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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN JOSE DIVISION

IN RE PERSONALWEB TECHNOLOGIES, LLC, ET AL., PATENT LITIGATION

CASE NO.: 5:18-md-02834-BLF

FIRST AMENDED COMPLAINT

DEMAND FOR JURY TRIAL

PERSONALWEB TECHNOLOGIES, LLC, a Texas limited liability company, and LEVEL 3 COMMUNICATIONS, LLC, a Delaware limited liability company,

Plaintiffs,

v.

SHOPIFY, INC., a Canadian corporation, and SHOPIFY (USA) INC., a Delaware corporation,

Defendant.

Case No.: 5:18-cv-04626-BLF

Plaintiff PersonalWeb Technologies, LLC ("Plaintiff" or "PersonalWeb") files this First Amended Complaint ("Complaint") for patent infringement against Defendant Shopify, Inc. and Shopify (USA) Inc. (collectively, "Defendant"). Plaintiff PersonalWeb Technologies, LLC alleges:

PRELIMINARY STATEMENT

1. PersonalWeb and Level 3 Communications, LLC ("Level 3") are parties to an agreement between Kinetech, Inc. and Digital Island, Inc. dated September 1, 2000 (the "Agreement"). Pursuant to the Agreement, PersonalWeb and Level 3 each own a fifty percent (50%) undivided interest in and to the patents at issue in this action: U.S. Patent Nos. 6,928,442, 7,802,310, 7,945,544, and 8,099,420 ("Patents-in-Suit"). Level 3 has joined in this Complaint pursuant to its contractual obligations under the Agreement, at the request of PersonalWeb.

2. Pursuant to the Agreement, Level 3 has, among other rights, certain defined rights to use, practice, license, sublicense and enforce and/or litigate the Patents-in-Suit in connection with a particular field of use ("Level 3 Exclusive Field"). Pursuant to the Agreement PersonalWeb has, among other rights, certain defined rights to use, practice, license, sublicense, enforce and/or litigate the Patents-in-Suit in fields other than the Level 3 Exclusive Field (the "PersonalWeb Patent Field").

3. All infringement allegations, statements describing PersonalWeb, statements describing any Defendant (or any Defendant's products) and any statements made regarding jurisdiction and venue are made by PersonalWeb alone, and not by Level 3. PersonalWeb alleges that the infringements at issue in this case all occur within, and are limited to, the PersonalWeb Patent Field. Accordingly, PersonalWeb has not provided notice to Level 3—under Section 6.4.1 of the Agreement or otherwise—that PersonalWeb desires to bring suit in the Level 3 Exclusive Field in its own name on its own behalf or that PersonalWeb knows or suspects that Defendant is infringing or has infringed any of Level 3's rights in the patents.

THE PARTIES

4. Plaintiff PersonalWeb Technologies, LLC is a limited liability company duly organized and existing under the laws of Texas with its principal place of business at 112 E. Line Street, Suite 204, Tyler, TX 75702.

5. Plaintiff Level 3 Communications, LLC is a limited liability company organized under the laws of Delaware with its principal place of business at 100 CenturyLink Drive, Monroe, Louisiana, 71203.

6. PersonalWeb's infringement claims asserted in this case are asserted by PersonalWeb and all fall outside the Level 3 Exclusive Field. Level 3 is currently not asserting patent infringement in this case in the Level 3 Exclusive Field against any Defendant.

7. Defendant Shopify, Inc. is, upon information and belief, a Canadian corporation having a principal place of business and regular and established place of business at 150 Elgin Street, 8th Floor, Ottawa, ON K2P 1L4, Canada.

8. Defendant Shopify (USA) Inc. is, upon information and belief, a Delaware corporation having a principal place of business and regular and established place of business at 33 New Montgomery Street, Suite 750, San Francisco, California 94105. Upon information and belief, Defendant Shopify (USA) Inc. is a subsidiary of Defendant Shopify Inc.

JURISDICTION AND VENUE

9. The court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a) because this action arises under the patent laws of the United States, 35 U.S.C. §§ 1 *et seq.*

10. Venue is proper in this federal district pursuant to 28 U.S.C. §§ 1391(b)–(c) and 1400(b) because Defendant Shopify Inc. is not a resident in the United States and because Defendant Shopify (USA) Inc. is incorporated in the State of Delaware, and on information and belief, has a regular and established place of business in this District and has committed acts of infringement in this District.

11. This court has personal jurisdiction over Defendant Shopify (USA) Inc. because, in addition to the allegations in above paragraphs, on information and belief, Defendant Shopify (USA)

Inc. purposefully directed activities at residents of California, the claims herein arise out of and relate to those activities, and assertion of personal jurisdiction over Defendant Shopify (USA) Inc. would be fair.

12. This court has personal jurisdiction over Defendant Shopify Inc. pursuant to Rule 4(k)(2) of the Federal Rules of Civil Procedure because, on information and belief, Defendant Shopify Inc., a Canadian company, is not incorporated in the United States and Defendant Shopify Inc's principal place of business is not in the United States. Defendant Shopify Inc. has sufficient contacts with the United States such that exercise of jurisdiction over Defendant Shopify Inc. comports with due process.

PERSONALWEB BACKGROUND

13. The Patents-in-Suit cover fundamental aspects of cloud computing, including the identification of files or data and the efficient retrieval thereof in a manner which reduces bandwidth transmission and storage requirements.

14. The ability to reliably identify and access specific data is essential to any computer system or network. On a single computer or within a small network, the task is relatively easy: simply name the file, identify it by that name and its stored location on the computer or within the network, and access it by name and location. Early operating systems facilitated this approach with standardized naming conventions, storage device identifiers, and folder structures.

15. Ronald Lachman and David Farber, the inventors of the Patents-in-Suit, recognized that the conventional approach for naming, locating, and accessing data in computer networks could not keep pace with ever-expanding, global data processing networks. New distributed storage systems use files that are stored across different devices in dispersed geographic locations. These different locations could use dissimilar conventions for identifying storage devices and data partitions. Likewise, different users could give identical names to different files or parts of files—or unknowingly give different names to identical files. No solution existed to ensure that identical file names referred to the same data, and conversely, that different file names referred to different data. As a result,

expanding networks could not only become clogged with duplicate data, they also made locating and controlling access to stored data more difficult.

16. Lachman and Farber developed a solution: replacing conventional naming and storing conventions with system-wide "substantially unique," content-based identifiers. Their approach assigned substantially unique identifiers to "data items" of any type: "the contents of a file, a portion of a file, a page in memory, an object in an object-oriented program, a digital message, a digital scanned image, a part of a video or audio signal, or any other entity which can be represented by a sequence of bits." Applied system-wide, this invention would permit any data item to be stored, located, managed, synchronized, and accessed using its content-based identifier.

17. To create a substantially unique, content-based identifier, Lachman and Farber turned to cryptography. Cryptographic hash functions, including MD4, MD5, and SHA, had been used in computer systems to verify the integrity of retrieved data—a so-called "checksum." Lachman and Farber recognized that these same hash functions could be devoted to a vital new purpose: if a cryptographic hash function was applied to a sequence of bits (a "data item"), it would produce a substantially unique result value, one that: (1) virtually guarantees a different result value if the data item is changed; (2) is computationally difficult to reproduce with a different sequence of bits; and (3) cannot be used to recreate the original sequence of bits.

18. These cryptographic hash functions would thus assign any sequence of bits, based on content alone, with a substantially unique identifier. Lachman and Farber estimated that the odds of these hash functions producing the same identifier for two different sequences of bits (i.e., the "probability of collision") would be about 1 in 2 to the 29^{th} power. Lachman and Farber dubbed their content-based identifier a "True Name."

19. Using a True Name, Lachman and Farber conceived various data structures and methods for managing data (each data item correlated with a single True Name) within a network—no matter the complexity of the data or the network. These data structures provide a key-map organization, allowing for a rapid identification of any particular data item anywhere in a network by comparing a True Name for the data item against other True Names for data items already in the network. In operation, managing data using True Names allows a user to determine the location of

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