United States District Court,
N.D. California.

NETWORK APPLIANCE, INC,
Plaintiff.
v.
BLUEARC CORP,
Defendant.

No. C 03-5665 MHP

Jan. 7, 2005.

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Claim Construction Memorandum and Order for United States Patent Nos. 5,802,366 **and** 5,931,918**: Construction of Means-Plus-Function Claim Elements**

MARILYN HALL PATEL**, District Judge.**

Plaintiff Network Appliance filed this action in the United States District Court for the District of Delaware, alleging infringement of three patents that relate to network file server architecture and operating system software. On defendant's motion, the District of Delaware ordered the case transferred to this court on December 16, 2003. On September 30, 2004, the court conducted a claim construction hearing per the requirements of Markman v. Westview Instruments. Inc., 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996), and an claim construction order issued on November 30, 2004. At the *Markman* hearing, the court requested further briefing on numerous disputed means-plus-function claim elements recited by two of the three patents in suit, United States Patent Nos. 5,802,366 (" '366 Patent") and 5,931,918 (" '918 Patent"). *See* 35 U.S.C. s. 112 para. 6. Now before the court are the parties' memoranda concerning construction of those disputed means-plus-function terms. Having fully considered the parties' arguments and submissions, and for the reasons set forth below, the court enters the following memorandum and order.

BACKGROUND

The facts giving rise to the instant patent infringement action are set forth in the court's November 30, 2004

order construing the disputed non-means-plus-function claim terms of the patents in suit. As the court discussed in that order, Network Appliance alleges infringement of three patents that were developed by Auspex Systems, Inc. in the late 1980s. The '366 Patent, issued on September 1, 1998, and the '918 Patent, issued on August 3, 1999, disclose closely related multiprocessor file server designs ("architectures") that employ separate processors to perform file system control and non-file system control tasks. The '037 Patent, issued on May 16, 2000, describes a computer operating system that allows for the implementation of the file server designs disclosed by the '366 and '918 Patents. Taken together, the patents are directed toward improving the performance of network file servers.

On September 30, 2004, the court held a *Markman* hearing for the purpose of construing the disputed non-means-plus function claim terms of the '037, '366, and '918 Patents. The court's order construing those terms issued on November 30, 2004. The November 30 order also addressed the threshold issue of whether two "processing unit" terms in the '366 Patent are means-plus-function terms subject to 35 U.S.C. s. 112 para. 6. The court held that these terms recite sufficiently definite structure to fall outside the scope of section 112 para. 6 and thus need not be construed as means-plus-function terms. November 30, 2004 Claim Construction Order (hereinafter "Claim Construction Order") at 20-22.

At the *Markman* hearing, the court requested further briefing on the construction of the means-plus-function elements of the '366 and '918 Patents. In so doing, the court directed the parties to focus on two points of contention that had been raised in their initial claim construction memoranda. First, the parties were requested to address whether each of the microprocessors disclosed as structures corresponding to the disputed means-plus-function terms must be limited to "a special purpose computer ... programmed to perform particular functions" pursuant to the Federal Circuit's decision in WMS Gaming, Inc. v. International Game Technology, Inc., 184 F.3d 1339 (Fed.Cir.1999). Id. at 1348. Second, the court requested that the parties submit a more detailed analysis of which structures in the specification are necessary to perform the functions recited by the patents' various means-plus-function claim elements. On December 7, 2004, the court held a hearing to address the issues raised in the parties' supplemental claim construction memoranda. This memorandum and order follows.

LEGAL STANDARD

I. ***Means Plus Function Claims***

Under Markman v. Westview Instruments, Inc., 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996), the court construes the scope and meaning of disputed patent claims as a matter of law. Id. at 389-90. The court's obligation to construe disputed claim terms extends to terms expressed as a "means or set for performing a specified function without the recital of structure, material, or acts in support thereof." 35 U.S.C. s. 112 para. 6. Where a claim term is expressed in this "means-plus-function" format, section 112 para. 6 of the Patent Act, 35 U.S.C. s. 112 para. 6, provides that "such a claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." *Id*. Accordingly, section 112 para. 6 permits the inventor to describe an element of his or her invention by the result accomplished or the function served rather than describing the item or element to be used. Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 28, 117 S.Ct. 1040, 137 L.Ed.2d 146 (1996).

In this district, Patent Local Rule 4 requires that the parties identify any claim element that either party contends to be governed by section 112 para. 6. Patent L.R. 4.2(a). Upon a finding that section 112 para. 6 applies, the court must construe the disputed term as a matter of law. Cardiac Pacemakers, Inc. v. St. Jude Med., Inc., 296 F.3d 1106, 1113 (Fed.Cir.2002). Construction of a means-plus-function claim term is a two-

step process. Medical Instrumentation & Diagnostics Corp. v. Elektra AB ("MIDCO"), 344 F.3d 1205, 1210 (Fed.Cir.2003), *cert. denied,* 541 U.S. 959, 124 S.Ct. 1715, 158 L.Ed.2d 400 (2004). The court must first identify the claimed function recited by the disputed means-plus-function element. *Id.* In the second step, the court looks to the specification and identifies the structure that corresponds to that function. *Id.* A structural element "corresponds" to the claimed function only if that element is necessary to perform the function recited in the claim and is clearly linked to that function by the disclosure in the specification. Asyst Techs., Inc. v. Empak, Inc., 268 F.3d 1364, 1370 (Fed Cir.200); *see also* Micro Chem., Inc. v. Great Plains Chem. Co., 194 F.3d 1250, 1258 (Fed.Cir., 1999). This inquiry "necessitates consideration of that disclosure from the viewpoint of one skilled in the art." Budde v. Harley-Davidson, Inc., 250 F.3d 1369, 1376 (Fed.Cir.2001).

II. ***Microprocessors as Structures Corresponding to Means-Plus-Function Terms***

A microprocessor configured to carry out particular functions can properly serve as corresponding structure that limits the scope of a means-plus-function claim element. In re Alappat, 33 F.3d 1526, 1545 (Fed.Cir.1994) (en banc). As the Federal Circuit has explained, a general purpose computer (or microprocessor) programmed to carry out an algorithm creates "a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software." *Id.; see also* WMS Gaming, 184 F.3d at 1348. Furthermore, because the instructions that create the "new machine" change the electrical paths within the device, the instructions modify the structure of the device. WMS Gaming, 184 F.3d at 1348. This modified device-i.e., the programmed microprocessor-is capable of disclosing a "structure" for the purpose of applying 35 U.S.C. s. 112 para. 6. *Id.* Hence the rule announced by the Federal Circuit in *WMS Gaming:* "If the disclosed structure is a computer, or microprocessor, programmed to carry out an algorithm, the disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm." *Id.* at 1349 (citing Alappat, 33 F.3d at 1545). In applying this rule, the court must review the specification to determine whether one skilled in the art would have understood the disclosure of the patent to encompass a particular algorithm and would have been able to implement that algorithm based on that disclosure. MIDCO, 344 F.3d at 1212 (citing Atmel Corp. v. Information Storage Devices, Inc. ., 198 F.3d 1374, 1380 (Fed.Cir.1999)). In addition, a programmed microprocessor, like any other structure, is considered "corresponding structure" only if it is clearly linked to the function recited in the claims and necessary to carry out that function. *See* id. at 1213.

DISCUSSION

The parties agree that each of the claim limitations to be construed here is a means-plus-function element governed by 35 U.S.C. s. 112 para. 6. The following discussion identifies the claimed function and corresponding structure for each of the disputed terms.

I. ***"means in said network control unit for decoding said NFS requests and for encoding said NFS reply messages"/"means for decoding NFS requests from said network"/"means for encoding any NFS reply messages for return transmission on said network"/"means for decoding file system requests from said network"/ "means for encoding any file system reply messages for return transmission on said network"***

The first group of disputed means-plus-function terms identified by the parties involves various "decoding" and "encoding" terms relating to the means by which the network controller disclosed in the patents in suit interprets and responds to network file system ("NFS") FN1 or file system requests from a data network. The "decoding" and "encoding" terms appear in claims 4, 5, and 8 of the ' 366 Patent, as well as in claims 1

and 5 of the ' 918 Patent. The parties agree that the claimed functions and the structures that correspond to those functions are the same in both patents in suit. Representative of the context in which the terms appears is claim 5 of the ' 366 Patent, which reads in pertinent part as follows:

FN1. NFS is a standard promulgated by Sun Microsystems that clients and servers use to exchange file data in a Unix environment. '366 Patent, 2:22-26. The standard is widely adopted in the Unix community and is incorporated by reference into the '366 Patent. '366 Patent, 2:22-26, 7:8-11.

A network file server for use with a data network and a mass storage device, said network file server including a first unit comprising:
means for decoding NFS requests from said network;

means for performing procedures for satisfying said NFS requests, including accessing said mass storage device if required; and

means for encoding any NFS reply messages for return transmission on said network

....

'366 Patent, 52:44-55. As noted above, the first step in construing a means-plus-function claim term is to identify the function recited by the claim. Asyst Techs., 268 F.3d at 1369. In its November 30, 2004 order, the court defined "decoding NFS requests" to mean "converting NFS requests from the format received from the network to another, decoded format." Claim Construction Order at 12. Similarly, the court defined "encoding NFS reply messages" as "converting NFS reply messages from a decoded data format to the format used for transmission on the network." *Id*. These definitions accurately reflect the "decoding" and "encoding" functions performed by the disputed claim elements.
Having defined the functions performed by the "decoding" and "encoding" limitations, the court turns to the means for performing those functions that are disclosed in the specifications. *See* Asyst Techs., 268 F.3d at 1369-70. The parties agree that the decoding and encoding functions are performed by microprocessor 210, a component of the network control processing unit. However, defendant contends that the specifications also disclose an algorithm for performing the claimed "decoding" and "encoding" functions, whereas plaintiff's proposed construction would limit the corresponding structure to the microprocessor alone.

As an initial matter, the court must address plaintiff's categorical refusal to admit the possibility that the disclosed procedures for decoding NFS requests and encoding NFS reply messages can limit the scope of its claims. Plaintiff argues that a contrary conclusion would require the court to read functional limitations into the structural portion of a means-plus-function claim term, which was correctly held to be improper in Faroudja Laboratories, Inc. v. Dwin Electronics, 76 F.Supp.2d 999 (N.D.Cal.1999) (Williams, J.). Id. at 1010; *see also* Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc., 145 F.3d 1303, 1308 (Fed.Cir.1998) (holding that "broad functional language" cannot be structure for the purpose of construing a claim under section 112 para. 6). However, as noted above, a general purpose computer effectively becomes a "new structure" when it is programmed to perform a specific task; consequently, such a programmed computer may properly limit the scope of a means-plus-function claim. WMS Gaming, 184 F.3d at 1348. While it is true that it may be necessary to describe the limitations imposed by a disclosed algorithm in functional terms, the programmed general purpose computer nonetheless remains a structural limitation. *See* id. at 1348-49; *see also* MIDCO, 344 F.3d at 1212.

In the patents in suit, the specifications disclose a number of software elements that are necessary to perform the claimed "decoding" and "encoding" functions. With respect to the "decoding" function, the disclosed embodiment describes software protocols-understood by those of skill in the art to be "standard NFS commands"-that convert encoded NFS messages into the "decoded" data format (i.e., LNFS). Alexander Dep. at 154; *see also* '366 Patent, 16:55-59. The disclosed "encoding" function reverses the effect of the decoding procedure, converting NFS reply messages from LFNS to the NFS format. *See, e.g.,* '366 Patent, 18:1-7. In performing these tasks, "[t]he server uses conventional NFS ported from Sun Microsystems." *Id*. at 9:46-47. Moreover, the steps for decoding NFS requests and encoding NFS reply messages contained in the description of the network controller operation are clearly linked to the "decoding" and "encoding" functions that the network controller performs. *See, e.g, id*. at 16:57-59 ("[M]icroprocessor 210 performs all necessary protocol processing to extract the NFS message and convert it to the local NFS (LNFS) format."); *id*. at 18:5-7 ("[T]his protocol processing [i.e., encoding] is performed entirely in the network controller, without any involvement of the local host.")

While appearing to concede that some type of software program is required to perform the claimed decoding and encoding functions, plaintiff nonetheless argues that none of the procedures disclosed in the specifications amounts to an algorithm. However, this view misunderstands the Federal Circuit's *WMS Gaming* decision. The patent in suit in *WMS Gaming* related to an electronic slot machine programmed to decrease a gambler's odds of winning. 184 F.3d at 1342. Among the disputed claim terms was a "means for assigning a plurality of numbers" representing one of the angular positions on the slot machine's reel. Id. at 1346. The court construed the structure corresponding to the "means for assigning" term as follows:

a microprocessor programmed to assign a plurality of single numbers to stop positions such that: 1) the number of single numbers exceeds the number of stop positions; 2) each single number is assigned to only one stop position; 3) each stop position is assigned at least one single number; and 4) at least one stop position is assigned more than one single number.

Id. at 1349. Thus, even though the patent did little more than disclose the steps necessary to perform the claimed function, the court held that this "algorithm" must be included as a structural limitation of the disputed term.

Being bound by the holding of the *WMS Gaming* court, this court must adopt an equally broad definition of the word "algorithm" for the purpose of construing the disputed means-plus-function claim elements of the patents in suit. Accordingly, in determining whether the '366 and '918 Patents disclose algorithms for decoding NFS requests and encoding NFS reply messages, the court's inquiry focuses on whether the specifications describe a "sequence of operations for performing a specific task," with the tasks in this case being the decoding of NFS requests and the encoding of NFS reply messages. *See Authoritative Dictionary of IEEE Standards Terms* 25 (2000) (hereinafter "*IEEE Dictionary*") (defining "algorithm" in the software field). The procedure for protocol processing described above easily meets this broad definition and thus defines the "algorithms" for decoding NFS requests and encoding NFS reply messages that are disclosed in the specifications of the '366 and '918 Patents.

Plaintiff also appears to suggest that specific "instructions" for performing the disclosed protocol processing algorithms must appear in the specifications if they are to limit the scope of the disputed claim terms. In support of this view, plaintiff cites the testimony of defendant's expert witness, Dr. Peter Alexander, who observed:

I do not recall explicit encoding and decoding instruction or description in the specification. But for one skilled in the art, since they are standard NFS commands, ... one would not have difficulty knowing how to ... implement encoding and decoding.

Alexander Dep. at 154. Contrary to plaintiff's assertion, this testimony supports rather than refutes defendant's proposed construction of the decoding and encoding terms. The Federal Circuit has consistently maintained that the question of whether the specification adequately describes and links structure to the claimed function must be answered from the perspective of one skilled in the relevant art. *See, e.g.,* MIDCO, 344 F.3d at 1212; *Budde,* 240 F.3d at 1376. In particular, where the structure at issue is a programmable computer, "[t]he correct inquiry is to look at the disclosure of the patent and determine if one of skill in the art would have understood that disclosure to encompass software for [performing the claimed function] and been able to implement such a program." MIDCO, 344 F.3d at 1212 (original emphasis omitted). Here, the disclosed software for decoding NFS requests and encoding NFS reply messages-i.e., the standard NFS commands referenced by Dr. Alexander-are both incorporated by reference into the patent and are well-understood by persons of ordinary skill in the art of network file server architecture. Furthermore, one of ordinary skill in the relevant art would perceive a link between the "decoding" and "encoding" functions and the disclosed algorithms. Finally, the court notes that plaintiff's proposed construction would encompass any general purpose microprocessor that performs the claimed functions. As one district court recently observed:

The Federal Circuit recognizes that the opportunity to forgo identification of all structures in a means-plus-function claim is offset by the requirement that some structure be identified in the accompanying specification. Allowing the instant claim to include all possible algorithms which could be programmed into the microprocessor would expand the claim to cover an untenable number of algorithms.

Medtronic, Inc. v. Guidant Corp., No. 00-2503, 2004 WL 1179338, at (D.Minn. May 25, 2004) (citing WMS Gaming, 184 F.3d at 1348) (citations omitted). The reasoning of the *Medtronic* court is equally apposite here. Accordingly, the court holds that the disclosed algorithms for "decoding NFS requests" and "encoding NFS reply messages" must limit the scope of the claimed functional terms.

Defendant's proposed construction also includes a number of additional structural limitations that relate to algorithms for determining whether a particular request made to the file server is an NFS request and for carrying out the functions of reading and writing NFS requests and reply messages to and from the system memory. These proposed limitations may be accurate functional descriptions of algorithms disclosed in the specifications of the '366 and ' 918 Patents. However, none of the described functions is necessary to decode NFS requests or to encode NFS reply messages. As the court noted in its November 30 order, "the 'decoding' and 'encoding' functions of the patented inventions are best described as a process of translation." Claim Construction Order at 11. Neither recognizing a particular request as an NFS request nor communicating with system memory is necessary to perform this translation function. Thus, the algorithms for performing these functions cannot limit the scope of the "decoding" or "encoding" terms.

Having addressed each of the areas of disagreement in the parties' proposed constructions of the "means for decoding" and "means for encoding" claim elements, the sole remaining issue is the precise phrasing of the court's construction of these terms. Stripped of its extraneous structural limitations, defendant's proposed construction defines the respective structures corresponding to the "decoding" and "encoding" functions to be "microprocessor 210 programmed to process all the protocol layer of the NFS request" and

"microprocessor 210 programmed to process all protocol layers of the NFS reply message based on the LFNS message." However, as the court noted in its November 30 order, nothing in the patents in suit compels the conclusion that *all* protocol layers must be processed to perform the claimed decoding and encoding functions. Claim Construction Order at 12. Although many protocol conversions are disclosed in the patents' specifications, the only algorithms that correspond to the "decoding" and "encoding" functions are those that are necessary to translate what the parties have colloquially referred to as the "payload" of a packet received from the network into LFNS format (i.e., decoding) and to reverse the effect of that translation for return transmission on the data network (i.e., encoding). *See* id. The court therefore concludes that the structure corresponding to the claimed "means for decoding" function is "microprocessor 210 programmed to convert data from the NFS message format to LNFS message format." Similarly, the court defines the structure that corresponds to the "means for encoding" claim term as "microprocessor 210 programmed to convert data from the LNFS message format to the NFS message format."

II. "*means for performing procedures for satisfying said NFS requests*"/"*means for performing procedures for satisfying said file system requests*"

The term "means for performing procedures" is found in claims 5 and 8 of the '366 Patent and claims 1 and 4 of the '918 Patent. In its November 30 claim construction order, the court declined defendant's invitation to construe the meaning of the "performing procedures" claim element, holding that the term as it is used in the patents in suit must be interpreted according to its ordinary and customary meaning. Claim Construction Order at 10. However, the issue now before the court is how to define this broad functional term for the purpose of construing the patents' means-plus-function claim elements. In this context, any structure necessary to perform the range of functions that the court has attributed to the "performing procedures" term must limit the scope of the claims in which it appears in means-plus-function format. *See* 35 U.S.C. s. 112 para. 6.

Looking first to the language of the claims to determine the scope of the claimed function, the court notes that claims in which the "performing procedures" term occurs each describe a data network that carries out three tasks: (1) decoding NFS requests, (2) performing procedures to satisfy those requests; and (3) encoding NFS reply messages. '366 Patent, 52:44-55, 52:65-53:9; '918 Patent, 127:2-14, 127:21-33. Based on the plain meaning of this claim language, the "performing procedures" term must encompass all steps taken to satisfy NFS or file system requests except for those performed by the claimed decoding and encoding means. Likewise, the specifications disclose that the hardware involved in processing NFS requests includes one or more network controller boards, one or more file controller boards, and one or more storage processor boards. *See,* e.g., at '366 Patent, 8:22-30. The specifications also reveal that in order to process NFS requests, each of the processing units in which these hardware components are located must communicate with one another via a VME bus. *See, e.g ., id*. at 8:5-9.

Although the parties for the most part agree that the aforementioned hardware components are necessary to carry out the "performing procedures" function and thus must limit the scope of the claims in which the term appears, they differ in the extent of detail that they would require the court to include in defining this structure. Plaintiff's proposed claim construction defines the structure broadly in terms of the major components of the inventions (e.g., the network controller), while defendant urges the court to include a number specific subcomponents of the disclosed file server as claim limitations. In determining the appropriate level of specificity necessary to describe the corresponding structure, the court is guided by the Federal Circuit's decision in Odetics, Inc. v. Storage Technology Corp., 185 F.3d 1259 (Fed.Cir.1999). In *Odetics,* the Federal Circuit observed that "[t]he individual components, if any, of an overall structure that

corresponds to the claimed function are not claim limitations." *Id*. at 1268. The court further noted that "[t]he appropriate degree of specificity is provided by the statute itself; the relevant structure is that which 'corresponds' to the claimed function." *Id*. Given the broad nature of the "performing procedures" function, the court concludes that the plaintiff's broader construction defines the disclosed hardware components with the appropriate degree of specificity.

Shifting focus from hardware to software, defendant again asserts that the specifications disclose software that performs procedures for carrying out NFS requests. Once again, the court agrees. The microprocessors located on each of the boards listed above must be programmed to perform all procedures that are necessary to satisfy NFS requests. These procedures include: NFS request dispatching and IP routing (performed by the network controller); searching system memory and the disk array in response to an NFS request (performed by the file controller); managing disk and storage tape operations (performed by the storage processor); and storing and buffering the requested data (performed by system memory). *See, e.g., id*. at 9:33-10:59. The algorithms for performing each of these procedures are disclosed in the specifications. *See, e.g., id*. at 17:20-18:7 (describing network controller operation); *id*. at 19:24-21:12 (describing file controller operation); *id*. at 26:26-28:67 (describing storage processor operation). With the exception of the procedures for decoding and encoding NFS requests, all of the steps required to respond to such requests define structure that perform procedures for satisfying NFS requests. Moreover, these steps are both clearly linked to the "performing procedures" function and necessary to carry out that function. The court therefore holds that the structure corresponding to the functional term "performing procedures for processing NFS [or file system] requests" includes the following hardware components: network controller 110, file controller 112, storage processor 114, system memory 116, and VME bus 120. The court further holds that these components must be programmed to perform such procedures based on the algorithms disclosed in the aforementioned sections of the specification. *See id*. at 17:20-18:7, 19:24-21:12, 26:26-28:67.

III. "***means for transmitting said specified storage data from said network to said buffer memory and from said buffer memory to said data control unit***"/ "***means for transmitting said specified retrieval data from said network to said buffer memory and from said buffer memory to said data control unit***"

The next two disputed claim terms appear in claim 4 of the '366 Patent and relate to the transmission of data between the data network, a "buffer memory," and a "data control unit." *See* '366 Patent, 51:59, 52:34-36, 52:41-43. Claim 4 reads as follows:

Apparatus according to claim 1, wherein said second processing unit comprises:

a network control unit coupleable to said network;

a data control unit coupleable to said mass storage device;

a buffer memory;

means in said network control unit for decoding said NFS requests and for encoding said NFS reply messages;

means for transmitting to said data control unit requests responsive to NFS requests from said network to store specified data from said network on said mass storage device;

means for transmitting said specified storage data from said network to said buffer memory and from said buffer memory to said data control unit;

means for transmitting to said data control unit requests responsive to NFS requests from said network to retrieve specified retrieval data from said mass storage device to said network;

means for transmitting said specified retrieval data from said data control unit to said buffer memory and from said buffer memory to said network.

'366 Patent, 51:56-52:43. The parties agree that the functions performed by the disputed claim elements are "transmitting said specified storage [or retrieval] data between said network and said buffer memory and between said buffer memory and said data control unit [i.e, the file controller and the storage processor]." *See generally* '366 Patent, fig. 6. This process is mediated by several local area network ("LAN") and direct memory access ("DMA") controllers, which allow for the transfer of messages via a VME bus. *See* id. Plaintiff does not dispute that a number of hardware components disclosed in the specification are required to perform this function. Thus, both parties propose constructions that include VME bus 120, LAN controller 234, LAN DMA controller 242, VME/FIFO DMA controller 272, and VME/FIFO DMA controller 580 as elements of the corresponding structure. The parties also agree that microprocessor 210 (located on the network controller board) and microprocessor 510 (located on the storage processor board) are part of the disclosed "means for transmitting." To these components, defendant proposes adding parity FIFO 240 and multiplexer unit 614 as claim limitations.

With respect to these disputed hardware components, it is clear that parity FIFO 240 and multiplexer 614 perform various functions related to the transmission of data. Specifically, the parity FIFO reconfigures data packets to allow them to pass between buses of different "widths," FN2 performs "speed matching" functions to correct for phase differentials among different buses, and buffers data transmitted between the network and a "buffer memory" (which the specification refers to as "system memory"). *See* '366 Patent, 15:4-27, 41:1-3; Reddy Decl. para. 16. Similarly, when data is transmitted between the memory array and system memory, multiplexer 614 "provides a multiplexing and demultiplexing function," '366 Patent, 29:21-22, i.e., it combines data from two or more messages on a signal channel (multiplexing) and reverses that procedure by separating a signal from a common input into several outputs (demultiplexing). *See IEEE Dictionary* at 288, 716. In addition, like FIFO 240, multiplexer 614 performs a size-matching function, converting data transmitted to system memory from 32-bit to 64-bit format and reversing that procedure when data is transmitted from system memory to the network or the data control unit. *See* ' 366 Patent, fig. 6.

FN2. The "width" of a bus determines how much data can be transmitted over the bus at one time. A 16-bit bus can transmit 16 bits of data, whereas a 32-bit bus can transmit 32 bits of data. Webopedia, http://www.webopedia.com/TERM/b/bus.html (lasted visited Dec. 2, 2004).

However, the fact that parity FIFO 240 and multiplexer 614 enable the transmission of data does not necessarily mean that they perform the claimed "data transmission" function. As the Federal Circuit observed in *Asyst Technologies:*

It is well established that it is not necessary to claim in a patent every device required to enable the invention to be used. An electrical outlet enables a toaster to work, but the outlet is not for that reason

considered part of the toaster. The corresponding structure to a function set forth in a means-plus function limitation must actually perform the function recited, not merely enable the pertinent structure to operate as intended ....

Id. at 1371 (citations and internal quotation marks omitted). Here, the functions performed by parity FIFO 240 and multiplexer 614 are best described as "matching" data width and speed and buffering data. It may be true that the disclosed embodiment of the invention would not be able to perform the recited "data transmission" function if these components were not present. However, this does not change the fact that neither parity FIFO 240 nor multiplexer 614 actually performs the function of transmitting data.FN3 Accordingly, the court holds that neither of these structures is necessary to carry out the claimed "data transmission" function and thus can not limit the scope of the "means for transmitting" claim terms.

FN3. The court also notes that defendant's proposed construction excludes numerous other components of the disclosed file server architecture that carry out the same functions that parity FIFO 240 and multiplexer 614 perform. For example, the bi-directional buffers on the network controller board perform a buffering function that, like the FIFO 240, enables the transmission of data from the data network to the system memory board. *See generally* '366 Patent, fig. 3. While the court agrees that the excluded components do not perform the claimed function, defendant has failed to identify any principled basis for including some of these components as limitations of the "means for transmitting" claim elements while excluding others from the structure corresponding to this function. Defendant's inability to do so lends further support to the court's conclusion that neither parity FIFO 240 nor multiplexer 614 are limitations on the "means for transmitting" claim element.

Having defined the hardware elements that correspond to the structure of the disputed "means for transmitting" terms, the court turns to the disclosed algorithms for transmitting data between the data network, system memory, and the data control unit. Here, plaintiff concedes that certain protocols for carrying out the claimed function are disclosed in the specification. Specifically, the parties agree that the network controller (microprocessor 210) must be programmed (1) to read an address from system memory that is designated for receipt of the specified storage data and (2) to configure LAN DMA controller 242 and VME/FIFO controller 272 to transfer the specified data over VME bus 120 to the selected system memory board. The parties also agree that in order to send data to and receive data from system memory board, the storage processor (microprocessor 510) must (1) read the address of the specified data on the selected system memory board and (2) configure VME/FIFO DMA controller 580 to transfer the specified data from the system memory board to the data control unit.

Despite these areas of consensus, the parties disagree as to whether the "fast transfer protocol" algorithms for the "BLOCK READ" and "BLOCK WRITE" cycles must be included as structural elements of the claimed function. This protocol, which is depicted graphically in Figures 7A-C and 8A-C of the '366 Patent, describes algorithms that "facilitate the rapid transfer of large amounts of data across the VME backplane bus by substantially increasing the data transfer rate." '366 Patent, 37:10-12. However, nothing in the specification "clearly links" these algorithms to the claimed function. Indeed, the specification states that the protocol is not "essential to the present invention" and goes on to note that the protocol is "compatible with the IEEE VME backplane bus standard." *Id*. at 37:9-10, 37:19-20. Implicit in these observations is the possibility that some functional units of the invention may operate using the conventional "VMEbus" protocol defined by the IEEE VME backplane bus standard, while others would simultaneously employ the fast transfer protocol. *Accord id*. at 37:23-27 (discussing operation of system employing both standard

VMEbus and fast transfer protocols); *see also id*. at 29:38-45 (listing the types of transfers that "[t]ypically" employ the fast transfer protocol). In light of these statements and in the absence of any language in the specification that would clearly link or associate the fast transfer protocol with relevant "means for transmitting" terms, the court must reject defendant's contention that the algorithms disclosed in Figures 7A-C and 8A-C of the ' 366 Patent limit the scope of the claims in which these terms appear.

In summary, the court rejects defendant's attempts to link parity FIFO 240, multiplexer 614, and the "fast transfer protocol" algorithm to the disputed "data transmission" function.FN4 The court therefore holds that the structures corresponding to the claimed "means for transmitting" include: "(1) VME bus 120; (2) LAN controller 234; (3) LAN DMA controller 242; (4) VME/FIFO DMA controller 272; (5) VME/FIFO DMA controller 580; (6) microprocessor 210, which is programmed (a) to read an address on system memory board 116 that is designated for receipt of specified storage data and (b) to configure LAN DMA controller 242 and VME/FIFO DMA controller 272 to transfer the specified data over VME bus 120 to the selected system memory board; and (7) microprocessor 510, which is programmed (a) to read the address of the specified data on the selected system memory board and (b) to configure the VME/FIFO DMA controller 580 to transfer the specified data over the VME bus 120 from the system memory board to the data control unit."

FN4. Because the court holds that parity FIFO 240 does not perform the claimed "data transmission" function, the court must also reject defendant's attempt to include the algorithms necessary to configure FIFO 240 as structural limitations of the "means for transmitting" claim elements.

IV. "*means for executing programs which make calls to a general purpose operating system*"/"*means for executing programs which make calls to a UNIX operating system*"

The final two disputed means-plus-function claim elements appear in claims 6 and 7 of the '366 Patent and in claim 2 of the '918 Patent. These dependent claims recite, *inter alia,* a "means for executing programs which make calls to a general purpose [or a Unix] operating system." '366 Patent, 52:56-64; '918 Patent, 127:15-19. The parties agree that the recited function is "executing programs which make calls to a general purpose [or a Unix] operating system." However, while the parties also agree that the corresponding structure must include host processor 118, defendant urges the court to limit the scope of the claim to a Sun Microsystems Central processor. The specifications expressly state that "[t]he host processor 118 is a conventional OEM Sun central processor card, Model 3E/120." *See, e.g.,* '366 Patent, 11:49-50. Elsewhere in the specifications, host 118 is described as "essentially a standard SunOS Unix processor." *See, e.g., id*. at 8:18-19. Although the inventors also observed that other processors such as a SPARC-based processor were possible alternatives to the Sun Microsystems computer, *see id*. at 11:52-53, the only disclosed embodiment describes the host as Sun Microsystems processor. The court therefore adopts defendant's view that the structure corresponding to the "executing programs" function must include a SunOS Unix processor.

Defendant also proposes numerous other structural limitations on the scope of the "executing programs" term. The first group of these asserted limitations is essentially a list of services that would typically be provided by a general purpose operation system (e .g., a server manager). *See id*. at 11:7-48. Relying on *WMS Gaming,* defendant argues that these functional attributes are "algorithms" and thus must be included as corresponding structure. However, nothing in *WMS Gaming* requires this result. The rule that the Federal Circuit announced in that case is worth repeating: "In a means-plus-function claim in which the disclosed structure is a computer, or microprocessor, programmed to carry out an algorithm, the disclosed structure is

not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm." 184 F.3d at 1349 (citing Alappat, 33 F.3d at 1545). The court has already observed that in applying this rule, *WMS Gaming* appeared to define "algorithm" broadly, concluding that a description of the steps necessary to carry out the claimed function was sufficient to constitute "structure" for the purpose of section 112 para. 6. *Id*.

It is true that the manner in which the court defined the structure of disclosed microprocessor was indirect and inferential in that it described the electronic configuration of the microprocessor by reference to a series of functional steps that the structure performs. *See id*. at 1348-49. Nonetheless, despite the indirect fashion in which the court described the disclosed structure, nothing in *WMS Gaming* suggests that the Federal Circuit intended to abandon the requirement that a structure corresponding to a means-plus-function element must be clearly linked to the claimed function and necessary to perform that function. *See* Asyst Techs., 268 F.3d at 1370. In contrast, defendant's proposed claim limitations are little more than a laundry list of applications that run on the host processor. Rather than describing a "means for executing programs"-in functional terms or otherwise-this list of programs merely describes the functional attributes of the programs that are executed by those means. This is not sufficient to disclose "structure" for purposes of applying section 112 para. 6.

Finally, defendant argues that the structure corresponding to the "executing programs" function must include algorithms for reading "message descriptors" sent to the local host by the network controller and for copying messages from either the network controller's local memory or from system memory. In other words, defendant seeks to include algorithms for communicating with other components of the file server as limitations of the "executing programs" term. However, the Federal Circuit "has repeatedly held that it is improper to restrict a means-plus-function limitation by adopting a function different from that explicitly recited in the claim." Creo Prods., Inc. v. Presstek, Inc., 305 F.3d 1337, 1346 (Fed.Cir.2002) (collecting cases). Simply put, "executing programs" is a different function than "communicating." Thus, because defendant's proposed "reading" and "copying" algorithms in defendant's proposed claim construction do not perform the "executing programs" function, they cannot limit the meaning of that term as it is used in the patents' means-plus-function claim elements. The court therefore holds that the structure corresponding to the "means for executing programs which make calls to a general purpose [or a Unix] operating system" is "a SunOS Unix processor."

CONCLUSION

For the foregoing reasons, the court construes the disputed claims in the manner described above.

IT IS SO ORDERED.

N.D.Cal.,2005.
Network Appliance, Inc. v. Bluearc Corp.