UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

JUNIPER NETWORKS, INC.,
Petitioner,

v.

SWARM TECHNOLOGY, LLC,
Patent Owner.

Case: IPR2021-01445
U.S. Patent No. 9,852,004

PATENT OWNER RESPONSE UNDER 37 C.F.R. § 42.120

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EXHIBIT LIST[1]

Exhibit	Description
2007	Declaration of Dr. Brent E. Nelson ("Nelson")
2008	Curriculum vitae of Dr. Brent E. Nelson
2009	Wendi A. Maloney, *Reopening of Exhibitions Attracts Thousands*, 32 THE LIBRARY OF CONG. GAZETTE 1, 1, 6-7 (2021).
2010	Transcript of the Deposition of Dr. Jon B. Weissman
2011	Transcript of the Deposition of Dr. Sylvia D. Hall-Ellis
2012	Tilak Agerwala, Jamshed H. Mirza & Marc Snir, Designing a Scalable Parallel System: the IBM SP2, in HIGH PERFORMANCE COMPUTING: TECHNOLOGY, METHODS AND APPLICATIONS 133, 133-156 (J.J. Dongarra, et al., eds., 1995).

[1] Aside from exhibits that are patents, declarations, or deposition transcripts, citations are to the footer allocated on the bottom-right of each page.

Pursuant to 37 C.F.R. § 42.120, Patent Owner Swarm Technology, LLC ("Patent Owner") hereby files its Response to the Petition in IPR2021-01445 requesting *inter partes* review of claims 1-12 of U.S. Pat. No. 9,852,004 ("the '004 Patent") (Exhibit 1001). This Response is timely filed according to the Scheduling Order set forth in Paper 16 at 11 (PTAB, March 2, 2022).

I. INTRODUCTION

The patentability of claims 1-12 of the '004 Patent should be confirmed. As shown below, and as supported by the Declaration of Dr. Brent Nelson (Exhibit 2007, "Nelson"), Petitioner has failed to show by a preponderance of evidence that any claim of the '004 Patent is unpatentable under 35 U.S.C. § 103.

Specifically, Petitioner has failed to show that the cited references teach or suggest, *inter alia*, the claimed:

i) "controller configured to populate the task pool with a plurality of first tasks and a plurality of second tasks"

ii) "co-processor configured to … retrieve a first task from the task pool; deliver the first task to the first co-processor"

iii) dynamic addition of co-processors "on a plug-and-play basis without any communication with the controller"

iv) co-processor including an agent "configured to search the task pool for a task of a first type"

v) agent comprising a first payload including "a first function which the first co-processor is configured to perform"

vi) agent comprising a first payload including "a descriptor of the first task;"

vii) co-processor "configured to modify a task within the task pool"

viii) task pool "configured to notify the controller upon completion of the first task."

ix) co-processor "configured to deposit a new task into the task pool."

Furthermore, Petitioner has failed to show that a person of ordinary skill in the art (POSITA) would have been motivated to modify Leong to include the teachings of AppleTalk as suggested by Petitioner, or that such a combination would have a reasonable expectation of success.

II. THE '004 PATENT

A. Overview of the '004 Patent

Alfonso Íñiguez is the sole inventor of U.S. Patent No. 9,852,004 titled "System and Method for Parallel Processing Using Dynamically Configurable Proactive Co-Processing Cells" ("the '004 Patent"). Prior to Mr. Íñiguez' invention, conventional multiprocessor systems included a central processing unit (a controller), and one or more co-processors (responders). Under the conventional "controller/responder" paradigm, the controller partitions the system's computational requirements into tasks and distributes those tasks to the co-

processors. Completed tasks, or threads of tasks, are reported to the controller, which continues to distribute additional tasks, or threads of tasks, to the co-processors as needed.[2] Such parallel processing architectures are disadvantageous in that "a significant amount of CPU bandwidth is consumed by task distribution; waiting for tasks to be completed before distributing new tasks (often with dependencies on previous tasks); responding to interrupts from co-processors when a task is completed; and responding to other messages from co-processors. In addition, co-processors often remain idle while waiting for a new task from the CPU."[3]

The '004 Patent describes novel and nonobvious parallel processing computing architectures that reduce CPU management overhead and more effectively exploit co-processing resources. This architecture includes, among other things, a controller, a task pool and one or more co-processors.[4] The controller is configured to divide a large computational task into a group of tasks, or task threads, and populate a task pool with a set of first tasks and a set of second tasks.[5] The task threads can represent a computational task that is a component or subset of a larger

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[2] *See* '004 Patent, 1:56-59.

[3] *Id.* 1:61-2:3.

[4] *See id.* Abstract; *see also* 1:14-18.

[5] *See id*. 6:39-42.

aggregate computational requirement imposed on the CPU.[6] The tasks, or threads, can include a task type and a descriptor.[7] The task type indicates which co-processors are capable of performing the task.[8] The descriptor can comprise a data structure that defines, among other things, the executable task instruction(s) and the location of the data to be processed.[9]

The plurality of first tasks can be performed by certain co-processors that are capable of performing first task types. The second plurality of tasks can be performed by certain co-processors that are capable of performing second task types.[10] The co-processors are configured to autonomously retrieve, deliver, and complete a suitable task from the task pool. Each co-processor is proactive in that it may interact with the task pool without being instructed to do so by the controller or the task pool.[11] Additional devices and their associated co-processors may be

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[6] *Id.*, 7:8-12.

[7] *Id.*, 7:12-16.

[8] *Id.*, 7:16-17.

[9] *Id.*, 7:37-58 and 9:32-46.

[10] *Id.*, 6:42-44.

[11] *Id.*, 2:36-40.

dynamically accepted into the processing system on a "plug and play" basis without communication with the controller.[12]

Fig. 6 of the '004 Patent (reproduced below) is representative of the operation of the parallel computing architecture described by the '004 Patent.

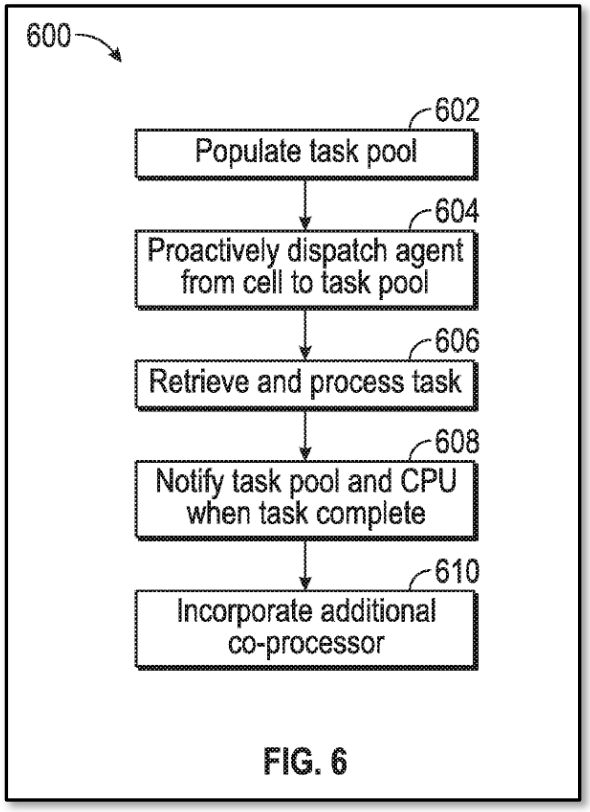

FIG. 6

As shown in Fig. 6, a controller populates the task pool with previously parsed tasks or threads (602). Each co-processor proactively dispatches an agent to the task pool to identify a particular task suitable for that co-processor (604). Each co-processor retrieves and processes a task and does so without communication with

[12] *Id*. 3:40-42.

the CPU (606). The task pool and controller are separately notified when the task is complete (608). Additional co-processor(s) can be dynamically recruited into the system as needed.[13]

B. Prosecution History

The '004 Patent was filed on July 24, 2014 and is a continuation of U.S. Application No. 13/750,696 filed on January 25, 2013, now U.S. Patent 9,146,777 ("the '777 Patent"). The '004 and '777 Patents were each examined by Examiner Wissam Rashid. The '777 Patent received its first office action on March 11, 2015 and was subsequently allowed by Examiner Rashid on June 29, 2015. Examiner Rashid then turned his attention to U.S. Application No. 14/340,322 (which became the '004 Patent) and issued a first office action rejection on November 30, 2016. Over the following year, the '004 Patent was rigorously examined by Examiner Rashid. After three rounds of rejection, argument and amendment, Examiner Rashid issued a notice of allowance of the '004 Patent on November 16, 2017.

C. Claim Construction

In an IPR, claims are construed using the same claim construction standard as is used in the federal courts. S*ee* 37 C.F.R. § 42.100(b). Patent Owner submits that all claim terms of the '004 Patent should be given their ordinary and customary

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[13] *Id.*, 12:25-34.

meaning as understood by one of ordinary skill in the art in light of the specification and '004 Patent file history.

In view of the positions advanced by the Petition, the Declaration of Dr. Jon B. Weissman (Dr. Weissman), and the deposition testimony of Dr. Weissman, Patent Owner now understands that Petitioner and Patent Owner apparently dispute the "ordinary and customary" meaning of the following claim terms: i) a controller ii) a task pool, iii) a task, iv) a first task, v) retrieve, vi) deliver, vii) dynamically accept, viii) plug and play basis, ix) without communication, x) descriptor, and xi) notify.

III. LEVEL OF ORDINARY SKILL IN THE ART

For purposes of the '004 Patent claims, a POSITA would have held at least 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 or distributed processing systems.

Alternatively, a POSITA 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.

IV. THE DECLARATION OF DR. SYLVIA D. HALL-ELLIS AND APPLETALK SHOULD BE ACCORDED LIMITED WEIGHT

Similar to district courts in a bench trial, "the Board, sitting as a non-jury tribunal with administrative expertise, is well positioned to determine and assign appropriate weight to evidence presented."[14]

Sylvia D. Hall-Ellis, Ph.D. was hired by Petitioner to provide expert testimony regarding the "public availability and authenticity of [Exhibit 1006]."[15] Patent Owner respectfully submits that Dr. Hall-Ellis's testimony regarding the public availability and authenticity of Exhibit 1006 ("AppleTalk PDF") should be given limited weight by the Board because Dr. Hall-Ellis failed to: (i) base her testimony on sufficient facts or data, (ii) provide testimony that was the product of reliable principles and methods, and (iii) reliably apply those principles and methods to the facts of this case.

Furthermore, as a consequence of Dr. Hall-Ellis's failure to properly authenticate the AppleTalk PDF, Patent Owner respectfully submits that the AppleTalk PDF should also be given limited (or no) weight by the Board.

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[14] *Corning Inc. v. DSM IP Assets B.V.*, IPR2013- 00053, Paper 66 at 19 (PTAB May 1, 2014). *See, e.g.*, *Donnelly Garment Co. v. NLRB*, 123 F.2d 215, 224 (8th Cir. 1941) ("One who is capable of ruling accurately upon the admissibility of evidence is equally capable of sifting it accurately after it has been received ….").

[15] *See* Ex. 1018 at 2 ("Hall-Ellis Declaration").

Evidentiary matters in *inter partes* reviews are generally governed by the Federal Rules of Evidence.[16] Under Fed. R. Evid. 901(a), in order to properly authenticate an item of evidence, "the proponent must produce evidence sufficient to support a finding that the item is what the proponent claims it is." Fed. R. Evid. 901(b) provides various exemplary methods of satisfying the authentication requirement, including "[a] comparison with an authenticated specimen by an expert witness …."[17]

Under Fed. R. Evid. 702, it is incumbent on the expert to base their testimony on "sufficient facts or data;" Rule 702 also requires that the expert's testimony be "the product of reliable principles and methods." Lastly, Rule 702 requires that the expert "reliably appl[y] the principles and methods to the facts of the case."

During her deposition, Dr. Hall-Ellis admitted that she downloaded the AppleTalk PDF from a website known as VintageApple.org,[18], but could not recall when she downloaded the AppleTalk PDF.[19] Dr. Hall-Ellis's Declaration states that

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[16] *See* Patent Trial and Appeal Board Consolidated Trial Practice Guide dated November 2019 at 8 ("PTAB Trial Guide").

[17] Fed. R. Evid. 901(b)(3).

[18] Ex. 2011 at 20:3-7.

[19] *Id* at 20:3-19.

she last accessed the website on August 17, 2021.[20] Her Declaration further states that the web address, https://vintageapple.org/macbooks/, indicates that "it created this PDF file on October 29, 2016."[21] However, other than her statement that she last accessed the website on August 17, 2021, Dr. Hall-Ellis provides no evidence regarding the actual date on which the AppleTalk PDF became publicly available, either via the website VintageApple.org or otherwise. Digital archiving websites, like the Internet Archive, indicate that the AppleTalk PDF was publicly posted sometime between February 3rd, 2019[22] and August 14th, 2019.[23]

Even assuming, *arguendo*, that the AppleTalk PDF was publicly available as early as its purported creation date, October 29, 2016, it would not qualify as a reference under 35 U.S.C. §102(b) because its public availability post-dates both the filing and priority dates of the '004 Patent.

In her Declaration, Dr. Hall-Ellis provides evidence to show that a publication titled "Hands-on AppleTalk" was publicly available at the Library of Congress as of

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[20] Ex. 1018 at 24.

[21] Ex. 1018 at 24 n. 38.

[22] *See* https://web.archive.org/web/20190203005320/http://vintageapple.org/macbooks/ (showing no AppleTalk PDF available on 02/03/2019).

[23] *See* https://web.archive.org/web/20190814134932/https://vintageapple.org/macbooks/ (showing AppleTalk PDF available on 08/14/2019).

June 23, 1989. However, Dr. Hall-Ellis fails to establish that the AppleTalk PDF is an authentic copy of the publication apparently accessible at the Library of Congress.

Section III.A of the Hall-Ellis Declaration outlines the legal standards upon which Dr. Hall-Ellis formed her opinions. Notably, Dr. Hall-Ellis does not identify any principles or methods in Section III.A for determining authenticity. When asked whether legal standards informed her review of the evidence and formation of her opinions, Dr. Hall-Ellis stated, "I would say no. I would say no."[24] When questioned on how she would know if a document was not authentic, Dr. Hall-Ellis stated, "there would be something that didn't feel right, something that didn't look right, something didn't appear in a way that it should be. You have to remember, I've been a librarian for many, many, many, many years, and there are some intuitive aspects of the work. I also have looked at thousands of documents."[25]

Respectfully, Dr. Hall-Ellis's mere "intuition" and "feel" are neither reliable nor appropriate principles or methods for authenticating a document. A legally cognizable method of authenticating the AppleTalk PDF would be to compare the AppleTalk PDF with an authenticated specimen of Hands-on AppleTalk.[26] In fact,

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[24] Ex. 2011 at 28:11-14.

[25] Ex. 2011 at 29:1-11.

[26] *See* Fed. R. Evid. 901(b)(3).

Dr. Hall-Ellis's Declaration states her "typical practice [is] to obtain a paper copy of each publication to further confirm [her] opinions …."[27]

However, Dr. Hall-Ellis provided no explanation for why she did not obtain an authenticated specimen of Hands-on AppleTalk for comparison to the AppleTalk PDF. In fact, Dr. Hall-Ellis admits that she has never seen a physical copy of Hands-on AppleTalk.[28] She made no attempt to visit any library that had a physical copy of Hands-on AppleTalk.[29] Dr. Hall-Ellis did not recall making any attempts to purchase the book.[30]

The only reason advanced by Dr. Hall-Ellis for not obtaining an authentic specimen of Hands-on AppleTalk was that "[a]s of the preparation and signing of this declaration, libraries across the nation are closed pursuant to an order of the federal and state governments due to the COVID-19 virus."[31] But this statement is misleading. Dr. Hall-Ellis signed her declaration on August 23, 2021.[32] Dr. Hall-Ellis visited the Library of Congress website on August 16, 2021 to prepare the

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[27] Ex. 1018 at ¶4.

[28] Ex. 2011 at 51:10-12.

[29] Ex. 2011 at 24:10-12.

[30] Ex. 2011 at 24:16-19.

[31] Ex. 1018 at ¶4.

[32] Ex. 1018 at ¶54.

attachments to her Declaration.[33] At the time of her preparation and signing of the declaration, the Library of Congress had in fact been open to the public for more than a month.[34] Even without personally visiting the Library of Congress, Dr. Hall-Ellis suggested that she likely could have obtained a physical specimen of the Hands-on AppleTalk via inter-library loan programs, had she attempted to do so.[35]

Thus, without an authentic specimen to compare the AppleTalk PDF to, Dr. Hall-Ellis resorted to her reliance on "intuition" and "feel." Dr. Hall-Ellis stated that the AppleTalk PDF was "created by Vintage Apple who preserves texts in a condition that creates no suspicion about its authenticity."[36] However, Dr. Hall-Ellis made no attempt to validate or even identify the creator of the AppleTalk PDF.[37] Dr.

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[33] Ex. 1018 at 81-82 and 86-87 (date of 8/16/2021 shown in upper left-hand corner of Library of Congress website screenshots).

[34] Wendi A. Maloney, *Reopening of Exhibitions Attracts Thousands*, 32 THE LIBRARY OF CONG. GAZETTE 1, 1, 6-7 (2021) (Ex. 2009, noting that "[t]he Library's doors swung fully open this month …. Some 2,100 visitors came during a three-day soft opening early in July. Then, on July 15-17, when the Library's major exhibitions opened for the first time since March 2020, another 2,900 ticketed visitors poured in, and it almost seemed like old times again").

[35] Ex. 2011 at 72:9 - 73:21.

[36] Ex. 1018 at ¶48.

[37] Ex. 2011 at 31:1-4.

Hall-Ellis made no attempt to contact VintageApple.org to discern the provenance of the AppleTalk PDF.[38] Dr. Hall-Ellis could not recall whether she reviewed the PDF file's metadata to verify its creation date.[39]

With respect to the AppleTalk PDF, Dr. Hall-Ellis states in her Declaration that "[t]he text is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; and, there are no visible alterations to the document." However, during her deposition, Dr. Hall-Ellis stated that she did not know if there were any pages added to the AppleTalk PDF.[40] A cursory review of the AppleTalk PDF reveals that the PDF includes two distinct scans of what appear to be the book's cover. These two book covers can be seen on page 1 and page 2 of the AppleTalk PDF (Exhibit 1006). Dr. Hall-Ellis said nothing about this alteration to the document in her Declaration. When asked during her deposition whether she believed that the authentic specimen at the Library of Congress also had two covers, Dr. Hall-Ellis stated that she did not know.[41] Nor could she know because she never located or compared an authentic specimen of Hands-on AppleTalk with the AppleTalk PDF.

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[38] Ex. 2011 at 31:21-25.

[39] Ex. 2011 at 48:24 - 49:3.

[40] Ex. 2011 at 51:1-2.

[41] Ex. 2011 at 63:15-18.

The Federal Circuit has stated that "[a]uthentication by comparison is routine."[42] Dr. Hall-Ellis's failure to make any attempt to locate and compare an authentic specimen of Hands-on AppleTalk with the AppleTalk PDF undermines the credibility of her testimony. Dr. Hall-Ellis's reliance on "feel" and "intuition" prevented her from identifying even conspicuous alterations to the AppleTalk PDF. As a result, her testimony is not the product of reliable principles and methods. In view of the above, Patent Owner respectfully submits that the Declaration of Dr. Hall-Ellis, and the non-authenticated AppleTalk PDF to which the Declaration is directed, be accorded limited weight by this Board.

V. THE DECLARATION OF DR. JON B. WEISSMAN SHOULD BE ACCORDED LIMITED WEIGHT

The Petition relies heavily on the Declaration of Dr. Jon B. Weissman (Ex.1003, "Weissman") to support its characterizations and modifications of the prior art, as well as its legal analyses and conclusions. As detailed below, Dr. Weissman selectively embellishes, augments, and mischaracterizes the references to support Petitioner's hindsight invalidity narrative. Furthermore, Dr. Weissman misunderstands or misapplies fundamental patent law principles in his analyses. Just as Dr. Weissman's declaration should be accorded little weight, so too should those portions of the Petition which rely on Dr. Weissman be accorded little weight.

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[42] *Valve Corp. v. Ironburg Inventions Ltd.*, 8 F.4th 1364, 1371 (Fed. Cir. 2021).

By way of non-limiting example, Petitioner's argument that Leong's task status information is somehow tantamount to or co-extensive with the underlying tasks is unsupported by the plain language of Leong. Petitioner therefore attempts to redefine Leong under the guise of an "annotation" to Leong's FIG. 6 (discussed in greater detail below). This tactic is particularly troubling because this Board's Institution Decision specifically relies on the contrived equivalence between tasks and task status information advanced by Petitioner.[43]

During his deposition, Dr. Weissman was asked whether the aforementioned annotation – and specifically the phrase "Posts Tasks to the Task Pool" – was written by him, or whether it was written by someone else and adopted by him.[44] After repeatedly refusing to answer the question, Petitioner's counsel formally instructed him not to answer.[45] Consequently, it remains unclear whether Dr. Weissman's expert opinions are based on his own analyses, or whether he "adopted" the building blocks underlying his opinions from someone else.

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[43] Paper 15 at 25 ("[a]ccording to Petitioner, the surveying unit posts the plurality of tasks to the bulletin board," citing the Pet. at 26 – 28).

[44] Ex. 2010 at 159:5-19; 161:3-11.

[45] Ex. 2010 at 160:8-18.

By way of further example, Dr. Weissman states in his Declaration that "a POSITA would have found that Leong in view of AppleTalkBook renders obvious, either expressly or inherently, each and every element of the Challenged Claims."[46]

While U.S. patent law and jurisprudence recognize that a particular disclosure or teaching in a reference can be either express or inherent, that same jurisprudence does not recognize the notion that a claim element can be expressly or inherently *obvious*. Dr. Weissman conflates his subjective understanding of obviousness with legal obviousness under 35 U.S.C. § 103. Consequently, Dr. Weissman's expert opinion that individual claim elements are expressly or inherently obvious reveals a fundamental misunderstanding of foundational invalidity principles. Dr. Weissman's failure to appreciate the legal significance of obviousness in this context casts a shadow over every recitation of the word "obvious" by Dr. Weissman.

In a surprising revelation during his deposition, Dr. Weissman announced a new opinion, not found in his declaration, that every element and sub-element of claim 1 of the '004 Patent are taught expressly by Leong without the need to combine Leong with any other reference.[47] Dr. Weissman's position cannot be reconciled

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[46] Ex. 1003 at ¶73.

[47] *See* Ex. 2010, 228:20 – 231:17; and 241:19-25.

with his earlier Declaration, and his willingness to overstate his opinions compromises the integrity of his Declaration.

Patent Owner respectfully submits that Dr. Weissman's tendency to employ hyperbole to support his opinions, his cavalier approach to "annotating" the prior art by fiat, coupled with his limited facility with basic invalidity principles, compels this Board to accord limited weight to the entirety of Dr. Weissman's Declaration.

VI. JUNIPER'S GROUNDS FAIL TO RENDER CLAIMS 1-12 OBVIOUS

A. None of the cited references teach or suggest "a controller configured to populate the task pool with a plurality of first tasks and a plurality of second tasks"

Every claim of the '004 Patent recites, expressly or by incorporation, "a controller configured to populate the task pool with a plurality of first tasks and a plurality of second tasks …."[48] When this limitation is viewed in the context of the '004 Patent specification, it is clear that Leong's surveying units do not teach or suggest the claimed controller because, *inter alia*: i) they do not divide a large computational task into smaller groups of tasks, and ii) they post "task status information" (as opposed to "tasks") to the bulletin board.

[48] '004 Patent, 14:12-13, 44-45.

1. Leong's surveying units do not teach the claimed controller because they do not divide a large computational task into smaller tasks

The '004 Patent states that the controller "divides an aggregate computational problem into a group of tasks, and populate[s] the task pool 13 with a first type, a second type, and a third type of tasks. A first cell 12A may [be] capable of performing only tasks of the first type; a second cell 12B may be capable of perform[ing] tasks of the second type; a third cell 12C may be capable of performing tasks of the third type; a fourth cell 12D may be capable of performing tasks of the second or third types; and a fifth cell 12N may be capable of performing all three task types."[49]

Dr. Weissman corroborates this description of the '004 Patent's controller. Specifically, Dr. Weissman declares "[t]he apparatus's controller (also referred to as 'CPU' in the '004 Patent) first divides an aggregated computational problem into groups of tasks and populates a task pool."[50] When asked about this statement during his deposition, Dr. Weissman confirmed that the '004 Patent's controller must perform both steps of dividing tasks and populating the tasks to the task pool.[51]

Both the Petition and Dr. Weissman's Declaration allege that Leong's

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[49] '004 Patent, 6:40-48.

[50] Ex. 1003 at ¶31.

[51] *See* Ex. 2010, 190:6-20.

surveying units "divide a computing requirement into tasks and populate those tasks to the bulletin board."[52] And both documents string cite to the identical five textual passages and three figures of Leong to support that assertion.[53] A thorough review of each of these citations, however, confirms that Leong's surveying units do not divide an aggregated computational problem into groups of tasks.

Rather, Leong teaches that the surveying units 'survey' the queue in memory "to determine whether new data has arrived. When new data has arrived in the memory 14, the surveying agents 12 *determine what task(s)* need to be performed on the data and *define the status information for those tasks*. The surveying agents 12 *then post the status information* for the tasks on the bulletin board 14a."[54]

A POSITA would not understand Leong to teach or suggest "divid[ing] a computing requirement into tasks and populat[ing] those tasks to the bulletin board" as Petitioner claims.[55] Leong's determination of tasks is qualitatively different than partitioning a large computing requirement into groups of tasks. A POSITA reading Leong would understand that Leong's method of determining tasks is simply a look-

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[52] Pet. at 20; Ex. 1003, ¶71.

[53] *See* Pet. at 20; Ex. 1003 at ¶71 (both Petition and Weissman Declaration cite to Leong, 3:9-11, 3:19-25, 4:9-24, 6:16-46, 8:65-9:4, FIGS. 3, 5, 6).

[54] Leong 4:9-16.

[55] *See* Nelson at ¶114.

up procedure followed by the formulation of status information based on the newly arrived data.[56] Leong describes this look-up procedure in further detail:"[t]he accepting agents 12 (as well as other agents described below) *use customer profiles and account profiles to determine what tasks* must be posted and *formulate the status information* for the tasks."[57] A POSITA reading Leong would understand that the surveying agents are simply looking up customer/account profiles to identify (or "determine") the tasks.[58] A POSITA would have understood that this look up action is unrelated to the notion of dividing an aggregate computational problem into groups of tasks.[59]

2. Leong's surveying units do not teach the claimed controller because they post "task status information" rather than "tasks"

According to the '004 Patent, each task, or task thread, "represents a computational task that is a component or subset of a larger aggregate computational requirement imposed on the CPU 11."[60] The tasks, or threads, can include "a task type and a descriptor."[61] The task type "indicates which cells are capable of

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[56] *See* Nelson at ¶114

[57] Leong, 9:1-4 (emphasis added).

[58] *See* Nelson at ¶115.

[59] *See* Nelson at ¶115.

[60] '004 Patent, 7:8-12.

[61] *Id.*, 7:15-16.

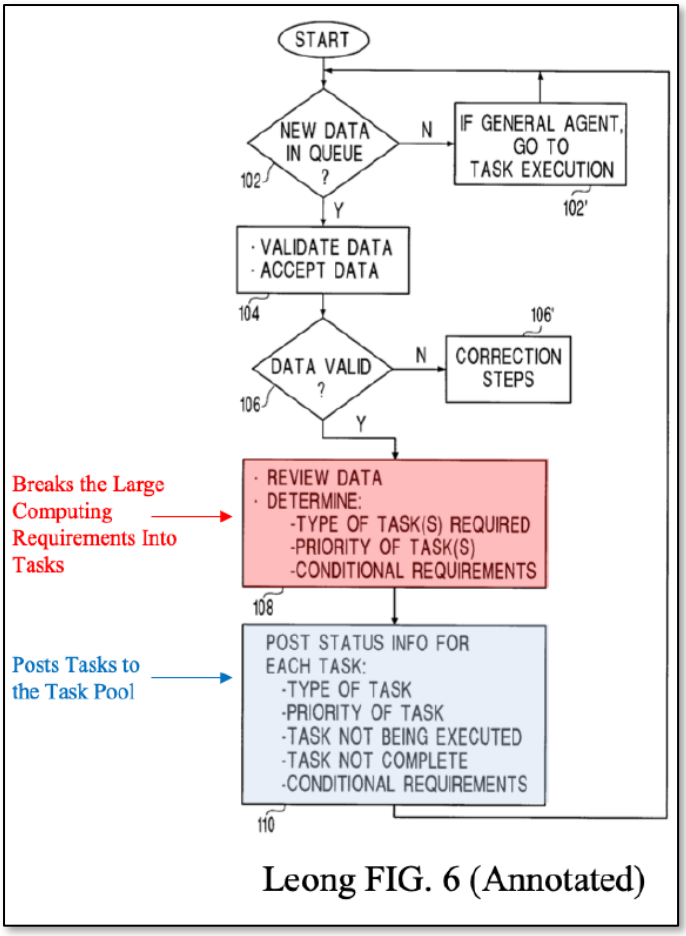
performing the task."[62] The descriptor comprises a data structure that defines, among other things, *the executable task instruction(s)* and the location of the data to be processed.[63]

Both the Petition and Dr. Weissman's Declaration allege that "Leong's surveying agents post a plurality of first and second tasks."[64] In support of this assertion Dr. Weissman and Petitioner propose an annotated version of Leong's FIG. 6 (shown below).

[62] *Id*., 7:16-17.

[63] *See id.*, 7:37-58 and 9:32-46.

[64] Pet. at 27; Ex. 1003 at ¶88.



Leong FIG. 6 (Annotated)

The annotations made by Petitioner go far beyond explaining the contents of the prior art; Petitioner actually changes the nature of the prior art and impermissibly offers Dr. Weissman's annotations as a substitute for the prior art itself. Petitioner took the liberty to insert the phrase "Posts Tasks to the Task Pool" next to box 110 of Fig. 6. It is worth noting that nowhere in Leong's specification does Leong refer to box 110 as "Posting Tasks" or "Posting Tasks to the Task Pool."

To the contrary, Leong's surveying units do not post "tasks" to the bulletin board; rather, Leong's surveying units post "task status information" to the bulletin board. Leong defines task status information as "includ[ing] (i) the type of task to

be executed; (ii) the priority of the task; (iii) that the task is being executed by one of the micro-processing units; (iv) that the task is complete; and/or (v) one or more conditions must be met before the task should be executed."[65] With regard to box 110 of Fig. 6, Leong does not support Petitioner's aggressive annotation. The figure unambiguously illustrates that only the "status info for each task" – as distinct from the actual tasks - is posted to the bulletin board.[66] The specification is equally straightforward: "the [t]ype, priority and conditions *as well as other status information* (i.e., 'task in progress' and 'task completion') is then posted on the bulletin board 14a at step 110."[67]

Leong further underscores the distinction between task status information and the tasks themselves by referring to the status information associated with each task "an *indication* of the type of task to be performed…."[68] In view of the '004 Patent's disclosure of tasks described earlier, a POSITA would not have understood Leong's task status information to be co-extensive with the "tasks" claimed in the '004 Patent.[69] In this regard, to the extent Leong uses to the shorthand terms TASK1

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[65] Leong, 3:20-25.

[66] Leong, Fig. 6.

[67] Leong, 6:42-46 (emphasis added).

[68] Leong, 3:26-27 (emphasis added).

[69] *See* Nelson at ¶120.

through TASKn to refer to the task status information in Leong's Fig. 3, a POSITA would have understood Leong's informal use of the word "tasks" in this context to refer only the "task status information" described by Leong and illustrated in Leong's Fig. 3.[70]

Petitioner does not argue that AppleTalk, Ethernet Standard, or Bates cure any of the above-described deficiencies in Leong. Thus, given that Leong does not teach or suggest "a controller configured to populate the task pool with a plurality of first tasks and a plurality of second tasks," Patent Owner respectfully submits that Petitioner's Grounds fail to render any of claims 1-12 of the '004 Patent unpatentable under 35 U.S.C. §103(a).

B. None of the cited references teach or suggest "a first co-processor configured to … retrieve a first task from the task pool; deliver the first task to the first co-processor"

Every claim of the '004 Patent recites, expressly or by incorporation, "a first co-processor configured to successively: retrieve a first task from the task pool; deliver the first task to the first co-processor …."[71] As described above in Section VI.A.2, Leong does not teach "tasks" posted to a bulletin board, but rather, teaches "task status information" posted to the bulletin board. For at least this reason, Leong

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[70] *See* Nelson at ¶122.

[71] '004 Patent, 14:14-15, 53-55.

does not and cannot teach a co-processor configured to retrieve a first task from the bulletin board and deliver it to a microprocessor.

Even assuming, *arguendo*, that Leong did disclose posting "tasks" to the bulletin board (it does not), Leong still fails to teach or suggest the claimed co-processors because: i) Leong's processing units do not *retrieve a first task* from the task pool, and *deliver the first task* to the first co-processor.

The '004 Patent states that the controller "divides an aggregate computational problem into a group of tasks, and populate[s] the task pool 13 with a first type, a second type, and a third type of tasks. A first cell 12A may [be] capable of performing only tasks of the first type; a second cell 12B may be capable of perform[ing] tasks of the second type; a third cell 12C may be capable of performing tasks of the third type; a fourth cell 12D may be capable of performing tasks of the second or third types; and a fifth cell 12N may be capable of performing all three task types."[72]

The '004 Patent's division and classification of tasks into a plurality of first tasks and a plurality of second tasks enables corresponding first and second co-processors to retrieve and deliver their respective tasks proactively. For example, the '004 Patent states that a cell (co-processor) "acquires a task from the task pool by

[72] '004 Patent, 6:40-48.

sending an agent 30 to interrogate (search for) the task pool and retrieve an available task 22 that requires completion, is not locked, and that has a task type that can be performed by the cell."[73] Furthermore, "[w]hen a matching task 22 is found, the agent 30A delivers the descriptor of the matching task 22 to the cell 12A …."[74]

In contrast to the '004 Patent's retrieval and delivery of a first task, Leong merely discloses processing units that "read the bulletin board"[75] and subsequently determine whether they are capable of performing one or more of the tasks based on the task status information read from the bulletin board.[76]

It is critically significant that Leong's bulletin board resides in memory.[77] There are no other embodiments of a bulletin board disclosed or taught by Leong. The only functions described in relation to Leong's bulletin board are its ability to be written to, and its ability to be read from. Thus, a POSITA would understand "reading the contents of the bulletin board" to mean that Leong's processing units read all of the contents (the task status information) into the processing unit's cache

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[73] '004 Patent, 8:24-28.

[74] '004 Patent, 9:35-36.

[75] *See* Leong, 3:26-30, 31-34, 48-54.

[76] Leong, 3:11-15.

[77] *See e.g.*, Leong Fig. 3 and Leong 3:9-11, describing information "posted on an electronic bulletin board 14a which may reside in the memory."

or local memory, and thereafter process the task status information to identify a task – if any – that the processing unit is capable of performing.[78] A POSITA would understand that the actual executable instructions associated with the task would be pre-loaded into the processor's local memory as described at Leong Column 5, lines 63 - 64.[79]

In sum, a POSITA would not understand Leong to teach co-processors that retrieve and deliver a first task from a task pool, but rather, a POSITA reading Leong would understand Leong to teach a processing unit that: i) reads the contents (task status information) of the bulletin board, ii) locally processes the task status information to identify tasks the processing unit is capable of performing, and iii) retrieve the executable task from local memory and execute the task.[80]

Petitioner does not argue that AppleTalk, Ethernet Standard, or Bates cure any of the above-described deficiencies in Leong. Thus, given that Leong does not teach or suggest "a first co-processor configured to … retrieve a first task from the task pool; deliver the first task to the first co-processor," Patent Owner respectfully submits that Petitioner's Grounds fail to render any of Claims 1-12 of the '004 Patent

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[78] *See* Nelson at ¶133.

[79] When asked, Dr. Weissman could not recall any embodiment in Leong where the task being retrieved included executable code. *See* Ex. 2010 at 80:9-12.

[80] *See* Nelson at ¶134.

unpatentable under 35 U.S.C. §103(a).

C. None of the cited references teach or suggest the dynamic addition of co-processors on a plug-and-play basis "without any communication with the controller"

Claims 1-12 of the '004 Patent each recite, expressly or by incorporation, the limitation that "the processing system is configured to dynamically accept the first co-processor, the second co-processor, and an additional co-processor into the processing system on a plug-and-play basis *without any communication with the controller* …."[81]

1. Leong does not teach accepting an "additional co-processor into the processing system"

The Petition asserts that Leong "contemplates changes in the number of processing units available to execute a given type of task."[82] The Petition also asserts that "Leong also discloses adding processing units when processing units switch their predispositions or return from idling."[83]

It is important to note, however, that the Petition does not cite a single instance, nor can it, where Leong *adds* a new processing unit into the system. Leong clearly admits that "if one or more micro-processing units 12 were to become

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[81] '004 Patent, 14:28-32, 61-65 (emphasis added).

[82] Pet. at 36

[83] Pet. at 36.

disconnected from the network or become incapable of performing tasks, the system 1 would not fail to manipulate the electronic data because other micro-processing units 12 would simply execute the posted tasks as designed (*although throughput may be affected*).[84] The only changes that Leong describes with regard to the number of processing units in Leong's system are in the form of reductions in the number of processing units.

2. AppleTalkBook does not teach "without any communication with the controller"

Contrary to Petitioner's stated position, AppleTalkBook does not teach, disclose, or suggest "dynamically accept[ing] the co-processor into the processing system on a plug-and-play basis without any communication with the controller." While it is understood that a reference "need not state a feature's absence in order to disclose a negative limitation,"[85] it is important to note that AppleTalkBook explicitly teaches a system that requires a newly added device to communicate with, and interrupt, all nodes on the network including any controller.

AppleTalkBook is a "practical guide for choosing, installing, and maintaining an AppleTalk local area network, or an AppleTalk LAN as a part of other networked

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[84] Leong, 5:29-35 (emphasis added).

[85] *AC Techs., S.A. v. Amazon.com, Inc.*, 912 F.3d 1358, 1367 (Fed. Cir. 2019).

environments."[86] According to the AppleTalkBook, an AppleTalk network comprises "cables, hardware, and software. The cables physically connect machines together. The hardware transmits and receives data to and from the cables and the attached devices. The software consists of two parts: *an implementation of the protocols (AppleTalk in this case)* and network applications chosen by the user."[87] AppleTalk also notes that "[t]he AppleTalk protocol stack is built into the Macintosh system software."[88]

Among the AppleTalk protocols touted by AppleTalkBook is "dynamic configuration."[89] According to AppleTalkBook, prior network protocols relied on "static configuration" with the disadvantage that "[b]efore the devices can communicate, an administrator is required to pick a unique node number, or address, for every device on the network and distribute that information around the Network. To a laser printer, they might assign node number 28."[90] AppleTalk, however, implemented "dynamic configuration" which granted each device "the ability to pick

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[86] Ex. 1006 at 15.

[87] *Id*. at 17 (emphasis added).

[88] *Id*. at 30.

[89] *Id*. at 104-110.

[90] *Id*.

its own unique network address."[91] While it is correct that the dynamic configuration of the AppleTalk protocol can occur "without a system administrator assigning an address for the [resource] and distributing it to the network,"[92] this does not mean that such dynamic configuration occurs "without any communication with the controller."

In order to implement the AppleTalk protocol and enable devices to set their own unique addresses (node numbers) and identify available resources on the AppleTalk network, the AppleTalk protocol employs a special packet of information known as the "broadcast packet." AppleTalkBook underscores that *"[t]he broadcast packet is critical* to the ease-of-use of AppleTalk; *it allows for simple configuration and reconfiguration of the network* without complicated administration tasks."[93]

Petitioner concedes the importance of broadcast packets, noting that "The AppleTalk network leverages each device's ability to identify its own address and transmit a broadcast packet to identify available services."[94] Petitioner fails, however, to mention that according to AppleTalk, "[a] broadcast packet doesn't

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[91] *Id.* at 105.

[92] *Id.* at 108-09.

[93] *Id.* at 109 (emphasis added).

[94] Pet. at 38.

travel to one particular node, *but is sent to every node on the network*."[95]

Combining AppleTalk with Leong requires the use of broadcast packets among all of Leong's processing units, including the "surveying unit." As a result, a newly added processing unit must necessarily communicate with the surveying unit by transmitting a broadcast packet to the surveying unit. This communication would necessarily be read by every surveying unit (broadcast packets are read by all nodes on the network).[96] In some instances, the surveying unit would be required to respond to the newly added processing unit (e.g., when the surveying unit has a node number between 1-254 that matches the node number selected by the newly added processing unit).[97] In either case, whether the surveying unit reads the broadcast packet or whether the surveying unit reads and responds to the broadcast packet, a communication between the newly added processing unit and the surveying unit necessarily occurs.[98] Any system that requires the CPU to be interrupted to process a broadcast packet every time a processing unit is added to the system teaches away from the '004 Patent claims' "without communication" requirement and is wholly incompatible with the objectives of the '004 Patent, namely, to reduce burden on the

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[95] Ex. 1006 at 108 (emphasis added).

[96] *See* Ex. 1006 at 108.

[97] *See id*; *See also N*elson at ¶129

[98] *See* Nelson at ¶129.

CPU.[99]

The above characterization is consistent with Petitioner's admission that "[i]n one implementation, Leong's modified processing units, when connected to a network *transmit a broadcast packet* seeking a bulletin board device type …. A POSITA would have understood this to be adding of the new processing unit '*on a plug-and-play basis*' because the devices are automatically configured …."[100] It bears repeating, however, that the "broadcast packet doesn't travel to one particular node, *but is sent to every node on the network*. In turn, every node receives a broadcast packet and, if appropriate, responds to it."[101] This required communication between the newly added processing unit and the surveying unit is wholly incompatible with the "without any communication with the controller" limitations of the '004 Patent.

Petitioner does not argue that Ethernet Standard or Bates cure any of the above-described deficiencies in Leong and AppleTalkBook. Thus, given that Leong and AppleTalkBook, alone or combined, do not teach or suggest "a controller configured to populate the task pool with a plurality of first tasks and a plurality of

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[99] *See* Nelson at ¶130.

[100] Petition at 39 (emphasis added).

[101] Ex. 1006 at 108 (emphasis added).

second tasks," Patent Owner respectfully submits that Petitioner's Grounds fail to render Claims 1-12 of the '004 Patent unpatentable under 35 U.S.C. §103(a).

D. There is no motivation to combine Leong with AppleTalk or reasonable expectation of success

For a patent claim to be obvious based on a combination of references, there must be evidence that a POSITA would have been motivated to combine or modify the prior art to achieve the claimed invention. When the prior art teaches away from such a combination, that combination is more likely to be nonobvious.[102]

It is worth noting that the Petition never actually asserts that a POSITA would be motivated to combine Leong and AppleTalk. At most, the Petition simply expresses Dr. Weissman's view that "a POSITA would have sought to implement [plug-and-play] techniques in Leong's system to facilitate adding of processing power."[103] Petitioner points to Leong's recognized need for a system that is "readily scalable" as evidence for this suggestion. In doing so, however, Petitioner oversimplifies Leong's discussion of needs, and ignores explicit evidence in Leong that teaches away from a combination of Leong with AppleTalk.

Leong's "Background of the Invention" section describes various prior art

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[102] *See KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).

[103] Pet. at 37.

multi-tasking systems, including the "IBM SP2, NCR, and Cray systems."[104] Each of these prior art systems addresses scalability. The IBM SP2, for example, could "scale up over a very wide range (4 to 512 nodes) in very small increments (one or two nodes)."[105] The problem in the prior art identified by Leong was not 'scalability' alone (systems like the IBM SP2 were scalable), rather, Leong notes that the scalability of prior art systems were disadvantaged by: 1.) a central managing unit that "may require customer hardware and/or software configuration changes when other processing units 12' are added to the system 1"[106] (along with the central managing unit's imposition of "overhead burdens on the system in terms of time, cost and complexity …."[107]), and 2.) the problem that prior art systems comprised "hardware [that] must be custom designed and usually requires special network switching technology."[108]

Thus, Leong's description of a need for a system that is "readily scalable" is properly understood by a POSITA as the identification of the need for a scalable system that dispenses with a central managing unit and that does not require

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[104] Leong 1:25-27.

[105] Ex. 2012 at 12.

[106] Leong, 1:45-48.

[107] Leong, 1:36-39.

[108] Leong 1:42-44.

specialized network switching technology.[109]

1. Leong expressly teaches away from any combination using a central managing unit

Leong advocates dispensing with a central managing unit altogether, and teaches against any system that includes a central managing unit.[110] According to Leong, a central managing unit "receives or monitors incoming electronic data."[111] Also, a central managing unit "controls which processing unit 12' performs which jobs in manipulating the electronic data."[112] As discussed in Section VI.A above, Leong's teachings to avoid a central managing unit are contrary to the system taught and claimed by the '004 Patent which discloses a system that includes a CPU (or controller) configured to "divide[] an aggregate computational problem into a group of tasks, and populate the task pool 13 with a first type, a second type, and a third type of tasks. A first cell 12A may [be] capable of performing only tasks of the first type …."[113] The '004 Patent describes a CPU (controller) that divides an aggregate

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[109] *See* Nelson at ¶¶136-137.

[110] *See* Leong, 2:47-48 ("Thus, there is no central management and/or control unit." *Compare* Leong Fig. 1 (Prior Art), *with* Leong Fig. 2 (having no Central Managing Unit).

[111] Leong. 1:20-21.

[112] Leong. 1:29-31.

[113] '004 Patent. 6:39-43; s*ee also*, '004 Patent. 13:59-61.

computational problem into groups of tasks that are specific to different types of co-processors (e.g., a first task for a first co-processor, etc.). The controller of the '004 Patent is antithetical to Leong's teachings against a central managing unit.[114]

2. Leong expressly teaches away from any combination with AppleTalk

Leong also teaches away from any combination with networking systems that require custom hardware and specialized switching technology.[115] AppleTalk teaches proprietary networking hardware and protocols including customized "cables, hardware, and software."[116] AppleTalk touts that Macintosh devices come preconfigured with the customized AppleTalk hardware/software where "[t]he serial ports can be used for the network because they have *specialized hardware* attached to them. Apple has provided networking hardware with every Macintosh delivered. … Apple also built network software functionality into the Macintosh. … The AppleTalk protocol stack *is built into the Macintosh system software*."[117] In order to connect and add non-specialized devices (such as PCs, UNIX machines, and other

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[114] *See* Nelson at ¶¶138-139.

[115] *See* Leong 1:42-44 ("Another disadvantage of the prior art system is that the hardware must be custom designed and usually requires special network switching technology.").

[116] Ex. 1006 at 17; s*ee also*, Ex. 1006 at 43, 70.

[117] Ex. 1006 at 29-30.

non-Apple devices) to an AppleTalk network, AppleTalk requires additional specialized network switching technology (such as specialized bridges, gateways, networking cards, and additional protocols).[118]

At the time of Leong's patent filing in 1997, the AppleTalk systems and their associated networking protocols had been around for almost 12 years and were nearing the end of their product lifecycle, prior to being replaced by TCP/IP-based systems.[119] A POSITA would have understood AppleTalk to embody precisely the "custom hardware" and "special network switching technology" from which Leong teaches away.[120] A POSITA reading Leong, would not have looked to AppleTalk-based systems or AppleTalk to modify the teachings of Leong.[121]

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[118] *See* Ex. 1006 at 71, 79-82, 97 and 157-161 (describing specialized networking bridges and gateways used to establish internetworks; also describing the separate EtherTalk protocol necessary to permit use of Ethernet devices on the AppleTalk Network). *See also id*. at 300-422 "AppleTalk Solutions: A Product Guide," advertising myriad of custom specialized network switching hardware (including bridges, gateways, interfaces cards, etc.) which are necessary to permit scalability on the AppleTalk network.

[119] *What Happened on August 28th*, COMPUT. HIST. MUSEUM, https://www.computerhistory.org/tdih/august/28/ (last visited May 22, 2022).

[120] *See* Nelson at ¶141.

[121] *See* Nelson at ¶141.

3. A POSITA would have no reasonable expectation of success combining Leong and AppleTalk as proposed by Petitioner

It is impermissible to "stitch together an obviousness finding from discrete portions of prior art references without considering the references as a whole."[122] The Petition's proposed combination of Leong and AppleTalk ignores the AppleTalk reference as a whole and as a result ignores significant obstacles to the proposed combination.

The Petition looks exclusively to pages 104-109 of AppleTalk to support its assertion that AppleTalk teaches the claim element of dynamic acceptance of a co-processor on a plug-and-play basis without any communication with the controller.[123] These pages of AppleTalk discuss Dynamic Configuration and the Name Binding Protocols under the AppleTalk Protocol.[124] After describing the AppleTalk protocol's dynamic configuration, the Petition boldly, but mistakenly, claims that "[n]othing in AppleTalkBook's teachings or the AppleTalk protocol prevent the implementation of at least the plug-and-play features of AppleTalk in a standard Ethernet network, if not the entirety of AppleTalk through EtherTalk

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[122] *In re Enhanced Sec. Research, LLC*, 739 F.3d 1347, 1355 (Fed. Cir. 2014).

[123] *See* Pet. at 38-39.

[124] Ex. 1006 at 104.

network-interface cards."[125]

Without any analysis, both the Petition and Dr. Weissman simply ignore the known, and unknown, consequences associated with implementing AppleTalk over Ethernet (called EtherTalk). For example, when EtherTalk is used, a new set of protocols, known as the EtherTalk protocols, must be employed. Some of the protocols override or disable the AppleTalk protocols. For example, the specific dynamic configuration protocol that is referenced to by Petitioner, appears to be unique to the AppleTalk Link Access Protocol (ALAP).[126] The ALAP protocol is *not* used when EtherTalk is selected.[127] The AppleTalk reference states that "[w]hen EtherTalk is selected, the [Link Access Protocol] Layer uses the Ethernet Link Access Protocol (ELAP) to communicate with the add-in Ethernet hardware. Another protocol, the Apple Address Resolution Protocol, or AARP, handles translation between Ethernet addresses and AppleTalk addresses."[128] Neither the

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[125] Pet. at 40.

[126] Ex. 1006 at 97, stating that under ALAP, "[n]ode numbers, unique to each station on the network, are assigned by ALAP. When the Mac is booted, ALAP assigns a node number …."

[127] *See* Ex. 1006 at 96-97 and Fig. 4-3 showing the LocalTalk physical layer implemented under ALAP datalink layer protocol, whereas the EtherNet physical layer is implemented under ELAP datalink layer protocol.

[128] *Id*.

Ethernet Link Access Protocol nor the Apple Address Resolution Protocol are described in any detail by the AppleTalk reference.

There is no indication in the AppleTalk reference that the Ethernet Link Access Protocol supports any form of the dynamic configuration used by the AppleTalk Link Access Protocol. To the contrary, a POSITA would understand that EtherTalk protocols would complicate network management and device address assignment as a result of the fact that each interface card/device would require both an Ethernet device address and an AppleTalk node ID.[129]

Nowhere does the AppleTalk reference teach or suggest that an EtherTalk network includes all capabilities of an AppleTalk network. To the contrary, since an EtherTalk network runs on top of an Ethernet backbone of cabling and hardware, a POSITA would understand that any limitations of Ethernet would be imputed to the EtherTalk network.[130]

Another exemplary change to the AppleTalk protocols created by the use of an EtherTalk network are EtherTalk packets. The AppleTalk reference states that when an EtherTalk network is used, "[t]he data packets travelling across the Ethernet

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[129] *See* Nelson at ¶145.

[130] *See* Nelson at ¶146.

cables are referred to as 'EtherTalk' packets." [131] The AppleTalk reference is silent as to the construction and translation of these EtherTalk data packets.

During his deposition, Dr. Weissman flatly admitted that he is "not an expert on, you know, all the different flavors of AppleTalk."[132] Dr. Weissman's claim to not being an expert was bolstered by his evasive, vague, non-committal responses to a string of inquiries regarding EtherTalk and AppleTalk.[133] For example, when asked if AppleTalk Protocols were the same thing as EtherTalk protocols, Dr. Weissman responded "I'm not certain. I'd have to read – I'd have to read the reference again, but I'm not certain. It's not relevant to my analysis."[134] It is inconceivable that Dr. Weissman would take the position that the differences between EtherTalk protocols and AppleTalk protocols were not relevant to his analysis, considering that every ground of his opinion (and those of the Petition) regarding the obviousness of the '004 Patent claims rest on the contrived combination of "applying AppleTalkBook's plug and play teaching to Leong's standard Ethernet network."[135]

The Federal Circuit has held that a "[d]etermination of obviousness cannot

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[131] Ex. 1006 at 71.

[132] Ex. 2010, 140:19-20.

[133] Ex. 2010, 142:5 - 151:12

[134] Ex. 2010, 143:23 – 144:7.

[135] *See* Ex. 2010 at ¶¶ 103-112 and 129.

be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention."[136] But, this selective culling is precisely what Dr. Weissman admits to doing. When asked whether EtherTalk interface cards were superfluous or necessary to adapt an AppleTalk network with an Ethernet network, Dr. Weissman responded, "Again, I mean, if you are literally taking an AppleTalk network and, you know, combining it with Leong's system, I mean physically, you would have to, you know – then you would need the EtherTalk, you know, protocol running. My point is that the combination is not necessarily dictating that one has to kind of run them as one physical unit. You can. But it's the teaching of AppleTalk network that are incorporated into Leong."[137] Dr. Weissman's selective culling of AppleTalk goes against AppleTalk's express teachings regarding ethernet applications.

As a result of the known obstacles described above, and in view of the insufficient disclosure of AppleTalk regarding its implementation and operation under an EtherTalk instantiation, a POSITA would have no reasonable expectation of success in combining Leong and AppleTalk in the manner proposed by

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[136] *ATD Corp. v. Lydall , Inc.,* 159 F.3d 534,546 (Fed. Cir. 1998).

[137] Ex. 2010, 144:15 – 145:8.

Petitioner and Dr. Weissman.[138] Furthermore, based on Leong's express teachings against the use of systems like AppleTalk, a POSITA would have had no motivation to combine Leong with AppleTalk.[139]

VII. JUNIPER'S GROUNDS FAIL TO RENDER CLAIM 2 OBVIOUS

A. None of the cited references teach or suggest "a first agent configured to search the task pool"

Claim 2 of the '004 Patent is dependent on Claim 1 and recites an "agent is configured to search the task pool for a task of the first type"[140] The '004 Patent specification describes that "a [co-processor] acquires a task from the task pool by sending an agent 30 to interrogate (search for) the task pool and retrieve an available task 22 that requires completion, is not locked, and that has a task type that can be performed by the cell."[141] Furthermore, the '004 Patent describes the agent as a "software module, analogous to a network packet, associated with a co-processor that interacts with the task pool to thereby obtain tasks which are appropriate for that co-processor cell."[142]

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[138] *See* Nelson at ¶148.

[139] *See* Nelson at ¶148.

[140] '004 Patent, 14:36-37; 15:1-2.

[141] '004 Patent, 8:24-28.

[142] '004 Patent, 3:14-17.

Under its Ground 1 analysis of Claim 2 (Claim Elements 2.1 and 2.2), the Petition does not appear to attempt to map any feature of Leong to the claimed agent.[143] The Petition refers to Leong's processing units as co-processors but does not identify any feature of Leong's system that would operate as the claimed agent.

As discussed above in Section VI.B, Leong only describes two functional interactions between Leong's processing units and Leong's bulletin board, namely, that the contents of Leong's bulletin board can be read and the contents of the bulletin board can be written to. A POSITA would understand "reading the contents of the bulletin board" to mean that Leong's processing units read the contents of the bulletin board (i.e. the task status information) into a processing unit's cache or local memory and then identify task status information (if any) that would indicate a task that the processing unit is capable of performing.[144] A POSITA would not view this form of functional interaction to teach an agent searching the task pool and retrieving an appropriate task.[145]

Petitioner does not address Claim 2 under either of its Ground 2 or Ground 3 Challenges. Thus, in view of the Petition's failure to even attempt to map a feature

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[143] *See* Pet. at 41-44.

[144] *See* Nelson at ¶¶133-134.

[145] *See* Nelson at ¶¶133-134.

of the Leong to the agent of Claim 2, Patent Owner respectfully submits that Petitioner's Grounds fail to render Claim 2 of the '004 Patent unpatentable under 35 U.S.C. §103(a).

VIII. JUNIPER'S GROUNDS FAIL TO RENDER CLAIMS 3-12 OBVIOUS

A. None of the cited references teach or suggest "a first agent configured to search the task pool"

Claims 3-12 of the '004 Patent recite, expressly or by incorporation, an "agent is configured to search the task pool for a task of the first type" As discussed above in Section VI.B and VII.A, Leong does not teach or suggest an agent (or a co-processor) configured to search the bulletin board. Leong only describes two functional interactions between Leong's processing units and Leong's bulletin board, namely, that the contents of Leong's bulletin board can be read and the contents of Leong's bulletin board can be written to. A POSITA would not understand "reading the contents of the bulletin board" to mean that Leong's processing units search the bulletin board and retrieve an appropriate task.[146]

Under the Petitioner's Ground 1 analysis of Claim 3 (Claim Elements 3.6 and 3.7), the Petition merely refers back to its analysis of Claim Elements 2.1 and 2.2 described above.[147] No additional analysis is provided by Petitioner as to these Claim

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[146] *See* Nelson at ¶¶133-134.

[147] *See* Pet. at 45.

Elements.

Petitioner's Ground 1 analysis of Claim 3 (Claim Element 3.8 – 3.13) attempts to map elements from the Ethernet Standard to various sub-elements of the '004 Patent's claimed agent (e.g. source, destination, and payload fields). While the data frame of the Ethernet Standard does include fields corresponding to a Source, Destination, and Data, the Ethernet Standard is agnostic as to the contents of the Data field. The Petition looks to Leong to supply the contents of the Data field, however, Leong does not teach or suggest either of the following limitations: i) a first payload including a first function which the first co-processor is configured to perform, or ii) a first payload including a descriptor of the first task.

B. None of the cited references teach or suggest "a first payload including a first function which the first co-processor is configured to perform"

Leong teaches a bulletin board that resides in memory.[148] There are no other embodiments of a bulletin board taught by Leong. Leong teaches that "[t]the micro-processing units 12 are capable of reading the contents … of the bulletin board 14a and determining whether they are capable of performing one or more of the tasks

[148] *See e.g.*, Leong Fig. 3 and Leong 3:9-11 (describing information "posted on an electronic bulletin board 14a which may reside in the memory").

…."[149] Assuming, *arguendo*, that Leong's bulletin board is capable of being accessed over an ethernet network (nowhere does Leong teach that the bulletin board forms part of an ethernet network), a POSITA would understand Leong to teach a processing unit that sends a data frame with a payload that included a transmit request (read request) for the contents to the bulletin board.[150] The bulletin board would respond by transmitting (reading out) the contents of the bulletin board to the requesting processing unit. [151]

The Petition, on the other hand, asserts that "because of Leong's disclosures regarding how the processing units can identify appropriate tasks, a POSITA would have understood the data frame payload in Leong's system includes functions to be performed by the processing units."[152] Petitioner does not provide any citation for this assertion as it constitutes impermissible hindsight reconstruction achieved using the '004 Patent as a roadmap. Quite simply, Petitioner can point to no teaching or suggestion of Leong where a processing unit transmits a payload to Leong's bulletin board, where the payload comprises a function (or list of functions) that the processing unit is configured to perform.

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[149] Leong, 3:11-14.

[150] *See* Nelson at ¶149.

[151] *See* Nelson at ¶149.

[152] Pet. at 53.

Instead, the Petition claims that "it would have been obvious to modify Leong so that the Ethernet data frame payload includes the information needed to identify the tasks …."[153] Petitioner's proposal again uses hindsight bias to wholesale replace the teaching of Leong with Petitioner's hindsight reconstruction.

Petitioner does not argue that AppleTalk, Ethernet Standard, or Bates cure any of the above-described deficiencies in Leong. Thus, given that Leong does not teach or suggest "a first payload including a first function which the first co-processor is configured to perform," Patent Owner respectfully submits that Petitioner's Grounds fail to render any of Claims 3-12 of the '004 Patent unpatentable under 35 U.S.C. §103(a).

C. None of the cited references teach or suggest "a first payload including a descriptor of the first task"

Claims 3-12 of the '004 Patent recite, expressly or by incorporation, "a first payload including a descriptor of the first task…."[154] According to the '004 Patent, each task, or task thread, "represents a computational task that is a component or subset of a larger aggregate computational requirement imposed on the CPU."[155] The

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[153] Pet. at 54.

[154] '004 Patent, 15:23-24.

[155] *Id.*, 7:8-12.

tasks, or threads, can include "a task type and a descriptor."[156] The task type "indicates which cells are capable of performing the task."[157] The descriptor can comprise a data structure that defines, among other things, one or more executable task instructions and the location of the data to be processed.[158]

As set forth more fully in Section VI.A.2., Leong does not teach that tasks or executable task instructions reside on the bulletin board. Rather, Leong teaches that the bulletin board is a repository of task status information.[159] As a result, Leong's bulletin board does not possess a descriptor to impart to, or to be collected by, the payload of an agent.

Petitioner attempts to gloss over Leong's missing descriptor by redefining a descriptor as simply the "necessary information"[160] The Petition employs this slight-of-hand without any regard to, or reference to, the '004 Patent. Anticipating that such a tactic would be refuted by Patent Owner, Petitioner resorts to summarily declaring that "[t]o the extent that Patent Owner argues Leong doesn't disclose this claim element, it would have been obvious to have Leong include the descriptor of the

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[156] *Id.*, 7:15-16.

[157] *Id.*, 7:16-17.

[158] *See id.*, 7:37-58 and 9:32-46.

[159] *See* Leong, Fig. 3; Leong, 3:20-25.

[160] *See* Pet. at 55.

matching task with the data frame payload so the solidarity cell begins execution of the matching task upon receipt."[161] Again, Petitioner does not provide any citation for this conclusory assertion as it constitutes impermissible hindsight reconstruction achieved using the '004 Patent as a roadmap.

Petitioner ignores the fact that Leong already plainly teaches its own operation and does not require Petitioner's hindsight modifications. Specifically, Leong teaches the following process:

1.) the surveying agents "define the status information for [the] tasks."[162]

2.) "[t]he surveying agents 12 then post the status information for the tasks on the bulletin board"[163]

3.) "since the status information of the posted tasks preferably includes the priority of the tasks, when the micro-processing units 12 read the bulletin board 14a they may determine which tasks should be executed first."[164]

4.) "one of the micro-processing units 12 executes the posted task."[165]

As to the location of the executable instructions, Leong describes Sequence

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[161] Pet. at 56.

[162] Leong, 4:12-14.

[163] Leong, 4:14-16.

[164] Leong, 3:31-34.

[165] Leong, 3:17-18.

200 of Fig. 4 as "Execution of the Posted Task."[166] Describing this sequence in more detail, Leong states that "[s]equences 100-400 are preferably executed by the micro-processing units 12 *operating under the control of their own application software programs.*"[167] A POSITA would understand this to mean that Leong's processing units are pre-configured with the executable instructions of any particular task; and that the only information that is read from the bulletin board is the task status information.[168]

Petitioner does not argue that AppleTalk, Ethernet Standard, or Bates cure any of the above-described deficiencies in Leong. Thus, given that Leong does not teach or suggest "a first payload including a descriptor of the first task," Patent Owner respectfully submits that Petitioner's Grounds fail to render any of Claims 3-12 of the '004 Patent unpatentable under 35 U.S.C. §103(a).

IX. JUNIPER'S GROUNDS FAIL TO RENDER CLAIM 9 OBVIOUS

A. None of the cited references teach or suggest "a task pool configured to notify the controller upon completion of the first task"

Claim 9 is dependent on Claim 8, which is dependent on Claim 3 of the '004 Patent. Claim 9 recites that "the task pool is configured to notify the controller upon

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[166] Leong, Fig. 4.

[167] Leong, 5:62-63.

[168] *See* Nelson at ¶153.

completion of the first task."[169] A POSITA would understand that to "notify" in the context of multiprocessor systems means to affirmatively transmit a notification from a sending device to receiving device.[170] In view of Claim 9 of the '004 Patent, the notification transmitted by the task pool would comprise information that would communicate to the controller that a first task has been completed.

Leong does not teach or suggest that the bulletin board is configured to notify the surveying agent upon the completion of a first task. Leong does teach that the "micro-processing unit 12 executes TASKn and when completed alters the status information for TASKn to indicate that TASKn is complete (step 216)."[171] However, there is nothing in Leong that teaches or suggests that the bulletin board does anything in response to the change in status information of TASKn. And there is nothing in Leong that teaches or suggests that the bulletin board engages in an affirmative transmission of a notification to the surveying unit. Furthermore, a POSITA would not understand Leong's bulletin board to be capable of such an affirmative transmission given that all embodiments of Leong teach that the bulletin board is a passive memory block.[172]

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[169] '004 Patent, 16:23-27.

[170] *See* Nelson at ¶156.

[171] Leong, 7:46-48.

[172] *See* Nelson at ¶157.

Additionally, there is nothing in Leong to suggest that the surveying units seek out information regarding the completion of tasks. Because Leong teaches away from a controller or central managing unit, the sole purpose of Leong's processing units updating a task's status information to "complete" is to prevent another processing unit from attempting to rework that particular task. As discussed above in Section VI.A, Leong's surveying units do not divide or centrally manage the overall computational work of the system. Therefore, a POSITA would not see any reason for Leong's surveying units to circle back to the bulletin board to monitor task completion.[173] There is nothing for the surveying unit to do with such information. Petitioner points to Leong's statement that "when the micro-processing units 12 read the bulletin board 14a, they will not execute that task because it is already being executed by another agent."[174] But, this statement does not teach or suggest anything about Leong's *surveying units*. Given the Petition's carefully orchestrated parsing of Leong's surveying units from Leong's processing units in order to read said devices onto the '004 Patent's controller and co-processors, it would be specious for Petitioner to now claim that Leong's processing units are one and the same as surveying units.

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[173] *See* Nelson at ¶158.

[174] Pet. at 68; Leong, 3:52-55.

Under Ground 3, Petitioner reformulates its arguments to allege Bates as the source for teaching "a task pool configured to notify the controller upon completion of the first task." The sum and substance of Petitioner's argument under Ground 3 is that Bates teaches a system comprising one or more power processing units ("PPUs") and multiple synergistic processing units ("SPUs"), and that "[an] SPU can notify the PPU of task completion through an ID that can be polled for completion, or through an interrupt sent to the PPU upon completion."[175]

As discussed above, Leong's surveying units do not divide or centrally manage the overall computational work of Leong's system. A POSITA would not see any reason for Leong's surveying units to circle back to the bulletin board to monitor task completion.[176] There is nothing for the surveying unit to do with such information. Therefore, there is no motivation to combine Bates with Leong because Leong would have no need for its surveying units to be updated with task completion information. The Petition refers vaguely to "efficient task completion" as a motivation to apply Bates to Leong.[177] Here the Petition is incorrect. A POSITA would not be motivated by efficiency to combine Bates with Leong because Leong

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[175] Pet. at 84-85.

[176] *See* Nelson at ¶160.

[177] Pet. at 83.

describes no need for surveying units to be informed of task completion information.[178] A POSITA would understand that interrupting the surveying units to convey such information would actually reduce the efficiency of the surveying units.[179]

X. CONCLUSION

The Petition is fatally deficient because, *inter alia*, Petitioner has failed to show that the cited references teach or suggest, *inter alia*, the claimed:

i) "controller configured to populate the task pool with a plurality of first tasks and a plurality of second tasks"

ii) "co-processor configured to … retrieve a first task from the task pool; deliver the first task to the first co-processor"

iii) dynamic addition of co-processors "on a plug-and-play basis without any communication with the controller"

iv) co-processor including an agent "configured to search the task pool for a task of a first type"

v) agent comprising a first payload including "a first function which the first co-processor is configured to perform"

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[178] *See* Nelson at ¶160.

[179] *See* Nelson at ¶160.

vi) agent comprising a first payload including "a descriptor of the first task;"

vii) co-processor "configured to modify a task within the task pool"

viii) task pool "configured to notify the controller upon completion of the first task."

ix) co-processor "configured to deposit a new task into the task pool."

In addition, Petitioner has failed to show a motivation to combine AppleTalk with Leong because Leong expressly teaches away from a combination with AppleTalk and because a POSITA would have no reasonable expectation of success in combining Leong and AppleTalk as proposed by Petitioner.

In sum, Petitioner has failed to show by a preponderance of evidence that any claim of the '004 Patent is unpatentable under 35 U.S.C. § 103.

For all of the foregoing reasons, Patent Owner respectfully submits that the Board maintain the claims of the '004 Patent and determine that no challenged claims are unpatentable.

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

This paper complies with the requirements of 37 C.F.R. § 42.24 and contains 11,176 words.

This paper complies with the typeface requirements of 37 C.F.R. § 42.6 and has been prepared in 14-point Times New Roman proportionally spaced typeface with normal spacing.

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