United States Court of Appeals
for the Federal Circuit

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**FIFTH GENERATION COMPUTER
CORPORATION,**
Plaintiff-Appellant,

v.

**INTERNATIONAL BUSINESS MACHINES
CORPORATION,**
Defendant-Appellee.

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2010-1201

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Appeal from the United States District Court for the Southern District of New York in Case No. 09-CV-2439, Judge Jed S. Rakoff.

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Decided: January 26, 2011

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DAVID B. TULCHIN, Sullivan & Cromwell LLP, of New York, New York, argued for plaintiff-appellant. With him on the brief was JAMES T. WILLIAMS.

JOHN M. DESMARAIS, Desmarais LLP, of New York, New York, argued for defendant-appellee. With him on the brief was ALAN K. KELLMAN. Of counsel on the brief

were STEVEN C. CHERNY, Kirkland & Ellis LLP, of New York, New York and JOHN C. O'QUINN, of Washington, DC.

Before RADER, *Chief Judge*, and LOURIE and MOORE, *Circuit Judges*.

LOURIE, *Circuit Judge*.

Fifth Generation Computer Corporation ("Fifth Generation") appeals from the dismissal by the District Court for the Southern District of New York of its suit against International Business Machines Corporation ("IBM") for infringement of U.S. Patent 6,000,024 (the "'024 patent"). Following the court's claim construction, *Fifth Generation Computer Corp. v. Int'l Business Machines Corp.*, 678 F. Supp. 2d 184 (S.D.N.Y. 2010), the parties stipulated to noninfringement of the asserted patent claims by IBM's accused computer system. The district court entered judgment of noninfringement in favor of IBM. Because we construe at least one of the disputed terms in the same manner as the district court did, we *affirm* its judgment of noninfringement.

BACKGROUND

Fifth Generation owns the '024 patent directed to a binary tree parallel computing system and issued to James Maddox, Fifth Generation's chief engineer. Parallel computing systems seek to increase their speed and processing power by employing multiple computer processors that operate simultaneously. The system divides computing tasks among the several processors, thus increasing the number of computations that can be performed in a given period of time. The parallel processing system claimed in the '024 patent is one configured as a

"binary tree" system. '024 patent, Abstract. Figure 1 from the '024 patent depicts an embodiment of the patented system:

FIG.1
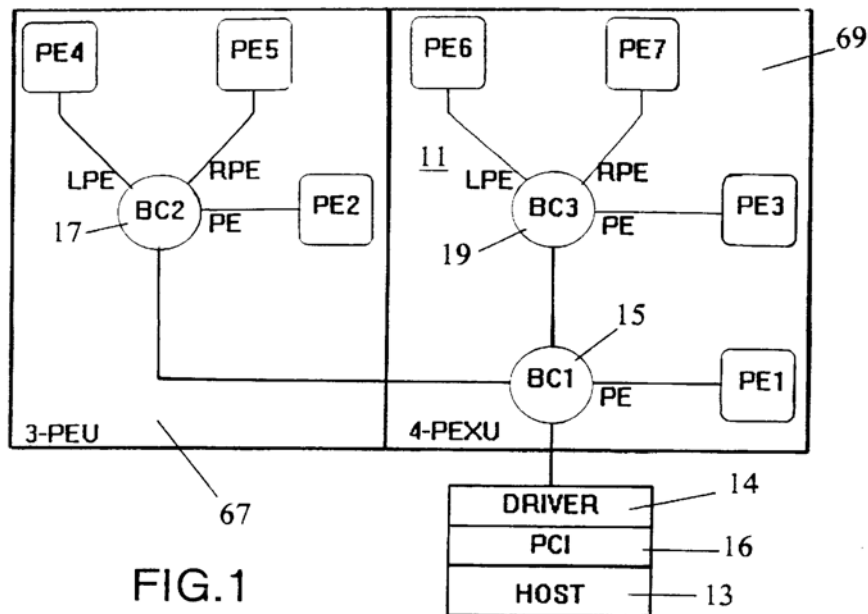
In the patented computer system, a number of Processor Elements ("PE"), each comprising a processor, associated random access memory, and an input/output device, are connected with each other and with a host computer (13) over a "binary tree-bus" consisting of bus control nodes such BC1 (15), BC2 (17) and BC3 (19). '024 patent, col.2 ll.28-36. As can be seen in Figure 1 of the '024 patent, each node is connected to its own PE and, depending upon the location of the node, to either two "child bus control nodes" or two "leaf PEs." *Id.*, col.2 ll.43-49 ("The nodes BC2 and BC3 are each connected to their own PE's, PE2 and PE3 respectively, and to left and right child PEs, PE4 and PE5, and PE6 and PE7, respectively. . . . referred to as the leaf PE's since they have no other children."). One of the bus control nodes, a "root node" (15), attaches

the tree to the host through a driver (14) and a PCI bus (16). '024 patent, col.2 ll.50-53. The root node can receive a problem to be solved from the host computer and distribute a portion of the problem to each PE in the tree. The PEs then execute the system's instructions, *i.e.*, perform the necessary calculations, and pass their solutions back up the tree toward the root node, which determines the overall solution to the problem it received from the host computer. The input/output device in each PE functions to transmit data up and down the tree levels. Claim 1 is representative of the patented parallel computing system:

> 1. A binary tree computer system *for connection to and control by a host computer*, comprising:
>
> > N bus controllers connected in a binary tree configuration in which each bus controller, except those at the extremes of the tree, are connected to left and right child bus controllers, where N is an integer greater than 2, *one of said bus controllers being a root bus controller for connecting said binary tree connected bus controllers to said host computer*;
> >
> > N processing elements, one attached to each of said bus controllers;
> >
> > N+1 leaf processing elements connected, two each, as right and left children to the bus controllers at the extremes of said binary tree;
> >
> > each of said processing elements including a microprocessor and a memory;
> >
> > each of said bus controllers including, for each processing element connected

thereto, a buffered interface connecting said processing element to said bus controller for transmitting instructions and data between the bus controller and the connected processing element, and means for writing information into the memory of the connected processing element without involving the microprocessor of said connected processing element.

'024 patent, claim 1 (emphases added).

The only other independent claim of the '024 patent, claim 7, recites a similar system. The '024 patent cites as prior art and incorporates by reference two other patents that are also assigned to Fifth Generation, U.S. Patents 4,843,540 and 4,860,201 to Salvatore Stolfo and Daniel Miranker (the "'540 and '201 patents" or the "Stolfo patents"). Those patents also claim a binary tree computer system as depicted by Figure 2 in the '201 patent:
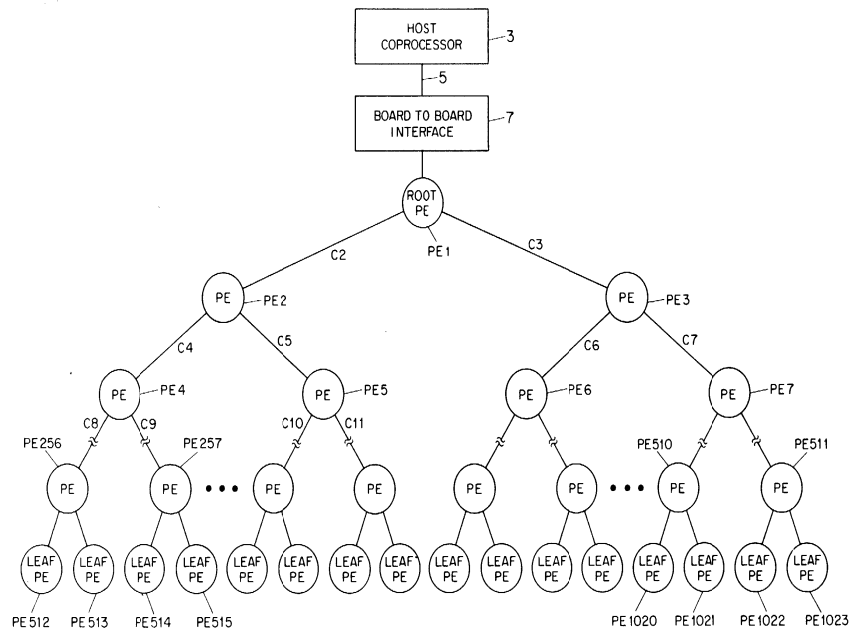
FIG. 2

The '201 patent specification explains that the binary tree processing system is partitionable "into a number of subtrees which maintain the full functionality of the ordinal tree." '201 patent, col.10 ll.53-55. The '540 patent similarly illustrates the concept of a binary tree being comprised of sub-binary trees. '540 patent, col.6 ll. 8-15 ("When functioning independent of its parent element the data processing element can act as a root element for a sub-binary tree formed by the lower order data processing elements connected below it.").

In October 2008, Fifth Generation brought suit against IBM in the United States District Court for the Eastern District of Texas, alleging infringement of the '240, '540 and '201 patents by IBM's BlueGene supercomputer, which is a large-scale parallel computing system. In March 2009, the case was transferred to the Southern District of New York, following which Fifth Generation,

by joint motion, dropped claims of infringement of the '540 patent. The court construed claims of the '240 and '201 patents in August 2009, as a result of which Fifth Generation conceded that it could not prove infringement of the asserted claims by IBM's system under the district court's construction of at least one claim limitation, the "root bus controller."

On January 6, 2010, the court issued a detailed claim construction opinion, *Fifth Generation*, 678 F. Supp. 2d 184, and subsequently entered final judgment of noninfringement against Fifth Generation. J.A.1. The court held that the "root bus controller," as used in the '024 claims, connects the binary tree of bus controllers to the host computer. *Fifth Generation*, 678 F. Supp. 2d at 201. The court read the claims to mean that the root bus controller is necessarily the link between the binary tree of bus controllers and the host computer. *Id.* at 202. The court reasoned that, as such, the root bus controller is the highest order bus controller and can have no parent bus controllers. *Id.* Thus, the court construed the term to mean "the bus controller at the highest order position of the binary tree computer system that connects the binary tree to the host computer and which has no parent bus controller." *Id.* In so holding, the court rejected Fifth Generation's argument that any bus controller in the system can be a root bus controller and that the "binary tree computer system" of the '024 patent should be construed broadly to read upon partitionable portions of the binary tree, such as "subtrees" similar to those disclosed in the '201 and '540 patents. *Id.*

Fifth Generation timely appealed the district court's final judgment, focusing on the claim construction of that limitation as well as two other limitations of the '024 patent claims: "host computer" and "binary tree computer

system."   We   have   jurisdiction   pursuant   to 28 U.S.C. § 1295(a)(1).

DISCUSSION

I.

We begin with the district court's construction of the claim term "root bus controller." Claim construction is an issue of law, *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 977-78 (Fed. Cir. 1995) (*en banc*), which we review *de novo*, *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454-55 (Fed. Cir. 1998) (*en banc*). The words of a claim are generally given their ordinary and customary meaning as understood by a person of ordinary skill in the relevant art at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (*en banc*).

Fifth Generation argues that the district court erred in construing "root bus controller" to refer to a controller at the highest order position of the binary tree computer system when the specification allows the claims to cover a system that is partitionable into subsets that are themselves binary tree computer systems. Fifth Generation argues that the '024 patent specification discloses the concepts of subtrees and partitionability because it incorporates the '201 and '540 patents by reference, and those patents clearly disclose those concepts. According to Fifth Generation, the district court's construction violates this court's black letter law by requiring that the '024 patent specification repeat and expressly describe those concepts in order for the '024 patent claims to include them within their scope. Fifth Generation argues that in light of the incorporated references, "root bus controller" should properly be construed to refer to "any bus controller that is the highest level bus controller in the tree or subtree."

IBM responds that nothing in the '024 patent claims or specification suggests that the concept of partitionability disclosed in the earlier patents should be imported into the '024 patent claims. IBM points out that the '024 patent claims never mention the word subtree. On the contrary, IBM argues, the '024 patent claims expressly require that the binary tree system be connected to a host computer and such a connection would not be possible if the claims were to be read to apply merely to portions of a binary tree. Moreover, according to IBM, the '024 patent specifically distinguishes itself from the Stolfo patents, suggesting that architectural concepts from the earlier patents should not be imported into the '024 patent claims.

We agree with IBM. Patent claims function to delineate the precise scope of a claimed invention and to give notice to the public, including potential competitors, of the patentee's right to exclude. *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950 (Fed. Cir. 2006); *see also Interactive Gift Express, Inc. v. Compuserve, Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001) ("In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to particularly point out and distinctly claim the subject matter which the patentee regards as his invention.") (quotation and alterations omitted). This notice function would be undermined, however, if courts construed claims so as to render characteristics specifically described in those claims superfluous. *Bicon*, 441 F.3d at 950. As such, we construe claims to give effect to all of their terms. *Id.* Claims 1 and 7 of the '024 patent clearly state that the root bus controller is "for connecting said binary tree connected bus controllers to said host computer." In order for the root bus controller to serve as this claimed link between the binary tree of

bus controllers and the host computer, it has to be the highest order bus controller. If the root bus controller were construed to be capable of having a parent bus controller, this claim limitation would simply lose its plain meaning.

Fifth Generation proposes that the root bus controller is merely the highest level bus controller of a subtree that could possibly connect to a parent bus controller as part of a larger tree. But a plain reading of claims 1 and 7 mandates a rejection of that argument. The claims are toward "[a] binary tree computer system for connection to and control by a host computer." '024 patent, claims 1, 7. Further, in claiming the bus controllers, the claim language specifically requires "*one* of said bus controllers" to be the root bus controller. *Id.* (emphasis added). We are therefore not persuaded by Fifth Generation's argument that requires not only that the root bus controller not provide the claimed link to the host computer, but also invalidates the claim requirement that only one of the bus controllers in the entire claimed system be the root bus controller.

Fifth Generation points out that the '024 patent specification shows that the root bus controller is connected to the host computer through the driver and the PCI bus. *See* '024 patent col.2 ll.41-42. Therefore, it argues, the claims do not require a direct connection between the root bus controller and the host computer. We reject that argument as well. The driver and the PCI bus merely provide the necessary interface that makes the connection to the host computer possible. *Id.* at 2:41-42. ("the root node . . . attaches the tree to the host 13 through a driver 14 an [sic] interface, such as PCI bus 16."). The presence of those elements does not in any way suggest that the inventors envisioned or claimed a system wherein a root bus controller connected to the host computer through

other bus controllers of the binary tree system. On the contrary, the specification repeatedly suggests a "direct" connection and supports the plain reading of the claims. *Id.* at 2:51-53 ("Each node BCx is connected upstream to a parent node, except for the root node BC1, which is connected to the host."); *id.* at Abstract ("One of the bus controllers is a root bus controller that connects the binary tree to the host computer."); *id.* at 1:52-53 ("one of the bus controllers being a root bus controller for connecting the tree to the host computer"). Under Fifth Generation's construction, the '024 claims could potentially read on any randomly networked group of computer nodes as long as one bus controller was eventually connected to a host computer somewhere. We find no basis for that position.

Fifth Generation's proposed broader construction of the disputed terms relies heavily on its argument that the '024 patent incorporated the '201 and '540 patents by reference and that a disclosure of subtrees in those earlier patents supports such a construction. Whether, and to what extent, material has been incorporated by reference into a host document, is a question of law that we review *de novo*. *Adv. Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1283 (Fed. Cir. 2000). We agree with Fifth Generation that the '024 patent specification does not need to expressly recite concepts disclosed in the earlier Stolfo patents in order to incorporate them into the later patent specification. The clear incorporation by reference suffices to serve that purpose here. *See Zenon Envtl., Inc. v. U.S. Filter Corp.*, 506 F.3d 1370, 1378 (Fed. Cir. 2007) ("Incorporation by reference provides a method for integrating material from various documents into a host document . . . by citing such material in a manner that makes clear that the material is effectively part of the host document as if it were explicitly contained therein.")

(quotation omitted). To the extent the district court imposed a contrary requirement by holding that the Stolfo patents were not incorporated by reference because of the '024 patent's criticism of those earlier inventions, *Fifth Generation*, 678 F. Supp. 2d at 197, we conclude that it erred. However, we do not agree with Fifth Generation that every concept of the prior inventions is necessarily imported into every claim of the later patent. *See Modine Mfg. Co. v. U.S. Int'l Trade Comm'n*, 75 F.3d 1545, 1553 (Fed. Cir. 1996) ("[I]ncorporation by reference does not convert the invention of the incorporated patent into the invention of the host patent."), *overruled on other grounds by Festo Corp. v. Shoketsu Kinzoku Kabushiki Co., Ltd.*, 234 F.3d 558 (Fed. Cir. 2000). Here, the '024 patent claims are clear in claiming a complete computer system, including specific functionality of the single root bus controller within that computer system. In light of such clear claim language, it is inappropriate to look to the incorporated references to arrive at a stretched reading of those claim limitations. *Interactive Gift Express*, 256 F.3d at 1331 ("If the claim language is clear on its face, then our consideration of the rest of the intrinsic evidence is restricted to determining if a deviation from the clear language of the claims is specified."); *see also Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1563 (Fed. Cir. 1991) ("When the language of a claim is clear, as here, and a different interpretation would render meaningless express claim limitations, we do not resort to speculative interpretation based on claims not granted.").

Moreover, the Stolfo patents do not disclose or claim subtrees that are independently connected to a host computer in the manner that Fifth Generation would like the '024 patent claims to be construed. What is disclosed and claimed in those patents are subtrees that comprise a subset of a larger binary tree computer system that, in its

entirety, connects to the host computer. The '201 patent disclosure relied upon by Fifth Generation as relating to subtrees recites a plurality of subtrees working together as part of a larger binary tree system. *See, e.g.*, '201 patent, claim 9 ("at least two of the sub-trees execute identical programs on identical data and the results of such program execution are compared to detect faults in the sub-trees"). Likewise, the '540 patent only describes subtrees that function together in parallel as an integral part of a larger computer system. *See* '540 patent, col.3 ll.49-60 ("It may be noted that one of the characteristics of the binary tree 20 as illustrated in FIG. 1 is that it includes *sub-sets* which are also binary trees. . . . the sub-binary trees of binary tree may act separately as separate processing systems *acting in parallel*.") (emphases added).

We also agree with IBM that the Stolfo patents in fact show that Fifth Generation's inventor did not claim independent subtree systems in the '024 patent in the manner now proposed by Fifth Generation. Fifth Generation asserts that the invention claimed in the '024 patent was merely an enhancement of the inventions claimed in the earlier patents assigned to Fifth Generation. Therefore, under Fifth Generation's own assertion, at the time of the filing of the '024 patent, its inventors had claimed subtrees, at least as part of a larger binary tree computer system, in the earlier patents, and yet the '024 patent inventor, employed by the same company, did not do so in the later patent, thereby demonstrating that such systems are not within the '024 patent claims' scope. *See Kara Tech. Inc. v. Stamps.com Inc.*, 582 F.3d 1341, 1347 (Fed. Cir. 2009) (citing *Phillips*, 415 F.3d at 1314) (holding that the claims at issue did not require the use of a "key" where the inventor had omitted the requirement in those claims while explicitly reciting it in other claims, thereby demonstrating an intent to claim a different

scope); *see also Abbott Labs. v. Sandoz, Inc.*, 566 F.3d 1282, 1297 (Fed. Cir. 2009) (holding that a chemical formulation that the applicants could have claimed given that it appeared in their priority application, but chose not to, falls outside the scope, literal or equivalent, of the claim).

Thus, we conclude that the district court's construction of the term "root bus controller" requiring that it be the highest order bus controller of the binary tree system was correct. In light of that disposition and the parties' stipulation below, we do not reach the claim construction of other disputed claim terms.

CONCLUSION

We have considered Fifth Generation's remaining arguments and do not find them persuasive. Accordingly, the judgment of the district court is

AFFIRMED.