

# United States Court of Appeals for the Federal Circuit

04-1263

PAUSE TECHNOLOGY LLC,

Plaintiff-Appellant,

v.

TIVO INC.,

Defendant-Appellee.

Joseph A. Micallef, Arnold & Porter LLP, of Washington, DC, argued for plaintiff-appellant. Of counsel were Joel M. Freed, Robert Worrall and Matthew Bathon.

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Appealed from: United States District Court for the District of Massachusetts

Judge Patti B. Saris

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DECIDED: August 16, 2005

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Before NEWMAN, LOURIE, and LINN, Circuit Judges.

LINN, Circuit Judge.

Pause Technology LLC (“Pause”) appeals from a judgment entered by the United States District Court for the District of Massachusetts (“district court”), in favor of TiVo Inc. (“TiVo”), following entry of summary judgment that TiVo’s digital video recorder (“DVR”) products 2.0 and above do not infringe U.S. Reissue Patent No. 36,801 (“the ’801 reissue patent”). See Pause Tech. LLC v. TiVo Inc., No. 01-11657-PBS (D. Mass. Apr. 7, 2005) (“Amended Final Judgment”); Pause Tech. LLC v. TiVo Inc., No. 01-11657-PBS (D. Mass. Feb. 6, 2004) (“Summary Judgment Opinion”). On Pause’s challenge to the district court’s claim construction rulings, we conclude that the district court did not err in construing the limitations “circular storage buffer” and “time interval

of predetermined duration.” Because we agree with the district court that on those claim constructions there are no genuine issues of material fact as to non-infringement and TiVo is entitled to judgment as a matter of law, we affirm the district court’s grant of TiVo’s motion for summary judgment.

## I. BACKGROUND

DVRs are devices used to record, pause, rewind, play, and fast-forward live television. DVRs improve upon Video Cassette Recorders (“VCRs”), which enabled viewers to watch programs that they pre-recorded on a videotape. By the early 1990’s, it became possible to provide VCR functionality using a digital system. DVRs allow storage of the program in a random access memory (“RAM”), comprising a semi-conductor RAM buffer and a disk memory. DVRs provide viewers with immediate access to programs without the time consuming fast-forward and fast-reverse tape motion required in VCRs. ’801 reissue patent, col. 1, ll. 20-33. The ’801 reissue patent is directed to providing this functionality while a viewer is watching the program concurrent with reception. Id., ll. 37-40. This allows viewers the use of “instant replay,” the ability to “zap” commercials, and the option to “pause” programming. Id., ll. 40-45.

When the invention is in operation, audio or video signals are continuously digitized, compressed, and stored in buffer memory. Id., ll. 47-50. The invention “maintains” a “circular storage buffer” that stores programming received during a “preceding time interval of predetermined duration.” Id., ll. 50-52. To implement the “circular storage buffer,” “the invention preferably employs a dual-ported memory system under microprocessor control.” Id., ll. 53-56. A viewer can use a “remote control” to select a portion of the buffered program to be viewed. Id., ll. 64-67. The

remote control directs a “microcontroller” for selecting the buffer memory location from which the programming is read for playback. Id., ll. 61-64. A decompression unit receives signals from the memory which are decompressed and directed to the television. Id., ll. 58-60.

On September 25, 2001, Pause filed suit alleging that TiVo's DVRs infringed the '801 reissue patent. TiVo raised affirmative defenses of invalidity and non-infringement and counterclaimed for a declaratory judgment of invalidity and non-infringement. TiVo filed a motion for summary judgment of non-infringement with respect to TiVo's DVRs running software versions 2.0 and above, and for invalidity. The parties disputed, inter alia, the meaning of the “circular storage buffer” and “time interval of predetermined duration” limitations of the only independent claim asserted, namely, claim 1 of the '801 reissue patent, reproduced below with the disputed terms in bold text:

1. In combination,
  - means for generating a substantially continuous sequence of [a] digital [television] input signal values *representing an incoming audio or video program signal*,
  - a source of control commands,
  - a [television] program signal utilization device, and
  - a variable delay **circular storage buffer** *for storing those of said digital input signal values which were received during the immediately preceding **time intervals of predetermined duration**, said **circular storage buffer** having an input port connected to receive said digital [television] input signal values and an output port connected to supply a delayed replica of said input signal values to said utilization device following a variable delay interval, the duration being selected in response to said control commands, said **circular storage buffer** comprising, in combination:*
  - an addressable digital memory,
  - a programmed processor,
  - memory access means for continuously writing said sequence of digital [television] input signal values into said addressable digital memory[,] at a sequence of *continually advancing* writing addresses established by said processor *to write over the oldest of said input signal values recorded in said digital memory as said sequence of writing*

*addresses are advanced so that said digital input signal values received during said immediately preceding **time interval of predetermined duration** are stored in said addressable memory, and for concurrently reproducing and supplying to said output port an output sequence of previously written ones of signal values read from said addressable digital memory at a sequence of different reading addresses established by said processor, and*

means for supplying said output sequence to said output port, wherein said programmed processor includes means responsive to said control commands for varying relative locations of said reading and writing addresses to selectively alter said variable delay interval.

'801 reissue patent, col. 6, ll. 7-47.<sup>1</sup>

The parties acknowledged that circular buffers were known in the art and could be configured in different ways to continuously record data over previously recorded data in the buffer memory. The parties disagreed about the configuration of the “buffer” recited in the claims and, in particular, the kind of data specified as written over during operation. Pause argued that the “buffer” could encompass a system implemented through “logical” addressing in which only the oldest logical addresses were written over and that newly input signal values need not continuously write over signal values previously stored at the oldest physical address. TiVo responded that the claim covers only systems implemented through physical addressing in which the buffer stores the newest input signal values by writing over the signal values stored at the oldest physical addresses.

As to the “time interval of predetermined duration” limitation, Pause asserted that the claim encompassed systems in which the time interval is subject to some variation. TiVo countered that the “time interval of predetermined duration” limitation required that

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<sup>1</sup> Matter enclosed in brackets appears in the original patent but not the reissue. Matter printed in italics indicates additions made by reissue.

the duration of the interval of signals recorded into the buffer must be “fixed” prior to operation.

On February 2, 2004, the district court adopted TiVo’s proposed construction of both limitations and granted TiVo’s motion for summary judgment of non-infringement. Summary Judgment Opinion at 1, 22-23. On February 9, 2004, the district court entered judgment for TiVo. On March 3, 2004, Pause filed a notice of appeal. Neither party’s brief indicated the disposition of the invalidity counterclaim. On December 27, 2004, this court cited the apparently unresolved counterclaim and issued an order to “show cause as to why th[e] appeal should not be dismissed for lack of jurisdiction.” Pause Tech. LLC v. TiVo Inc., No. 04-1263 (Fed. Cir. Dec. 27, 2004). On January 13, 2005, the court heard oral argument and explored with the parties the jurisdictional issue related to the invalidity counterclaim and the merits of the appeal. On March 14, 2005, we dismissed the appeal for lack of jurisdiction, subject to reinstatement on compliance with the rule of finality. Pause Tech. LLC v. TiVo Inc., 401 F.3d 1290, 1295 (Fed. Cir. 2005). On April 7, 2005, the district court entered an amended final judgment, dismissing all remaining claims and counterclaims without prejudice. Amended Final Judgment at 2. On April 8, 2005, Pause filed a new notice of appeal and a motion to reinstate the appeal. Because the judgment appealed from is final, the appeal is now properly before us, and we have jurisdiction under 28 U.S.C. § 1295(a)(1).

On the merits, Pause appeals the district court’s construction of the “circular storage buffer” and “time interval of predetermined duration” limitations and the subsequent grant of TiVo’s motion for summary judgment of non-infringement.

## II. ANALYSIS

### A. Standard of Review

The court reviews de novo the trial court's grant of summary judgment of non-infringement. Hilgraeve Corp. v. McAfee Assocs., Inc., 224 F.3d 1349, 1352 (Fed. Cir. 2000). Summary judgment is proper only if there are no genuine issues of material fact and the movant is entitled to judgment as a matter of law. See Fed. R. Civ. P. 56(c); Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 250 (1986). Claim construction is a question of law reviewed de novo. Phillips v. AWH Corp., No. 03-1269, 03-1286, 2005 U.S. App. LEXIS 13954, at \*68-\*69 (Fed. Cir. July 12, 2005) (en banc). Infringement, whether literal or under the doctrine of equivalents, is a question of fact. Ferguson Beauregard v. Mega Sys., Inc., 350 F.3d 1327, 1338 (Fed. Cir. 2003).

### B. Claim Construction

#### 1. "circular storage buffer"

Buffers are electrical devices having sectors divided into tracks for the storage of data. Blocks of data can be stored in consecutive tracks or disparately throughout the storage device, as long as data can be correlated logically. Thus, data written onto a track can have both a "physical address" and a "logical address." The "physical address" identifies the sector and track on which data is located. The "logical address" explains how data with one physical address is related to data with a different physical address. "Look-up tables" are used to correlate the logical and physical addresses. (Decl. of Hellman at 3-8.)

The district court construed the "circular storage buffer" limitation to mean:

a physical memory device that contains digital signal values and that is circular in the sense that when the last address is reached, the next

address accessed is the first address location. While the digital input signal values are always stored in the same repeating physical addresses, these addresses do not have to be physically contiguous. The “circular buffer limitation” requires that the circular buffer store the digital input signal values in continually advancing physical addresses.

Summary Judgment Opinion at 17. The district court explained that the claim requires that “digital signal input values representing an incoming audio or video program signal” be written into memory, and that when the circular buffer “writes over the oldest of said input signal values,” it must write over the oldest actual signal values and not just the logical address. Id. at 16-17. The district court went on to reason that the extrinsic evidence proffered by Pause conflicted with the claim language, and that nothing in the intrinsic record defined the buffer as “logically” circular. Id. at 14-16. The district court concluded that “this claim limitation precludes a logical circular buffer which would only store pointers or references that wrap around.” Id. at 17.

Pause asserts that the claimed “circular storage buffer” can be a buffer system that stores data at “continually advancing” logical addresses. In such a system, when the write address circles back to the oldest logical address, that address is overwritten by a new logical address, which is correlated to the physical address of the newest input signal values. According to Pause, the claimed buffer need not immediately circle back and write over the actual signal values, which may remain stored at the oldest physical address.

To support its construction, Pause quotes from the Encyclopedia of Computer Science 143 (3d ed. 1993), which says that “[c]ircular buffering . . . typically uses a single buffer, usually one that is larger than a single physical record and which is managed as a queue. The basic strategy is to give the appearance that the buffer is

organized in a circle with data ‘wrapping around’ . . . .” Id. Pause argues that this description reflects the ordinary meaning of “circular storage buffer.” Pause notes that the claim recites, inter alia, a “circular storage buffer” comprising “an addressable digital memory,” “a programmed processor,” and “memory access means.” ’801 reissue patent, col. 6, ll. 23-25. Pause argues that the inclusion of a “programmed processor” indicates the use of a logical addressing scheme. Pause asserts that the “writing addresses established by said processor” at which data is stored, id., ll. 28-29, need not be physical addresses. Pause also argues that the written description does not disclose a “fully physical addressing scheme” and that the written description is only consistent with logical addressing. In Pause’s view, physical addressing would read out an embodiment. Pause adds that the Examiner reviewing the reissue application did not think that “circular storage buffer” was limited to physical addressing.

TiVo responds that regardless whether a circular buffer could employ logical addressing, the claimed buffer must write to “continually advancing” physical addresses. According to TiVo, the phrase “circular storage buffer” as used in the context of the claim requires that the system “write over” signal values stored at the oldest physical address with the newly input signal values, which are then stored at the same physical address. TiVo argues that Pause’s construction ignores the surrounding words in the claim. TiVo asserts that the written description and prosecution history are consistent with its proposed construction. We agree with TiVo.

We begin with the language of the claim. The claimed “circular storage buffer” comprises, inter alia, a “memory access means [that] continuously writ[es] said sequence of digital input signal values into said addressable digital memory.” Id., ll. 23-

27. The writing occurs “at a sequence of continually advancing writing addresses established by said processor to write over the oldest of said input signal values recorded in said digital memory as said sequence of writing addresses are advanced.” Id., ll. 27-32. In this way, “said digital input signal values received during said immediately preceding time interval of predetermined duration are stored in said addressable memory.” Id., ll. 27-35. The antecedent for “said digital input signal values” is the “digital input signal values representing an incoming audio or video program signal.” Id., ll. 9-10. Thus, as “writing addresses” advance, new signal values “write over” the “oldest of [the] input signal values recorded in [the] digital memory.” Id., ll. 30-32.

Pause urges us to ignore the “write over” clause and other language appearing later in the claim in construing “circular storage buffer.” Specifically, Pause argues that “[r]egardless of what claim language appears in a later portion of the claim, that language should not be read into the interpretation of a separate claim element.” However, “[p]roper claim construction . . . demands interpretation of the entire claim in context, not a single element in isolation.” Hockerson-Halberstadt, Inc. v. Converse Inc., 183 F.3d 1369, 1374 (Fed. Cir. 1999); accord Phillips, 2005 U.S. App. LEXIS 13954, at \*27 (“[T]he context in which a term is used in the asserted claim can be highly instructive.”); ACTV, Inc. v. Walt Disney Co., 346 F.3d 1082, 1088-90 (Fed. Cir. 2003) (“While certain terms may be at the center of the claim construction debate, the context of the surrounding words of the claim also must be considered . . . .”); Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc., 334 F.3d 1294, 1299 (Fed. Cir. 2003) (same). The parties dispute how the claimed “circular storage buffer” must operate to store digital signal

values in memory and, specifically, whether the claim is broad enough to cover a buffer implemented through purely logical addressing. The “write over” clause and other language appearing later in the claim detail how the buffer employs addressing to store digital signal values in memory. There is no basis for us to ignore that language in properly construing the claim language in dispute.

Because the claim recites that the “circular storage buffer” must function to “write over” the oldest digital signal values in memory as the sequence of writing addresses advances “so that” the new digital signal values are stored in memory, ’801 reissue patent, col. 6, ll. 23-35, a logical implementation in which the oldest digital signals remain in memory for some period impermissibly conflicts with the plain meaning of the claim. See Phillips, 2005 U.S. App. LEXIS 13954, at \*39 (“[A] court should discount any expert testimony that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words with the written record of the patent.” (internal quotations omitted) (emphasis added)); Vitronics Corp. v. Conceptronc, Inc., 90 F.3d 1576, 1584 (Fed. Cir. 1996) (noting that expert testimony may not be used “to vary or contradict the claim language”). The context of the claims makes clear that the term “write over” means that new signal values replace the oldest signal values in memory.

Pause argues that the digital signal values need not be stored in the same repeating physical addresses. Pause adds that the buffer need not be circular in the sense that when the last address is reached, the next address accessed is the first address location. However, because the claim specifies that the new digital signal values replace the oldest digital signal values in memory, the new signal values must be

written to the physical address of the oldest signal values. Because the new signal values must be written to the physical address of the oldest signal values, and because the writing addresses are “continually advancing,” when the last physical address is reached in the buffer, the next address accessed will be the address at which the oldest digital signal values are stored, i.e., the first physical address location. In this manner, digital signal values are stored in the same repeating physical addresses. We also reject Pause’s argument that an implementation of the buffer through physical addressing is inconsistent with the written description and would read out an embodiment. The written description says that “[t]he memory subsystem 5 continually stores the incoming data, writing over the oldest data stored on the hard disk 7,” ’801 reissue patent, col. 3, ll. 11-15, and, thus, is not inconsistent.

The prosecution history also confirms that the claimed “buffer” must employ physical addressing. In a June 27, 1997 Office Action (“Office Action”), the Examiner said that “circular buffer” was “a term well-known in the art and used to describe a memory controlled so as to continuously record—ultimately over the oldest-recorded material.” Office Action at 3. The Examiner concluded that it would have been obvious to modify the memory-management algorithm in Goldwasser et al., U.S. Patent No. 5,241,428 (“Goldwasser”), to implement a circular buffer, and entered a final rejection. Id. at 2 & 8. In a January 9, 1998 Preliminary Amendment (“Amendment”), the applicant added language “to more clearly distinguish [his] invention” and asserted that:

[c]laim 1 as amended requires the presence of a circular storage buffer for storing those digital input values representing audio or video programming which was received during the immediately preceding time interval of predetermined duration. The circular storage buffer as claimed includes an addressable digital memory and memory access means for continuously writing into the addressable digital memory at a sequence of

continually advancing writing addresses to write over the oldest of said input signal values recorded in said digital memory as said sequence of writing addresses are advanced so that said digital input signal values received during said immediately preceding time interval of predetermined duration are stored in said addressable memory.

Amendment at 5. The applicant then distinguished Goldwasser:

Goldwasser et al. teach both analog tape memory and digital random-access memory embodiments of their invention, neither of which operates as claimed in applicants' claim 1. The reel-to-reel tape embodiment shown in Goldwasser et al. Figs. 1 and 2 is physically incapable of operation as a circular buffer since the recording head cannot physically write over the oldest of the signal values which are located on the tape wound at the interior of the take-up reel. The digital random access mechanism seen in Fig. 3, as noted by the Examiner, employs an address control mechanism which operates in accordance with the algorithm shown in Fig. 4, is not a circular buffer, and has no mechanism for writing over the oldest recorded signal values as claimed.

. . . It is submitted that nothing in the cited art would suggest to one of ordinary skill in the art that the function of the Goldwasser et al. recorder should be altered by substituting a circular storage buffer which, as claimed, writes over the oldest of said input values recorded.

. . . .  
Applicants' invention works in a way not taught by Goldwasser et al. Applicants' circular buffer is fully loaded during viewing and the oldest recorded programming is being continuously overwritten. . . . [T]he buffer memory is fully loaded with prior programming at time viewing begins. Nothing in any of the cited references suggests or discloses this unique mode of operation in which the oldest material is being continually overwritten.

Id. at 5-7.

Thus, Pause made clear to the Examiner that the buffer "as claimed" is "unique" in that it must write over the oldest signal values recorded in the digital memory as the writing addresses advance. Id. at 5. In other words, the "oldest material" stored at the oldest physical address must be "continuously overwritten" with newly inputted signal values, which are stored at the same repeating physical addresses. Because this construction is driven by the use of "circular storage buffer" in the context of the claim

and is supported by the written description, a broader construction that lacks support in the intrinsic record must yield. See Phillips, 2005 U.S. App. LEXIS 13954, at \*40-\*42; see also Vitronics, 90 F.3d at 1584-85 (“[R]egardless of how those skilled in the art would interpret a term in other situations, where those of ordinary skill . . . would conclude that the [patent] documents preclude the term being given the meaning propounded by the expert witnesses, we must give it the meaning indicated by the patentee in the patent claim, specification, and file history.”).

Pause’s final argument as to this limitation is that the “physical address,” “same repeating,” and “last address/next address” language employed in the district court’s construction does not appear verbatim as claim language, and that an interpretation employing this language impermissibly narrows claim scope. Pause correctly notes that courts cannot “rewrite” claims. However, in clarifying the meaning of claim terms, courts are free to use words that do not appear in the claim so long as “the resulting claim interpretation . . . accord[s] with the words chosen by the patentee to stake out the boundary of the claimed property.” Cf. Renishaw PLC v. Marposs Societa’ per Azioni, 158 F.3d 1243, 1248 (Fed. Cir. 1998) (noting that “[w]ithout any claim term susceptible to clarification . . . there is no legitimate way to narrow the property right”).

In this case, we agree that the district court’s claim construction stayed true to the claim language as it is used in the context of the claim itself. Moreover, the district court’s interpretation is consistent with the written description and prosecution history. Accordingly, we affirm the district court’s construction of the “circular storage buffer” limitation.

## 2. “time interval of predetermined duration”

The district court construed the “time interval of predetermined duration” limitation to mean that “the time interval of the recorded signal must be of a fixed duration determined prior to operation.” Summary Judgment Opinion at 22. The district court defined “interval” as a “space of time between events or states,” and “predetermined” as “to determine beforehand.” Id. at 19 (citing Merriam Webster’s Collegiate Dictionary 613, 917 (10th ed. 1993)). The district court explained that “predetermined duration” means that the space of time for receipt of the signal values was determined before the time interval began. Id. The court noted that the parties agreed that “‘predetermined’ refers to before the time the system begins storing signals—whether the company sets the time interval, or the user sets the time interval before watching.” Id. The court went on to explain that the written description supports this construction because it refers to the amount of programming stored in the memory as “fixed,” and that the prosecution history supports the construction because the applicant added the limitation to overcome prior art. Id. The district court rejected Pause’s argument that “[b]ecause the ’801 patent contemplates that the actual or effective capacity of the buffer may change [based on the compression ratio], the time interval of predetermined duration necessarily must refer to a minimum capacity of the buffer—that is, the buffer must be sufficiently large to hold signals of the predetermined duration.” Id. at 18 (internal quotations omitted). The court reasoned that “[w]hile the program capacity of the buffer can be increased by adjusting the compression ratio, the patent describes fixing the time interval for recording before recording begins.” Id. at 21. The district court concluded that “[i]n this way a predetermined and fixed amount of

programming is stored in the buffer during operation, no matter what the compression ratio.” Id.

Pause argues that determining the “time interval” of signal values entering the buffer is not equivalent to fixing the “time interval” of signal values entering the buffer. Pause contends that the time interval can change after the buffer begins receiving signals so long as the buffer stores at least the data received during the predetermined time period. Pause adds that the district court erroneously imported a limitation from an embodiment and erred in relying on prosecution history. TiVo responds that the time interval must be fixed prior to operation. Again, we agree with TiVo.

The claim recites that the “circular storage buffer [is] for storing those of said digital input signal values which were received during the immediately preceding time intervals of predetermined duration,” ’801 reissue patent, col. 6, ll. 13-16, and that the oldest signals are overwritten “so that said digital input signal values received during said immediately preceding time interval of predetermined duration are stored in said addressable memory,” id., ll. 33-36. The parties agree that time interval refers to the space of time in which the signal values are received and that this space of time must be determined before the buffer begins receiving the signals. The parties agree that the determination can be made by either the manufacturer or the user of the system. The dispute is over what the claim requires to be determined. By arguing that the “time interval” can vary after the determination is made and the buffer begins receiving signals, Pause attaches no significance to the word “predetermine.” In construing claims, however, we must give each claim term the respect that it is due. Merck & Co. v. Teva Pharms. USA, Inc., 395 F.3d 1364, 1372 (Fed. Cir. 2005) (“A claim construction

that gives meaning to all the terms of the claim is preferred over one that does not do so.”). The written description explains that:

[t]he memory subsystem 5 continually stores the incoming data [that was received during the immediately preceding time interval of predetermined duration], writing over the oldest data stored on the hard disk 7, so that a fixed duration or “time window” of prior recorded signals are recorded in the memory subsystem 5 at all times.

...  
Using the remote control 13, or the connected computer 14, the user may select for viewing on the monitor 10 not only a particular incoming program but may select any point in time within the stored time window.

'801 reissue patent, col. 3, ll. 11-15 & 63-66 (emphases added). Pause argues that because the phrase “fixed duration or “time window”” is in the disjunctive, the written description indicates that a time window is an alternative to a fixed duration of signals recorded in the buffer. However, the use of the quotation marks and the context of the surrounding text shows that this phrase does not specify two alternative time intervals but simply describes in different words the same interval. This supports an interpretation of the claim to require that signals received during the immediately preceding time interval—of a duration fixed prior to operation—be stored in the addressable memory.

The prosecution history is consistent with this construction. In a March 14, 1997 Response to an Office Action (“Response”), the applicant explained that:

[a]pplicants’ invention particularly claims the use of a circular buffer in order to provide a continuous recording capability wherein only a specified interval of the most recently recorded material is retained. Among other advantages, this eliminates a specific drawback of prior art devices, such as that disclosed in the cited Goldwasser et al., whereby recording is stopped when the capacity of the storage medium, whether videotape or RAM, is reached.

Response at 2 (emphasis added). This indicates that the duration of the time interval in which signal values are recorded into the buffer is “specified” prior to operation. Id. As noted supra, the “time interval of predetermined duration” language was eventually added via Amendment to overcome the cited prior art.

We recognize that the user can vary the buffer capacity and thus the amount of programming that may be stored by changing the compression ratio. ’801 reissue patent, col. 6, ll. 20-21 (“the duration of said interval being selectable in response to said control commands”); id., ll. 64-65 (the “compression means is responsive to said processor means for varying the compression ratio”). However, a variation of buffer capacity by the user does nothing more than predetermine a new “time interval,” which is then fixed prior to re-commenced operation.

For these reasons, we conclude that the district court properly construed “time interval of predetermined duration” to mean that the duration of the time interval for recording signals into the buffer memory must be fixed prior to operation.

### C. Infringement

A determination of infringement is a two-step process. The court must first construe the asserted claims and then compare the properly construed claims to the allegedly infringing devices. Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc., 289 F.3d 801, 812 (Fed. Cir. 2002). “[T]he patentee must show that the accused device meets each claim limitation either literally or under the doctrine of equivalents.” Id.

The district court determined that TiVo could not infringe as a matter of law based on its construction of the “circular storage buffer” and “time interval of predetermined duration” limitations. Summary Judgment Opinion at 22. The district

court noted that “Pause . . . introduced no evidence that the TiVo DVR writes ‘digital input signals’ to ‘continually advancing writing addresses’ when addresses are defined as physical addresses.” Id. It ruled that “because the TiVo DVR actually records a time interval that varies in duration between 31 and 37 minutes, which is not predetermined, it is not a time interval of fixed duration determined prior to operation.” Id.

Pause makes no argument that the “circular storage buffer” limitation reads on TiVo’s DVRs under the district court’s construction. As to the “time interval of predetermined duration” limitation, Pause argues that the limitation is met because the TiVo DVR provides viewers a 30-minute playback interval that is predetermined prior to viewing. TiVo counters that although its DVR gives viewers that playback interval and thus the DVR appears to record 30 minutes worth of signals, it is undisputed that, in actuality, the storage interval of TiVo’s DVR varies between 31 and 37 minutes and is not fixed beforehand. TiVo maintains that the focus of the inquiry must be on the interval of signals recorded into the buffer and not on the perception of the viewers, citing Hilgraeve, 224 F.3d at 1354-55. Pause responds that because at least the 30 minutes of programming provided to viewers is recorded, the limitation is met and the actual storage interval can vary.

We agree with TiVo that the infringement question turns on whether the duration of the interval of signals being recorded is fixed prior to operation, and not whether the duration of the interval available to the user for playback is fixed. See Hilgraeve, 224 F.3d at 1354-55 (holding that the inquiry was whether the program actually scanned data “prior to storage” and not whether scanning occurred prior to storage from the user’s perspective). The claim requires that “values received during [the] immediately

preceding time interval of predetermined duration are stored in [the] addressable memory.” ’801 reissue patent, col. 6, ll. 33-36. In this case, there is no “predetermined duration” of signals being recorded into the buffer. The undisputed evidence shows that the TiVo system records anywhere from 31 to 37 minutes worth of signals to support a 30-minute playback interval and that the actual interval recorded is not fixed prior to operation. Pause has made no argument that this limitation is met under the doctrine of equivalents. Thus, we agree with the district court that the accused products do not infringe as a matter of law.

### III. CONCLUSION

The district court did not err in construing the “circular storage buffer” and “time interval of predetermined duration” limitations. Based on these constructions, we agree with the district court that there are no genuine issues of material fact and that the accused products do not infringe as a matter of law. Accordingly, we affirm the district court’s grant of TiVo’s motion for summary judgment of non-infringement.

AFFIRMED