

United States District Court,
E.D. Texas, Marshall Division.

REMBRANDT TECHNOLOGIES, L.P,
Plaintiff.

v.
COMCAST CORP., et al,
Defendants.

Civil Action No. 2-05-CV-443 (TJW)

June 5, 2007.

Background: Owner of patents relating to transmission of digital data on time division multiplexed (TDM) network brought infringement action against cable company.

Holdings: The District Court, Everingham, United States Magistrate Judge, held that:

- (1) term "time-division multiplexed bus" meant bus having bandwidth partitioned into defined, repeated sequence of time slots, that was shared by two or more sources of data by limiting each source's transmission opportunities to discrete intervals of time;
- (2) phrase "allocate access to the allotted bandwidth among said packet data sources" did not require any sort of permission to transmit in given time period; and
- (3) term "trellis encoded channel symbol" did not limit output to single state transition.

Ordered accordingly.

4,937,819, 5,243,627, 5,719,858, 5,852,631. Construed.

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MEMORANDUM OPINION AND ORDER

CHARLES EVERINGHAM, IV, United States Magistrate Judge.

After considering the submissions and the arguments of counsel, the court issues the following order concerning the claim construction issues:

I. Introduction

Plaintiff Rembrandt Technologies, LP ("Rembrandt") accuses Comcast Corporation, Comcast Cable Communications, LLC, and Comcast of Plano, LP (collectively, "Comcast") of infringing United States Patent Nos. 5,719, 858 ("the '858 patent") entitled "Time-Division Multiple-Access Method for Packet Transmission on Shared Synchronous Serial Buses," 4,937,819 ("the '819 patent") entitled "Time Orthogonal Multiple Virtual DCE for Use in Analog and Digital Networks," 5,852,631 ("the '631 patent") entitled "System and Method for Establishing Link Layer Parameters Based on Physical Layer Modulation," and 5,243,627 ("the '627 patent") entitled "Signal Point Interleaving Technique." This opinion resolves the parties' various claim construction disputes.

II. Background of the Technology

The '858 patent discloses a mechanism for allowing data sources to allocate, among themselves, time slots on a time division multiplexed ("TDM") bus. TDM allows multiple data sources to transmit data over a single network connection by dividing the network connection into discrete time slots. Data sources generally transmit data only during their assigned time slot.

The '819 patent discloses an improved ranging mechanism for transmitting data from several remote units over a TDM network. Ranging is a way of measuring the transmission delay of data sent from a remote unit to a central node. By measuring this delay, the remote units can adjust the timing of their transmissions in order to reduce the empty times between transmissions.

The '631 patent addresses a manner to reduce the time required to establish a connection between two modems. Generally, when two modems attempt to communicate, they need to establish the two lowest "layers" of communication protocol, called the "physical layer" and the "link layer." The modems first negotiate the protocol to establish the "physical layer" connection and then negotiate the protocol to establish the "link layer" connection. The '631 patent discloses a technique for modems to use the "physical layer" negotiation to establish the "link layer" connection and, effectively, dispense with the "link layer" negotiations. This reduces the time necessary to establish a connection between the two modems.

The '627 patent discloses a method for correcting errors in digital data transmissions. In the prior art, one technique for correcting errors involved a "trellis encoder" in the transmitter and a "trellis" or "Viterbi" decoder in the receiver. In some circumstances, Viterbi decoders may fail to correct errors properly. The '627 patent discloses a combination of trellis encoding and signal point interleaving in an effort to improve error correction. Interleaving shuffles the data so that it is not in the same order as originally created. By using this technique, the system is able to guard against the situation where a number of consecutive transmitted bits become corrupted. As disclosed in the '627 patent, signal point interleaving helps to reduce errors within a single channel symbol. Bearing this background in mind, the court now addresses the claim construction issues.

III. General Principles Governing Claim Construction

[1] [2] "A claim in a patent provides the metes and bounds of the right which the patent confers on the patentee to exclude others from making, using or selling the protected invention." *Burke, Inc. v. Bruno Indep. Living Aids, Inc.*, 183 F.3d 1334, 1340 (Fed.Cir.1999). Claim construction is an issue of law for the court to decide. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970-71 (Fed.Cir.1995) (en banc), *aff'd*, 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996).

[3] [4] [5] To ascertain the meaning of claims, the court looks to three primary sources: the claims, the specification, and the prosecution history. *Markman*, 52 F.3d at 979. Under the patent law, the specification must contain a written description of the invention that enables one of ordinary skill in the art to make and use the invention. A patent's claims must be read in view of the specification, of which they are a part. *Id.* For claim construction purposes, the description may act as a sort of dictionary, which explains the invention and may define terms used in the claims. *Id.* "One purpose for examining the specification is to determine if the patentee has limited the scope of the claims." *Watts v. XL Sys., Inc.*, 232 F.3d 877, 882 (Fed.Cir.2000).

[6] [7] Nonetheless, it is the function of the claims, not the specification, to set forth the limits of the patentee's claims. Otherwise, there would be no need for claims. *SRI Int'l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1121 (Fed.Cir.1985) (en banc). The patentee is free to be his own lexicographer, but any special definition given to a word must be clearly set forth in the specification. *Intellicall, Inc. v. Phonometrics*, 952 F.2d 1384, 1388 (Fed.Cir.1992). And, although the specification may indicate that certain embodiments are preferred, particular embodiments appearing in the specification will not be read into the claims when the claim language is broader than the embodiments. *Electro Med. Sys., S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 1054 (Fed.Cir.1994).

[8] This court's claim construction decision must be informed by the Federal Circuit's decision in *Phillips v. AWH Corporation*, 415 F.3d 1303 (Fed.Cir.2005) (en banc). In *Phillips*, the court set forth several guideposts that courts should follow when construing claims. In particular, the court reiterated that "the *claims* of a patent define the invention to which the patentee is entitled the right to exclude." 415 F.3d at 1312 (emphasis added) (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc.*, 381 F.3d 1111, 1115 (Fed.Cir.2004)). To that end, the words used in a claim are generally given their ordinary and customary meaning. *Id.* The ordinary and customary meaning of a claim term "is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Id.* at 1313. This principle of patent law flows naturally from the recognition that inventors are usually persons who are skilled in the field of the invention. The patent is addressed to and intended to be read by others skilled in the particular art. *Id.*

[9] The primacy of claim terms notwithstanding, *Phillips* made clear that "the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Id.* Although the claims themselves may provide guidance as to the meaning of particular terms, those terms are part of "a fully integrated written instrument." *Id.* at 1315 (quoting *Markman*, 52 F.3d at 978). Thus, the *Phillips* court emphasized the specification as being the primary basis for construing the claims. *Id.* at 1314-17. As the Supreme Court stated long ago, "in case of doubt or ambiguity it is proper in all cases to refer back to the descriptive portions of the specification to aid in solving the doubt or in ascertaining the true intent and

meaning of the language employed in the claims." *Bates v. Coe*, 98 U.S. 31, 38, 25 L.Ed. 68 (1878). In addressing the role of the specification, the Phillips court quoted with approval its earlier observations from *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed.Cir.1998):

Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim. The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction.

Consequently, Phillips emphasized the important role the specification plays in the claim construction process.

The prosecution history also continues to play an important role in claim interpretation. The prosecution history helps to demonstrate how the inventor and the PTO understood the patent. Phillips, 415 F.3d at 1317. Because the file history, however, "represents an ongoing negotiation between the PTO and the applicant," it may lack the clarity of the specification and thus be less useful in claim construction proceedings. *Id.* Nevertheless, the prosecution history is intrinsic evidence. That evidence is relevant to the determination of how the inventor understood the invention and whether the inventor limited the invention during prosecution by narrowing the scope of the claims.

Phillips rejected any claim construction approach that sacrificed the intrinsic record in favor of extrinsic evidence, such as dictionary definitions or expert testimony. The *en banc* court condemned the suggestion made by *Texas Digital Systems, Inc. v. Telegenix, Inc.*, 308 F.3d 1193 (Fed.Cir.2002), that a court should discern the ordinary meaning of the claim terms (through dictionaries or otherwise) before resorting to the specification for certain limited purposes. *Id.* at 1319-24. The approach suggested by Texas Digital—the assignment of a limited role to the specification—was rejected as inconsistent with decisions holding the specification to be the best guide to the meaning of a disputed term. *Id.* at 1320-21. According to Phillips, reliance on dictionary definitions at the expense of the specification had the effect of "focus[ing] the inquiry on the abstract meaning of words rather than on the meaning of the claim terms within the context of the patent." *Id.* at 1321. Phillips emphasized that the patent system is based on the proposition that the claims cover only the invented subject matter. *Id.* What is described in the claims flows from the statutory requirement imposed on the patentee to describe and particularly claim what he or she has invented. *Id.* The definitions found in dictionaries, however, often flow from the editors' objective of assembling all of the possible definitions for a word. *Id.* at 1321-22.

Phillips does not preclude all uses of dictionaries in claim construction proceedings. Instead, the court assigned dictionaries a role subordinate to the intrinsic record. In doing so, the court emphasized that claim construction issues are not resolved by any magic formula. The court did not impose any particular sequence of steps for a court to follow when it considers disputed claim language. *Id.* at 1323-25. Rather, Phillips held that a court must attach the appropriate weight to the intrinsic sources offered in support of a proposed claim construction, bearing in mind the general rule that the claims measure the scope of the patent grant. The court now turns to a discussion of the disputed claim terms.

IV. Terms in Dispute

A. '858 Patent

1. "time-division multiplexed bus"

The first term for construction is "time-division multiplexed bus." The plaintiff argues that the term means "a bus having a bandwidth partitioned into regular time slots, that is shared by two or more sources of data by limiting each source's transmission opportunities to discrete intervals of time." The defendants argue that the term means "a group of one or more conductors that is shared among several users by allowing each user to use the bus for a given period of time in a defined, repeated sequence." The parties appear to agree that a bus allows different sources of data to share bandwidth. The principal dispute is whether the transmission sequence must be a "defined, repeated sequence."

The defendants cite to portions of the specifications that refer to repeated frames for a fixed portion of the TDM bandwidth. *See* '858 patent, 4:56-57, 5:21-6:5. In addition, the defendants point to extrinsic evidence. *See* The New IEEE Standard Dictionary of Electrical and Electronic Terms, at 1377 (5th ed.1993). The plaintiff argues, however, that by limiting the transmission sequence to be a "defined, repeated sequence," the defendants' construction would exclude a preferred embodiment where data sources are skipped when they have no data to send. *See* '858 patent, Fig. 6, 7:25-9:15.

[10] The court agrees that the patent discloses an embodiment where certain data sources are skipped when they have no data to send. For this reason, the "defined, repeated sequence" more appropriately describes the frames for the fixed portion of the TDM bandwidth. So viewed, the court agrees that the frames are arranged in a "defined, repeated sequence." Accordingly, the court construes the term to mean "a bus having a bandwidth partitioned into a defined, repeated sequence of time slots, that is shared by two or more sources of data by limiting each source's transmission opportunities to discrete intervals of time."

2. "packet data" and "synchronous data"

The plaintiff proposes that "packet data" means "variable bit rate data" and "synchronous data" means "constant bit rate data." The defendants propose that "packet data" means "data that is transmitted in packets" and "synchronous data" means "constant bit rate data that is not transmitted in packets." Both parties appear to agree that "synchronous data" refers to constant bit rate data. The dispute is whether "packet data" can also include constant bit rate data.

The specification defines these terms:

The present invention relates to data communications, and more particularly to communications systems that have channelized network access, and may transport both synchronous data and variable-bit-rate data such as frame relay data (hereafter referred to as packet data), in a time-division multiplexed format.

'858 patent, 1:8-11.

[11] Contrary to the defendants' arguments, the patent defines "variable bit rate data" as "packet data," and the court adopts this construction. Moreover, the court defines "synchronous data" as "constant bit rate data."

3. "portion of the [predefined] bandwidth"

The next term is "portion of the [predefined] bandwidth." The plaintiff argues that this term means "one or

more time slots in a TDM frame assigned to a group of data sources." The defendants contend that the term means "the part, but less than all, of the data transfer capacity of the bus that is allotted either to packet data or to synchronous data." The dispute is whether the term "portion" can include the full bandwidth or whether it is limited to less than the full bandwidth.

[12] The intrinsic evidence does not support a construction which departs from the ordinary meaning of "portion." As argued by the defendants, the purpose of the invention was to facilitate the transmission of both packet and synchronous data over the TDM bus. *See* '858 patent, 2:42-45 ("I have realized an alternative approach to the design of TDM-based equipment that supports *both synchronous data and packet data* and, in addition, provides an efficient substrate for packet handling.") (emphasis added); Figs. 3, 5 (depicting the allocation of a part of the TDM bus to the multiple access packet channel). As used in the patent, "portion" means less than all. Accordingly, the court construes the term to mean "the part, but less than all, of the data transfer capacity of the bus that is assigned to a group of data sources."

4. "predefined bandwidth"

[13] The plaintiff contends that this term means "a TDM frame with a fixed number of time slots." The defendants argue that this term means "data transfer capacity fixed in advance of operation." Although the plaintiff cites to the abstract, the defendants' proposed construction embraces the definitions of "predefined" and "bandwidth" as used in the claims. The court adopts the defendants' proposed construction.

5. "distributed packet manager"

The next term is "distributed packet manager." The plaintiff argues that this term means "a device, process or algorithm that is located within each packet data source, that controls how the packet data source accesses a portion of the bandwidth assigned to the packet data." The defendants propose "a decentralized mechanism that performs all the functions required to aggregate and synchronize packet data to the time-division multiplexed bus and to prevent packet collisions." The defendants' proposed construction limits the claim by requiring, essentially, an entirely decentralized mechanism for performing "all" of the functions required to aggregate and synchronize packet data to the bus. In addition, the defendants' construction requires the packet manager to prevent packet collisions.

[14] The court is not persuaded that either limitation is appropriate. The specification does not require the elimination of all of the central control functions. Moreover, the doctrine of claim differentiation counsels against the requirement that the packet manager prevent packet collisions. Claim 9 recites "only one of the plurality of packet data sources accesses the ... predefined bandwidth at a time" whereas claim 7 does not require that "only one" packet data source can access the bus at a time. Claim 9 thus expresses the concept of preventing packet collisions by allowing only one of the packet data sources to access the predefined bandwidth at a time. The defendants' proposed construction would incorporate limitations from the preferred embodiment that are not required by the language of the claims. As such, the court construes the term to mean "a device, process or algorithm located within each packet data source, that controls how the packet data source accesses the time-division multiplexed bus."

6. "allocate access to the allotted bandwidth among said packet data sources" FN1

FN1. Corresponding phrases include "allocate access to the second portion of the predefined bandwidth among said packet data sources" and "controlling [the] access by said packet data sources to the allocated portion of the bandwidth."

[15] The plaintiff defines this term to mean "controlling access by each of the packet data sources to the portion of bandwidth previously assigned to packet data." The defendants' proposed construction is "apportion to each of the packet data sources sole permission to attempt to transmit in the portion of bandwidth previously assigned to packet data." The dispute is whether "allocating/controlling access" requires some sort of permission to transmit in a given time period. The defendants argue that packet sources do not contend for bandwidth by transmitting simultaneously, but by "capturing" permission to use the MAPC. *See* '858 patent, 6:53-7:8. The plaintiff argues that the defendants are attempting to limit the construction to a preferred embodiment. The court agrees and concludes the term means "controlling access by each of the packet data sources to the portion of bandwidth previously assigned to packet data."

7. "network access manager/module"

The plaintiff contends that this term means "a device, process or algorithm for controlling the assignment of synchronous and packet data portions on a TDM bus, and for passing data between the bus and a network." The defendants argue that the court should not construe this term. They add that the plaintiff's proposed construction is confusing because it describes functions from the "distributed packet manager." The plaintiff, on the other hand, contends that the specification discusses two functions of the network access manager and that a construction consistent with the specification would help the jury understand the functions of the network access manager.

[16] A review of the specification demonstrates the propriety of the plaintiff's proposal. The specification states that the network access module "controls time-slot allocation among the synchronous modules and the packet modules." '858 patent, 5:12-13. The network access module also "provides the interface between the TDM bus and network facility." '858 patent, 3:46-47. The plaintiff's proposed construction captures a definition of the network access manager in essentially these terms. The court construes the term to mean "a device, process or algorithm for controlling the assignment of synchronous and packet data portions on a TDM bus, and for passing data between the bus and a network."

B. '819 Patent

1. "application program"

Claim 1 of the '819 patent requires a master unit communicating with a plurality of remote units. The remote units must be executing "application programs." The parties dispute the construction of this term. The plaintiff defines the term to mean "a computer program or process." The defendants propose "a program designed to assist in the performance of a specific end-user task (*e.g.*, word processing, accounting, or inventory management) in contrast to a program designed to perform management of or maintenance work on the system or system components."

[17] The ordinary meaning of the term "application program" is software that performs tasks for an end-user. Despite the parties' arguments for different constructions, the court discerns nothing in the patent or the prosecution history that would vary the ordinary meaning for this term. As such, the court defines "application program" to mean "software that performs tasks for an end-user."

2. "time slot assigned to each of said application programs"

Claim 1 also requires that the remote units receive messages from the master unit and respond in a "time slot assigned to each of said application programs." The parties' dispute concerns whether the "assignment" function must occur at initialization of the application program (the defendants' construction) or whether it may occur at any time. The plaintiff argues that the defendants' construction is inconsistent with the disclosure because the remote units can request additional time slots during data transmission, which is after initialization. *See* '819 patent, 2:18-26, 3:7-11. The defendants argue that the specification repeatedly discloses time slots assigned to applications at initialization. *See* '819 patent, 2:46-49, 5:42-43, Fig. 6, Fig. 7.

[18] Although the specification refers to the assignment of time slots during initialization, there is nothing in the patent that requires the claims to be limited in this manner. The court construes "time slot" to mean "an interval of time during which data from an application program is transmitted." All other terms have their plain and ordinary meaning.

3. "dividing a period of a clock in said master unit into a number of subframes, dividing each subframes into a number of slots, each corresponding to transmission times for one of said remote units, and assigning a slot to each of said application programs"

This phrase appears in claim 14 of the '819 patent. The defendants contend that the phrase needs clarification because it is not clear what "each" refers to. They also urge that the file history indicates a disclaimer that messages sent from the master unit to the remote units are not packetized. The court has reviewed the cited portions of the prosecution history and is not persuaded that the patentee limited the claim to outbound non-packetized messages from the master unit. The court therefore construes "each corresponding to transmission times" to mean "each subframe corresponding to transmission times." All other terms have their plain and ordinary meaning.

4. "master network timing means"

Claim 1 requires a master unit with a master network timing "means." In relevant part, claim 1 states "said master unit including a master network timing means with a period which is divided into a plurality of subframes, wherein each subframe is divided into said time slots, and each of said time slots is used as an interval in which one of said application programs...." '819 patent, claim 1. The parties debate whether this limitation is a means-plus-function limitation.

[19] Use of the word "means" invokes a presumption that the claim is governed by 35 U.S.C. s. 112 para. 6. The plaintiff, however, correctly observes that the limitation does not recite any function performed by the means and, as such, is outside the scope of s. 112 para. 6. *Sage Products, Inc. v. Devon Industries, Inc.*, 126 F.3d 1420, 1427 (Fed.Cir.1997).

Although the phrase is not a means-plus-function limitation, the plaintiff suggests that the court should construe the "timing means" limitation. The plaintiff proposes a construction of "a clock for determining network timing or for delineating time into time slots." Although the defendants do not propose an alternative construction, they disagree that a clock determines what the period shall be and how the period should divide into subframes and time slots. The defendants instead argue that the period, subframes, and time slots are determined by the network timing and control processor. *See* '819 patent, 3:1-3. The plaintiff, on the other hand, argues that the description of "master network clock" in the specification matches the language of the claim. *See* '819 patent, 6:37-39, 7:38-39.

Because the term is not governed by s. 112 para. 6, it is improper to limit the term to the structures described in the specification. The language of this claim limitation needs no further construction, and the court rejects the plaintiff's attempt to limit the term to the master network clock recited in the patent.

5. "ranging means"

Like the previous term, the parties dispute whether the term is a means-plus-function limitation. In relevant part, claim 1, states:

said master unit including ranging means communicating with said master network timing means *wherein a transmission time between said master unit and each of said respective remote units is calculated and transmitted* from said master unit to each of said respective remote units, each of said respective remote units using said transmission time to adjust initiation of said time slots.

'819 patent, claim 1 (emphasis added).

Again, the plaintiff urges that there is no recited function performed by the recited means. According to the plaintiff, the limitations in the claim refer to the master unit and not to the ranging means.

The court disagrees. The plaintiff has not overcome the presumption that this term is drafted according to s. 112 para. 6. What distinguishes this term from the previous one is the inclusion of the functional language "wherein a transmission time between said master unit and each of said respective remote units is calculated and transmitted." This language, coupled with the use of the word "means," counsels the court to apply s. 112 para. 6.

[20] The court construes the function to mean "calculating and transmitting to each remote unit the time it takes to transmit between the master and that remote unit." The corresponding structure is the network timing and control processor 12, the ranging and network initialization generator 20, and ranging receiver 32.

6. "reservation request generator" and "reservation request processor"

The plaintiff proposes that "reservation request generator" means "a device or process that adds to a message a request for additional time slots" and that "reservation request processor" means "a device or process for receiving and processing requests for additional time slots from a reservation request generator." The defendants contend that the terms do not need construction. However, if the court decides that the terms require construction, the defendants propose that "reservation request generator" means "a device or process that sets reservation bits in a message to request additional time slots" and "reservation request processor" means "a device or process that can grant a request from a remote unit for more time slots in order for the remote unit to transmit a longer message."

[21] [22] The defendants' proposals improperly limit the terms to preferred embodiments. The court adopts the plaintiff's proposed constructions for both terms.

7. "priority bit"

[23] The term "priority bit" appears in claim 11 of the '819 patent. The issue is whether the priority bit is limited to defining the importance of remote units or whether it can define the importance of other things, such as an application. By limiting the construction to the importance of remote units, the defendants

attempt to limit the construction to a preferred embodiment. The language of the claim is entitled to a broader construction, and the court construes this term to mean "a bit that is used to convey the relative importance of the communication."

C. '631 Patent

1. "physical layer" and "physical layer modulation"

[24] [25] The court concludes that the term "physical layer" means "the lowest layer of the Open Systems Interconnect (OSI) seven layer model, concerned with establishing the mechanical, electrical, functional, and procedural connection between two modems." Similarly, "physical layer modulation" means "a protocol that is concerned with establishing the mechanical, electrical, functional, and procedural connection between two modems."

2. "negotiated physical layer modulation"

The parties are in agreement that this term means "a physical layer modulation selected by a process permitting two modems supporting different layer modulations to agree on a common supported physical layer modulation after exchanging information at run time." The court accordingly adopts this construction.

3. "link layer"

As expressed at oral argument, it appears that the parties are in substantial agreement on the construction of this term. They agree that the link layer is the second lowest layer of the OSI seven layer model and that it performs error checking functions. The main issues appear to be whether error correction is limited to frame transmission and/or whether the plaintiff's construction includes error correction at the physical layer. The defendants also argue that one of ordinary skill in the art would understand that retransmission of messages is the way to correct transmission errors.

[26] The court has considered the briefs and the arguments of the parties in light of the intrinsic record. The court construes the term "link layer" to mean "the second lowest layer of the Open Systems Interconnect (OSI) seven layer model, providing the functional and procedural means to transfer data between modems, and to detect and correct errors."

4. "means for establishing a physical layer connection between said calling and said answer modems, wherein said physical layer connection is based on a negotiated physical layer modulation chosen from said first and second physical layer modulations"

The parties agree that this phrase is drafted in means-plus-function form. They also agree that the function is "establishing a physical layer connection based on a negotiated physical layer modulation." The parties disagree on the structure. Although the parties agree that a control processor or digital signal processor chip must be able to execute the algorithms described in Fig. 4-9, they disagree over whether the processor may be capable of executing each algorithm standing alone (the plaintiff's argument) or whether the processor must be capable of executing pairs of algorithms (the defendant's argument).

To establish a connection, both a calling and answering modem must perform an algorithm. The specification discloses only two alternative pairs of interdependent algorithms (Fig. 4 with Fig. 5, and Fig. 6 with Fig. 7), and either pair must run to perform the claimed function of establishing a connection. This is

because establishing a connection requires both a calling and an answering modem. The corresponding structure includes a processor running the algorithms shown in Figs. 4 and 5 or, alternatively, Figs. 6 and 7.

5. "means for establishing said link layer connection based upon said negotiated physical layer modulation"

The parties agree that the function is "establishing the link layer connection based upon the negotiated physical layer." The parties disagree on the structure.

The plaintiff argues that the only structure necessary to perform this function is programmable hardware (*i.e.*, a control processor or digital signal processor chip) configured to perform the function set forth in Fig. 8. The defendants argue that Fig. 8 is purely a functional diagram and no algorithm has been disclosed. According to the defendants, the claim is invalid as indefinite. In reply, the plaintiff argues that the court should not entertain the indefiniteness argument because the defendants failed to disclose it in their Invalidity Contentions.

The timing of the argument notwithstanding, this court's role is to construe the claims. That task implicates a question of law. As a result, the court has attempted, unsuccessfully, to identify any disclosed corresponding structure. At this time, however, the court reserves construction of this phrase and invites the plaintiff to submit supplemental briefing on this issue within ten (10) days from the date of this order. The briefing shall respond to the defendants' argument that *WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed.Cir.1999) controls this issue and that the specification fails to disclose corresponding structure in the form of an algorithm. Such briefing shall be limited to ten (10) pages. This procedure is sufficient to cure any prejudice resulting from the failure to timely raise the indefiniteness argument.

6. "means for presetting link layer parameters of said link layer connection to pre-defined settings based on said negotiated physical layer modulation"

For essentially the reasons expressed in the preceding discussion, the court reserves construction of this phrase pending receipt of supplemental briefing. The plaintiff shall include any 18 argument on this term within the page limits allotted to it.

D. '627 Patent

1. "trellis encoded channel symbol"

The plaintiff argues that this term means "a set of one or more trellis encoded signal points that corresponds to a group of bits that is treated as a unit by an encoding system." The defendants propose a construction that defines the term to mean "the output of a mapper that is generated using the output(s) of a single state transition of a trellis encoder." The principal dispute is whether the output is limited to a "single state transition."

The plaintiff argues that a channel symbol is the output of the trellis encoding process corresponding to a group of input bits or "parallel bits." *See* '627 patent, 2:61-65, 3:53-58. The plaintiff observes that the trellis encoded channel symbol is derived from a "succession of N outputs from the trellis encoder...." '627 patent, 4:20. According to the plaintiff, multiple outputs correspond to a separate state change and, therefore, a single state transition cannot be a limitation.

The defendants argue that a trellis state transition occurs only when the encoder has moved on to the next symbol. According to the defendants, the "succession of outputs" referenced by the plaintiff refers to subset identifiers which are generated in parallel while the encoder operates on the data. Subset identifiers collectively determine the trellis encoded symbol. The defendants argue that nothing in the intrinsic evidence suggests that these outputs are the result of multiple state changes in the trellis encoder.

[27] The plaintiff's argument is correct. A trellis encoder working on a multiple bit word produces a succession of subset identifiers which collectively make up the trellis encoded symbol. *See* '627 patent, 5:1-30. The subset identifiers are then supplied to another encoder, *e.g.*, a four-dimensional QAM encoder, which outputs a stream of signal points comprised of interleaved streams of trellis encoded channel symbols. *Id.* The plaintiff's construction of this term is correct, and the court adopts it.

2. "signal point"

The plaintiff proposes that the term "signal point" means "a value that is transmitted by a modulator in one signaling interval." The defendants propose "a single mapped point in a signal constellation." The defendants support this construction by arguing that one of ordinary skill in the art would understand the term "signal point" to refer to a mapped point in a signal constellation. The defendants also contend that signal constellations include many different dimensionalities. In addition, the defendants argue that a "signal point" is not actually transmitted; instead, a waveform representing the bits values associated with the signal point is transmitted.

The plaintiff responds by arguing that the '627 patent does not mention "mapping." The plaintiff also points to the specification which states that "signal points are thereupon communicated over the channel." '627 patent, 4:1-3.

[28] The court agrees with the plaintiff that the intrinsic evidence fails to require a signal point "mapped" in a constellation. Based on the cited portion of the specification, the court agrees that the proper construction for this term is "a value that is transmitted by a modulator in one signaling interval."

3. "distributed Viterbi decoder"

The process of Viterbi decoding is used to decode a trellis encoded signal. Claims 9 and 19 of the '627 patent require a "distributed Viterbi decoder." The plaintiff proposes that this term means "a Viterbi decoder having multiple Viterbi decoding processes operating on separate portions of a stream of data to be decoded." The defendants argue that the term means "two or more Viterbi decoders operating in round-robin fashion on separate portions of a stream of encoded data." The issue is whether there needs to be more than one Viterbi decoder operating in round-robin fashion.

The defendants point to the specification which shows separate Viterbi decoders that are accessed sequentially. '627 patent, Fig. 4, 3:13-20. The plaintiff, on the other hand, contends that the defendants are attempting to limit the term to a preferred embodiment. According to the plaintiff, a distributed Viterbi decoder can be implemented as a single Viterbi decoder that emulates through software the function of multiple devices. The relevant passage from the specification supports the plaintiff's argument. '627 patent, 9:61-66 ("multiple trellis encoders and decoders can be realized using a single program routine which, through the mechanism of indirect addressing of multiple arrays within memory, serves to provide the functions of each of the multiple devices.").

[29] In light of this passage from the specification, the court is persuaded that the plaintiff's construction is correct. The court concludes that this term means "a Viterbi decoder having multiple Viterbi decoding processes operating on separate portions of a stream of data to be decoded."

4. "means for deinterleaving the interleaved signal points to recover said plurality of streams of trellis encoded channel symbols"

Both parties agree that this is a means-plus-function claim to be construed pursuant to s. 112 para. 6. The court concludes that the claimed function is "deinterleaving the interleaved signal points to recover said plurality of streams of trellis encoded channel symbols." The corresponding structure that is clearly linked to the claimed function is the signal point deinterleaver 441 or, alternatively, signal point deinterleaver 741. *See* '627 patent, Figs. 4 and 7; 5:67-68; 9:45-51.

V. Conclusion

The court adopts the above constructions for the terms in need of construction. The parties are ordered that they may not refer, directly or indirectly, to each other's claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the court.

E.D.Tex.,2007.

Rembrandt Technologies, L.P. v. Comcast Corp.

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