continue to assert claims 61 and 67, despite

> the Court's clear guidance as to the limited scope
> of these claims imposed by the claim language.

J.A. 7341 n.4 (emphasis added). Moreover, according to SanDisk, because it had already presented its claim construction positions to the district court during the *Markman* proceedings, it was not required to continue challenging the court's construction during summary judgment to preserve its arguments for appeal.

We agree with SanDisk. Based on Kingston's own representations to the district court, the parties assumed that the court's constructions for claims 1 and 10 of the '842 patent would also apply to the related terms in claim 61 of the '842 patent and claim 67 of the '316 patent. We, therefore, are not persuaded by Kingston's argument that SanDisk failed to present its claim construction position to the district court. Nor was SanDisk required to repeat its unsuccessful construction arguments to the district court during summary judgment to preserve the issue for appeal. *See O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1358-59 (Fed. Cir. 2008) (finding that party did not waive right to challenge claim construction on appeal when it had advanced the argument during *Markman* proceedings but did not object to the district court's jury instruction on that claim construction).

Accordingly, because we conclude that we lack jurisdiction over the '808 and '893 patents and claims 1 and 10 of the '842 patent, we limit our review of the district court's claim constructions to (1) the "recording a relative time of programming . . ." limitation in claims 1 and 3 of the '424 patent, and (2) the "at least a user data portion and an overhead portion" limitation in claim 61 of the '842 patent and claim 67 of the '316 patent.

1. "recording a relative time of programming that at least one page of new data and the at least one page of superceded data" ('424 patent, claims 1 & 3)

In the conventional flash EEPROM system, an entire block of data is copied to a new block, with the updated data replacing the superceded data. The entire old data block is then erased. This method caused re-writing of the non-updated data with the resulting wear and tear on the flash memory cells.

The '424 patent covers a method for performing "partial block" updates in flash memory devices. When the flash memory system makes minor updates to already stored data, such as by changing a few words in a document, it performs a "partial block" update; in other words, only part of the data block is updated. The controller writes only the pages with the updated data into the new block as opposed to rewriting the entire block of data. The new data shares a logical address with the superceded data. The controller reads the data from the blocks, identifying those pages that have been superceded by a more recently updated page sharing the logical address. When the controller reports the data to the host system, it substitutes the superceded pages with this updated data.

Claim 1 of the '424 patent is representative:

1. In a non-volatile memory system having a plurality of blocks of memory storage elements that are individually erasable as a unit and which are individually organized into a plurality of pages of memory storage elements that are individually programmable together, a method of substituting new data for superceded data within at least one page of one of the plurality of blocks while data in

at least another page of said one block is not re-placed, comprising:

programming the new data into at least one page of said one or another of the plurality of blocks,

identifying the at least one page of superceded data and the at least one page of new data by a common logical address,

recording a relative time of programming the at least one page of new data and the at least one page of superceded data; and

wherein the at least one page of superceded data is less than all the data contained in said one block.

'424 patent col.12 l.60-col.13 l.10 (emphasis added).

The specification teaches two methods for identifying the physical page containing the most recent version of data with the same logical address. First, the specification discloses writing a time stamp onto each individual page that "provides an indication of its time of programming, at least relative to the time that other pages with the same logical address are programmed." *Id.* at col.8 ll.26-40. Second, the specification teaches recording the programming time for an entire block, referred to by the parties as the "Block Recording Method." *See id.* at col.9 l.40-col.10 l.43. In this method, "the time stamp . . . does not need to be stored as part of each page" but "[r]ather, a single time stamp can be recorded for each block, either as part of the block or elsewhere within the non-volatile memory, and is updated each time a page of data is written into the block." *Id.* at col.9 ll.42-50. Within the

block, the new data is physically stored after the old data such that the most recent page with a particular logical address is determined by the relative physical order of those pages within the block: "Data is then read from pages in an order of descending physical address, starting from the last page of the most recently updated block containing data pages having the same LBN [Logical Block Number]." *Id.* at col.9 ll.50-53.

On appeal, SanDisk challenges the district court's construction of the "recording a relative time of programming . . ." limitation in claims 1 and 3 of the '424 patent. According to SanDisk, the district court improperly construed the claims to exclude the "Block Recording Method" and further limited the claims during summary judgment to require the recording of an actual time. Specifically, SanDisk argues, inter alia, that Figures 8 and 11, along with the specification's teaching of the Block Recording Method, indicate that claims 1 and 3 encompass this method. In response, Kingston contends that the claims need not cover all embodiments in the specification particularly where none of the embodiments is described as being "preferred." Kingston maintains that the district court's construction was correct because claims 1 and 3 of the '424 patent explicitly require recording the time the pages were programmed, as opposed to only recording a single time value for the entire block as in the Block Recording Method.

We agree with SanDisk that the district court improperly excluded the Block Recording Method from claims 1 and 3 of the '424 patent. First, the claim language supports SanDisk's broader construction. The claims only require "recording a *relative* time of programming," not "a time of programming." The use of "relative" is significant: whereas "recording the time of

programming" would suggest that a time of programming must be recorded for each page, "recording a *relative* time of programming" merely requires recording some indication of the order of programming for those pages sharing a logical address. The claims place no limitation on how the claimed "recording" occurs.

Turning to the specification, its teachings are consistent with this interpretation. The specification unambiguously discloses two distinct techniques for "distinguish[ing] the pages containing the superceded data from those containing the new, updated version [of the data]." '424 patent col.7 ll.59-60. In the first method, a time stamp indicator is associated with each page of data; in the second method—the Block Recording Method—the time stamp indicator is associated with the block, and the physical order of the pages in the block identifies the most recently updated data with a particular logical address. As quoted above, in this "second specification implementation of the inventive technique," "[t]he time stamp . . . does not need to be stored as part of each page. Rather, a single time stamp can be recorded for each block." *Id.* at col.9 ll.40-53.

Figures 8 and 11 of the '424 patent provide further illustrations of this second implementation. In Figure 8, the relative time of programming the updated and original logical pages 3, 4, and 5 is determined by reading the pages in the most recent physical block (PBN1) in reverse order, "followed by reading the pages of the original block (PBN0) in the same reverse order." *Id.* at col.9 ll.56-57. After the data in the updated pages—here, logical pages 3, 4, and 5 on physical pages 0, 1, and 2 of block PBN1—is read, "the superceded data in those pages of the original block PBN0 that are identified by the same logical page

numbers can be skipped during the reading process." *Id.* at col.9 ll.58-61.

FIG. 8
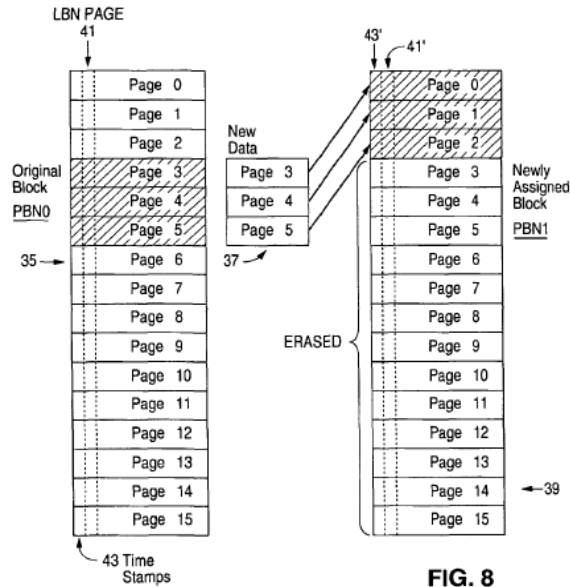
In describing Figure 8, the specification additionally instructs that "[o]nly an identity of those physical blocks containing data of a common logical block and the relative times that the physical blocks were programmed need to be known in order to carry out this efficient reading process." *Id.* at col.10 ll.3-7.

Similarly, Figure 11 discloses a second update to logical page 5 within the same physical block (PBN1) where the physical location of the two pages within the block identifies the most recently updated page:
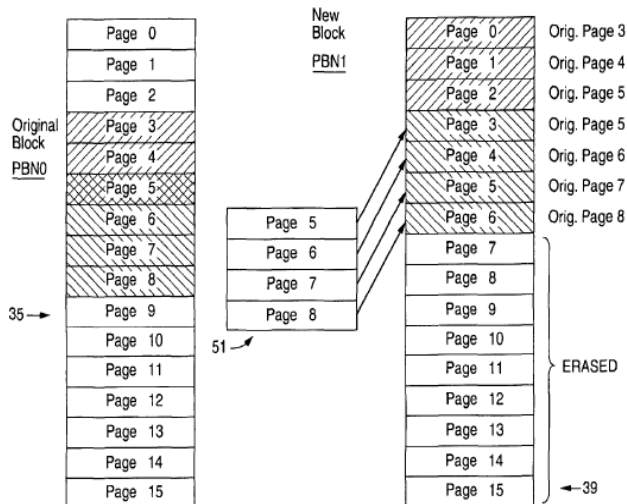
Specifically, in Figure 11, the new physical block (PBN1) contains two versions of original page 5 located at PBN1 physical page 2 and PBN1 physical page 3. Because the data will be read backwards starting from the last page of the new block, the user data on PBN1 physical page 3 will be read, but the data on PBN1 physical page 2 will not: "It will be noted that this example of reading pages in a reverse order efficiently sorts out the new data pages from the superceded data pages because data are written in physical page locations of an erased block in order from page 0 on." *Id.* at col.10 ll.29-33.

Reading the claims in light of the specification, we conclude that the district court erred in finding that claims 1 and 3 of the '424 patent excluded the Block Recording Method. Further, to the extent that the district court, during summary judgment, interpreted this limitation as requiring the recording of an actual time of programming, we agree with SanDisk that such an interpretation is incorrect. Consistent with our conclusion that the claims encompass the Block Recording Method, it necessarily follows that the "relative time of program-

ming" can be recorded through non-temporal means such as the location of the physical pages within the block or the use of a "modulo-N counter" which also is disclosed in the specification.[1]

2. "at least a user data portion and an overhead portion"
('842 patent, claim 61 & '316 patent, claim 67)

The district court found that the "user data and overhead information" limitation in claims 1 and 10 of the '842 patent was "limited to a single user data and a single overhead portion." J.A. 35. During summary judgment, the court applied this construction to the related limitation, "a user data portion and an overhead portion" in claim 61 of the '842 patent and claim 67 of the '316 patent, which, as we concluded above, are before us on appeal.

Claim 61 of the '842 patent is representative:

61. A method of operating a memory system with a host system that includes a processor, wherein the memory system includes one or more integrated circuit chips individually including an array of non-volatile floating gate memory cells partitioned into a plurality of sectors that individually include a distinct group of memory cells that are erasable together as a unit, comprising:

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[1] The specification discloses storing the output of a "modulo-N counter" to identify the most recently updated page of a specific logical address. As the specification explains, "[w]hen updating the data of a particular page . . . the controller first reads the count stored in the field 43 of the page whose data are being updated, increments the count by some amount, such as one, and then writes that incremented count in the new block . . . ." '424 patent col.8 ll.45-51.

providing said one or more of the memory in-
tegrated circuit chips and a memory con-
troller within a card that is removably
connectable to the host system said con-
troller being connectable to said proces-
sor for controlling operation of the
memory system when the card is con-
nected to the host system,

operating memory cells within individual sec-
tors with *at least a user data portion and
an overhead portion,*

causing the controller, in response to receipt
from the processor of an address in a
format designating at least one mass
memory storage block, to designate an
address of at least one non-volatile mem-
ory sector that corresponds with said at
least one mass memory storage block;

either writing user data to, or reading from,
the user data portion of said at least one
non-volatile memory sector; and

either writing to, or reading from, *said over-
head portion* of said at least one non-
volatile memory sector, overhead data re-
lated either to said at least one non-
volatile memory sector or to data stored
in the user data portion of said at least
one non-volatile memory sector.

'842 patent col.22 l.51-col.23 l.12 (emphases added).

   SanDisk argues that the district court improperly fo-
cused on the claims' use of the definite articles "the" and

"said" in connection with the user data portion and over-head portion without looking at the language of the claim as a whole. According to SanDisk, because the claims' earlier references to the user data and overhead portions use the indefinite articles "a" and "an," under traditional claim construction rules, those terms cover "one or more," not only one. This position, SanDisk contends, is supported by several dependent clams that expressly include an "only one" user data portion and overhead portion limitation. Lastly, SanDisk argues that the specification suggests the possibility of multiple user data and overhead data portions. In response, Kingston argues that the claims' use of indefinite articles does not assist SanDisk because the specification only discloses a single user data portion and a single overhead data portion. With respect to SanDisk's claim differentiation argument, Kingston contends that the court's construction does not violate the doctrine of claim differentiation because the independent claims "allow[] the system to include other potential portions of information beside overhead and user data." Kingston's Resp. Br. 36.

We agree with SanDisk that the court improperly limited the claims to only one user data portion and only one overhead data portion. In its claim construction opinion, the district court determined that "[t]he claim's reference to '*the* user data portion' and '*said* overhead portion' supports the proposed limitation." J.A. 7. The court also emphasized this use of "the" and "said" in concluding that "the claim leaves no doubt that it covers a method involving only one user data portion and one overhead portion." J.A. 8.

This conclusion is contrary to *Baldwin Graphics Systems, Inc. v. Siebert*, 512 F.3d 1338 (Fed. Cir. 2008). In *Baldwin*, we explained that the later use of "the" and

"said" to refer back to an earlier claim term does not limit that claim term to the singular, and we also articulated the general rule that the use of the indefinite articles "a" or "an" means "one or more":

> [T]his court has repeatedly emphasized that an indefinite article "a" or "an" in patent parlance carries the meaning of "one or more" in open-ended claims containing the transitional phrase "comprising." That "a" or "an" can mean "one or more" is best described as a rule, rather than merely as a presumption or even a convention. *The exceptions to this rule are extremely limited: a patentee must "evince[] a clear intent" to limit "a" or "an" to "one." The subsequent use of definite articles "the" or "said" in a claim to refer back to the same claim term does not change the general plural rule, but simply reinvokes that non-singular meaning.*

Id. at 1342 (second alteration in original) (internal quotation marks and citations omitted) (emphasis added). Further, this general rule applies unless "the language of the claims themselves, the specification, or the prosecution history necessitate[s] a departure from the rule." *Id.* at 1342-43. In this case, the intrinsic evidence does not demonstrate an intention to exclude multiple user data portions or overhead portions from the claims' scope.

First, the claims recite "at least a user data and an overhead data portion." '316 patent col.21 ll.40-41; '842 patent col.22 ll.64-65. The phrase "at least" suggests that the claim covers more than one user data portion and overhead portion. *See Biagro W. Sales, Inc. v. Grow More, Inc.*, 423 F.3d 1296, 1304 (Fed. Cir. 2005) ("The phrase 'at least one' in patent claims typically is construed to mean

'one or more.'"). This interpretation further comports with the general rule set forth in *Baldwin* against limiting claim terms using the indefinite articles "a" and "an" to mean "one." 512 F.3d at 1342-43.

Dependent claims 16 and 67 of the '842 patent and claim 73 of the '316 patent additionally bolster SanDisk's interpretation. Those claims add the limitation that either the individual blocks (claim 16 of the '842 patent) or sectors (claim 67 of the '842 patent and claim 73 of the '316 patent) "include only one user data portion and only one overhead portion." '842 patent col.18 ll.7-9, col.24 ll.7-9; '316 patent col.22 ll.14-16. Where, as here, the sole difference between the independent claim and the dependent claims is the limitation that one party is trying to read into the independent claim, "the doctrine of claim differentiation is at its strongest." *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004); *see also Phillips*, 415 F.3d at 1315 ("[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not in the independent claim.").

Although the doctrine creates only a rebuttable presumption, *see, e.g.*, *Liebel-Flarsheim*, 358 F.3d at 910, here Kingston has not identified any intrinsic evidence that overcomes this presumption and justifies its narrow construction. To the contrary, we agree with SanDisk that the specification suggests that the precise configuration of the user data and overhead portions is not fixed:

> It is to be understood that the partitioning between the user data portion 403 and the spare [i.e., overhead] portion 405 need not be rigid. The relative size of the various partitioned areas may be logically reassigned. *Also the grouping of the*

various areas is largely for the purpose of discus-
sion and not necessarily physically so.

'842 patent col.8 ll.52-57 (emphasis added).

Thus, for the above reasons, we conclude that the district court erred in its construction of the phrase "at least a user data portion and an overhead portion" in claim 61 of the '842 patent and claim 67 of the '316 patent. Under the correct construction, this claim limitation covers "one or more" user data portion and overhead portion.

B. Summary Judgment of Non-Infringement

In addition to SanDisk's claim construction arguments, SanDisk raises two challenges to the district court's summary judgment decision. First, SanDisk argues that the district court erred in applying the disclosure-dedication rule from *Johnson & Johnston Associates, Inc. v. R.E. Service Co.*, 285 F.3d 1046 (Fed. Cir. 2002) (en banc), in finding that Kingston's accused products did not infringe claim 20 of the '424 patent under the doctrine of equivalents. Second, SanDisk contends that the district court erred in finding that the accused products did not infringe claim 79 of the '316 patent either literally or under the doctrine of equivalents because they lacked a "controller." This second finding of non-infringement also implicates *Johnson & Johnston*'s disclosure-dedication rule.[2]

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[2] On appeal, Kingston has maintained the confidentiality of the specific design implementations of its accused products. To preserve that confidentiality, we limit our discussion of the products to counsels' statements during oral argument, *see* Oral Argument 12:20-12:27, *available at* *http://www.cafc.uscourts.gov/oral-argument-recordings/2011-1346/all* ("No kind of block

1. '424 Patent, Claim 20

Claim 20 of the '424 patent recites:

20. In a re-programmable non-volatile memory system having a plurality of blocks of memory storage elements that are erasable together as a unit, the plurality of blocks individually being divided into a plurality of a given number of pages of memory storage elements that are programmable together, a method of operating the memory system, comprising:

>   *programming* individual ones of a first plurality of said given number of pages in each of at least a first block *with* original data and *a logical page address associated with the original data,*

>   thereafter programming individual ones of a second plurality of a total number of pages less than said given number in a second block with updated data and a logical page address associated with the updated data, wherein *the logical page addresses associated with the updated data programmed into the second plurality of pages are the same as those associated with the original data programmed into the first plurality of pages*, and

>   thereafter reading and assembling data from the first and second plurality of pages in-

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marker alone or in combination with a logical block address is in any way disclosed . . . ."), and the non-confidential information in the parties' briefs.

> cluding, for pages having the same logi-
> cal addresses, selecting the updated data
> from the pages most recently pro-
> grammed and omitting use of the origi-
> nal data from the pages earlier
> programmed.

'424 patent col.15 ll.40-64 (emphases added).

Claim 20 claims a method for performing partial block updates. In a partial block update, data retains the same logical address throughout each update. The controller identifies the data sharing a logical page address and provides the most updated data with that address to the host device. To accomplish this, the logical page address must identify a specific logical page within a block. It is undisputed that a logical block number, by itself, does not identify a logical page address. Instead, to provide a logical page address, additional information must be added to the logical block number, such as a logical page offset.

The parties' dispute centers on whether the accused products contain an equivalent of the "programming . . . a logical page address associated with the original data" limitation in claim 20. The district court construed a "logical page address" as not being limited to a "logical block number plus logical offset." J.A. 37.

During summary judgment, SanDisk argued that an indication that the pages within a block are stored se-quentially—referred to by SanDisk's expert as a "Sequen-tial Block Marker"—coupled with programming a logical *block* address was equivalent to the "programming . . . a logical page address" limitation in claim 20. According to SanDisk, when the data is programmed sequentially, the

logical page matches the physical page. SanDisk's Br. 53.
For data programmed into physical page 3 of logical block
6, for example, "[t]he logical page address is necessarily
logical block 6, logical page 3 because the logical page
address within the block (i.e., 3) matches the physical
address of the block." *Id.* at 53 n.4. Therefore, in San-
Disk's view, knowing both the logical block number and
that the pages are sequentially stored identifies the
logical page address. The district court, however, deter-
mined that SanDisk could not pursue this infringement
theory, finding that Figure 9 of the '424 patent disclosed
this alleged equivalent and thus dedicated it to the public
under the disclosure-dedication rule set forth in *Johnson
& Johnston*.

On appeal, SanDisk argues that the disclosure in the
specification relied upon by the district court does not
amount to a dedication under *Johnson & Johnston* be-
cause neither Figure 9 relied on by the district court nor
the remainder of the specification discloses using a Se-
quential Block Marker in combination with a logical block
address to identify the logical page address. Instead,
according to SanDisk, all the disclosed embodiments,
including Figure 9 reproduced below, show that a logical
page address includes only (1) a logical block number
(LBN) and (2) a logical page offset:

LBN	Page	PBN0	Page	PBN1	Page
0	0	0	0		
0	1	0	1		
0	2	0	2		
0	3	0	3	1	0
0	4	0	4	1	1
0	5	0	5	1	2
0	6	0	6		
0	7	0	7		
:	:	:	:		

FIG. 9

In response, Kingston argues that Figures 4, 8, and 9 in the '424 patent depict systems in which the logical block number is programmed and the blocks are written in sequential order, such that the logical page address and the physical page address are the same. Kingston contends that this information discloses to one of ordinary skill SanDisk's proposed equivalent to the "programming . . . a logical page address" limitation.

We agree with Sandisk that its proposed equivalent was not dedicated to the public. Under the doctrine of equivalents, "a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is 'equivalence' between the elements of the accused product or process and the claimed elements of the patented invention." *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 21 (1997). A patentee, however, can disclaim an equivalent by disclosing it in the specification. As we held in *Johnson & Johnston*, "[W]hen a patent drafter discloses but declines to claim subject matter, . . . this action dedicates that unclaimed subject matter to the public." 285 F.3d at 1054.

Johnson & Johnston's disclosure-dedication rule is not without restriction. In *PSC Computer Products v. Foxconn International, Inc.*, 355 F.3d 1353 (Fed. Cir. 2004), we explained that the rule "does not mean that any generic reference in a written specification necessarily dedicates all members of that particular genus to the public." *Id.* at 1360. Rather, "the disclosure must be of such specificity that one of ordinary skill in the art could identify the subject matter that had been disclosed and not claimed." *Id.* Additionally, in *Pfizer, Inc. v. Teva Pharmaceuticals USA, Inc.*, 429 F.3d 1364 (Fed. Cir. 2005), this court further clarified that "before unclaimed

subject matter is deemed to have been dedicated to the public, that unclaimed subject matter must have been identified by the patentee as an alternative to a claim limitation." *Id.* at 1379. Whether the disclosure-dedication rule prevents a patentee from pursuing a doctrine of equivalents infringement theory is a question of law we review de novo. *Id.* at 1378.

Here, the disclosures in Figure 9 relied upon by the district court and the other teachings in the specification cited by Kingston do not satisfy the disclosure-dedication rule's requirements. Figure 9 and the accompanying description in the specification teach a logical page address composed of a logical block number and a logical page offset. Neither Figure 9 nor any other portion of the specification identified by Kingston refers to using an indication in the address that the block is sequentially programmed combined with programming a logical block address as an alternative to "programming . . . a logical page address." Whether a person of ordinary skill ultimately could employ the disclosures of the patent to implement a purported equivalent does not amount to actually disclosing to one of ordinary skill that equivalent "as an alternative to a claim limitation." *See Pfizer*, 429 F.3d at 1379. We have considered Kingston's remaining arguments and find they lack merit. Accordingly, we conclude that the district court erred in finding that SanDisk's proposed equivalent to the "programming . . . a logical page address limitation" was dedicated to the public.

2. '316 Patent, Claim 79

Claim 79 of the '316 patent provides in pertinent part:

79. A memory system connectable to a host proc-
essor to enable the exchange of data therebe-
tween, and memory system comprising:

> *an array of non-volatile floating gate memory
> cells* partitioned into a plurality of blocks
> of cells that individually store a given
> amount of user data and overhead data,
> wherein the memory cells are individu-
> ally programmable into one of more than
> two distinct threshold level ranges corre-
> sponding to more than one bit of data per
> cell,

> *a controller* connected to the array and re-
> movably connectable to the host through
> an electrical connector, said controller
> including:

>> *an address generato*r that is respon-
>> sive to receipt of a mass memory
>> storage block address from the
>> host to address a corresponding
>> at least one of the plurality of
>> memory blocks, and

>> *a data transfer control* that responds
>> to an instruction from the host to
>> perform a designated one of read-
>> ing user data from, or writing
>> user data to, said at least one ad-
>> dress block, including *a data writ-
>> ing circuit* that generates at least
>> some of the overhead data associ-
>> ated with at least one of at least
>> one addressed block or user data

being written therein, and *a data reading circuit* that reads the overhead data from said at least one addressed block, wherein the data writing circuit programs the individual memory cells into said one or more than two distinct threshold level ranges and the data reading circuit reads one of more than two distinct threshold level ranges form the individual memory cells.

'316 patent col.22 ll.35-79 (emphases added).

The memory system in claim 79 includes two main limitations: (1) an array of non-volatile floating gate memory cells and (2) a controller. The controller has both an "address generator" and a "data transfer control." Within the data transfer control are a "data writing circuit" and a "data reading circuit." It is undisputed that the accused devices contain data writing and data reading circuits, but those circuits are located on the flash memory chip, not the controller chip. The key issue is whether the read and write circuitry in the accused products are part of the claimed "controller," either literally or under the doctrine of equivalents, even though the circuitry is located on the flash memory chip.

The district court recognized that the circuitry for the controller could be located on more than one chip but found that the accused products did not literally infringe because "[t]here is no evidence that the data writing and reading circuitry on the flash memory chips of the accused products are otherwise part of the 'controller.'" J.A. 60. With respect to infringement under the doctrine of

equivalents, the district court again applied the disclosure-dedication rule of *Johnson & Johnston*, finding that the '316 patent, through the incorporated by reference U.S. Patent No. 5,172,338 ("'338 patent"),[3] disclosed but did not claim programming and reading that is that is regulated on the separate flash memory chip. J.A. 61.

On appeal, SanDisk argues that the district court's literal infringement analysis is irreconcilable with its doctrine of equivalents analysis. According to SanDisk, if, as the district court found, the '316 patent discloses controller circuitry on the flash memory chip, claim 79 should be read to cover that embodiment; on the other hand, if such an embodiment is not disclosed, the disclosure-dedication rule does not apply to bar infringement under the doctrine of equivalents. SanDisk further contends that because the claims define the controller as having a read circuit and a write circuit, the accused products—which include read and write circuitry—necessarily infringe.

In response, Kingston challenges SanDisk's framing of the question, arguing that the correct inquiry is not whether the claimed controller must reside on one chip, as SanDisk contends, but rather whether the writing and reading circuits in the accused products are a part of the controller. Kingston maintains that, contrary to SanDisk's position, the presence of read and write circuits somewhere in the accused system does not mean that

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[3]   The '316 patent expressly incorporates U.S. Patent Application No. 07/337,579 ("'579 application") by reference. *See* '316 patent col.6 ll.3-9, col.11 ll.4-11. The '338 patent is a continuation-in-part of the '579 application. On appeal, the parties do not dispute that the '338 patent is incorporated by reference into the '316 patent.

those circuits necessarily are part of the controller as required by the claim. Kingston also disputes SanDisk's position that the court's doctrine of equivalents analysis is incongruous with the literal infringement analysis. According to Kingston, the specification discloses two embodiments, and only one of those embodiments is claimed. In the first embodiment, the read and write circuits are part of the controller; in the second unclaimed embodiment, disclosed in Figure 5 of the incorporated '338 patent, the read and write circuits are separate from the controller.

With respect to literal infringement, we agree with Kingston that the district court correctly found that SanDisk failed to present evidence that the read and write circuitry in the accused devices were part of the controller such that claim 79 of the '316 patent was literally infringed. Although the district court concluded that the controller circuitry need not be located on the same chip, that construction does not resolve the infringement issue. The read and write circuits are not only part of the claimed system; the claims explicitly require that these circuits be part of the claimed controller. Thus, the presence of a read circuit and a write circuit somewhere in the system does not establish that those circuits are part of the controller for purposes of establishing infringement.

The district court correctly treated this infringement issue as a question of fact and found that SanDisk failed to present any evidence on summary judgment that "the data writing and reading circuit on the flash memory chips of the accused products are otherwise part of the 'controller.'" J.A. 60. On appeal, SanDisk has not identified any evidence that the district court overlooked in reaching this conclusion. Consequently, we affirm the

district court's judgment in favor of Kingston as to literal infringement of claim 79.

We reach a different conclusion, however, with respect to the district court's application of the disclosure-dedication rule in its doctrine of equivalents analysis. The district court found that Kingston's accused products did not infringe under the doctrine of equivalents because the '316 patent disclosed the use of read and write circuitry located on the flash memory chip rather than the controller chip. The disclosure relied upon by the district court does not appear within the four corners of the '316 patent but instead is in Figure 5 of the incorporated '338 patent.

We have yet to address the circumstances in which the disclosure of subject matter in a document incorporated by reference amounts to a dedication of that subject matter under *Johnson & Johnston*. Because a document incorporated by reference "becomes effectively part of the host document as if it were explicitly contained therein," *Telemac Cellular Corp. v. Topp Telecom, Inc.*, 247 F.3d 1316, 1329 (Fed. Cir. 2001), the disclosure of subject matter in an incorporated document can dedicate that subject matter to the public for purposes of the host patent. Incorporation by reference, however, "does not convert the invention of the incorporated patent into the invention of the host patent." *Modine Mfg. Co. v. Int'l Trade Comm'n*, 75 F.3d 1545, 1552 (Fed. Cir. 1996). Thus, in determining whether incorporated subject matter satisfies the disclosure-dedication rule standards set forth in *Johnson & Johnston* and its progeny, we must look first to the teachings of the host patent. Consistent with *Pfizer*, the host patent must sufficiently inform one of ordinary skill that the incorporated document contains subject matter that is an alternative to a claim limitation.

429 F.3d at 1379. If it does, the inquiry then shifts to the incorporated document to assess whether the disclosure of that subject matter is "of such specificity that one of ordinary skill in the art could identify the subject matter that had been disclosed and not claimed." *PSC Computer Prods.*, 355 F.3d at 1360.

Here, the '316 patent's discussion of the incorporated '338 patent does not sufficiently identify to one of ordinary skill that the incorporated patent contains subject matter that is an alternative to the claimed controller. To the contrary, in discussing the parent '579 application, the '316 patent speaks only in general terms: "Optimized erase implementations have been disclosed in two copending U.S. patent applications," '316 patent col.6 ll.3-4; and "Optimized implementations of write operation for Flash EEprom device have been disclosed in two previously cited co-pending U.S. applications . . . ," *id.* at col.11 ll.4-6. Such cursory discussion does not sufficiently provide notice to one of ordinary skill that the incorporated '338 patent contains subject matter that is an alternative to the claimed controller, as required by *Pfizer*. Consequently, we conclude that the district court erred as a matter of law in finding that the '316 patent dedicated SanDisk's proposed equivalent to the public.

III. CONCLUSION

We lack jurisdiction to address SanDisk's claim construction arguments that are solely related to the '893 and '808 patents and claims 1 and 10 of the '842 patent. As to the claim construction issues that are properly before us on appeal, we conclude that the district court erred in its constructions of the "recording a relative time of programming . . ." limitation in claims 1 and 3 of the '424 patent, and the "at least a user data portion and an

overhead portion" limitation in claim 61 of the '842 patent and claim 67 of the '316 patent. Those constructions accordingly are reversed and the judgment of non-infringement in favor of Kingston as to those claims is vacated. Lastly, the district court's judgment of no literal infringement of claim 79 of the '316 patent is affirmed, but the court's judgment that Kingston did not infringe claim 20 of the '424 patent and claim 79 of the '316 patent under the doctrine of equivalents is vacated. The case is remanded to the district court for further proceedings consistent with this opinion.

AFFIRMED-IN-PART, VACATED-IN-PART, AND REMANDED

United States Court of Appeals for the Federal Circuit

SANDISK CORPORATION,
Plaintiff-Appellant,

v.

KINGSTON TECHNOLOGY CO., INC.
AND **KINGSTON TECHNOLOGY CORP.,**
Defendants-Appellees.

2011-1346

Appeal from the United States District Court for the Western District of Wisconsin in consolidated case nos. 07-CV-0605 and 07-CV-0607, Senior Judge Barbara B. Crabb.

REYNA, *Circuit Judge*, concurring-in-part and dissenting-in-part.

I concur with the majority opinion except for its construction of the term "recording a relative time of programming" in claims 1 and 3 of the '424 patent. The majority construes this term to include an embodiment in which no indication, temporal or otherwise, is recorded. From this conclusion I respectfully dissent.

Claim 1 is representative of claims 1 and 3 of the '424 patent:

1. In a non-volatile memory system having a plurality of blocks of memory storage elements that are individually erasable as a unit and which are individually organized into a plurality of pages of memory storage elements that are individually programmable together, a method of substituting new data for superceded data within at least one page of one of the plurality of blocks while data in at least another page of said one block is not replaced, comprising:

> programming the new data into at least one page of said one or another of the plurality of blocks,

> identifying the at least one page of superceded data and the at least one page of new data by a common logical address,

> recording a relative time of programming the at least one page of new data and the at least one page of superceded data; and

> wherein the at least one page of superceded data is less than all the data contained in said one block.

'424 patent col.12 l.60-col.13 l.10 (emphasis added).

The specification describes two embodiments. The first is faithful to the claim language, recording a time stamp in each individual page. The second, called the "Block Recording Method," is not. According to the specification, in the block recording method, "the time stamp . . . does not need to be stored as part of each page" and "is used only to determine the relative age of the data stored in blocks." *Id.* at col.9 ll.41-47. The block time stamp is

"recorded for each block, either as part of the block or elsewhere within the non-volatile memory, and is updated each time a page of data is written into the block."[1] *Id.* at col.9 ll.42-50. In the block recording method, pages are written in order within the block, and the most current data for a logical page within a block will always be the last physical page in the block containing data for that logical page. However, since the physical pages do not contain any timestamp data, relative or otherwise, all that can be said is that the pages were written at the same time or after the time stamp in the physical block. In other words, although the relative *order* can be inferred from the physical number of the page, nothing is known about the relative *times*.

The majority avoids the distinction between "order" and "relative time" by focusing on the "relative" limitation in the claim and ignoring the limitations that the time must be recorded and that it must be a time. Thus, the majority states that "'recording a *relative* time of programming' merely requires recording some indication of the order of programming for those pages sharing a logical address." Majority Op. at 14. Because recording

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[1]   Updating the timestamp for a block once it is written appears to be impossible. A cell must be erased before it can be re-written. *See* '424 patent col.1 ll.23-24. Cells can only be erased by erasing an entire block. *See id.* Therefore, to update the timestamp in a block when a page in that block is written, it would be necessary to erase the entire block, including the newly written data. It is possible, as the specification indicates, to store the relative time elsewhere in non-volatile memory. That is exactly what the first embodiment does, and it would appear that storage of the timestamps in any location other than the page being written would be much less efficient and would result in additional wear on the flash memory.

new updates in the next available page in the most recent block implicitly encodes the order in which the updates were received, the majority concludes that the claim was met. This construction improperly ignores express limitations of the claims and uses the specification to broaden the patent. *See, e.g.*, *Maxwell v. J. Baker, Inc.*, 86 F.3d 1098, 1105 (Fed. Cir. 1996) (rejecting a claim interpretation that would ignore explicit limitations in the claim); *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1562 (Fed. Cir. 1991) ("All the limitations of a claim must be considered meaningful."); *see also United States v. Adams*, 383 U.S. 39 (1966) (stating that claims limit the inventions and "specifications cannot be used to expand the patent monopoly").

The majority then attempts to explain how, under this reading, the block recording method satisfies the language of the claim. In particular, the majority discusses Figure 11, which depicts a second update to logical page 5 within the same physical block (PBN1) where the physical location of the two pages within the block identifies the most recently updated page:
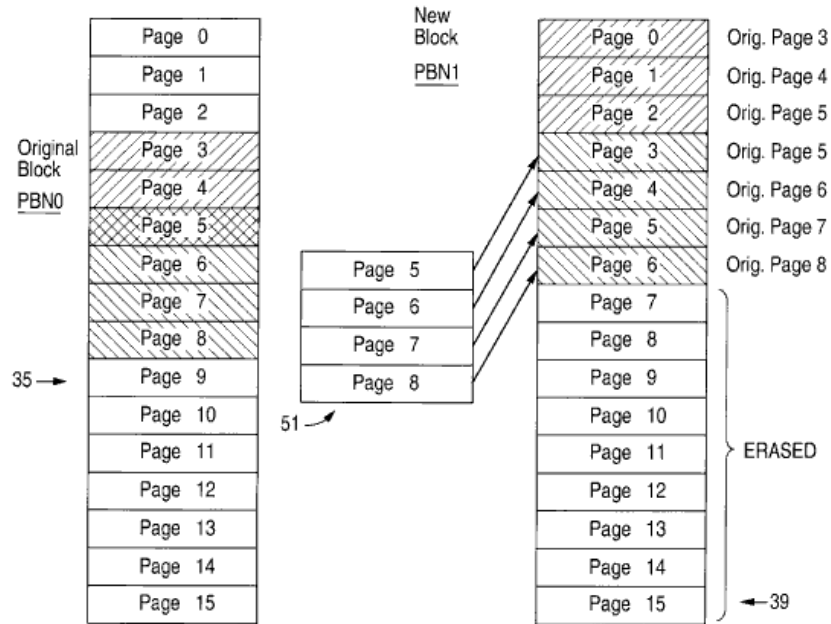
Specifically, in Figure 11, the new physical block (PBN1) contains two versions of original page 5 located at PBN1 physical page 2 and PBN1 physical page 3. In this example, page 5 on the left has been modified twice. The first modification is stored at page 2 on the right. The second is stored at page 3 on the right. Because the data will be read backwards starting from the last page of the new block, the user data on PBN1 physical page 3 will be read, but the data on PBN1 physical page 2 will not.

If anything, the majority's analysis of this embodiment proves that the claim does not cover the block recording method. In PBN1, pages 2 and 3 were written at two different times. When page 2 was written, a relative time was recorded for the new physical block. However, when page 3 was written, no relative time was recorded. The relative times of the updates of pages 2 and 3 are unknown and unknowable, because no relative time

information is recorded at the page level. Instead, the system infers the *order*—as opposed to the relative *times*—in which the data was written. This is undoubtedly more elegant than recording relative times, but it does not satisfy the terms of the claim, which require that a relative time be recorded.

Even if it is possible to update the time for the block, this does not save the embodiment. If the block time is not updated, time information is only available for the first physical page in the block. If the block time is updated, time information is only available for the last page that has been written in the block. In either case, all that can be determined is the order of the pages, not their relative times. Indeed, in describing the block recording method, the specification notes that "[o]nly . . . the relative times that the physical *blocks* were programmed need to be known." '424 Patent col.10 ll.3-7 (emphasis added). Thus, in the block recording method, relative times are recorded for physical blocks, not for pages. If a page update does not require a new block, no relative time is recorded, and the terms of the claim are not met.

The majority focuses only on the term "relative" and ignores that the claims explicitly require a time to be recorded. In doing so, it improperly expands SanDisk's patent monopoly beyond what was claimed. I respectfully dissent.