United States Court of Appeals for the Federal Circuit

02-1083, -1084

BELL COMMUNICATIONS RESEARCH, INC.
(now known as Telcordia Technologies, Inc.),

Plaintiff-Appellant,

v.

FORE SYSTEMS, INC.
(now known as Marconi Communications, Inc.),

Defendant-Cross Appellant.

DECIDED: March 27, 2003

Before MAYER, Chief Judge, CLEVENGER and BRYSON, Circuit Judges.

Opinion for the court filed by Circuit Judge CLEVENGER. Dissenting opinion filed by Chief Judge MAYER.

CLEVENGER, Circuit Judge.

Bell Communications Research, Inc. ("Bellcore," now known as Telcordia Technologies, Inc.), appeals the judgment of the

United States District Court for the District of Delaware, granting judgment of noninfringement of United States Patents No. 4,893,306 ("'306 patent") and No. 4,835,768 ("'768 patent") to FORE Systems, Inc. ("FORE," now known as Marconi Communications, Inc.). Bell Communications Research, Inc. v. FORE Sys., Inc., No. 98-586-JJF (D. Del. Sept. 21, 2000), amended, No. 98-586-JJF (D. Del. Sept. 21, 2001). FORE cross-appeals to contest two of the district court's claim construction rulings on the '306 patent. We vacate the judgment of noninfringement of the '306 patent, affirm the judgment of noninfringement of the '768 patent, dismiss the cross-appeal, and remand the case for further proceedings.

BACKGROUND

Both the '306 and '768 patents relate to multiplexed data transmission protocols. The '306 patent is concerned with a method of dynamic time division multiplexing (DTDM), in which a single transmission line is shared among several data sources by allocating discrete segments, or "frames," of the bit stream to each data source. Rather than pre-assign partitions of the bit stream to each data source, the system described by the patent allocates frames to each data source dynamically, depending on the priority of each data source and whether each data source has data available for transmission.

According to the disclosure of the '306 patent, the bit stream is formed by generating a train of DTDM frames, each consisting of a "transmission overhead field" that contains information about the frame and marks its boundary, and a "payload field," which is initially empty. Incoming source data streams are broken into discrete segments, or packets, each of which has a header identifying from which data source it originates. Specialized "framer" circuits in a DTDM assembler then insert the packets individually into available payload fields of the DTDM bit stream, with priority among the data sources determined automatically by the proximity of each data source's framer to the origin of the empty bit stream.

The '768 patent is addressed to a slightly different form of multiplexing, employed with a signal hierarchy termed SONET (Synchronous Optical Network). SONET transmissions are structured around an 810-byte frame, which the parties refer to as a "base-level" frame. The lowest rate of SONET communication, STS-1, transmits data at 8,000 base-level frames per second, for a serial bit transmission rate of 51.84 megabits per second. Higher rates of data transmission are achieved by interleaving multiple STS-1 frames together into a larger, "higher-level" frame. These higher-level frames are referred to generally as STS-N frames; a particular designation (such as STS-24) means a frame with that number of STS-1 frames interleaved.

The '768 specification discloses circuitry and algorithms to perform steps in preparation for separating STS-N signals into lower-level frames. In particular, the specification describes two preliminary functions that may be performed by high-speed integrated circuits. The first function is conversion of the incoming serial data stream to parallel (byte-wide) form, also referred to as synchronization of byte formatting. In order to format the serial bit stream into data bytes with the appropriate byte registration, the protocol described in the specification identifies a signature byte, F1, that appears once in each STS-1 frame. Identification of the F1 byte in the bit stream allows the circuitry to divide the incoming bit stream into bytes with the same boundaries as the bytes of the original transmission. The second function disclosed in the specification is the identification of a "benchmark" occurring once in each higher-level frame. In a SONET STS-N frame, this benchmark is the three-byte sequence F1F2F2, marking the transition between the interleaved F1 framing bytes and the interleaved F2 framing bytes of the STS-1 frames. The '768 specification teaches that the F1F2F2 benchmark may be used to determine the boundaries of frames in the bit stream, and discloses circuitry that monitors each frame for the F1F2F2 benchmark in order to ensure that byte synchronization is maintained.

Bellcore filed suit against FORE for infringement of the '306 and '768 patents, as well as two counts for infringement of other patents that have been dismissed. FORE counterclaimed, asserting noninfringement, invalidity, and unenforceability. The district court held a Markman hearing, and issued an opinion and order construing disputed claim terms, with a supplemental order on a means-plus-function claim of the '306 patent.

After the district court construed the claims, Bellcore advised the court that it could not prevail under the court's claim construction. Bellcore requested that the court either certify an interlocutory appeal under Rule 54(b), or enter judgment of noninfringement and dismiss FORE's counterclaims without prejudice as moot. Bellcore did not identify precisely which claim constructions precluded infringement. Over FORE's opposition, the district court complied with Bellcore's request, entering judgment of noninfringement in favor of FORE and dismissing FORE's counterclaims without prejudice as moot. The object of this exercise was to permit early review by this court of the claim constructions that precluded Bellcore from asserting infringement of the '306 and '768 patents.

FORE protested the form of the judgment, because Bellcore had not identified the relevant claim constructions that would be disputed on appeal. In response, Bellcore stipulated that the construction given to three limitations of the '306 claims and a portion of the '768 claim 13 preamble precluded a finding of infringement. The district court then granted FORE's motion to

amend the judgment "to incorporate [Bellcore's] . . . concessions."

Bellcore appeals the judgment of noninfringement entered against it, based on the district court's claim constructions identified in Bellcore's stipulations. Bellcore also appeals other claim constructions which do not appear to have been addressed in the stipulations. FORE cross-appeals to argue additional claim limitations of the '306 patent that were construed against it below, stating that its cross-appeal is conditional upon this court resolving the appeal on the '306 patent in Bellcore's favor. We exercise jurisdiction over the appeals pursuant to 28 U.S.C. § 1295(a)(1).

I

Claims 1, 3, and 4 of the '306 patent are at issue in this appeal. Because the district court construed the terms of claims 1, 3, and 4 in conformity with each other, all the issues disputed by the parties are common to all three claims. Essentially all of the disputed language appears in claim 1:

1. A method for simultaneously transmitting data from sources having different bit rates in a telecommunication network comprising the steps of:

generating a bit stream comprising a sequence of frames, each of said frames including a transmission overhead field containing frame timing information and an empty payload field, and

filling the empty payload fields in said frames with data in packetized format from a plurality of sources which have access to the bit stream including circuit or packet sources, such that data in packetized format from any of said sources is written into any available empty payload field of any of said frames for transmitting data from each of said sources at its own desired bit rate via said bit stream and for transmitting data from said plurality of sources simultaneously via said bit stream.

As a question of law, we review the district court's claim construction without deference. Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1456, 46 USPQ2d 1169, 1174 (Fed. Cir. 1998) (en banc). In light of Bellcore's stipulation that it cannot establish infringement without prevailing on its claim construction arguments, we confine our review to the district court's claim construction rulings.

A

The first and most salient dispute over construction of the '306 claims is whether a complete frame must be generated before a framer may begin filling it with data (FORE's position), or whether the framer can begin filling the "front" part of the frame with data while the "rear" end is still being generated (Bellcore's position). Although the district court's claim construction does not explicitly require that a "complete" frame must be generated before the payload fields are filled with data, we accept the parties' interpretation that the district court so held. Thus, the question before us is whether the first claim step ("generating") must be completed, for at least one frame, before the second step ("filling") can begin.

We conclude that it does not. FORE, citing several cases in which we have construed method claims to require sequential performance of their steps, seems to suggest a general principle that method claims should be construed to require sequential performance of their recited steps. The precise question here is not whether the first step must be performed before the second step is performed, but whether it must be completed before the second step is begun. Regardless, as we recently reiterated in Altiris, Inc. v. Symantec Corp., 318 F.3d 1363, 1369-71, 65 USPQ2d 1865, 1869-70 (Fed. Cir. 2003), the steps of a method claim need not be performed in the order written unless logic, grammar, or the content of the specification dictates otherwise. See also Interactive Gift Express, Inc. v. Compuserve Inc., 256 F.3d 1323, 1342, 59 USPQ2d 1401, 1416 (Fed. Cir. 2000) ("Unless the steps of a method actually recite an order, the steps are not ordinarily construed to require one.").

In the case of the '306 patent, neither logic, grammar, nor the specification compels the conclusion that "generating" must be complete before "filling" may begin. It is undisputed that some "generating" must precede "filling," because at least part of a frame must be generated before it can begin receiving data. But unlike railroad boxcars, in which filling of a partially generated car might pose some problems, frames are capable of receiving data even if they are only partially generated. Consequently, logic does not demand that the filling process must wait until the rear boundaries of the frame have been generated.

Nor does grammar demand such a result. Because both "generating" and "filling" are continuous and concurrent processes in the method of the claims, it makes little sense to speak of the generating process being "complete" before filling begins.

Indeed, as Bellcore notes, a strict grammatical requirement that the first step be complete before the second begins would lead to an unreasonable interpretation of the claim. The first step of the claim recites generation not of a single frame, but a "bit stream comprising a sequence of frames." If the first step must be completed before the second step begins, then all the frames, not just one, must be generated before any data may be inserted into the bit stream. While such a mode is theoretically possible, it would be manifestly unsuitable for continuous transmission of data in a telecommunications network.

Nor does the specification teach that generating must be completed before filling can begin. It is fair to say that the specification is silent on the subject of whether frames are generated "byte-by-byte," as Bellcore suggests, or whether complete frames are generated before data insertion begins, as FORE contends. FORE argues that Figures 2 and 4 of the specification indicate that empty frames must be generated before they can be filled. However, we agree with Bellcore that Figure 2 depicts the claimed process only schematically, not literally. While Figure 2 does show a train of pre-generated frames entering a "DTDM assembler," Figure 2 obviously does not attempt to explain how frames arise, because Figure 2 shows frames arriving from an undepicted source. Moreover, despite FORE's argument to the contrary, Figure 4 of the patent clearly depicts a "DTDM assembler" comprising a framer (52) that generates empty frames. Thus, to interpret Figure 2 literally would set it at odds with Figure 4: Figure 4 indicates that a "DTDM assembler" generates empty frames internally, instead of receiving them from an external source as depicted in Figure 2. Figures 2 and 4 therefore do not compel FORE's interpretation.

Nor does the specification describe any circuitry or algorithm that would delay the filling process until a complete empty frame was generated or received, or any indication that frames are passed from framer to framer as frame-long chunks of data rather than byte-by-byte. Such features might be expected if FORE's interpretation were correct. However, the specification does disclose a feature that would allow a framer to begin filling frames before generation was complete. According to the specification, each frame comprises a "transmission overhead field" containing information about the contents of the frame. Included in the overhead field may be a flag indicating whether the frame is empty or full. '306 patent, col. 6, ll. 61-65. Because the transmission overhead field is shown preceding the payload field in the bit stream, see id. Fig. 1, a framer can determine whether an incoming frame is "empty" or "full" when it receives the overhead field, even if the remainder of the frame has yet to be generated. Accordingly, the embodiment described in the specification permits a framer to begin inserting data once it has received the overhead field and the first bytes of the payload field, without complete generation of an empty frame. This description supports Bellcore's interpretation.

Finally, FORE contends that Bellcore limited itself to a "sequential" interpretation of the claims during prosecution. When distinguishing the pending claims from the prior art (the Baran reference), Bellcore described the claimed method as "first generating a bit stream comprised of frames," and "then" inserting packets "into the empty payload fields of the frames." Statements in the prosecution history will limit claim terms to exclude interpretations disclaimed during prosecution. Southwall Techs., Inc. v. Cardinal IG Co., 54 F.3d 1570, 1576, 34 USPQ2d 1673, 1676-77 (Fed. Cir. 1995). However, no such disclaimer took place here. The Baran reference which Bellcore was traversing used a completely different system of multiplexing. Bellcore did not disclaim coverage to concurrent generating and filling to overcome Baran, nor did Bellcore distinguish Baran by arguing that its invention required complete generation of the frames before filling could begin. The prosecution history therefore does not address whether generation of an entire frame must be completed before filling begins.

In summary, neither precedent, grammar, logic, specification, nor prosecution history dictates that a complete frame be generated before the filling process may begin. Given that the specification discloses features of the overhead field that would permit filling to begin before generation is complete, it would be error to impose upon the claims a requirement that filling cannot begin until one or more empty frames are generated completely. We therefore agree with Bellcore that the claims encompass the insertion of data into a frame's empty payload field while the frame is still being generated.

B

The second dispute over construction of the asserted claims of the '306 patent concerns the requirement imposed by the district court that "two or more empty frames are filled at the same time by different data sources." The district court drew this requirement from the preamble language, "for transmitting data from said plurality of sources simultaneously via said bit stream." The dispute, as presented by the parties, is whether this limitation requires two or more data sources to be inserting data into empty frames at the same moment in time.

We agree with Bellcore that data sources need not insert data into empty frames at the same moment in time. The claim speaks not of simultaneous insertion of data into empty payload fields, but of the simultaneous transmission of data from several sources in the bit stream. Perhaps the term "simultaneously" is ambiguous because it could refer either to events taking place at the same moment in time, or to events that both take place within a defined interval of time. But reference to

the specification unquestionably shows that the latter meaning is correct. The entire '306 patent is directed to time division multiplexing, and the essence of time division multiplexing is that a single communications line transmits the signals from two or more sources by allocating sequential portions of the bit stream to the competing input sources. '306 patent, cols. 1-2, 5. While any given point of the bit stream is dedicated exclusively to a single input source, over an interval of time (determined by the bit rate of the slowest data source) the bit stream will carry data from all the input sources. Hence, a time division multiplexed signal carries several input signals "simultaneously" without regard to the precise timing of data insertion.

The district court drew the opposite conclusion—interpreting "simultaneously" to mean at the same moment in time—from the specification's single use of the term "simultaneously" to describe the operation of demultiplexing circuitry. '306 patent, col. 13, ll. 49-51. But this portion of the specification refers to an entirely different aspect of the invention. Moreover, as Bellcore notes, the disclosure nowhere suggests that data is inserted into two or more empty frames at the same moment in time. According to the specification, the timing with which interface units insert data into the bit stream is controlled solely by whether the interface unit has data stored in its FIFO, and whether upstream interface units have left empty frames available in the bit stream. Id. col. 9, ll. 50-53; col. 7, ll. 46-61. There is no mention of any mechanism to coordinate simultaneous insertion of data.

FORE points out that it is possible for multiple data sources to insert data simultaneously into the bit stream, if two or more interface units have data stored in their FIFOs and have empty frames positioned in their framer units at the same time. But of course, a claimed invention is not limited to a particular mode of operation simply because it is capable of operating in that mode. We conclude that "simultaneously" in the claim preamble refers to the capability of the multiplexed bit stream to carry signals from multiple sources during a finite interval, not to any requirement that several data sources must be inserting data into empty frames at the same instant in time.

C

The third issue raised by Bellcore illustrates the difficulties posed by what are essentially interlocutory appeals from district courts' claim construction orders. The district court construed "empty payload field" to mean that "a frame's payload has zero data in it," rejecting Bellcore's argument that "empty payload field" means any condition representing an absence of source data. Bellcore is not certain exactly what the district court meant by "zero data." Nonetheless, Bellcore has appealed the district court's construction of this term, stating that it cannot prevail if the district court actually meant "no bit signals of any kind" when it said "zero data."

We decline to play Prophetes to the district court's Pythia. At oral argument, FORE stated its understanding that "zero data" encompasses various bit signals that might maintain the stated transmission rate of a bit stream, including "placeholders" or "garbage bits." Because Bellcore conceded noninfringement only under a definition of "zero data" restricted to "no bit signals of any kind," the parties' agreement on a broader meaning for "zero data" removes this limitation as grounds for noninfringement, at least at this stage of the proceedings. We need not speculate further on the district court's meaning, nor refine its construction of this limitation any further on appeal.

D

FORE's cross-appeal addresses two additional limitations appearing in the '306 claims, "bit stream" and "frame timing information." We dismiss the cross-appeal, sua sponte, as improper. The district court entered judgment of noninfringement in favor of FORE and dismissed FORE's counterclaims as moot. FORE has not objected to this procedure on appeal. A prevailing party has no right of cross-appeal, Lindheimer v. Ill. Bell Tel. Co., 292 U.S. 151, 176 (1934), and a defendant who prevails on noninfringement has no right to bring a "conditional" cross-appeal to challenge claim construction rulings. Bailey v. Dart Container Corp. of Mich., 292 F.3d 1360, 63 USPQ2d 1319 (Fed. Cir. 2002).

Yet FORE, despite its prevailing party status, is entitled to argue those claim constructions on which Bellcore prevailed as alternative grounds for affirming the district court's judgment. United States v. Am. Ry. Express Co., 265 U.S. 425, 435 (1924); Bailey, 292 F.3d at 1362, 63 USPQ2d at 1320. However, we cannot determine from FORE's submissions whether the district court's judgment of noninfringement could be upheld if we were to agree with FORE's additional claim construction arguments. Bellcore has not conceded noninfringement under the two claim constructions advocated in FORE's cross-appeal, and FORE makes no attempt to demonstrate that a ruling in its favor would preclude Bellcore from establishing infringement of the '306 patent. FORE's argument on "frame timing information," in which FORE argues for a broad construction while Bellcore argues for a narrow one, may even be directed to one of FORE's dismissed invalidity counterclaims. We will not resolve disputes which we cannot relate to a case or controversy under the patent laws, and we therefore decline to address the claim construction arguments made in FORE's cross-appeal. FORE is not precluded from

disputing the district court's construction of these limitations in the future.

II

Claim 13 of the '768 patent is the only claim asserted by Bellcore against FORE. We think that both parties have misconstrued claim 13. Claim 13 recites a method operating on

a serial data bit stream consisting of a continuum of an interleaved multiplicity of data bytes of predetermined size derived from a plurality of identically-formatted contributory frames each containing a plurality of said data bytes.

The parties assert in their briefs that claim 13's "contributory frames" are "base-level" frames that may be interleaved into a higher-level frame, i.e. STS-1 frames that may be interleaved into an STS-N frame. However, the claim speaks of only one kind of frame, and those frames might well be "contributory" to the recited bit stream instead of "contributory" to unrecited higher-level frames. Further, step (e) of claim 13 refers to identifying a "contiguous plurality of bytes" present in "each of said contributory frames." In the context of the SONET benchmark identification process disclosed by the specification, the "contiguous plurality of bytes" is the sequence F1F2F2. This sequence is present in each STS-N frame, but not in an STS-1 frame. '768 patent, col. 5, ll. 47-62. Indeed, the entire utility of using the F1F2F2 signal as a benchmark rests on the principle that the F1F2F2 sequence repeats once each STS-N frame. Id. col. 5, ll. 53-57. This disclosure cannot be reconciled with the parties' interpretation of step (e), which equates "contributory frame" with "base-level frame." We think this inconsistency reflects not a "glitch" or "mistake" in the claim (as suggested by the parties), but an error in the premise that "contributory frame" means "base-level frame."

Nonetheless, at oral argument, both parties were steadfast in their insistence that "contributory frames" in claim 13 means base-level frames such as STS-1, not higher-level frames such as STS-N. Accordingly, rather than impose our own interpretation of "contributory frame" upon the case, we will decide the claim construction dispute on the grounds set forth by the parties, and under their definition of "contributory frame" as a base-level frame.

Bellcore advances, again with some uncertainty, the view that the district court limited claim 13 to require "pre-existing contributory frames." In terms of the SONET protocol, this translates to a requirement that STS-1 frames exist as distinct entities prior to being interleaved into an STS-N frame. On the premise that the district court so limited the claim, Bellcore argues that the district court erred.

We affirm the district court's claim construction. The district court's claim construction order makes clear that it did require the "bit stream" in question to have been formed from pre-existing base-level frames. The district court stated that the preamble of claim 13:

means taking multiplexed STS-N frames and separating them into the original STS-1 frames that were previously combined to create the STS-N frames. The serial bit stream that is being demultiplexed must have been formed by interleaving the bytes of two or more contributory frames.

This language clearly indicates that the base-level frames must have had a separate existence prior to being interleaved into a higher-level frame.

Regardless of whether the district court was correct to require the actual separation of the higher-level frame into its base-level constituents, or whether the district court limited claim 13 to the SONET protocol, we hold that under the parties' definition of "contributory frame" the district court correctly required the bit stream to have been formed from pre-existing contributory frames.

We agree with FORE that this conclusion must follow from the preamble phrase "derived from a plurality of identically-formatted contributory frames." "Derive" is best defined here as "to have or take origin: ORIGINATE: STEM, EMANATE." Webster's Third New International Dictionary 608 (1993). A thing cannot originate from a source that has never existed. Consequently, a bit stream cannot be derived from base-level frames unless those frames first existed. Bellcore presents from the same dictionary the competing definition "to trace the origin, descent or derivation of," and argues that this definition supports a broader reading of "derived." However, Bellcore has put forth a definition of "derive" in its

transitive sense rather than its intransitive one, and simple grammar precludes Bellcore's interpretation. In claim 13's preamble, the subject of "derived" is "bit stream," or perhaps "data bytes," and "derived" as a transitive verb would require a direct object not to be found in the claim language. Put more simply, the bit stream or data bytes of the preamble are not busy "tracing" their origin or descent, or being so traced, from anything. Claim 13 refers to a method of multiplexing, not a method of genealogy.

Having concluded that the plain meaning of "derived from" supports FORE's position, we find no indication that the term actually means "following the format of," as Bellcore contends. The specification is not particularly concerned with how the bit stream was generated, although as FORE and the district court noted, the descriptions of multiplexing and demultiplexing in the specification do refer to assembly of the bit stream from STS-1 frames, and its disassembly into STS-1 frames. '768 patent, col. 1, ll. 37-44; col. 4, ll. 9-13; col. 5, ll. 45-47. But while the algorithms disclosed in the specification might function properly on a bit stream formatted as if it were assembled from STS-1 frames, we find no indication in the specification that the claim language "derived from a plurality of identically-formatted contributory frames" has any meaning other than its plain meaning. The district court therefore correctly construed this claim language to require that the bit stream be assembled from two or more pre-existing base-level frames.

Bellcore's stipulation of noninfringement, or at least that portion of it which the parties have provided to us, does not speak directly of a requirement for pre-existing base-level frames. However, Bellcore concedes that it must prevail on all its claim construction arguments in order to prevail on each patent, and Bellcore has unequivocally framed the dispute in terms of whether claim 13 requires the bit stream to be generated from pre-existing base-level frames. Moreover, from what meager information we have regarding the accused device, it appears that FORE's system does not build up a bit stream from pre-existing base-level frames. The district court's entry of judgment of noninfringement of claim 13 of the '768 patent may therefore be sustained on the basis of this holding alone. In light of this disposition, we need not address the other claim construction issues raised by Bellcore in its appeal.

CONCLUSION

For the reasons set forth above, we affirm the district court's judgment of noninfringement of the '768 patent, but vacate the district court's judgment of noninfringement of the '306 patent and remand the case for further proceedings. We dismiss FORE's cross-appeal as improper.

COSTS

No costs.

United States Court of Appeals for the Federal Circuit

02-1083, -1084

BELL COMMUNICATIONS RESEARCH, INC.
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Defendant-Cross Appellant.

MAYER, Chief Judge, dissenting.

While I do not take issue with the court's construction of the simultaneous transmission language or the empty payload field requirement, Bell Communications ("Belcore") conceded that under the district court's claim construction, it could not prove infringement of these limitations as well as the frame limitation of claims 1, 3, and 4 of United States Patent No. 4,893,306 ("'306 patent"). Because the district court correctly concluded that the '306 patent requires generation of a complete frame prior to filling, however, I would affirm the judgment of non-infringement.

Claim 1 of the '306 patent requires, inter alia, "generating a bit stream comprising a sequence of frames, each of said frames including a transmission overhead field containing frame timing information and an empty payload field, and filling the empty payload fields in said frames with data in packetized format from a plurality of sources . . . " '306 patent, col. 17, ll. 47-53, (emphasis added). While the steps of method claims may not necessarily have to be performed sequentially or each step fully completed before the next begins, there are method claims that require full completion of each step prior to the start

of the next and a strict adherence to the sequential order. The plain meaning of the claims themselves, the place that all claim construction must begin, mandates that the generating step must be completed prior to the beginning of the filling step. CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1366, 62 USPQ2d 1658, 1662 (Fed. Cir. 2002) (There is a heavy presumption that the plain meaning of the claim language controls and can only be overcome in limited circumstances.).

"Fill" is defined as "to supply with as much as can be held or contained; to put or pour something into (a receptacle) till no more can be received." 5 Oxford English Dictionary 908 (2nd ed. 1989). The Webster's Dictionary provides almost the identical definition. Webster's Third New International Dictionary 849 (1993). Logic dictates that an incomplete container or frame cannot be filled because filling requires a finite volume. The patentee could have chosen alternative language to convey partial frame filling, whether by expressly stating the possibility or using a verb such as "placing" which would not require a finite volume, but did not do so. The prosecution history confirms this construction. In overcoming the Baran reference, the patentee stated that the claims require "first generating a bit stream comprised of frames with empty payload fields. . . . The packets are then inserted into the empty payload fields . . ." The patentee stated that first frames, plural, are generated and then data is inserted. The patentee makes no mention of generating the transmission overhead field of a frame and the first boundary of the payload field and then inserting data on a byte-by-byte basis. And the fact that Baran uses a different type of multiplexing is of no matter. Clear assertions made during prosecution in support of patentability, whether or not actually required to secure allowance of the claim, can create an estoppel. Texas Instruments, Inc. v. United States Int'l Trade Comm'n, 988 F.2d 1165, 1174, 26 USPQ2d 1018, 1025 (Fed.Cir.1993).

The court frames the issue as whether the specification or the prosecution history obviates the construction that filling could begin into a partially generated frame and answers in the negative. While the specification may not expressly exclude such a construction, nothing supports it either. The specification only speaks of generated frames and is silent as to anything less.

The court cites to a paragraph in the specification and argues that it presents a possible mechanism for byte-by-byte insertion prior to completion of the frame. Ante, at 8-9. The cited portion of the specification states: "Typically, the bit rate of the DTDM bit stream illustrated in FIG. 1 is about 150 Megabits/sec. The following information may be available in the overhead field of every DTDM frame; frame alignment word for frame timing, empty/full status of the frame, and span identification." '306 patent, col. 6, ll. 61-65. This statement offers nothing more than the components that make up a frame and certainly does not provide support for partial frame filling. While the court is correct that it is fair to say that the specification is silent about whether frames are generated byte-by-byte or whether complete frames are generated before data insertion begins, the patentee should bear the burden for the lack of information and the plain meaning of the language chosen by the patentee should control.

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