

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MASIMO CORPORATION
Petitioner,

v.

APPLE INC.
Patent Owner.

Case No. IPR2023-00634
U.S. Patent No. 10,627,783

DECLARATION OF SYLVIA D. HALL-ELLIS, Ph.D.

I, Sylvia D. Hall-Ellis, declare as follows:

I. INTRODUCTION

1. My name is Sylvia D. Hall-Ellis. I have been retained as an expert by Masimo, Corp., the Petitioner.

2. I have written this declaration at the request of the Petitioner to provide my expert opinion regarding the authenticity and public availability of several books. My declaration sets forth my opinions in detail and provides the basis for my opinions regarding the authenticity and public availability of these publications. If called to testify in the above-captioned proceeding, I will testify regarding the opinions and bases set forth below.

3. I reserve the right to supplement or amend my opinions, and bases for them, in response to any additional evidence, testimony, discovery, argument, and/or other additional information that may be provided to me after the date of this declaration.

4. I am being compensated for my time spent working on this matter at my normal consulting rate of \$350 per hour, plus reimbursement for any additional reasonable expenses. My compensation is not in any way tied to the content of this declaration, the substance of my opinions, or the outcome of this proceeding. I have no other interests in this proceeding or with any of the parties.

5. All the materials that I considered and relied upon are discussed explicitly in this declaration.

II. QUALIFICATIONS

6. I am currently an Adjunct Professor in the School of Information at San José State University in San José, California. I obtained a Master of Library Science from the University of North Texas in 1972 and a Ph.D. in Library Science from the University of Pittsburgh in 1985. Over the last fifty years, I have held various positions in the field of library and information resources. I was first employed as a librarian in 1966 and have been involved in the field of library sciences since, holding numerous positions.

7. I am a member of the American Library Association (ALA) and its Association for Library Collections & Technical Services (ALCTS) Division, and I served on the Committee on Cataloging: Resource and Description (which wrote the new cataloging rules) and as the chair of the Committee for Education and Training of Catalogers and the Competencies and Education for a Career in Cataloging Interest Group. I also served as the founding Chair of the ALCTS Division's Task Force on Competencies and Education for a Career in Cataloging. Additionally, I have served as the Chair for the ALA Office of Diversity's Committee on Diversity, as a member of the REFORMA National Board of Directors, as a member of the Editorial Board for the ALCTS premier cataloging

journal, *Library Resources and Technical Services*, and as a Co-Chair of the Membership Committee for the Library Research Round Table (LRRT) of the American Library Association. Currently I serve as a member of the LRRT Nominating Committee.

8. I have also given over one hundred presentations in the field, including several on library cataloging systems and Machine-Readable Cataloging (“MARC”) standards. My current research interests include library cataloging systems, metadata, and organization of electronic resources.

9. I have been deposed twenty-seven times: (1) *Symantec Corp. v. Finjan, Inc.*, Petition for *Inter Partes Review* of U.S. Patent No. 7,613,926, May 26, 2016, on behalf of Symantec Corp.; (2) *Symantec Corp. v. Finjan, Inc.*, 14-cv-299-HSG (N.D. Cal.), on behalf of Symantec Corp., September 14, 2017; (3) one deposition for ten matters: *Intellectual Ventures I LLC v. AT&T Mobility LLC*; *AT&T Mobility II LLC*, *New Cingular Wireless Services, Inc.*, *SBC Internet Services, Inc.*, *Wayport, Inc.*, and *Cricket Wireless LLC*, C.A. No. 12-193 (LPS); *Intellectual Ventures II LLC v. AT&T Mobility LLC*; *AT&T Mobility II LLC*, *New Cingular Wireless Services, Inc.*, *SBC Internet Services, Inc.*, *Wayport, Inc.*, and *Cricket Wireless LLC*, C.A. No. 13-1631 (LPS); *Intellectual Ventures I LLC v. T-Mobile USA, Inc. and T-Mobile US, Inc.*, C.A. No. 13-1632 (LPS); *Intellectual Ventures II LLC v. T-Mobile USA, Inc. and T-Mobile US, Inc.*, C.A.

No. 13-1633 (LPS); *Intellectual Ventures I LLC, v. Nextel Operations, Inc., Sprint Spectrum L.P., Boost Mobile, LLC and Virgin Mobile USA, L.P.*, C.A. No. 13-1634 (LPS); *Intellectual Ventures II LLC v. Nextel Operations, Inc., Sprint Spectrum L.P., Boost Mobile, LLC and Virgin Mobile USA, L.P.*, C.A. No. 13-1635 (LPS); *Intellectual Ventures I LLC, v. United States Cellular Corporation*, C.A. No. 13-1636 (LPS); *Intellectual Ventures I LLC v. United States Cellular Corporation*, C.A. No. 13-1637 (LPS); *Intellectual Ventures II LLC v. AT&T Mobility LLC, AT&T Mobility II LLC, New Cingular Wireless Services, Inc.*, C.A. No. 15-799 (LPS); *Intellectual Ventures I LLC v. T-Mobile USA, Inc. and T-Mobile US, Inc.*, C.A. No. 15-800 (LPS), on behalf of AT&T Mobility LLC; AT&T Mobility II LLC, Boost Mobile, LLC Cricket Wireless LLC, Nextel Operations, Inc., New Cingular Wireless Services, Inc., SBC Internet Services, Inc., Sprint Spectrum L.P., T-Mobile USA, Inc., T-Mobile US, Inc., United States Cellular Corporation Virgin Mobile USA, L.P., and Wayport, Inc., November 15, 2016; (4) *Hitachi Maxell, LTD., v. Top Victory Electronics (Taiwan) Co. Ltd., et al.*, 2:14-cv-1121 JRG-RSP (E.D. Texas), on behalf of Top Victory Electronics (Taiwan) Co. LTD, *et. al.*, January 20, 2016; (5) *Sprint Spectrum, L.P. v. General Access Solutions, Ltd.*, Petition for *Inter Partes* Review of U.S. Patent No. 7,173,916, on behalf of Sprint Spectrum L.P., July 13, 2018; (6) *Nichia Corporation v. Vizio, Inc.*, 8:16-cv-00545; on behalf of Vizio, Inc., October 12, 2018; (7) *Intellectual Ventures I*

LLC, v. T-Mobile USA, Inc., T-Mobile US, Inc., Ericsson Inc., and Telefonaktiebolaget LM Ericsson, 2:17-cv-00557 (JRG), on behalf of T-Mobile USA, Inc., T-Mobile US, Inc., Ericsson Inc., and Telefonaktiebolaget LM Ericsson, October 19, 2018; (8) *Pfizer, Inc. v. Biogen, Inc.*, Petition for *Inter Partes Review* of U.S. Patent No. 8,821,873, on behalf of Pfizer, November 3, 2018; (9) *Finjan, Inc. v. ESET, LLC and ESET SPOL. S.R.O.*, 3:17-cv-00183-CAB-BGS, on behalf of ESET, January 15, 2019; (10) *Finjan, Inc. v. Cisco Systems, Inc.*, 5:17-cv-00072-BLF-SVK, on behalf of Cisco Systems, Inc., September 6, 2019; (11) *Facebook, Inc., Instagram, LLC and Whatsapp Inc. v. Blackberry Limited*, Petition for *Inter Partes Review* of U.S. Patent No. 9,349,120 B2, on behalf of Facebook, Inc., Instagram, LLC and Whatsapp Inc. December 20, 2019; (12) *3Shape A/S and 3Shape Inc. v. Align Technology, Inc.*, Petition for *Inter Partes Review* of U.S. Patent No. 7,156,661, IPR 2020-00222 and IPR 2020-00223, August 10, 2020, on behalf of 3Shape A/S and 3Shape Inc.; (13) *Finjan Inc. v. Rapid7, Inc. and Rapid7 LLC*, Northern District of Delaware; 1:18-cv-01519-MN, September 15, 2020; (14) *VLSI Technology LLC v. Intel Corporation*, Western District of Texas, 6:19-cv-00254, 6:19-cv-00255, 6:19-cv-00256, on behalf of Intel Corporation, September 23, 2020; (15) *Finjan Inc. v. Sonicwall, Inc.*, Northern District of California, 5:17-cv-04467-BLF-HRL, on behalf of Sonicwall, Inc., October 27, 2020; (16) *VLSI Technology, LLC v. Intel*

Corporation, District of Delaware, 1:18-cv-00966-CFC-CJB, February 5, 2021, on behalf of the Intel Corporation; (17) *Unified Patents, LLC v. Good Kaisha IP Bridge 1*, Petition for *Inter Partes Review* of U. S. Patent 7,817,868, February 11, 2021, on behalf of Unified Patents; (18) *Finjan, Inc. v. Qualsys, Inc.*, Northern District of California, 4:18-cv-07229-YGR, March 1, 2021, on behalf of Qualsys, Inc.; (19) *Qualcomm, Inc. v. Monterey Research LLC*, Petition for *Inter Partes Review* of U. S. Patent 6,534,805, May 6, 2021, on behalf of Qualcomm, Inc.; (20) *Hulu, LLC v. Sound View Innovations, LLC*, Petition for *Inter Partes Review* of U. S. Patent 5,806,062, May 14, 2021, on behalf of Hulu, LLC; (21) *VLSI Technology LLC v. Intel Corporation*, Western District of Texas, 6:19-cv-00254, 6:19-cv-00255 and 6:19-cv-00256, August 3, 2021, on behalf of Intel Corporation; (22) *Liquidia Technologies, Inc. v. United Therapeutics Corporation*, Petition for *Inter Partes Review* of U. S. Patent 10,716,793 B2, October 20, 2021, on behalf of Liquidia Technologies, Inc.; (23) *EcoFactor, Inc. v. Google, Inc.*, Western District of Texas, 6:20-cv-00075 (ADA), 6:20-0078-ADA, and 6:20-cv-00080 ADA, October 27, 2021, on behalf of Google, Inc.; (24) *Liquidia Technologies, Inc. v. United Therapeutics Corporation*, Petition for *Inter Partes Review* of U. S. Patent 10,716,793 B2, March 11, 2022, on behalf of Liquidia Technologies, Inc.; (25) *Juniper Networks, Inc. v. Swarm Technology LLC*, Petition for *Inter*

Partes Review of U. S. Patent 9,852,004, May 5, 2022, on behalf of Juniper Networks, Inc.; (26) *ParkerVision, Inc. v. Intel Corporation*, Western District of Texas, 6:20-cv-108 (ADA), October 26, 2022, on behalf of the Intel Corporation; and, (27) *CommScope v. TQ Delta*, Petition for *Inter Partes Review* of U. S. Patents 9,094,348 and 10,833,809, February 16, 2023, on behalf of CommScope.

10. My full curriculum vitae is attached as Appendix 1.

III. PRELIMINARIES

A. Scope of Declaration and Legal Standards

11. I am not an attorney and will not offer opinions on the law. I am, however, rendering my expert opinion on the authenticity of the documents referenced herein and on when and how each of these documents was disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising ordinary diligence, could have located the documents by September 2, 2014.

12. I am informed by counsel that a printed publication qualifies as publicly accessible as of the date it was disseminated or otherwise made available such that a person interested in and ordinarily skilled in the relevant subject matter could locate it through the exercise of ordinary diligence.

13. While I understand that the determination of public accessibility under the foregoing standard rests on a case-by-case analysis of the facts particular to an individual publication, I also understand that a printed publication is rendered “publicly accessible” if it is cataloged and indexed by a library such that a person interested in the relevant subject matter could locate it (i.e., I understand that cataloging and indexing by a library is sufficient, though there are other ways that a printed publication may qualify as publicly accessible). One manner of sufficient indexing is indexing according to subject matter category. I understand that the cataloging and indexing by a single library of a single instance of a particular printed publication is sufficient, even if the single library is in a foreign country. I understand that, even if access to a library is restricted, a printed publication that has been cataloged and indexed therein is publicly accessible so long as a presumption is raised that the portion of the public concerned with the relevant subject matter would know of the printed publication. I also understand that the cataloging and indexing of information that would guide a person interested in the relevant subject matter to the printed publication, such as the cataloging and indexing of an abstract for the printed publication, is sufficient to render the printed publication publicly accessible.

14. I understand that routine business practices, such as general library cataloging and indexing practices, can be used to establish an approximate date on which a printed publication became publicly accessible.

B. Persons of ordinary skill in the art.

15. I am told by counsel that the subject matter of this proceeding relates to watches, wearable electronic devices, and components thereof.

16. I have been informed by counsel that a “person of ordinary skill in the art at the time of the invention” (“POSITA”) is a hypothetical person who is presumed to be familiar with the relevant field and its literature at the time of the inventions. This hypothetical person is also a person of ordinary creativity, capable of understanding the scientific principles applicable to the pertinent field.

17. I am told by counsel that persons of ordinary skill in this subject matter or art would have had at least a bachelor’s degree in a discipline related to electrical engineering, mechanical engineering, physics, industrial design, or equivalent, and at least three years of experience working with or developing electronic medical or consumer devices. I understand that a POSITA would also have familiarity with the watches and wearable electronic devices and components thereof. I understand that additional education could compensate for less practical experience and vice versa. I have been further informed by counsel that a person of ordinary skill in the art would have been familiar with and able to understand the

information known in the art relating to these fields, including the publication discussed in this declaration.

18. It is my opinion that such a person would have been engaged in research, learning, study, and practice in the field, and formal instruction so that bibliographic resources relevant to his or her research would be familiar. By September 2, 2014, such a person would have had access to a vast array of long-established print resources in watches, wearable devices, and components thereof as well as to a rich set of online resources providing indexing information, abstracts, and full text services.

IV. LIBRARY PROFESSIONAL PRACTICES

19. In preparing this declaration, I used authoritative databases, such as the OCLC bibliographic database, the Library of Congress Online Catalog, and the Library of Congress Subject Authorities, to confirm citation details of the various publications discussed. Unless I note otherwise below in reference to a specific serial publication, it is my expert opinion that this standard protocol was followed for the serial publication discussed below.

20. *Indexing.* A researcher may discover material relevant to his or her topic in a variety of ways. One common means of discovery is to search for relevant information in an index of periodicals and other publications. Having found relevant material, the researcher will then normally obtain it online, look for

it in libraries, or purchase it from the publisher, a bookstore, a document delivery service, or other provider. Sometimes, the date of a document's public accessibility will involve both indexing and library date information. However, date information for indexing entries is often unavailable. This is especially true for online indices.

21. Indexing services use a wide variety of controlled vocabularies to provide subject access and other means of discovering the content of documents. The Library of Congress Subject Authorities includes standard forms of terms and cross references that are included in bibliographic records. Subject headings are terms that an individual seeking a document regardless of format can enter in the search bar of the online catalog. Subjects also connect an authenticated term (one included in the Library of Congress subject headings list) with related, broader, and narrower terms. The formats in which these access terms are presented vary from service to service.

22. Online indexing services commonly provide bibliographic information, abstracts, and full-text copies of the indexed publications, along with a list of the documents cited in the indexed publication. These services also often provide lists of publications that cite a given document. A citation of a document is evidence that the document was publicly available and in use by researchers no later than the publication date of the citing document. Prominent indexing services

include *Scopus*, the *IEEE Xplore* database, the *ACM Digital Library*, *Google Scholar*, and the *Internet Archive*.

V. LIBRARY CATALOGING PRACTICES

23. I am fully familiar with the library cataloging standard known as the MARC standard, which is an industry-wide standard method of storing and organizing library catalog information.¹ MARC was first developed in the 1960's by the Library of Congress. A MARC-compatible library is one that has a catalog consisting of individual MARC records for each of its items. Today, MARC is the primary communications protocol for the transfer and storage of bibliographic metadata in libraries.²

¹ The full text of the standard is available from the Library of Congress at <http://www.loc.gov/marc/bibliographic/> (last visited January 29, 2022).

² Almost every major library in the world is MARC-compatible. *See, e.g., MARC Frequently Asked Questions (FAQ)*, Library of Congress, <https://www.loc.gov/marc/faq.html> (last visited January 29, 2022) ("MARC is the acronym for Machine-Readable Cataloging. It defines a data format that emerged from a Library of Congress-led initiative that began nearly fifty years ago. It provides the mechanism by which computers exchange, use, and interpret bibliographic information, and its data elements make up the foundation of most

24. Since at least the early 1970s and continuing to the present day, MARC has been the primary communications protocol for the transfer and storage of bibliographic metadata in libraries.³ As explained by the Library of Congress:

You could devise your own method of organizing the bibliographic information, but you would be isolating your library, limiting its options, and creating much more work for yourself. Using the MARC standard prevents duplication of work and allows libraries to better share bibliographic resources. Choosing to use MARC enables libraries to acquire cataloging data that is predictable and reliable. If a library were to develop a “home-grown” system that did not use MARC records, it would not be taking advantage of an industry-wide standard whose primary purpose is to foster communication of information.

Using the MARC standard also enables libraries to make use of commercially available library automation systems to manage library

library catalogs used today.”). MARC is the ANSI/NISO Z39.2-1994 (reaffirmed 2016) standard for Information Interchange Format.

³ A complete history of the development of MARC can be found in *MARC: Its History and Implications* by Henrietta D. Avram (Washington, DC: Library of Congress, 1975) and available online from the Hathi Trust (<https://babel.hathitrust.org/cgi/pt?id=mdp.39015034388556;view=1up;seq=1>; last visited January 29, 2022).

operations. Many systems are available for libraries of all sizes and are designed to work with the MARC format. Systems are maintained and improved by the vendor so that libraries can benefit from the latest advances in computer technology. The MARC standard also allows libraries to replace one system with another with the assurance that their data will still be compatible.

Why Is a MARC Record Necessary? LIBRARY OF CONGRESS.⁴

25. Thus, almost every major library in the world is MARC-compatible. See, e.g., *MARC Frequently Asked Questions (FAQ)*, LIBRARY OF CONGRESS.⁵ (“MARC is the acronym for MACHine-Readable Cataloging. It defines a data format that emerged from a Library of Congress-led initiative that began fifty years ago. It provides the mechanism by which computers exchange, use, and interpret bibliographic information, and its data elements make up the foundation of most library catalogs used today.”). MARC is the ANSI/NISO Z39.2-1994 standard (reaffirmed in 2016) for Information Interchange Format. The full text of the standard is available from the Library of Congress.⁶

26. A MARC record comprises several fields, each of which contains specific data about the work. Each field is identified by a standardized, unique,

⁴ <http://www.loc.gov/marc/umb/um01to06.html#part2>

⁵ <https://www.loc.gov/marc/faq.html>

⁶ <http://www.loc.gov/marc/bibliographic/>

three-digit code corresponding to the type of data that follow. For example, a work's title is recorded in Field 245; the primary author of the work is transcribed in Field 100; an item's International Standard Book Number ("ISBN") consisting of ten or thirteen digits is transcribed in Field 020; an item's International Standard Serial Number ("ISSN") is transcribed in Field 022; the Library of Congress classification notation is recorded in Field 050; and the publication date is recorded in Field 260 under the subfield "c." If a work is a periodical, then its publication frequency is recorded in Field 310, and the publication dates (e.g., the first and last publication) are recorded in Field 362, which is also referred to as the enumeration/chronology field.⁷

27. The library that created the record is recorded in Field 040 in subfield "a" with a unique library code. When viewing the MARC record online via Online Computer Library Center's ("OCLC") bibliographic database, hovering over this code with the mouse reveals the full name of the library. I used this method of "mousing over" the library codes in the OCLC database to identify the originating library for the MARC records discussed in this declaration. Where this "mouse over" option was not available, I consulted the Directory of OCLC Libraries to

⁷ <http://www.loc.gov/marc/bibliographic/bd3xx.html>

identify the institution that created the MARC record.⁸

28. MARC records also include several fields that include subject matter classification information. An overview of MARC record fields is available through the Library of Congress.⁹ For example, 6XX fields are termed “Subject Access Fields.”¹⁰ Among these, for example, is the 650 field; this is the “Subject Added Entry – Topical Term” field.¹¹ The 650 field is a “[s]ubject added entry in which the entry element is a topical term.” These entries “are assigned to a bibliographic record to provide access according to generally accepted thesaurus-building rules (e.g., *Library of Congress Subject Headings* (LCSH), *Medical Subject Headings* (MeSH)).” *Id.* Further, MARC records include call numbers, which themselves include a classification number. For example, the 050 field is the “Library of Congress Call Number.”¹² A defined portion of the Library of Congress Call (LCC) Number is the classification number, and “source of the classification number is *Library of Congress Classification* and the *LC*

⁸ <https://www.oclc.org/en/contacts/libraries.html>

⁹ <http://www.loc.gov/marc/bibliographic/>

¹⁰ <http://www.loc.gov/marc/bibliographic/bd6xx.html>

¹¹ <http://www.loc.gov/marc/bibliographic/bd650.html>

¹² <http://www.loc.gov/marc/bibliographic/bd050.html>

Classification-Additions and Changes.” Thus, included in the 050 field is a subject matter classification. Further, the 082 field is the “Dewey Decimal Call Number.”¹³ A defined portion of the Dewey Decimal Call (DDC) Number is the classification number, and “source of the classification number is the *Dewey Decimal Classification and Relative Index.*” Thus, included in the 082 field is a subject matter classification. Each item in a library has a single classification number. A library selects a classification scheme (*e.g.*, the Library of Congress classification scheme just described or a similar scheme such as the Dewey Decimal classification scheme) and uses it consistently. When the Library of Congress assigns the LCC classification number, it appears as part of the 050 field. When the Library of Congress assigns the DDC classification number, it appears as part of the 082 field. If a local library assigns the classification number, it appears in a 090 field. In either scenario, the MARC record includes a classification number that represents a subject matter classification.

29. The OCLC was created “to establish, maintain and operate a computerized library network and to promote the evolution of library use, of libraries themselves, and of librarianship, and to provide processes and products for the benefit of library users and libraries, including such objectives as increasing

¹³ <http://www.loc.gov/marc/bibliographic/bd082.html>

availability of library resources to individual library patrons and reducing the rate of rise of library per-unit costs, all for the fundamental public purpose of furthering ease of access to and use of the ever-expanding body of worldwide scientific, literary and educational knowledge and information.”¹⁴ Among other services, OCLC and its members are responsible for maintaining the WorldCat database (<http://www.worldcat.org/>), used by independent and institutional libraries throughout the world.

30. OCLC also provides its members online access to MARC records through its OCLC bibliographic database. When an OCLC member institution acquires a work, it creates a MARC record for this work in its computer catalog system in the ordinary course of its business. MARC records created at the Library of Congress are tape-loaded into the OCLC database through a subscription to MARC Distribution Services daily or weekly. Once the MARC record is created by a cataloger at an OCLC member institution or is tape-loaded from the Library of Congress, the MARC record is then made available to any other OCLC members online, and therefore made available to the public. Accordingly, once the

¹⁴ Third Article, Amended Articles of Incorporation of OCLC Online Computer Library Center, Incorporated (available at <https://www.oclc.org/content/dam/oclc/membership/articles-of-incorporation.pdf>).

MARC record is created by a cataloger at an OCLC member institution or is tape-loaded from the Library of Congress or another library anywhere in the world, any publication corresponding to the MARC record has been cataloged and indexed according to its subject matter such that a person interested in that subject matter could, with reasonable diligence, locate and access the publication through any library with access to the OCLC bibliographic database or through the Library of Congress.

31. When an OCLC member institution creates a new MARC record, OCLC automatically supplies the date of creation for that record. The date of creation for the MARC record appears in the fixed Field (008), characters 00 through 05. The MARC record creation date reflects the date on which, or shortly after which, the item was first acquired or cataloged. Initially, Field 005 of the MARC record is automatically populated with the date the MARC record was created in year, month, day format (YYYYMMDD) (some of the newer library catalog systems also include hour, minute, second (HHMMSS)). Thereafter, the library's computer system may automatically update the date in Field 005 every time the library updates the MARC record (*e.g.*, to reflect that an item has been moved to a different shelving location within the library). Field 005 is visible when viewing a MARC record via an appropriate computerized interface, but when a MARC record is printed to hardcopy, no "005" label appears. The initial Field 005

date (*i.e.*, the date the MARC record was created) does appear, however, next to the label “Entered.”¹⁵ The date upon which the most recent update to Field 005 occurred also appears, next to the label “Replaced.” Thus, when an item’s MARC record has been printed to hardcopy—as is the case with the exhibits to this declaration—the date reflected next to the label “Entered” is necessarily on or after the date the library first cataloged and indexed the underlying item.

32. Once one library has cataloged and indexed a publication by creating a MARC record for that publication, other libraries that receive the publication do not create additional MARC records—the other libraries instead rely on the original MARC record. They may update or revise the MARC record to ensure accuracy, but they do not replace or duplicate it. This practice does more than save libraries from duplicating labor. It also enhances the accuracy of MARC records. Further, it allows librarians around the world to know that a particular MARC record is authoritative (in contrast, a hypothetical system wherein duplicative records were created would result in confusion as to which record is authoritative).

¹⁵ Field 005 is visible when viewing a MARC record via an appropriate computerized interface. But when a MARC record is printed directly to hardcopy from the OCLC database, the “005” label is not shown. The date in the 005 field instead appears next to the label “Replaced.”

33. Catalogers can create MARC records for all types of print, online, and digital resources. The date of creation of the MARC record by a cataloger at an OCLC member institution reflects when the underlying item is accessible to the public. Upwards of two-thirds to three-quarters of book sales to libraries come from a jobber or wholesaler for online and print resources. These resellers make it their business to provide books to their customers as fast as possible, often providing turnaround times of only a single day after publication. Libraries purchase a significant portion of the balance of their books directly from publishers themselves, which provide delivery on a similarly expedited schedule. In general, libraries make these purchases throughout the year as the books are published and shelve the books as soon thereafter as possible to make the books available to their patrons. Thus, books are generally available at libraries across the country within just a few days of publication.

VI. PUBLICATION 1: *Ceramic and Glass Materials: Structure, Properties and Processing*, edited by James F. Shackelford and Robert H. Doremus. EX1042 (“Shackelford”)

34. Exhibit 1042 (EX1042) is a copy of the cover, title page, copyright page, dedication, contents, and an excerpt from a book titled *Ceramic and Glass Materials: Structure, Properties and Processing* edited by James F. Shackelford and Robert H. Doremus (hereafter “Shackelford”) and issued by Springer with a 2008 copyright date. Exhibit 1042 is a true and correct copy of the pages listed

above and the excerpt comprising: Chapter 1, “Alumina” by Robert H. Doremus (pp. 1-26). The Shackelford book is held by the Library of Congress. Exhibit 1042 is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1042 is a true and correct copy in a condition that creates no suspicion about its authenticity.

35. Attachment 1a is a true and correct copy of the MARC record for this book from the online catalog at the Library of Congress. The library ownership is indicated by the presence of the library codes (“DLC”) in field 040. The book was originally submitted for cataloging to the Library of Congress on October 9, 2007, (as shown in field 955) as part of the Cataloging in Publication program¹⁶ and assigned a Library of Congress Control Number (“2007938894”) as shown in field 010. A cataloger prepared basic information about the forthcoming book which is included on the verso of the title page (also called the copyright page). The information is provided to save time needed for the cataloging process at a library after the book is purchased. The CIP data includes the author (field 100), title (field 245), edition statement (field 250), ISBN (field 020), subject headings (field 650), classification numbers for the Library of Congress classification number (field 050), and the Dewey Decimal classification number (field 082). These data

¹⁶ <https://www.loc.gov/publish/cip/>

elements are included in the MARC record that the Library of Congress contributed to the OCLC bibliographic database. The library continues to update and enhance the MARC record to meet current cataloging rules. The most recent enhancement to the MARC record occurred on January 9, 2017, as shown in the field 005 (“20170109”) of Attachment 1a. I personally identified and retrieved the library catalog records which are Attachment 1a.

36. Based on finding a print copy of the book titled *Ceramic and Glass Materials: Structure, Properties and Processing* in the Library of Congress and MARC record in its online library catalog attached as Attachment 1a, it is my opinion that the Shackelford book was publicly available on or shortly after October 9, 2007. The International Standard Book Number (ISBN) on Exhibit 1042 (978-0-387-73361-6) matches the ISBN in the first field 020 of Attachment 1a. Therefore, Exhibit 1042 is the same book as the one that the cataloger at the Library of Congress used to create the MARC record that is Attachment 1a.

37. Attached hereto as Attachment 1b is a true and correct copy of the MARC record for the volume titled *Ceramic and Glass Materials: Structure, Properties and Processing* obtained from the OCLC bibliographic database. As can be seen in the “Entered” field in the MARC record for this exhibit, a cataloger at the British Library created OCLC record number 228193147 on August 22, 2007, as shown in the “Entered” field (“20070822”).

38. Attachment 1b further includes an entry in field 050 (“TA455.C43 \$b C438 2008”) as described above, this includes a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 082 (“620.14”), a subject matter consistent with the Dewey Decimal classification system. Attachment 1b further includes two descriptor terms reading “Ceramic materials” (see Attachment 1c, Library of Congress subject heading sh85022004) and “Silicates” (see Attachment 1d, Library of Congress subject heading sh85122503) in the 650 fields. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 1b was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entries. Further, as of August 22, 2007, the MARC record attached hereto as Attachment 1b was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that added this book to its collection, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

39. Attachment 1b indicates that the book titled *Ceramic and Glass Materials: Structure, Properties and Processing* as cataloged at the British Library

is currently available from 128 libraries. In view of above, the book titled *Ceramic and Glass Materials: Structure, Properties and Processing* was publicly available on or shortly the publication date of April 3, 2008 (see Attachment 1e) because by that date it had been received, cataloged, and indexed at the British Library and made part of the OCLC bibliographic database. For these reasons, it is my opinion that Exhibit 1042 was published and accessible to the public on or shortly after April 3, 2008.

40. Further supporting my opinion that Exhibit 1042 was publicly accessible to ordinarily skilled and interested researchers in the field is the fact that the book titled *Ceramic and Glass Materials: Structure, Properties and Processing* was registered with the U. S. Copyright Office as item TX0007520398 on May 9, 2012, and indicated a publication date of April 3, 2008 (see Attachment 1e, U. S. Copyright Office Public Catalog). As noted above, this would have provided a POSITA with keyword searching capabilities and other tools to locate this book.

VII. PUBLICATION 2: *Ceramic Materials: Progress in Modern Ceramics* edited by Feng Shi. EX1043 (“Shi”)

41. I understand that Exhibit 1043 (EX1043) is a copy of the title page, copyright page, contents, and preface from a book titled *Ceramic Materials: Progress in Modern Ceramics* edited by Feng Shi (hereafter “Shi”) and issued by InTech with a 2012 copyright date.

42. Attachment 2a is a true and correct copy of the metadata record for this book from the online catalog at the National Library of China (Beijing, People's Republic of China). The library ownership is indicated by the presence of the library name at the bottom of the screen. I personally identified and retrieved the library catalog record which is Attachment 2a.

43. I have ordered a print copy of the book titled *Ceramic Materials: Progress in Modern Ceramics* from the National Library of China. It is currently being shipped to me. Based on the metadata record in the National Library of China's online library catalog attached as Attachment 2a, it is my opinion that the Shi book was publicly available. The International Standard Book Number (ISBN) on Exhibit 1043 (978-953-51-0476-6) matches the ISBN in the field 020 of Attachment 2a. Therefore, Exhibit 1043 is the same book as the one that the cataloger at the National Library of China used to create the MARC record that is Attachment 2a.

44. Attached hereto as Attachment 2b is a true and correct copy of the MARC record for the volume titled *Ceramic Materials: Progress in Modern Ceramics* obtained from the OCLC bibliographic database. As can be seen in the "Entered" field in the MARC record for this exhibit, a cataloger at the National Library of China created OCLC record number 908265200 on January 6, 2012, as shown in the "Entered" field ("20120106").

45. Attachment 2b further includes an entry in field 050 (“TB321 \$b C411”) as described above, this includes a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system). Attachment 2b further includes a descriptor term reading “Ceramic materials” (see Attachment 1c, Library of Congress subject heading sh85022004) in the 650 field. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 2b was indexed according to its subject matter by virtue of at least two independently sufficient classifications: the field 050 entry and the field 650 entry. Further, as of January 6, 2012, the MARC record attached hereto as Attachment 2b was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that added this book to its collection, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

46. Attachment 2b indicates that the book titled *Ceramic Materials: Progress in Modern Ceramics* as cataloged at the National Library of China is currently available from 2 libraries. In view of above, the book titled *Ceramic Materials: Progress in Modern Ceramics* was publicly available on or shortly after January 6, 2012, because by that date it had been received, cataloged, and indexed at the National Library of China and made part of the OCLC bibliographic

database. For these reasons, it is my opinion that Exhibit 1043 was published and accessible to the public on or shortly after January 6, 2012.

VIII. PUBLICATION 3: *Characterization of Ceramics* edited by Ronald E. Loehman. EX1044 (“Loehman”)

47. Exhibit 1044 (EX1044) is a copy of the cover, title page, copyright page, contents, and two prefaces from a book titled *Characterization of Ceramics* edited by Ronald E. Loehman (hereafter “Loehman”) and issued by Butterworth-Heinemann with a 1993 copyright date. Exhibit 1044 is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1044 is a true and correct copy in a condition that creates no suspicion about its authenticity.

48. Attachment 3a is a true and correct copy of the MARC record for this book from the online catalog at the University of Wisconsin – Madison Libraries. The library ownership is indicated by the presence of the library code (“GZZ”) in the field 049. The library continues to update and enhance the MARC record to meet current cataloging rules. The most recent enhancement to the MARC record occurred on March 10, 2011, as shown in the field 005 (“20110310”) of Attachment 3a. I personally identified and retrieved the library catalog record which is Attachment 3a.

49. Based on finding a print copy of the book titled *Characterization of Ceramics* in the University of Wisconsin – Madison Libraries and MARC record

in its online library catalog attached as Attachment 3a, it is my opinion that the Loehman book was publicly available on or shortly after September 15, 1992, as shown in field 008 (“920915”). The International Standard Book Number (ISBN) on Exhibit 1044 (0-705-69253-7) matches the ISBN in the field 020 of Attachment 3a. Therefore, Exhibit 1044 is the same book as the one that the cataloger at the University of Wisconsin – Madison Libraries used to create the MARC record that is Attachment 3a.

50. Attached hereto as Attachment 3b is a true and correct copy of the MARC record for the volume titled *Characterization of Ceramics* obtained from the OCLC bibliographic database. As can be seen in the “Entered” field in the MARC record for this exhibit, a cataloger at the Library of Congress created OCLC record number 26720453 on September 15, 1992, as shown in the “Entered” field (“20050228”). The book was originally submitted for cataloging to the Library of Congress as part of the Cataloging in Publication program¹⁷ by September 15, 1992, as shown in field 008 (“920615”) and assigned a Library of Congress Control Number (92021549) as shown in field 010. A cataloger prepared basic information about the forthcoming book which is included on the verso of the title page (also called the copyright page). The information is provided to save time needed for the cataloging process at a library after the book is purchased. The CIP

¹⁷ <https://www.loc.gov/publish/cip/>

data includes the author (field 100), title (field 245), edition statement (field 250), ISBN (field 020), subject headings (field 650), classification numbers for the Library of Congress classification number (field 050), and the Dewey Decimal classification number (field 082). These data elements are included in the MARC record that the Library of Congress contributed to the OCLC bibliographic database.

51. Attachment 3b further includes an entry in field 050 (“TP807 \$b .C463 1993”) as described above, this includes a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 082 (“620.1/4”), a subject matter consistent with the Dewey Decimal classification system. Attachment 3b further includes a descriptor term reading “Ceramics” (see Attachment 3c, Library of Congress subject heading sh85022017) in the 650 field. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 3b was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry , the field 082 entry, and the field 650 entry. Further, as of September 15, 1992, the MARC record attached hereto as Attachment 3b was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that added this book to its collection, which means that the corresponding

publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

52. Further supporting my opinion that Exhibit 1044 was publicly accessible to ordinarily skilled and interested researchers in the field is the fact that the book titled *Characterization of Ceramics* was registered with the U. S. Copyright Office as item TX0003572326 on June 14, 1993, and indicated a publication date of January 12, 1993 (see Attachment 3d, U. S. Copyright Office Public Catalog). As noted above, this would have provided a POSITA with keyword searching capabilities and other tools to locate this book.

53. Attachment 3b indicates that the book titled *Characterization of Ceramics* as cataloged at the Library of Congress is currently available from 140 libraries. In view of above, the book titled *Characterization of Ceramics* was publicly available on or shortly after January 12, 1993, because by that date it had been cataloged and indexed at the Library of Congress, made part of the OCLC bibliographic database, and received at the University of Wisconsin – Madison Libraries. For these reasons, it is my opinion that Exhibit 1044 was published and accessible to the public on or shortly after January 12, 1993.

IX. PUBLICATION 4: *Advanced Ceramics and Future Materials: An Introduction to Structures, Properties, Technologies, Methods* by Fritz Aldinger and Volker A. Weberruß. EX1045 (“Aldinger”)

54. Exhibit 1045 (EX1045) is a copy of the title page, copyright page,

preface, contents, and Chapter 1 (“Advanced Ceramics”) from a book titled *Advanced Ceramics and Future Materials: An Introduction to Structures, Properties, Technologies, Methods* by Fritz Aldinger and Volker A. Weberruß (hereafter “Aldinger”) and issued by Wiley-VCH with a 2010 copyright date. Exhibit 1045 is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1045 is a true and correct copy in a condition that creates no suspicion about its authenticity.

55. Attachment 4a is a true and correct copy of the MARC record for this book from the online catalog at the Linda Hall Library of Science, Engineering & Technology (Kansas City, Missouri). The library ownership is indicated by the presence of the library code (“LHL”) in the field 049. The library continues to update and enhance the MARC record to meet current cataloging rules. The most recent enhancement to the MARC record occurred on April 17, 2013, as shown in the field 005 (“20130417”) of Attachment 4a. I personally identified and retrieved the library catalog record which is Attachment 4a.

56. Based on finding a print copy of the book titled *Advanced Ceramics and Future Materials: An Introduction to Structures, Properties, Technologies, Methods* in the Linda Hall Library of Science, Engineering & Technology and MARC record in its online library catalog attached as Attachment 4a, it is my

opinion that the Aldinger book was publicly available on or shortly after October 27, 2009, as shown in field 008 (“091027”). The International Standard Book Number (ISBN) on Exhibit 1045 (978-3-527-32157-5) matches the ISBN in the first field 020 of Attachment 4a. Therefore, Exhibit 1045 is the same book as the one that the cataloger at the Linda Hall Library of Science, Engineering & Technology used to create the MARC record that is Attachment 4a.

57. Attached hereto as Attachment 4b is a true and correct copy of the MARC record for the volume titled *Advanced Ceramics and Future Materials: An Introduction to Structures, Properties, Technologies, Methods* obtained from the OCLC bibliographic database. As can be seen in the “Entered” field in the MARC record for this exhibit, a cataloger at the British Library created OCLC record number 463642241 on September 15, 1992, as shown in the “Entered” field (“19920915”). The MARC record in the British Library online catalog indicates that an update to the record when the book was received and cataloged on April 15, 2010 (see Attachment 4c, field 005 (“20100415”).

58. Attachment 4b further includes an entry in field 050 (“TP810.5 \$b .A43 2010”) as described above, this includes a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 082 (“666”), a subject matter consistent with the Dewey Decimal classification system.

Attachment 4b further includes two descriptor terms reading “Ceramics \$x Analysis” (see Attachment 3c, Library of Congress subject heading sh85022017) and “Ceramic materials” (see Attachment 4d, Library of Congress subject heading sh85022017) in the 650 fields. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 4b was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entries. Further, as of October 27, 2009, the MARC record attached hereto as Attachment 4b was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that added this book to its collection, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

59. Attachment 4b indicates that the book titled *Advanced Ceramics and Future Materials: An Introduction to Structures, Properties, Technologies, Methods* as cataloged at the British Library is currently available from 111 libraries. In view of above, the book titled *Advanced Ceramics and Future Materials: An Introduction to Structures, Properties, Technologies, Methods* was publicly available on or shortly after April 15, 2010, because by that date it had been received, cataloged, and indexed at the British Library and made part of the

OCLC bibliographic database. For these reasons, it is my opinion that Exhibit 1045 was published and accessible to the public on or shortly after April 15, 2010.

X. PUBLICATION 5: *Introduction to Ceramics*, 2nd edition, by D. W. Kingery. EX1046 (“Kingery”)

60. Exhibit 1046 (EX1046) is a copy of the cover, title page, copyright page, preface, contents, introduction, and selections from chapter 1 (“Ceramic Processes and Products”) from a book titled *Introduction to Ceramics*, 2nd edition, by W. D. Kingery (hereafter “Kingery”) and issued by Wiley & Sons with a 1960 copyright date. Exhibit 1046 is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1046 is a true and correct copy in a condition that creates no suspicion about its authenticity.

61. Attachment 5a is a true and correct copy of the MARC record for this book from the online catalog at the University of Wisconsin – Madison Libraries. The library ownership is indicated by the presence of the library code (“uwmadisondb”) in the third field 035. The library continues to update and enhance the MARC record to meet current cataloging rules. The most recent enhancement to the MARC record occurred on June 4, 1999, as shown in the field 005 (“19990604”) of Attachment 5a. I personally identified and retrieved the library catalog record which is Attachment 5a.

62. Based on finding a print copy of the book titled *Introduction to*

Ceramics, 2nd edition, in the University of Wisconsin – Madison Libraries and MARC record in its online library catalog attached as Attachment 5a, it is my opinion that the Kingery book was publicly available on or shortly after July 25, 1970, as shown in field 008 (“700725”). The Library of Congress Control Number (LCCN) on Exhibit 1046 (60-53448) matches the LCCN in the field 010 of Attachment 5a. Therefore, Exhibit 1046 is the same book as the one that the cataloger at the University of Wisconsin – Madison Libraries used to create the MARC record that is Attachment 5a.

63. Attached hereto as Attachment 5b is a true and correct copy of the MARC record for the volume titled *Introduction to Ceramics*, 2nd edition, obtained from the OCLC bibliographic database. As can be seen in the “Entered” field in the MARC record for this exhibit, a cataloger at the Library of Congress created OCLC record number 547135 on July 25, 1970, as shown in the “Entered” field (“19700725”).

64. Attachment 5b further includes an entry in field 050 (“TP807 \$b .K52”) as described above, this includes a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system), an entry in field 060 (“TP807 \$b .K52i 1960”) as described above, this includes a subject matter classification number consistent with the National Library of Medicine classification system (analogous

to the Dewey Decimal classification system), and an entry in field 082 (“666”), a subject matter consistent with the Dewey Decimal classification system. Attachment 5b further includes a descriptor term reading “Ceramics” (see Attachment 3c, Library of Congress subject heading sh85022017) in the 650 field. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 5b was indexed according to its subject matter by virtue of at least four independently sufficient classifications: the field 050 entry, the field 060 entry, the field 082 entry, and the field 650 entry. Further, as of July 25, 1970, the MARC record attached hereto as Attachment 5b was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that added this book to its collection, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

65. Further supporting my opinion that Exhibit 1046 was publicly accessible to ordinarily skilled and interested researchers in the field is the fact that the book titled *Introduction to Ceramics*, 2nd edition, was registered with the U. S. Copyright Office as item RE0000394307 on September 6, 1988, and indicated a publication date of December 19, 1960 (see Attachment 5c, U. S. Copyright Office Public Catalog). As noted above, this would have provided a POSITA with

keyword searching capabilities and other tools to locate this book.

66. Attachment 5b indicates that the book titled *Introduction to Ceramics*, 2nd edition, as cataloged at the Library of Congress is currently available from 444 libraries. In view of above, the book titled *Introduction to Ceramics*, 2nd edition, was publicly available on or shortly after December 19, 1960, because by that date it had been received, cataloged, and indexed at the Library of Congress and made part of the OCLC bibliographic database. For these reasons, it is my opinion that Exhibit 1046 was published and accessible to the public on or shortly after December 19, 1960.

XI. SUMMARY OF OPINIONS

67. In view of the foregoing, it is my opinion that the publications described above were publicly available no later than the corresponding date listed in the table below:

Exhibit	Publication	Publicly Available No Later Than
1042	<i>Ceramic and Glass Materials: Structure, Properties and Processing</i> , edited by James F. Shackelford and Robert H. Doremus. New York: Springer, ©2008.	April 3, 2008
1043	<i>Ceramic Materials: Progress in Modern Ceramics</i> , edited by Feng Shi. Rijeka, Croatia: InTech: ©2012.	January 6, 2012
1044	<i>Characterization of Ceramics</i> , edited by Ronald E. Loehman. Boston, MA: Butterworth-Heinemann, ©1993.	January 12, 1993
1045	Aldinger, Fritz, and Volker A. Weberruß. <i>Advanced Ceramics and Future Materials: An Introduction to Structures, Properties, Technologies, Methods</i> . Weinheim, Germany: Wiley-VCH, ©2010.	April 15, 2010
1046	Kingery, W. D. <i>Introduction to Ceramics</i> . 2nd ed. London ; New York: Wiley & Sons, ©1960.	December 19, 1960

68. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: February 23, 2023

By: Sylvia D. Hall-Ellis
Sylvia D. Hall-Ellis, Ph.D.