

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re *Inter Partes* Review of:)
U.S. Patent No. 9,771,169)
Issued: Sep. 26, 2017)
Application No.: 13/257,669)
Filing Date: Sep. 20, 2011)

For: **Preconditioned Air Unit with Variable Frequency Driving**

DECLARATION OF INGRID HSIEH-YEE, PH.D.

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I, Ingrid Hsieh-Yee, declare as follows:

I. INTRODUCTION AND QUALIFICATIONS

1. I am over the age of eighteen and otherwise competent to make this declaration.

2. I have been retained by counsel for Petitioner to provide my expert opinion in connection with the above-captioned proceeding (“IPR”) regarding the public availability of certain prior art reference in relation to U.S. Patent No. 9,771,169 (the “’169 patent”).

3. I am being compensated for my time in connection with this IPR at my current consulting rate. I am also being reimbursed for any reasonable expenses associated with my work and testimony in this investigation. My compensation is not contingent on the results of my study, the substance of my opinions, or the outcome of this matter.

A. Qualifications and Professional Experience

4. My complete qualifications and professional experience are described in my academic curriculum vitae (**Exhibit 1023**). The following is a brief summary of my relevant qualifications and professional experience.

5. I was a professor in the Department of Library and Information Science at the Catholic University of America for 32 years and was conferred the title of Professor Emerita in December 2022. I have experience working in an academic

library, a medical library, and a legislative library. I hold a Ph.D. and a Masters in Library and Information Studies from the University of Wisconsin-Madison.

6. I am an expert on library cataloging and classification and have published two editions on this subject, *Organizing Audiovisual and Electronic Resources for Access: A Cataloging Guide* (2000 and 2006). I taught a variety of courses, including Cataloging and Classification, Advanced Cataloging and Classification, Organization of Internet Resources, Organization of Information, Metadata, Digital Content Creation and Management, Internet Searches and Web Design, Information Literacy Instruction, Advanced Information Retrieval and Analysis Strategies, and The Information Professions in Society. I am familiar with metadata schema design and implementation. In my teaching, I covered the design and implementation of metadata in databases, search engines, digital repositories, digital libraries, and digital archives. I also covered how information organization affects the discovery and access to digital resources on the Internet. My research interests cover cataloging and classification, information organization, metadata, information retrieval, information architecture, digital collections, scholarly communication, social media, user interaction with information systems, and others

7. I am personally familiar with many digital collections, digital archives, online catalogs, databases, and search engines. In preparing for this declaration, I used the following authoritative information systems to search for records:

- Google (<https://google.com/>)
- Internet Archive (<https://archive.org/>)

B. Scope of this Declaration

8. I have been asked to offer an opinion on the public availability dates of the following document:

Variable frequency drive: Operation and application of variable frequency drive (VFD) technology. Syracuse, New York: Carrier Corporation, 2005, **Ex. 1040** (“*VFD*”).

9. I am informed by counsel and understand that a given reference is “published” upon a satisfactory showing that such a document has been disseminated or otherwise made publicly available to the extent that persons interested and ordinarily skilled in the subject matter or art could locate it exercising reasonable diligence and obtain the document.

10. I have been informed by counsel that the ’169 patent was filed in the United States and it claims March 20, 2009 as its earliest priority date. I have assessed public accessibility of the documents referenced below as of this claimed priority date.

11. I have been informed by counsel that the subject matter of this proceeding generally relates to the technology of variable frequency driving for air conditioning applications.

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

13. I have been informed by counsel that a person of ordinary skill in the art as of March 20, 2009 would have knowledge of the scientific literature and have skills relating to air conditioning and variable frequency drivers. A POSA would typically have a bachelor’s degree, or equivalent, in subject discipline.

14. It is my opinion that such a person would have been actively engaged in learning about the field, possibly through formal instruction and through the bibliographic resources. By at least March 20, 2009 such a person would have had access to a vast array of print and electronic resources, including at least the documents referenced below.

C. Evidence Considered in Forming My Opinion

15. In the preparation of this declaration, I have reviewed **Ex. 1040** referenced in Paragraph 8 above, and any other documents I reference herein. Each of these is a type of material that experts in my field would reasonably rely upon when forming their opinions. I provided a further description of materials I

considered in **Appendix A**.

II. AUTHENTICITY AND PUBLIC AVAILABILITY OF *VFD* (EX. 1040)

A. Authentication

16. **Ex. 1040** is a true and correct copy of “Variable frequency drive: Operation and application of variable frequency drive (VFD) technology,” (“*VFD*”), published in October 2005 by Carrier Corporation of Syracuse, New York, that I obtained from Internet Archive. When I began researching this document, I searched Internet Archive for copies and located a copy of VFD archived on July 18, 2009 at https://web.archive.org/web/20090718111829/http://www.docs.hvacpartners.com/idc/groups/public/documents/marketing/wp_varfreqdrive.pdf. This archived copy is presented as **Ex. 1040** in this declaration.

17. Page 1 is the title page of *VFD* that shows “Variable frequency drive” as the main title, “Operation and application of variable frequency drive (VFD) technology” as the subtitle, Carrier Corporation of Syracuse, New York as the publisher, and “October 2005” as the publication date. Page 2 is the table of contents that shows *VFD* has four parts: Introduction, VFD operation, Benefits of VFD, and Harmonic distortion and industry standards. **Ex. 1040** shows this document has 10 numbered pages and a back sheet, including 5 figures (some color), five tables, six references and a list of “Further Reading from Carrier” that includes Carrier papers published in 1993, 1999, and 2005. The back sheet shows “Copyright 2005 Carrier

Corporation www.carrier.com Printed in U.S.A 10-05” indicating this document has a publication date of October 2005.

18. Page 3 of **Ex. 1040** shows a caption for “Fig. 2 VFD Basics: Existing technology,” but the color figure is not displayed in the PDF copy. When visiting this archived copy on the Internet, the color figure is clearly displayed, so I used a screen capture of Figure 2 to show this image is part of *VFD*. This captured image of Figure 2 is presented as **Ex. 1041** in this declaration. The Wayback Machine calendar at the top shows this image is part of the copy of *VFD* archived by Internet Archive on “JUL 18 2009” (*i.e.*, July 18, 2009).

19. **Ex. 1040** is in a condition that creates no suspicion about its authenticity. Specifically, this copy is not missing any intermediate pages, and there are no visible alterations to the document. Furthermore, I have produced **Ex. 1041** to clarify that Figure 2 is in fact part of this archived copy. Based on my review and analysis, it is my opinion that **Ex. 1040** is authentic.

B. Archived Copies of Carrier White Papers Webpage

20. Internet Archive is a digital library that archives scholarly materials, cultural artifacts, and other web resources on the Internet and provides free public access to its collections. I have used Internet Archive in the past and am familiar with their Wayback Machine and their practice of assigning an extended URL to an archived resource in the format of [http://www.archive.org/web/\[Year in](http://www.archive.org/web/[Year in)

yyyy][Month in mm][Day in dd][Time code in hh:mm:ss]/[Archived URL] to show the point of time the archived file was captured.

21. Internet Archive archives web resources on the Internet as much as it can, but it does not archive all web resources all the time. Internet Archive usually does not archive web resources the moment they appear on the Internet, and a web resource must be available first before it can be archived. For these reasons, the archive date of a web file captured by the Internet Archive is **not** the earliest public availability of the archived file. Rather, the archive date indicates that the archived file was available before, and definitely no later than, the archive date.

22. To determine the public availability of *VFD* on the Internet, I searched Internet Archive for records and learned that Carrier offered a White Papers webpage to help interested users discover Carrier's white papers. Three archived records of Carrier's White Papers webpage are discussed below to show that *VFD* was available by at least December 1, 2007.

23. **Ex. 1024** is a true and correct copy of the White Papers webpage of Carrier that I personally located, identified, and obtained. This is the type of record experts in my field would reasonably rely upon when forming their opinion.

24. Page 1 is a screen capture of a Wayback Machine calendar that shows this webpage was captured 14 times from "26 Jun 2006" and "22 Feb 2015" and this particular copy was archived on "DEC 01 2007" and available at

https://web.archive.org/web/20071201093321/http://www.commercial.carrier.com/commercial/hvac/technical_literature/1%2C3063%2CCLI1_CNT1_DIV12_ETI8627_MID4337_QRYYY%2C00.html. This archived webpage shows “White Papers” is the title, and explains that “[w]hite papers provide you with in-depth articles on HVAC issues and ways that Carrier products can help meet the demands of our changing industry. Carrier expert engineers have taken all the guesswork out of important issues, such as IAQ, refrigerants and controls.” The stated purpose of this webpage indicates that Carrier shares their expertise on HVAC issues by providing a White Papers webpage to help interested users discover and access their white papers.

25. **Ex. 1024** shows visitors can reach the White Papers webpage in a number of ways. The navigation path above the image on page 1 shows “You are here: Commercial Home / Literature / White Papers” indicating users can navigate to the White Papers webpage of Carrier from the home page of the Carrier Commercial website. This process is illustrated by Page 2, which is a screen capture of the Carrier Commercial Home page archived on December 16, 2007, that shows a navigation panel on the left side includes several topics to help users explore the website, and when visitors mouse over the “Literature” category, the system displays a list of subcategories, including “White Papers,” to help visitors discover papers of interest to them.

26. Page 3 of **Ex. 1024** is a screen capture that shows the same navigation

panel on the left side of the webpage with a group of categories to help users explore various categories from this webpage and users can use these categories and submenus (such as the subcategories under “Literature”) to discover white papers of interest.

27. The text below the webpage title on page 1 instructs visitors to “[u]se the form below to search for current white papers” and to “[c]hoose a discussion topic for white papers on that topic. Page 4 is a screen capture that shows that users can search for a white paper, choose to view all white papers or choose a topic to examine the papers grouped under that topic. These navigational features show Carrier supports interested users in a number of ways to explore Carrier’s white papers and to identify papers of interest to users.

28. Pages 5 to 7 are the PDF of the archived webpage that shows “42 matching documents” are available and presented in a table that shows the title and topic of available white papers, and the estimated download time for each paper. The titles are presented as hypertext links for quick access to the white papers. Page 7 shows “Variable Frequency Drive. Operation and Application of Variable Frequency Drive (VFD) Technology” is a white paper about the topic “Variable Frequency Drives,” and the estimated download time is “1 Minute(s) and 27 Seconds@56k.” When I selected the link to this title in December 2024, Internet Archive led me to a copy of *VFD*. Page 8 is a Wayback Machine calendar that shows this copy of *VFD*

was archived five times between “18 Jul 2009” and “6 Jul 2022” and this particular copy was archived on “JUL 18 2009” (*i.e.*, July 18, 2009). The full text of this July 2009 copy is available at https://web.archive.org/web/20090718111829/http://www.docs.hvacpartners.com/idc/groups/public/documents/marketing/wp_varfreqdrive.pdf. I have included the PDF of this July 2009 copy as pages 10 to 20 of **Ex. 1024**. This archived copy is the same as **Ex. 1040**.

29. As discussed earlier, Internet Archive does not archive everything on the Internet, and the system usually does not archive a web file when it first appears on the Internet, meaning there is usually a time lag between the appearance of a web file on the Internet and the time Internet Archive archives that file. For this reason, the archive date of a file archived by Internet Archive should not be treated as the first public availability date of that file. Rather, the archive date means the file was available before, and definitely no later than, the archive date. Since *VFD* carries a publication date of “October 2005,” and the White Papers webpage of Carrier archived on December 1, 2007, shows *VFD* was available by that date, it is my opinion that *VFD* was publicly available on the Internet by December 1, 2007.

30. As further evidence of Carrier’s effort to share their white papers on the Internet, I obtained two more archived copies of Carrier’s White Papers webpage. **Ex. 1025** is a true and correct copy of the Carrier White Papers webpage that I

personally located, identified, and obtained from Internet Archive. This is the type of record experts in my field would reasonably rely upon when forming their opinion.

31. Page 1 is a screen capture of a Wayback Machine calendar that shows this webpage was captured 14 times from “26 Jun 2006” and “22 Feb 2015” and this particular copy was archived on “JAN 03 2008” and available at https://web.archive.org/web/20080103002120/http://www.commercial.carrier.com/commercial/hvac/technical_literature/1%2C3063%2CCLI1_CNT1_DIV12_ETI8627_MID4337_QRY%2C00.html. This archived copy shows the same navigational path and links as **Ex. 1024**, indicating that by January 3, 2008, interested users would be able to use navigational features provided by Carrier to reach the White Papers webpage and use it to search and browse for white papers on topics of interest.

32. Page 4 of **Ex. 1025** shows “Variable Frequency Drive. Operation and Application of Variable Frequency Drive (VFD) Technology” is a white paper about the topic “Variable Frequency Drives,” and the estimated download time is “1 Minute(s) and 27 Seconds@56k.” When I selected the link to this title in December 2024, Internet Archive led me to a copy of *VFD*. Page 5 is a Wayback Machine calendar that shows this copy of *VFD* was archived five times between “18 Jul 2009” and “6 Jul 2022” and this particular copy was archived on “JUL 18 2009” (*i.e.*, July 18, 2009). The full text of this copy is available at <https://web.archive.org/web/20090718111829/http://www.docs.hvacpartners.com/id>

c/groups/public/documents/marketing/wp_varfreqdrive.pdf. I have included the PDF of this July 2009 copy as pages 6 to 16 of **Ex. 1025**. This archived copy is the same as **Ex. 1040**.

33. As discussed above, the archive date of a web file archived by Internet Archive indicates the file was available before, and definitely no later than, the archive date. Since *VFD* carries a publication date of “October 2005,” and copies of the White Papers webpage of Carrier archived on December 1, 2007, and January 3, 2008, show *VFD* was available on those dates, it is my opinion that *VFD* was publicly available on the Internet by December 1, 2007.

34. **Ex. 1026** is a true and correct copy of the Carrier White Papers webpage that I personally obtained from Internet Archive. This is the type of record experts in my field would reasonably rely upon when forming their opinion.

35. Page 1 is a screen capture of a Wayback Machine calendar that shows this webpage was captured 4 times from “7 Feb 2008” to “18 Apr 2009” and this particular copy was archived on “FEB 07 2008” and available at https://web.archive.org/web/20080207173830/http://www.commercial.carrier.com/commercial/hvac/technical_literature/1%2C3063%2CCCLI1_CNT1_DIV12_ETI8627_MID4440_QRYYY%2C00.html. The URL of this Carrier White Papers webpage in

Ex. 1026 is http://www.commercial.carrier.com/commercial/hvac/technical_literature/1%2C30

[63%2CCLI1_CNT1_DIV12_ETI8627_MID4440_QRY%2C00.html](#), which is different from the URLs of the webpage archived on December 1, 2007, and January 3, 2008, indicating that White Papers webpage of Carrier had a different filename by February 2008, and this copy was archived four times since it was archived on February 7, 2008. **Ex. 1026** shows the same webpage title, instructions for visitors, navigational panel, and the search box for searching and browsing white papers as **Ex. 1024** and **Ex. 1025**. The differences are that in **Ex. 1026** the White Papers webpage was listed as a subcategory under “Industry Issues” and it shows “49 matching documents” are available. **Ex. 1026** shows that by February 7, 2008, interested users would be able to use navigational features provided by Carrier to reach the White Papers webpage and use it to search and browse for white papers on topics of interest.

36. Page 4 of **Ex. 1026** shows “Variable Frequency Drive. Operation and Application of Variable Frequency Drive (VFD) Technology” is a white paper about the topic “Variable Frequency Drives,” and the estimated download time is “1 Minute(s) and 27 Seconds@56k.” When I selected the link to this title in December 2024, Internet Archive led me to a copy of *VFD*. Page 5 is a Wayback Machine calendar that shows this copy of *VFD* was archived five times between “18 Jul 2009” and “6 Jul 2022” and this particular copy was archived on “JUL 18 2009” (*i.e.*, July 18, 2009). The full text of this copy is available at

https://web.archive.org/web/20090718111829/http://www.docs.hvacpartners.com/idc/groups/public/documents/marketing/wp_varfreqdrive.pdf. I have included the PDF of this July 2009 copy as pages 6 to 16 of **Ex. 1026**. This archived copy is the same as **Ex. 1040**.

37. As discussed above, the archive date of a web file archived by Internet Archive indicates the file was available before, and definitely no later than, the archive date. Since *VFD* carries a publication date of “October 2005,” and copies of the White Papers webpage of Carrier archived on December 1, 2007 (**Ex. 1024**), January 3, 2008 (**Ex. 1025**), and February 7, 2008 (**Ex. 1026**) show *VFD* was available by those dates, it is my opinion that *VFD* was publicly available on the Internet by December 1, 2007. The webpage structure of these three archived copies also inform my opinion that interested users would be able to discover the White Papers webpage from the Carrier Commercial Home Page, and use the navigational features to explore the White Papers webpage to search and browse for white papers of interest to them.

C. Archive Dates of *VFD*

38. **Ex. 1027** is a true and correct copy of archived postings from Refrigeration-Engineer.com forums that I received from counsel, which shows that on “20-04-2007” a posting by Peter_1 on “Link about Starting & protecting AC motors” includes a reference to a Carrier paper at

http://www.xpedio.carrier.com/idc/groups/public/documents/marketing/wp_varfreq_drive.pdf?SMSESSION=NO. As I verified this record in January 2025, I learned that the website has changed, and this posting by Peter_1 is now available at <https://www.refrigeration-engineer.com/forum/technical-refrigeration/electrical/6602-link-about-starting-protecting-ac-motors>. **Ex. 1039** is a true and correct copy of my navigation on the forums and the Peter_1 posting at this new URL to illustrate my discovery. I began at the Refrigeration-engineer.com forums site, followed the thread of “Technical Refrigeration” (page 1), and selected the “Electrical” forum to reach the “Electrical” forum category (page 3) that shows this forum has 84 pages of postings. I then identified the Peter_1 posting in **Ex. 1027** on page 76 (page 5 of **Ex. 1039**), which shows the first posting is “Link about Starting & protecting AC motors” started by Peter_1, 20-04-2007, 11:03 PM” that has “9 responses, 3,647 views” and the last post by momo was posted on “20-05-2007, 11:06 PM.” Pages 7 to 11 of **Ex. 1039** show the postings on the topic of “Link about Starting & protecting AC motors.” Page 7 shows Peter_1 is an “HVAC/R Instructor” and page 8 displays the Peter_1 posting last edited by Peter_1 on “20-04-2007” at “11:22 PM.” that shows a message of “While Im busy, one of Carrier <http://www.xpedio.carrier.com/idc/gr...fSMESSAGE=NO>” that references *VFD*. The omission mark in this URL indicates the URL was truncated. I have closely compared the Peter_1 posting in **Ex. 1039** with the copy obtained in October (**Ex.**

1027) and concluded that they are the same message, and the filename for *VFD* would be helpful for discovering the public availability date of this white paper. My research is discussed in **Ex. 1029** below. Before that, I searched for information on Refrigeration-Engineer.com to determine the nature of this site.

39. I searched Internet Archive for records to learn about the nature of Refrigeration-Engineer.com, and found an archived record that shows this website is a legitimate website. **Ex. 1028** is a true and correct copy of two archived copies of this website that I personally located, identified, and obtained from Internet Archive. They are the type of records experts in my field would reasonably rely upon when forming their opinion.

40. Page 1 of **Ex. 1028** is a screen capture of a Wayback Machine calendar that shows Refrigeration Engineer.com (<http://www.refrigeration-engineer.com/>) was archived 432 times between “31 Mar 2001” and “21 Sep 2024” and this particular copy was archived on “OCT 12 2007” and available at <https://web.archive.org/web/20071012021115/http://www.refrigeration-engineer.com/>. Pages 2 and 3 are the PDF of this archived copy that shows new users need to register to access the forums, and the website is for users to post questions and share knowledge and information about issues of interest to refrigeration engineers. Page 2 shows a list of discussion threads, number of replies, number of views, and the forum where a thread is posted. Page 2 also shows that as of October

12, 2007, the forums had 14,127 members, 8,291 threads, and 71,700 posts. Page 4 is a copy of “Refrigeration-Engineer.com forums” archived on February 13, 2004, and available at <https://web.archive.org/web/20040213191227/http://www.refrigeration-engineer.com/chat/>. Pages 5 and 6 are the PDF of the archived copy that shows a welcome message stating, “Welcome to Refrigeration-Engineer.com forums. If this is your first visit, be sure to check out the FAQ by clicking the link above. You may have to register before you can post: click the register link above to proceed. To start viewing messages, select the forum that you want to visit from the selection below.” Page 5 shows that as of February 13, 2004, the forums had 2,081 members, 1,320 threads, and 11,032 posts. **Ex. 1028** informs my opinion that “Refrigeration-Engineer.com forums” provides forums for engineers interested in refrigeration related issues to post questions and share expertise and resources. The forums were first archived by Internet Archive in 2001, had 2,081 registered members in February 2004, and the number of registered members increased to 14,127 on October 12, 2007.

41. After verifying the nature of Refrigeration-Engineer.com forums, I used the URL of *VFD* from the April 20, 2007 message by Peter_1 (**Ex. 1027**) to search Internet Archive for records. **Ex. 1029** presents true and correct copy of my search results. I personally researched, identified, and obtained these screenshots.

They are the type of material experts in my field would reasonably rely upon when forming their opinion.

42. Specifically, I used the main index of the Wayback Machine to search for all the web resources indexed under <http://www.xpedio.carrier.com/idc>. Page 1 of **Ex. 1029** shows the Wayback Machine responded to my request with 3,399 entries, and showed the PDF of *VFD* was indexed twice on “Feb 23 2006” and “Jan 24, 2013” (see the second entry from the bottom). When I selected the URL for this PDF file, Internet Archive led me to a calendar showing the file was archived twice (page 2). Page 3 shows a link from February 23, 2006 in green, and page 4 shows this link led to a redirect message that led to a copy of *VFD* archived on January 24, 2013. Page 5 is a screen capture of a Wayback Machine calendar that shows the file at this URL was archived twice on “23 Feb 2006” and “24 Jan 2013.” My search experience informs my opinion that *VFD* was first archived by Internet Archive on February 23, 2006, and the file was moved later, so the February 2006 link was redirected to the January 2013 archived copy. The full text of this archived copy is available at https://web.archive.org/web/20130124022403/http://www.xpedio.carrier.com:80/idc/groups/public/documents/marketing/wp_varfreqdrive.pdf. I have included a PDF of this copy as pages 6 to 16 of **Ex. 1029**. I noticed Figure 2 is not displayed clearly in this PDF, so I have used a screen capture to produce **Ex. 1042** to show Figure 2 is included in the copy of *VFD* archived by Internet Archive in January 2013. This

January 2013 archived copy is the same as **Ex. 1040**.

43. Based on the main index of the Wayback Machine, the calendar of the Wayback Machine, and the redirect message I encountered, it is my opinion that *VFD* was publicly available on the Internet by February 23, 2006.

D. Archived Indexes of Carrier Marketing Documents

44. My research on Internet Archive also discovered Carrier's indexes of their marketing documents. Two archived indexes are presented below to show *VFD* was included in the Carrier index of marketing documents no later than January 10, 2006, so *VFD* would have been publicly available on the Internet by that date. I personally located, identified, and obtained these indexes. They are the type of material experts in my field would reasonably rely upon when forming their opinion.

45. **Ex. 1030** is a true and correct copy of "Index of /idc/groups/public/documents/marketing/" from Internet Archive. Page 1 is a screen capture of a Wayback Machine calendar that shows this index file at <http://www.xpedio.carrier.com/idc/groups/public/documents/marketing/> was archived 21 times between "3 Sep 2006" and "9 Jun 2013" and this particular copy was archived on "NOV 22 2007" and available at <https://web.archive.org/web/20071122161731/http://www.xpedio.carrier.com/idc/groups/public/documents/marketing/>. The index shows the name of each file indexed, the last file modification date, and the size. Page 51 shows "wp_varfreqdrive.pdf"

(the URL of *VFD* referenced in the April 20, 2007 message on the Refrigeration-Engineer.com forums) was last modified on this index site on “10-Jan-2006 09:46” (*i.e.*, January 10, 2006, at 9 am and 46 minutes). When I selected the link, Internet Archive led me to a site management agent page, then could not direct me further. I then searched the main index of the Wayback Machine for web resources archived under <http://www.xpedio.carrier.com/idc/groups/public/documents/marketing/>. The Wayback Machine index responded with 590 entries for my search, and showed that “wp_varfreqdrive.pdf” was indexed twice on “Feb 23, 2006” and “Jan. 24, 2013” (see pages 52 and 53 of **Ex. 1030**). The indexing information on *VFD* is the same as what I discovered earlier (see **Ex. 1029**).

46. As evidence that Carrier continued to index *VFD* for public access, I obtained a copy of their index at a later date. **Ex. 1031** is another archived copy of Carrier’s index for their marketing documents at “Index of /idc/groups/public/documents/marketing/”. Page 1 is a screen capture of a Wayback Machine calendar that shows this index file at <http://www.xpedio.carrier.com/idc/groups/public/documents/marketing/> was archived 21 times between “3 Sep 2006” and “9 Jun 2013” and this particular copy was archived on “FEB 07 2009” and available at <https://web.archive.org/web/20090207000247/http://www.xpedio.carrier.com/idc/groups/public/documents/marketing/>. The index shows the name of each file indexed,

the last file modification date, and the size. Page 54 shows “wp_varfreqdrive.pdf” (the URL of *VFD* referenced in the April 20, 2007 message on the Refrigeration-Engineer.com forums) was last modified on this index site on “10-Jan-2006 09:46” (*i.e.*, January 10, 2006, at 9 am and 46 minutes). When I selected the link, Internet Archive led me to a to a site management agent page, then could not direct me further. I then searched the main index of the Wayback Machine for web resources archived under <http://www.xpedio.carrier.com/idc/groups/public/documents/marketing/>. The Wayback Machine index responded with 590 entries for my search, and showed that “wp_varfreqdrive.pdf” was indexed twice on “Feb 23, 2006” and “Jan. 24, 2013” (see pages 55 and 56 of **Ex. 1031**). The indexing information on *VFD* is the same as what I discovered earlier (see **Ex. 1029**).

47. Based on my review of archived copies of Carrier’s index for their marketing documents, it is my opinion that Carrier placed *VFD* in their index on the Internet no later than January 10, 2006, and the file link led to an archived copy of *VFD* first archived on February 23, 2006, then redirected to a copy archived in 2013. Since archived copies of the index from November 22, 2007 (**Ex. 1030**), and February 7, 2009 (**Ex. 1031**), both show the last modification date for this file as January 10, 2006, it is my opinion that *VFD* was publicly available on the Internet by January 10, 2006, that meaning by that time interested users would have been able to discover Carrier’s index for their marketing documents, use the index to discover the link for

VFD, and follow the link to access the PDF of this document.

E. Summary of My Opinion on *VFD*

48. The copy of *VFD* that I located and obtained from Internet Archive (**Ex. 1040**) is authentic because the document shows no signs to raise suspicion about its authenticity, and I have used a captured image of Figure 2 from Internet Archive (**Ex. 1041**) to show that Figure 2 is part of *VFD*, is included in the copy archived by Internet Archive in July 2009, and is clearly displayed on the Internet Archive when one accesses this archived copy on the Internet.

49. Carrier has used white papers to share the expertise of their engineers. Archived copies of the Carrier White Papers webpage (**Ex. 1024**, **Ex. 1025**, and **Ex. 1026**) show interested users could begin with the company's commercial website to discover the White Papers webpage, and use navigational features on the White Papers webpage to search and browse white papers of interest to them. The archived copies of the White Papers webpage show that by December 1, 2007, *VFD* was listed as available on the Internet for user discovery and access.

50. A reference to *VFD* was made on April 20, 2007, on the Refrigeration-Engineer.com forums (**Ex. 1027** and **Ex. 1039**). My research of the URL on Internet Archive led to my discovery that *VFD* was archived twice on February 23, 2006, and January 24, 2013. The link to the "February 23, 2006" copy was documented by Internet Archive, and redirected later to the 2013 copy (**Ex. 1029**), indicating *VFD*

was publicly available on the Internet by February 23, 2006. Archived copies of Carrier's index for their marketing documents, in fact, shows *VFD* was publicly available earlier, since the archived copies (**Ex. 1030** and **Ex. 1031**) show Carrier last modified *VFD* on their indexes on January 10, 2006. It is therefore my conclusion that *VFD* was publicly accessible on the Internet to interested users by January 10 2006.

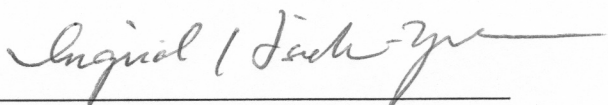
III. CONCLUSION

51. In signing this Declaration, I recognize that the Declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in this proceeding. If required, I will appear for cross-examination at the appropriate time.

52. I hereby declare that all statements made herein of my own knowledge are true and that all statements are made on information and belief are believed to be true, and further 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 18 U.S.C. §1001.

Dated: 1-7-2025

Respectfully submitted,


Ingrid Hsieh-Yee, Ph.D.

APPENDIX A

Appendix A. Materials Considered

Exhibit	Description
1023	Hsieh-Yee CV
1024	Carrier White Papers webpage, archived on December 1, 2007, available at https://web.archive.org/web/20071201093321/http://www.commercial.carrier.com/commercial/hvac/technical_literature/1%2C3063%2CCLL1_CNT1_DIV12_ETI8627_MID4337_QRY%2C00.html ; and <i>VFD</i> , archived on July 18, 2009, available at https://web.archive.org/web/20090718111829/http://www.docs.hvacpartners.com/idc/groups/public/documents/marketing/wp_varfreqdrive.pdf
1025	Carrier White Papers webpage, archived on January 3, 2008, available at https://web.archive.org/web/20080103002120/http://www.commercial.carrier.com/commercial/hvac/technical_literature/1%2C3063%2CCLL1_CNT1_DIV12_ETI8627_MID4337_QRY%2C00.html ; and <i>VFD</i> , archived on July 18, 2009, available at https://web.archive.org/web/20090718111829/http://www.docs.hvacpartners.com/idc/groups/public/documents/marketing/wp_varfreqdrive.pdf
1026	Carrier White Papers webpage, archived on February 7, 2008, available at https://web.archive.org/web/20080207173830/http://www.commercial.carrier.com/commercial/hvac/technical_literature/1%2C3063%2CCLL1_CNT1_DIV12_ETI8627_MID4440_QRY%2C00.html ; and <i>VFD</i> , archived on July 18, 2009, available at https://web.archive.org/web/20090718111829/http://www.docs.hvacpartners.com/idc/groups/public/documents/marketing/wp_varfreqdrive.pdf
1027	Postings on “Link about Starting & protecting AC motors (Archive)” from Refrigeration-Engineer.com forums, https://www.refrigeration-engineer.com/forums/archive/index.php/t-7742.html (accessed in October 2024 by counsel).
1028	Refrigeration-Engineer.com forums, archived by Internet Archive on October 12, 2007, available at

	https://web.archive.org/web/20071012021115/http://www.refrigeration-engineer.com/ ; and archived on February 13, 2004, available at https://web.archive.org/web/20040213191227/http://www.refrigeration-engineer.com/chat/ .
1029	Wayback Machine index for https://web.archive.org/web/*/http://www.xpedio.carrier.com/idc/* and <i>VFD</i> archived on January 24, 2013, available at https://web.archive.org/web/20130124022403/http://www.xpedio.carrier.com:80/idc/groups/public/documents/marketing/wp_varfreqdrive.pdf
1030	Carrier Index of /idc/groups/public/documents/marketing/ archived by Internet Archive on Nov. 11, 2007, available at https://web.archive.org/web/20071122161731/http://www.xpedio.carrier.com/idc/groups/public/documents/marketing/
1031	Carrier Index of /idc/groups/public/documents/marketing/ archived by Internet Archive on February 7, 2009, available at https://web.archive.org/web/20090207000247/http://www.xpedio.carrier.com/idc/groups/public/documents/marketing/
1039	Postings in the “Electrical” category on Refrigeration-engineering.com forums, available at https://www.refrigeration-engineer.com/forum/technical-refrigeration/electrical/page76 and “Link about Starting & protecting AC motors” at https://www.refrigeration-engineer.com/forum/technical-refrigeration/electrical/6602-link-about-starting-protecting-ac-motors that includes the posting by Peter_1 that references <i>VFD</i> (accessed in January 2025).
1040	Variable frequency drive. Operation and application of variable frequency drive (VFD) technology. Carrier Corporation. Syracuse, New York: Carrier Corporation, 2005 (“ <i>VFD</i> ”), available at https://web.archive.org/web/20090718111829/http://www.docs.hvacpartners.com/idc/groups/public/documents/marketing/wp_varfreqdrive.pdf from Internet Archive.
1041	Screen capture of Figure 2 of <i>VFD</i> from the copy archived by Internet Archive on July 18, 2009, available at https://web.archive.org/web/20090718111829/http://www.docs.hvacpartners.com/idc/groups/public/documents/marketing/wp_varfreqdrive.pdf

1042	Screen capture of Figure 2 of <i>VFD</i> from the copy archived by Internet Archive on January 24, 2013, available at https://web.archive.org/web/20130124022403/http://www.xpedio.carrier.com:80/idc/groups/public/documents/marketing/wp_varfreqdrive.pdf
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