

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE, INC.,

Petitioner

v.

KOVE IO, INC.,

Patent Owner

IPR2024-01021
U.S. Patent 7,233,978

PATENT OWNER'S PRELIMINARY RESPONSE

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PATENT OWNER'S EXHIBIT LIST

Exhibit	Description
2001	Declaration of Dr. Michael T. Goodrich In Support of Patent Owner's Preliminary Response
2002	Declaration of Nancy Adams, EdD
2003	Curriculum Vitae of Nancy Adams, EdD
2004	Website for ETH Zürich Research Collection - ETH Zürich Jahresbericht 1993 (available at https://www.research-collection.ethz.ch/handle/20.500.11850/643838)
2005	ETH Zürich, <i>Jahresbericht</i> (1993)
2006	Website for ETH Zürich Research Collection - Distributed file organization with scalable cost/performance (available at https://www.research-collection.ethz.ch/handle/20.500.11850/68912)
2007	Metadata of Distributed File Organization With Scalable Cost/Performance in the ETH Zurich repository (available at https://www.research-collection.ethz.ch/handle/20.500.11850/68912?show=full)
2008	ETH Zurich Library Online Catalog Search Results
2009	ETH Zurich Library Online Catalog Search Result for Jahresbericht – Eidgenössische Technische Hochschule
2010	Marc Record for Jahresbericht – Eidgenössische Technische Hochschule (available at https://eth.swisscovery.slsp.ch/discovery/fulldisplay?docid=alma99117224951305503&context=L&vid=41SLSP_ETH:ETH&lang=en&search_scope=DiscoveryNetwork&adaptor=Local%20Search%20Engine&tab=discovery_network&query=any,contains,1015-4191&mode=basic)
2011	Certified English Translation of ETH Zürich, <i>Jahresbericht</i> (1993)
2012	Norrie et al., <i>The Database Research Group at ETH Zurich</i> (available at https://dl.acm.org/doi/pdf/10.1145/181550.181567)
2013	Joint Claim Construction Chart in <i>Kove IO, Inc. v. Amazon Web Services, Inc.</i> , Case No. 1:18-cv-08175 (N.D. Ill. May 29, 2020) (Dkt. 382)
2014	Reexam Decision in <i>Ex Parte</i> Reexamination No. 90/014,552

I. INTRODUCTION

Petitioner fails to demonstrate a reasonable likelihood of prevailing in its challenge to any claim of U.S. Patent No. 7,233,978 (“’978 patent”). The Petition suffers from numerous deficiencies and flawed reasoning and should not be instituted for at least the following reasons.

All claims of the ’978 patent require that the location information sets contained in each location server in a plurality of location servers be unique from one another. In particular, Claims 1-9 recite the limitation “a second location server comprising a second set of location information, wherein at least *a portion of the second set of location information differs from the first set of location information*”; claims 10-16 recite “*each location server [contains/containing] a unique set of location information of an aggregate set of the location information*”; and claim 17 and its dependents recite, “*each of the plurality of location servers stores unique set of location information of an aggregate set of location information.*” Petitioner relies on Kahn to disclose these limitations. But the citations Petitioner relies on do not support its interpretation. Petitioner’s failure to show that Kahn teaches these limitations is dispositive of every Ground.

Ground 2 requires combining Kahn with Krasner. But Krasner and Kahn are directed to different fields of art such that a person of ordinary skill in the art (POSITA) would not have been motivated to combine them. Having failed to

establish reasonable motivation to combine these disparate references, Petitioner cannot meet its burden with respect to Ground 2.

Grounds 3, 4, and 5 require combining Kahn with Vingralek. Petitioner has not provide sufficient evidence qualifying Vingralek as pre-AIA § 102(b) prior art. Petitioner provides incorrect and insufficient evidence that Vingralek was publicly accessible before the '978 patent's critical date. Without Vingralek, Ground 3, 4, and 5 fail as a matter of law.

Claims 3, 4, and 10-16 all require a “redirect message.” Neither Kahn alone (as Petitioner contends in Ground 1) nor Kahn in combination with Vingralek (as Petitioner contends in Ground 3) teach or render obvious the required “redirect message” limitation. Petitioner also fails to establish a motivation to combine Kahn with Vingralek or that a POSITA would have a reasonable expectation of success in doing so. These deficiencies further defeat Petitioner's arguments with respect to Grounds 1 and 3.

Petitioner also relies on modifying Kahn view of Vingralek for its argument that claims 17, 23-26, and 30 are obvious in view of the combination. Petitioner, however, cannot meet its burden of showing that a POSITA would have been motivated to combine Kahn's system with Vingralek's to meet the “*transferring a portion of the identifiers and associated locations to a second data location server when a performance criterion of the first location server reaches a predetermined*

performance limit” limitation because Kahn and Vingralek have different architectures that make them incompatible. Petitioner also fails to establish a reasonable expectation of success were a POSITA to attempt such a combination.

For at least these reasons, Petitioner has not met its burden of demonstrating a reasonable likelihood of prevailing in its challenges to any ’978 patent claim. Trial should therefore not be instituted under 35 U.S.C. § 314(a). Should the Board nonetheless decide to institute, Patent Owner reserves the right to further address these and other issues.¹

II. RELATED MATTERS

The ’978 patent is among the patents asserted against Petitioner (Google) in the matter *Kove IO, Inc. v. Google LLC*, Case No. 1:23-cv-04244 (N.D. Ill.). In another related litigation, claims 10, 17, and 30 of the ’978 patent were asserted against Amazon Web Services in *Kove IO, Inc. v. Amazon Web Services, Inc.*, Case

¹ This Response focuses on certain limitations of the challenged claims and presents arguments for why the Petition should not be instituted due to the specific deficiencies in the Petition described herein. However, the Petition fails to establish that the challenged claims are invalid for additional reasons, and Patent Owner reserves the right to present additional evidence and arguments if the Petition were instituted.

No. 1:18-cv-08175 (N.D. Ill.). In that matter, which was tried before a federal jury in April of 2024, Amazon dismissed all of its invalidity defenses with prejudice, and the jury found infringement of all asserted claims. The court denied Amazon's motion for judgment as a matter of law and request for a new trial. The case is currently on appeal.² Amazon also filed an IPR challenging the '978 patent (IPR2020-00276), where institution was denied. The '978 patent was also subjected to two concluded *ex parte* reexaminations: No. 90/019,034, where substantial new questions of patentability were raised regarding claims 1, 3, 6, 10, 14, 17, 23, 24, 30, and 31 and all claims were confirmed, except for claims 1 and 31, which were cancelled; and No. 90/019,109, where claims 17, 23, 24, and 30 were confirmed. The '978 patent is pending in a third *ex parte* reexamination No. 90/019,162, where claims 3, 10, and 14 were originally confirmed patentable and substantial new questions of patentability were raised regarding claim 6 and reexamination was ordered on May 16, 2023. Amazon filed a request for reconsideration as to the confirmed claims and reexamination was ordered as to them on June 5, 2024. No office action has been issued.

² 24-2350 *Kove IO, Inc. v. Amazon Web Services, Inc.*

III. BACKGROUND

A. Overview of the '978 Patent

Drs. John Overton and Stephen Bailey, co-inventors of the '978 patent (Ex. 1001), developed breakthrough distributed data storage technology while studying at the University of Chicago in the 1990s. By 1998, the inventors of the '978 patent recognized that data would grow so fast that storing and retrieving it reliably and efficiently would require a new and better way of doing things. The inventors founded a company to commercialize their inventions, which enabled high-performance, hyper-scalable distributed storage, years before the advent of the cloud. While that technology was ahead of its time commercially, Dr. Overton later went on to develop adjacent technologies for his company Kove IO, which is the Patent Owner. Kove's patented distributed storage innovations addressed the challenges of efficiently storing and retrieving location information for massive amounts of data across distributed servers, enabling the scalable distributed storage systems that are ubiquitous today. Goodrich Decl. (EX2001), ¶¶38-40.

The '978 patent (EX1001) describes an innovative system for efficiently managing and retrieving data stored across a distributed network. In large-scale distributed data collections, data may be spread across many different data repositories. In such environments, it can be challenging to locate and retrieve data associated with a particular entity. The '978 patent teaches techniques to efficiently

separate the “where” (i.e., which data storage server(s) to query) from the “what” (i.e., the data itself). EX2001, ¶38.

The ‘978 patent teaches that, for example, data entities are stored in data repositories, where each data entity is associated with a unique identifier. EX1001, 4:20-28. (“A network distributed tracking protocol (NDTP) is a transfer protocol having the capability to manipulate location information used to efficiently track the location of information associated with an individual entity in the distributed data base system. An “entity identifier” or an “identifier is a unique encoding, which may be a string in one embodiment, with which zero or more data location specifiers are associated in an NDTP server”). A network of data location servers stores the mapping between identifiers and the locations of the corresponding data in the data repositories. *See, e.g., id.*, 4:34-38 (“An ‘NDTP server’ or a ‘server’ is a network-attached component that maintains a set of identifier/location mappings that are modified or returned in response to NDTP request messages from clients.”). The patent further teaches that it is expected that the list of data location servers may change over time, necessitating server redirection. *Id.*, 16:66-17:5; EX2001, ¶¶39-40.

B. Overview of the Challenged Claims

Towards the latter half of the 1990’s, data storage was still relatively manageable. Most data could be stored locally, on local drives, compact discs (CDs)

or disk drives. Single servers were often sufficient for data storage needs. Not long thereafter, the amount and size of data began increasing, soon reaching exponential rates. Networking became ubiquitous and storing data in single servers became impractical if not impossible. This paved the way for distributed data collection environments. EX2001, ¶¶41-54.

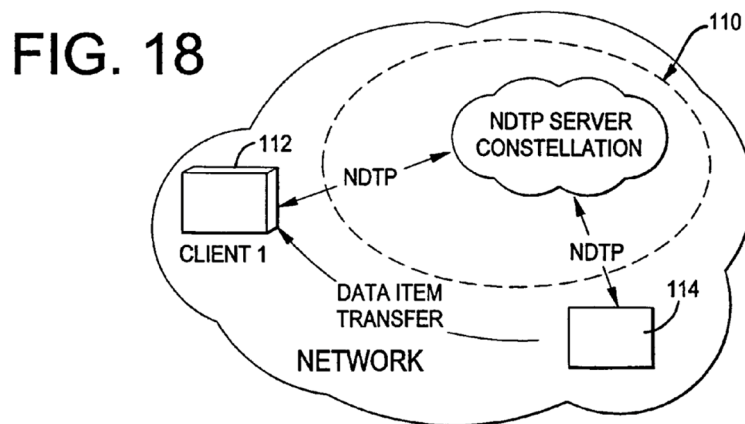
Distributed data collection involves storing data stored and retrieved among multiple databases or data repositories connected by a network. Conventional distributed data collection environments maintained a static relationship of data and its location. In this regard, conventional distributed data collection environments maintained a static relationship of data and its location. Every time data moved from one location to the next, all of the systems that maintained the static relationship had to be updated. As a result, while conventional distributed data collection environments allowed for dispersed storage, doing so made reliably locating and retrieving the data challenging, particularly where data is added or removed dynamically. *Id.*, 1:63-67; EX2001, ¶41.

The Inventors concluded that conventional systems were fundamentally limited in the types of searches that could be performed and the forms of data returned based on the search. EX1001, 1:45-48. “One example is where a client requests files based on a subject, like a person’s name. Search results for this type of search may only retrieve text files of peoples’ names. Another problem in current

retrieval systems is that the client may receive text and image files in the search results, but cannot seamlessly access the image files. Yet another problem in current retrieval systems is that video and sound files related to the request may not even be found in the search results. For example, a doctor might be able to retrieve medical records on a specific patient, but cannot view MRI or X-Ray results associated with that record.” *Id.*, 1:48-58; EX2001, ¶42.

The Inventors addressed the limitations of pre-existing systems in the ’978 Patent in two foundational ways. First, the ’978 patent teaches separating the data location information from the data itself. *See e.g.*, EX1001, 1:64-66, 18:38-58, Figs. 18-20. The ’978 patent teaches that, for example, data entities are stored in data repositories, where each data entity is associated with an identifier. *Id.*, 4:25-29 (“An ‘entity identifier’ or an ‘identifier’ is a unique encoding, which may be a string in one embodiment, with which Zero or more data location specifiers are associated in an NDTP server.”). The ’978 patent teaches utilizing a transfer protocol configured to transport identifier and location information between clients and servers and between servers themselves. A network of data location servers stores the mapping between identifiers and the locations of the corresponding data in the data repositories. *See, e.g., id.*, 24:4-6 (“NDTP servers maintain a mapping between entity identifiers and data locations.”). Each location server stores the location information in a formatted location store comprising identifiers associated with one

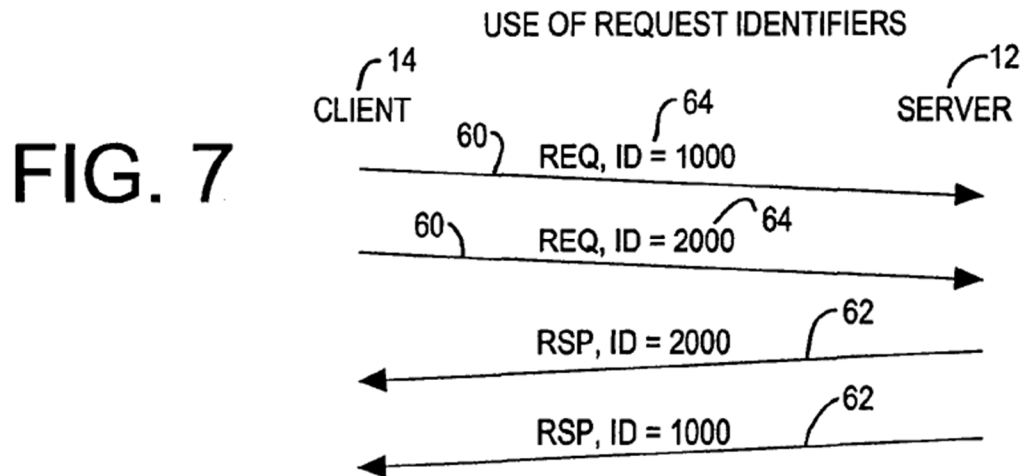
or more locations. When an identifier and relevant location are received at a first location server, they are stored in its location store with the location associated to that identifier. *See, e.g., id.*, 5:37-6:7. The '978 patent thereby describes a network distributed tracking protocol system where a client communicates with a constellation of NDTP servers and separately transacts with an application server, as illustrated in Fig. 18:



EX1001, Fig. 18. The '978 patent teaches that techniques that can allow multiple data location servers to be combined in networks that can offer performance scalability to handle potentially massive data storage. For example, the '978 patent describes how “[t]he NDTP server organization also allows NDTP servers to be combined in various ways to build server constellations that offer arbitrary server performance scalability and administrative control of the location of positions of the identifier/data location relation mappings.” *Id.*, 18:38-42; EX2001, ¶43.

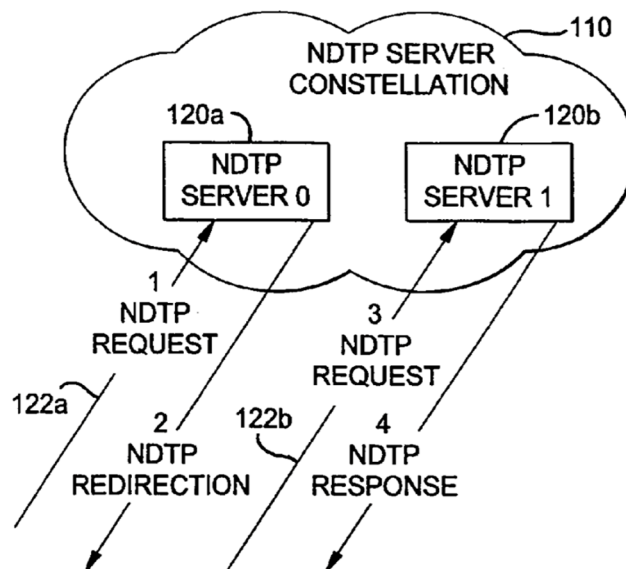
Second, the '978 patent teaches ways clients can request location information associated with an identifier, where each request has a corresponding response

message returned by the server receiving the request. EX1001, 9:55-56. An example of NDTP protocol requests and responses are depicted in Figure 7:



EX1001, Fig. 7. The '978 patent also teaches an NDTP redirection mechanism that allows distribution of identifiers to location mappings across an NDTP server cluster in a “client-centric” paradigm, as shown in Fig. 19.

FIG. 19



EX1001, Fig. 19. A client (not shown) may send a request (1 NTDP Request) to a server (NDTP Server 0) in the network; if that server does not have the requested data, then it will send an “NDTP Redirection” response, or *redirect message* (2 NDTP Redirection) back to the client. The client uses information it receives in the NDTP Redirection response (2 NDTP Redirection) to ask another server (NDTP Server 1) for the requested data and that second server sends a response (4 NDTP Response) back to the client. *Id.*, 18:61-19:3. Thus, a redirect message provides the client with information to determine the location of a different server that has the information, thereby providing an efficient way to navigate the dynamically changing distributed network of location servers. *Id.*, 12:58-63. The ’978 patent also teaches that the redirection responses to client queries are returned to the client from the queried server. *See e.g., id.*, 2:42-52; 4:34-38; 7:55-8:6; 9:52-67; 13:16-24; 15:64-16:2; 16:29-35; 18:51-57; 18:60-19:4; 19:27-37; *see also* Reexam Decision in *Ex Parte* Reexamination No. 90/014,552 (EX2014), 13-14 (quoting the August 11, 2005 Response to Office Action at 11 for the underlying application of the ’640 patent, recognizing that redirect messages provide the client the information necessary to determine the correct data location server and redirect its query to that server)). EX2001, ¶¶44-54.

IV. LEGAL STANDARDS

Before instituting an inter partes review (IPR), the Director must determine, based on the parties' submissions, whether "there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1361 (2018) (quoting 35 U.S.C. §314(a)). The burden rests with the petitioner to demonstrate "a reasonable likelihood that at least one of the claims challenged in the petition is unpatentable." 37 C.F.R. §42.108.

When evaluating the reasonable likelihood of success, "[n]ot every factual contradiction rises to the level of a genuine issue of material fact at the preliminary stage of a proceeding." Consolidated Practice Trial Guide at 50-51. Moreover, "[t]he mere existence in the record of dueling expert testimony does not necessarily raise a genuine issue of material fact." (*Mortgage Grader, Inc. v. First Choice Loan Servs. Inc.*, 811 F.3d 1314, 1325–26 (Fed. Cir. 2016) (cited by the Consolidated Practice Trial Guide)). For example, in *Honda Motor Co., Inc. v. Neo Wireless LLC*, IPR2023-00797, Paper 29 at 21-22 (PTAB Sept. 3, 2024), the Board denied institution where the patent owner submitted an expert declaration with its preliminary response that effectively countered the petitioner's obviousness argument.

The petitioner also has the obligation to clearly set forth the basis for its challenges. *See Harmonic Inc. v. Avid Tech. Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. §312(a)(3), which requires IPR petitions to “identify with particularity . . . the evidence that supports the grounds for the challenge to each claim”). A petitioner may not introduce new evidence or arguments during the trial to remedy defects in its original petition. *SAS Inst.*, 138 S. Ct. at 1355. The Petitioner is the “master of the complaint” and must not reserve new theories to the reply. *Yita LLC v. MacNeil IP LLC*, 69 F.4th 1356, 1367 (Fed. Cir. 2023); *see also Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367 (Fed. Cir. 2015) (holding that “a challenge can fail even if different evidence and arguments might have led to success”); *Intelligent Bio-Sys. Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (quoting 37 C.F.R. §42.23(b) (“All arguments for the relief requested in a motion must be made in the motion. A reply may only respond to arguments raised in the corresponding opposition or patent owner response.”)).

When alleging obviousness, a petition must provide a clear explanation of how specific references could be combined, the elements from each reference that would result in a predictable outcome, and how any proposed combination addresses the claims at issue. *ActiveVideo Networks, Inc. v. Verizon Commc’ns Inc.*, 694 F.3d 1312, 1327-28 (Fed. Cir. 2012); *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1051 n.14 (Fed. Cir. 2016) (en banc) (“Of course, concluding that the references are

within the scope and content of the prior art to be considered for obviousness does not end the inquiry.”). Obviousness must not rely on hindsight; the petitioner must establish a rational motivation to combine references and show that the combination would have been within the skill of a person of ordinary skill in the art. *Personal Web Techs. v. Apple, Inc.*, 848 F.3d 987, 993 (Fed. Cir. 2017). The Petition must articulate “some articulated reasoning with some rational underpinning” to support its proposed obviousness ground. *KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

V. LEVEL OF ORDINARY SKILL

Patent Owner does not dispute Petitioner's definition of a POSITA for the purposes of the Preliminary Patent Owner Response. Patent Owner reserves its right to dispute the Petitioner's definition if this Petition is instituted.

VI. CLAIM CONSTRUCTION

Petitioner identifies certain claim constructions that were either construed in a previous IPR proceeding concerning the '978 patent (Ex. 1022) or during a recent District Court litigation involving the '978 patent and related patents (Ex. 1024, 1025). Pet. 10-13. These constructions are consistent with reexamination proceedings involving the '978 patent and its related patents, including claims similar to those at issue in this proceeding. *See generally* EX1024, 1043, 1046, 1048. During these prior proceedings before the Board, District Court, and Patent Office,

the constructions were found to be consistent with the intrinsic record of the '978 patent.

Kove believes the applicability of constructions determined in previous IPR and district court litigation proceedings, as set forth in part in the Petition. Pet., 9-10; EX2001, ¶67. For ease of reference, the relevant constructions are:

'978 Patent Terms	AWS Proceeding/IPR Construction
identifier	a unique encoding that identifies an individual entity, and with which zero or more data location specifiers are associated in a location server (EX1022, 13) a unique encoding that identifies an individual entity, and with which zero or more data location strings are associated in a location server (EX2013, Exhibit B, 3) ³

³ Patent Owner includes this construction, which was agreed to between the parties in the *Kove IO, Inc. v. Amazon Web Services, Inc.*, Case No. 1:18-cv-08175 (N.D. Ill.) matter, for completeness. The construction differs non-substantively from the construction determined by the Board in IPR2020-00276 only insofar as the word “strings” replaces “specifiers.”

location information	information pertaining to one or more locations of data and/or the identities of one or more location servers (EX1024, 35)
location server	a network-attached component that maintains a set of identifier/location mappings that are modified or returned in response to location request messages from clients (EX1024, 35)
client	a network-attached component (which may be software or hardware) that initiates update or lookup of identifier/location mappings from a location server with location request messages (EX1024, 35)
plurality of location servers	location servers in non-hierarchical structures (EX1025, 19)
Preamble – claim 14	Preamble after “comprising” limits the claim

	(EX2013, Exhibit B, 1) ⁴
Preamble – claim 17	Preamble after “having” limits the claim (EX2013, Exhibit B, 1)

Petitioner includes these same constructions in the Petition, with the exception of the second construction for “identifier,” which substantively similar to the construction Petitioner includes, and the two preambles of claims 14 and 17. The preambles are limiting as noted because they “recite[] essential structure or steps” and are “necessary to give life, meaning, and vitality to the claim.” *Pitney Bowes, Inc. v. Hewlett–Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999). The preambles provide important context for the nature and structure of the inventions being claimed, without which the remainder of the claim would be difficult (if not impossible) to understand. In particular, the preamble of claim 14 introduces the term “*a plurality of location servers*” that is the antecedent basis for terms recited the body of the claim (e.g., “one of the plurality of location servers,” “the queried location server”). The preamble also defines necessary characteristics of the servers (“*each location server containing a unique set of location information of an*

⁴ The parties in *Kove IO, Inc. v. Amazon Web Services, Inc.*, Case No. 1:18-cv-08175 (N.D. Ill.) agreed that these preambles are limiting, and the District Court noted the parties’ agreement with approval in its claim construction order (EX1044, n. 1).

aggregate set of location information correlating each of a plurality of identifiers with at least one location.”). The preamble of claim 17 is similarly necessary to the scope and context of the claim and is limiting for the same reasons as claim 14.

VII. THE PETITION DOES NOT DEMONSTRATE A REASONABLE LIKELIHOOD OF SUCCESS ON ANY GROUND

Petitioner challenges claims 1-7, 10-17, 23-26, and 30 of the '978 patent. The Petition asserts five grounds of unpatentability:

Ground 1: Claims 3, 5, 6, 10, and 12-16 are unpatentable under pre-AIA 35 U.S.C. §103 as being obvious over Kahn (EX1005).⁵

Ground 2: Claims 2 and 11 are unpatentable under pre-AIA 35 U.S.C. §103 as being obvious over Kahn and Krasner (EX1009).

Ground 3: Claims 3-4, 7, 10, 12-17, 23, and 30 are unpatentable under pre-AIA 35 U.S.C. §103 as being obvious over Kahn and Vingralek (EX1007).

Ground 4: Claim 11 is unpatentable under pre-AIA 35 U.S.C. §103 as being obvious over Kahn, Vingralek, and Krasner.

⁵ Petitioner lists claim 1 as part of Ground 1. As Petitioner noted, claim 1 was canceled in a prior proceeding and thus is not a part of this proceeding nor can it serve as a basis on which to institute trial. Pet., 4; *Fresenius USA, Inc. v. Baxter Intern., Inc.*, 721 F. 3d 1330, 1345-46 (Fed. Cir. 2013).

Ground 5: Claims 24-26 are unpatentable under pre-AIA 35 U.S.C. §103 as being obvious over Kahn, Vingralek, and Sato (EX1011).

All Grounds fail because Petitioner has not meet its burden of proving that the prior art discloses a limitation that is common to every challenged claim: this limitation requires that the claimed location servers in the claimed plurality of location servers contain sets of location information that are unique or distinct from one another. Petitioner relies exclusively on Kahn to disclose this limitation, but for reasons detailed below, it does not. Petitioner's failure to show that Kahn discloses this element defeats Petitioner's argument with respect to every claim and every Ground.

Petitioner's arguments with respect to Ground 2 fail for the additional and independent reason that Petitioner does not articulate a meaningful reason for why a POSITA would attempt to combine Kahn with Krasner. Krasner is directed to a different field of art than either Kahn or the '978 patent, making it not a suitable reference for Petitioner to rely on for purposes of demonstrating obviousness.

Grounds 3, 4, and 5 all fail for the added reason that each depends on combining Kahn with Vingralek. Petitioner has not provided sufficient evidence that Vingralek qualifies as a prior art reference under pre-AIA §102(b). In particular, Petitioner has failed to show that Vingralek was publicly accessible to persons interested and ordinarily skilled in the art prior to the '978 patent's earliest possible

priority date of July 8, 1998⁶. Petitioner's reliance on its declarant, Dr. Sylvia Hall-Ellis is misplaced and insufficient. Dr. Hall-Ellis's declaration is rife with errors, and the evidence she relies on to support her opinion regarding Vingralek's alleged public availability is wrong, irrelevant, and/or insufficient.

Additionally, Petitioner's arguments with respect to claims 3 and 10-16 fail for the independent reason that Petitioner's prior art does not disclose or render obvious the "redirect message" limitation present in each of these claims. Petitioner relies on Kahn or Kahn in view of Vingralek as allegedly disclosing or rendering obvious these claims, but neither Kahn alone (Ground 1) or Kahn in combination with Vingralek (Ground 3) teach or render obvious this limitation.

Petitioner's arguments with respect to claims 17, 23-26, and 30 also fail for the added reason that Petitioner fails to articulate sufficient reasoning and underpinning for combining Kahn with Vingralek such that the combination renders these claims obvious. Kahn hash-based approach for storing data evenly across servers is fundamentally different than that of Vingralek, which distributes keys into

⁶ Petitioner states that it does not concede that the '978 patent is entitled to a July 8, 1998 prior date, but also "does not raise that issue in this petition as it is not relevant." Pet. n.2. Patent Owner reserves the right to dispute Petitioner's position should trial be instituted.

buckets, multiples of which may be held on a server, which tends towards uneven distributions of load. Petitioner fails to reconcile the architectural mismatch between these systems and wrongly assumes that a POSITA would be motivated to modify Kahn in view of Vingralek. Petitioner also leaves unaddressed how a POSITA would go about redesigning Kahn's system to implement Vingralek's methodology for managing loads and why the POSITA could expect a reasonable likelihood of success.

VIII. ALL GROUNDS - THE CHALLENGED CLAIMS REQUIRE LOCATION SERVERS WITH UNIQUE SETS OF LOCATION INFORMATION

All claims of the '978 patent recite limitations requiring that the location servers within the plurality of location servers contain unique sets of location information. The '978 patent teaches that, in one embodiment, "each of the NDTP server in the cluster [of servers] may contain a different portion of a pool of associated identifier and location information." EX1001, 7:43-48. This feature is reflected in the claims of the patent. In particular, independent claims 1, 10, 14, and 17 recite, in pertinent part:

[1.b] *a second location server comprising a second set of location information, wherein at least a portion of the second set of location information differs from the first set of location information; and*

[10.a] a plurality of location servers containing location information corresponding to a plurality of entities, the location information formatted according to a transfer protocol configured for manipulating location information, and comprising at least one application server address, wherein the plurality of location servers are arranged in a cluster topology such that *each location server contains a unique set of location information of an aggregate set of the location information*; and

[14.pre] A method of handling location queries in a network, the network comprising a plurality of location servers, *each location server containing a unique set of location information of an aggregate set of location information* correlating each of a plurality of identifiers with at least one location, the method comprising:

[17.pre] A method of scaling at least one of capacity and transaction rate capability in a location server in a system having a plurality of location servers for storing and retrieving location information, wherein *each of the plurality of location servers stores unique set of location information of an aggregate set of location information*, the method comprising:

Petitioner relies on Kahn alone as allegedly teaching these limitations. Pet. 22, 31, 34-35, 55. For claim 1, Petitioner relies on two disclosures in Kahn as allegedly teaching this element: “EX1005, 45:25-29, 37:31-38:3.” Pet. 22. And for

claims 10, 14, and 17, Petitioner relies on “EX1005, 29:23-26, 37:31-38:3.” Pet. 31, 34-35, 55. The citation to EX1005 29:23-26 is irrelevant because it refers to *handle server directory* which is different from *handle server* and is not what Petitioner points to as the “location servers” of the claims. The citations to EX1005 4:25-29 and EX1005 37:31-38:3 do not stand for the proposition that the handle-to-pointer mappings (i.e., what Petitioner asserts are the claimed “sets of location information”) among the plurality of handle servers are unique. Instead, Kahn merely says that a handle server “holds pointers for a subset of all handles.” EX1005 37:31-33; *see also id.*, 4:25-29. This simply teaches that a handle server does not hold all possible handles, but something less than the whole (a subset). It does not say that what a given handle server holds must be *different* than (or unique with respect to) what another handle server holds.⁷ Because Kahn does not teach this limitation, and Petitioner relies solely on Kahn to do so, there is no reasonable likelihood that Petitioner will succeed in proving any of the claims of the ’978 patent unpatentable. EX2001, ¶¶68-69.

⁷ Kahn teaches that handle servers can hold the same handles as one another so “they can be used to back each other up.” EX1005, 39:7-9.

IX. GROUND 2 - NO MOTIVATION TO COMBINE KAHN WITH KRASNER

In Ground 2, Petitioner alleges that claims 2 and 11 are obvious over Kahn in view of Krasner. Claim 2 depends from claim 1 and adds the requirement, “*the at least one location comprises a plurality of geographic locations, each of the geographic locations representing a position of the entity at a different time.*” Claim 11 depends from claim 10 and adds the similar requirement, “*the location information comprises geographic location information.*” Petitioner acknowledges that Kahn does not teach either limitation. Pet., 40-43; EX2001, ¶¶70-74.

Petitioner contends a POSITA would have been motivated to combine Kahn with Krasner, to fill the gap created by the added limitations. Pet. 41-43. Petitioner states that because Krasner “relates to a client-server system” and has “location servers that store information pertaining to a mobile GPS unit,” that is sufficient motivation for a POSITA “to consider Krasner when implementing Kahn’s system/method.” Pet. 41. Petitioner’s conclusory argument lacks both reasoning and support. “A claimed invention is unpatentable if the differences between it and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the *pertinent art.*” *Tokai Corp. v. Easton Enters., Inc.*, 632 F.3d 1358, 1366 (Fed.Cir.2011). In other words, Petitioner must show that a POSITA would have been motivated to combine Kahn with Krasner because those references are in analogous fields of art

and would have been consulted by a POSITA in seeking a solution to the problem that the invention of claims 2 and 11 were trying to solve. Kahn and Krasner, however, are not in analogous fields of art. EX2001, ¶¶70-71.

Kahn is directed to a digital rights management system, where “objects are stored at locations accessible in the network using a storage technique which render the digital objects secure against unauthorized access.” EX1005, Abstract; *see also* 3:15-32. Kahn’s field of endeavor, as summarized by its title, relates to “identifying, managing, accessing, and tracking digital objects and associated rights and payments.” *Id.*, Title; EX2001, ¶72.

Krasner, on the other hand, is about techniques for operating a satellite positioning system receiver. EX1009, Title; Abstract. Krasner teaches that prior art systems that provided ways to track the route of a moving GPS receiver suffered from drawbacks including needing “a good view of the sky,” the ability to “receive multiple satellites clearly,” “large amounts of battery power,” and/or to be “repeatedly powered up.” *Id.*, 1:48-38. Krasner therefore sought to teach a way “for providing multiple sets of position information over a period of time through a mobile GPS unit” (*id.*, 2:39-41) by disclosing techniques for determining pluralities of pseudoranges, transmitting them to a location server in a single transmission, and having the sever determine the GPS receiver’s position from the plurality of

pseudoranges, preferably in response to a predetermined event. *Id.*, Abstract, 4:66-5:24; 5:49-6:15; 6:54-7:27; EX2001, ¶73.

Krasner's field of endeavor is therefore distinct and different from Kahn's and a POSITA would not have found them to be analogous for the purpose referring to both Kahn and Krasner to find a solution to the problem that the '978 patent was trying to solve. *In re Natural Alternatives, LLC*, 659 Fed.Appx. 608, 613 (2016) ("The 'analogous arts test' governs the question of whether a skilled artisan would have looked to an unrelated prior art reference. Under this test, 'a reference is either in the field of the applicant's endeavor or is reasonably pertinent to the problem with which the inventor was concerned in order to rely on [that] reference as a basis for rejection.'"). EX2001, ¶74.

Controlling law further requires that Petitioner show that "a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention." *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (emphasis in the original). Merely alleging that two references could have combined the references is not enough; there must be a valid reason why a POSITA would have done so. *See Virtek Vision Int'l v. Assembly Guidance Sys.*, 97 F.4th 882, 886 (Fed. Cir. 2024). Because Kahn and Krasner relate to different technological fields, a POSITA would not have turned to

Krasner as analogous art and therefore would not have sought to combine them.

Failing this showing, Petitioner cannot succeed as to Ground 2.

X. GROUNDS 3, 4, 5 - VINGRALEK IS NOT PRIOR ART

To qualify as printed publication prior art under pre-AIA 35 U.S.C. §102(b), Vingralek (EX1007) must have been publicly available prior to July 8, 1998, the priority date of the '978 patent. Petitioner bears the burden of demonstrating a reasonable likelihood of such public availability. As detailed in the accompanying declaration of Nancy E. Adams, an expert in library cataloging, classification, and searching, confirms, Petitioner has failed to carry its burden. EX2002, ¶¶ 14-40.

A reference is considered publicly accessible if it was “disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it.” *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016). Whether a particular reference qualifies as a printed publication is determined on a case-by-case basis. *In re Cornyn*, 890 F.2d 1158, 1161 (Fed. Cir. 1989) (internal quotations omitted). Petitioner’s burden for institution is to “identify, with particularity, evidence sufficient to establish a reasonable likelihood that the reference was publicly accessible before the critical date of the challenged patent and therefore that there is a reasonable likelihood that it qualifies as a printed publication.” *Hulu, LLC*

v. Sound View Innovations, LLC, IPR2018-01039, Paper 29 at 13 (PTAB Dec. 20, 2019) (precedential).

Petitioner offers two theories in support of Vingralek's alleged public availability: (1) that Vingralek was included in a December 1993 *Jahresbericht* (Annual Report) that was purportedly catalogued and indexed by libraries (Ex. 1020, ¶¶50, 51, 54) and (2) that Vingralek was mentioned in an article by Norrie that was purportedly published in 1994 (Ex. 1015). Neither theory is availaing: (1) the December 1993 Annual Report *does not* include Vingralek and is therefore irrelevant, EX2002, ¶¶ 20-21, EX2005, EX2011; and (2) Vingralek's mention in Norrie is not evidence of public availability because the two papers originated from the same department in the same university around the same time and share a common author, making it likely that Vingralek was known to Norrie personally, *id.*, ¶¶ 34-40, EX2012. Personal knowledge is not a sufficient indicator of public availability.

A. The Hall-Ellis Declaration Fails to Establish Vingralek's Public Availability Before the Critical Date

The copy of Vingralek provided as Ex. 1007 is an electronic file that was not available until 2017, which is years after the '978 patent's July 1998 priority date. EX2002, ¶¶ 23-25, EX2006, EX2007. To overcome this, Petitioner's declarant, Dr. Hall-Ellis, alleges Vingralek's public availability is tied to the publication of a different document – a 1993 Annual Report that she contends was catalogued by

various libraries around that time. EX1020, ¶46 (“The Vingralek article was published on pages 3-26 in Volume 207 dated December 1993 of the open access *Jahresbericht* [Annual Report] issue of the journal *Eidgenössische Technische Hochschule* [Federal Technical University] Zürich (ETH Zürich) and was found in the digital repository Zeitschriftendatenbank [German Union Catalog of Serials] (ZBD) (Berlin, Germany).”⁸ But the Annual Report (which was not included in Dr. Hall-Ellis’ Declaration but which was readily available on a website she identified) does not actually include Vingralek, making the Annual Report not relevant evidence of Vingralek’s public availability. EX2002, ¶¶ 20-21, EX2005, EX2011.

1. Vingralek Bears No Indicia of Public Availability and Was Never Part of a December 1993 *Jahresbericht*

Vingralek EX1007 does not contain any indicia evidencing a date of public availability. EX2002, ¶¶ 15- 16. The exhibit’s cover page bears a “Publication date” of “1993” but no corroborating indication of public accessibility. EX1007, 1. The second page has a date of December 1993, and the third page has a “© 1993.” *Id.*,

⁸ The terms *Jahresbericht* and Annual Report are used interchangeably herein and refer to the December 1993 copy of the open access *Jahresbericht* issue of the journal *Eidgenössische Technische Hochschule* Zürich (ETH Zürich) Dr. Hall-Ellis identifies in paragraph 46 of her Declaration (EX1020).

2-3. Copyright and publication dates alone are not sufficient indication of public availability under §102(b).

For example, in *Sophos v. Open Text*, IPR2023-00731, the Board held that “[s]imply pointing to a date, alleged to be a ‘publication date,’ even where that date cascaded through various patent references, without interpretation or explanation, does not meet the threshold standard to show that it is reasonably likely that a reference was publicly accessible on that date.” Paper 23 (PTAB Nov. 2, 2023) (quoting *In-Depth Geophysical, Inc. v. ConocoPhillips Co.*, IPR2019-00849, Paper 17 at 5 (PTAB Mar. 30, 2020)). Dr. Hall-Ellis was also the declarant in the *Sophos* proceeding, and the Board found that “Petitioner and Dr. Hall-Ellis rely on nothing more than speculation that [the reference] was publicly accessible in the relevant time frame.” *Id.* at 19. The same is true here – Dr. Hall-Ellis “simply points to” the December 1993 date and speculates, without anything more, that Vingralek became publicly accessible around that time.⁹ Ex. 1020 ¶46. That is not enough.

⁹ Dr. Hall-Ellis’s opinion of Vingralek’s public availability around December 1993 is even more questionable in view of the fact the References section at the end of Vingralek cites to a paper from 1994, the year *after* Vingralek allegedly became publicly available. EX1007, 26 (“[HW94] Y. Huang, O. Wolfson, Object Allocation in Distributed Databases and Mobile Computers, Data Engineering Conference,

Overall, Exhibit 1007 bears no indication of whether or when it was made publicly available, either as a standalone document or as part of any other publication, including a *Jahresberich*. EX2002, ¶¶ 14-17.

Dr. Hall-Ellis explains that she downloaded Exhibit 1007 from a particular webpage.¹⁰ EX1020, n. 20. Included at the bottom of that webpage is a “Show all metadata” hyperlink that identifies the paper availability date as 2017, nearly two decades after the 1998 priority date. EX2002, ¶¶ 23-25, EX2006, EX2007.

Distributed file organization with scalable cost/performance	
dc.contributor.author	Vingralek, Radek
dc.date.accessioned	2017-11-17T14:34:28Z
dc.date.available	2017-06-10T18:45:16Z
dc.date.available	2017-11-17T14:34:28Z

Houston, 1994.”). A paper that was supposedly available in 1993 could not have cited to a paper that did not yet exist.

¹⁰ Dr. Hall-Ellis does not claim any personal knowledge of when Vingralek was first published or became publicly available. Her opinions appear to be based solely on her review of online databases (presumably around the time she prepared her declaration).

Dr. Hall-Ellis made no mention of metadata or the 2017 date in her declaration.¹¹

Dr. Hall-Ellis included Attachments 1A-1D to her declaration as evidence supporting her opinion that Vingralek was publicly available around December 1993. All of the attachments relate to the Annual Report that she contends contains Vingralek. Ex. 1020, ¶46. Attachment 1A is supposedly “the web page where Vingralek is found on ZDB.” Ex. 1020, ¶46. Attachment 1A, however, relates to the “Jahresbericht / ETH, Eidgenössische Technische Hochschule Zürich” serial generally, but does not describe any individual articles published within it; that is not its purpose. EX2002, ¶ 27. Attachment 1A also identifies that the journal was published in German, not English. *Id.* Neither Vingralek nor a “volume 207” is mentioned anywhere in Attachment 1A. *Id.*, ¶¶ 18, 27.

Dr. Hall-Ellis claims Attachment 1B is “the MARC record for the open access *Jahresbericht* [Annual Report] of the journal *Eidgenössische Technische Hochschule* [Federal Technical University] Zürich in the ETH Zürich Library online

¹¹ The Board has denied institution where a petitioner relied on a website without further evidence that it was a “true and correct copy” as of a date before the priority date of the patent at issue. *See I-Blason LLC v. Aevoe Corp.*, IPR2016-00231, Paper 6 at 14-15 (PTAB May 8, 2016); *Next Step Group, Inc. v. Deckers Outdoor Corp.*, IPR2024-00164, Paper 16 at 13-14 (PTAB Aug. 6, 2024).

catalog,” and cites to a link at footnote 21. Ex. 1020, ¶49, n.21. Attachment 1B, however, does not connect Vingralek to the *Jahresbericht ETH Zurich* publication and does not provide any evidence that Vingralek was published in the *Jahresbericht*. In fact, there is no support for Dr. Hall-Ellis’s statements that Attachment 1B is the true and correct copy of the MARC record for the print copy of *Jahresbericht ETH Zurich 1993*, where she claimed Vingralek was published. EX2002, ¶¶28-31, EX2008-EX2010.

Attachment 1C, which Dr. Hall-Ellis states is a “copy of the MARC record for the journal *Eidgenössische Technische Hochschule* [Federal Technical University] Zürich obtained from the OCLC bibliographic database” (Ex. 1020, ¶52), also does not provide any link between Vingralek and the Annual Report of ETH Zurich. Attachment C, which also references a German language publication (EX2002, ¶18), contains no information regarding the existence of a “volume 207” or any particular articles or authors.

Finally, Attachment 1D is the site where Dr. Hall-Ellis says the *Jahresbericht* journal can be found, according to the WorldCat database. Again, Attachment D relates to a German language publication and does not mention Vingralek or any article, author, or volume. EX2002, ¶¶18, 28-33.

Curiously, Dr. Hall-Ellis never includes a copy of the December 1993 Annual Report, even though the report can be found in the ETH Zürich digital repository

identified in her declaration.¹² Ex. 1020, ¶¶47-48, n. 19, 20. In particular, searching for “*Jahresbericht ETH Zurich*” at <https://www.research-collection.ethz.ch>¹³ returns 51 results, which, when filtered by date range from “1990-1999” yields 10 results, one of which is the 1993 Annual Report. EX2002, ¶19. Per Dr. Hall-Ellis, this issue supposedly contains the Vingralek article. It does not. EX2002, ¶¶20-22.

The 1993 Annual Report (EX2005) is a document written entirely in German, whereas Vingralek (EX1007) is written entirely in English. EX2002, ¶¶18-19. It ***does not*** contain the Vingralek article or any mention of Vingralek or his paper. EX2002, ¶¶20-21, 26, EX2005, EX2011. Dr. Hall-Ellis does not explain why she did not include the Report in her declaration, or whether she reviewed a copy of it before rendering her opinion that “[t]he Vingralek article was published on pages 3-26 in Volume 207 dated December 1993 of the open access *Jahresbericht* [Annual Report] issue of the journal *Eidgenössische Technische Hochschule*.”

¹² Dr. Hall-Ellis identifies the link <http://www.research-collection.ethz.ch>. The 1993 *Jahresbericht* can be found by entering “Jahresbericht 1993” in the search box, which leads to the following website, which includes the PDF for download: <https://www.research-collection.ethz.ch/handle/20.500.11850/643838>. EX2002, ¶19.

¹³ EX1020, ¶47-48, n. 19, n. 20.

Vingralek's absence from the Annual Report renders it, and all evidence relating to it, including Dr. Hall-Ellis's declaration statements, irrelevant. Petitioner should not be permitted to rely on Dr. Hall-Ellis's opinions or Attachments 1A-1D as evidence of Vingralek's public availability. Even if Petitioner were so permitted, such evidence cannot support Vingralek's availability because they bear no discernable relationship to Vingralek.

2. Norrie is Not Sufficient to Establish Vingralek's Public Availability

Norrie (EX1015) is an article about database research centers that appears in the publication *SIGMOD Record* that bears the date March 1994. Norrie references Vingralek in a single footnote (and nowhere else):

[3] R. Vingralek, Y. Breitbart, G. Weikum and R. Yavatker, "Distributed File Organisation with Scalable Cost/Performance", Technical Report 207, Dept. of Computer Science, ETH Zurich, Switzerland, December 93.

EX1015, 121, n. 3. This footnote is not sufficient indication of Vingralek's public availability for the reasons below.

a. Vingralek was personally known to the Norrie authors

Both Norrie and Vingralek originated from the same institution (the Computer Science Department at ETH-Zurich) and shared a common author (Weikum). Compare EX1015, 1 to EX1007, 1. Both papers also appear to have been prepared around 1993-1994. *Id.*; EX2002, ¶38, 40.

These facts indicate that the Norrie authors became aware of Vingralek through Weikum's shared authorship, as well as their departmental affiliations at ETH Zurich. As such, Norrie's citation to Vingralek cannot serve as reasonable indication that Vingralek was publicly accessible. *See Samsung Elecs. Co. v. Infobridge Pte. Ltd.*, 929 F.3d 1363, 1372 (Fed. Cir. 2019) (finding that a reference's accessibility to members of the authoring organization was insufficient to establish public accessibility); *Sophos*, Paper 23 at 18 (finding unpersuasive "citations by authors who had 'personal knowledge regarding the cited' reference).

b. There is insufficient evidence that the *SIGMOD* publication containing Norrie was indexed or searchable

Dr. Hall-Ellis describes the cataloging of the *SIGMOD Record* generally. Ex. 1020 ¶¶56-61; EX2002, ¶36. The attachments she provides (Attachments 2A, 2B, 2C, 2D, and 2E) focus on the *SIGMOD Record* itself, and do not provide any indication of the contents of any article, nor any indication of how anyone would search for and locate a particular article within any record. *Id.* In other words, Dr. Hall-Ellis does not describe the cataloging or indexing of any article within any *SIGMOD Record* issue. Thus, based on the evidence submitted by Dr. Hall-Ellis, someone searching for Norrie would need to review each *SIGMOD Record*, its table of contents, and the documents within the record to find the particular article at issue. *Acceleration Bay, LLC v. Activision Blizzard Inc.*, 908 F.3d 765, 773 (Fed. Cir.

2018) (finding a reference not publicly accessible where searching for it “would have required skimming through potentially hundreds of titles . . . with most containing unrelated subject matter”). And, with respect to Norrie itself, the title is simply “The Database Research Group at ETH Zurich,” which refers generally to the group at the university and does not describe any particular content or topic. EX2002, ¶36.

Dr. Hall-Ellis also does not provide any evidence or assertion as to when Norrie may have been published in an online form. She provides a link <<https://dl.acm.org/doi/pdf/10.1145/181550.181567>> and states that “[t]he Norrie article is available in the *ACM Digital Library* which indicates a March 1, 1994, publication date.” Ex. 1020, ¶55, n.23. The document available at the link (EX2012) is not the same as the version that was submitted as Ex. 1015. EX2002, ¶37. In particular, the online version is 6 pages (compared to 8 pages for Norrie) and does not include the general cover page or table of contents included in Norrie, which Dr. Hall-Ellis appears to indicate is a “print copy.” Ex. 1020, ¶57; EX2002, ¶37, EX2012. The spellings of the titles are also different (“Organization” versus “Organisation”), which raises further questions about the document referenced in footnote 3 relative to Vingralek, especially when Norrie does not include or describe the contents of the document referenced in footnote 3. EX2002, ¶37. There is no indication or evidence as to when an online version was first made publicly available.

XI. CLAIMS 3, 4, 10-16 - NO DISCLOSURE OF “REDIRECT MESSAGE”

Each of claims 3, 4, 10, and 14 recites a “redirect message” limitation not taught or rendered obvious by Kahn alone or Kahn in view of Vingralek.¹⁴

For Ground 1, Petitioner relies on Kahn alone as allegedly disclosing the “redirect message” limitation. Pet. 24, 32-33, 37-39. For Ground 2, Petitioner relies on Kahn in combination with Vingralek. Pet. 43-48, 51-53. Both Grounds fail for the reasons below. EX2001, ¶¶55-57, 75-85.

A. Ground 1 - Kahn Does Not Teach the Claimed “Redirect Message” Limitation

1. Claims 3 and 4

Claim 3, which depends from claim 1, recites a “redirect message”:

3. The system of claim 1, wherein the programming logic further comprises logic responsive to the location query to return one of a location message or a redirect message, wherein the location server receiving the query returns the location message if the queried location server contains location information for the desired entity, and wherein *the queried location server returns a redirect message if the queried location server lacks location information for the desired entity, the redirect message comprising information for finding a*

¹⁴ Claim 4 depends from claim 3. Claims 11-13 depend from claim 10, and claims 15-16 depend from claim 14.

location server known to have location information relevant to the location query.

In Ground 1, Petitioner relies on Kahn alone to disclose the “redirect message” limitation. As relevant to the issue here, Kahn teaches a “handle management system” that is “used to find the location of digital objects and the locations of each object’s RMS [rights management system].” EX1005, 28:29-31. Kahn teaches that a client sends a handle query request to a handle server in its handle management system. *Id.*, 29:5-12. If the handle server does not have the requested information, it transmits back to the client either a “not responsible” or “handle not found” message. *Id.*, 47:13-19; Fig. 8, step 182 (annotated below).¹⁵

¹⁵ Petitioner’s additional citation to EX1005, 73:1-74:26 adds nothing. Pet. 26. The “invalid-handle-server-selected response UDP packet” merely tells the client that it has queried the wrong server. It provides no information for finding the handle server known to have the sought after information relevant to the location query.

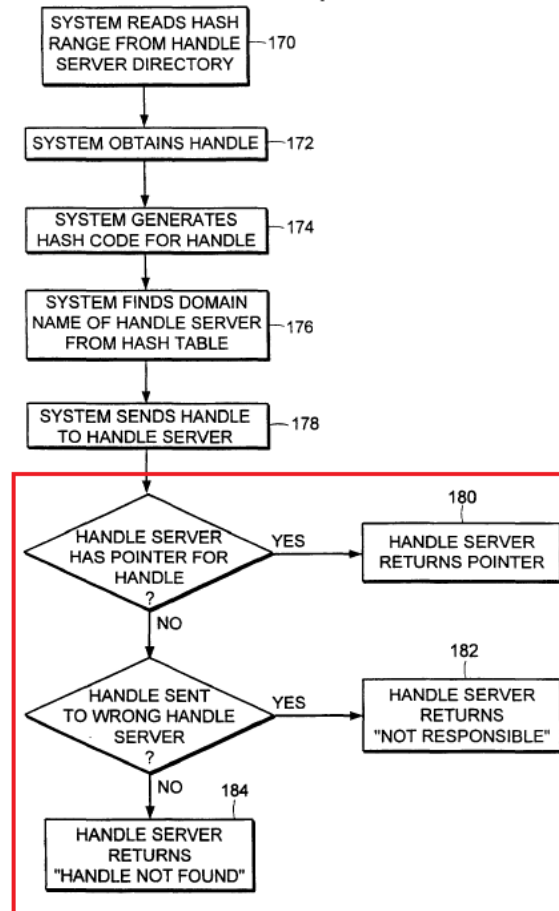


FIG. 8

Petitioner identifies the “not responsible for handle” message as the alleged “redirect message.”¹⁶ Pet. 26. But the “not responsible” message cannot be the

¹⁶ Petitioner repeatedly identifies the “not-responsible-for-handle” message as the “redirect message.” Pet. 26 (“Kahn discloses that the queried handle server (‘queried location server’) transmits a not-responsible-for-handle message (‘returns a redirect message’) to the client...”). But elsewhere Petitioner tries to murky the waters by suggesting that the “not-responsible-for-handle” message also “informs the client to

claimed “redirect message” for the straightforward reason that does not contain “*information for finding a location server known to have location information relevant to the location query.*” Rather, Kahn’s “not responsible” message indicates only that the queried server is “not responsible” and nothing more. EX2001, ¶¶55-57, 75-77.

Petitioner’s theory that Kahn’s “not responsible” message discloses the “redirect message” limitation is rooted in Petitioner’s contention that because Patent Owner (in a complaint in a related district court proceeding) alleged that “a cache miss response due to stale or incorrect location information” reads on the “redirect message” limitation, that must mean Kahn’s “not responsible” message suffices to disclose that limitation. Pet. 25-26. Not so. Patent Owner’s complaint (which is based only on publicly available information) alleges facts sufficient to plausibly

download an updated table.” *Id.* As explained, the “not-responsible-for-handle” message does not “inform” the client of anything other than that the handle server it queried is not responsible. Kahn teaches that a client “should download the hash range/handle-server-domain-name table” from a different server if the requested server does not have the correct information, but there is nothing to suggest that the impetus to download is contained *within* the not-responsible-for message. EX1005, 47:13-19, 74:5-9.

allege that Google's accused system includes the claimed redirect message. Patent Owner's allegation that "the client detects a miss, which is the redirect message" refers to the process triggered by the cache miss, which it believes includes receiving the required redirect message with the claimed contents. This is evident from the description of using a "location algorithm which calculates a location of a second data location server," which suggests the redirect message contains information used for this calculation, as required by the claims. See EX1001, cls. 3, 10, 14; EX2001, ¶¶78. But how redirection actually works in those accused products – including whether the detection of a cache miss includes receiving information for use by a client to calculate the location of a server containing the desired information – is the subject of forthcoming discovery.¹⁷ Simply put, if the evidence shows that the accused products perform redirection in the manner claimed, then the products infringe; if not, then they don't. What is not contestable, however, is the claim's express requirement that a redirect message must contain "*information for finding a location server known to have location information relevant to the location query.*"

¹⁷ Discovery in *Kove IO, Inc. v. Google LLC*, Case No. 1:23-cv-04244 (N.D. Ill.) is still in its early stages, and the case is currently stayed.

Kahn’s “not responsible” message does not contain any such information (or indeed any information beyond its “not responsible” message).¹⁸ EX2001, ¶¶78.

2. Claim 10

Claim 10 recite a “redirect message”:

[10.b] programming logic stored on each of the plurality of location servers responsive to a location query for a desired identifier to return one of a location message, *wherein a queried location server returns* a location message if the queried location server contains location information for the desired identifier, and *a redirect message if the queried location server does not contain location information relevant to the desired identifier, wherein the*

¹⁸ Petitioner states that its arguments are made in accordance with Patent Owner’s “interpretation.” Pet. 27. Petitioner presents no alternative arguments, but then cites to sections of its expert’s declaration that “address[] ‘redirect message’ under other interpretations.” *Id.* This is improper. Petitioner should be limited to arguments actually present in its Petition; it should not be allowed to circumvent statutory word count limits by incorporating additional arguments made by its expert. [CASE CITE]. If Petitioner is permitted to import arguments not present in its Petition, Patent Owner reserves the right to respond to them.

redirect message comprises information for finding a location server having location information related to the desired identifier.

In Ground 1, Petitioner relies on Kahn alone to disclose the “redirect message” for the same reasons it presented for claim 3. Those arguments fail for the same reasons stated above. *See supra* §XI.A.1; EX2001, ¶¶79-80.

3. Claim 14

Claim 14 recites a “redirect message”:

[14.c] *sending a redirect message to the client if the queried location server does not contain data location information relevant to the entity identified in the query, the redirect message comprising information for finding a location server storing the entity identified in the query.*

In Ground 1, Petitioner relies on Kahn alone to disclose this limitation, presenting two alternative theories. The first, which comprises the same arguments as presented for claim 3, fails for the same reasons stated above. *See supra* §XI.A.1; EX2001, ¶¶81-82.

Petitioner’s second theory also fails. Under this theory (“to the extent limitation [14.c] does not require that the redirect message be sent from the queried location server”), Petitioner argues that the client’s downloading of a “handle-server-domain-name table” fulfills the “redirect message” limitation. Pet. 38. As explained above, a POSITA would understand from the specification and

prosecution history of the '978 patent that claim 14 requires the responding server to be the same server that received the request (here, the handle server). *See supra* §III.B. *Netword, LLC v. Centraal Corp.*, 242 F.3d 1347, 1352 (Fed.Cir.2001) (“The claims are directed to the invention that is described in the specification; they do not have meaning removed from the context from which they arose.”); EX2001, ¶¶47-52, 83.

The '978 patent teaches that a goal of the invention is a mechanism that would “permit queries to be directed only at data repositories with relevant information.” EX1001, 2:1-5. The specification consistently discloses networks where a client may query a location server in a network and, if that queried server does not have the requested information, it (and not something else) returns a redirection message containing information useable to determine the right server. *See e.g., id.*, 2:42-52; 4:34-38; 7:55-8:6; 9:52-67; 13:16-24; 15:64-16:2; 16:29-35; 18:51-57; 18:60-19:4; 19:27-37; EX2001, ¶¶47-52, 81. The specification does not describe or provide teachings to enable a system where a client queries one server but a different server or component returns the redirect information. EX2001, ¶¶47-52, 83; *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 389, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996) (“[A claim] term can be defined only in a way that comports with the instrument as a whole.”); *see also Amdocs (Isr.), Ltd. v. Openet Telecom, Inc.*, 761 F.3d 1329, 1340 (Fed. Cir. 2014) (“The district court properly concluded that the

embodiments define the outer limits of the claim term and did not err in reading the ‘in a distributed fashion’ and the ‘close to the source’ of network information requirements into the term ‘enhance.’”)

As Petitioner admits, the “hash range/handle-server-domain-name table” comes from a *handle directory server*, and not the *handle server*:

The handle server then returns its response to the requesting system. If the handle server found the pointers, a list of pointers is returned (step 180). This could include pointers to use one or more repositories and one or more RMS’s. **If the handle was sent to the wrong handle server, it returns a not-responsible-for-handle message (step 182).**

In this case, **the client system should download the hash range/handle server-domain-name table from the handle server directory** again and attempt the mapping again. The requester will determine how many times to try before giving up (and this same approach is used in other similar situations described below).

EX1005, 47:9-21 (emphases added).

The “hash range/handle-server-domain-name table” is something the client downloads from a “handle directory server” when the handle server it sent its query to returns a “not-responsible-for-handle” message. Kahn teaches that “handle

servers” and “handle directory servers” are different servers.¹⁹ EX1005, 38:9-11.

Kahn explains that “handle server system 1230 includes *handle servers 1232* and *handle directory servers 1234*” *Id.* (emphasis added).

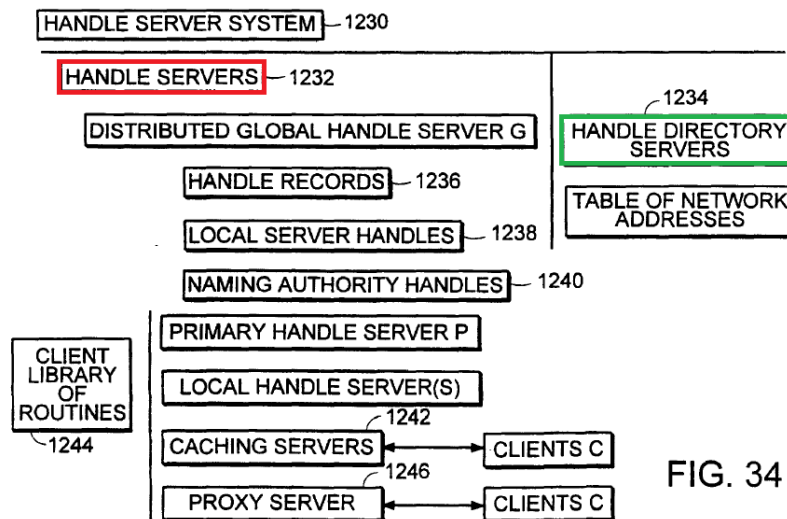


FIG. 34

Id., Fig. 34. Assuming *arguendo* that the client’s download of a “hash range/handle-server-domain-name table” from a handle directory server counts as a “transmission” of that message from the handle directory server to the client, that

¹⁹ Kahn uses “handle directory server” and “handle server directory” interchangeably. See, e.g., EX1005, 38:9-11 (“As seen in Fig. 34, the handle server system 1230 includes handle servers 1232 and *handle directory servers* 1234 located at certain well known locations.”), 46:29-32 (“In a first step 170, a client system downloads the table that associates hash ranges with handle server domain names from the *handle server directory* for future use.”) (emphasis added).

still does not meet the limitation of the claim. This is because the claim requires the transmission of “redirect message” come from the server that the client queried, not a different server. In Kahn, a client queries a *handle server*; what sends the “hash range/handle-server-domain-name table” is a *handle directory server* – a message coming from a different server cannot be the claimed “redirect message.” Because Kahn teaches that a “hash range/handle-server-domain-name table” comes from a handle directory server and not the handle server, that table cannot be the claimed redirect message. EX2001, ¶¶55-57, 84-85.

B. Ground 3 - Kahn in View of Vingralek Does Not Teach the “Redirect Message” Limitation, as Required by Claims 3, 10, and 14²⁰

Petitioner contends that “[t]o the extent Kahn does not disclose “the redirect message comprising information for finding a location server known to have location information relevant to the location query,” a POSITA would have found it obvious to implement this feature in view of Vingralek.” Pet. 43. This Ground fails because combining Kahn with Vingralek does not cure Kahn’s deficiencies or render any of the claims obvious. Petitioner alleges that a POSITA would have been motivated to “modify Kahn’s mechanism of notifying the client” by having the

²⁰ Ground 3 comprises substantially the same arguments for the “redirect” limitations of claims 3, 10, 14. Pet., 43-48, 51-53.

handle server “transmit a message (‘redirect message’) to the client, including the handle server’s hash table for use by the client to calculate a location of a correct handle server that contains the pointers associated with the handle.” Pet., 46. For the reasons below, this “combination” fails because it depends on Kahn’s handle servers storing hash tables, but they do not. EX2001, ¶¶86-96.

1. Kahn’s “handle servers” do not store hash tables

Petitioner contends that Kahn’s “handle server store copies the hash table,” citing EX1005, 38:9-17 and 46:29-32 in support. Pet. 45; *see also*, 46, 47. This fundamentally misreads Kahn, and Petitioner’s own citations disprove its theory. The first citation says:

As seen in Fig. 34, the handle server system 1230 includes handle servers 1232 and handle directory servers 1234 located at certain well known locations. **The directory servers will maintain a table of network addresses of handle servers (generally, each handle server will contain such a directory).** This table will 15 generally be downloaded by each participating site frequently enough to be “acceptably” up-to-date at all times.

EX1005, 38:9-17 (emphasis added). The “directory” that each handle server generally contains is the “table of network address of handle servers.” This is not a hash table. EX2001, ¶¶56-58, 87-88.

The second citation says:

In a first step 170, **a client system downloads the table that associates hash ranges with handle server domain names from the handle server directory** for future use.

EX1005, 46:29-32 (emphasis added). The hash table referenced here is downloaded by a *client* (not a handle server) from a handle server directory (not a handle server). Absent any support in Kahn, Petitioner's theory that "Kahn discloses that both client and handle server store copies of the hash table" fails. EX2001, ¶¶55-57, 89-90.

2. A POSITA would not have been motivated or found it obvious to modify Kahn in view of Vingralek

Vingralek teaches a "distributed file organization for record-structured, disk-resident files with key-based exact-match access." EX1007, 3. In the Vingralek system, a client *c* sends a key *K* to a server *s*. *Id.*, 9. Server *s* applies certain hash functions to *K* until it identifies a server *s'* that it thinks has the records associated with *K*. *Id.* Vingralek explains:

If *K* does belong to the server that received it (i.e., if *s* = *s'*), the server performs the requested operation. However, ***if K has been sent to the wrong server, the server forwards it to s', and updates the client's view with its file level L, and its address table.*** Eventually, *K* is received by the correct server and the client operation is executed. Further, as an important side effect, clients gradually bring their

perception of the file up-to-date, so that the probability of wrongly addressed messages is significantly reduced.

Id., 10 (emphasis added). In other words, if the queried server s does not have the requested information, server s performs the calculation to identify server s' and forwards the key on. Server s also “updates the client’s view with its file level L , and its address table.” Vingralek explains that:

[e]ach client c and each server s have their own perception of the file that is characterized by their value of the file level, denoted as L_c and L_s , respectively, and a copy of the address table that they currently have. The client’s and the server’s perception of the file may or may not coincide with the current picture of the file (i.e., they may have stale information on the file level and the address table).

Id., 9. This means that the next time the client c sends a new request, it will have updated (less stale) information to use to identify a new server to query. Importantly, this updated information is *not* used by the client to resolve its initial request involving K – as Vingralek teaches, that work is done by server s , not the client (“if K has been sent to the wrong server, the server forwards it to s ”). EX2001, ¶¶58-62, 90-93.

Petitioner asserts that a skilled artisan would have been motivated to combine Vingralek’s system of server forwarding and client updates with Kahn to reduce the

“communication overhead” associated with Kahn’s method of updating the client’s hash table and function.²¹ Pet., 48. Petitioner’s reasoning is an exercise in impermissible hindsight. Indeed, a POSITA would not look to modify Kahn to implement Vingralek’s alleged “redirect message” to arrive at the claimed invention because Kahn already describes an effective methodology (different from the claimed invention) for locating the handle server with the requested information. EX2001, ¶¶94-96.

Vingralek’s method of a server transmitting an updated address table to the client is not an efficient or reliable modification to Kahn’s system. That is, even if Kahn could be modified using Vingralek’s teachings such that the handle servers could store and transmit address tables to the client, there is no evidence that that Kahn’s handle servers would transmit reliable address tables to the client. EX2001, ¶¶94-96.

Indeed, a POSITA would understand that Kahn already provides a solution for retrieving an updated address table (i.e., by downloading it from the hash server

²¹ Reducing communication overhead is a stated goal of Vingralek’s (EX1007, 4), never of Kahn’s. Thus, Petitioner’s supposition that a POSITA would have been motivated to modify Kahn with Vingralek to allegedly improve Kahn’s communication overhead is illogical and without basis.

directory). EX1005, 46:29-32. Petitioner offers no plausible reason why a skilled artisan would have discarded Kahn’s approach in favor of Vingralek’s error-prone system. *In re Anova Hearing Labs, Inc.*, 809 Fed. Appx. 840, 843 (Fed. Cir. 2020) (“The Board also does not explain why a person of ordinary skill in the art would be motivated to modify Brown, which already includes vents, to address occlusion effect.”) Far from reducing overhead (even if that were a stated goal of Kahn’s), incorporating Vingralek’s scheme into Kahn would introduce additional complexity and inefficiency, as client requests bounce from server to server before eventually reaching their destination. EX2001, ¶96.

The Federal Circuit has cautioned against the exact type of impermissible hindsight that animates Petitioner’s arguments, where an obviousness assertion “simply retrace[s] the path of the inventor with hindsight, discounting the number and complexity of the alternatives which might have been considered by the inventor but ultimately discarded.” *Ortho-McNeil Pharm., Inc. v. Mylan Labs., Inc.*, 520 F.3d 1358, 1364 (Fed. Cir. 2008). The Petition’s failure to provide a rational motivation to combine the teachings of Kahn and Vingralek, as well as its improper reliance on hindsight, render its obviousness challenge untenable. The Board should reject this deficient attempt to reconstruct the claimed invention through the distorted lens of hindsight. *See Personal Web Techs.*, 848 F.3d at 993-94 (affirming PTAB decision rejecting obviousness where petitioner relied on “a conclusory assertion from its

expert” and failed to explain sufficiently “why a skilled artisan would have been motivated to combine [the asserted references]”); *Metalcraft of Mayville, Inc. v. The Toro Co.*, 848 F.3d 1358, 1367 (Fed. Cir. 2017) (reversing PTAB obviousness determination for “fail[ing] to identify a reason why one of ordinary skill in the art would make the modification” despite expert’s “unsupported and conclusory statement that the combination would be obvious to one of ordinary skill”).

3. A POSITA Would Not Have a Reasonable Expectation Of Success of Arriving at the Claimed Invention

A POSITA would not have a reasonable expectation of success to modify Kahn with Vingralek to satisfy the requirements of claims 3, 10, and 14. Petitioner alleges a POSITA would have a reasonable expectation of success because in part “Kahn already utilizes a message to provide updated information to the client when a wrong server is reached, but would benefit from reducing communication overhead by implementing Vingralek’s teaching.” Pet., 47-48. But Petitioner does not address how a POSITA would cure the deficiencies of the Kahn-Vingralek combination to arrive at the claimed invention. *Teva Pharms. USA, Inc. v. Corcept Therapeutics, Inc.*, 18 F.4th 1377, 1381 (Fed. Cir. 2021) (“The reasonable-expectation-of-success analysis must be tied to the scope of the claimed invention.”).

Neither Kahn nor Vingralek teach a location server configured to redirect a client’s query using a redirect message. As described above, Kahn’s handle servers do not transmit a “redirect message” to a client. *See supra* §XI.A. Similarly,

Vingralek also does not teach redirecting a client's query. As indicated above, in Vingralek, when a client queries a server, the server pushes an updated address table to the client. EX1007, 9-10. However, the pushed updated address table does not actually redirect the client's query. *Id.* Instead, like Kahn, the queried server attempts to locate the requested data in another server by forwarding the query to the other server. *Id.* For example, Vingralek states "if *K* has been sent to the wrong server, the server forwards it to *s'* ... Eventually, *K* is received by the correct server and the client operation is executed." *Id.* The updated address table itself does not redirect the client's query. Rather, the client may use it sometime in the future to attempt to locate the correct server. As such, a POSITA would not have a reasonable expectation of arriving at the claimed invention by modifying Kahn with Vingralek, as neither reference teaches a location server "redirecting" a client's query. EX2001, ¶97.

XII. CLAIMS 17, 23-26, 30 - NO MOTIVATION TO COMBINE KAHN WITH VINGRALEK

The Petition fails to demonstrate a reasonable likelihood of success on the only ground (Ground 3) asserted against claim 17 because it fails to establish a POSITA's motivation to combine Kahn with Vingralek. Petitioner also fails to demonstrate why a POSITA would have had a reasonable expectation of success in doing so. Even assuming factual inferences in Petitioner's favor at this stage,

Petitioner's theories are so flawed that they cannot support a basis for proving obviousness at trial. EX2001, ¶¶98-107.

A. The Petition Fails to Establish a POSITA's Motivation to Combine

Petitioner fails to establish that a POSITA would have been motivated to combine Kahn and Vingralek to meet at least the claim 17 limitation: “*transferring a portion of the identifiers and associated locations to a second data location server when a performance criterion of the first location server reaches a predetermined performance limit.*” EX1001, 27:40-43.

It is a bedrock principle of patent law that “obviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.” *Belden*, 805 F.3d at 1073 (emphasis in original). In violation of this basic principle, Petitioner's obviousness position rests on factually unsupported theories about what a POSITA *could* have done, but does nothing to establish that a POSITA *would* actually have been motivated to combine Kahn and Vingralek in the manner Petitioner suggests.

1. Kahn and Vingralek teach distinct and incompatible architectures for distributing data across servers

Petitioner's obviousness argument ignores a critical architectural mismatch between Kahn's hash-based handle distribution and Vingralek's bucket-based key

management approach. Kahn's handle server architecture is designed to distribute handles *evenly* across servers based on predetermined hash ranges. Kahn teaches that "identifiers are generated in a manner to distribute the pointer information with the unique identifier information) *relatively evenly among the servers*, using a hashing algorithm." EX1005, 4:19-22 (emphasis added); 86:17-22. "This strategy assures *a random distribution of handle server requests among many handle servers distributed on a network* without a central nodal point in the system (for reliability)." *Id.*, 73:27-31 (emphasis added); EX2001, ¶55-62, 99.

Vingralek's system, on the other hand, uses a very different architecture. Instead of distributing keys evenly across servers, the keys are put into buckets; the buckets are then spread across multiple servers, with a single server holding multiple buckets and each bucket holding different numbers of keys depending on their "levels". EX1007, 8-9. This technique allows Vingralek's system to enable *uneven* distribution by enabling buckets to be filled until they reach some capacity, before the buckets need to be split or migrated, so that buckets can store uneven numbers of keys and servers can store uneven numbers of buckets. *Id.*, 12-13. Vingralek teaches that this enables systems to scale in a "cost-conscious" manner "by aiming to minimize the number of servers that are used for providing the necessary performance capacity." *Id.*, 5. As Vingralek explains, its design goals are competing ones: its system seeks "to limit the growth in the number of servers

across which the file is spread” while also “guarantee[ing] good performance of each server by controlling the server load.” EX1007, 10. To reconcile the tension between these goals, Vingralek teaches that buckets can be redistributed, “either by splitting or by migration of buckets,” which becomes necessary when “either all servers are operating in the range above the feasible load capacity or at least one server reaches the panic load capacity.” *Id.* “[T]he *feasible load capacity* C_F ” of a server is “the maximum number of keys that the server can keep without being overloaded,” and the “*panic load capacity* C_P ” of a server is the number of keys after which a server is no longer capable of accepting additional keys.” EX1007, 9 (emphasis in original). “If a server s reaches the panic load capacity, then the file advisor first tries to migrate some of the buckets of s to other servers that have enough unused performance capacity to accept it.” *Id.*; EX2001, ¶¶55-62, 99.

Petitioner points to Vingralek’s response to a “panic load capacity” as allegedly disclosing claim limitation [17.e]. Pet., 56, 63. Petitioner *assumes* that Kahn’s handle servers will reach the same kind of “panic load capacity” as Vingralek and concludes that a POSITA would therefore be motivated to modify Kahn’s response to mirror Vingralek’s. Pet. 57. Petitioner assumption is incorrect. Unlike Vingralek, Kahn does not discuss “cost-conscious scalability” as a goal. Petitioner’s suggestion that a POSITA would seek to modify Kahn to achieve that unstated goal lacks any support. Pet. 43, 57, 70. Petitioner points to two citations in Kahn that

allude to extending and expanding its system to accommodate “any number of objects” in support (Pet. 57 (citing EX1005, 9:23-27; 33:8-10)), but neither relates to scaling or managing load capacity. Rather, Kahn is talking about extendable *naming conventions* to accommodate growth in the number of objects. Not server capacity. EX1005, 33 (“the identifier’s namespace must be variable an unrestricted, since the number of objects created may be expected to increase”). EX2001, ¶¶55-62, 100.

Petitioner also never reconciles Kahn’s hash-based, even distribution scheme with Vingralek’s bucket-based approach that permits servers to be unevenly loaded. Under Kahn’s scheme, there would be no need for the kind of “panic load capacity” solution that Vingralek describes, because Kahn’s system distributes handles to handle servers evenly based on a random distribution for a hash table. Kahn teaches that it is optimized for performance and reliability by “distributing the computing load” and providing “simple access controls to handle data” so that “[w]hen several computers are used, handles are distributed amongst them using a hash table” and “[f]or reasons of performance and reliability, data may be replicated across these computers.” EX1005, 39:3-7, 39:24-20. In addition, Kahn teaches against minimizing the number of servers insofar as Kahn teaches using *additional* cache computers to “reduce the load on other handle servers” and so that resolution of handles is “faster.” *Id.*, 41:3-6. Thus, in view of their fundamentally

different architectures and the fact that Kahn does not share Vingralek’s goal of “minimizing the number of servers” in order to achieve “cost-conscious scaling,” a POSITA would not be motivated to combine Kahn with Vingralek’s inapposite teachings about “panic load capacity” thresholds to achieve the limitation of [17.e]. EX2001, ¶¶ 55-62, 100.

Petitioner’s failure to resolve the inherent differences between the Kahn and Vingralek systems, as well as its failure to explain why a POSITA would be motivated to combine two such disparate systems, makes the likelihood it will succeed on its Ground 3 arguments against claim 17 unreasonable.

2. Petitioner’s hindsight-driven analysis fails to establish a motivation to combine as a matter of law

Rather than providing a well-reasoned explanation for why a POSITA would have been motivated to combine the references’ teachings, the Petition relies on unsupported assertions and impermissible hindsight. Petitioner’s attempt to combine the fundamentally different architectures of Kahn and Vingralek is not only misguided but also fails as a matter of law to establish a motivation to combine.

The Federal Circuit’s recent decision in *Virtek Vision* is instructive. 97 F.4th at 886. There, the prior art references disclosed different coordinate systems for laser projectors—one using angular measurements and the other using 3D coordinates. *Id.* at 886. The court found that the mere existence of these two alternative approaches was insufficient to establish a motivation to combine, and that

the Board, having granted the petition, erred as a matter of law by relying on this reasoning. *Id.*

Similarly, here, Kahn and Vingralek disclose different architectures for distributed storage systems—Kahn uses a hash-based approach that evenly distributes loads whereas Vingralek uses a bucket-based approach designed to minimize the number of servers in the system. As in *Virtek Vision*, the mere fact that these alternative architectures existed in the prior art is not enough to establish a motivation to combine them. Petitioner improperly treats the references as “separate pieces of a simple jigsaw puzzle” that can be fitted together to arrive at the claimed invention, without explaining what reason or motivation a POSITA would have had to combine their disparate teachings. See *InTouch Technologies, Inc. v. VGO Commc’ns, Inc.*, 751 F.3d 1327, 1351 (Fed. Cir. 2014); EX2001, ¶102.

B. The Petition Fails to Show a Reasonable Expectation of Success in Combining Kahn with Vingralek

The Petition asserts that “combining the teachings of Kahn and Vingralek would have involved modifying the Kahn system in a manner that Kahn suggests is feasible” because they “are in the same field of art” and “Kahn itself suggests that the digital objects, and thus handle servers, may be scaled arbitrarily” and that Kahn does not teach it. Pet. 57-58. This argument relies on an incorrect reading of Kahn. Petitioner also fails to articulate any concrete analysis of the specific modifications

required to integrate Vingralek's techniques into Kahn's system. EX2001, ¶101-105.

Combining Vingralek's bucket-based approach with Kahn's hash-based distribution would introduce unevenness in the distribution of handles across servers, undermining the fundamental design principles of Kahn's system. As detailed above, Kahn relies on a single predetermined hash function to ensure handles are evenly distributed across servers based on their hash values. EX1005, 7:17-20, 9:26-27, 29:21-23, 47:1-5; *See supra* §XII.A. Introducing Vingralek's bucket splitting and migration would lead to uneven distribution of handles, breaking the basics of Kahn's hash-based approach. *Plas-Pak Indus., Inc. v. Sulzer Mixpac AG*, 600 F. App'x 755, 760 (Fed. Cir. 2015) (finding that a POSITA would not have been motivated to modify a primary reference such that it would be rendered "inoperable for its intended purpose"). This architectural mismatch would require significant modifications to Kahn's core design, undermining the feasibility and likelihood of success of the proposed combination. EX2001, ¶104.

The Petition fails to address any of the technical challenges or potential drawbacks of making such a significant modification to Kahn's core architecture. Adapting Kahn's system to work with Vingralek's techniques would have required significant changes to how handles are distributed and managed across servers. For example, Kahn has a single hash function and Vingralek has multiple hash functions

and multiple levels of buckets, resulting in a complex address table structure (*see, e.g.,* EX1005, 9:26-27, 4:19-24, 46:29-32, 86:17-22, 73:27-31; EX1007, 8-10 – but, but Petitioner never addresses the technical details of how Kahn and Vingralek’s integration would have been achieved, or the potential impact on the performance and reliability of handle resolution. Moreover, Vingralek is a theoretical paper presenting simulations and algorithms rather than a practical implementation and acknowledges that its simulation results are “preliminary,” requiring further research to compare its approach to other methods. Ex. 1007, 25; EX2001, ¶105.

One example of the technical challenges that the Petition fails to address is that Kahn never addresses migrating handles between handle servers. This lack of disclosure underscores that Kahn teaches away from less efficient and unreliable methods like Vingralek’s, which would require costly migration steps to maintain system operation. Another example is that Kahn teaches that handle servers perform a verification step before locating the pointer information associated with a handle to determine whether that server has been assigned the handle, returning a “not-responsible-for-handle” message if not. Ex. 1005, 47:1-19. Petitioner acknowledges this functionality with respect to other challenged claims, such as claim 3 (Pet., 25-27), but not for claim 17; neither the Petition nor Dr. Chatterjee’s declaration addresses how this verification step could be maintained if Kahn’s handle

distribution scheme were upended by introducing Vingralek’s splitting and migration of handle data across hash ranges. EX2001, ¶106.

The Petition’s failure to address the technical issues implicated in a POSITA’s reasonable expectation of success in combining Kahn and Vingralek is fatal. Petitioner bears the burden to articulate at least *some* evidence as to what kind of technical challenge might be associated in modifying a reference to add another’s functionality. *Personal Web Tech.*, 848 F.3d at 993. For example, in a recent Federal Circuit case, the court determined that an expert providing the conclusory theory that “a combination was simple” was insufficient. *Juniper Networks, Inc. v. Correct Transmission, LLC*, No. 2023-1046, 2023-1236, 2024WL3517862 at *6 (Fed. Cir., July 24, 2024). Here, Petitioner’s technical expert does not even say that much about the complexity of implementing the combination. Dr. Chatterjee merely parrots the Petition and relies on the references being in the same field of art, which says nothing of how compatible they are. Ex. 1002, ¶¶131, 135. As explained above, the Petition fails to address the incompatibilities. This absence of evidence and theory is fundamental, and Petitioner cannot remedy it at trial. *See, e.g., Yita*, 69 F.4th at 1367 (holding that petitioner, “as the master of its complaint could have presented its reply argument in its petition but chose not to”) (cleaned up); EX2001, ¶106-107.

XIII. DISCRETIONARY DENIAL 35 U.S.C. § 314(a)

The Board should exercise its discretion under 35 U.S.C. § 314(a) to deny institution. The PTAB Consolidated Trial Practice Guide explains that “the panel will evaluate the challenges and determine whether, in the interests of efficient administration of the Office and integrity of the patent system (*see* 35 U.S.C. § 316(b)), the entire petition should be denied under 35 U.S.C. § 314(a).” PTAB Consolidated Trial Practice Guide (Nov. 2019) at 64. The decision “to deny a petition is a matter committed to the [USPTO’s] discretion.” *Cuozzo Speed Techs., LLC v. Lee*, 579 U.S. 261, 273, 136 S. Ct. 2131, 2140 (2016); *see also Biodelivery Scis. Int’l, Inc. v. Aquestive Therapeutics, Inc.*, 935 F.3d 1362 (Fed. Cir. 2019). The Board has exercised this discretion to deny institution in cases where the Petitioner demonstrates a reasonable likelihood of prevailing on only a fraction of the challenged claims or asserted grounds. *See Helmerich & Payne Int’l Drilling Co. v. Nabors Drilling Techs. USA, Inc.*, IPR2021-00621, Paper 12 at 28 (PTAB Sept. 21, 2021) (failure to demonstrate likelihood of prevailing on at least eighteen of nineteen challenged claims sufficient to denying institution); *Lenovo Holding Co., Inc. v. InterDigital Tech. Corp.*, IPR2020-01515, Paper 11 at 46-47 (PTAB Apr. 15, 2021) (denying institution where petition met the institution threshold for at most two of twenty challenged claims); *Deeper, UAB v. Vexilar, Inc.*, IPR2018-01310, Paper 7

at 41–43 (PTAB Jan. 24, 2019) (informative); *Chevron Oronite Co. v. Infineum USA L.P.*, IPR2018-00923,11, Paper 9 at 10-11 (PTAB Nov. 7, 2018) (informative).

Here, Petitioner has failed to establish that Vingralek was publicly available on the alleged date, and thus, Vingralek is not qualified prior art. *See supra* §X. Ground 3 relies on Vingralek and therefore is non-meritorious. Furthermore, all grounds include significant weaknesses (beyond Vingralek’s lack of qualification) which prevent Petitioner from likely prevailing either ground. Instituting on grounds that are non-meritorious and/or include significant weaknesses would be inefficient administration of the Office. As such, the Board should exercise its discretion under 35 U.S.C. § 314(a) to deny institution “in the interests of efficient administration of the Office and integrity of the patent system.” PTAB Consolidated Trial Practice Guide (Nov. 2019) at 64.

XIV. CONCLUSION

For each of the foregoing reasons, the Petition fails to show a reasonable likelihood of prevailing against any challenged claim. Institution should be denied.

Dated: November 19, 2024

By: /s/ Khue Hoang

Case IPR2024-01021

Patent No. 7,233,978

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CERTIFICATE OF COMPLIANCE

The undersigned hereby certifies that Patent Owner's Preliminary Response (the "POPR") consists of 13,987 words, excluding the table of contents, certificate of service, this certificate of compliance, or table of exhibits. The POPR complies with the type-volume limitation of 14,000 words as mandated in 37 C.F.R. § 42.24. In preparing this certificate, counsel has relied on the word count of the word-processing system used to prepare this paper (Microsoft Word).

Dated: November 19, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing **PATENT OWNER'S PRELIMINARY RESPONSE** was served on, via electronic mail, as agreed to by counsel, upon the following counsel for Petitioner:

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