

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HULU, LLC,
Petitioner,

v.

SOUND VIEW INNOVATIONS, LLC,
Patent Owner.

IPR2018-01039
Patent 5,806,062

Before JAMESON LEE, DEBRA K. STEPHENS, and DANIEL J.
GALLIGAN, *Administrative Patent Judges*.

STEPHENS, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background and Summary

Hulu, LLC (“Petitioner”) filed an *Inter Partes* Review petition (Paper 3 (“Pet.”)) to institute an *inter partes* review of claims 1–3, 7, 10, 11, 14, and 15 (the “challenged claims”) of U.S. Patent 5,806,062 (Exhibit 1001, the

“’062 Patent”; 35 U.S.C. § 311). Sound View Innovations, LLC (“Patent Owner”) timely filed a Preliminary Response (Paper 10 (“Prelim. Resp.”)).

In our original Decision Denying Institution of *Inter Partes* Review (“Decision Denying Institution”), we¹ declined to institute *inter partes* review because Petitioner failed to persuade us sufficiently that relied-upon prior art qualifies under 35 U.S.C. §§ 102(a) and 102(b) (Paper 12, 12). Petitioner then requested rehearing of our Decision Denying Institution by the Precedential Opinion Panel (Paper 13, 13). The Precedential Opinion Panel determined that Petitioner established a reasonable likelihood that the relied-upon prior art qualified as a printed publication for the purposes of institution (Paper 29, 20). The Precedential Opinion Panel further granted Petitioner’s request for rehearing and remanded this matter to the original panel for consideration of whether to institute a trial on the merits of the unpatentability ground presented in the Petition (*id.* at 21).

In light of the Precedential Opinion Panel’s Decision, we determined that Petitioner established a reasonable likelihood that the relied-upon reference taught the challenged claims (Paper 31). More specifically, based on our review of the record, we concluded that Petitioner was reasonably likely to prevail in demonstrating that at least one of the challenged claims is not patentable (*id.*). Thus, we instituted *inter partes* review of claims 1–3, 7, 10, 11, 14, and 15 on all of the alleged grounds of unpatentability (*id.*).

Patent Owner then filed a response (Paper 45 (“PO Response”)), which was followed by Petitioner’s Reply (Paper 47 (“Pet. Reply”)). Patent Owner then filed a Sur-Reply in response (Paper 56 (“PO Sur-Reply”)).

¹ The panel changed on December 28, 2020, due to unavailability of one of the judges (Paper 37). “We” and “our” in this Decision refer to the panel of judges that presided at the relevant time.

An Oral Hearing was held July 1, 2021, a transcript of which has been entered (Paper 65 (“Tr.”)). We additionally granted supplemental briefing on *Valve Corp. v. Ironburg Inventions Ltd.*, 8 F.4th 1364 (Fed. Cir. 2021) (hereinafter, “*Valve*”) and its impact on the publication status of the asserted prior art (Papers 62, 63).

Petitioner challenges claims 1–3, 7, 10, 11, 14, and 15 as unpatentable under 35 U.S.C. § 103 (Pet. 4, 20–52). Generally, Patent Owner contends that the Petition fails as to all challenged claims (PO Resp. *passim*).

B. Real Parties in Interest

Patent Owner states that the real parties-in-interest are Sound View Innovations, LLC and Sound View Innovation Holdings, LLC (Paper 27, 1).

Petitioner states Hulu, LLC, is the real party-in-interest (Pet. 2).
Petitioner further attests that:

The following entities own ten percent or more of the stock of Petitioner: The Walt Disney Company, 21st Century Fox, Comcast Corporation and Time Warner Inc. None of the parties listed above as part-owners of Hulu controlled or funded this Inter Partes Review proceeding (IPR), nor did they contribute to the preparation of this IPR in any way
(*id.*).

C. Related Matters

Both Petitioner and Patent Owner identify the following related current proceeding as involving the patent-at-issue:

Sound View Innovations, LLC v. Hulu, LLC, No. 2:17-cv-04146
(C.D. Cal.)
(Pet. 2; Paper 27, 1).

Patent Owner additionally identifies the following related former proceedings that involve the patent-at-issue:

Sound View Innovations, LLC v. Cigna Corp. et al., No. 1-19-cv00964 (D. Del.);

Sound View Innovations, LLC v. AMC Networks, Inc., No. 1-19-cv00145 (D. Del.);

Sound View Innovations, LLC v. Delta Air Lines, Inc., No. 1-19-cv00659 (D. Del.);

Sound View Innovations, LLC v. HSN, Inc., No. 1-19-cv-00193 (D. Del.);

Sound View Innovations, LLC v. CBS Corp., No. 1-19-cv-00146 (D. Del.);

Sound View Innovations, LLC v. Walmart Inc., No. 1-19-cv-00660 (D. Del.);

Sound View Innovations, LLC v. The CW Network, LLC, No. 1-19-cv00147 (D. Del.);

Sound View Innovations, LLC v. Facebook Inc., No. 2:17-cv-04275 (C.D. Cal.) (terminated Jan. 10, 2018, Dkt. 59);

Sound View Innovations, LLC v. FMR, LLC et al., No. 1-17-cv-01388 (D. Del.) (dismissed Feb. 17, 2018, Dkt. 17);

Sound View Innovations, LLC v. Twitter, Inc., No. 1-16-cv-00652 (D. Del.) (dismissed Jan. 16, 2017, Dkt. 21); and

Sound View Innovations, LLC v. LinkedIn Corp., No. 1-16-00497 (D. Del.) (dismissed Jan. 17, 2017, Dkt. 20)

(Paper 52, 1–2).

Petitioner also has requested *inter partes* review of various other patents owned by Patent Owner.²

² IPR2018-00017 (6,125,371), IPR2018-00366 (6,125,371), IPR2018-00582 (6,502,133 B1), IPR2018-01023 (6,708,213 B1).

D. The '062 Patent (Ex. 1001)

The '062 Patent, titled “DATA ANALYSIS SYSTEM USING VIRTUAL DATABASES,” issued on September 8, 1998, from an Application filed October 17, 1995³ (Ex. 1001, codes (21), (22), (45), (54)). The '062 Patent is directed to “creating data analysis applications using reusable software operators” (*id.* at code (57)). As explained in the '062 Patent, “[w]hen dealing with large or complex documents, it is often desirable to analyze the structure of the documents” (*id.* at 1:16–18). To accomplish this, various operators are used to analyze a repository comprising a collection of documents along with an associated database that describes the structure of the documents (*id.* at 1:23–34). An operator is “[a] computer program that extracts or converts information from a repository” (*id.* at 1:33–34). As described in the '062 Patent, existing operators were designed for a single application and there was no convenient mechanism for combining various operators (*id.* at 1:44–52). Thus, when a new application was desired, a new operator had to be designed from scratch (*id.* at 1:52–53).

The '062 Patent describes customizable data analysis on virtual databases using such reusable software operators (*id.* at 2:1–8). That is, a virtual database “may be operated on by . . . operators” (*id.* at 3:37–39). As described by the Specification, a “virtual database” (VDB) “is a sequence of characters organized into one or more sections” containing “zero or more records, with each record made up of one or more fields” (*id.* at 3:27–30). Further, the “virtual database . . . has a schema which describes the format of the entire virtual database” (*id.* at 3:33–36). Still further, “[v]irtual databases which may be used in conjunction with the present invention may

³ The '062 Patent does not claim priority to any prior application.

be of the type which are described in . . . *A Flat File Database Query Language*” (*id.* at 7:47–50).

The operators, operating on the virtual database, include initial operators that convert source information into virtual database format, query operators that perform search queries on the virtual databases, and terminal operators that convert a virtual database into an external format (*id.* at 2:2–9; *see id.* at 3:45–4:30). For example, a “query operator takes a VDB of a given schema, performs an operation on the VDB, and outputs another VDB of the same schema” (*id.* at 3:53–55). Operators may be combined in various ways “to create customizable data analysis applications” (*id.* at 2:8–19).

E. Illustrative Claims

Of the challenged claims, claims 1, 7, and 14 are independent and reproduced below.

1. A data processing apparatus comprising:
a plurality of query operators, each of said query operators configured to receive a first virtual data base having a schema, for processing data in said virtual database, and for outputting a second virtual database reflecting said processing and having said schema; and
means for combining at least two of said query operators to create an application.

(Ex. 1001, 14:65–15:5).

7. A data processing apparatus comprising:
a first software operator for receiving a first virtual database having a first schema, for processing data in said first virtual database, and for outputting a second virtual database having said first schema; and
a second software operator for receiving said second virtual database, for processing data in said second virtual database,

and for outputting a third virtual database having said first schema.

(Ex. 1001, 15:19–27).

14. A method for processing information comprising the steps of:

providing a plurality of software operators each configured to receive a virtual database having a first schema, for processing information contained in said virtual database, and for outputting a virtual database having said first schema; and combining at least two of said software operators to create an application.

(Ex. 1001, 15:66–16:7). Claims 2 and 3 depend directly from claim 1; claims 10 and 11 depend directly from claim 7; and claim 15 depends directly from claim 14.

F. Reference Relied Upon

Petitioner relies upon the following prior art reference:

Reference	Exhibit No.
Dale Dougherty, <i>Sed & Awk</i> , (edited by Tim O'Reilly) O'Reilly & Associates, Inc., November 1990 (hereinafter, "Dougherty")	1004

(Pet. 3).

Petitioner supports its challenge with a Declaration by Phillip B. Gibbons, Ph.D. ("Gibbons Decl.") dated May 8, 2018 (Ex. 1003) and a Reply Declaration dated April 12, 2021 (Ex. 1014).

Patent Owner supports its response with a Declaration of Dr. Sigurd Meldal ("Meldal Decl.") dated February 1, 2021 (Ex. 2007).

The '062 Patent incorporates by reference (Ex. 1001, 7:47–53) an article by one of the inventors of the '062 Patent, Glenn Stephen Fowler:

Fowler, Glenn, *cql —A Flat File Database Query Language*, USENIX Winter 1994 Conference, San Francisco, 11–21, January 1994 (“Fowler”) (Ex. 1008).

G. Asserted Ground

Petitioner asserts that claims 1–3, 7, 10, 11, 14, and 15 would have been unpatentable on the following ground:

Claims Challenged	35 U.S.C. §	Reference
1–3, 7, 10, 11, 14, 15	103 ⁴	Dougherty

(Pet. 29).

II. ANALYSIS

A. Level of Ordinary Skill in the Art

The level of skill in the art is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis (*Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991))).

Petitioner asserts that

[a]t the time the ’062 patent was filed, a person of ordinary skill in the art (“POSITA”) would have had at least a Bachelor’s degree in electrical engineering or computer science (or equivalent degree or experience) with at least two years of experience in the design and/or development of database and record management systems. Alternatively, a POSITA may have had less than two years of practical experience but had more formal education in computer science, such as a Master’s degree

⁴ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), included revisions to 35 U.S.C. §§ 102 and 103 that became effective after the effective filing date of the challenged claims. Therefore, we apply the pre-AIA version of 35 U.S.C. §§ 102 and 103.

(Pet. 4 (citing Ex. 1003 ¶¶ 9–11)).

Patent Owner does not contest Petitioner’s assertion regarding the level of ordinary skill in the art (*see generally* PO Resp.).

We regard Petitioner’s formulation of the level of skill as consistent with the prior art before us (*see Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (prior art itself may reflect an appropriate level of skill)). Based on the record before us and in view of the parties’ agreement at this stage of the proceeding, we adopt Petitioner’s formulation of the level of ordinary skill in the art, with the exception of the language “at least,” which introduces ambiguity.

Thus, we determine, based on the record before us, a person of ordinary skill in the art would have had a Bachelor’s degree in electrical engineering, computer science, or equivalent degree or experience, with (i) two years of experience in the design and/or development of database and record management systems or (ii) more formal education in computer science, such as a Master’s degree, without the two years of practical experience.

*B. Claim Construction*⁵

Patent Owner submitted a Motion for District Court-Type Claim Construction in accordance with 37 C.F.R. § 42.100(b), certifying that the challenged patent has expired or will expire within 18 months of the entry of

⁵ The 2018 amendment to 37 C.F.R. § 42.100(b) does not apply here because the Petition was filed before November 13, 2018 (*see Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board*, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018)).

the Notice of Filing Date Accorded to Petition (Paper 7). Patent Owner certified “[t]he ’062 Patent expired no later than October 17, 2015” (*id.* at 1). Thus, the patent expired before the filing date of the Petition, May 8, 2018⁶; therefore, we interpret claim terms under a district court-type claim construction. Accordingly, we determined Patent Owner’s Motion was moot (Paper 30).

For claims of an expired patent, our claim interpretation analysis is similar to that of a district court (*see In re Rambus, Inc.*, 694 F.3d 42, 46 (Fed. Cir. 2012)). Under district court-type claim construction, claim terms are given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention, in light of the language of the claims, the specification, and the prosecution history of record (*Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*); *see also In re Rambus Inc.*, 694 F.3d at 46 (“While claims are generally given their broadest possible scope during prosecution, the Board’s review of the claims of an expired patent is similar to that of a district court’s review.”) (internal citations omitted)).

“[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention” (*Phillips*, 415 F.3d at 1313). “Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the

⁶ We note the Notice of Filing Date Accorded to Petition states the filing date accorded is May 8, 2016. We consider this date to have a typographical error in the year. We thus determine the filing date accorded is May 8, 2018.

specification” (*id.*). An inventor may provide a definition of the term with “reasonable clarity, deliberateness, and precision” in the specification (*In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994)). In the absence of such a definition, limitations are not to be read from the specification into the claims (*In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993)).

Both Petitioner and Patent Owner propose interpretations for various terms (Pet. 15–19; PO Resp. 15–38).

We address only those terms necessary for this decision. Accordingly, on the record before us, we construe the claim terms as follows.

1. “virtual database”

Petitioner asserts the term “virtual database,” as recited in claim 14, should be construed to mean “a self-contained sequence of characters organized into one or more sections, which contains zero or more records made up of one or more fields containing information” (Pet. 16–17 (emphasis omitted)). Independent claims 1 and 7 also recite a virtual database (Ex. 1001, 14:65–15:5, 15:19–27).

Patent Owner disagrees with Petitioner’s proposed construction (PO Resp. 19–38). In our Decision to Institute, we preliminarily construed “virtual database” as:

a sequence of characters organized into one or more sections which contains zero or more records made up of one or more fields containing information, in that if a record is referred to in a field in the virtual database, then the referred to record is contained in the virtual database

(Dec. 18). Patent Owner contends the preliminary construction “goes directly against the specification and prosecution history, which exclude flat file databases from the claimed ‘virtual database’” (PO Resp. 19).

According to Patent Owner, “[d]uring prosecution, the applicant made a clear and unmistakable disclaimer of flat file databases . . . and the specification unambiguously confirms that the claimed ‘virtual database’ does not include flat file databases” (*id.* at 20).

a) Claim Construction Standards

The words of a claim are generally given their ordinary and customary meaning as understood by a person of ordinary skill in the art when read in the context of the specification and prosecution history. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed.Cir.2005) (en banc). There are only two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1580 (Fed.Cir.1996).

(*Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012); *see Info-Hold, Inc. v. Applied Media Technologies Corp.*, 783 F.3d 1262, 1266 (Fed. Cir. 2015)).

To determine the proper meaning of claims, the intrinsic evidence, i.e., the claims, the written description, and, if in evidence, the prosecution history, are reviewed (*see Vitronics Corp.*, 90 F.3d at 1582). “Even within the intrinsic evidence, however, there is a hierarchy of analytical tools” (*Digital Biometrics, Inc. v. Identix, Inc.*, 149 F.3d 1335, 1344 (Fed. Cir. 1998)). The actual words of the claim are the controlling focus (*see Thermalloy, Inc. v. Aavid Engineering, Inc.*, 121 F.3d 691, 693 (Fed. Cir. 1997)). “The written description is considered, in particular to determine if the patentee acted as his own lexicographer, as our law permits, and ascribed a certain meaning to those claim terms. If not, the ordinary meaning, to one skilled in the art, of the claim language controls” (*Digital Biometrics*, 149

F.3d at 1344). “Without an express intent to impart a novel meaning to claim terms, an inventor’s claim terms take on their ordinary meaning” (*York Prods., Inc. v. Central Tractor Farm & Family Ctr.*, 99 F.3d 1568, 1572 (Fed. Cir. 1996)).

b) Own Lexicographer

The ’062 Patent sets out an explicit definition of “virtual database.” Specifically, the Specification of the ’062 Patent discloses that

[a] virtual database is a sequence of characters organized into one or more sections. *Each section contains zero or more records*, with each record made up of one or more fields containing information. Each section of the virtual database has an associated schema which describes the format of the records and fields. The virtual database itself has a schema which describes the format of the entire virtual database. The schema of the virtual database includes the schemas of each of the sections.

A virtual database (VDB), such as initial VDB 106, is self contained and may be operated on further by other operators. A VDB is self contained, in that if a record is referred to in a field in the VDB, then the referred to record is contained in the VDB.

(Ex. 1001, 3:28–42 (emphasis added).) The meaning of “virtual database” is clearly and deliberately set forth in the ’062 Patent so as to put an ordinarily skilled artisan on notice as to its intended definition.

Here, we have the applicants acting as their own lexicographer. As discussed above, we preliminarily construed “virtual database” as:

a sequence of characters organized into one or more sections which contains zero or more records made up of one or more fields containing information, in that if a record is referred to in a field in the virtual database, then the referred to record is contained in the virtual database.

Patent Owner contends the Board’s preliminary construction should include that “[e]ach section of the virtual database has an associated schema

which describes the format of the records and fields,’ and that the ‘virtual database itself has a schema which describes the format of the entire virtual database,’ and which ‘includes the schemas of each of the sections’” which was not included in our preliminary construction of “virtual database” (PO Resp. 31 (citing Ex. 1001, 3:31–36)).

The explicit definition, however, states a section may contain *zero* records (Ex. 1001, 3:30–35). Thus, a virtual database having one section with zero records and therefore, zero fields, would not have an associated schema as no records exist for which a format can be described (*id.*). Therefore, although the definition describes “[e]ach section of the virtual database has an associated schema which describes the format of the records and fields,” the associated schema would not exist if the virtual database has one section with zero records and fields (Ex. 1001, 3:32–35). Nevertheless, we include the requirement of an associated schema in the claim construction because such inclusion is not inconsistent with the explicit definition (*id.* at 3:30–35). We also note the independent claims specifically recite that the virtual database has a schema (*see id.* at 14:65–15:5, 15:19–27, 15:66–16:7).

On the record before us, in light of the explicit definition in the Specification, we construe “virtual database” as a sequence of characters organized into one or more sections which contains zero or more records made up of one or more fields containing information, having a schema describing the format of the entire virtual database, and, if a section has records and fields, an associated schema that describes the format of the records and fields, and being self contained in that if a record is referred to in a field in the virtual database, then the referred to record is contained in the virtual database.

c) Alleged Flat File Databases Disclaimed

Despite the explicit definition in the Specification, Patent Owner argues that during prosecution, the applicants “[c]learly [a]nd [u]nambiguously [d]isavowed [f]lat [f]ile [d]atabases” (PO Resp. 19–24). According to Patent Owner, the Specification and prosecution history of the ’062 Patent exclude flat file databases from the claimed “virtual database” (*id.* at 19–20).

[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs. *See CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed.Cir.2002). In other cases, the specification may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor. In that instance as well, the inventor has dictated the correct claim scope, and the inventor's intention, as expressed in the specification, is regarded as dispositive. *See SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1343–44 (Fed.Cir.2001).

(*Phillips*, 415 F.3d at 1316.) The applicants set forth a special definition to the claim term, “virtual database,” in the Specification of the ’062 Patent (Ex. 1001, 3:28–42). Thus, the inventor’s lexicography governs.

Nonetheless, we address Patent Owner’s contention that flat file databases are disclaimed. To that end, we determine the applicants did not set forth words or expressions of manifest exclusion or restriction. “[I]n order to disavow claim scope, a patent applicant must clearly and unambiguously express surrender of subject matter during prosecution” (*Arendi S.A.R.L. v. Google LLC*, 882 F.3d 1132, 1135 (Fed. Cir. 2018)).

(1) Prosecution History

Patent Owner first points to the prosecution history as supporting its assertion that “flat file database” is disclaimed from “virtual database” (PO

Resp. 20 (citing Ex. 1002, 117–119)). The portion of the prosecution history cited by Patent Owner is the beginning of the Examiner’s detailed action (Ex. 1002, 117) and thus, does not appear to be a correct cite. We look to the applicants’ amended claims and arguments in distinguishing over the prior art reference, Exhibit 1008 (“Fowler”), set forth by the Examiner (Ex. 1002, 131–137). We do not see anything in this argument that rises to the level of a clear disavowal. Patent Owner points to a statement made in their arguments — “[t]he first, virtual database files, Fig. 3, allows multiple schemas to be defined in a single file. This portion of Fowler is Fowler’s only discussion of virtual databases” (*id.* at 136). The applicants, however, without further argument or explanation, then state “[t]here is no indication in Fowler that each of a plurality of query operators is ‘configured to receive a first virtual database having a schema, for processing data in said virtual database, and for outputting a second virtual database reflecting said processing and having said schema’” (*id.*). These contentions do not clearly disavow the explicit definition set forth in the ’062 Patent. Indeed, the statement does not make clear that it is a flat file database being distinguished from Fowler or the processing of a first virtual database with a schema and outputting a second virtual database reflecting that schema. The applicants’ amendments to the claims are made to clearly distinguish a first and a second virtual database and to add that the second virtual database reflects the processing (*id.* at 132). None of these amendments clearly disclaims flat file databases from virtual databases. The applicants’ additional arguments distinguishing Fowler are focused on the “means for combining” but do not discuss or distinguish flat database files (*id.* at 136–137).

The applicants do not discuss flat file databases in any of their responses (*see* Ex. 1002). Nor do the Examiner's reasons for allowance indicate any discussion or recognition of any alleged disavowal (Ex. 1002, 148). Thus, the prosecution history does not support Patent Owner's assertion of a disclaimer of flat file databases from the explicit definition of virtual database set forth in the '062 Patent.

(2) *The '062 Patent Specification*

Patent Owner further contends Fowler is incorporated by reference into the Specification of the '062 Patent and, specifically with regard to virtual databases (PO Resp. 25–26). More specifically, Patent Owner contends, “the claimed ‘virtual database’ cannot include what Fowler and the specification clearly *distinguish from* a virtual database” (*id.* at 28). Patent Owner asserts,

the incorporated Fowler reference discusses *cql*, a query language for flat file databases. *Fowler, e.g.*, 7 (title “cql – A Flat File Database Query Language”). While much of Fowler generally discusses the *cql* tool for use in flat file databases, Fowler also explains that “alternate database formats” are supported for *cql*. *Id.*, 19. Among those “alternate database formats,” Fowler says, are “virtual database files.” *Id.*, 19. Thus, Fowler expressly describes “virtual database files” as an “alternate database format” to flat file databases. *Meldal Declaration*, ¶46

(PO Resp. 28.) Thus, according to Patent Owner, “[t]his disclosure, incorporated in the Patent's specification, makes clear that ‘virtual’ databases and ‘flat file’ databases are two different things” (*id.*).

The '062 Patent discloses:

Virtual databases which *may be used* in conjunction with the present invention may be of the type which are described in Fowler, Glenn, *cql—A Flat File Database Query Language*,

USENIX Winter 1994 Conference, San Francisco, pages 11–21, January 1994, which is incorporated by reference herein. *Other types of virtual databases may also be implemented by one skilled in the art.*

(Ex. 1001, 7:47–53 (first and third emphases added).) Therefore, the '062 Patent describes a type of virtual database that may be used, but does not preclude other types of virtual databases and, importantly, does not distinguish between flat file databases and virtual databases. Nevertheless, Patent Owner argues that we need to look to Fowler because “Fowler expressly describes ‘virtual database files’ as an ‘alternate database format’ to flat file databases” (PO Resp. 28).

The Specification points to pages 11–21 of Fowler as being incorporated by reference (Ex. 1001, 7:47–52). Patent Owner points to Fowler’s discussion that “‘alternate database formats’ are supported for *cql*,” one of which is “virtual database files” (PO Resp. 28). Thus, Patent Owner is asserting that because Fowler is part of the Specification, we should adopt Fowler’s alleged distinction between flat file databases and virtual databases (*id.*). Fowler, on page 19, discusses alternate database formats which include virtual database files (Ex. 1008, 19).

The '062 Patent, however, sets forth an explicit definition (Ex. 1001, 3:28–42). In spite of this, Patent Owner appears to contend an ordinarily skilled artisan would not adopt this definition, but instead, define “virtual database” by looking at Fowler (PO Resp. 28). We do not see that the '062 Patent limits its definition to Fowler’s description as Patent Owner would have us do (Ex. 1001, 3:28–42). Rather, the '062 Patent states “[v]irtual databases which *may be used* in conjunction with the present invention *may be* of the type which are described in” Fowler and “[o]ther types of virtual

databases may also be implemented by one skilled in the art” (Ex. 1001, 7:47–53). These statements that virtual databases are not limited to those in Fowler and the explicit definition support that the ’062 Patent does not limit virtual databases to those described in Fowler. Thus, we are not persuaded the applicants limited the claimed virtual databases to those described in Fowler.

d) Conclusion

The applicants have an express intent to impart a specific meaning to a claim term. Thus, we do not impart the “plain and ordinary meaning.” Indeed, the applicants chose to be their own lexicographer by setting forth an explicit definition (Ex. 1001, 3:28–42). “The public has a right to rely on such definitive statements made during prosecution. Notice is an important function of the patent prosecution process” (*Digital Biometrics*, 149 F.3d at 1347). “The specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication” (*Vitronics Corp.* 90 F.3d at 1582 (citing *Markman v. Westview Instruments, Inc.* 52 F.3d, 967, 979 (Fed. Cir. 1995))).

Accordingly, as stated above, we construe “virtual database” in light of the explicit definition, as a sequence of characters organized into one or more sections which contains zero or more records made up of one or more fields containing information, having a schema describing the format of the entire virtual database, and, if a section has records and fields, an associated schema that describes the format of the records and fields, and being self contained in that if a record is referred to in a field in the virtual database, then the referred to record is contained in the virtual database.

2. “*schema*,” “*schema of a virtual database*,” and “*associated schema of a section*”

Petitioner asserts the term “schema,” as recited in claim 14, should be construed to mean “format of the entire virtual database that includes format of the records and fields of each section of the virtual database” (Pet. 18 (emphasis omitted)).

Patent Owner contends the claims should be construed to match the District Court’s “[u]ndisputed [c]onstrutions” (PO Resp. 36 (emphasis omitted)). Patent Owner, however, indicates in its Response that “the District Court’s construction did not need to, and therefore did not, address *all* issues related to the ‘schema,’ such as whether the virtual database requires an assigned schema” (*id.* at 37, n.6). Indeed, when questioned in the Oral Hearing, Patent Owner indicated “the district court did not have that part of the construction because it did not need it at that time” (Tr. 62:19–25).

In our Institution Decision, we preliminarily construed “schema” as “the format” and “schema of a virtual database” as “the format of the entire virtual database including the format of any records and fields of the section of the virtual database” (Paper 31, 19). Patent Owner contends “schema of a virtual database” should be construed to “include the ‘format of the entire virtual database, which includes the formats of each section of the virtual database’” (PO Resp. 38 (citing Ex. 2007 ¶ 62)).

The ’062 Patent discloses “[e]ach section of the virtual database has an associated schema which describes the format of the records and fields” and “[t]he schema of the virtual database includes the schemas of each of the sections” (Ex. 1001, 3:32–34, 36–37). As previously noted, however, a virtual database may be one section with zero records and, therefore, may

not have an associated schema of the section (Ex. 1001, 3:28–32). In particular, a schema of a virtual database may not include the recited “associated schema” of the section. Nevertheless, because it is not inconsistent with the explicit definition, on this record, we construe “schema of a virtual database” as “the format of the entire virtual database including the format(s) of the section(s).” We note, however, the schema of the section may not be present if there are zero records and fields.

Although not recited in any of the challenged claims, because “associated schema of a section” is in the definition of “virtual database” set forth in the Specification of the ’062 Patent, we further interpret “associated schema of a section” as “the format of the records and fields.”

In light of the record before us, we construe “schema” as “format”; “schema of a virtual database” as “the format of the entire virtual database including the format(s) of the section(s)”; and “associated schema” as “the format of the records and fields of a section, if the section has any records.”

C. Public Availability of Dougherty

In the grounds proffered by Petitioner, Petitioner relies on Dougherty, Exhibit 1004, which has a copyright date of 1990. Petitioner additionally submits Exhibit 1005, pages from a different version of Dougherty, showing a date-stamp from Cornell University Library, which has a copyright date of 1991 (hereinafter, “the Cornell Dougherty”). Petitioner further provides an affidavit from an Administrative Supervisor in the Original Cataloging Unit of Cornell University Library, Ms. Stansbury, (Exhibit 1006), to support the “public availability” of the Cornell Dougherty.

1. Legal Standards

Petitioner has the burden to prove Dougherty qualifies as prior art under 35 U.S.C. §§ 102 (a) and 102 (b) (*see In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1376 (Fed. Cir. 2016)).

The standard of proof to *institute* a trial is “that there is a reasonable likelihood that the petitioner would prevail” (35 U.S.C. § 314(a)) while the standard of proof for a final decision is whether the Petitioner has met “the burden of proving a proposition of unpatentability by a preponderance of the evidence” (35 U.S.C. § 316(e)).

2. Evidence Submitted with Petition

a) Dougherty (Ex. 1004)

Petitioner relied on Dougherty, a textbook titled “sed & awk” authored by Dale Dougherty, to support its assertion of unpatentability (*see* Pet. 20–52; Ex. 1004). Dougherty has a copyright date of 1990 by O’Reilly & Associates, Inc. (*id.* at *iv*). Dougherty lists its printing history:

Printing History:

November 1990:	First Edition.
March 1991:	Minor corrections.
July 1992:	Minor corrections.
November 1992:	Minor corrections.

Dougherty additionally indicates its ISBN number and “impression” date:

ISBN: 0-937175-59-5

[8/94]

(*id.*).

b) Cornell Version of Dougherty and Affidavit of Pamela Stansbury

Cornell Dougherty is also a textbook titled “sed & awk” authored by Dale Dougherty (Ex. 1005). Cornell Dougherty has a copyright date of 1991

by O'Reilly & Associates, Inc. (*id.*). Cornell Dougherty lists its printing history:

Printing History:

November 1990: First printing.

March 1991: Minor corrections.

(*id.*). Cornell Dougherty also lists its ISBN number and “impression” date:

ISBN: 0-937175-59-5

[1/92]

Petitioner provides only the beginning pages of Cornell Dougherty, but does not provide the body of the textbook which, importantly, includes the alleged corresponding portions of Dougherty (*id.*). Petitioner provides an Affidavit of Pamela Stansbury to support the public availability of Cornell Dougherty (Ex. 1006).

As noted in the POP Decision, Petitioner no longer relies on the Affidavit of Ms. Stansbury, accompanying Cornell Dougherty (Paper 17, 3 n. 1; Paper 29, 20). In particular, Petitioner states Ms. Stansbury's Affidavit “is unnecessary to resolve the question presented[; thus, Petitioner] does not rely on it” (Paper 17, 3 n. 1). The POP Decision, however, pointed to Ms. Stansbury's Affidavit as being “probative that Dougherty is the type of book that a university library would have collected and catalogued” (Paper 29, 20).

We do not rely on Cornell Dougherty or Ms. Stansbury's Affidavit in determining whether Dougherty qualifies as prior art because Petitioner no longer relies on the Affidavit of Ms. Stansbury. Further, this evidence is unnecessary for our findings herein.

3. *Additional Evidence Submitted with Petitioner’s Reply*

Patent Owner contends Petitioner may not submit any further evidence on this subject beyond the evidence submitted with the Petition (PO Resp. 13–15). More specifically, Patent Owner asserts, “Petitioner has not sought to . . . supplement the record” (*id.* at 14). According to Patent Owner, “[a]fter the Petition in this case was filed, Patent Owner raised the issue of public availability in the [Patent Owner Preliminary Response]” (*id.*). Patent Owner further asserts that the POP Decision made a “reasonable-probability finding [that] pointed expressly to Petitioner’s right ‘to move to submit supplemental information . . . within one month of institution’” (*id.* at 14–15 (citing Paper 29, 8)). However, Patent Owner contends, “no supplemental information was offered” (*id.* at 15). Thus, Patent Owner asserts “[g]iven that the central focus of the POP rehearing was the question of Dougherty’s public availability, now that Patent Owner’s window to timely submit rebuttal evidence has closed[,] it is too late for Petitioner to seek to submit any further evidence on this subject” (*id.* at 15 (citing Paper 29, 8; *Unified Patents Inc. v. Plectrum LLC*, IPR2017-01430, Paper 17, 6 & n.2 (PTAB June 6, 2018))).

In its Reply, Petitioner asserts the POP Decision “invited” Petitioner to submit additional evidence to “properly respond to [Patent Owner’s] challenges” (Pet. Reply 3 (citing Paper 29, 7–8)). Petitioner asserts it is “not prohibited from relying on new evidence and arguments in a reply, if the evidence and arguments are responsive to arguments made in a patent owner response” (*id.* (citing *Microsoft Corp. v. Uniloc 2017 LLC*, IPR2019-00973, Paper 11, 16 (Nov. 13, 2020))).

Patent Owner, however, argues the POP Decision said “after institution, the petitioner ‘may not submit new evidence or argument in reply

that it could have presented earlier,” such as by “mov[ing] to submit supplemental information...within one month of institution” or with a “show[ing] ‘why [it] reasonably could not have been obtained earlier,’” and “cannot raise new issues in reply” (PO Sur-Reply 1 (quoting Paper 29, 7–8 (quoting 37 C.F.R. § 42.123; citing Consolidated Trial Practice Guide (“CTPG”)⁷, 73–74))). Thus, Patent Owner asserts, as held by the POP Decision, “after institution, the petitioner ‘may not submit new evidence or argument in reply that it could have presented earlier’” (*id.* (quoting Paper 29, 7 (quoting CTPG at 73))).

As noted in the POP Decision, Petitioner may file a reply and, although Petitioner “‘may not submit new evidence or argument in reply that it could have presented earlier, e.g., to make out a prima facie case of unpatentability[,]’ . . . [t]he exception to this general rule precluding the submission of new evidence is that the parties can respond to arguments raised in a prior brief and ‘[a] party also may submit rebuttal evidence in support of its reply’” (Paper 29, 7 (citing CTPG, 73–74)). The POP Decision further determined “[a]fter institution, there is also an opportunity for the petitioner to move to submit supplemental information under 37 C.F.R. § 42.123” (*id.* at 8). However, “[u]nless this motion is filed within one month of institution, the petitioner must show ‘why the supplemental information reasonably could not have been obtained earlier’” (*id.* (citing 37 C.F.R. § 42.123(b) and (c))).

We agree with Patent Owner that Petitioner had the opportunity to submit supplemental evidence after the Preliminary Response was filed but did not request to supplement the record (*see* PO Resp. 13–15). Patent

⁷ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

Owner contends it asserted Dougherty was not prior art in the Preliminary Response (Prelim. Resp. 4–23), the briefing for the POP (Papers 17, 25) and the Patent Owner Response (PO Resp. 3–15). Patent Owner argues, however, Petitioner did not contact the Board to request to submit supplemental evidence after the Preliminary Response, after the POP Decision which specifically addressed this issue (*see* Paper 29), or after Patent Owner’s Response. Nonetheless, as discussed above, Petitioner is permitted to file additional evidence in response to Patent Owner’s arguments (Paper 29, 14; *see also* Paper 29, 7–8 (“The exception to this general rule precluding the submission of new evidence is that the parties can respond to arguments raised in a prior brief and “[a] party also may submit rebuttal evidence in support of its reply” (citing CTPG, 73–74; *Belden Inc.*, 805 F.3d at 1077–78))).

Thus, in light of the POP Decision, we determine evidence submitted with Petitioner’s Reply that is rebuttal evidence in support of its Reply, is permitted to be submitted (*see* Paper 29, 7). Here, Patent Owner argued in its Response that Dougherty does not qualify as prior art (PO Resp. 3–15). Accordingly, evidence that Petitioner asserts supports its assertion that Dougherty qualifies as prior art is permitted to be submitted (*see* Paper 29, 7).

Petitioner submits the following evidence as support.

a) Johns Hopkins Dougherty (Ex. 1010)

Petitioner provides the front pages and table of contents from a book entitled “sed & awk” authored by Dale Dougherty (Ex. 1010 (hereinafter, “Johns Hopkins Dougherty”)). The front pages disclose that Johns Hopkins Dougherty has a copyright date of 1990 by O’Reilly & Associates, Inc. (*id.* at *iv*). Johns Hopkins Dougherty lists its printing history:

Printing History:

November 1990:	First Edition.
March 1991:	Minor corrections.
July 1992:	Minor corrections.
November 1992:	Minor corrections.

(*id.*). Johns Hopkins also lists its ISBN number and “impression” date:

ISBN: 0-937175-59-5	+	[4/95]
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(*id.*). The remaining pages of the excerpt provided are the Table of Contents, List of Figures, and List of Tables (*id.* at v–xiii).

b) University of Michigan Dougherty (Exhibit 1011)

Petitioner provides excerpts from a book entitled “sed & awk” authored by Dale Dougherty housed at the University of Michigan (Ex. 1011 (hereinafter, “Michigan Dougherty”)). Michigan Dougherty has a copyright date of 1990 by O’Reilly & Associates, Inc. (*id.* at iv). Michigan Dougherty lists its printing history:

Printing History:

November 1990:	First Edition.
March 1991:	Minor corrections.
July 1992:	Minor corrections.
November 1992:	Minor corrections.

(*id.*). Michigan Dougherty also lists its ISBN number and “impression” date:

ISBN: 0-937175-59-5	+	[3/94]
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(*id.*). The remaining pages of the excerpt provided in the Exhibit, include the Table of Contents, List of Figures, and List of Tables (*id.* at v–xiii) as

well as excerpts from the body of the book that, according to Petitioner, are “relevant” (Pet. Reply 8).

c) Declarations of Dr. Hall-Ellis (Exs. 1012, 1013)

Petitioner submits two Declarations of Dr. Hall-Ellis to support its assertion that Johns Hopkins Dougherty and Michigan Dougherty are the same textbook as Dougherty and were publicly available as required under 35 U.S.C. § 103 (*see* Exs. 1012, 1013).

d) Special Libraries (Ex. 1015)

Petitioner relies on a book review by Hope N. Tillman of “The Whole Internet Users Guide and Catalog” authored by Ed Krol and published by O’Reilly and Associates, that was included in the publication, Special Libraries (Tillman, Hope N., *Book Review*, Special Libraries, Winter 1993 (1993) (found at <https://scholarworks.sjsu.edu/slasl1993/1>)) to support its assertion that “Dougherty’s publisher, O’Reilly and Associates (now O’Reilly Media) is a well-known publisher of technical textbooks and has been since the 1990s” (Pet. Reply 4).

e) College Syllabi (Exs. 1016–1018)

Petitioner further relies on several college syllabi as evidence of O’Reilly & Associates being a “well-known publisher of technical textbooks” (Pet. Reply 4). Exhibit 1016 is a copy of course information for a Fall 2015 Bioinformatics class in the Computer Science Department at San José University. According to Petitioner, “[d]uring Dr. Meldal’s tenure at [San José State University], his colleagues recommended reading from O’Reilly textbooks to students in published course syllabi” (*id.* at 4–5 (citing Ex. 1016, 2–3)).

Also submitted, are two course syllabi from Carnegie Mellon University (CMU) (Exs. 1017, 1018). Exhibit 1017 is a copy of “Course

Policies and Syllabus” from a Fall 2003 Statistical Computing class at CMU. Dougherty is not listed as any of the resources. Exhibit 1018 is a copy of information for Software Architecture for User Interfaces for a Spring 2001 course at CMU.

4. *Propriety of Petitioner’s Reply Evidence*

Patent Owner asserts, “Petitioner failed to show by a preponderance of the evidence that its only reference, Dougherty, was publicly available as a printed publication by the October 17, 1995 filing date of the ’062 Patent” (PO Resp. 3). Patent Owner contends Petitioner has not made its case in the Petition and the POP’s “reasonable likelihood determination was based on evidence and arguments not identified by the Petition . . . and not in the evidentiary record” (*id.* at 4–5; PO Sur-Reply 4). More specifically, Patent Owner contends, the POP Decision based its decision on “statements not found in the Petition” and “allegations never subsequently substantiated in the record on which this instituted trial will be decided” (PO Resp. 5).

Patent Owner further contends the POP determined that Dougherty is “a textbook from an established publisher, O’Reilly, and a well-known book series”; however, Patent Owner asserts, Petitioner did not identify in its Petition or its exhibits any mention or proof that Dougherty is “from an established publisher” or part of a “well-known book series” (*id.* at 5–6 (footnote omitted)). Rather, Patent Owner contends, the POP Decision relied on a brief and evidence submitted by a third party (Paper 29, 19 (citing Paper 20, 11–12)). Patent Owner additionally contends the copyright dates of Dougherty and Cornell Dougherty cited by the POP Decision, were not “cited, let alone identified, in the Petition” (PO Resp. 6 (citing Pet. 3)).

In its Reply, Petitioner argues Dougherty has a 1990 copyright date with “Minor corrections” printing date of November 1992 and an impression date of August 1994 (Pet. Reply 1). Petitioner also asserts, “Dougherty is a textbook from an established publisher, O’Reilly, and from a well-known book series” (Pet. Reply 2 (citing Paper 24, 10; Paper 20, 11 (citing <http://www.oreilly.com/about/history.html>))). Petitioner argues the POP Decision found that Dougherty is a textbook from an established publisher and a well-known book series and credited Dr. Stansbury’s Affidavit (Ex. 1006) as “probabtive that Dougherty is the type of book that a university library would have collected and cataloged” (Pet. Reply 1–2 (citing Paper 24, 10; Paper 29, 19–20)). Petitioner contends the POP Decision therefore determined Petitioner had “establish[ed] a reasonable likelihood that Dougherty is a printed publication that a publisher made available to the pertinent public prior to the October 1995 critical date” (*id.* at 2 (citing Paper 29, 19–20)). Thus, according to Petitioner, “[t]here is no reason to disturb the POP[Decision] now: this same evidence is also sufficient to show Dougherty’s public availability for the purposes of Final Written Decision” (*id.* at 1–2 (citing Ex. 1004, 4; Paper 24, 10; Paper 29, 19–20)).

Patent Owner argues, even in light of the POP’s permitting new evidence to be submitted, Petitioner may not “raise a new public availability theory in the Reply based on new evidence it ‘could have presented earlier’” (PO Sur-Reply 2 (citing Paper 29, 7)). Patent Owner asserts that Petitioner’s Reply

substitutes a new theory, based on new facts (a printed “copyright date of 1990, a ‘Minor correction’ printing date of November 1992, and an impression date of “8/94”); two new versions of Dougherty allegedly from Johns Hopkins University (Ex. 1010 . . .), and the University of Michigan (Ex. 1011 . . .);

two new declarations from new witness Dr. Hall-Ellis (Exs. 1012-1013), and four more new exhibits allegedly showing for the first time that Dougherty had a “well-known publisher”

(PO Sur-Reply 2 (citing Pet. Reply 1–9)). Patent Owner therefore argues Petitioner has submitted new evidence or argument in reply that it could have presented earlier and that raises new issue in the reply (*id.* at 3 (citing Paper 29, 7)).

Initially, we note the standards are different in instituting an *inter partes* review and in assessing proffered grounds for a final written decision (*see* 35 U.S.C. §§ 314(a), 316(e)). Thus, we consider the evidence in light of the standard for a final written decision.

Petitioner contends it “properly responds” to Patent Owner’s challenges — “Petitioners are not prohibited from relying on new evidence and arguments in a reply, if the evidence and arguments are responsive to arguments made in a patent owner response” (Pet. Reply 3; *see generally* POP).

We determine, based on the record before us and the POP Decision, Petitioner’s newly proffered evidence and arguments, as set forth above in Section II C 4., do not introduce a new theory of public availability (*see* Paper 29). Petitioner’s theory remains that Dougherty qualifies as prior art (*see* Pet. Reply). Accordingly, evidence that supports Petitioner’s assertion that Dougherty qualifies as prior art is permitted (*see* Paper 29, 7). More specifically, the POP Decision set forth that

some limited opportunities exist for the petitioner to present new evidence later, including: (1) in a reply to a patent owner preliminary response; (2) in a reply to the patent owner response; and (3) in a motion to file supplemental information. 37 C.F.R. §§ 42.108(c), 42.23, 42.123. As to the first two opportunities, the evidence must be responsive to the prior briefing. 37 C.F.R.

§ 42.23 (“A reply may only respond to arguments raised in the corresponding opposition, patent owner preliminary response, or patent owner response.”). As to the third, the supplemental information must be relevant to a claim for which trial was instituted and, if the submission occurs after one month from institution, the petitioner must show good cause as to “why the supplemental information reasonably could not have been obtained earlier, and that consideration of the supplemental information would be in the interests-of-justice.” 37 C.F.R. § 42.123

(Paper 29, 14; *see also* Paper 29, 7–8 (“The exception to this general rule precluding the submission of new evidence is that the parties can respond to arguments raised in a prior brief and ‘[a] party also may submit rebuttal evidence in support of its reply’” (citing CTPG, 73–74; *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1077–78 (Fed. Cir. 2015)))). The POP Decision further indicated that “Patent Owner may challenge Petitioner’s evidence,” here, the Dougherty reference, and “Petitioner may respond if appropriate, as indicated herein” (*id.* at 21).

Patent Owner challenged Petitioner’s evidence — Dougherty — as not qualifying as prior art under 35 U.S.C. §§ 102, 311(b) for failure to establish Dougherty was publicly available at the time of the invention, in the Preliminary Response (Prelim. Resp. 4–23), the briefing for the POP (Papers 17; 25), and the Patent Owner Response (PO Resp. 3–15). Petitioner submitted evidence supporting Dougherty as prior art with the Petitioner Reply (*see* Pet. Reply). Thus, in light of the POP Decision, we determine the new evidence submitted — two new printings of Dougherty (Johns Hopkins Dougherty (Ex. 1010) and Michigan Dougherty (Ex. 1011); two new declarations from a new witness, Dr. Hall-Ellis (Exs. 1012–1013); and four more new exhibits allegedly showing Dougherty had a “well-

known publisher” — is permitted under 37 C.F.R. §§ 42.108(c), 42.23, 42.123 and the Consolidated Trial Practice Guide.

Thus, we consider the two new printings of Dougherty, Johns Hopkins Dougherty (Ex. 1010) and Michigan Dougherty (Ex. 1011); the two new declarations from a new witness, Dr. Hall-Ellis (Exs. 1012–1013); and the four more new exhibits allegedly showing Dougherty had a “well-known publisher,” as they properly respond to arguments raised in the Preliminary Response and Patent Owner Response.

5. Alleged Failure to Show Dougherty was Publicly Available

Patent Owner contends the Petition’s entire argument on Dougherty’s public availability is

Dougherty, *Sed & Awk* (edited by Tim O’Reilly), O’Reilly & Associates, Inc. (November, 1990) (“Dougherty”, Ex. 1004), which is prior art under pre-AIA 35 U.S.C. § 102(a) and (b) (*see also*, Ex. 1005 and Ex. 1006 confirming public availability as of September 16, 1992, and at least before October 17, 1995.)

(PO Resp. 7 (quoting Pet. 3)). First, Patent Owner asserts “[t]he Petition does not explain the significance of ‘November, 1990,’” or its origin (PO Resp. 7). By looking at Dougherty’s title page, we determine Petitioner is citing to the printing date of the “First Edition” of November 1990; the copyright date only lists the year, 1990 (Ex. 1004).

Patent Owner further asserts, “Petitioner has submitted no evidence showing that the asserted version of Dougherty is materially the same as any earlier versions” (PO Resp. 8). Patent Owner contends the table of contents “reflects numerous changes between the printings, including additional headings in chapters starting at the beginning of the book” (*id.*).

As to the evidence submitted with Petitioner’s Reply Brief, Patent Owner asserts the new evidence does not support that Dougherty is prior art (PO Sur-Reply 4–7).

a) Dougherty

(1) Printing and Impression Date

Patent Owner contends Petitioner has not explained how the “‘printing date of November 1992’ . . . demonstrates Dougherty’s public availability . . . (or even [that it was] printed) as of November 1992 or shortly thereafter” because the impression date is “8/94”— “almost two years after the alleged ‘printing date of November 1992’” (PO Resp. 10).

Patent Owner contests the POP Decision’s finding that the number “appear[ing] on the same line as (albeit well away from) Dougherty’s International Standard Book Number (‘ISBN’) . . . indicates ‘8/94’ is a so-called ‘ISBN date’ or even materially connected to Dougherty’s ISBN” (PO Resp. 10–11). Patent Owner contends that “[a]t most, ‘8/94’ shows that this reference was not printed before August 1994” and, thus, “does not prove Dougherty was *publicly available* by the patent’s priority date” (*id.* at 11).

Dr. Hall-Ellis states the date and year after the ISBN number represents the date “the publisher printed this copy of the book” (Ex. 1013 ¶ 42; Pet. Reply 1, n. 1). Dr. Hall-Ellis testifies the various printings of Dougherty are “the same work because they contain[] the same ISBN. Therefore[,] they are the same— the same work, which in lay parlance is the same book” (Ex. 2012, 43:9–18).

We are persuaded, based on the record, that the copyright date indicates the date the work was created while the impression date indicates when the copy was physically printed. We credit Dr. Hall-Ellis’s undisputed

testimony that the “impression” or “imprint” date — the date following the ISBN number — “corresponds to the month and year . . . that the publisher printed this copy of the book” (Ex. 1012 ¶ 42; Ex. 1013 ¶ 42). Dr. Hall-Ellis continues that

publishers routinely print additional copies of the book to satisfy [new consumer] demand. Those additional copies will be printed from the same source . . . and have the same contents as prior printings of the same version . . . the impression date will vary to reflect the month and year of the particular additional printing (Ex. 1012 ¶ 42; Ex. 1013 ¶ 42).

(2) “*Established Publisher*” and “*Well-Known Book Series*”

Patent Owner again contests the POP Decision’s finding that O’Reilly was an “established publisher” and part of a “well-known book series” (PO Resp. 11 (citing Paper 29, 19)). Patent Owner contends Petitioner has not proffered evidence that O’Reilly was either an established publisher or part of a well-known book series *at the patent’s filing date (id.)*. Patent Owner further contends that even if O’Reilly is “the most established and well regarded publisher in the Nation,” this would not be probative as to “its publishing procedures or when a specific book was printed and made publicly available” (*id.* at 12).

Petitioner, however, contends “[t]here can be no question that O’Reilly’s textbooks, generally, are well-known and publicly available to those in the field” (Pet. Reply 6).

In its Sur-Reply, Patent Owner contends that Petitioner’s submitted evidence does not support that O’Reilly & Associates was a well-known publisher as of the priority date (PO Sur-Reply 4).

We agree that none of the course syllabi submitted supports that contention as all are from well after the priority date of the ’062 Patent (Ex.

1016 from 2015, Exhibit 1017 from 2003, and Exhibit 1018 from 2001). Nonetheless, Petitioner asserts, “colleagues at Carnegie Mellon University[] (CMU) have been recommending O’Reilly books to students for decades” (Pet. Reply 5). The priority date of the ’062 Patent is October 17, 1995 (Ex. 1001). Thus, the course syllabi proffered by Petitioner do little to illuminate O’Reilly & Associates’ status in October, 1995 as these syllabi are from 2001, 2003, and 2015 (*see* Exs. 1016–1018).

The book review from Special Libraries is from 1993 and thus, predates the ’062 Patent’s priority date (Ex. 1015). In the book review of an O’Reilly & Associates book, “The Whole Internet Users Guide & Catalog,” the reviewer writes “[t]he publisher, O’Reilly and Associates, is noted for high-caliber technical publications on UNIX and networking” (Ex. 1015, 66; Tillman, Hope N., *The Whole Internet Users Guide & Catalog*, Special Libraries, Winter 1993, 66 (1993)). Patent Owner argues that this is a statement about “the publisher’s publications on UNIX (not *sed* or *awk*)” and “does not preponderantly show the publisher was ‘well-known’ for publishing on relevant subjects at the relevant time” (PO Sur-Reply 4). But Dougherty states that it is a “book . . . about a set of uncommonly named UNIX utilities, **sed** and **awk**.” Thus, we disagree with Patent Owner’s implication that Dougherty is not about UNIX. Rather, we find this evidence persuasive of O’Reilly & Associates’ status as a well-known publisher as of the ’062 Patent’s priority date.

Patent Owner argues the evidence relied upon by the POP is “a link to O’Reilly’s own website – not an exhibit – asserting O’Reilly’s importance” (PO Resp. 11 (citing Paper 29, 19; Paper 20, 11–12; quoting “<https://www.oreilly.com/about/history.html>”))). Patent Owner’s argument is moot because, based on the article in Special Libraries, we are persuaded

O'Reilly and Associates was a well-known publisher as of the '062 Patent's priority date (Ex. 1015). In particular, the statement that O'Reilly and Associates is noted for high-caliber technical publications in the networking and UNIX fields is persuasive that O'Reilly and Associates would have been a well-known publisher to an ordinarily skilled artisan at the time of the invention.

“A reference will be 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” (*Vidstream LLC v. Twitter, Inc.*, 981 F.3d 1060, 1065 (Fed. Cir. 2020)). “When there is an established publisher there is a presumption of public accessibility as of the publication date” (*id.* at 1065 (citing *Giora George Angres, Ltd. v. Tinny Beauty & Figure, Inc.*, 116 F.3d 1497, No. 96-1507, 1997 WL 355479 at *7 (Fed. Cir. 1997) (“[A]s *Memoirs* was published (in England) by an established publisher, there is no reason to suspect that it was not publicly available, including to one skilled in the art, and no evidence was presented that it was not”))).

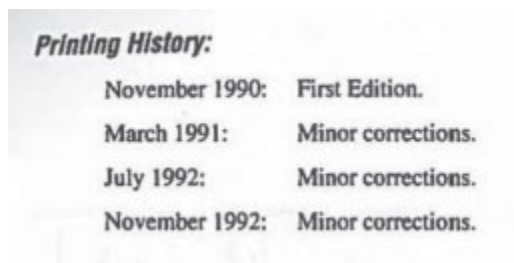
Here, the publisher of Dougherty was an established publisher as of the '062 Patent's priority date and thus, there is no reason on this record to suspect Dougherty was not publicly available.

b) Michigan Dougherty

Petitioner contends, “the Michigan copy of Dougherty is the *same version* as [Dougherty], it will have the *same contents* despite coming off the printing press in a different month” (Pet. Reply 8). Petitioner further asserts, “Dr. Gibbons has compared the relevant pages of the Michigan copy of Dougherty to the pages he cited and relied upon from Dougherty in his initial Declaration. . . . Dr. Gibbons found that all of the relied upon content

was *exactly the same* between the [Exhibit] 1004 copy of Dougherty and the Michigan copy” (Pet. Reply 8; Ex. 1014 ¶ 6).

The copyright dates and printing history of Dougherty and Michigan Dougherty are the same, as are the ISBN numbers (*compare* Ex. 1011, *iv* with Ex. 1004, *iv*). More specifically, the front pages of Michigan Dougherty set forth a copyright date of 1990 by O’Reilly & Associates, Inc. (Ex. 1011, *iv*), the same as Dougherty (Ex. 1004, *iv*). Michigan Dougherty lists its printing history:



<i>Printing History:</i>	
November 1990:	First Edition.
March 1991:	Minor corrections.
July 1992:	Minor corrections.
November 1992:	Minor corrections.

(Ex. 1011, *iv*) which is the same as Dougherty’s printing history (Ex. 1004, *iv*). Michigan Dougherty also lists its ISBN number as 0-937175-59-5 (Ex. 1011, *iv*) which is the same as Dougherty’s ISBN number (Ex. 1004, *iv*). Michigan Dougherty has an “impression” date of 3/94 (Ex. 1011, *iv*) – several months before Dougherty’s impression date of 8/94 (Ex. 1004, *iv*). Thus, this book was physically printed *before* Dougherty was physically printed.

Petitioner relies on Dr. Hall-Ellis who testifies

any copy of the book issued by O’Reilly & Associated with a 1990 copyright date and showing minor corrections in March 1991, July 1992, and November 1992, would have been printed from the same source and contain the same contents, regardless of the particular impression date found in the verso.

(Ex. 1013 ¶ 43). Dr. Hall-Ellis states the Dougherty and Michigan Dougherty “versions and contents therein are the same” (*id.* ¶ 45).

Dr. Hall-Ellis further states review of Michigan Dougherty from the Frances Willson Thompson Library, was of scanned copies of the selected pages, not the entire book (Ex. 1013 ¶ 44). Dr. Hall-Ellis declares Michigan Dougherty was “issued by O’Reilly & Associate[s] with a 1990 copyright date and minor correction in March 1991, July 1992, and November 1992” (*id.* ¶ 45). Additionally, Dr. Hall-Ellis declares “the verso of [Michigan Dougherty’s] title page also indicates that the volume was printed in March 1994, as shown by the impression date designation” (*id.* ¶ 45). Thus, Dr. Hall-Ellis determines “because the copy of Dougherty of Exhibit 1004 was issued by O’Reilly & Associate[s] with a 1990 copyright date and minor corrections in March 1991, July 1993, I can conclude that [Michigan Dougherty of Exhibit] 1011 is the same version of Dougherty as that of the Ex[hibit] 1004 copy of Dougherty” (*id.*). Therefore, Dr. Hall-Ellis determines, “despite the differing impression dates, the versions and contents therein are the same” (*id.*).

Dr. Gibbon additionally states, “I have reviewed the technical content of both copies of Dougherty and determined that the only difference between the copies is the addition of ‘We’d Like to Hear From You’ on the preface page of Ex[hibit] 1004. The technical content of both Ex[hibit] 1004 and Ex[hibit] 1011 is otherwise identical” (Ex. 1014 ¶ 6). Patent Owner argues this admission, of the addition of “We’d Like to Hear From You” as a preface page, is an admission that Dougherty and Michigan Dougherty have different content (PO Sur-Reply 6). We do not consider the addition of a preface page to be sufficient to indicate differences in the technical content.

Patent Owner further argues, “Petitioner filed some pages of Michigan-Dougherty, [but] inexplicably omitted other pages” (PO Sur-Reply 6). In particular, Patent Owner asserts, Petitioner failed to provide

corresponding pages of Michigan Dougherty for the pages of Dougherty that are cited by Petitioner in the Petition and Petitioner's Reply (PO Sur-Reply 6 (citing Pet. 33 (citing Ex. 1004, 58); Pet. Reply 11 (citing Ex. 1004, 41), 27 (citing Ex. 1004, *xvi*, *xvii*), 29 (citing Ex. 1004, 189–192))).

Petitioner asserted “Dr. Gibbons has compared the relevant pages of the Michigan copy of Dougherty to the pages he cited and relied upon from Dougherty in his initial Declaration [and] found that all of the relied upon content was *exactly the same* between [Dougherty] and the Michigan [Dougherty]” (Pet. Reply 8; Ex. 1014 ¶ 6).

We do note that not all the pages cited in Petitioner's Briefs were provided (PO Sur-Reply 6). Indeed, we do not have the full Michigan Dougherty text or the disputed pages of Michigan Dougherty (*see* Ex. 1011). Nor do we have a statement from Dr. Gibbons that the additional pages cited in Petitioner's Reply are “exactly the same.” However, the court in *Valve* found that although some of the images were missing in certain copies of the articles, “it does not amount to ‘affirmative evidence challenging . . . material facts’” (*Valve Corp.*, 8 F.4th at 1372 (quoting *Suffolk Techs., LLC v. AOL Inc.*, 752 F.3d 1358, 1365–66 (Fed. Cir. 2014))). Thus, we determine the missing pages do not amount to affirmative evidence challenging material facts. Patent Owner has not alleged the missing pages are required as support for Petitioner's assertions.

Dr. Ellis-Hall testifies that the books are identical (Ex. 1013 ¶¶ 44–51) and Dr. Gibbons also testifies that the scanned pages of Michigan Dougherty have the same technical content as the pages of Dougherty (Ex. 1014 ¶ 6).

We are persuaded the relevant contents of Michigan Dougherty and Dougherty have the same contents based on our review of the scanned pages and Dougherty's corresponding pages, the testimony of Dr. Gibbons, and the

identical ISBN number, copyright date, and printing history of Dougherty and Michigan Dougherty.

In addition, Petitioner proffers a declaration of Dr. Hall-Ellis (Ex. 1013) who testifies that Michigan Dougherty “was cataloged and made publicly available by the Frances Willson Thompson Library at the University of Michigan . . . on or shortly after January 10, 1995” (Pet. Reply 8 (citing Ex. 1013 ¶¶ 44–51)). Petitioner relies on testimony of Dr. Hall-Ellis who relies on the MARC record (Pet. Reply 8 (citing Ex. 1013 ¶¶ 44–51)). Dr. Hall-Ellis testifies Attachment 1A to her Declaration “is a true and correct copy of the online catalog record for *Sed & Awk* in the Frances Willson Thomson Library” as indicated by field 852 — MiFliC, the library’s code (*id.* ¶ 46). Dr. Hall-Ellis states, based on the MARC record, Michigan Dougherty “was publicly available on or shortly after January 10, 1995 as indicated in field 008 (‘950110’)” (*id.* ¶¶ 46–47, Attachment 1A; Pet. Reply 8). Dr. Hall-Ellis further states, “the most recent enhancement to Attachment 1[A] was November 29, 1999, as shown in field 005 (‘19991129’)” (*id.*).

Patent Owner argues, “MARC record dates are not reliable indicators of when a particular printing of a book was shelved” (PO Sur-Reply 7). Thus, Patent Owner contends, “Dr. Hall-Ellis’s testimony . . . is insufficient to shown when [Michigan Dougherty], let alone [Dougherty], was publicly available” (*id.*).

Dr. Hall-Ellis admits, “this MARC record was based on a prior imprint of the same book,” but determines, “the different impression date would not have been significant enough to merit creation of a separate MARC record” (Ex. 1013 ¶ 47). Indeed, Dr. Hall-Ellis did not testify that the MARC record for the “prior imprint of the same book” has the same

printing history as Dougherty (*id.* at Att. 1A), nor does Dr. Hall-Ellis explain how the “prior imprint” recorded in the MARC, has the same content as Dougherty. Indeed, Dr. Hall-Ellis concluded Dougherty and Michigan Dougherty are the same “versions” because of the same publisher, copyright date, printing history, and ISBN number (*id.* ¶ 45). These MARC records postdate Michigan Dougherty’s impression date (3/94) by 10 months as acknowledged by Dr. Hall-Ellis (Ex. 2012, 33:12–21).

Dr. Hall-Ellis further provides an attachment of the MARC record created at the NASA Goddard Space Flight Center Library and contributed to the OCLC (the Library of Congress Online Catalog) bibliographic database (Ex. 1013 ¶ 49, Att. 1F). This entry was created on October 19, 1992 (shown in the “Entered” field (“19921019”) (*id.*). The entry shows an ISBN (field 020) (*id.*) that is the same as Dougherty (Ex. 1004, *iv*). Dr. Hall-Ellis then again states Michigan Dougherty was publicly available “on or shortly after January 10, 1995”:

Attachment 1f indicates that the volume *Sed & Awk* by Dougherty as cataloged at the NASA Goddard Space Flight Center Library is currently available from 215 libraries. In view of above, the Dougherty book was publicly available on or shortly after October 19, 1992, because by that date it had been received, cataloged, and indexed at the NASA Goddard Space Flight Center Library and made part of the OCLC bibliographic database. For these reasons, it is my opinion that Exhibit 1011 was published and accessible to the public in the Frances Willson Thompson Library on or shortly after January 10, 1995

(Ex. 1013 ¶ 50).

We determine the only reasonable interpretation of the declaration is that Dr. Hall-Ellis is relying on university libraries’ general practice for indexing, cataloging, and shelving books in estimating the time it would

have taken to make the book available to the interested public (*see In re Hall* 781 F.2d 897, 899 (Fed. Cir. 1986)). We have no evidence rebutting Dr. Hall-Ellis's testimony as to university library practice (*see id.*). Although there is some discrepancy in what printing of Dougherty was relied upon when the MARC record and OCLC records were created, and what printing was cataloged and shelved, we determine, as a whole, these records evidence that the technical content of Dougherty relied upon was available at multiple libraries before the priority date. We determine Dr. Hall-Ellis's declaration is competent evidence, and in light of the record before us, are persuaded the testimony and proffered evidence show Michigan Dougherty was accessible prior to the critical date.

c) Johns Hopkins Dougherty

The copyright dates and printing history of Dougherty and Johns Hopkins Dougherty are the same, as are the ISBN numbers (*compare* Ex. 1010, *iv with* Ex. 1004, *iv*). More specifically, the front pages of Johns Hopkins Dougherty set forth a copyright date of 1990 by O'Reilly & Associates, Inc. (Ex. 1010, *iv*), the same as Dougherty (Ex. 1004, *iv*). Johns Hopkins Dougherty lists its printing history:

Printing History:

November 1990:	First Edition.
March 1991:	Minor corrections.
July 1992:	Minor corrections.
November 1992:	Minor corrections.

(Ex. 1010, *iv*) which is the same as Dougherty's printing history (Ex. 1004, *iv*). Johns Hopkins also lists its ISBN number as 0-937175-59-5 (Ex. 1010, *iv*) which is the same as Dougherty's ISBN number (Ex. 1004, *iv*). Johns

Hopkins Dougherty has an “impression” date of 4/95 (Ex. 1010, *iv*) – several months after Dougherty’s impression date of 8/94 (Ex. 1004, *iv*). Thus, this book was physically printed *after* Dougherty was physically printed.

The remaining pages of the excerpt provided by Petitioner, are the Table of Contents, List of Figures, and List of Tables (*id.* at *v–xiii*). Petitioner does not provide any excerpts of Johns Hopkins Dougherty that allegedly correspond to the relied-upon excerpts of Dougherty, or any part of the body of the text of Johns Hopkins Dougherty. Thus, neither Patent Owner nor the Board are able to compare the texts.

Petitioner further relies on testimony from Dr. Hall-Ellis that Johns Hopkins Dougherty was publicly available “or shortly after February 14, 1994” (Pet. Reply 7 (citing Ex. 1012 ¶¶ 44–51)). Dr. Hall-Ellis’s Johns Hopkins Declaration is substantially similar to that set forth in Dr. Hall-Ellis’s Michigan Declaration for the opening paragraphs (*compare* Ex. 1012 ¶¶ 1–43 *with* Ex. 1013 ¶¶ 1–43).

Johns Hopkins Dougherty was printed in April 1995, so this date of public availability is not for the current text submitted as evidence. Rather, Petitioner relies on MARC records submitted as Attachments 1A–1D to Dr. Hall-Ellis’ declaration (Ex. 1012 ¶ 47).

Dr. Hall-Ellis testifies that the MARC record for Johns Hopkins Dougherty “was created for the work from the first printing” and thus, “was created prior to the library receiving [Johns Hopkins Dougherty] (Ex. 2012, 30:22–32:5). In review of the MARC records, Attachments 1A and 1D, we note the “catalogued” versions do not appear to be the same version as Johns Hopkins Dougherty or even of Dougherty (Ex. 1012, Att. 1A, 1D). The MARC records indicate a 1992 copyright date for the textbooks referred to, in contrast to Dougherty’s 1990 copyright date (*compare* Ex. 1012, Att. 1A–

1D *with* Ex. 1004, *iv*). Further, the MARC records list only minor corrections in “Nov. 1992” and not the date of first edition and several dates of “minor corrections” (*id.*).

Although we are unable to determine if the texts are the same because none of the body of Johns Hopkins Dougherty was proffered in the proceeding, we credit Dr. Hall-Ellis’s testimony that “in the case of the Dougherty book, any copy of the book issued by O’Reilly & Associated [sic] with a 1990 copyright date and showing minor revisions in March 1991, July 1992, and November 1992, would have been printed from the same source and contain the same contents, regardless of the particular impression date found in the verso” (*id.* ¶ 43).

As noted by Dr. Hall-Ellis, Johns Hopkins Dougherty also has a 1990 copyright date with minor revisions in March 1991, July 1992, and November 1992 and an impression date designation of April 1995 (*id.* ¶ 45 (citing Ex. 1010, title page)). Thus, although Dr. Hall-Ellis only reviewed scanned copies of selected pages of the Johns Hopkins Dougherty and did not review the entire book, we credit Dr. Hall-Ellis’s testimony that Johns Hopkins Dougherty is the same version as Dougherty (*id.* ¶¶ 44, 45).

Dr. Hall-Ellis further states upon review of the Machine Readable Cataloging (MARC) Standard, the Johns Hopkins Dougherty was “publicly available on or shortly after February 14, 1994 as indicated in field 008 (‘940214’),” in the Johns Hopkins University Library (*id.* ¶ 47). As previously discussed, Dr. Hall-Ellis “note[s] that this MARC record was based on a *prior* imprint of the same book” (*id.* (emphasis added)).

Dr. Hall-Ellis additionally points to Attachments to the Declaration which, according to Dr. Hall-Ellis, are the MARC record for Dougherty obtained from the OCLC (Library of Congress) that indicate the MARC

record for this book was created at the NASA Goddard Space Flight Center Library (*id.* ¶¶ 48–49). Dr. Hall-Ellis states, “[t]he library continues to update this MARC record and enhance the MARC record to meet current cataloging rules” (*id.* ¶ 49). Thus, Dr. Hall-Ellis testifies “the Dougherty book was publicly available on or shortly after October 19, 1992 because by that date it had been received, cataloged, and indexed at the NASA Goddard Space Flight Center Library and made part of the OCLC bibliographic database” (*id.* ¶ 50).

Again, we determine the only reasonable interpretation of the declaration is that Dr. Hall-Ellis is relying on university libraries’ general practice for indexing, cataloging, and shelving books in estimating the time it would have taken to make the book available to the interested public (*see In re Hall*, 781 F.3d at 899). We have no evidence rebutting Dr. Hall-Ellis’s testimony as to university library practice (*see id.*). Although there is some discrepancy in what printing of Dougherty was relied upon when the MARC record and OCLC records were created, and what printing was cataloged and shelved, we determine, as a whole, these records evidence that the technical content of Dougherty relied upon was available at multiple libraries before the priority date. We determine Dr. Hall-Ellis’s declarations are competent evidence, and in light of the record before us, are persuaded the testimony and proffered evidence show Johns Hopkins Dougherty was accessible prior to the critical date.

d) Totality of the evidence

Patent Owner contends Petitioner has set forth allegations that do not prove Dougherty was publicly available by the ’062’s filing date when taken as a whole, rather than one at a time. The

issue is not whether Dougherty’s copyright date, printing date, ISBN, and alleged status of Dougherty’s publisher, taken together, demonstrate that Dougherty was publicly available. The issue is whether Dougherty was publicly available ***by the patent’s filing date***. None of the “evidence” in the Petition or cited by the POP proves by a preponderance that it was

(PO Resp. 12–13).

We have reviewed all of the submitted evidence as well as Patent Owner’s contentions. We determine the evidence, viewed as a whole, sufficiently supports that Dougherty was publicly accessible and, therefore, is a printed publication that qualifies as prior art. In particular, Petitioner has shown Dougherty was published by an established publisher (*see Vidstream*, 981 F.3d at 1064); Michigan Dougherty has the same technical content as Dougherty and was publicly accessible prior to the critical date (Ex. 1013 ¶ 45; Ex. 1014 ¶ 6); and a version of Dougherty with a prior imprint date was available publicly before the priority date (Ex. 1013 ¶¶ 47, 50). Additionally, Johns Hopkins Dougherty supports that Dougherty was publicly available before the priority date (Ex. 1010; Ex. 1012 ¶¶ 44–47). Furthermore, we determine O’Reilly & Associates’ purpose of publishing Dougherty was “dialogue with an intended audience,” thus indicating public accessibility of Dougherty (*see Valve Corp.*, 8 F.4th at 1374).

D. Asserted Obviousness over Dougherty

Petitioner contends Dougherty would have rendered claims 1–3, 7, 10, 11, 14, and 15 obvious (Pet. 29–52).

1. Dougherty (Ex. 1004)

Dougherty is a textbook titled “sed & awk.” (Ex. 1004). Sed and awk are UNIX utilities that use regular expressions for pattern matching in text

files (*id.* at xv). Sed is a stream editor used to apply a series of edits to files (*id.*). Awk is a programming language the permits manipulation of structured data and the generation of formatted reports (*id.*). That is, both sed and awk are tools which execute instructions to edit or manipulate data and generate a resulting output (*id.* at 8). Figure 2-1 of Dougherty is a block diagram illustrating the basic operation of sed and awk, and is reproduced below.

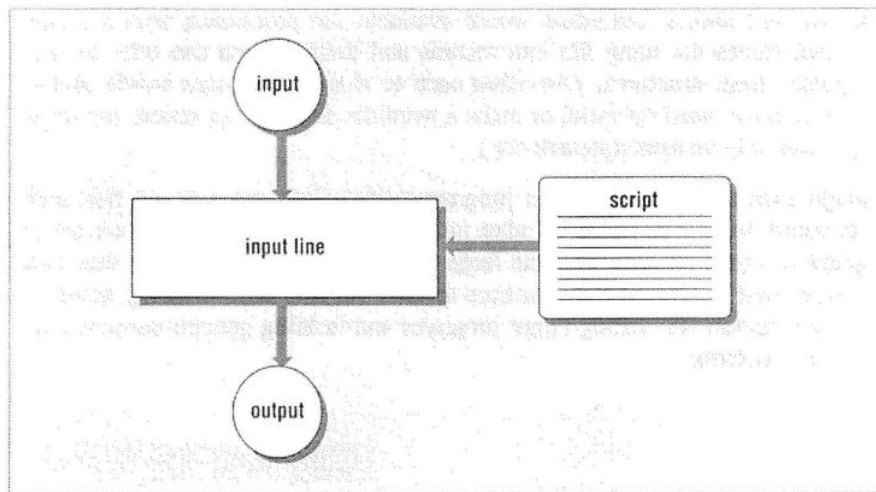


Figure 2-1 is a block diagram showing the basic operation of sed and awk (Ex. 1004, 14).

As shown in Figure 2-1, “an input line . . . is read one at a time from the input file” (*id.* at 14). That input file may be “a text file . . . made up of records and fields in a textual database” (*id.* at 6; *see id.* at 172). Dougherty “makes the assumption that its input is structured” and “in the usual case, interprets each input line as a record and each word on that line, delimited by blank spaces or tabs, as a field” (*id.* at 21, 147). For example, an input file

“contains a list of names and addresses,” such as depicted below:

```
$ cat list
John Daggett, 341 King Road, Plymouth MA
Alice Ford, 22 East Broadway, Richmond VA
Orville Thomas, 11345 Oak Bridge Road, Tulsa OK
Terry Kalkas, 402 Lans Road, Beaver Falls PA
Eric Adams, 20 Post Road, Sudbury MA
Hubert Sims, 328A Brook Road, Roanoke VA
Amy Wilde, 334 Bayshore Pkwy, Mountain View CA
Sal Carpenter, 73 6th Street, Boston MA
```

(*id.* at 15). The above image from Dougherty relates to sample file named “list” that includes eight lines with the name of a person and their respective street address, such as “John Daggett, 341 King Road, Plymouth MA” (*id.*).

To perform operations on the file, an “instruction specified in the script” is executed on the input line read in from the file (*id.* at 14). After “applicable instructions have been interpreted and applied for a single line,” the line is output (*id.* at 15). Returning to the example, a script includes an instruction which is a “command for substitution to replace ‘MA’ with ‘Massachusetts’” (*id.* at 16). Accordingly, after execution of the script to the input file, the resulting output reads:

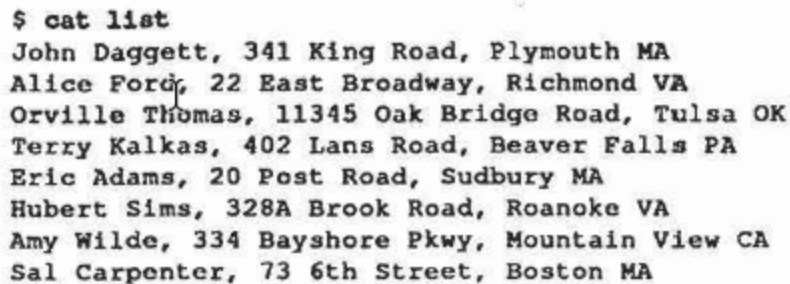
```
% sed 's/MA/Massachusetts/' list
John Daggett, 341 King Road, Plymouth Massachusetts
Alice Ford, 22 East Broadway, Richmond VA
Orville Thomas, 11345 Oak Bridge Road, Tulsa OK
Terry Kalkas, 402 Lans Road, Beaver Falls PA
Eric Adams, 20 Post Road, Sudbury Massachusetts
Hubert Sims, 328A Brook Road, Roanoke VA
Amy Wilde, 334 Bayshore Pkwy, Mountain View CA
Sal Carpenter, 73 6th Street, Boston Massachusetts
```

(*id.* at 17). The above image from Dougherty relates to a sample output file that includes eight lines with the name of a person and their respective street address, such as “John Daggett, 341 King Road, Plymouth Massachusetts” (*id.*). Further, the output can be saved to another file that is not the input file (*id.* at 13, 19).

2. *Independent Claims 1, 7, and 14*

a) *Virtual Database Having a Schema*

Petitioner contends Dougherty teaches a virtual database having a first schema (Pet. 34–43 (citing Ex. 1004, 5–6, 15–16, 19–21, 147, 172, 193, 229–230, 287, 291–292)). Petitioner contends Dougherty teaches that the benefits of awk, a reusable software operator, “are ‘best realized when the data has some kind of structure’” (*id.* at 34 (quoting Ex. 1004, 5–6, 172)). Petitioner identifies an example from Dougherty that Petitioner asserts discloses the recited virtual databases (*id.* at 34–35 (quoting Ex. 1004, 15, 291–292)). A sample mailing list disclosed in Dougherty is reproduced below:



```
$ cat list
John Daggett, 341 King Road, Plymouth MA
Alice Ford, 22 East Broadway, Richmond VA
Orville Thomas, 11345 Oak Bridge Road, Tulsa OK
Terry Kalkas, 402 Lans Road, Beaver Falls PA
Eric Adams, 20 Post Road, Sudbury MA
Hubert Sims, 328A Brook Road, Roanoke VA
Amy Wilde, 334 Bayshore Pkwy, Mountain View CA
Sal Carpenter, 73 6th Street, Boston MA
```

(Ex. 1004, 15). The above image from Dougherty relates to a sample mailing list that includes eight lines with the name of a person and their respective street address, such as “John Daggett, 341 King Road, Plymouth MA” (*id.*). According to Petitioner, “[t]he data structure of Dougherty’s mailing list text file is the *schema* of the text file” (Pet. 26 (citing Ex. 1003 ¶ 44)). In particular, the schema of the sample mailing list contains a list of names and addresses separated by commas (Pet. 34 (citing Ex. 1003 ¶ 61; Ex. 1004, 15)). According to Petitioner, the contents of Dougherty’s mailing list file make up a section and each “section of Dougherty’s mailing list

example contains several lines of information, each line representing a *record*” (*id.* at 25 (quoting Ex. 1004, 15; Ex. 1003 ¶¶ 41–42)).

Patent Owner contends Dougherty fails to teach the recited virtual database because Dougherty teaches flat file databases which are not virtual databases; Dougherty’s files lack the required assigned schema; and Dougherty’s files are not organized into one or more sections (PO Resp. 39–40).

(1) Dougherty’s Database

Petitioner contends Dougherty only teaches flat file databases (PO Resp. 40). As discussed in our claim construction, “virtual database” does not preclude flat file databases (*see supra*). For the reasons given by Petitioner and as further explained below, we find Dougherty’s database teaches a virtual database as construed above.

(2) Virtual Database Must Have Assigned Schema

Patent Owner argues that Dougherty fails to teach the recited “virtual database” because the virtual database must have an “assigned” schema (PO Resp. 31, 42). More specifically, Patent Owner asserts the claims recite “has an associated schema,” “has a schema,” and “includes the schemas” and that such recitations “make[] it plain that a schema must be assigned as a fundamental attribute of the virtual database itself, and not merely independently ‘associated’ after the fact by an interpreting tool” (*id.* at 31–32). According to Patent Owner, “for a given sequence of characters to meet the ‘virtual database’ recited in the claims, that sequence ***must first be assigned a schema***” (*id.*).

The explicit definition of virtual database in the Specification, however, does not require the schema be assigned (Ex. 1001, 3:28–42). Thus, nothing in the explicit definition requires “assignment” of the schema

as proposed by Patent Owner. Additionally, independent claims 1, 7, and 14 do not recite “assign” or “assigning” a schema (*see* Ex. 1001, 14:65–15:5, 15:19–27, 15:66–16:7). Nevertheless, despite the explicit definition, Patent Owner proffers extrinsic evidence and contends the experts, Dr. Gibbons and Dr. Meldal, agree a sequence of characters is not a virtual database until a schema is assigned (PO Resp. 32, 42). Patent Owner then argues that none of Dougherty’s files has an assigned schema (PO Resp. 43–51).

Petitioner provides examples from Dougherty as teaching the recited virtual database (Pet. 34–43). A first example is a mailing list, reproduced below:

```
$ cat list  
John Daggett, 341 King Road, Plymouth MA  
Alice Ford, 22 East Broadway, Richmond VA  
Orville Thomas, 11345 Oak Bridge Road, Tulsa OK  
Terry Kalkas, 402 Lans Road, Beaver Falls PA  
Eric Adams, 20 Post Road, Sudbury MA  
Hubert Sims, 328A Brook Road, Roanoke VA  
Amy Wilde, 334 Bayshore Pkwy, Mountain View CA  
Sal Carpenter, 73 6th Street, Boston MA
```

(Ex. 1004, 15; Pet. 34, 39–40). In this mailing list, each line contains a name, street address, city and state (Ex. 1004, 15; Pet. 34 (citing Ex. 1003 ¶ 61)). Dougherty provides an example that uses an s command to replace a state abbreviation (MA) with the state’s full name (Massachusetts) (Ex. 1004, 16). When the mailing list is input into a sed script and processed, the resulting database is output, as reproduced below:

```
% sed 's/MA/Massachusetts/' list
John Daggett, 341 King Road, Plymouth Massachusetts
Alice Ford, 22 East Broadway, Richmond VA
Orville Thomas, 11345 Oak Bridge Road, Tulsa OK
Terry Kalkas, 402 Lans Road, Beaver Falls PA
Eric Adams, 20 Post Road, Sudbury Massachusetts
Hubert Sims, 328A Brook Road, Roanoke VA
Amy Wilde, 334 Bayshore Pkwy, Mountain View CA
Sal Carpenter, 73 6th Street, Boston Massachusetts
```

(*id.*; Pet. 39). Petitioner further asserts “[e]ach record in Dougherty’s mailing list example contains several *fields*, including names and addresses, separated by commas” — “John Daggett” is a field, for example (Pet 25 (quoting Ex. 1004, 15; Ex. 1003 ¶ 43)). Thus, according to Petitioner, “[t]he data structure of Dougherty’s mailing list text file is the *schema* of the text file” (*id.* at 26 (citing Ex. 1003 ¶ 44)).

Another example described in Dougherty and relied upon by Petitioner is that of a database of students and their respective grades, reproduced below:

```
% cat grades.test
mona 70 77 85 83 70 89
john 85 92 78 94 88 91
andrea 89 90 85 94 90 95
jasper 84 88 80 92 84 82
dunce 64 80 60 60 61 62
ellis 90 98 89 96 96 92
```

(Ex. 1004, 193; Pet. 41). In this database, each line has a student’s name, followed by six numerical grades, each separated by a space (Ex. 1004, 193; Pet. 41). Dougherty provides examples of use of this database (Ex. 1004, 193, 229–230; Pet. 41–42). For example, Dougherty teaches use of a “nawk” command that “[w]hen the grades test file is *input* into the described sort routing and *processed*,” results in a database with each line having a

student name followed by a colon, and six space delineated numerical grades in ascending order, as reproduced below:

```
% awk -f grade.sort.awk grades.test
mona: 70 70 77 83 85 89
john: 78 85 88 91 92 94
andrea: 85 89 90 90 94 95
jasper: 80 82 84 84 88 92
dunce: 60 60 61 62 64 80
ellis: 89 90 92 96 96 98
```

(Ex. 1004, 229–230; Pet. 41–42). Thus, Dougherty’s example results in a sorted grade database (Ex. 1004, 230).

Petitioner additionally relies on a description input.idx, a program “produc[ing] output records with three colon-separated fields,” reproduced below:

```
% input.idx test
XView:programs; initialization:45
XV_INIT_ARGS macro::46
macro:XV_INIT_ARGS:46
Xv_object type::49
type:Xv_object:49
Xv_singlecolor type::80
type:Xv_singlecolor:80
graphics:~zz(see also server image):
graphics:XView model:83
X Window System:events:84
graphics:CANVAS_X_PAINT_WINDOW:86
X Window System:X Window ID for paint window:87
graphics:~zz(see also server image):
Xlib:repainting canvas:88
Xlib.h header file::89
header file:Xlib.h:89
```

(Pet. 35 (citing Ex. 1004, 291–292), 27–28). The above image from Dougherty relates to the output of a program called “input.idx” that outputs

16 lines having three colon-separate fields, including, for example, “XView:programs; initialization:45” (*id.*). “The first field contains the primary key; the second field contains the secondary and tertiary keys, if defined; and the third field contains the page number” (Pet. 35 (quoting Ex. 1004, 291–292; citing Ex. 1003 ¶ 62), 26). The sample output has “examples of entries with only a primary key, those with primary and secondary keys, and those with primary, secondary, and tertiary keys” (Ex. 1004, 292). Thus, for example, the first line: “XView:programs; initialization:45” has a primary key “XView,” a secondary key of “programs; initialization,” and a tertiary key “45” (*id.*). The last line in the example, has a primary key “header file,” a secondary key “xlib.h,” and a tertiary key “89” (*id.*).

Petitioner asserts “[i]n the input.idx example, the virtual database has a schema that indicates ‘[e]ach entry now consists of three colon-separated fields,’ where ‘[t]he first field contains the primary key; the second field contains the secondary and tertiary keys, if defined; and the third field contains the page number’” (Pet. 35–36 (citing Ex. 1004 ¶ 287)).

Each of these databases has a schema or format. In the case of the mailing list, it is each line representing the name, street address, city, and state of a person (Ex. 1004, 16). In the case of the grades, each line represents a student and six separate grades (*id.* at 193). In the case of the input.idx example, each entry consists of three colon-separated fields (*id.* at 292).

Patent Owner relies on testimony by Petitioner’s expert, Dr. Gibbons, as evidence the two proffered examples of Dougherty do not have an “assigned” schema (PO Resp. 44–48). We do not find Dr. Gibbons’ testimony to state the examples shown in Dougherty do not have a schema.

In particular, Patent Owner relies on responses when Dr. Gibbons was questioned as to whether a sequence of characters as shown on the page is by itself a virtual database (Ex. 2006, 42–60; PO Resp. 44–48). We find this excerpted portion does not take into account Dr. Gibbons’ full testimony. Indeed, Dr. Gibbons clearly stated, in response to Patent Owner’s question if Figure 7 of the ’062 Patent has schema, that it did — “Figure 7, the schema is not explicitly shown in the figure, but in the description that accompanies Figure 7, the schema is discussed” and “[w]hen you look at the text that describes Figure 7, it talks about the different fields and what they mean. So it describes the schema associated with what we are seeing there in Figure 7” (Ex. 2006, 46:10– 47:1). Thus, we determine the excerpted portions of Dr. Gibbons’ testimony do not evidence that the examples in Dougherty proffered by Petitioner lack a schema.

Patent Owner further contends that because “Dougherty’s mailing list must be *interpreted* by an external tool, such as Awk, means that there is *no schema assigned* to the file” (PO Resp. 45). Patent Owner argues “the interpretation of records and fields is tied to the tool in Dougherty that interprets the file, not anything in the file. The file in Dougherty has no schema as the claims require: it is merely read by an external tool and interpreted to have a format” (PO Resp. 49 (citing Ex. 2007 ¶ 77)).

We find this contention unavailing. In response to the Board’s question — whether the schema has to be in the file — Patent Owner admits, “We are not contending that [the schema] has to be in the file itself, but there has to be something defining the schema for the virtual database” (Tr., 54:1–14). Patent Owner contends Dougherty’s databases have a schema defined “after the fact” (Tr. 54:15–56:6). According to Patent Owner, “Dougherty does not teach that its tools identify or locate an existing assigned schema of

a database file” (PO Sur-Reply 18). Patent Owner further argues, “the claims show ‘a schema must be assigned as a fundamental attribute of the virtual database itself, and not merely independently ‘associated’ after the fact by an interpreting tool”” (PO Sur-Reply 16).

The claims, however, do not require that the “processing” recited in the claims includes “identifying and locating an existing assigned schema” of the virtual database (*see* Ex. 1001, 14:65–15:5, 15:19–27, 15:66–16:7). Additionally, the claims do not recite “assigning a schema”; rather, they recite “a virtual database having a schema” (*id.*). Indeed, the claims do not recite what, who, or how the virtual database acquires its schema nor do they recite any timing of when the virtual database acquires its schema as Dr. Gibbons testified (*id.*; Ex. 2011, 12:18–13:6). Instead, the claims merely recite a virtual database having a schema (Ex. 1001, 14:65–15:5, 15:19–27, 15:66–16:7).

We also do not find Dougherty’s virtual database having a schema is “after the fact.” Each of Dougherty’s databases has a schema. For example, the mailing list schema has a schema of lines of name, street address, city and state (Ex. 1004, 15–16). Thus, the mailing list schema has a schema – each line representing a different person and each of those lines having that person’s name, street address, city, and state. Further, Dougherty’s example of a grade database and sorting that grade database, evidences the grade database has a schema of name and grades, because to sort the grade database, the operator would use the schema (Ex. 1004, 5–6, 229–230; Pet. 34; Ex. 1003 ¶ 60).

Accordingly, we are persuaded Dougherty teaches “a first virtual database having a schema,” as recited in claim 1 and “a first virtual database having a first schema,” as recited in claim 7; and “a virtual database having a

first schema,” as recited in claim 14 (*see* Ex. 1001, 14:65–15:5, 15:19–27, 15:66–16:7).

(3) “*Sequence of Characters Organized into One or More Sections*”

Patent Owner contends the ’062 Patent’s definition of “virtual database” includes “a sequence of characters organized into ***one or more sections*** which contains zero or more records made up of one or more fields” (PO Resp. 52). Therefore, according to Patent Owner, “for a sequence of characters to be organized into one or more sections, something must identify a grouping of characters as a particular section” (*id.*).

The terms “section” and “record” are not defined explicitly in the ’062 Patent (*see* ’062 Patent). Rather, these terms represent data in the virtual database. In particular, the ’062 Patent discloses “[a] virtual database is a sequence of characters organized into one or more sections” (Ex. 1001, 3:27–29). Therefore, we determine that an ordinarily skilled artisan would understand “section” to be a size equal to or less than the virtual database. The ’062 Patent does not disclose the size of a section other than “[e]ach section contains zero or more records, with each record made up of one or more fields containing information” (Ex. 1001, 3:30–32). Thus, we determine an ordinarily skilled artisan would understand, “record,” if one exists, to be a size equal to or less than that of the section.

Virtual database, as defined in the ’062 Patent, permits *one* section (Ex. 1001, 3:28–30). Patent Owner indicates Petitioner and its expert all admit Figure 6 of the ’062 Patent has a section heading (PO Resp. 54–56). Thus, according to Patent Owner, “[i]ndicators such as these section headers are consistently used in each of the embodiments of the claimed ‘virtual database’ in the ’062 patent to separate the records of one section from the records in another section” (PO Resp. 56 (citing Ex. 2007 ¶ 87)).

This does not negate that the applicants defined virtual database as having one section with zero records (*see* Ex. 1001, 3:28–32). Patent Owner, however, admits “it is possible for the ‘virtual database’ in the claims to have only one section,” but contends, “neither the requirement nor the benefit of a section indicator evaporates when the virtual database has only one section” (PO Resp. 57). Patent Owner’s expert, Dr. Meldal, explains “even when the virtual database has only one section, there still has to be something indicating that single section as such” (Ex. 2007 ¶ 90; PO Resp. 57). Dr. Meldal continues:

This will inform the user, designer, or maintainer of the database about the structure of the database, and how it can be updated, queried, or otherwise used. Without a way to indicate a section, even in a one section database, there is no way to ensure that the designer, maintainer, or user would not misinterpret or misuse the database, such as interpreting the database to have multiple sections with different schemas.

(Ex. 2007 ¶ 90.)

None of the claims recite a section identifier or section heading (Ex. 14:65–15:5, 15:19–27, 15:66–16:7). Patent Owner points to Figure 6 of the ’062 Patent which “shows the schema of an example database,” as disclosing a section heading, “Section 604 . . . delimited by a section heading ‘ENTITY’ 610” (PO Resp. 54 (citing Ex. 1001, Figs. 6–8, 6:31–32; 7:12–13, 730–31); Ex. 1001, 2:66). However, we will not read that requirement into the claim. We are not persuaded an ordinarily skilled artisan would understand the ’062 Patent as requiring a section heading in the virtual database, based on the explicit definition of virtual database including a virtual database with one section and zero records.

Patent Owner further contends Dougherty “do[es] not contain anything that would distinguish a section — nor does Petitioner point to anything” (PO Resp. 59). According to Patent Owner, Dougherty’s files (mailing file and input file) “simply contain lines of characters, with nothing that tells where a section starts” (*id.*). Relying on Dr. Meldal’s testimony, Patent Owner asserts “these simple files in Dougherty, at best, merely contain a single table with alleged ‘records’” (*id.* at 60 (citing Ex. 2007 ¶ 95)).

Dr. Meldal’s statement, however, describes a sequence of characters organized into a “table” or section. The terms “table” and “section” are both describing a sequence of characters that is organized into something understandable by a user, designer, or maintainer of the database. We determine the input text files disclosed in Dougherty describe a sequence of characters organized into something understandable by a user, designer, or maintainer of the database. In particular, Dougherty discloses “[t]he key to all of these operations [described in Dougherty, such as sed and awk,] is that the data has some kind of structure” (Ex. 1004, 5). Thus, Dougherty teaches that the data has a schema upon which operations such as sed and awk act.

Patent Owner further argues if Dougherty’s files are determined to be organized into one or more sections, the requirement that the claimed “virtual database” be organized into one or more sections would be obviated (PO Resp. 61). In particular, Patent Owner contends neither Petitioner nor Dr. Gibbons “attempts to offer any explanation or evidence showing why a POSITA would understand Dougherty’s files to contain ‘one or more sections’” (*id.* at 62). Patent Owner argues Dr. Gibbons, in discussing Dougherty’s input.idx example file, testifies, “[t]here is nothing in Dougherty that describes this collection of records as being organized into

. . . different groups’ yet contended that a ‘POSITA would interpret this as being a single section’” (*id.* at 62–63 (quoting Ex. 2006, 7:12–17)). Patent Owner further contends Dougherty’s flat files have no indication of where a section starts and Dr. Gibbons is “advocating an interpretation of ‘section’ such that *any* ‘sequence of characters’ would *always* be at least organized into one section” (*id.* at 64). Thus, according to Patent Owner, “[t]hat interpretation would read out the section requirement of the ‘virtual database’ construction and is contrary to the Patent’s express disclosure” (*id.* (citing Ex. 2007 ¶ 100)).

Although Patent Owner contends Dr. Gibbons indicated such a feature must be “inherent,” Patent Owner does not cite to any specific testimony by Dr. Gibbons (*id.* at 63). Rather, Dr. Gibbons testifies “[a] POSITA would interpret this as being a single section” (Ex. 2006, 74:12–25).

As previously discussed, the ’062 Patent does not explicitly define “section” (*see* Ex. 1001). Patent Owner would have us read the requirement that a section have a section identifier into the claim (Tr. 58:7–60:2). We decline to do so. Patent Owner has not identified anything in the claims or ’062 Patent that requires a section heading or identifier in the virtual database (*see id.*). Applicants defined virtual database as including a virtual database with one section and zero records (Ex. 1001, 3:28–32). With respect to Patent Owner’s contention that this would obviate the recited “organized into one or more sections,” we do not find this to be the case. A database of one section is “organized into one section.” Moreover, the definition of “virtual database” allows “one or more sections” and thus, a sequence of characters may be organized into two or more sections, as permitted by the explicit definition (*id.*). Here, we find Dougherty describes

a virtual database having one or more sections, with both the virtual database and the section each having a respective schema.

Therefore, we determine Dougherty's examples each provide a defined structure that includes at least one or more sections. And we are persuaded, based on the record before us, Dougherty's examples teach "a virtual database organized into one or more sections."

(4) Conclusion

For the reasons set forth above, Petitioner has established that Dougherty teaches or suggests "a first virtual database having a schema," as recited in claim 1 and as commensurately recited in claims 7 and 14.

b) Remaining Limitations

With respect to claim 14, Petitioner contends Dougherty teaches:

[a] method for processing information comprising the steps of:
(Pet. 29–30 (citing Ex. 1004, xv));

providing a plurality of software operators each configured to receive
(Pet. 30–34 (citing Ex. 1004, 3–5, 18–20, 26, 287, 292–293));

for processing information contained in said virtual database,
(Pet. 38–43 (citing Ex. 1004, 15–16, 21, 193, 229–230)); and

combining at least two of said software operators to create an application.
(Pet. 43–48 (citing Ex. 1004, 18–19, 23–24, 287, 23–24, 292–293).)

Petitioner references its analysis of independent claim 14 in analyzing similar elements recited in independent claim 1 (*id.* at 30–48 (citing Ex. 1004, 2–3, 5–6, 15–16, 18–21, 193, 229–230, 287, 291–293; Ex. 1003 ¶¶ 51–57, 59–85)). Petitioner references the analysis of independent claim 14 in analyzing similar elements recited in independent claim 7 (*id.* at 30–48

(citing Ex. 1004, 2–3, 5–6, 15–16, 18–21, 193, 229–230, 287, 291–293; Ex. 1003 ¶¶ 51–57, 59–85)).

Patent Owner does not proffer any argument specifically directed to these limitations (*see generally* PO Resp.).

Upon review of the entire trial record and the specific portions of Dougherty cited by Petitioner, Petitioner has established that Dougherty teaches the subject matter of the remaining limitations recited in claims 1, 7, and 14.

c) Conclusion

For the reasons discussed above, Petitioner has established that Dougherty teaches the subject matter of claims 1, 7, and 14. Based on the entire trial record, we determine Petitioner has established by a preponderance of the evidence that the subject matter of claims 1, 7, and 14 would have been obvious over Dougherty under 35 U.S.C. § 103.

3. Dependent claims 2, 3, 10, 11, and 15

Petitioner contends Dougherty renders dependent claims 2, 3, 10, 11, and 15 obvious (Pet. 43–48, 50–52). Patent Owner does not proffer any argument specifically directed to these dependent claims (*see generally* PO Resp.).

Claim 15 recites “wherein said step of combining further comprises the step of: providing a virtual database pipeline” (Ex. 1001, 16:8–10). Claim 2 has a commensurate recitation as does claim 11 (*id.* at 15:6–7, 41–43). Dougherty teaches pipes that pass output from one program as input to the next program in a UNIX system (Pet. 48 (citing Ex. 1004, 23)). Thus, Petitioner has shown Dougherty teaches the subject matter of claims 2, 11, and 15.

Claim 3 recites “wherein said query operators are combinable in any order to create an application” (Ex. 1001, 15:8–9). Dougherty teaches using the output produced by one operator to be used by another operator to sort the results (Ex. 1004, 292; Pet. 43). Thus, Petitioner has shown Dougherty teaches the subject matter of claim 3.

Claim 10 recites “wherein said first and second operators are chosen from a library of operators, and wherein each of said operators in said library are configured to receive a virtual database having said first schema, process information in said received virtual database, and output a virtual database having said first schema” (Ex. 1001, 15:36–44). Dougherty teaches a library of operators such as “sed” and “awk” scripts and “sort” and “uniq” (Ex. 1004, 3–5, 18–19, 26, 287, 292). As discussed above in conjunction with claims 1, 7, and 14, Dougherty describes that each of these operators, e.g., sort, receives a virtual database having a schema, processes the information, e.g., performs the sort on the received virtual database, and outputs a virtual database having the schema (e.g., the sorted database) (*id.*). Thus, Petitioner has shown Dougherty teaches the subject matter of claim 10.

For the reasons discussed above, Petitioner has established that Dougherty teaches the subject matter of claims 2, 3, 10, 11, and 15. Based on the entire trial record, we determine Petitioner has established by a preponderance of the evidence that the subject matter of claims 2, 3, 10, 11, and 15 would have been obvious over Dougherty under 35 U.S.C. § 103.

III. CONCLUSION

Petitioner has demonstrated by a preponderance of the evidence that claims 1–3, 7, 10, 11, 14, and 15 of the ’062 Patent would have been obvious over Dougherty.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, on the record before us, Petitioner has shown by a preponderance of the evidence that claims 1–3, 7, 10, 11, 14, and 15 of the '062 Patent are unpatentable.

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
1–3, 7, 10, 11, 14, 15	103	Dougherty	1–3, 7, 10, 11, 14, 15	
Overall Outcome			1–3, 7, 10, 11, 14, 15	

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