IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

INTERNATIONAL BUSINESS MACHINES CORPORATION,	)))	
Plaintiff,	))	
v.	))	C.A. No. 20-351-LPS
AIRBNB, INC.,	))	**JURY TRIAL DEMANDED**
Defendant.	))	

FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff International Business Machines Corporation ("IBM"), for its First Amended

Complaint for Patent Infringement against Airbnb, Inc. ("Airbnb"), demands a trial by jury on all

issues so triable and alleges as follows:

INTRODUCTION

1.   IBM is in the innovation business. Every year, IBM spends billions of dollars on

research and development to invent, market, and sell new technology. For example, through its

investments and innovations in the new frontier of quantum information science, IBM is the leader

in commercializing quantum computing, once thought to be a purely academic exercise. IBM's Q

Network service—a community of Fortune 500 companies, academic institutions, research

organizations, and startups working with IBM to advance quantum computing—now has over 100

members.

2.   IBM obtains patents on the technology its inventors develop. The United States Patent

Office awards thousands of patents to IBM each year. In fact, for each of the last 27 years, the Patent

Office has awarded IBM more patents than any other company. Each of those patents grants IBM

protection from those who would take its technology without permission. Those patents are critical

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to IBM's business and its licensing philosophy.

3.   For over twenty years, IBM has been a strong proponent of open source technologies. IBM was a founding member of Open Invention Network, the largest patent non-aggression community in history, which supports freedom of action in Linux, a key element of open source software. IBM has also pledged to provide open access to key innovations covered by hundreds of IBM software patents for those working on open source software. And early in 2020, IBM joined the License on Transfer Network ("LOT Network"), a non-profit community of companies that supports open innovation and responsible stewardship of technology. LOT Network affirms the traditional use of patents—safeguarding the innovations of companies who research, develop, and sell new technologies—while protecting its members against companies who purchase or acquire patents from others.

4.   IBM also believes in the protection of its proprietary technologies, which result from IBM's extensive investments in research and development and the hard work of IBM's employees. IBM believes that companies who use IBM's patented technology should agree to a license and pay a fair royalty. When a company is using IBM's patents without authorization, IBM first seeks to negotiate an agreement whereby IBM and the other company each receive a license to the other's patent portfolio. That way, each company can avoid litigation, be fairly compensated for the use of all of its patents, and maintain freedom to operate in its respective markets.

5.   IBM's research and development is currently focused on technology that includes quantum computing, big data analytics, artificial intelligence, and natural language processing. But IBM also has a long history of innovating and licensing its technology in the field of internet commerce. In fact, long before Airbnb existed, IBM partnered with other companies to launch Prodigy, one of the very first e-commerce services. Airbnb, which was founded in 2008, long after

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e-commerce was already established, took those prior innovations made by IBM and others to create

and run its new business.

6.   For almost six years, IBM has tried to negotiate a cross license with Airbnb. Dozens

of similar companies, including Amazon, Apple, Google, and Facebook, have agreed to cross licenses

with IBM. Unfortunately, Airbnb is not among them. Instead, to this day, Airbnb has chosen to

willfully infringe IBM's patents.

7.   After six years, enough is enough. This lawsuit seeks to end Airbnb's unauthorized

use of IBM's patented technology.

NATURE OF THE CASE

8.   This action arises under 35 U.S.C. § 271 for Defendant's infringement of IBM's

United States Patent Nos. 7,072,849 (the "'849 patent"), 6,778,193 (the "'193 patent"), 7,631,346

(the "'346 patent"), 6,966,038 (the "'038 patent"), 6,785,676 (the "'676 patent"), and 9,710,760 (the

"'760 patent") (collectively the "Patents-In-Suit").

THE PARTIES

9.   Plaintiff IBM is a New York corporation, with its principal place of business at 1 New

Orchard Road, Armonk, New York 10504.

10.   Defendant Airbnb is a Delaware corporation, with its principal place of business at

888 Brannan Street, San Francisco, California 94103.

JURISDICTION AND VENUE

11.   IBM incorporates by reference paragraphs 1-10.

12.   This action arises under the patent laws of the United States, including 35 U.S.C. §

271 *et seq*. The jurisdiction of this Court over the subject matter of this action is proper under 28

U.S.C. §§ 1331 and 1338(a).

13.   Venue is proper in this Court pursuant to 28 U.S.C. §§ 1391(b) and (c) and 1400(b).

Airbnb is an entity organized under the laws of Delaware and resides in Delaware for purposes of venue under 28 U.S.C. §1400(b). Airbnb conducts business in Delaware, at least by offering for sale and selling products and services through its websites and mobile applications, which are accessible in Delaware. Infringement has occurred and continues to occur in Delaware.

14.   Personal jurisdiction exists over Airbnb because Airbnb conducts business in Delaware, at least by offering for sale and selling products and services through its websites and mobile applications, which are accessible in Delaware, and because infringement has occurred and continues to occur in Delaware. Personal jurisdiction also exists over Airbnb because it is an entity organized under the laws of Delaware.

FACTUAL BACKGROUND

A.   IBM Is A Recognized Innovator.

15.   IBM is recognized throughout the world as a pioneer in many aspects of science and technology. On ten occasions—more times than any other company or organization—IBM has been awarded the U.S. National Medal of Technology, the nation's highest award for technological innovation. During IBM's over 100-year history, IBM's employees have included six Nobel laureates, five National Medal of Science recipients, and at least fourteen inventors in the National Inventors Hall of Fame.

16.   These and other IBM employees have introduced the world to technology that the global community takes for granted today, including the dynamic random access memory (DRAMs) found in nearly all modern computers; magnetic disk storage (hard disk drives) found in computers and portable music players; and some of the world's most powerful supercomputers, and including Deep Blue, the first computer to beat a reigning chess champion. IBM's commitment to developing these types of advanced computing technologies has helped to usher in the information age.

B.   IBM Is Committed To Protecting Its Innovations Through The Patent System.

17.   IBM's research and development operations differentiate IBM from many other companies. IBM annually spends billions of dollars for research and development. In addition to yielding inventions that have literally changed the way in which the world works, IBM's research and development efforts have resulted in more than 60,000 patents worldwide.

18.   Like the research upon which the patents are based, IBM's patents also benefit society. Indeed, the Supreme Court has recognized that the patent system encourages both the creation and the disclosure of new and useful advances in technology. Such disclosure, in turn, permits society to innovate further. And, as the Court has further recognized, as a reward for committing resources to innovation and for disclosing that innovation, the patent system provides patent owners with the exclusive right to prevent others from practicing the claimed invention for a limited period of time.

C.   IBM Routinely Licenses Its Patents In Many Fields But Will Enforce Its Rights Against Those Who Use Its Intellectual Property Unlawfully.

19.   IBM's commitment to creating a large patent portfolio underscores the value that IBM places in the exchange of innovation, and disclosure of that innovation, in return for limited exclusivity. Indeed, IBM has used its patent portfolio to generate revenue and other significant value for the company by executing patent cross-license agreements. The revenue generated through patent licensing enables IBM to continue to commit resources to innovation. Cross licensing, in turn, provides IBM with the freedom to innovate and operate in a manner that respects the technology of others.

20.   Given the investment IBM makes in the development of new technologies and the management of its patent portfolio, IBM and its shareholders expect companies to act responsibly with respect to IBM's patents. IBM facilitates this by routinely licensing its patents in many fields and by working with companies that wish to use IBM's technology in those fields in which IBM grants licenses. When a company appropriates IBM's intellectual property but refuses to negotiate a

license, IBM has no choice but to seek judicial assistance.

D.   IBM Invented Methods For Presenting Applications And Advertisements In An Interactive Service While Developing The PRODIGY Online Service.

21.   The inventors of the '849 patent developed the patented technology as part of the efforts to launch the PRODIGY online service ("Prodigy"), a forerunner to today's Internet, in the late 1980s. The inventors believed that to be commercially viable, Prodigy would have to provide interactive applications to millions of users with minimal response times. The inventors believed that the "dumb" terminal approach that had been commonly used in conventional systems, which heavily relied on host servers' processing and storage resources for performance, would not be suitable. As a result, the inventors sought to develop more efficient methods of communication that would improve the speed and functionality of interactive applications and reduce equipment capital and operating costs.

22.   In light of the above considerations, the inventors developed novel methods for presenting applications and advertisements in an interactive service that would take advantage of the computing power of each user's PC and thereby reduce demand on host servers, such as those used by Prodigy. The inventors recognized that if applications were structured to be comprised of "objects" of data and program code capable of being processed by a user's PC, the Prodigy system would be more efficient than conventional systems. By harnessing the processing and storage capabilities of the user's PC, applications could then be composed on the fly from objects stored locally on the PC, reducing reliance on Prodigy's server and network resources.

23.   The service that would eventually be called Prodigy embodied inventions from the '849 patent when it launched in late 1988, before the existence of the World Wide Web. The efficiencies derived from the use of the patented technology permitted the implementation of one of the first graphical user interfaces for online services. The efficiencies also allowed Prodigy to quickly

grow its user base. By 1990, Prodigy had become one of the largest online service providers with hundreds of thousands of users. The technological innovations embodied in this patent persist to this day and are fundamental to the efficient communication of Internet content.

E.   IBM Invented Methods of Improving Contextual Searching Using Visual Workspaces.

24.   The inventors of the '193 patent developed the patented technology as part of IBM's efforts to improve graphical user interfaces ("GUIs") for customer self-service search and retrieval systems. Customer search and retrieval may include knowledge management systems, information portals, search engines, and data miners. Providing efficient and satisfactory search results using such systems requires that users provide relevant contextual information in conjunction with a search query. At the time of the invention, engineers attempted to solve this problem through the use of GUIs, which represented available applications and data sets via icons. However, these prior art GUIs failed to address the full range of relevant contextual variables for user queries, and also did not provide a graphical method for fine tuning the relevant context variables.

25.   The inventors of the '193 patent thus recognized a need to provide an improved GUI for customer search and retrieval functions to facilitate the efficient location of relevant resources in response to a query by enabling the expression of a user's context as part of the query and indicating the relevance of returned results in that context. The inventors of the '193 patent developed systems and methods of using user context attributes and graphical user interfaces to allow users to search for content and subsequently narrow the results based on user context to obtain increased specificity and accuracy in search results. The patented technology of the '193 patent provides for more efficient search and retrieval in part through a novel iconic graphical user interface that enables the expression of a user's context as part of the user query, which has the benefit of minimizing user time and resource intensive system processes. For example, the more efficient search processes of the '193

patent reduce the server processing steps required to provide relevant search results and thus allow the server to process search queries faster.

F.   IBM Invented Methods For A Runtime User Account Creation Operation Using A Single-Sign-On Process In A Federated Computer Environment.

26.   The inventors of the '346 patent developed the patented technology as part of IBM's efforts to improve single-sign-on technology. To access a protected resource at a service provider on the Internet, a user typically has to authenticate him or herself with the service provider. Single-sign-on technology facilitates a user's connection to resources by requiring only one authorization operation during a particular user session. However, conventional technology at the time of the invention required that the user already have an account with the service provider to use single-sign-on technology.

27.   The inventors of the '346 patent sought to develop single-sign-on technology that would permit a new user of a service provider to access protected resources. They developed novel methods for systems interacting within a federated computing environment to trigger a single-sign-on operation on behalf of a user that would obtain access to a protected resource and create an account for the user. The specification discloses how to structure a federated computing environment and the sequence and content of interactions between different systems that can support the patented methods. The '346 patent thus extends the benefits of single-sign-on technology.

G.   IBM Invented Methods For Improved Navigation Using Bookmarks For Movement Between File And Program Locations In A Computer Network Environment.

28.   The inventors of the '038 patent developed the patented technology as part of IBM's efforts to provide easy navigation between distributed resources in a computer environment. Prior to the '038 patent, to access a program or file on a computer system, a user typically had two options. The user could enter the name of the program or file into a menu, which typically required the user to remember the name of the file for the program or browse through a number of options.

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Alternatively, the user could manually search the computer system to find and select the desired program. To access a file within a particular program, the user would take the additional step of opening the file by accessing it using the associated program. Both of these conventional methods presented major drawbacks, especially as computer systems became more complex. A user would have to either remember or have a list of every file and program name in the computer system in order to locate and access any desired program or file.

29. The inventors of the '038 patent recognized a need for a more efficient method of navigating to different locations in one or more computer systems. The inventors therefore developed technology for enabling a user to select specialized bookmarks in a graphical user interface. The bookmarks could refer to one or more locations in the computer system and allow the user to instantly access files, programs, files within programs, views within programs, or other resources. Users could thus proceed directly to the desired location through the desired program in the desired computer system. Computer systems at the time of the invention were growing in storage space and processing power, and the inventions of the '038 patent helped address new demands to easily and efficiently access an ever-growing number of files, programs, interfaces, and computer systems.

H.   IBM Invented Methods For Improving Searching Using Real-Time Incorporation Of Contextual Information.

30. The inventors of the '676 patent developed the patented technology as part of IBM's efforts to improve search mechanisms for customer self-service search and retrieval systems. Customer self-service search and retrieval systems may include knowledge management systems, information portals, search engines, and data miners. Providing efficient and satisfactory search results using such systems could be improved by incorporating relevant contextual information about the user. At the time of the invention, conventional customer self-service search and retrieval systems required users to input their contextual information when conducting each search query. However,

these prior art search mechanisms failed to utilize the contextual information to rank search results and did not adapt or change these rankings over time, even as the user's contextual information changed.

31.   The inventors of the '676 patent recognized a need for an improved method of annotating and ranking search results in real-time using up-to-date contextual information about the user. The inventors of the '676 patent developed systems and methods of classifying a user's context—by using a search query and raw contextual information inputted by the user and comparing this information against both the interaction history of the user and data from a context attribute database—to generate a set of context parameters that are specific to the current context of the user. The technology of the '676 patent also provides for more efficient retrieval of search results through the use of an adaptive algorithm, which maps specific search results not only to the user's search query, but also to a user context vector containing the context parameters for the user. Moreover, the technology of the '676 patent comprises systems and methods for generating a more specific, accurate, and personalized set of search results using an ordering and annotation function which ranks the search results based on the user context, and is executed interactively, each time that a user inputs a new search query. The systems and methods of the '676 patent thus provide for a more efficient search and retrieval process, which greatly reduces the user time and resource intensive system processes required to provide relevant search results.

I.   IBM Invented Methods For Multi-Facet Classification Of Information Artifacts.

32.   The inventors of the '760 patent developed the patented technology as part of IBM's efforts to improve and streamline automatic categorization of images. Prior to the filing date of the '760 patent, the growth of the Internet and the improvement of computer technology led to a rapid increase in the volume of digital images used online. In order for users to be able to effectively search for and retrieve specific images, a classification system needed to accurately and efficiently

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categorize each image based on its content. Prior art methods classified digital images by ingesting each image and automatically categorizing it by labeling each feature displayed in the image. However, these methods led to less accurate and increasingly dated classification schemes, because they failed to continuously improve classifications based on the labels applied to each new image added to the database. Each added image introduces new information regarding the types of features that present in an image. By failing to adapt and account for such new information, the prior art methods failed to ensure that the categorization applied was relevant and current, leading to an outdated classification scheme.

33.   The inventors of the '760 patent recognized a need to develop a scheme that allows for the automatic classification of a large number of images while ensuring that the classification scheme stays up-to-date. The inventors therefore developed a system that iteratively refines the categorization scheme by taking into account the relationships between labels applied to the images already in the database in order to continuously develop and improve an understanding of what features tend to co-occur and what features are mutually exclusive. As an example, if images in the database that include a feature labeled as "underwater" often include a feature labeled as "blue," then the categorization scheme would be confident that images containing both an "underwater" label and a "blue" label are accurate. On the other hand, if images in the database never include both an "outside" label and an "inside" label, then the categorization scheme would never apply both labels to an image. By iteratively refining the categorization scheme, the inventors developed ways to ensure that images retrieved in response to a user request is as accurate as possible. The '760 patent thus helped address a need for an image classification scheme that continuously improves its accuracy throughout the categorization process.

J.   **Airbnb Has Built Its Business By Infringing IBM's Patents.**

34.   Airbnb connects consumers wishing to make reservations related to lodging, tourism,

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and other travel experiences with providers of those services. Airbnb has grown rapidly and now has billions of dollars of revenue per year.

35.   Rather than build its business on its own technologies, Airbnb has appropriated the inventions of the Patents-In-Suit.   Websites under Airbnb's control, including at least www.airbnb.com, use the technology claimed by the Patents-In-Suit to provide services related to lodging, tourism, and other travel experiences to users. Mobile applications under Airbnb's control, including at least mobile applications running on, for example, Apple iOS and Google Android operating systems, use the technology claimed by the Patents-In-Suit to provide services related to lodging, tourism, and other travel experiences to users.

36.   IBM has tried to work with Airbnb to negotiate a licensing agreement since May 2014.

37.   In May 2014, IBM first contacted Airbnb about a potential license agreement. In the following months, the parties discussed IBM's patent portfolio, including the '849 and '346 patents. In August 2014, IBM met with Airbnb to attempt to reach a license agreement without success.

38.   In the following year, IBM continued to attempt to engage with Airbnb. In May and June 2015, IBM informed Airbnb that it was infringing the '849 and '346 patents, among several other IBM patents.

39.   Over the next several years, IBM continued to attempt to resolve Airbnb's continued infringement without success. In March 2017, IBM provided Airbnb with detailed evidence showing how Airbnb infringed the '849 and '346 patents, among other IBM patents. Airbnb refused to engage in serious discussions to end Airbnb's unauthorized use of IBM's patents.

40.   In November 2019, IBM provided Airbnb with detailed evidence showing how it infringed additional patents, including the '193 and '038 patents. Airbnb continued to stonewall and delay rather than engaging in negotiations. In January 2020, IBM made yet another attempt to

negotiate a license to its patented technology with Airbnb, but Airbnb steadfastly refused to enter into a license agreement fairly compensating IBM for Airbnb's longstanding use of IBM's patented technology.

41.   In 2020, IBM discovered that Airbnb was infringing two more of IBM's patents, the '676 and '760 patents. Finally, on May 28, 2020, IBM sent Airbnb a letter with detailed evidence showing how it infringed these two additional patents. Airbnb has not responded to or even acknowledged IBM's letter.

42.   Since 2014, IBM has repeatedly attempted to engage with Airbnb. During this process, Airbnb has refused to engage in any meaningful discussions about reaching a license to end Airbnb's infringement of IBM's patents. Instead, Airbnb has continued to willfully infringe IBM's patents so as to obtain the significant benefits of IBM's innovations without paying any compensation to IBM.

43.   Because IBM's over five-year struggle to negotiate a license agreement that remedies Airbnb's unlawful conduct has failed, IBM has been forced to seek relief through litigation. Among other relief sought, IBM seeks royalties and damages on the billions of dollars in revenue that Airbnb has received based on its willful infringement of IBM's patented technology.

<u>COUNT ONE</u>

<u>INFRINGEMENT OF THE '849 PATENT</u>

44.   IBM incorporates by reference paragraphs 1-43.

45.   IBM is the owner of all right, title and interest in the '849 patent. The '849 patent was duly and properly issued by the USPTO on July 4, 2006. The '849 patent was duly assigned to IBM. A copy of the '849 patent is attached hereto as Exhibit A.

46.   In violation of 35 U.S.C. § 271(a), Airbnb has directly infringed one or more of the claims of the '849 patent by having made, designed, offered for sale, sold, provided, used, maintained,

and/or supported its websites (including www.airbnb.com) and its mobile applications (including the

Airbnb applications for mobile devices running on, for example, the Apple iOS and Google Android

operating systems).   Alternatively, Airbnb has contributed to the infringement of one or more of the

claims of the '849 patent in violation of 35 U.S.C. § 271(c) by selling, offering to sell, and/or

supplying components, materials, or apparatuses for use in practicing the patented methods of the

'849 patent by end users and consumers, as described below.   Alternatively, Airbnb has induced

others, including end users and customers, to infringe one or more of the claims of the '849 patent in

violation of 35 U.S.C. § 271(b), as described below.   Airbnb's infringement is continuing.

47.   For example, Airbnb directly infringes at least claim 1 of the '849 patent through

www.airbnb.com and the Airbnb mobile applications, at least by:

a.   presenting advertising obtained from a computer network (such as the

Internet), the network including a multiplicity of user reception systems (such as the

computers or mobile devices of Airbnb's customers) at which respective users can request

applications (such as Stays, Experiences, and Adventures), from the network, that include

interactive services (such as offering reservations), the respective reception systems

including a monitor (such as a computer monitor or mobile screen of an Airbnb customer's

computer or mobile device) at which at least the visual portion of the applications can be

presented as one or more screens of display, the method comprising the steps of:

b.   structuring applications (such as Stays, Experiences, and Adventures) so that

they may be presented, through the network, at a first portion (such as the portion of the

webpage in which the content for Stays, Experiences, and Adventures is presented) of one

or more screens of display; and

c.   structuring advertising (such as advertising for Stays) in a manner

compatible to that of the applications so that it may be presented, through the network, at

a second portion (such as the portion of the webpage in which the advertising for Stays is

presented) of one or more screens of display concurrently with applications (such as Stays,

Experiences, and Adventures), wherein structuring the advertising includes configuring the

advertising as objects (such as HTTP Responses containing png or jpeg files) that include

advertising data and;

> d.   selectively storing (such as by setting a cache control parameter) advertising

objects at a store (such as the browser cache) established at the reception system.

48.   Alternatively, to the extent the "structuring" step is performed by a third party (in

addition to and/or separate from Airbnb's performance), such as a browser or mobile operating

system, that performance is attributable to Airbnb at least because Airbnb has an agency or

contractual relationship with said third party, or Airbnb directs or controls the performance of said

third party. For example, Airbnb directs or controls the performance of the "structuring" steps by

browsers and mobile operating systems because it, for example, establishes the manner or timing of

the performance by, for example, designing and generating the HTML template and computer code

(such as JavaScript and JSON), which comprise www.airbnb.com and the Airbnb mobile

applications. That HTML template and computer code contains instructions that direct the browser

or mobile operating system to structure the Airbnb webpage or mobile applications in a particular

manner. For another example, Airbnb directs or controls the performance of the "structuring" steps

by browsers and mobile operating systems because it profits from such performance by, for example,

increasing use and user interactions by designing its website in a user-friendly manner. Airbnb has

the right to stop or limit infringement by, for example, redesigning the HTML and computer code of

www.airbnb.com and the Airbnb mobile applications to function in a non-infringing manner.

49.   Alternatively, to the extent that the "selectively storing" step is performed by a third party (in addition to and/or separate from Airbnb's performance), such as a browser or mobile operating system, that performance is attributable to Airbnb at least because Airbnb has an agency or contractual relationship with said third party, or Airbnb directs or controls the performance of said third party. For example, Airbnb directs or controls the performance of the "selectively storing" step by browsers and mobile operating systems because it, for example, conditions receipt of a benefit, such as reduced latency, on the performance of the claimed steps, and establishes the manner or timing of the performance by, for example, determining which image and other data is cached and for how long. For another example, Airbnb directs or controls the performance of the "selectively storing" step by browsers and mobile operating systems because it profits from such performance by, for example, increasing use and user interactions through reduced latency. Airbnb has the right to stop or limit infringement by, for example, determining that image and other data should not be cached.

50.   Alternatively, to the extent that the "selectively storing" step is performed by a third party (in addition to and/or separate from Airbnb's performance), such as a Content Delivery Network ("CDN") or other server, that performance is attributable to Airbnb at least because Airbnb has an agency or contractual relationship with said third party, or Airbnb directs or controls the performance of said third party. For example, Airbnb directs or controls the performance of the "selectively storing" step by CDNs because it, for example, conditions receipt of a benefit, such as payment for services, on the performance of the claimed steps, and establishes the manner or timing of the performance by, for example, determining which image and other data is cached and for how long. For another example, Airbnb directs or controls the performance of the "selectively storing" step by browsers and mobile operating systems because it profits from the performance by, for example,

increasing use and user interactions through reduced latency. Airbnb has the right to stop or limit infringement by, for example, determining that image and other data should not be cached.

51.   Airbnb has had knowledge of the '849 patent and its alleged direct and indirect infringement since March 30, 2015, based on communications with IBM.

52.   Airbnb also indirectly infringes one or more claims of the '849 patent through its websites (including www.airbnb.com) and the Airbnb mobile applications (including the Airbnb applications for mobile devices running on, for example, the Apple iOS and Google Android operating systems). On information and belief, in certain circumstances, client devices and software (e.g., devices and software used by end users and customers of Airbnb's website and the associated mobile applications) directly infringe the '849 patent through the use of the website and mobile applications. In particular, to the extent Airbnb does not perform the method steps, in certain circumstances, client devices and software (e.g., devices and software used by end users, customers, and potential customers of Airbnb's website and the associate mobile applications) perform at least the method of presenting advertising recited by claim 1 of the '849 patent.

53.   On information and belief, despite knowledge of the infringement of the '849 patent, Airbnb intended and continues to intend to contribute to patent infringement by third parties by selling, offering to sell, and/or supplying components, materials, or apparatuses for use in practicing the patented methods of the '849 patent by end users and consumers, as described in this section.

54.   For example, Airbnb provides computer code (such as HTML, JavaScript, JSON, and image files) underlying the Airbnb website and mobile applications that is sent to customers and end users for use in infringing the '849 patent, and such computer code does not have substantial non-infringing uses. Such computer code is especially made and/or especially adapted for use in infringing the '849 patent and is not a staple article or commodity of commerce suitable for substantial

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non-infringing use. The only substantial use of such computer code is for the claimed subject matter involving presenting applications along with advertising as described in the '849 patent.

55.   Further, as a part of providing said computer code, Airbnb enters into binding contracts with end users and customers to use Airbnb's website and mobile applications, including in an infringing manner, including by binding the users to a terms of service governing access to and use of the accused website and mobile applications.

56.   Airbnb receives valuable consideration from customers and end users located in this judicial district, including information provided by customers and end users, information automatically collected from customers and end users, and monetary consideration from customers and end users who purchase lodging and other travel services through Airbnb's website and mobile applications. When customers and end users in this judicial district use the accused website and/or mobile applications, Airbnb collects information about the customers and end users, their devices, and their interaction with the accused website and the associated mobile applications. Airbnb works with service providers and advertising networks to track and manage cookie information and activities of customers and end users across different websites and devices. Third parties use cookie information collected by Airbnb to deliver advertisements to end users and customers based on their use of the accused website and mobile applications. Airbnb's business is funded through advertising. The applications and website are especially made and/or especially adapted for use in infringing the Patents-In-Suit, at least as detailed above, and are not a staple article or commodity of commerce suitable for substantial non-infringing uses because, among other things, the components sent to users are uniquely designed only to access the infringing aspects of Airbnb's website and mobile applications.

57.   On information and belief, despite its knowledge of the infringement of the '849

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patent, Airbnb has intended and continues to intend to induce patent infringement by third parties, including at least the direct infringement by end users and customers, as described in this section. Airbnb has and continues to encourage and instruct customers and end users to use Airbnb's website and the associated mobile applications in a manner that infringes the '849 patent by advertising the website and mobile applications, providing customer support, and designing its website and mobile applications in such a way that the use of the website and mobile applications by an end user or customer infringes the '849 patent.

58.   On information and belief, to the extent Airbnb was not aware that it was encouraging its customers and end users to infringe the '849 patent, its lack of knowledge was based on being willfully blind to the possibility that its acts would cause infringement.

59.   IBM has been damaged by the infringement of its '849 patent by Airbnb and will continue to be damaged by such infringement. IBM is entitled to recover from Airbnb the damages sustained by IBM as a result of Airbnb's wrongful acts.

60.   The continued infringement by Airbnb of the '849 patent is deliberate and willful, entitling IBM to increased damages under 35 U.S.C. § 284 and to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

61.   IBM has suffered and continues to suffer irreparable harm, for which there is no adequate remedy at law, and will continue to do so unless Airbnb is enjoined therefrom by this Court.

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COUNT TWO

INFRINGEMENT OF THE '193 PATENT

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62.   IBM incorporates by reference paragraphs 1-61.

63.   IBM is the owner of all right, title and interest in the '193 patent. The '193 patent was duly and properly issued by the USPTO on August 17, 2004. The '193 patent was duly assigned to IBM. A copy of the '193 patent is attached hereto as Exhibit B.

64.   In violation of 35 U.S.C. § 271(a), Airbnb has directly infringed one or more of the claims of the '193 patent by having made, designed, offered for sale, sold, provided, used, maintained, and/or supported its websites (including www.airbnb.com) and its mobile applications (including the Airbnb applications for mobile devices running on, for example, the Apple iOS and Google Android operating systems). Alternatively, Airbnb has contributed to the infringement of one or more of the claims of the '193 patent in violation of 35 U.S.C. § 271(c) by selling, offering to sell, and/or supplying components, materials, or apparatuses for use in practicing the patented methods of the '193 patent by end users and consumers, as described below. Alternatively, Airbnb has induced others, including end users and customers, to infringe one or more of the claims of the '193 patent in violation of 35 U.S.C. § 271(b), as described below. Airbnb's infringement is continuing.

65.   For example, Airbnb directly infringes at least claim 1 of the '193 patent through www.airbnb.com and the Airbnb mobile applications at least by:

    a.   Providing a graphical user interface (such as an Airbnb GUI) for a customer self service system (such as the Airbnb website) that performs resource search and selection (such as allowing travelers to select and search "Places to Stay" and "Things to Do") comprising:

    b.   a first visual workspace (such as the initial Airbnb search/query screen) comprising entry field enabling entry of a query for a resource (such as the query fields on the initial Airbnb search/query screen) and, one or more selectable graphical user context elements (such as the search options in the Airbnb search/query screen), each element representing a context associated with the current user state and having context attributes (such as the number and type of guests and options for Stays, Experiences, and Adventures) and attribute values (such as the values associated with the aforementioned context

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attributes) associated therewith;

      c.   a second visual workspace for visualizing (such as the Airbnb search results page) the set of resources that the customer self service system has determined to match the user's query (such as each search result displayed on the search results page), said system indicating a degree of fit of said determined resources with said query (such as the sort order of the search results displayed on the search results page);

      d.   a third visual workspace (such as the "More filters" window accessed from the Airbnb search results screen) for enabling said user to select and modify context attribute values to enable increased specificity and accuracy of a query's search parameters (such as the dropdown fields that appear on selection), said third visual workspace further enabling said user to specify resource selection parameters and relevant resource evaluation criteria (such as checkboxes for "Superhost" and "Amenities") utilized by a search mechanism in said system (such as the search button in the "More filters" window), said degree of fit indication based on said user's context, and said associated resource selection parameters and relevant resource evaluation criteria (such as the sort order of the search results displayed on the search results page); and,

      e.   a mechanism enabling said user to navigate among said first, second and third visual workspaces to thereby identify and improve selection logic and response sets fitted to said query (such as the search button on the initial Airbnb search/query screen and/or the "More filters" link in the Airbnb search results screen).

66.   Airbnb has had knowledge of the '193 patent and its alleged direct and indirect infringement since November 2019 based on communications with IBM.

67.   Airbnb also indirectly infringes one or more claims of the '193 patent through its

websites (including www.airbnb.com) and the Airbnb mobile applications (including the Airbnb applications for mobile devices running on, for example, the Apple iOS and Google Android operating systems). On information and belief, in certain circumstances, client devices and software (e.g., devices and software used by end users and customers of Airbnb's website and the associated mobile applications) directly infringe the '193 patent through the use of the website and mobile applications.

68.   On information and belief, despite knowledge of the infringement of the '193 patent, Airbnb intended and continues to intend to contribute to patent infringement by third parties by selling, offering to sell, and/or supplying components, materials, or apparatuses for use in practicing the patented methods of the '193 patent by end users and consumers, as described in this section.

69.   For example Airbnb provides computer code (such as HTML, JavaScript, JSON, and image files) underlying the Airbnb website and mobile applications that are sent to users to customers and end users for use in infringing the '193 patent, and such computer code does not have substantial non-infringing uses. Such computer code is especially made and/or especially adapted for use in infringing the '193 patent and is not a staple article or commodity of commerce suitable for substantial non-infringing use. The only substantial use of such computer code is for the claimed subject matter involving a search GUI comprising the visual workspaces claimed by the '193 patent.

70.   Further, as a part of providing said computer code, Airbnb enters into binding contracts with end users and customers to use Airbnb's website and mobile applications, including in an infringing manner, including by binding the users to a terms of service governing access to and use of the accused website and mobile applications.

71.   Airbnb receives valuable consideration from customers and end users located in this judicial district, including information provided by customers and end users, information

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automatically collected from customers and end users, and monetary consideration from customers and end users who purchase lodging and other travel services through Airbnb's website and mobile applications. When customers and end users in this judicial district use the accused website and/or mobile applications, Airbnb collects information about the customers and end users, their devices, and their interaction with the accused website and the associated mobile applications. Airbnb works with service providers and advertising networks to track and manage cookie information and activities of customers and end users across different websites and devices. Third parties use cookie information collected by Airbnb to deliver advertisements to end users and customers based on their use of the accused website and mobile applications. Airbnb's business is funded through advertising. The applications and website are especially made and/or especially adapted for use in infringing the Patents-In-Suit, at least as detailed in the individual Counts above, and are not a staple article or commodity of commerce suitable for substantial non-infringing uses because, among other things, the components sent to users are uniquely designed only to access the infringing aspects of Airbnb's website and mobile applications.

72.   On information and belief, despite its knowledge of the infringement of the '193 patent, Airbnb has intended and continues to intend to induce patent infringement by third parties, including at least the direct infringement by end users and customers, as described in this section. Airbnb has and continues to encourage and instruct customers and end users to use Airbnb's website and the associated mobile applications in a manner that infringes the '193 patent by advertising the website and mobile applications, providing customer support, and designing its website and mobile applications in such a way that the use of the website and mobile applications by an end user or customer infringes the '193 patent.

73.   On information and belief, to the extent Airbnb was not aware that it was encouraging

its customers and end users to infringe the '193 patent, its lack of knowledge was based on being willfully blind to the possibility that its acts would cause infringement.

74.   IBM has been damaged by the infringement of its '193 patent by Airbnb. IBM is entitled to recover from Airbnb the damages sustained by IBM as a result of Airbnb's wrongful acts.

75.   The infringement by Airbnb of the '193 patent was deliberate and willful, entitling IBM to increased damages under 35 U.S.C. § 284 and to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

76.   IBM has suffered and continues to suffer irreparable harm, for which there is no adequate remedy at law, and will continue to do so unless Airbnb is enjoined therefrom by this Court.

COUNT THREE

INFRINGEMENT OF THE '346 PATENT

77.   IBM incorporates by reference paragraphs 1-76.

78.   IBM is the owner of all right, title and interest in the '346 patent. The '346 patent was duly and properly issued by the USPTO on December 8, 2009. The '346 patent was duly assigned to IBM. A copy of the '346 patent is attached hereto as Exhibit C.

79.   In violation of 35 U.S.C. § 271(a), Airbnb has directly infringed one or more of the claims of the '346 patent by having made, designed, offered for sale, sold, provided, used, maintained, and/or supported its websites (including www.airbnb.com) and its mobile applications (including the Airbnb applications for mobile devices running on, for example, the Apple iOS and Google Android operating systems).   Airbnb's infringement is continuing.

80.   For example, Airbnb directly infringes at least claim 1 of the '346 patent through www.airbnb.com and the Airbnb mobile applications at least by:

a.   managing user authentication (such as verifying the identity of an Airbnb user) within a distributed data processing system (such as a computer network), wherein a

first system (such as Facebook and its network) and a second system (such as Airbnb and its network) interact within a federated computing environment (such as a computer network; for example, the Internet, including Facebook and Airbnb) and support single-sign-on operations ("Sign in" operations) in order to provide access to protected resources (such as the "Trips" option), at least one of the first system and the second system comprising a processor, the method comprising;

b.   triggering a single-sign-on operation (such as launching an operation to "Sign up" using Facebook) on behalf of the user in order to obtain access to a protected resource that is hosted by the second system, wherein the second system requires a user account for the user to complete the single-sign-on operation (such as requiring the user to have an Airbnb account) prior to providing access to the protected resource;

c.   receiving from the first system at the second system an identifier associated with the user (such as an email address, Facebook ID, name, or access token);

d.   creating a user account (such as an Airbnb account) for the user at the second system based at least in part on the received identifier associated with the user after triggering the single-sign-on operation but before generating at the second system a response for accessing the protected resource (such as the "Trips" option), wherein the created user account supports single-sign-on operations (such as future Airbnb single-sign-on operations) between the first system and the second system on behalf of the user;

81.   Alternatively, to the extent the "triggering" step is performed by a third party (in addition to and/or separate from Airbnb's performance), such as a user, browser, or mobile operating system, that performance is attributable to Airbnb at least because Airbnb has an agency or contractual relationship with said third party, or Airbnb controls or directs the performance of said

third party. For example, Airbnb controls or directs the performance of the "triggering" step by users, browsers, and mobile operating systems because it, for example, conditions receipt of a benefit, such as access to certain applications on Airbnb's website and mobile applications, on the performance of the claimed steps, and establishes the manner or timing of the performance by, for example, triggering the single-sign-on operation using its underlying computer code. For another example, Airbnb controls or directs the performance of the "triggering" step by users, browsers, and mobile operating systems because it profits from the performance by, for example, increasing the number of signed-in users accessing Airbnb's website and mobile applications. Airbnb has the right to stop or limit infringement, by, for example, not enabling the use of single-sign-on operations.

82.   Airbnb has had knowledge of the '346 patent and its alleged direct infringement since March 30, 2015, based on communications with IBM.

83.   IBM has been damaged by the infringement of its '346 patent by Airbnb and will continue to be damaged by such infringement. IBM is entitled to recover from Airbnb the damages sustained by IBM as a result of Airbnb's wrongful acts.

84.   The continued infringement by Airbnb of the '346 patent is deliberate and willful, entitling IBM to increased damages under 35 U.S.C. § 284 and to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

85.   IBM has suffered and continues to suffer irreparable harm, for which there is no adequate remedy at law, and will continue to do so unless Airbnb is enjoined therefrom by this Court.

COUNT FOUR

INFRINGEMENT OF THE '038 PATENT

86.   IBM incorporates by reference paragraphs 1-85.

87.   IBM is the owner of all right, title and interest in the '038 patent. The '038 patent was duly and properly issued by the USPTO on November 15, 2005. The '038 patent was duly assigned

to IBM. A copy of the '038 patent is attached hereto as Exhibit D.

88.   In violation of 35 U.S.C. § 271(a), Airbnb has directly infringed one or more of the claims of the '038 patent by having made, designed, offered for sale, sold, provided, used, maintained, and/or supported its websites (including www.airbnb.com) and its mobile applications (including the Airbnb applications for mobile devices running on, for example, the Apple iOS and Google Android operating systems). Alternatively, Airbnb has contributed to the infringement of the claims of the '038 patent in violation of 35 U.S.C. § 271(c) by selling, offering to sell, and/or supplying components, materials, or apparatuses for use in practicing the patented methods of the '038 patent by end users and consumers, as described below. Alternatively, Airbnb has induced others, including end users and customers, to infringe one or more of the claims of the '038 patent in violation of 35 U.S.C. § 271(b), as described below. Airbnb's infringement is continuing.

89.   For example, Airbnb directly infringes at least claim 7 of the '038 patent through www.airbnb.com and Airbnb mobile applications at least by:

        a.   enabling a user to navigate within a computer system (such as servers supported by Airbnb and/or its content delivery networks) through the use of bookmarks (such as deep links) comprising the steps of:

        b.   presenting one or more bookmarks (such as deep links) in a graphical user interface (such as the Airbnb computer interface presented to a user), the one or more bookmarks corresponding to at least one link to any location within the computer system (such as a particular resource location at servers supported by Airbnb and/or its content delivery networks);

        c.   enabling the user to select one or more bookmarks (such as deep links) corresponding to one or more programs (such as programs supporting Airbnb's website

and mobile applications) and one or more views within the programs,

> d.   wherein the bookmarks (such as deep links) are presented in the graphical user interface (such as the Airbnb computer interface presented to a user); and responding to the bookmark selection (such as selection of a deep link) means to resolve the link and present information to which the link refers (such as by accessing and presenting information at the resource location specified by a deep link), wherein the link is capable of referring to a Uniform Resource Locator and is also capable of referring to other location identifying information within the computer system.

90.   Alternatively, to the extent the "presenting" step is performed by a third party (in addition to and/or separate from Airbnb's performance), such as a user, browser, or mobile operating system, that performance is attributable to Airbnb at least because Airbnb has an agency or contractual relationship with said third party, or Airbnb controls or directs the performance of said third party. For example, Airbnb controls or directs the performance of the "presenting" step by users, browsers, and mobile operating systems because it, for example, conditions receipt of a benefit, such as direct access to certain listings or pages on Airbnb's website and mobile applications through the use of a bookmark, on the performance of the claimed steps, and establishes the manner or timing of the performance by, for example, presenting these particular bookmarks using its underlying computer code. For another example, Airbnb controls or directs the performance of the "presenting" step by users, browsers, and mobile operating systems because it profits from the performance by, for example, increasing the ease of access and the number of users accessing Airbnb's website and mobile applications and specifically accessing a particular listing. Airbnb has the right to stop or limit infringement by, for example, not enabling the use of bookmarks such as deep links.

91.   Airbnb has had knowledge of the '038 patent and its alleged direct and indirect

infringement since November 2019 based on communications with IBM.

92.   Airbnb also indirectly infringes one or more claims of the '038 patent through its websites (including www.airbnb.com) and the Airbnb mobile applications (including the Airbnb applications for mobile devices running on, for example, the Apple iOS and Google Android operating systems). On information and belief, in certain circumstances, client devices and software (e.g., devices and software used by end users and customers of Airbnb's website and the associated mobile applications) directly infringe the '038 patent through the use of the website, mobile applications, and bookmarks, such as deep links. In particular, to the extent Airbnb does not perform the method steps, in certain circumstances, client devices and software (e.g., devices and software used by end users, customers, and potential customers of Airbnb's website and the associate mobile applications) perform at least the method of presenting one or more bookmarks recited by claim 7 of the '038 patent.

93.   On information and belief, despite knowledge of the infringement of the '038 patent, Airbnb intended and continues to intend to contribute to patent infringement by third parties by selling, offering to sell, and/or supplying components, materials, or apparatuses for use in practicing the patented methods of the '038 patent by end users and consumers, as described in this section.

94.   For example, Airbnb provides computer code (such as HTML, JavaScript, JSON, and image files) underlying the Airbnb website and mobile applications that is sent to customers and end users for use in infringing the '038 patent, and such computer code does not have substantial non-infringing uses. Such computer code is especially made and/or especially adapted for use in infringing the '038 patent and is not a staple article or commodity of commerce suitable for substantial non-infringing use. The only substantial use of such computer code is for the claimed subject matter involving navigation within a computer system through the use of bookmarks as described in the '038

patent.

95.   Further, as a part of providing said computer code, Airbnb enters into binding contracts with end users and customers to use Airbnb's website and mobile applications, including in an infringing manner, including by binding the users to a terms of service governing access to and use of the accused website and mobile applications.

96.   Airbnb receives valuable consideration from customers and end users located in this judicial district, including information provided by customers and end users, information automatically collected from customers and end users, and monetary consideration from customers and end users who purchase lodging and other travel services through Airbnb's website and mobile applications. When customers and end users in this judicial district use the accused website and/or mobile applications, Airbnb collects information about the customers and end users, their devices, and their interaction with the accused website and the associated mobile applications. Airbnb works with service providers and advertising networks to track and manage cookie information and activities of customers and end users across different websites and devices. Third parties use cookie information collected by Airbnb to deliver advertisements to end users and customers based on their use of the accused website and mobile applications. Airbnb's business is funded through advertising. The applications and website are especially made and/or especially adapted for use in infringing the Patents-In-Suit, at least as detailed in the individual Counts above, and are not a staple article or commodity of commerce suitable for substantial non-infringing uses because, among other things, the components sent to users are uniquely designed only to access the infringing aspects of Airbnb's website and mobile applications.

97.   On information and belief, despite its knowledge of the infringement of the '038 patent, Airbnb has intended and continues to intend to induce patent infringement by third parties,

including at least the direct infringement by end users and customers, as described in this section. Airbnb has and continues to encourage and instruct customers and end users to use Airbnb's website and the associated mobile applications in a manner that infringes the '038 patent by advertising the website and mobile applications, providing customer support, and designing its website and mobile applications in such a way that the use of the website and mobile applications by an end user or customer infringes the '038 patent.

98.   On information and belief, to the extent Airbnb was not aware that it was encouraging its customers and end users to infringe the '038 patent, its lack of knowledge was based on being willfully blind to the possibility that its acts would cause infringement.

99.   IBM has been damaged by the infringement of its '038 patent by Airbnb and will continue to be damaged by such infringement. IBM is entitled to recover from Airbnb the damages sustained by IBM as a result of Airbnb's wrongful acts.

100.   The continued infringement by Airbnb of the '038 patent is deliberate and willful, entitling IBM to increased damages under 35 U.S.C. § 284 and to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

101.   IBM has suffered and continues to suffer irreparable harm, for which there is no adequate remedy at law, and will continue to do so unless Airbnb is enjoined therefrom by this Court.

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COUNT FIVE

INFRINGEMENT OF THE '676 PATENT

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102.   IBM incorporates by reference paragraphs 1-101 above.

103.   IBM is the owner of all right, title and interest in the '676 patent. The '676 patent was duly and properly issued by the USPTO on August 31, 2004. The '676 patent was duly assigned to IBM. A copy of the '676 patent is attached hereto as Exhibit E.

104.   In violation of 35 U.S.C. § 271(a), Airbnb has directly infringed one or more of the

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claims of the '676 patent by having made, designed, offered for sale, sold, provided, used, maintained, and/or supported its websites (including www.airbnb.com) and its mobile applications (including the Airbnb applications for mobile devices running on, for example, the Apple iOS and Google Android operating systems). Alternatively, Airbnb has contributed to the infringement of the claims of the '676 patent in violation of 35 U.S.C. § 271(c) by selling, offering to sell, and/or supplying components, materials or apparatuses for use in practicing the patented methods of the '676 patent by end users and consumers, as described in this section. Alternatively, Airbnb has induced others, including end users and customers, to infringe one or more of the claims of the '676 patent in violation of 35 U.S.C. § 271(b), as described below. Airbnb's infringement is continuing.

105.   For example, Airbnb directly infringes at least claim 14 of the '676 patent through www.airbnb.com and the Airbnb mobile applications, at least by:

a.   receiving a resource response set of results (such as search result listings for the Similar Listings Carousel) obtained in response to a current user query (such as a search for listings submitted by a user);

b.   receiving a user context vector (such as a set of data associated with a specific user) associated with said current user query (such as the user's current search on Airbnb's website or mobile application), said user context vector comprising data associating an interaction state with said user (such as a short-term history set of a user, including the listing_type embeddings associated with a user) and including context that is a function of the user (such as data classifying the user, including the user_type embeddings associated with a user);

c.   applying an ordering and annotation function for mapping the user context vector with the resource response set (such as executing a function to order and annotate a

set of listings, including by calculating the cosine similarity between the listing_type and user_type embeddings) to generate an annotated response set having one or more annotations (such as a JSON array comprising the ordered set of listings to be included in the Similar Listings Carousel); and,

d.   controlling the presentation of the resource response set to the user according to said annotations (such as presenting the Similar Listings Carousel on the Airbnb website or mobile application), wherein the ordering and annotation function is executed interactively at the time of each user query (such as Airbnb executing the algorithm whenever a user selects a listing).

106.   Airbnb has had knowledge of the '676 patent and its alleged direct and indirect infringement since May 28, 2020, based on communications with IBM.

107.   Airbnb also indirectly infringes one or more claims of the '676 patent through its websites (including www.airbnb.com) and its mobile applications (including the Airbnb applications for mobile devices running on, for example, the Apple iOS and Google Android operating systems). On information and belief, in certain circumstances, client devices and software (e.g., devices and software used by end users and customers of Airbnb's website and the associated mobile applications) directly infringe the '676 patent through the use of the website and mobile applications. In particular, to the extent Airbnb does not perform the method steps, in certain circumstances, client devices and software (e.g., devices and software used by end users, customers, and potential customers of Airbnb's website and the associate mobile applications) perform at least the method of annotating resource results recited by claim 14 of the '676 patent.

108.   On information and belief, despite knowledge of the infringement of the '676 patent, Airbnb has intended and continue to intend to contribute to patent infringement by third parties by

selling, offering to sell, and/or supplying components, materials, or apparatuses for use in practicing the patented methods of the '676 patent by end users and consumers, as described in this section.

109.   For example, Airbnb provides computer code (such as HTML, JavaScript, and image files) underlying the Airbnb website and mobile applications to customers and end users for use in infringing the '676 patent, and such computer code does not have substantial non-infringing uses. Such computer code is especially made and/or especially adapted for use in infringing the '676 patent and is not a staple article or commodity of commerce suitable for substantial non-infringing use. The only substantial use of Airbnb's computer code responses is for the claimed subject matter involving annotating resource results obtained in a customer self-service system that performs resource search and selection as described in the '676 patent.

110.   Further, as a part of providing said computer code, Airbnb enters into binding contracts with end users and customers to use Airbnb's website and mobile applications, including in an infringing manner, including by binding the users to a terms of service governing access to and use of the accused website and mobile applications.

111.   Airbnb receives valuable consideration from customers and end users located in this judicial district, including information provided by customers and end users, information automatically collected from customers and end users, and monetary consideration from customers and end users who purchase lodging and other travel services through Airbnb's website and mobile applications. When customers and end users in this judicial district use the accused website and/or mobile applications, Airbnb collects information about the customers and end users, their devices, and their interaction with the accused website and the associated mobile applications. Airbnb works with service providers and advertising networks to track and manage cookie information and activities of customers and end users across different websites and devices. Third parties use cookie

information collected by Airbnb to deliver advertisements to end users and customers based on their use of the accused website and mobile applications. Airbnb's business is funded through advertising. The applications and website are especially made and/or especially adapted for use in infringing the Patents-In-Suit, at least as detailed above, and are not a staple article or commodity of commerce suitable for substantial non-infringing uses because, among other things, the components sent to users are uniquely designed only to access the infringing aspects of Airbnb's website and mobile applications.

112.   On information and belief, despite its knowledge of the infringement of the '676 patent, Airbnb has intended and continues to intend to induce patent infringement by third parties, including at least the direct infringement by end users and customers, as described in this section. Airbnb has and continues to encourage and instruct customers and end users to use Airbnb's website and the associated mobile applications in a manner that infringes the '676 patent by advertising the website and mobile applications, providing customer support, and designing its website and mobile applications in such a way that the use of the website and mobile applications by an end user or customer infringes the '676 patent.

113.   On information and belief, to the extent Airbnb was not aware that it was encouraging its customers and end users to infringe the '676 patent, its lack of knowledge was based on being willfully blind to the possibility that its acts would cause infringement.

114.   IBM has been damaged by the infringement of its '676 patent by Airbnb and will continue to be damaged by such infringement. IBM is entitled to recover from Airbnb the damages sustained by IBM as a result of Airbnb's wrongful acts.

115.   The continued infringement by Airbnb of the '676 patent is deliberate and willful, entitling IBM to increased damages under 35 U.S.C. § 284 and to attorney fees and costs incurred in

prosecuting this action under 35 U.S.C. § 285.

116.   IBM has suffered and continues to suffer irreparable harm, for which there is no adequate remedy at law, and will continue to do so unless Airbnb is enjoined therefrom by this Court.

COUNT SIX

INFRINGEMENT OF THE '760 PATENT

117.   IBM incorporates by reference paragraphs 1-116 above.

118.   IBM is the owner of all right, title and interest in the '760 patent. The '760 patent was duly and properly issued by the USPTO on July 18, 2017. The '760 patent was duly assigned to IBM. A copy of the '760 patent is attached hereto as Exhibit F.

119.   In violation of 35 U.S.C. § 271(a), Airbnb has directly infringed one or more of the claims of the '760 patent by having made, designed, offered for sale, sold, provided, used, maintained, and/or supported its websites (including www.airbnb.com) and its mobile applications (including the Airbnb applications for mobile devices running on, for example, the Apple iOS and Google Android operating systems).   Airbnb's infringement is continuing.

120.   For example, Airbnb directly infringes at least claim 1 of the '760 patent through www.airbnb.com and Airbnb mobile applications at least by:

   a.   constructing a hierarchical multi-faceted classification structure (such as Airbnb's image classification model) comprising;

   b.   classifying a plurality of visual categories (such as room types and amenities) into a multi-relational reference ontology that accounts for a plurality of different types of relationships, the multi-relational reference ontology including a plurality of faceted nodes of visual categories that can co-occur in an image (such as amenities including pillows, beds, towels, etc.) and a plurality of regular nodes of visual categories that are mutually exclusive in the image (such as room types including bedrooms, kitchens, swimming pools,

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etc.);

c.   determining a plurality of content-based tags (such as labels for the amenities and room types) for one or more media artifacts (such as images), wherein each content-based tag of the plurality of content-based tags is determined based on a confidence score using the plurality of visual categories (such as an accuracy confidence score calculated using an algorithm);

d.   for a set of conflicting content-based tags from the plurality of content-based tags, removing all but one conflicting content-based tag from visual categories that are mutually exclusive (such as room types) for each of the one or more media artifacts;

e.   storing the multi-relational reference ontology, remaining content-based tags of the plurality of content-based tags, and the one or more media artifacts with relationships as a hierarchical multi-faceted classification structure in computer-readable memory storage (such as Airbnb's back-end servers); and

f.   retrieving at least one media artifact from the one or more media artifacts (such as images) by at least one content-based tagging application (such as an application running Airbnb's website and mobile applications) using the multi-relational reference ontology and the remaining content-based tags.

121.   Alternatively, to the extent the "retrieving" step is performed by a third party (in addition to and/or separate from Airbnb's performance), such as a user, browser, or mobile operating system, that performance is attributable to Airbnb at least because Airbnb has an agency or contractual relationship with said third party, or Airbnb controls or directs the performance of said third party. For example, Airbnb controls or directs the performance of the "retrieving" step by users, browsers, and mobile operating systems because it, for example, conditions receipt of a benefit (such

as a home tour or search request results) on Airbnb's website and mobile applications on the performance of the claimed steps and it establishes the manner or timing of the performance by, for example, sending the images to the user, browser, or mobile operating system in response to receiving a request. For another example, Airbnb controls or directs the performance of the "retrieving" step by users, browsers, and mobile operating systems because it profits from such performance by, for example, increasing the number of users accessing listings on Airbnb's website and mobile applications. Airbnb has the right to stop or limit infringement, by, for example, not enabling the user access to these listings.

122. Airbnb has had knowledge of the '760 patent and its alleged direct infringement since May 28, 2020, based on communications with IBM.

123. IBM has been damaged by the infringement of its '760 patent by Airbnb and will continue to be damaged by such infringement. IBM is entitled to recover from Airbnb the damages sustained by IBM as a result of Airbnb's wrongful acts.

124. The continued infringement by Airbnb of the '760 patent is deliberate and willful, entitling IBM to increased damages under 35 U.S.C. § 284 and to attorney fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

125. IBM has suffered and continues to suffer irreparable harm, for which there is no adequate remedy at law, and will continue to do so unless Airbnb is enjoined therefrom by this Court.

RELIEF REQUESTED

Wherefore, IBM respectfully requests that this Court enter judgment against Airbnb as follows:

    A.   That the '849 patent has been and continues to be infringed by Airbnb;

    B.   That Airbnb's infringement of the '849 patent has been and continues to be willful;

    C.   An injunction against further infringement of the '849 patent;

D.   That the '193 patent has been infringed by Airbnb;

E.   That Airbnb's infringement of the '193 patent has been and continues to be willful;

F.   An injunction against further infringement of the '193 patent;

G.   That the '346 patent has been and continues to be infringed by Airbnb;

H.   That Airbnb's infringement of the '346 patent has been and continues to be willful;

I.   An injunction against further infringement of the '346 patent;

J.   That the '038 patent has been and continues to be infringed by Airbnb;

K.   That Airbnb's infringement of the '038 patent has been and continues to be willful;

L.   An injunction against further infringement of the '038 patent;

M.   That the '676 patent has been and continues to be infringed by Airbnb;

N.   That Airbnb's infringement of the '676 patent has been and continues to be willful;

O.   An injunction against further infringement of the '676 patent;

P.   That the '760 patent has been and continues to be infringed by Airbnb;

Q.   That Airbnb's infringement of the '760 patent has been and continues to be willful;

R.   An injunction against further infringement of the '760 patent;

S.   An award of damages adequate to compensate IBM for the patent infringement that has occurred, together with pre-judgment interest and costs;

T.   An award of all other damages permitted by 35 U.S.C. § 284, including increased damages up to three times the amount of compensatory damages found;

U.   That this is an exceptional case and an award to IBM of its costs and reasonable attorneys' fees incurred in this action as provided by 35 U.S.C. § 285; and

V.   Such other relief as this Court deems just and proper.

DEMAND FOR JURY TRIAL

IBM hereby demands trial by jury on all claims and issues so triable.

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                                              /s/ Karen E. Keller
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