

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE, INC.,

Petitioner

v.

KOVE IO, INC.,

Patent Owner

IPR2024-01022
U.S. Patent 7,233,978

PATENT OWNER'S PRELIMINARY RESPONSE

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	RELATED MATTERS	3
III.	BACKGROUND	4
	A. Overview of the '978 Patent.....	4
	B. Overview of the Challenged Claims	6
IV.	LEGAL STANDARDS	11
V.	LEVEL OF ORDINARY SKILL	14
VI.	CLAIM CONSTRUCTION	14
VII.	THE PETITION DOES NOT DEMONSTRATE A REASONABLE LIKELIHOOD OF SUCCESS ON ANY GROUND.....	18
VIII.	ALL GROUNDS: THE CHALLENGED CLAIMS REQUIRE LOCATION SERVERS WITH UNIQUE SETS OF LOCATION INFORMATION	21
IX.	GROUND 1 - OBVIOUSNESS OVER SKAGERWALL AND VINGRALEK	23
	A. Vingralek Is Not Prior Art.....	23
	1. The Hall-Ellis Declaration Fails to Establish Vingralek's Public Availability Before the Critical Date.....	25
	B. Claims 10-16 - Skagerwall in view of Vingralek Does Not Render Obvious the "Redirect Message" Limitation.....	34
	1. Vingralek does not return "hash table" updates.....	36
	2. A POSITA Would Not Be Motivated or Find It Obvious to Modify Skagerwall in view of Vingralek	38
	C. Skagerwall In View of Vingralek Does Not Render the Claims 17, 23, and 30 Obvious.....	41

1.	The Petition Fails to Establish a Motivation to Combine.....	41
2.	Skagerwall and Vingralek teach distinct and incompatible architectures for distributing data across servers	42
3.	Petitioner’s hindsight-driven analysis fails to establish a motivation to combine as a matter of law	45
4.	The Petition Fails to Show a Reasonable Expectation of Success in Combining Skagerwall with Vingralek	46
X.	GROUND 2: NO MOTIVATION TO COMBINE SKAGERWALL-VINGRALEK WITH KRASNER.....	49
XI.	GROUND 3	51
XII.	DISCRETIONARY DENIAL 35 U.S.C. § 314(a).....	51
XIII.	CONCLUSION.....	53

TABLE OF AUTHORATIES

Cases

<i>Acceleration Bay, LLC v. Activision Blizzard Inc.,</i> 908 F.3d 765 (Fed. Cir. 2018)	33
<i>ActiveVideo Networks, Inc. v. Verizon Commc'ns Inc.,</i> 694 F.3d 1312 (Fed. Cir. 2012)	13
<i>Apple Inc. v. Samsung Elecs. Co.,</i> 839 F.3d 1034 (Fed. Cir. 2016)	13
<i>Belden Inc. v. Berk-Tek LLC,</i> 805 F.3d 1064 (Fed. Cir. 2015)	41, 50
<i>BioDelivery Sciences International, Inc. v. Aquestive Therapeutics, Inc.,</i> 935 F.3d 1362 (Fed. Cir. 2019)	51
<i>Blue Calypso, LLC v. Groupon, Inc.,</i> 815 F.3d 1331 (Fed. Cir. 2016)	23
<i>Chevron Oronite Co. v. Infineum USA L.P.,</i> IPR2018-00923,11, Paper 9 (P.T.A.B Nov. 7, 2018).....	52
<i>Cuozzo Speed Techs., LLC v. Lee,</i> 579 U.S. 261 136 S. Ct. 2131 (2016).....	51
<i>Deeper, UAB v. Vexilar, Inc.,</i> IPR2018-01310, Paper 7 (PTAB Jan. 24, 2019)	52
<i>Harmonic Inc. v. Avid Tech. Inc.,</i> 815 F.3d 1356 (Fed. Cir. 2016)	12
<i>Honda Motor Co., Inc. v. Neo Wireless LLC,</i>	

IPR2023-00797, Paper 29 (PTAB Sept. 3, 2024).....	12
<i>Hulu, LLC v. Sound View Innovations, LLC,</i>	
IPR2018-01039, Paper 29 at 13 (PTAB Dec. 20, 2019)	24
<i>In re Anova Hearing Labs, Inc.,</i>	
809 Fed. Appx. 840 (Fed. Cir. 2020).....	40
<i>In re Cornyn,</i>	
890 F.2d 1158 (Fed. Cir. 1989)	24
<i>In re Kahn,</i>	
441 F.3d 977 (Fed. Cir. 2006)	14
<i>In re: Natural Alternatives, LLC,</i>	
659 Fed. Appx. 608 (Fed. Cir. 2016).....	49
<i>In-Depth Geophysical, Inc. v. ConocoPhillips Co.,</i>	
IPR2019-00849, Paper 17 (PTAB Mar. 30, 2020)	26
<i>Intelligent Bio-Sys. Inc. v. Illumina Cambridge Ltd.,</i>	
821 F.3d 1359 (Fed. Cir. 2016)	13
<i>InTouch Technologies, Inc. v. VGO Commc'ns, Inc.,</i>	
751 F.3d 1327 (Fed. Cir. 2014)	45
<i>Juniper Networks, Inc. v. Correct Transmission, LLC, No.</i>	
2023-1046, 2023-1236, 2024WL3517862 (Fed. Cir., July 24, 2024).....	47
<i>KSR Int'l Co. v. Teleflex Inc.,</i>	
550 U.S. 398, 127 S. Ct. 1727 (2007).....	14
<i>Lenovo Holding Co., Inc. v. InterDigital Tech. Corp.,</i>	
IPR2020-01515, Paper 11 (PTAB Apr. 15, 2021)	52

Mortgage Grader, Inc. v. First Choice Loan Servs. Inc.,

811 F.3d 1314 (Fed. Cir. 2016) 12

Personal Web Techs. v. Apple, Inc.,

848 F.3d 987 (Fed. Cir. 2017) 13, 48

Pitney Bowes, Inc. v. Hewlett–Packard Co.,

182 F.3d 1298 (Fed. Cir. 1999) 17

SAS Inst. Inc. v. Iancu,

584 U.S. 357, 138 S. Ct. 1348 (2018).....12

Sophos v. Open Text,

IPR2023-00731, Paper 23 (PTAB Nov. 2, 2023)..... *passim*

Tokai Corp. v. Easton Enters., Inc.,

632 F.3d 1358 (Fed.Cir.2011) 49

Virtek Vision Int'l v. Assembly Guidance Sys.,

97 F.4th 882, 886 (Fed. Cir. 2024) *passim*

Yita LLC v. MacNeil IP LLC,

69 F.4th 1356, 1367 (Fed. Cir. 2023) 13, 48

Statutes

35 U.S.C. § 314(a) *passim*

35 U.S.C. §312(a)(3).....12

pre-AIA 35 U.S.C. §102(b)..... *passim*

Regulations

37 C.F.R. §42.23(b) 13

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

The Petition 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:

Each Ground relies combining Skagerwall with Vingralek. Petitioner did 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, each of the Grounds fail as a matter of law.

Each of the challenged claims 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 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 contends Skagerwall directly discloses these limitations. But the citations Petitioner relies on do not support its interpretation. Petitioner’s failure to show that Skagerwall teaches these limitations is dispositive of every Ground.

Claims 10-16 all require a “redirect message.” Skagerwall in combination with Vingralek does not render this limitation obvious. Petitioner also fails to establish a motivation to combine Skagerwall 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 Ground 1.

Petitioner also relies on modifying Skagerwall 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 Skagerwall’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.

Ground 2 requires combining Skagerwall (and Vingralek) with Krasner. But Skagerwall (and Vingralek) 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.

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 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

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.

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.

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

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

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.

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.

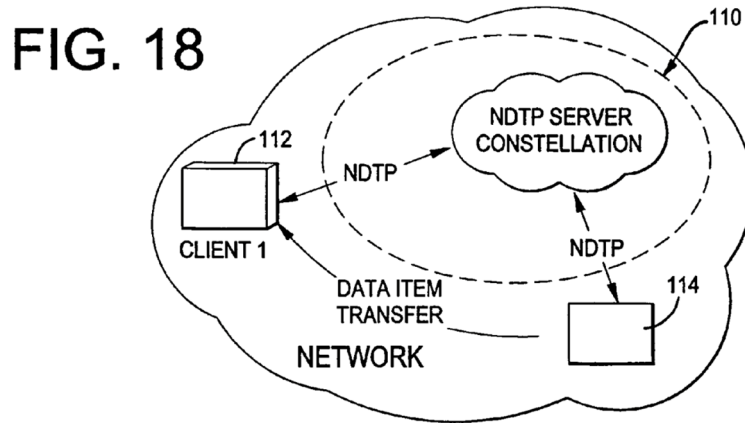
Distributed data collection involves storing data stored and retrieved among multiple databases or data repositories connected by a network. Conventional distributed data collection environments maintained a static relationship of data and its location. In this regard, conventional distributed data collection 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

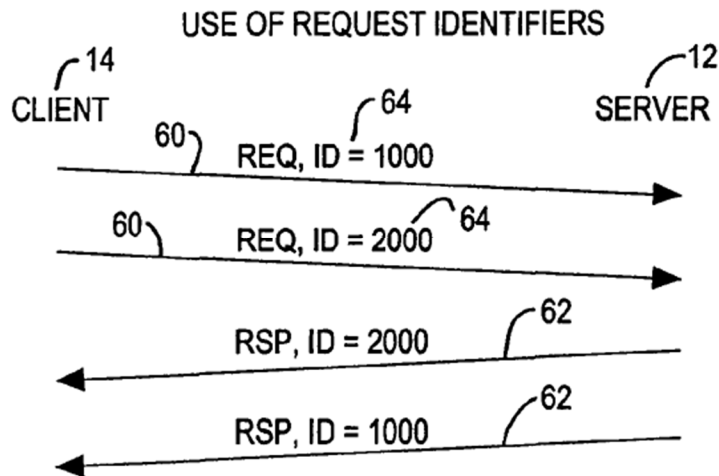
constellation of NDTP servers and separately transacts with an application server, as illustrated in Fig. 18:



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, ¶43-44.

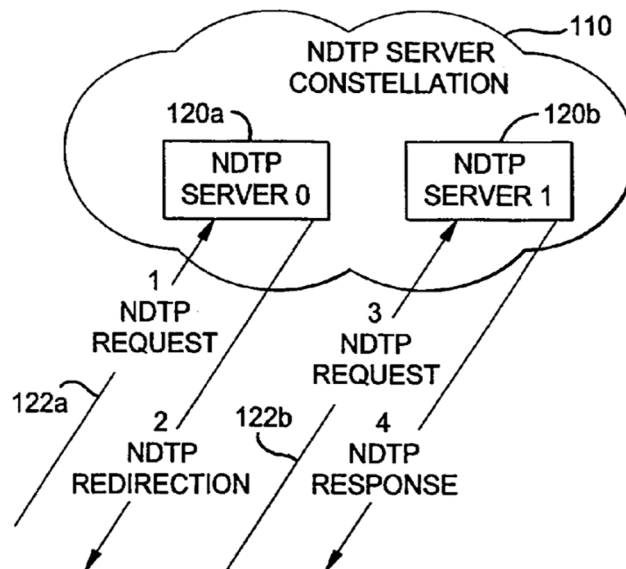
Second, the '978 patent teaches ways clients can request location information associated with an identifier, where each request has a corresponding response message returned by the server receiving the request. EX1001, 9:55-56. An example of NDTP protocol requests and responses are depicted in Figure 7:

FIG. 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, ¶¶45-46.

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*, 584 U.S. 357, 373 138 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 Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 127 S. Ct. 1727, 1741 (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, 1025, 1043, 1045, 1047, 1049. 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, ¶68. 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 10-17, 23-26, and 30 of the '978 patent. The Petition asserts three grounds of unpatentability:

Ground 1: Claims 10, 12-17, 23, 30 are unpatentable under pre-AIA 35 U.S.C. §103 as being obvious over Skagerwall (EX1006) in view of Vingralek (EX1007).

Ground 2: Claim 11 is unpatentable under pre-AIA 35 U.S.C. §103 as being obvious over Skagerwall in view of Vingralek and Krasner (EX1009).

Ground 3: Claims 24-26 are unpatentable under pre-AIA 35 U.S.C. §103 as being obvious over Skagerwall in view of 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 Skagerwall to disclose this element, but for reasons detailed below, it does not. Skagerwall's failure to disclose this element defeats Petitioner's argument with respect to every claim and every Ground.

All Grounds fail for the added reason that each depends on combining Skagerwall with Vingralek. But Petitioner has not provided sufficient evidence of Vingralek's viability 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, 1998⁵. Petitioner's reliance on its declarant, Dr. Sylvia Hall-Ellis is misplaced. As detailed below, 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. Because Petitioner failed to qualify Vingralek as prior art, each of the Grounds cannot reasonably succeed.

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 Skagerwall (and Vingralek) with Krasner. Krasner is directed to a different field of art than Skagerwall, Vingralek, or the '978

⁵ 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.

patent, making it not a suitable reference for Petitioner to rely on for purposes of demonstrating obviousness.

Additionally, Petitioner's arguments with respect to claims 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. For the reasons explained below, Skagerwall in combination with Vingralek fail to teach or render obvious the "redirect message" limitation recited in these claims.

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 Skagerwall with Vingralek such that the combination renders these claims obvious. Skagerwall's hash-based approach for storing data evenly across servers is fundamentally different than that of Vingralek, which distributes keys into buckets, multiples of which may be held on a server. Petitioner fails to reconcile the architectural mismatch between these systems and wrongly assumes that a POSITA would be motivated to modify Skagerwall 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 10, 14, and 17 recite, in pertinent part:

[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 Skagerwall alone as allegedly teaching these limitations. Pet. 27, 42, 48. In particular, Petitioner relies on two disclosures in Skagerwall as allegedly teaching this element: “Ex. 1006, 8:15-27, 8:48-51.” Pet. 27.⁶ These citations do not support Petitioner’s theory that the object data-to-object tag mappings (i.e., what Petitioner asserts are the claimed “sets of location information”) among the plurality of directory servers are unique. Instead, Skagerwall merely says that a directory server “preferably stores object data related to a small number of the range of available object tags T; T1-Tw.” EX1006, 8:21-22; *see also id.*, 8:48-51. This simply says that a directory server does not hold all possible object data and object tags, but something less than the whole (a subset). It does not say that what a given directory server holds must be *different* than what another directory server

⁶ Petitioner cites back to claim 10 with respect to this limitation in claims 14 and 17.

holds. In fact, Skagerwall states that “a newly available directory server may also be inserted as a backup server to *replicate one of the directory servers*, in which case that part of the data base of object data is copied from the replicated server to the backup server.” *Id.*, 11:61-64 (emphasis added). Because Skagerwall does not teach this limitation, and Petitioner relies solely on Skagerwall to do so, there is no reasonable likelihood that Petitioner will succeed in proving any of the claims of the ’978 patent unpatentable.

IX. GROUND 1 - OBVIOUSNESS OVER SKAGERWALL AND VINGRALEK

The Petition fails to demonstrate a reasonable likelihood that the challenged claims are unpatentable under Ground 1, which argues that the challenged claims are obviousness in view of Skagerwall in combination with Vingralek. As a threshold matter, the Petition fails to establish that Vingralek is prior art under pre-AIA 35 U.S.C. §102(b). Even if Vingralek is considered to be prior art, the Petition fails to demonstrate that a POSITA would have found it obvious or be motivated to combine Skagerwall with Vingralek.

A. 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 *Jahresberich* (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.

1. 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).”⁷ 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.

a. 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.*, 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

⁷ 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).

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.⁸ Ex. 1020 ¶46. That is not enough.

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.

⁸ 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, Houston, 1994.”). A paper that was supposedly available in 1993 could not have cited to a paper that did not yet exist.

Dr. Hall-Ellis explains that she downloaded Exhibit 1007 from a particular webpage.⁹ 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

Dr. Hall-Ellis made no mention of metadata or the 2017 date in her declaration.¹⁰

⁹ 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).

¹⁰ 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).

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 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.¹¹ Ex. 1020, ¶¶47-48, n. 19, 20. In particular, searching

¹¹ 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.

for “*Jahresbericht ETH Zurich*” at <https://www.research-collection.ethz.ch>¹² 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 *Jahresberich* [Annual Report] issue of the journal *Eidgenössische Technische Hochschule*.”

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.

¹² EX1020, ¶47-48, n. 19, n. 20.

b. 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.

i. 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”).

ii. 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.

B. Claims 10-16 - Skagerwall in view of Vingralek Does Not Render Obvious the “Redirect Message” Limitation

Claim elements [10.b] and [14.c] claim a “redirect” functionality.

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

[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.*

Petitioner admits Skagerwall does not disclose the claimed “redirect message,” and instead argues that “a POSITA would have been motivated and found it obvious to implement this feature in view of Vingralek.” Pet., 32; *see also* 45-46.¹³ More particularly, Petitioner alleges that a POSITA would have been motivated and found it obvious to implement “**programming logic ... responsive to a location query for a desired identifier to return ... a redirect message** if the queried location server does not contain location information relevant to the desired identifier, **wherein the redirect message comprises information for finding a**

¹³ Petitioner does not provide any additional arguments for the “redirect message” limitations in claim 14 beyond what is provided for claim 10.

location server having location information related to the desired identifier”

Pet. 31-32 (emphasis in original).

Petitioner’s arguments fail because combining Skagerwall with Vingralek does not cure Skagerwall’s deficiencies nor does it render any of the claims obvious. And several of Petitioner’s characterizations about Vingralek and Skagerwall are false or misleading. EX2001, ¶¶71-72.

1. Vingralek does not return “hash table” updates

To lay the foundation for its obviousness argument, Petitioner characterizes Vingralek as a “hash-based distributed file system [that] is implemented using an address table, [and] which a POSITA would have understood is *akin to a hash table*, to look up the server that corresponds to a hashed key.” Pet., 32 (emphasis added). From there, Petitioner mischaracterizes Vingralek as teaching the sending of “hash table updates.” Pet. 35 (“Vingralek discloses that the ‘most salient feature’ of its approach, where a client’s hash table is updated in a deferred manner”), *id.* (“features similar to those disclosed by Vingralek when implementing Skagerwall by providing a deferred address/hash table update”), *id.*, 36 (“Vingralek’s method of deferred hash table updates”). Petitioner’s mischaracterizations of Vingralek, which are central to its obvious arguments, should be disregarded. EX2001, ¶¶59-63, 71-76.

Vingralek teaches a “distributed file organization for record-structured, disk-resident files with key-based exact-match access.” EX1007, 3. Files are hashed into

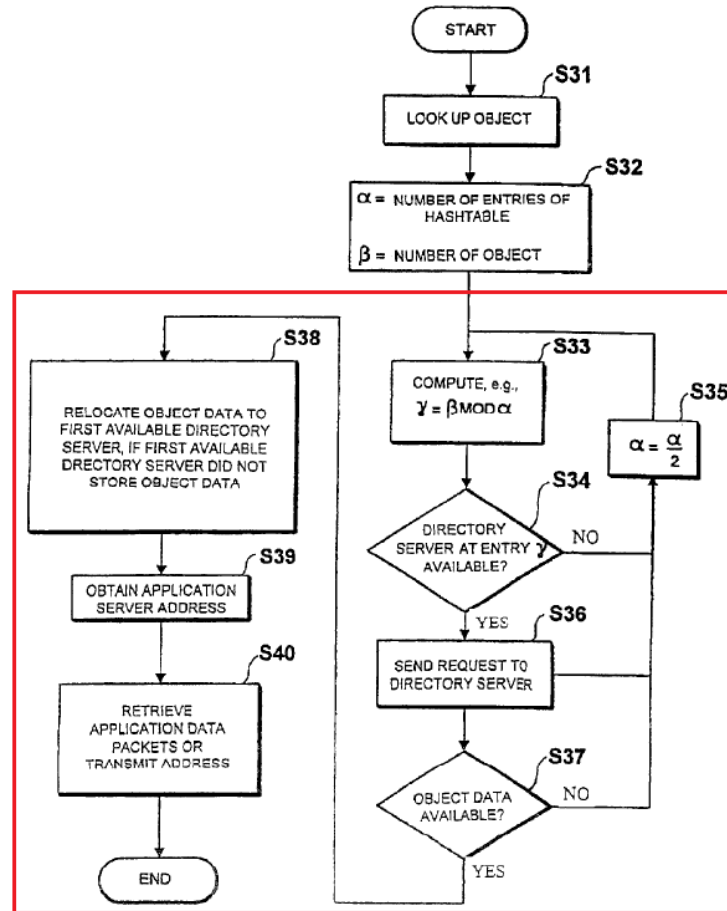
buckets (*id.* 5). The buckets are spread across multiple servers, with a single server holding multiple buckets and each bucket holding different numbers of keys depending on their “levels”. EX1007, 5, 8-9, Fig. 1. Vingralek teaches that a client *c* sends a key *K* to a server *s*. *Id.*, 9. Server *s* applies certain hash functions to *K* until it identifies a server *s*’ that it thinks has the records associated with *K*, using an address table that identifies which server the bucket containing *K* is. *Id.* “The *address table* contains the mapping of bucket number onto server numbers.” *Id.*, 8 (emphasis in original). A POSTIA would have understood that Vingralek’s address table is *not* “akin” to a hash table, as Petitioner contends. Pet., 32. And a POSTIA would have understood Vingralek to teach that bucket-to-server assignments are distinct from the hashing of keys into buckets. EX1007, 6 (“Hashing is used merely to distribute keys across buckets” whereas “[t]he internal organization of buckets can be chosen freely, and may vary between servers.”). As buckets reach capacity, they may be redistributed among existing servers or “split” or “migrated” onto new servers, necessitating that address tables containing bucket-to-server mappings be updated. *Id.* 5-6. Importantly, Vingralek never discusses updating hash tables or sending such hash tables to the client. Petitioner’s statements in that regard are unsupported and should be given no weight. EX2001, ¶¶71-76.

Absent these mischaracterizations, Petitioner’s argument that “a POSITA would have found it beneficial to include Vingralek’s method of deferred hash table

updates, via a redirect message, when implementing Skagerwall's system/process" lacks support, and it cannot claim a reasonable likelihood of prevailing in its challenge to claims 10-16.

2. A POSITA Would Not Be Motivated or Find It Obvious to Modify Skagerwall in view of Vingralek

A POSITA would not be motivated to modify Skagerwall in view of, or combine Skagerwall with, Vingralek at least because Skagerwall already teaches its own method for finding the desired location information. That method does not require "redirecting" the access server after a failed request by sending that access server a message containing information for finding the correct directory server. This is because Skagerwall's method allows the access server receive the ultimate information it wants (application server addresses) directly, i.e., it does not need the intermediate step of receiving information for finding the location of the server containing that information. Skagerwall describes the process using Fig. 3:



EX1006, Fig. 3. A request is sent at step S32. If the queried primary directory server does not have the requested record (step 34), the flow returns to step S33 through step 35. “This loop of steps S33, S34 and S35 is repeated” until the “directory server storing the object data is found.” *Id.*, 13:52-65. If that object data is not in the first available directory server, Skagerwall teaches that the object data should be “relocated” to that first available directory server. *Id.*, 11:49-52 (“the previously stored object data is transferred to the correct target directory server, i.e., the directory server which was determined based on the current, that is, new number of directory servers”). The “retrieved [application server] addresses and application

identifiers” are then returned to the access server. *Id.*, 14:12-14; EX2001, ¶¶55-58, 77-78.

Interposing an intermediate step where the queried primary directory server returns a message to the access server does not make sense – the directory server would still need to go through the “loop of steps S33, S34, and S35” to identify the “directory server storing the object data” in order to include that information in the message to the access server. EX1006, 13:52-65. But once found, Skagerwall teaches the directory server retrieves the desired content (application server addresses) and sends that back. *Id.*, 14:12-14. It is non-sensical to send information to calculate the directory server location instead, particularly where Skagerwall relocates the desired content out of that directory server and into the primary directory server. *Id.*, 11:49-52. Sending the access server information to calculate the soon-to-be-stale second directory server is not only unnecessary (the access server already has the information it requested) but is an added step without any particular purpose. *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.”). EX2001, ¶¶77-78.

A POSITA would therefore not look to modify Skagerwall to implement Vingralek’s alleged “redirect message” to arrive at the claimed invention.

Accordingly, Petitioner has not demonstrated a reasonable likelihood of success in proving prima facie obviousness based on the Skagerwall-Vingralek combination, and trial should not be instituted. EX2001, ¶¶77-78.

C. Skagerwall In View of Vingralek Does Not Render the Claims 17, 23, and 30 Obvious

Petition cannot demonstrate a reasonable likelihood of success on its only ground asserted against claim 17 because the Petition fails to: (1) establish a POSA's motivation to combine Skagerwall with Vingralek, and (2) show that a POSA would have had a reasonable expectation of success in combining Skagerwall with Vingralek to meet the limitations of claim 17. Even assuming factual inferences in Petitioner's favor, Petitioner's theories are so flawed that they cannot support a basis for proving obviousness at trial, as explained further below in turn.

1. The Petition Fails to Establish a Motivation to Combine

Petitioner fails to establish a sufficient rationale for a POSITA to be motivated to combine Skagerwall 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.

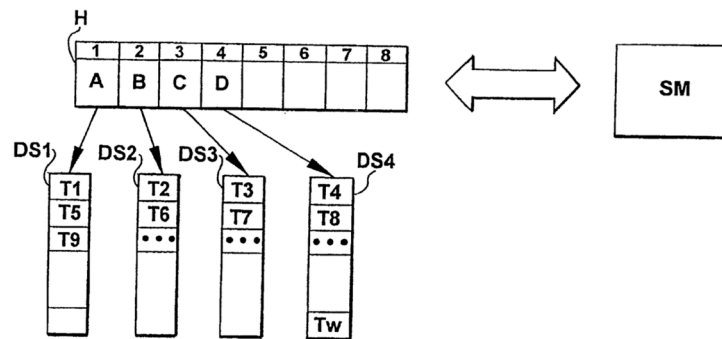
It is a bedrock principle of patent law that “obviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.”

Belden Inc. v. Berk-Tek LLC, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (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, and does nothing to establish that a POSITA *would* actually have been motivated to combine Kahn and Vingralek in the manner Petitioner suggests.

2. Skagerwall and Vingralek teach distinct and incompatible architectures for distributing data across servers

Petitioner’s obviousness argument ignores a critical architectural mismatch between Skagerwall’s hash-based object tag distribution and Vingralek’s bucket-based key management approach. Skagerwall’s directory server architecture is designed to distribute object tags evenly across servers based on a direct hash mapping. Skagerwall teaches that “[p]referably, the hashfunction distributes the object tags evenly over the available servers.” Ex. 1006, 8:50-54. Specifically, Skagerwall discloses a scheme where each directory server stores object data for a specific range of tag hash values, with tags assigned to servers sequentially based on a simple modulo function. *Id.*, 8:15-19, 10:28-11:16, 10:63-11:1. Skagerwall provides an example of its data distribution scheme, showing object tags (indicated as T1, T2, . . .) distributed across four directory servers, DS1, DS2, DS3, and DS4. stored across four directory servers. *Id.*, 11:1-11. The hash table according to this example is shown in Fig. 2 of Skagerwall, shown below:

FIG.2



Id., Fig. 2. Skagerwall's scheme thereby ensures that object tags are generally evenly distributed across the available servers. *Id.*, 8:50-54. This architecture inherently prevents any single server from becoming overloaded, as each is only responsible for tags within its assigned hash range. *Id.*, 8:63-67; EX2001, ¶¶79-82.

In contrast, Vingralek's system allows for *uneven* growth of buckets across servers, necessitating load balancing techniques. Unlike Skagerwall, Vingralek uses an indirection between bucket numbers and server numbers, allowing multiple buckets per server. EX1007, 6. Hashing distributes keys across buckets, not directly to servers. *Id.*, 7. Buckets are variably sized and grow dynamically, enabling uneven key distribution across both buckets and servers. *Id.*, 8-9. Vingralek's bucket approach thus allows servers to become overloaded when the aggregate keys exceed capacity, requiring load balancing and redistribution. EX2001, ¶83.

Petitioner points to Vingralek's response to a "panic load capacity" as allegedly disclosing claim limitation [17.e]. Pet., 51. Petitioner *assumes* that

Skagerwall's directory servers will reach the same kind of "panic load capacity" as Vingralek and, as such, a POSITA would be motivated to modify Skagerwall's response to mirror Vingralek's. Pet., 51-52; EX2001, ¶¶83-84.

Petitioner assumes incorrectly. Petitioner does not explain how or why a Skagerwall server would reach "panic load capacity" given its even distribution design. This leaves a critical gap in evidence supporting a POSITA's motivation to add Vingralek's splitting and migration techniques to Skagerwall. Skagerwall and Vingralek fundamentally solve different problems. Vingralek addresses "unequal distribution of bucket entries" by monitoring loads and transferring records when thresholds are exceeded. EX1007, 6, 10, 13. Skagerwall has no unequal distribution issue, as it stores records "evenly over the available servers." *Id.*, 8:49-51; EX2001, ¶¶83-84.

Furthermore, Skagerwall never mentions the goal of "cost-conscious scalability". Pet., 51. It is just as reasonable to assume that if Skagerwall's system grows, it will simply increase the number of directory servers rather than employ Vingralek's "bucket migration" technique." EX2001, ¶85.

In sum, the references' disclosures explicitly demonstrate that Skagerwall's even distribution of records eliminates the need for Vingralek's complex monitoring and transferring of records between buckets. Petitioner's failure to resolve the inherent differences between the Skagerwall 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. EX2001, ¶86.

3. 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 Skagerwall 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 Int’l v. Assembly Guidance Sys.* is instructive. 97 F.4th 882, 886 (Fed. Cir. 2024). 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, Skagerwall and Vingralek disclose different architectures for distributed storage systems—one using a hash-based approach and the other using a bucket-based approach. 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, ¶¶80-86.

4. The Petition Fails to Show a Reasonable Expectation of Success in Combining Skagerwall with Vingralek

Petitioner’s argument that a POSITA would have had a reasonable expectation of success in combining Skagerwall and Vingralek is flawed. The Petition asserts that “combining the teachings of Skagerwall and Vingralek would have involved modifying the Skagerwall system in a manner that Skagerwall suggests is feasible” because “Skagerwall discloses that its directory servers may be scaled arbitrarily.” Pet., 52 (citing EX1006, 4:12-15, 8:15-19). This argument lacks any concrete analysis of the specific modifications required to integrate Vingralek’s techniques into Skagerwall’s system. EX2001, ¶¶87-91.

Combining Vingralek’s bucket-based approach with Skagerwall’s hash-based distribution would introduce unevenness in the distribution of object tags across servers, undermining the fundamental design principles of Skagerwall’s system. As detailed above, Skagerwall relies on a hash function to ensure object tags are evenly distributed across servers based on their hash values. EX1006, 8:50-54, 11:1-11.

Introducing Vingralek's bucket splitting and migration would lead to uneven distribution of object tags, breaking the simplicity and efficiency of Skagerwall's hash-based approach. This architectural mismatch would require significant modifications to Skagerwall's core design, undermining the feasibility and likelihood of success of the proposed combination. EX2001, ¶¶88.

Petitioner fails to address the technical challenges or potential drawbacks of making such a significant modification to Skagerwall's core architecture. Adapting Skagerwall's system to work with Vingralek's techniques would have required substantial changes to how object tags are distributed and managed across servers. The Petition does not provide any technical details on how this integration would be achieved or the potential impact on the performance and reliability of object data retrieval. EX2001, ¶¶89-90.

To this end, Petitioner fails to address that Skagerwall's architecture is designed to evenly distribute object tags across servers based on predetermined hash ranges, inherently balancing the load and avoiding the need for Vingralek's load balancing techniques. Even if additional servers were added to Skagerwall's system to increase capacity, there would be no reason to adopt Vingralek's approach, which is designed to address the uneven load distribution that can arise in its bucket-based architecture. Introducing Vingralek's techniques would undermine the fundamental

principles of Skagerwall’s design and require significant modifications to how object tags are distributed and managed. EX2001, ¶¶89-90.

The Petition’s failure to address the technical issues implicated in a POSITA’s reasonable expectation of success in combining Skagerwall 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, Petitioner fails to address the incompatibilities. This absence of evidence and theory is fundamental, and Petitioner cannot remedy it at trial. *See, e.g., Yita LLC v. MacNeil IP LLC*, 69 F.4th 1356, 1367 (Fed. Cir. 2023) (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, ¶91.

X. GROUND 2: NO MOTIVATION TO COMBINE SKAGERWALL-VINGRALEK WITH KRASNER

In Ground 2, Petitioner alleges that claim 11 is obvious over Skagerwall in view Vingralek and Krasner. Claim 11 depends from claim 10 and adds the requirement, “*the location information comprises geographic location information.*” Petitioner acknowledges that Skagerwall-Vingralek does not teach the added limitation. Pet., 63.

Petitioner contends a POSITA would have been motivated to combine Skagerwall with Krasner, to fill the gap created by the added limitations. Pet. 63-65. Petitioner states that because Krasner “relates to a client-server system” and teaches “location server storing geographical location information,” that is sufficient motivation for a POSITA “to consider Krasner when implementing Skagerwall’s system/method.” Pet. 63. 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 Skagerwall 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 claim 11 was trying to solve. Skagerwall and Krasner, however, are not in analogous fields of art. EX2001, ¶¶92-95.

Controlling law 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*, 805 F.3d at 1073 (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*, 97 F.4th at 886. Skagerwall and Krasner relate to different technological fields; one is not reasonably pertinent to the other, thus making it improbable that a POSITA would have looked to Krasner to modify Skagerwall. *In re: Natural Alternatives, LLC*, 659 Fed. Appx. 608, 613-614 (Fed. Cir. 2016).

Skagerwall describes a system “for linking each of a plurality of tagged objects to information services stored on a network.” EX1006, Abstract, 5:25-38, 6:45-48. Skagerwall’s focus is to “design a system, which readily delivers focused information about a certain topic or object without the need of performing time consuming network searches with sophisticated arrangements of search terms, in order to narrow down the number of ‘hits.’” It does this by providing “a system and method capable of communicating information associated with an arbitrary number of objects.” EX1006, 2:8-12, 2:48-50; EX2001, ¶¶92-95.

Krasner, on the other hand, is directed to operating a satellite positioning system receiver. EX1009, Abstract. Krasner tracks mobile devices while the mobile device is on the move by receiving signals from a GPS receiver and storing the mobile device's GPS coordinates. *Id.*, 3:56-65. Krasner's stated purpose is to "provid[e] multiple sets of position information over a period of time through a mobile GPS unit." *Id.*, 2:39-41; EX2001, ¶¶92-95.

Krasner is therefore not within the same field of endeavor as, and therefore cannot reasonably be pertinent to, Skagerwall, making it improbable that a POSITA would consider Krasner in modifying Skagerwall to achieve the patented invention. Petitioner's cherry-picked similarities, which are divorced from both references' stated purposes, are insufficient to support its claim that a skilled artisan would have combined them. Failing this showing, Petitioner cannot succeed as to Ground 2. EX2001, ¶¶92-95.

XI. GROUND 3

Ground 3 alleges that claims 24-26 are obvious over Skagerwall in view of Vingralek and Sato. Claims 24-26 depend from claim 17, and therefore, Ground 3 fails for the same reasons as with respect to claim 17.

XII. 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 Sciences International, 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 (P.T.A.B 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* §IX.A. Each of the Grounds rely on Vingralek and therefore are non-meritorious. Furthermore, each of the Grounds include significant weaknesses (beyond Vingralek’s lack of qualification) which prevent Petitioner from likely prevailing on any 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.

XIII. 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 20, 2024

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CERTIFICATE OF COMPLIANCE

The undersigned hereby certifies that Patent Owner's Preliminary Response (the "POPR") consists of 10,983 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 20, 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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