Trials@uspto.gov
571-272-7822

Paper 15
Date: February 1, 2022

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

JUNIPER NETWORKS, INC.,
Petitioner,

v.

SWARM TECHNOLOGY LLC,
Patent Owner.

IPR2021-01317
Patent 9,146,777 B2

Before MICHAEL R. ZECHER, GREGG I. ANDERSON, and SCOTT B. HOWARD, *Administrative Patent Judges.*

HOWARD, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

INTRODUCTION

A. Background and Summary

Juniper Networks, Inc. ("Petitioner") filed a Petition requesting *inter partes* review of claims 1–14 of U.S. Patent No. 9,146,777 B2 (Ex. 1001, "the '777 patent"). Paper 1 ("Pet."). Swarm Technology LLC ("Patent Owner") filed a Preliminary Response. Paper 6 ("Prelim. Resp."). With our authorization, Petitioner filed a Preliminary Reply and Patent Owner filed a Preliminary Sur-reply. Paper 11; Paper 13.

We have authority, acting on the designation of the Director, to determine whether to institute an *inter partes* review under 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a). *Inter partes* review may not be instituted unless "the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a) (2018). "When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim." 37 C.F.R. § 42.108(a) (2021).

B. Real Parties in Interest

Petitioner identifies itself as the real party in interest. Paper 3, 1 (Petitioner's Updated Mandatory Notices).[1] Patent Owner identifies itself as the real party in interest. Paper 5, 5 (Patent Owner's Mandatory Notices).

---

[1] Petitioner originally identified Amazon.com as an additional real party in interest. Pet. ix. In its Updated Mandatory notices, Petitioner states that "[l]isting Amazon.com, Inc. in the Petition (page ix) was due to a clerical error." Paper 3, 1 n.1.

C. Related Matters

The parties identify the following district court proceedings involving the '777 patent: (1) *Juniper Networks, Inc. v. Swarm Technology LLC*, No. 3:20-cv-03137-JD (N.D. Cal.) and (2) *Swarm Technology, LLC v Amazon.com, Inc.*, 2:21-cv-00438-DJH (D. Az.). Pet. ix; Paper 5, 5. Patent owner also identifies a number of patents and patent applications that claim or may claim the benefit of the filing date of the '777 patent. Paper 5, 5–6.

D. The '777 Patent

The '777 patent is titled "Parallel Processing with Solidarity Cells by Proactively Retrieving from a Task Pool a Matching Task for the Solidarity Cell to Process" and is generally directed to "a method and apparatus that facilitates parallel processing of computing tasks using autonomous co-processors that proactively seek tasks to perform." Ex. 1001, code (54), 1:9–13.

According to the '777 patent, "[p]arallel processing is a computational approach that breaks a large computational requirement into a group of smaller computations for concurrent resolution across the computer's processing resources." Ex. 1001, 1:17–20. A central processing unit ("CPU") "divides the large requirement into tasks that contain segments of executable code" which it then distributes to co-processors. *Id.* at 1:20–28. "Completed threads are reported to the CPU, which continues to distribute threads until the primary processing is complete." *Id.* at 1:28–30.

The '777 patent identifies two major drawback associated with that typical multiprocessing framework. Ex. 1001, 1:31–45. "First, a significant amount of the CPU's processing time is consumed in managing the co-processing tasks." *Id.* at 1:33–35. "Second, a co-processor will remain idle as it waits for a thread to be assigned to it by the CPU." *Id.* at 1:41–42. The

’777 patent addresses those problems by using autonomous co-processors that proactively searches a task pool to acquire tasks for the co-processor to perform. *Id*. at 1:46–55.

Figure 1 of the ’777 patent is reproduced below.

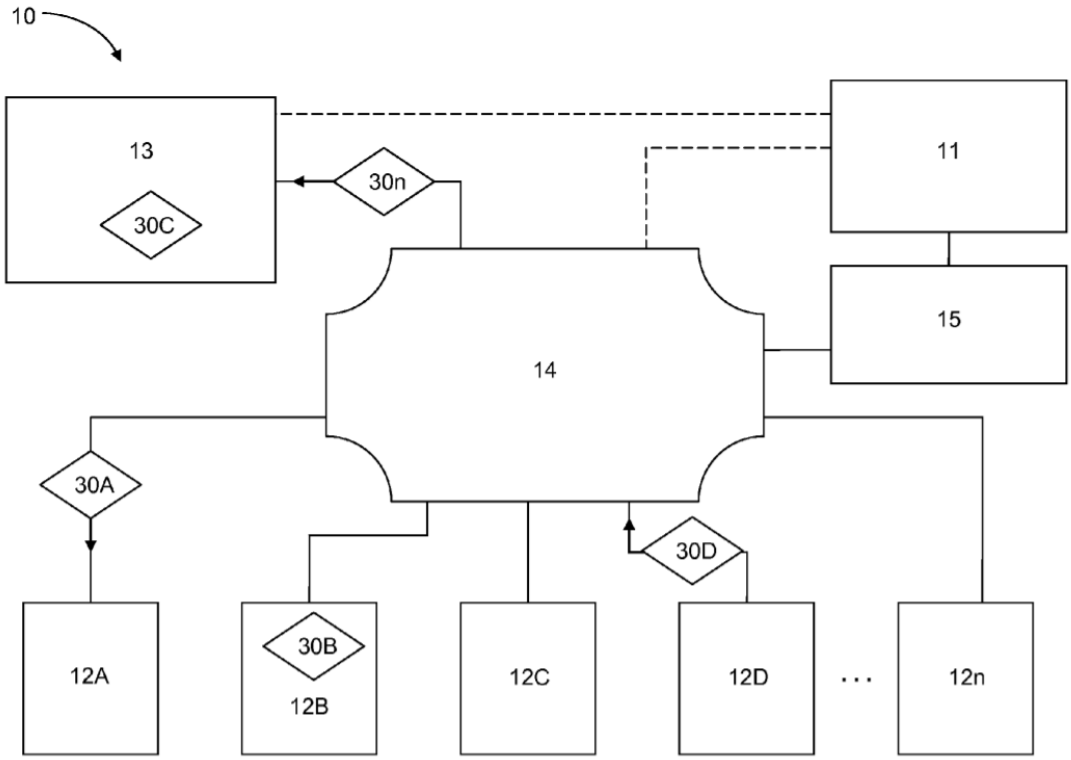

FIG. 1

Figure 1 “is illustrated the preferred embodiment of a parallel processing system 10 for performing computing tasks, such as data-intensive computations and complex programs and algorithms.” Ex. 1001, 2:29–32. “The system 10 has at least one CPU 11 and one or more solidarity cells 12A, B, C, D . . . n, hereinafter referred to collectively as solidarity cells 12A . . . n to indicate that the system 10 may have any number n of solidarity cells, that cooperate to perform the computing tasks ascribed to the system 10.” *Id.* at 2:47–52. “The solidarity cells 12A . . . n communicate with a task pool 13, preferably through a switching fabric 14. The solidarity

cells 12A . . . n may further communicate with each other through the switching fabric 14 or through a separate cell bus (not shown)." *Id.* at 2:52–56. "The CPU 11 may communicate with the task pool 13 directly or through the switching fabric 14 as shown. One or more memory units 15 contain data and instructions to perform computations." *Id*. at 2:56–59.

E. Illustrative Claim

Claims 1 and 14 are independent. Claim 1, reproduced below, is illustrative of the claimed invention.

> 1. An apparatus for parallel processing of a large computing requirement, the apparatus comprising:
>
> a central processing unit ("CPU");
>
> a task pool in electronic communication with the CPU; and
>
> a first solidarity cell in electronic communication with the task pool, the first solidarity cell comprising a first agent configured to proactively retrieve, from the task pool, without requiring an instruction from the CPU, a matching task for the solidarity cell to process;
>
> wherein the CPU populates the task pool by dividing the requirement into one or more threads and placing the threads in the task pool, each thread comprising one or more tasks, and the matching task being one of the tasks;
>
> wherein each task comprises a descriptor, the descriptor containing at least:
>
> a function to be executed; and
>
> a memory location of data upon which the function is to be executed;
>
> wherein the first agent is a data frame comprising: a source address, a destination address and a payload;
>
> wherein the first agent retrieves the matching task by:

> being dispatched by the first solidarity cell to the task pool, during which the source address is the first solidarity cell's address, the destination address is the task pool's address, and the payload comprises a list of functions the first solidarity cell is configured to perform;
>
> searching the task pool for a task that is ready to be processed and has a function that the first solidarity cell can perform; and
>
> returning to the first solidarity cell, during which the source address is the task pool's address, the destination address is the first solidarity cell's address, and the payload comprises the descriptor of the matching task.

Ex. 1001, 7:41–8:9

F. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–14 would have been unpatentable based on the following grounds:

Claim(s) Challenged	35 U.S.C. §[2]	Reference(s)/Basis
1–14	103(a)	Leong[3]
1–14	103(a)	Leong, Ethernet Specification[4]
2	103(a)	Leong, Bates[5]
2	103(a)	Leong, Ethernet Specification, Bates

[2] The Leahy-Smith America Invents Act ("AIA") included revisions to 35 U.S.C. §§ 102, 103 that became effective on March 16, 2013. Because the '777 patent issued from an application filed before March 16, 2013, we apply the pre-AIA versions of the statutory bases for unpatentability. *See* Ex. 1001, codes (21), (22) (application filed Jan. 25, 2013).

[3] US 6,006,249, issued Dec. 21, 1999 (Ex. 1005).

[4] The Ethernet, A Local Area Network, Data Link Layer and Physical Layer Specifications, dates Sept. 30, 1980 (Ex. 1006). All citations are to the native pagination.

[5] US 2007/0074207, published Mar. 29, 2007 (Ex. 1007).

Petitioner also relies on the testimony of Dr. Jon B. Weissman (Ex. 1003 (Declaration of Dr. Weissman In Support of Petition)).

ANALYSIS

A. Legal Standards

In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), the Supreme Court set out a framework for assessing obviousness under 35 U.S.C. § 103 that requires consideration of four factors: (1) the "level of ordinary skill in the pertinent art," (2) the "scope and content of the prior art," (3) the "differences between the prior art and the claims at issue," and (4) if in evidence, "secondary considerations" of non-obviousness such as "commercial success, long-felt but unsolved needs, failure of others, etc." *Id.* at 17–18. "While the sequence of these questions might be reordered in any particular case," *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 407 (2007), the U.S. Court of Appeals for the Federal Circuit has repeatedly emphasized that "it is error to reach a conclusion of obviousness until all those factors are considered," *WBIP v. Kohler*, 829 F.3d 1317, 1328 (Fed. Cir. 2016).

B. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. "The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry." *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). The "person having ordinary skill in the art" is a hypothetical construct, from whose vantage point obviousness is assessed. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998).

Factors pertinent to a determination of the level of ordinary skill in the art include "(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field." *Envtl. Designs, Ltd. v. Union Oil Co. of Cal.*, 713 F.2d 693, 696–697 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). "Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case." *Id.*

Petitioner argues that a person having ordinary skill in the art "would have had a bachelor's degree in computer science, electrical engineering, computer engineering, or a closely related field, and one or more years of experience in the design and development of parallel and distributed processing systems." Pet. 12 (citing. Ex. 1003 ¶¶ 58–63). Petitioner alternatively argues that a person having ordinary skill in the art "would have a master's degree or similar post-graduate work in computer science, electrical engineering, computer engineering, or a closely related field, and less design and development experience." *Id*. (citing. Ex. 1003 ¶¶ 58–63).

Patent Owner does not address the level of skill in the art. *See* Prelim. Resp.

Accordingly, for purposes of this Decision, we adopt Petitioner's proposed formulation of the level of ordinary skill in the art, except that we delete the qualifier "or more" to eliminate vagueness as to the amount of practical experience. The qualifier expands the range indefinitely without an upper bound, and thus, precludes a meaningful indication of the level of ordinary skill in the art.

C. Claim Construction

We apply the same claim construction standard used in the federal courts, in other words, the claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b), which is articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b). Under the *Phillips* standard, the "words of a claim 'are generally given their ordinary and customary meaning,'" which 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." *Phillips*, 415 F.3d at 1312–13.

Petitioner proposes construction for the terms "solidarity cell" and "thread(s)." Pet. 12–17.

Patent Owner does not address claim construction. *See* Prelim. Resp.

For purposes of this Decision, we need not expressly construe any claim terms. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (noting that "we need only construe terms 'that are in controversy, and only to the extent necessary to resolve the controversy'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

D. Asserted Obviousness in View of Leong

Petitioner argues that claims 1–14 would have been obvious over Leong. *See* Pet. 17–84. Based on the current record, we are not sufficiently persuaded that Petitioner has established a reasonable likelihood of prevailing on this asserted obviousness ground with respect to any of claims 1–14.

1. Summary of Leong

Leong is titled "Method and Apparatus for Concurrent Data Processing" and is directed "to multi-tasking systems employing networked stand alone and independently operating micro-processing units each of which perform one or more tasks for manipulating electronic data." Ex. 1005, code (54), 1:7–11. Leong states it is an improvement on prior art multi-tasking computing systems which used a CPU coupled to a plurality processing unites. *Id.* at 1:19–24, Fig. 1.

Leong Figure 2 is reproduced below.

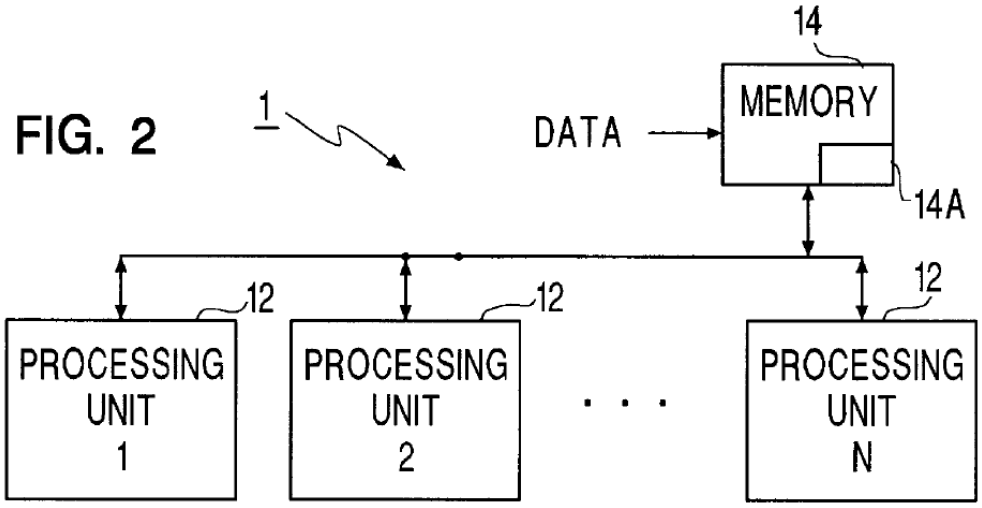

Figure 2 "is a block diagram of a multi-tasking computing system." Ex. 1001, 2:14–16. Unlike the prior art, each processing unit 12 "is self controlled using a software application running on its own operating system" and "there is no central management and/or control unit." *Id.* at 2:43–48. The one or more processing units 12 determine which tasks need to be performed and posts status information about the tasks on the bulletin board 14. *Id*. at 4:9–16. Additionally, each micro-processing unit 12 is capable of reading the tasks on the bulletin board and executing tasks that it is capable of performing. *Id*. at 3:6–18.

2. Analysis of Claims 1–14

Claim 1 recites, in relevant part, "*a central processing unit* ("CPU")" and "*a first solidarity cell* in electronic communication with the task pool, the first solidarity cell comprising a first agent configured to proactively retrieve, from the task pool, without requiring an instruction from the CPU, a matching task for the solidarity cell to process." Ex. 1001, 7:41–49. Claims 2–13 depend, directly or indirectly, from claim 1. *Id.* at 8:9–50. Independent claim 14 recites substantially the same limitations as recited above, and Petitioner relies on the same evidence and argument. *Id*. at 8:51–58; Pet. 81–82.

a) Petitioner's Arguments

Petitioner maps the claimed CPU to Leong's micro-processing units 12. Pet. 26–30, 37–41. For example, with regard to the CPU limitation, Petitioner states that "Leong discloses multiple processing units as standalone computers coupled over a standard network" and cites to Leong micro-processing units 12. Pet. 26 (citing Ex. 1005, 5:20–24, 8:34–43; Ex. 1003 ¶ 85); *see also* Ex. 1005, 5:20–24 (discussing micro-processing units 12), 8:34–43 (same). As another example, with regard to "a task pool in electronic communication with the CPU" limitation, Petitioner describes how the bulletin board—which Petitioner maps to the task pool—is in communication with Leong's processing units 12. Pet. 29–30 (citing Ex. 1005, 3:11–15; Ex. 1003 ¶ 93); *see also* Ex. 1005, 3:11–15 (describing how micro-processing units 12 read the tasks posted to the bulletin board). Similarly, with regard to "the CPU populates the task pool" limitation, Petitioner describes how Leong's micro processing units 12 "determine which tasks need to be performed to accomplish the overall project, define the status information for each task, and post the status information to the

bulletin board." Pet. 38 (referring back to arguments regarding the CPU and task pool limitations discussed above).

Petitioner also maps Leong's micro-processing units 12 to the "first solidarity cell." Pet. 30–37. Specifically, Petitioner states that "Leong's processing units are disclosures of solidarity cells." *Id.* at 30. Petitioner also identifies specific portions of Leong that discuss micro-processing 12. *See id*. at 31–32 citing (2:43–48, 3:6–18, 3:26–30, 4:18–35, 5:29–35, 5:66–6:6, 6:47–61, 7:34–50).

b) Patent Owner's Argument

Patent Owner argues that claim 1 recites "the distinct and separate elements of 'a Central Processing Unit ("CPU")' and 'a first solidarity cell.'" Prelim. Resp. 40. Patent Owner further argues that the Petitioner identifies Leong micro-processing units 12 as teaching both elements: "Early on, the Petition takes the position that Leong's 'processing units' correspond to the 'Central Processing Unit' of claim 1. (*See* Pet. 26-27). Later, the Petition takes the position that 'Leong's processing units are disclosures of solidarity cells.'" (*See* Pet. 31)." Prelim. Resp. 40. According to Patent Owner, "[t]he aforementioned positions are clearly contradictory as Leong's processing units simply cannot simultaneously act as the 'Central Processing Unit' and as 'solidarity cells' which 'don't require instruction from the CPU.'" *Id*.

c) Our Analysis

Based on the current record and how Petitioner argues Leong teaches the relevant limitations, we are not sufficiently persuaded that Leong teaches both a "central processing unit" and a separate "first solidarity cell" as recited in claims 1 and 14.

Claims 1 and 14 each list three separate elements: (1) a CPU, (2) a task pool, and (3) a first solidarity cell. Ex. 1001, 7:41–49, 8:51–59. "Where a claim lists elements separately, 'the clear implication of the claim language' is that those elements are 'distinct component[s]' of the patented invention.'" *Becton Dickinson & Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) (quoting *Gaus v. Conair Corp.*, 363 F.3d 1284, 1288 (Fed. Cir. 2004); *Engel Indus., Inc. v. Lockformer Co.*, 96 F.3d 1398, 1404–05 (Fed. Cir. 1996) (concluding that where a claim provides for two separate elements, a "second portion" and a "return portion," these two elements "logically cannot be one and the same"). There is nothing in the asserted claims to suggest that the CPU and the first solidarity cell can be the same structure. *See CAE Screenplates, Inc. v. Heinrich Fiedler GmbH & Co.*, 224 F.3d 1308, 1317 (Fed.Cir.2000) ("In the absence of any evidence to the contrary, we must presume that the use of . . . different terms in the claims connotes different meanings.").

Moreover, the specification of the '777 patent confirms that the CPU and the first solidarity cell are two separate elements. Figure 1 of the '777 patent shows CPU 11 as a distinct and separate element from solidarity cells 12A . . . n. Moreover, there is nothing in the specification to indicate that a solidarity cell can be used to populate the task pool by dividing the requirement into one or more threads and placing the threads in the task pool. *See* Ex. 1001, 4:21–28. In short, the specification comports with the plain language of the claims, fully supporting the conclusion that the CPU and the first solidarity cell are separate structural components of the patented invention. *See Astrazeneca AB v. Mut. Pharm. Co.*, 384 F.3d 1333, 1336 (Fed.Cir.2004) ("A long line of cases indicates that evidence intrinsic to the patent—particularly the patent's specification, including the inventors'

statutorily-required written description of the invention—is the primary source for determining claim meaning."); *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed.Cir.1996) (The specification is "is the single best guide to the meaning of a disputed [claim] term.").

Because Petitioner relies on a single structural component—Leong's micro-processing units 12A . . .n—to teach two different structural limitations of claims 1 and 14—the CPU and the first solidarity cell—based on the current record, Petitioner has not sufficiently shown how Leong teaches both of those limitations. Accordingly, Petitioner has not shown a reasonable likelihood of showing that claims 1 and 14 are unpatentable based on Leong.

Similarly, because claims 2–13 depend directly or indirectly from claim 1, Petitioner has not shown a reasonable likelihood of showing that claims 2–13 are unpatentable based on Leong. *See In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992) ("[D]ependent claims are nonobvious if the independent claims from which they depend are nonobvious.").

E. Asserted Obviousness in View of Leong and Ethernet Specification

Petitioner argues that claims 1–14 would have been obvious over Leong and Ethernet Specification. *See* Pet. 84–87. Based on the current record, we are not sufficiently persuaded that Petitioner has established a reasonable likelihood of prevailing on this asserted obviousness ground with respect to any of claims 1 through 14.

1. Ethernet Specification

Ethernet Specification "contains the specification of the Ethernet, a local area network." Ex. 1006, i. Ethernet Specification "is intended as a design reference document, rather than an introduction or tutorial." *Id*.

Relevant to Petitioner's argument, chapter 6 provides the "Ethernet Data Link Layer Specification." Ex. 1006, 19–44. Figure 6-1 is reproduced below.

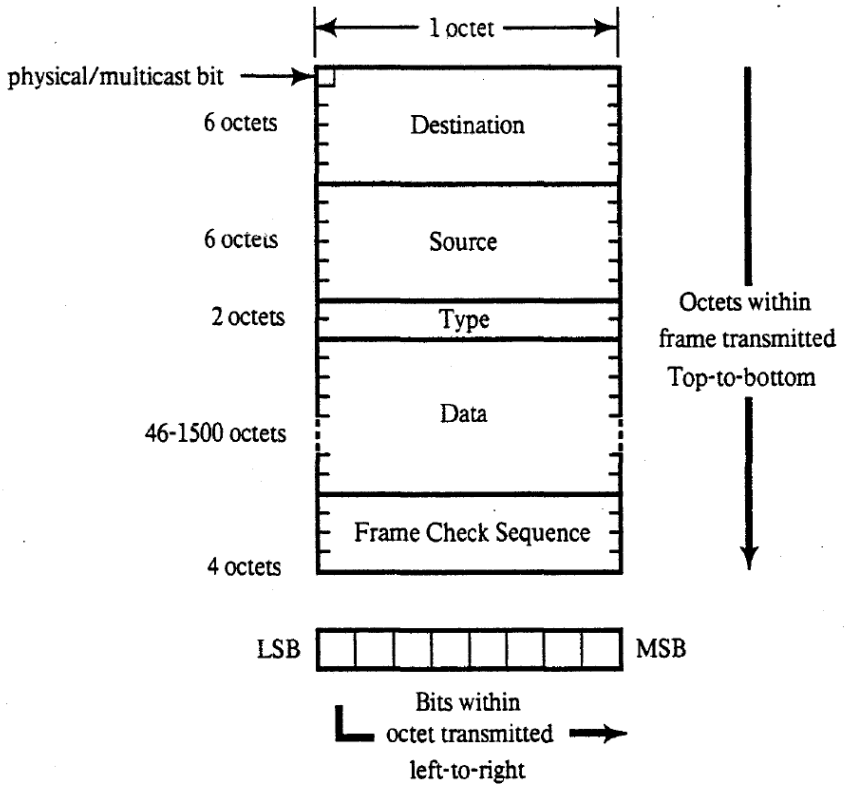

Figure 6-1: Data Link Layer Frame Format

Ex. 1006, 20. Figure 6-1 depicts a "Data Link Frame Format" which includes a destination, source, type, data, and frame check sequence. *Id.*

2. Analysis of Claims 1–14

Petitioner argues that, in the event Leong does not teach some of the limitations relating to the claimed "agent," Ethernet Specification teaches those limitations:

> [O]ne may argue Leong lacks an express disclosure of the agent being a data frame comprising a source address, a destination address, and a payload, as set forth in claim element 1.7 (and claim element 14.6), and/or the specific values set in each of those data frame fields, as set forth in elements 1.8 and 1.10 (and claim elements 14.6, 14.7, 14.9). But as evidenced by the prior

> art, this would have been obvious to a [person of ordinary skill in the art].

Pet. 85 (footnotes omitted). For all other limitations, including the "CPU" and "first solidarity cell," Petitioner continues to rely on Leong. *See* Pet. 84–87.

For the same reasons discussed above when addressing the obviousness ground based on Leong alone, Petitioner has not shown a reasonable likelihood of showing that claims 1 through 14 are unpatentable based on Leong and Ethernet Specification.

F. Asserted Obviousness in View of (1) Leong and Bates and (2) Leong, Ethernet Specification, and Bates

Petitioner argues that claim 2 would have been obvious over (1) Leong and Bates and (2) Leong, Ethernet Specification, and Bates. *See* Pet. 87–92. Based on the current record, we are not sufficiently persuaded that Petitioner has established a reasonable likelihood of prevailing on either asserted obviousness ground with respect to claim 2.

1. Bates

Bates is titled "SPU [synergistic processing units] Task Manager for Cell Processor" and is generally directed "to parallel processing and more particularly to managing tasks in cell processors." Ex. 1007, code (54), ¶ 6.

Bates teaches a "[c]ell processor task management in a cell processor having a main memory, one or more power processor units (PPU) and one or more synergistic processing units (SPU), each SPU having a processor and a local memory is described." Ex. 1007, code (57). Both the PPU and SPU can add tasks to the task queue. *Id.* ¶ 36. The SPUs can automatically get more tasks whenever they run out. *Id.* ¶ 42.

2. Analysis of Claim 2

Petitioner relies on Bates to teach the additional limitation recited in claim 2. Pet. 87–92. Petitioner does not argue that Bates cures the deficiency identified above with regard to Leong alone or in combination with the Ethernet Specification. *See id*.

Because claim 2 depends from claim 1, Petitioner has not shown a reasonable likelihood of showing that claim 2 is unpatentable based on (1) Leong and Bates or (2) Leong, Ethernet Specification and Bates. *See Fritch*, 972 F.2d at 1266.

CONCLUSION

For the foregoing reasons, we determine that Petitioner fails to show a reasonable likelihood that it would prevail with respect to at least one of the claims challenged in the Petition. We, therefore, do not institute an *inter partes* review of the challenged claims based on the Petition.

ORDER

In consideration of the foregoing, it is hereby:

ORDERED that no *inter partes* review is instituted as to any claim of the ’777 patent.

FOR PETITIONER:

Joseph F. Edell
Kyle K. Tsui
FISCH SIGLER LLP
Joe.Edell.IPR@fischllp.com
kyle.tsui@fischllp.com

FOR PATENT OWNER:

Daniel Pote
JENNINGS STROUSS & SALMON PLC
p@jsslaw.com

Michael K. Kelly
BEUS GILBERT MCGRODER PLLC
mkelly@beusgilbert.com