

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

THE PETITIONER
Cisco Systems, Inc.,

v.

THE PATENT OWNER
UMBRA Technologies Ltd.

U.S. Patent No. 11,146,632
Issue Date: October 12, 2021

Inter Partes Review No.: IPR2024-00344

PATENT OWNER'S RESPONSE TO PETITION FOR
INTER PARTES REVIEW OF U.S. PATENT NO. 11,146,632

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Ex. 2001	Declaration of W. Cook Alciati in Support of Motion for Admission <i>Pro Hac Vice</i>
Ex. 2002	Qin, Y., et al. “Mobility Weakens the Distinction Between Multicast and Unicast,” IEEE/ACM Transactions on Networking, Vol. 24, No. 3, June 2016.
Ex. 2003	U.S. Publication No. 2012/0196646 A1.
Ex. 2004	U.S. Patent No. 9,736,870.
Ex. 2005	U.S. Publication No. 2014/0310243 A1.
Ex. 2006	Microsoft Press (2002). Beacon. In <i>Microsoft Computer Dictionary Fifth Edition</i> . Retrieved on May 13, 2024 from: https://burmatarrecords.wordpress.com/wp-content/uploads/2009/12/microsoft_computer_dictionary_fifth_edition1.pdf .
Ex. 2007	PCMag. Retrieved on May 13, 2024 from: https://www.pcmag.com/encyclopedia/term/beacon ; https://www.pcmag.com/encyclopedia/term/beaconing .
Ex. 2008	April 8, 2024, Letter from Patrick Delaney to Counsel for Cisco Systems, Inc.
Ex. 2009	UMBRA Technologies Ltd.’s Revised Infringement Chart, served on Cisco Systems, Inc. on May 13, 2024.
Ex. 2010	Transcript of PTAB Conference Call dated June 10, 2024.
Ex. 2011	Declaration of Dr. Micah Beck in Support of Patent Owner’s Response to Petition for <i>Inter Partes</i> Review of U.S. Patent No. 11,146,632
Ex. 2012	A chart demonstrating that each of the Challenged Claims of the ’632 patent

I. INTRODUCTION

Patent Owner UMBRA Technologies Ltd. (“Patent Owner”) hereby Responds to Petitioner Cisco Systems, Inc.’s (“Petitioner”) Petition for *Inter Partes* Review seeking to find the Challenged Claims of U.S. Patent No. 11,146,632 (“’632 patent”) invalid. For the reasons stated below, Patent Owner respectfully asks that the Board **reject** the Petition’s assertions that the ’632 patent’s Challenged Claims are unpatentable.

II. TECHNOLOGY BACKGROUND

The ’632 patent resulted from the pioneering efforts of the inventor, Joseph E. Rubenstein, in the areas related to secure network optimization, virtual networks including large area or global virtual networks (GVNs), next generation software-defined wide area networking (SD-WAN), advanced smart routing (ASR), slingshot interconnection systems for sending files, for example, via remote direct memory access (RDMA), security such as multiple perimeter firewalls and other technologies. These efforts resulted in the development of systems and methods for improving the performance of internet connections and large networks. For example, the inventions improved quality of service in a virtualized network. The SD-WAN inventions provide a wide range of benefits for individuals and distributed organizations, including improved architectures for implementing highly efficient, secure, optimized virtual WAN architectures over the top of the regular internet and other fabrics. The slingshot inventions improve over past

technologies by, for example, overcoming limitations related to packetization and next-hop routing.

At the time of these pioneering efforts, the most widely implemented technology in use involved multiprotocol label switching, or MPLS, a networking technology that routed traffic using the shortest path based on “labels,” rather than network addresses. MPLS networks have the disadvantage of needing to transmit all traffic from the branch to a centralized data center and have limited capabilities for low latency/high performance access to cloud applications. In addition, the security and management requirements associated with disparate traffic flows in MPLS adds to the complexity of managing network operations, thus increasing operational requirements. The invention claimed in '632 patent overcomes these limitations in traditional MPLS networks as well as other limitations in various prior art technologies. As one example, the patented invention provides a number of advantages over the prior art and improve the operations of virtualized networks implementing highly efficient, secure, optimized virtual WAN architectures.

The patented inventions disclosed and claimed in the '632 patent resolve specific technical problems, such as, the distance issues associated with TCP/IP (transmission control protocol/internet protocol) and UDP/IP (user datagram protocol/internet protocol), because with “repeat queries to fast moving and rapidly changing information, especially during times of heavy activity, UDP/IP and TCP/IP are subject to congestion events and subsequent packet loss. UDP/IP will

simply drop packets without receiver nor sender being aware of this loss” (Ex. 1001 at 5:21-30). These problems are resolved by following the “data beacon” (DB) protocols of the Challenged Claims, thus “offering reliability and speed superior to UDP/IP and TCP/IP over distance.” (*Id.* at 5:30-32.) In particular, the Challenged Claims call for providing DBs over a first node to a second node, each node with its own queues and parallel file system. The first node writes the DB data from its write queue to the second node parallel file system. The second node places this DB data from its parallel file system into its read queue. (Ex. 1001 at 23:2-12). The invention resolves, for example, problems related to the utilization of TCP/IP (transmission control protocol/internet protocol) and UDP/IP (user datagram protocol/internet protocol) over long distances. As the ’632 patent explains, the DB protocols of the claimed inventions do not have the same congestion and inefficiencies as TCP/IP and UDP/IP, instead offering reliability and superior speed over distance. (*Id.* at 5:20-32.)

III. APPLICABLE LEGAL PRINCIPLES

A patent is invalid for anticipation under 35 U.S.C. § 102 only “if a single prior art reference discloses ***each and every***¹ limitation of the claimed invention.” *Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (citing *Lewmar Marine, Inc. v. Barient, Inc.*, 827 F.2d 744, 747 (Fed. Cir. 1987)).

¹ Unless otherwise indicated, all emphasis in this brief is added.

A prior art reference may anticipate without disclosing a feature of a claimed invention only when that missing characteristic is necessarily present—or inherent—in the single reference. *Id.* at 1377.

To make a *prima facie* showing of obviousness under 35 U.S.C. § 103, the Petition must, among other requirements, fulfill the requirements set forth in *Graham v. John Deere Co.*, 383 U.S. 1 (1966), including demonstrating that the cited references disclose each element of a challenged claim. *In re Magnum Oil Tools Int’l.*, 829 F.3d 1364, 1376 (Fed. Cir. 2016).

Petitioner also has the burden to show that there would have been sufficient motivation to combine the asserted prior art, and that the proposed combination would render the patented claims obvious. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Even if individual modifications or choices were obvious, a petition must explain why making all of the changes at once would have been obvious at the time of the patented invention. *Apple Inc. v. Contentguard Holdings, Inc.*, IPR2015-00442, Paper 9 at 16-17.

The Federal Circuit has found that, even for an obviousness challenge based on a single reference in view of the knowledge and skill of a person of ordinary skill in the art, there must be a motivation to make the combination and a reasonable expectation that such a combination would be successful, otherwise a skilled artisan would not arrive at the claimed combination. *In re Stepan Co.*, 868 F.3d 1342, 1345-46 (Fed. Cir. 2017). In other words, when a gap in a single prior

art reference requires filling with, for example, the knowledge of one of ordinary skill, there must be a further showing that the skilled artisan would arrive at the claimed invention without anything other than the artisan's skill and the teachings of the reference.

IV. PETITIONER HAS FAILED TO SHOW THAT THE CHALLENGED CLAIMS ARE UNPATENTABLE

Even if the '421 patent and '685 provisional application were both prior art, Petitioner has failed to show that either the '421 patent or the '685 provisional application disclose all limitations of the challenged claims of the '632 patent.

A. The '632 Patent Is Entitled to the April 26, 2016 Priority Date of Its Provisional Applications

The '632 patent is entitled to the priority date of the three provisional applications to which the '632 patent claims priority, as listed on the face of the '632 patent: 62/327,907, 62/327,846, and 62/327,911, each filed on April 26, 2016. (See Ex. 2011 at ¶ 30.) A chart demonstrating that each of the Challenged Claims of the '632 patent is fully supported by the subject matter disclosed in these provisional applications is attached to the Expert Declaration of Micah Beck, filed in support of this Response. (See Ex. 2012.)

The Petition does not dispute that the '632 patent is entitled to the priority date of Provisional Application No. 62/327,907. (See Pet. at 11.) The Petition merely asserts that the prior art relied upon therein “predates the earliest possible priority date, April 26, 2016, and thus for purposes of this Petition, this issue is

moot.” (Pet. at 11.) The issue is not moot. As explained below, the cancelled matter of the ’685 provisional application—which was never carried forward into the ’421 patent—did not become available to the public until the February 28, 2017 issuance of the ’421 patent, the first publication event in its family. Thus, it is relevant that the ’632 patent is entitled to the priority date of April 26, 2016.

B. The ’685 Provisional Application Is Not Prior Art Under 35 USC § 102

Most of the paragraphs and the figures of the ’685 provisional were omitted from, and thus cancelled before, the filing of the ’421 patent. Only select portions of the ’685 provisional application were copied over to ’421 patent. The only common figures between the ’685 provisional and the ’421 patent are Figures 1 and 2, neither of which is relied upon by Petitioner for anticipation. (See Ex. 2011 at ¶ 43.) Paragraphs 0037-0046 and 0053-00126 of the ’685 provisional are omitted from the ’421 patent. The specification of the ’685 provisional contains over 20,000 words, while the specification of the ’421 patent contains less than 10,000 words. Petitioner attempts to rely upon this cancelled material but, as explained below, such material does not become ‘prior art’ until it is publicly available. As noted above, the first publication event in the family of the ’421 patent was the February 28, 2017 issuance of the ’421 patent.

This Board routinely relies upon the USPTO Manual of Patent Examining Procedure (MPEP) for legal guidance concerning the legal framework for

assessing prior art. *See, e.g., Incyte Corp. v. Concert Pharma., Inc.*, PGR2021-00006 (P.T.A.B. May 11, 2022). According to the MPEP, “[c]anceled matter in the application file of a U.S. patent or application publication cannot be relied upon in a rejection under 35 U.S.C. 102(a)(2) or pre-AIA 35 U.S.C. 102(e).” MPEP § 2127(II)(A) (citing *Ex Parte Stalego*, 154 USPQ 52, 53 (Bd. App. 1966)). “The canceled matter only becomes available as prior art as of the date the application file history becomes available to the public.” *Id.* (citing *In re Lund*, 376 F.2d 982, 153 USPQ 625 (CCPA 1967)).

1. Disclosures in a Provisional Application Which Are Canceled in a Subsequent U.S. Patent Application Cannot Constitute 35 U.S.C. 102(a)(2) Prior Art

For a provisional patent application to constitute prior art under 35 U.S.C. § 102, the provisional patent application must be cited as part of a non-provisional patent application “deemed published under [35 U.S.C.] Section 122(b).” 35 U.S.C. § 102(a)(2). In such cases, the non-provisional patent application must make a “*specific reference*” to the matter within the provisional application sought to be included in the non-provisional application. *See* 35 U.S.C. § 119(c). Where matter contained in a provisional application is, however, intentionally **omitted** from the non-provisional application, the omitted matter is not entitled to the priority date of the provisional application and is considered “cancelled matter.” *See* MPEP § 2127(II)(A); *see also*, MPEP § 901.01. “Cancelled matter” is not

prior art under 35 U.S.C. § 102(a)(2) or Pre-AIA 35 U.S.C. 102(e). *See* MPEP § 2127(II)(A); *see also*, MPEP 901.01 (same).

The Petition attempts to sidestep this cancellation issue by asserting that “[t]he ’421 Patent claims priority to and incorporates by reference” the ’685 Provisional. Such a broad and generic statement does not suffice to re-import the entire contents of the ’685 Provisional, particularly the cancelled material intentionally omitted from inclusion in the ’421 Patent. The Federal Circuit clarified this point in *Advanced Display Sys. v. Kent State Univ.*, 212 F.3d 1272, 1283 (Fed. Cir. 2000). In *Advanced Display*, the Federal Circuit found that incorporating material by reference requires more than a mere identification of the document sought to be incorporated. *Id.* at 1282. Specifically, the document citing the reference to be incorporated “must identify *with detailed particularity* what specific material it incorporates and clearly indicate where that material is found in the various documents.” *Id.* at 1282. Where the material sought to be incorporated into the host document has not been so identified, the material is not actually incorporated. *Id.* at 1283 (*citing with approval In re Lund*, 376 F.2d 982 (CCPA 1967)).

The MPEP explicitly recognizes that—until it becomes publicly available—“cancelled matter” from a provisional patent application cannot be considered prior art under 35 U.S.C. § 102(a)(2), by citing—as good law—the over-60-year-old holding of *Ex Parte Stalego*, 154 USPQ 52, 53 (Bd. App. 1966). In *Stalego*, the

Board of Patent Interferences considered whether material in an unpublished patent application which was omitted from the contents of the issued patent, *i.e.*, “canceled matter,” constituted prior art. *Id.* at *1. The Board found that, whether prior private or secret information constitutes prior art as of the filing of the unpublished application turns on whether the private or secret information is described “in a patent.” *Id.* at *4. If the private or secret information is not described in the patent, the private or secret information is considered cancelled and “cancelled portions of the application are not part of the patent.” *Id.* at *5.

The Board made a similar finding in the institution decision for *Samsung Electronics Co., Ltd., et al., v. Black Hills Media, LLC*, IPR2014-00740, 2014 WL 5788570 (P.T.A.B. Nov. 4, 2014). In that case, Samsung sought to apply the teachings of the Lau provisional application, in addition to the non-provisional application citing the Lau provisional application, against a challenged patent. *Id.* at *12. In its Institution Decision, the Board found that Lau was substantially different from the non-provisional patent application that cited the Lau provisional application. *Id.* at *12. Based on these substantial differences, the Board refused to institute the grounds utilizing the Lau reference because the Lau provisional was not prior art. *Id.* at *12-13. As noted in *Samsung*, “a patent that claimed the benefit of an earlier filed provisional application qualified as prior art, as of the filing date of the provisional application, **for all commonly disclosed subject matter.**” *Id.* at 23 (citing *Ex parte Yamaguchi*, 88 USPQ2d 1606, 1612 (BPAI

2008)). Here, Petition does not attempt to rely only upon the “commonly disclosed subject matter” between the ’685 provisional application and the ’421 patent. Thus, for those relied-upon portions of the ’685 provisional application that do not also appear in the ’421 patent, this does not “qualif[y] as prior art, as of the filing date of the provisional application.” *Id.*

While cancelled matter can become prior art as of a publication event, such as patent issuance, thereby making an application’s entire file history publicly accessible (see MPEP 2127(II)(A) (*citing In re Lund*, 376 F.2d 982 (CCPA 1967))), this is not the case here. In *Lund*, the United States Court of Customs and Patent Appeals (“CCPA”) was asked to determine the priority date of asserted prior art disclosed in an abandoned parent patent application but omitted from a child application. *In re Lund*, 376 F.2d at 988. The sole effort of the child application to incorporate the disclosures of the parent application consisted of a single sentence: “The present application is a continuation-in-part application of our application Serial No. 763,806, filed September 29, 1958 (now abandoned).” *Id.* at 988. The Court found that this single sentence was insufficient to “carry over” the information from the abandoned parent application to the child application. *Id.* at 989. The matter which was not carried over was therefore considered to be available only when the child application’s file history became available to the public. *Id.* at 991. As noted above, the Federal Circuit recognizes *Lund* as good law. *See Advanced Display*, 212 F.3d at 1283 (*citing Lund*, 376 F.2d at 989).

C. The Alleged Prior Art '421 Patent Does Not Incorporate all of the '685 Provisional Application

The '421 patent does not actually include all of the information disclosed in the '685 provisional application. (See Ex. 2011 at ¶ 43.) For example, the '685 provisional application included 20 figures, but the '421 patent includes only the first two figures of the '685 provisional application. (Compare Ex. 1004 at 66-84 with Ex. 1005 at Fig. 1 and Fig. 2.) As another example, based on the word count function of Adobe Acrobat, the '685 provisional application includes over 20,000 words, but the '421 patent includes less than 10,000 words. Thus, the '421 patent does not contain much of the disclosure of the '685 provisional application and the '685 provisional application, not publicly available at the time of the '421 patent's filing, cannot be incorporated by reference into the '421 patent.

Thus, as in *Samsung*, the material relied upon in the '685 provisional application is not “commonly disclosed”. This non-common materials constitutes “cancelled matter,” which should not be considered prior art under 35 U.S.C. 102(a)(2). It can only be prior art as of the date the file history of the '421 patent became available to the public. See MPEP 2127(II)(A). Again, there was no publication event related to the '421 patent until its issuance on February 28, 2017. Thus, the '421 patent file history was not published until February 28, 2017. Because, as discussed above, the '632 patent is entitled to the April 26, 2016

effective filing date of the provisional applications to which the '632 patent claims priority, the '685 provisional application is not prior art to the '632 patent.

D. Standing Alone, Neither the '421 Patent Nor the '685 Provisional Application Disclose All Elements of the Challenged Claims

Notwithstanding the above analysis showing that the '685 patent is not prior art to the '632 patent, Petitioner still fails to demonstrate that either the '421 patent or the '685 provisional application, in isolation, teach all limitations of the challenged claims of the '632 patent. As explained below, neither the '421 patent, nor the '685 provisional application—in isolation—teach all elements of the Challenged Claims. (See Ex. 2011 at ¶ 31.) Any argument that the '421 Patent, in combination with the '685 Provisional, collectively disclose all elements of the Challenged Claims, is immaterial. As explained above, any such combination was only possible and permissible with respect to the date of February 28, 2017, when the '685 provisional application became publicly available.

1. The Petition Offers No Citations to the '421 Patent for Element [1.3] of Claim 1, Claim 5, Claim 6, and Element [7.1] of Claim 7

With respect to the '421 patent, the Petition does not even attempt to cite this reference in its analysis of the '632 patent with respect to element [1.3] of claim 1 (Pet at 44-47), claim 5 (*id.* at 54), claim 6 (*id.* at 55-56), and element 7.1 of claim 7 (*id.* at 57-59).

Specifically, the Petition cites only to the '685 provisional application as anticipating element [1.3] of claim 1. (Pet. at 44-47.) Claim 1 is the only independent claim of the '632 patent, from which the remaining six claims of the '632 patent depend. Because Petitioner fails to show that at least element [1.3] of claim 1 is anticipated by the '421 patent, claim 1 and all dependent claims cannot be found unpatentable on the asserted grounds of the Petitioner and should be rejected.

Further, the Petition cites to only the '685 provisional application in its anticipation analysis for claims 5 and 6. (Pet at 53-56.) Similarly, the Petition cites to only the '685 provisional application in its anticipation analysis for element [7.1] of claim 7. (Pet at 57-59.) For the same reasons stated above for claim 1, at least dependent claims 5, 6, and 7 cannot be found unpatentable on the asserted grounds of the Petitioner and should be rejected.

2. At a Minimum, the Petition Fails to Show that the '685 Provisional Discloses Element [1.4] of Claim 1 of the '632 Patent: “*wherein the second node reads the first data from the second parallel file system and places the first data in the second read queue.*”

As noted above, the '685 provisional application is not prior art to the '632 patent. Even so, Petitioner has failed to demonstrate that the '685 provisional application discloses element [1.4] of claim 1 of the '632 patent: “wherein the second node reads the first data from the second parallel file system and places the first data in the second read queue.” (Ex. 1001 at claim 1; Pet. at 47-49.)

As required by each of the Challenged Claims, the “first data” that is written from the first node to the second node must be placed into a “read queue”. (See Ex. 2011 at ¶ 39.) Specifically, claim 1 requires “the first data” be placed into “the second read queue” from “the second parallel files system” of the “second node”. (See *id.* at ¶ 39.) The concept of the ‘same node’ source from which this data is placed into the “read queue” is also repeated in the specification of ’632 patent. (See Ex. 1001, Abstract; Summary of the Disclosure at 7:38-39.) This reinforces the importance of the source location from which “the first data” is place into “the second read queue” and indicates this is an *intra-node* movement of data. No such *intra-node* movement of data from a “parallel file system” to a “read queue” is disclosed in the ’685 provisional.

The section of the Petition directed to element [1.4] begins with an unsupported conclusory paragraph:

Agarwala² discloses that after data is written into the persistent storage of a second storage node, it will be read from persistent storage and added to the read cache... [a] POSITA understood that this read occurs following replication of the data from a first node to a second mirror node as part of an asynchronous replication.

² Again, Patent Owner disputes Petitioner’s characterization of “Agarwala” as a single reference. As explained above, the ’685 provisional application and the ’421 patent contain significantly different (i.e., not “commonly disclosed”) disclosures, and most of the figures and paragraphs of the ’685 provisional were omitted—and, thus, “cancelled”—from the filing of the ’421 patent. As such, the ’685 provisional application and the ’421 patent must be consider separately or at least not as combinable until the ’421 patent’s February 28, 2017 issuance, *i.e.*, the first public availability of both documents.

Pet. at 48.

For support, the Petition only provides a “see” to the Petition’s prior section regarding element [1.3] and a reference to the expert report—which provides only the same conclusory statement and same “see” to the discussion on element [1.3]. (Pet. at 48; Ex. 1003 at ¶ 98.) As none of this discussion on element [1.3] says anything about this allegedly inferred read operation on the second storage node, Petitioner’s conclusory and unsupported assertion of what a POSITA “understood” does not suffice. *Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1373 (Fed. Cir. 2008) (“[T]here must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. . . . Nowhere does [the expert] state how or why a [POSITA] would have found the claims . . . obvious in light of some combination of those particular references....”); *see also*, *In re Stepan Co.*, 868 F.3d 1342, 1346 (Fed. Cir. 2017).

The ’685 provisional application simply does not teach “placing the first data in the second read queue” as required by element [1.4] of claim 1 of the ’632 patent. (See Ex. 2011 at ¶ 33.) The Petition never attempts to correlate “the first data” that is to be placed in “the second read queue” with what it calls the “first data” that was written from the first write queue to the second parallel file system (as recited in element [1.3]) per the ’685 provisional application. (See *id.* at ¶ 33.) This is an important and fatal omission. The “first data” of element 1.4 has an antecedent in element 1.3. (See *id.* at ¶ 33.) Thus, the data being placed in the

second read queue must be the same data that was written from the first write queue. (*See id.* at ¶ 33.) The Petition makes no effort to show this sameness other than the impermissibly conclusory and unsupported statement of what a POSITA understood. (*See id.* at ¶ 33.) For this reason alone, the Petition fails to render the challenged claims unpatentable. (*See id.* at ¶ 33.)

In addition, the Petition fails as to element [1.4] for the separate, independent reason that it does not disclose placement from the second parallel file system into the second read queue. While Petitioner points to Figure 3 of the ‘685 provisional to argue the disclosure of “first data” being written from the “write queue” of a first node to a second node, this does not address the aforementioned claim requirement. Specifically, element [1.4] requires placement of “first data” from “the second parallel file system” of the second node into the “second ready queue” at the same “second node”.

As to Petitioner’s reliance on Figure 3, the following is a reproduction of a colorized annotation Petitioner created from Figure 3 of the ‘685 provisional, which is repeated (in some variation) on at least six occasions in the Petition.

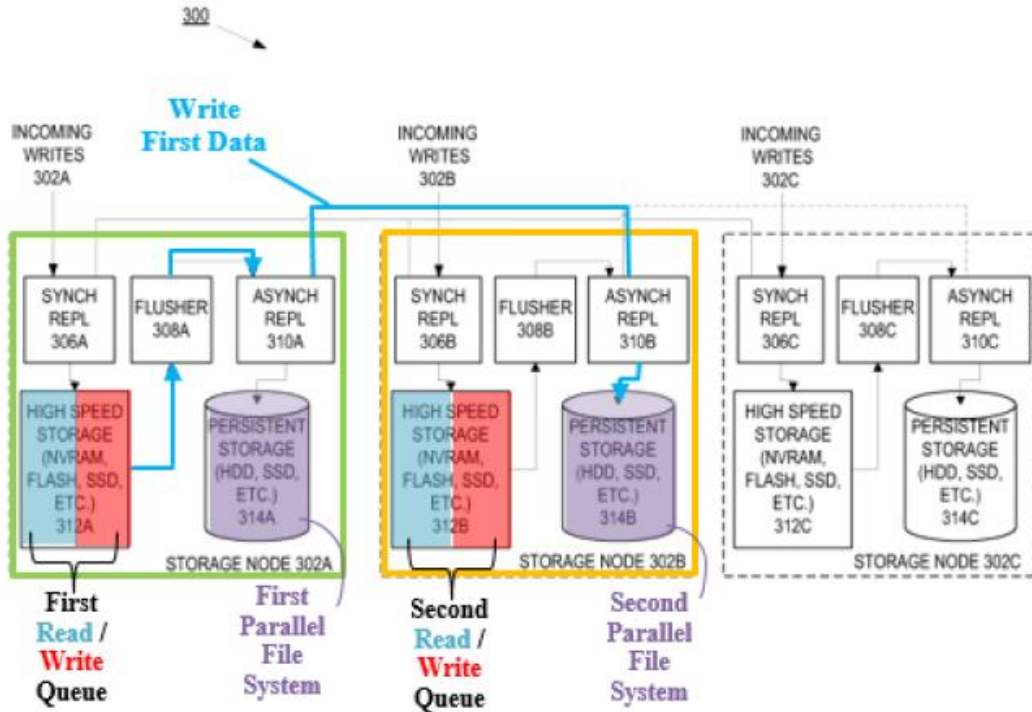


FIGURE 3

(Pet. at 47.) As illustrated, Figure 3 includes arrows indicating movement of data into “persistent storage” components numbered 314 (A-C), which Petitioner equates with the claimed “parallel file system[s]” of the Challenged Claims. There are no arrows in Figure 3, nor descriptions elsewhere the ‘685 provisional, indicating a location to which data is moved from persistent storage. (See Ex. 2011 at ¶ 41.) Thus, Petitioner does not rely on Figure 3 as a prior art disclosure of the element of the Challenged Claims reciting “wherein the second node reads the first data from the second parallel file system and places the first data in the second read queue.” (See *id.* at ¶ 41.)

Instead, Petitioner resorts to Figure 9B of the ‘685 provisional. (See *id.* at ¶ 34.) Specifically, the Petition incorrectly attempts to rely on the ‘685 provisional

application's Figure 9B as illustrating a queue to which "the first data" is copied to from persistent storage, (Pet. at 46-47), to allege a disclosure of this element. (*See id.* at ¶ 34.) Petitioner asserts:

The read process is also disclosed in FIG. 9B, where at block 950 content is read from persistent storage upon a cache miss and placed in the cache storage at block 966. EX-1004 ¶¶0061-62; FIG. 9.

(Pet. at 48.) Nothing about this statement is accurate. (See Ex. 2011 at ¶ 35.) The illustrated elements of Figure 9B fail to disclose the concept of a "read queue," and neither block 966 nor paragraphs 0061 and 0062 say anything about cache miss data being placed in cache storage. (*See id.* at ¶ 36.) To the contrary, Figure 9B illustrates the process by which a response (either delivery of content or an error) is generated to a request initiated by a client. (*See id.* at ¶ 36.)

While the "MERGED CONTENTS" in block 966 of the flow chart in Figure 9B of the '685 provisional will potentially include "WRITELOG" content, Figure 9B does not disclose a queue specifically designated to hold "read" data, let alone the claimed "second read queue" residing on "the second node". (*See id.* at ¶ 37.)

The Petition also attempts to tie, through mere attorney argument, the Figure 9B embodiment of the '685 provisional application to the Figure 5 embodiment of the '421 Patent. (See Pet. at 48.) But nothing in either document ties them together. (See Ex. 2011 at ¶ 43.) As discussed above, the disclosures of the '421 patent differ greatly from the disclosures of the '685 provisional application. For example, with the exception of Figures 1 and 2, the '421 patent contains

completely different disclosures and drawings. (See Ex. 2011 at ¶ 43.) Thus, Figure 3 and Figure 9B of the '685 provisional do not even appear in the '421 patent. (See Ex. 2011 at ¶ 43.) Further, the '685 provisional application says nothing about L1 and L2 caches and multi-layer DOCL systems and MFU lists. (See Ex. 2011 at ¶ 43.) As another example, the '421 patent says nothing about reading from a combination of writelogs and persistent storage. (See Ex. 2011 at ¶ 43.)

Because Petitioner fails to show the same data passing through the same elements as recited in claim 1, Petitioner has failed to show that claim 1 of the '632 patent is rendered unpatentable. And, as noted above, because all other claims of the '632 patent depend from claim 1, no dependent claim of the '632 patent is rendered unpatentable for the same reasons.

E. The Petition Does Not Demonstrate that Either the '421 Patent or the '685 Provisional Application Disclose a Data Beacon

The term “data beacon” refers to a signal delivered via one-way casting or one-way multi-casting. The term “data beacon” should therefore be construed to mean a signal delivered via one-way casting or multi-casting. Because neither the alleged prior art '421 patent nor the '685 provisional application, in isolation, disclose such a data beacon, the Petition does not demonstrate that the challenged claims are unpatentable.

1. “A Data Beacon” Should Be Construed as a “Signal Delivered Via One-Way Casting or Multi-Casting”

The intrinsic evidence shows that the term “data beacon” refers to a signal delivered via one-way casting or one-way multi-casting (the latter of which is simply one-way casting to multiple recipients, as explained in Ex. 2002).

The Background of the Invention section of the patent begins with the following passage:

The present disclosure relates generally to networks, and more particularly, to the topology, configuration and operation of a data beacon pulser (DBP). A DBP offers fast, efficient, and dependable oneway casting/multi-casting of information globally. A DBP can be utilized for transmission of financial data, news feeds, seismic data, and many other applications where dependable and accurate near wire speed dissemination of rapidly changing information is time critical.

(Ex. 1001 at 1:29-37.) The Background section continues by framing the invention in terms of its use of “slingshot” technology, which uses a one-way communication protocol. (*See id.* at 1:41-43; *see also, id.* at 3-36-38.)

One of the key benefits of using a data beacon slingshot is that it does not require responses or acknowledgements, which are required for common communication protocols such as TCP over IP. (*Id.* at 2:54-57; 4:6-19; 6:1-5.) The specification explains that the elimination of the overhead and latency associated with TCP/IP ACK packets (or other responsive communications required in prior art two-way communication protocols) provides substantial performance benefits over longer distances. (*Id.* at 6:29-42.)

Much of the background section is dedicated to distinguishing the invention over a particularly relevant prior art technique that involves one-way casting or multi-casting: UDP over IP. The specification explains in detail how the inventive one-way casting/multi-casting technique is superior to and different from the prior art UDP/IP multi-casting technique. (*Id.* at 4:43-5:51.)

During prosecution, the Examiner cited several references which relate generally to data beacons. In the notice of allowance, the Examiner stated that:

[a] broader search for ‘data beacon’ in the same paragraph as variations of the term ‘pulse’ yielded the reference, Crinon et al. (US 20120196646 A1) and related references by the same inventors.

(Ex. 1002 at 10.) The “beacon” described in Crinon is a one-way broadcast. (Ex. 2003 at [0056].) Two other references cited by the Examiner disclose beacons, and each of those references describe one-way information broadcasts. (Ex. 2004, 2005.)

For the sake of completeness, the Microsoft Computer Dictionary defines beacon in the context of one network as “a special frame generated and passed along when a node detects a problem.” (Ex. 2006.) PC Magazine defines beacon as “[a] device that transmits a continuous signal, typically via Bluetooth.” (Ex. 2007, definition 3; see also definition of “beaconing”.) Considering the foregoing, the proper interpretation of “data beacon” is a signal delivered via one-way casting or one-way multi-casting. It is fundamental to the claimed systems that the delivery be of such one-way signals.

2. The Claims Were Allowed Due to the Preamble Recitations, and The Are Limiting

The preamble recitation “network system for providing data beacons” is limiting for two reasons: i) this feature was relied upon during prosecution to distinguish over the prior art, and ii) the entirety of the specification makes clear that providing data beacon functionality is the fundamental purpose of the invention.

The title of the '632 patent is “Data Beacon Pulser(s) Powered by Information Slingshot.” The Background of the Invention section explains that “[t]he present disclosure relates generally to networks, and more particularly, to the topology, configuration and operation of a data beacon pulser (DBP).” (Ex. 1001 at 1:29-31.) The entirety of the background section, which spans six columns of the patent, exclusively discusses prior art and technical issues related to data beacon pulsers (DBPs). It explains that “[t]he invention overcomes the distance issues associated with TCP/IP and UDP/IP because the underlying protocol of Slingshot powering DBP does not have the same congestion and inefficiencies problems over distance.” (*Id.* at 5:21-24.) Each mention of “the invention” involves a data beacon. The first sentence of the Summary of the Disclosure section summarizes the specification as follows: “Systems and methods for providing data beacons are disclosed.” (*Id.* at 7:30-31.)

Courts have uniformly looked to the entirety of the patent application to understand when a preamble term provides a claim limitation. Whether to treat a preamble as a limitation is a determination “resolved only on review of the entire[] . . . patent to gain an understanding of what the inventors actually invented and intended to encompass by the claim.” *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1257 (Fed. Cir. 1989).

In Poly-America LP v. GSE Lining Tech., Inc., the Federal Circuit explained:

a ‘[r]eview of the entirety of the [] patent reveals that the preamble language relating to ‘blown-film’ does not state a purpose or an intended use of the invention, but rather discloses a fundamental characteristic of the claimed invention that is properly construed as a limitation of the claim itself.’

383 F.3d 1303, 1310 (Fed. Cir. 2004); *see also Corning Glass*, 868 F.2d at 1257; *General Electric Co. v. Nintendo Co.*, 179 F.3d 1350, 1361-62 (Fed. Cir. 1999).

In this case, a fundamental characteristic of the claimed network system is a “data beacon” system implemented in a novel fashion using queues, parallel file systems, and direct writes, which demonstrates the preamble is limiting. *See Proveris Scientific Corp. v. Innovasystems, Inc.*, 739 F.3d 1367, 1373 (Fed. Cir. 2014).

Here, under the *Corning Glass Works* instruction for “review of the entire patent,” it is evident that the inventors actually invented improved systems for delivering data beacons and intended that the claims encompass only improved data beacon delivery systems having certain features recited in the body of the

claim. The specification consistently refers to the invention as relating solely to data beacons. The title expressly recites data beacons. The claims as originally filed recite data beacons. *See Rotatable Techs. LLC v. Motorola Mobility LLC*, 567 F. App'x 941, 943 (Fed. Cir. 2014). And, to the best understanding of the undersigned, nothing in the specification suggests that the inventors intended to claim anything outside the realm of data beacons. Accordingly, the preamble recitation “network system for providing data beacons” is fundamental to the invention and limiting.

The prosecution history is consistent with the specification's focus on the data beacons recited in the preamble as being the disclosed invention. For example, in a first action notice of allowance, the Examiner explained that “[a]lthough independent claim 1 appears at first to be somewhat non-complex subject matter, it was found to be novel in the art.” (Ex. 1002 at 9.) The Examiner then notes that “a search for the term ‘data beacon pulser,’ which is disclosed in the specification as the technology upon which the invention is based, was not found in any prior art other than that of the inventor.” (*Id.* at 10.) Similarly, the Examiner noted:

[a] broader search for ‘data beacon’ in the same paragraph as variations of the term ‘pulse’ yielded the reference, Crinon et al. (US 20120196646 A1) and related references by the same inventors. However, those references deal with mobile networks, and do not disclose any information about read queues, write queues, or parallel file systems. The Examiner also reviewed the prior art references provided as being relevant in the PCT International Search Report, but

did not find that the references teach the claimed subject matter with the required level of specificity.

(*Id.* at 10.)

Thus, like the specification, the prosecution highlights the fact that the data beacons recited in the preamble are the basis of the invention. To that end, the Examiner was exactly correct in allowing the claims on the basis of the preamble's recitation of data beacons. Indeed, reliance on the preamble in the notice of allowance is of particular importance. M.P.E.P. 1302.14 ("The examiner's statement of reasons for allowance is an important source of prosecution history"). When there is an allowance in the first action, the notice of allowance may embody the entirety of the "back-and-forth" between the applicant and the examiner.

More generally, the prosecution history can be highly instructive in confirming that a preamble provides a meaningful limitation. *See Loctite Corp. v. Ultraseal Ltd.*, 781 F.2d 861, 866 (Fed. Cir. 1985). To that end, it is well settled that:

[n]o litmus test defines when a preamble limits claim scope [] but dependence on a particular disputed preamble phrase for antecedent basis may limit claim scope because it indicates a reliance on both the preamble and claim body to define the claimed invention.

Shoes by Firebug LLC v. Stride Rite Children's Grp., LLC, 962 F.3d 1362, 1367 (Fed. Cir. 2020) (internal quotations and citations omitted).

Here, while it was the examiner's (rather than the applicant's) reliance on the preamble that distinguished the prior art, Patent Owner respectfully submits

that such reliance is nonetheless indicative that the preamble is limiting—especially where the examiner allowed the claims in a first action allowance before the applicant had a chance to distinguish prior art. Indeed, the examiner’s data beacons premised allowance is consistent with the specification’s clear reliance on the importance of the “data beacons” to the overall disclosed invention. Indeed, the Notice of Allowance explained that claims were being allowed because they were a novel implementation of a data beacon system and not just a network system:

Although independent Claim 1 appears at first to be somewhat noncomplex subject matter, it was found to be novel in the art. Examiner was unable to find any prior art references that teach the subject matter, which recites as follows: [entire claim including preamble].

(EX-1002 at 9-10.)

In addition, a search for the term “data beacon pulser,” which is disclosed in the specification as the technology upon which the invention is based, was not found in any prior art other than that of the inventor. A broader search for “data beacon” in the same paragraph as variations of the term “pulse” yielded the reference, Crinon et al. (US 20120196646 A1) and related references by the same inventors. However, those references deal with mobile networks, and do not disclose any information about read queues, write queues, or parallel file systems. Examiner also reviewed the prior art references provided as being relevant in the PCT International Search Report, but did not find that the references teach the claimed subject matter with the required level of specificity.

(*Id.* at 10.)

Thus, the Notice of Allowance plainly relied upon the “data beacon” term in finding that the claims distinguished over the prior art.

3. The Petition Does Not Meaningfully Address the Data Beacon Limitation, and Neither the ’421 Patent Nor the ’685 Provisional Application Disclose a Data Beacon

The Petition does not attempt to interpret the term “data beacon”. Rather, it assumes that the term “data beacon” is met if the recitations in the body of the claim are met. Petitioner argues that any system that writes or reads data across nodes provides a data beacon. (*See, e.g.*, Pet. at 29-30.) As noted above, this position cannot be squared with the Notice of Allowance.

Neither the Petition nor the supporting declaration asserts that the ’421 patent or any of the other cited prior art uses one-way casting or multi-casting (*i.e.*, one-way casting to multiple recipients). Because the Petition provides no explanation as to how the cited art might meet the “data beacon” limitation, properly interpreted, Petitioner’s Grounds alleging unpatentability of the Challenged Claims of the ’632 patent should be rejected.

V. PETITIONER HAS FAILED TO SHOW THAT THE PRIOR ART ’421 PATENT IS ENTITLED TO THE DISCLOSURES OF THE ’685 PROVISIONAL APPLICATION

A. The Federal Circuit Requires that a Petitioner Prove that an Alleged Prior Art Patent Is Entitled to the Priority Date and Disclosures of Its Provisional Application When the Priority Date Is Subject to Pre-AIA Law

1. The Federal Circuit's Holding in *Dynamic Drinkware*

A petitioner that seeks to rely on both a patent and that patent's underlying unpublished provisional patent application as alleged pre-AIA prior art references—as in this action—must make an initial showing that the unpublished provisional application supports at least one claim of the alleged prior art patent. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375 (Fed. Cir. 2015).

In *Dynamic Drinkware*, the Fed. Cir. explained that a petitioner must meet both its burden of persuasion by proving that a challenged patent claim is invalid—a burden that never shifts from petitioner to patent owner—and its burden of production by offering evidence in support of its argument—a burden that only shifts to patent owner when initially met. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1380 (Fed. Cir. 2015).

Where an IPR petition seeks to rely on a prior art patent which itself relies on the disclosures of a provisional patent application, the petitioner's burden of production is greater. In *Dynamic Drinkware*, the Federal Circuit stated that, in such circumstances, the petitioner's initial burden of production includes “the further burden to prove that [the reference] was entitled to claim the benefit of the filing date of its provisional application.” *Dynamic Drinkware*, 800 F.3d at 1381. This is because the PTO does not automatically examine priority claims unless necessary, so the Board would have “no basis to presume that a reference patent is

necessarily entitled to the filing date of its provisional application.” *Id.* at 1380.

Only when this initial burden is met does the burden of production then shift to the patent owner to show that the reference does not actually anticipate or that the reference is not actually prior art. *Id.* at 1380.

2. The Board’s Holding in *Penumbra* Applies Only to Patents and Provisional Applications Subject to the AIA

After the Federal Circuit’s holding in *Dynamic Drinkware*, the PTAB designated a Precedential Decision impacting when a *Dynamic Drinkware* analysis should be applied in a given case. *See Penumbra, Inc. v. Rapidpulse, Inc.*, IPR2021-01466, Paper 34 (P.T.A.B. Mar. 10, 2023) (designated Precedential Nov. 15, 2023).

In *Penumbra*, the petitioner challenged the validity of a patent which relied on the benefit of a provisional application with an earliest effective filing date of October 24, 2018, (*id.* at 25), based on a prior art reference which relied on the benefit of a provisional application with an earliest effective filing date of July 24, 2018 (*id.* at 28). The patent owner argued that the petitioner was required to perform a *Dynamic Drinkware* analysis showing—that the prior art provisional application taught at least one claim in the alleged prior art patent—in order for the prior art patent to be entitled to the priority date of the prior art provisional application. *Id.* at 28-29 .

The *Penumbra* Board disagreed. The Board stated that a *Dynamic Drinkware* analysis is required only for patents that rely on a priority date before March 16, 2013 (i.e., before the enactment of the AIA):

“[W]e determine that, **for prior-art determinations under AIA § 102**, “there is no need to evaluate whether any claim of [a reference] patent document is actually entitled to priority or benefit under 35 U.S.C. 119, 120.” MPEP § 2154.01(b) (emphasis added). Rather, **under the AIA**, a reference patent document need only meet the “ministerial requirements” of §§ 119 and 120, and the provisional or other earlier application(s) to which the reference patent document claims a right of priority must “describe[] the subject matter” relied upon in the reference patent document as prior art.”

Id. at 32.

The *Penumbra* Board found that the AIA version of § 102 applied in the proceeding. (*Id.* at 30.) Because the AIA applied, the petitioner was not required to perform a *Dynamic Drinkware* analysis to show that the alleged prior art reference was “actually entitled” to the priority date and disclosures of the prior art patent’s provisional application. *Id.* at 32.

B. Because the Alleged Prior Art ’421 Patent Relies on a Pre-AIA Provisional Application, Petitioner Was Required to Shows the ’421 Patent is “Actually Entitled” to the Benefit of the ’685 Provisional Application

In this action, Petitioner was required—and failed—to meet its initial burden of production by showing that U.S. Patent No. 9,582,421 (“’421 patent”) is entitled to the benefit of U.S. Provisional Application 61/739,685 (“’685 provisional”). Petitioner admits that, in order to “predate” the ’632 patent, the alleged prior art

'421 patent must rely on a priority date that predates the '632 patent's "earliest possible priority date, April 26, 2016" (Pet. at 11.) Petitioner further admits that "[t]he '421 Patent claims priority to and incorporates by reference U.S. Provisional Application 61/739,685 (EX-1004) **filed December 19, 2012.**" (Pet. at 18.)

Petitioner therefore knew that the alleged prior art '421 patent relied on a pre-AIA priority date and Petitioner was required to perform a *Dynamic Drinkware* analysis. Petitioner should have further understood that the Board's guidance in *Penumbra*, which only applied to a prior art reference relying on a priority date under the AIA, is not applicable to this case.

Petitioner's only statement regarding whether the alleged prior art '421 patent is actually entitled to the benefit of the priority date of the '685 provisional application states:

The '421 Patent claims priority to and incorporates by reference U.S. Provisional Application 61/739,685 (EX-1004) filed December 19, 2012. EX-1005 1:6-8. The '421 Patent is prior art to the '632 Patent under §102(a)(2)(AIA). Together the '421 Patent and the incorporated '685 Provisional are referred to herein as "Agarwala".

(Pet. at 18.) This bare and conclusory statement falls far short of the requirements of *Dynamic Drinkware*. Specifically, the Federal Circuit stated that a petitioner's initial burden of production includes "the further burden to prove that [the reference] was entitled to claim the benefit of the filing date of its provisional application." *Dynamic Drinkware*, 800 F.3d at 1381. Petition did not and cannot

meet this burden of proof and, thus, cannot rely on the benefit of the filing date of the '685 provisional application.

VI. CONCLUSION

For the reasons discussed above, Petitioner fails to show that the challenged claims of the '632 patent are rendered unpatentable. Patent Owner respectfully requests that the Board issue a Final Written Decision accordingly.

Dated: October 25, 2024

/s/ James Lennon

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CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing PATENT OWNER'S RESPONSE was served on October 25, 2024, in its entirety by filing this document through the Patent Trial and Appeal Case Tracking System (P-TACTS) as well as providing a courtesy copy via e-mail to the following attorneys of record for the Petitioner listed below:

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