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12 UNITED STATES DISTRICT COURT
 13 NORTHERN DISTRICT OF CALIFORNIA
 14 SAN JOSE DIVISION

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

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

SECOND AMENDED COMPLAINT

DEMAND FOR JURY TRIAL

19 _____
 20 PERSONALWEB TECHNOLOGIES, LLC,
 21 ET AL.,

Case No.: 5:18-cv-03455-BLF

22 Plaintiffs,

23 v.

24 FIVERR INTERNATIONAL LIMITED, an
 25 Israel corporation,

26 Defendant.
 27 _____
 28

1 Plaintiff PersonalWeb Technologies, LLC (“Plaintiff” or “PersonalWeb”) files this Second
2 Amended Complaint (“Complaint”) for patent infringement against Defendant Fiverr International
3 Limited (“Defendant”). Plaintiff PersonalWeb Technologies, LLC alleges:

4
5 **PRELIMINARY STATEMENT**

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

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

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

THE PARTIES

1
2 4. Plaintiff PersonalWeb Technologies, LLC is a limited liability company duly organized
3 and existing under the laws of Texas with its principal place of business at 112 E. Line Street, Suite
4 204, Tyler, TX 75702.

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

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

11 7. Defendant Fiverr International Limited is, upon information and belief, an Israel
12 corporation having a principal place of business or regular and established place of business at 8
13 Eliezer Kaplan St., Tel Aviv, 6473409, Israel.

14
15 **JURISDICTION AND VENUE**

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

18 9. Venue is proper in this federal district pursuant to 28 U.S.C. §§ 1391(b)-(c) and
19 1400(b). On information and belief, Defendant is not a resident of the United States and thus may be
20 sued in any judicial district.

21 10. Venue is also proper in this Court because this action has been transferred to this district
22 by the Judicial Panel on Multidistrict Litigation for coordinated or consolidated pretrial proceedings
23 pursuant to 28 U.S.C. § 1407.

24 11. This court has personal jurisdiction over Defendant pursuant to Rule 4(k)(2) of the
25 Federal Rules of Civil Procedure because, on information and belief, Defendant, an Israel corporation,
26 is not incorporated in the United States and Defendant's principal place of business is not in the United
27 States. Defendant has sufficient contacts with the United States such that exercise of jurisdiction over
28 Defendant comports with due process.

1 12. On information and belief, Defendant is subject to this Court’s jurisdiction because this
2 action has been transferred to this district by the Judicial Panel on Multidistrict Litigation for
3 coordinated or consolidated pretrial proceedings pursuant to 28 U.S.C. § 1407.
4

5 **PERSONALWEB BACKGROUND**

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

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

14 15. Ronald Lachman and David Farber, the inventors of the Patents-in-Suit, recognized
15 that the conventional approach for naming, locating, and accessing data in computer networks could
16 not keep pace with ever-expanding, global data processing networks. New distributed storage systems
17 use files that are stored across different devices in dispersed geographic locations. These different
18 locations could use dissimilar conventions for identifying storage devices and data partitions.
19 Likewise, different users could give identical names to different files or parts of files—or unknowingly
20 give different names to identical files. No solution existed to ensure that identical file names referred
21 to the same data, and conversely, that different file names referred to different data. As a result,
22 expanding networks could not only become clogged with duplicate data, they also made locating and
23 controlling access to stored data more difficult.

24 16. Lachman and Farber developed a solution: replacing conventional naming and storing
25 conventions with system-wide “substantially unique,” content-based identifiers. Their approach
26 assigned substantially unique identifiers to “data items” of any type: “the contents of a file, a portion
27 of a file, a page in memory, an object in an object-oriented program, a digital message, a digital
28 scanned image, a part of a video or audio signal, or any other entity which can be represented by a

1 sequence of bits.” Applied system-wide, this invention would permit any data item to be stored,
2 located, managed, synchronized, and accessed using its content-based identifier.

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

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

16 19. Using a True Name, Lachman and Farber conceived various data structures and
17 methods for managing data (each data item correlated with a single True Name) within a network—
18 no matter the complexity of the data or the network. These data structures provide a key-map
19 organization, allowing for a rapid identification of any particular data item anywhere in a network by
20 comparing a True Name for the data item against other True Names for data items already in the
21 network. In operation, managing data using True Names allows a user to determine the location of
22 any data in a network, determine whether access is authorized, and to selectively provide access to
23 specific content not possible using the conventional naming arts.

24 20. On April 11, 1995, Lachman and Farber filed their patent application, describing these
25 and other ways in which content-based “True Names” elevated data-processing systems over
26 conventional file-naming systems. The first True Name patent issued on November 2, 1999. The last
27 of the Patents-in-Suit has expired, and the allegations herein are directed to the time period before
28 expiration of the last of the Patents-in-Suit.

1 21. PersonalWeb has successfully enforced its intellectual property rights against third
2 party infringers, and its enforcement of the Patents-In Suit is ongoing. This enforcement has resulted
3 in PersonalWeb obtaining settlements and granting non-exclusive licenses regarding the Patents-in-
4 Suit.
5

6 **GENERAL BACKGROUND**

7 22. A webpage is a type of document that is typically retrieved over the World Wide Web,
8 made viewable and formatted

9 23. (rendered) by a web browser, and displayed electronically. A “webpage” often refers
10 to what is visible in a browser, but sometimes also refers to a computer file (“webpage base file”),
11 usually written in Hypertext Markup Language (“HTML”) or a comparable markup language. Such
12 HTML webpage base files typically include text, formatting, and references (hyperlinks) to other web
13 content, such as style sheets, scripts, and images that make up part of the webpage. Web content
14 referenced in an HTML or similar file are also called “asset files” herein. The web browser coordinates
15 the retrieval of the various asset files of a webpage and renders the webpage for display from the
16 webpage base file and the asset files referenced in the webpage base file or referenced in other asset
17 files.

18 24. On the World Wide Web, hyperlinks generally include Uniform Resource Identifiers
19 (“URIs”), which each typically include an address of a server (“host”) from which the asset file is to
20 be retrieved (*e.g.*, “www.website.com”), a “path” to the location of that asset file on the host server
21 (*e.g.*, “/directory/”), and a filename (*e.g.*, “filename.ext”).

22 25. On the Internet, a web browser typically retrieves a webpage base file from a remote
23 web server and retrieves referenced asset files from the same or different servers. The web browser
24 retrieves a webpage base file or an asset file by making a GET “request” to a web server using the
25 Hypertext Transfer Protocol (“HTTP”), an industry standard. The web server may respond to such an
26 HTTP request with a HTTP “response” that includes the requested web content and may include other
27 information or instructions.
28

1 26. A static webpage is delivered exactly as stored, as web content in the web server’s file
2 system or memory. In contrast, a dynamic webpage is generated by a web server application, usually
3 driven by server-side software, upon receipt of a request from a browser (user). For example, a picture
4 of a building might be delivered as static content (a picture) whereas the latest traffic conditions may
5 be delivered dynamically based on real time traffic information.

6 27. The speed of a browser retrieving webpage base files and incorporated asset files can
7 be increased by the browser storing previously retrieved webpage base files and asset files in a browser
8 “cache” on the computer running the browser. If a browser’s user later requests a previously retrieved
9 webpage base file or requests a webpage that includes an asset file previously used by the browser in
10 rendering the same or a different webpage (for example, by reloading a webpage or visiting the same
11 webpage again), the browser may use the cached webpage base file or asset file rather than having to
12 download the same file repeatedly over the Internet again.

13 28. Two computers communicating over the Internet usually are not directly connected to
14 each other but rather interact via chains of network appliances and other computers (*e.g.*, “switches”
15 and “intermediate” servers). Many intermediate servers have caches similar to and complementing
16 the browser cache that store webpage base files and assets that pass through that intermediate server.
17 If a browser or server requests a file from the intermediate server that is present in that intermediate
18 server’s cache, the intermediate server can use the content in its cache to respond to the request rather
19 than send the request upstream towards the web server from which the file initially originated (also
20 called the “origin server”).

21 29. Responses to HTTP requests may include header elements (control elements) and a
22 body (the “object” that was requested). Under HTTP, web servers can include a “cache-control”
23 header with a response that includes a webpage or asset file. A “cache-control” header includes one
24 or more directives that instruct browsers and intermediate server caches (“intermediate caches”) as to
25 whether and for how long the file (object) included in the response may be cached or under what
26 circumstances and under what conditions the cached content may be used. HTTP also provides for
27 including other headers in responses that provide similar types of instructions to browsers and
28

1 intermediate caches. Collectively, these other headers and directives in a “cache-control” header are
2 referred to herein as “cache-control headers.”

3 30. Given that webpage content changes, sometimes rather quickly and regularly, a
4 problem that website owners face is effectively instructing a browser that is re-rendering a previously
5 cached webpage that one or more of its cached files for that webpage are no longer the correct and
6 authorized content (the content of those files has changed) and similarly reauthorizing the use of those
7 cached files whose content has not changed.

8 31. On one hand, website owners want to encourage the browsers that render their web
9 pages to use cached files thereby reducing the number of requests for these files that are being made
10 to their webpage servers. Therefore, they frequently will set cache-control headers that authorize the
11 browser to cache their webpage base files and asset files so the files are on hand when the browser
12 needs to render that webpage again. On the other hand, website owners want the browsers to use the
13 latest authorized files so that their users do not see the wrong content when viewing their webpage.

14 15 **DEFENDANT’S BACKGROUND**

16 32. On information and belief, Defendant has operated a website located at **fiverr.com**,
17 and has done so since before expiration of the last to expire of the Patents-in-Suit, which has operated
18 to provide authorized webpage content to its users in the manner herein described.¹

19 33. On information and belief, Defendant’s web servers utilized a system of notifications
20 and authorizations to control the distribution of content, *e.g.*, what webpage content may be served
21 from web servers and intermediate caches and what cached webpage content a browser is re-authorized
22 to use to render Defendant’s webpage(s).

23 34. On information and belief, Defendant’s system and its associated method of providing
24 webpage content used “conditional” HTTP GET requests with If-None-Match headers and associated

25
26
27
28 ¹ While the complaint is sometimes written in the present or present perfect tense, all specific
allegations are directed to the system’s operations and the method’s performance in the relevant time
period.

1 content-based ETag values for various webpage base files required to render various webpages of the
2 Defendant.

3 35. On information and belief, Defendant's system and its associated method of providing
4 webpage content also inserted fingerprints generated based on the content of asset files into the
5 filenames of asset files required to render various webpages of the Defendant.

6 36. On information and belief, Defendant's system and associated method used these
7 ETags and fingerprints to instruct both the intermediate cache servers and the endpoint caches at
8 browsers to verify whether they were still authorized to reuse the previously cached webpage base
9 files of Defendant and to instruct them to obtain newly authorized content in rendering Defendant's
10 webpage when that content had changed. In other words, whether the previously cached content was
11 still considered valid for use by the Defendant website operator.

12 37. On information and belief, Defendant thereby reduced the bandwidth and computation
13 required by its origin servers and any intermediate cache servers to field user requests to render
14 Defendant's webpages as those servers only need to serve files whose content has changed. On
15 information and belief, this has allowed for the efficient update of cached information only when such
16 content has changed, thereby reducing transaction overhead and bandwidth and allowing the
17 authorized content to be served from the nearest cache.

18 38. More particularly, on information and belief, each of Defendant's webpages included
19 a webpage base file (*e.g.*, a main or initial HTML file) and one or more asset files referenced in the
20 webpage base file (or referenced in other asset files that contained references to other asset files). On
21 information and belief, the references in the webpage base file to the asset files needed to render the
22 webpage were typically Uniform Resource Identifiers ("URIs"), which each typically included a
23 filename, the address of a host server from which the asset file could be retrieved, and a "path" to the
24 location of that asset file on that server.

25 39. On information and belief, Defendant's website used a web application framework to
26 develop and compile various webpages of the Defendant, including asset files that were used in
27 rendering the webpages, and to generate fingerprints of the contents of asset files. On information and
28 belief, the fingerprints of individual asset files that were part of the webpage's content were included

1 in the respective filenames of the individual asset files. On information and belief, the modified
2 filenames were then used as part of the URI used to access the individual asset files over the Internet.
3 On information and belief, when an asset file's content was changed, a new fingerprint was generated
4 and included in the filename, its URI thus being changed accordingly.

5 40. On information and belief, the asset file fingerprint was generated with a hash function
6 and used to identify content changes. Furthermore, on information and belief, asset file URIs (with
7 respective fingerprints) were included in webpage base files or other asset files contained references
8 to other asset files. On information and belief, static webpage base files, if any, were recompiled when
9 any URI of a referenced asset file was changed (due to the fingerprint of the referenced asset file
10 changing). Thus, a content change in an asset file for a given webpage would result in a change to its
11 fingerprint, its URI, and a subsequent change to the content of any static webpage base files
12 referencing that changed asset file for that webpage.

13 41. On information and belief, a dynamic webpage base file generated for a webpage of
14 Defendant webpages in response to one request from a user could be the same as it was when it was
15 generated in response to a prior request from that or another user. However, on information and belief,
16 this would not be the case if any of the asset files referenced in the webpage base file had changed
17 between the time of the two requests and the URIs of the changed asset files included fingerprints as
18 described above.

19 42. On information and belief, when an asset file's content was changed, a new fingerprint
20 was generated and included in the filename, and its URI was thus changed accordingly, resulting in a
21 content change to any webpage base file or other asset file that referenced that URI. This, in turn,
22 caused a new and different ETag being generated for such webpage base file or other asset file that
23 referenced that URI.

24 43. On information and belief, when Defendant created a webpage base file for a webpage,
25 whether dynamic or static, that webpage base file included a sequence of bits and an associated ETag
26 value was generated by Defendant by applying a hash function to the sequence of bits; wherein any
27 two webpage base files comprising identical sequences of bits had identical associated ETag values.
28 Thus, on information and belief, when a webpage base file's content was changed and a new associated

1 ETag value was generated by Defendant, it thereafter instructed the respective service by intermediate
2 cache servers or use by endpoint caches such as browser caches to no longer use the previous cached
3 webpage base file's content. Conversely, when the webpage base file content had not changed and
4 thus its ETag was unchanged, the cached asset files with fingerprints in their URIs referenced in the
5 webpage base file had not changed and were still valid to use.

6 44. On information and belief, when an intermediate cache server or a browser requested
7 a webpage from the Defendant for the first time, it sent an HTTP GET request with the webpage's
8 URI and Defendant's origin server or an upstream cache server responded by sending an HTTP 200
9 (OK) response message containing the webpage base file, along with its respective associated ETag.

10 On information and belief, a browser then sent individual HTTP GET requests, each with an asset
11 file's URI that was referenced in the webpage base file, and the asset files' origin servers or
12 intermediate cache servers responded by sending individual HTTP 200 responses containing the
13 requested asset files. On information and belief, upon receipt of the HTTP 200 responses, the
14 intermediate cache server or browser cached the webpage base file and asset files with their associated
15 URI and the browser used them in rendering the requested web page of the Defendant. On information
16 and belief, the origin servers, intermediate cache servers, and browser caches were caused to maintain
17 databases/tables which mapped the URIs of webpage base files and asset files to their respective
18 responses and, if applicable, associated cache-control headers and ETags.

19 45. On information and belief, by responding to an HTTP GET request for a given webpage
20 by transmitting content of a webpage base file with an associated ETag, Defendant instructed the
21 browser cache and all intermediate cache servers, to use an HTTP conditional GET request the next
22 time that webpage base file is requested. More specifically, on information and belief, the browser or
23 intermediate cache is instructed to include the ETag in the HTTP conditional GET request with an "If-
24 None-Match" header to re-verify that they are still authorized to serve or use that content or determine
25 that they are no longer authorized to use that content and therefore must use new content.

26 46. On information and belief, Defendant did this, for example, by causing cache-control
27 headers to be included in HTTP responses containing its webpage base file. On information and belief,
28 Defendant benefits from using the ETags to control the distribution of its webpage content by

1 communicating to a downstream cache and to a browser which of Defendant's cached webpage base
2 files it is reauthorized to serve/use and what newly authorized files it must first obtain in
3 serving/rendering Defendant's webpages.

4 47. More particularly, on information and belief, when a browser again requested the
5 Defendant's webpage, the browser either used a cached copy, if allowed by the cache-control headers,
6 or retrieved a new copy of the webpage base file for Defendant's webpage.

7 48. On information and belief, for a webpage base file stored in the browser's cache with
8 an ETag, and based on the cache-control headers received in the original response, the browser sent a
9 conditional GET request with an If-None-Match header using the associated ETag value and the URI
10 for the webpage base file so as to be notified whether the browser still had Defendant's authority to
11 render the webpage with its locally cached webpage base file. In other words, whether the cached
12 content was still valid for use in rendering Defendant's webpage.

13 49. On information and belief, under most circumstances, a responding intermediate cache
14 server having content cached for the URI in the conditional GET request and having an ETag for that
15 URI responded to the request by determining whether it had the same associated ETag value for that
16 URI. If it had no ETag value for that URI, on information and belief, the request was passed up to an
17 upstream intermediate cache server capable of responding or, if none, to the URI's origin server, which
18 responded to the request. On information and belief, if the intermediate cache server did not have
19 content cached for the URI in the conditional GET request, the request was similarly passed up to an
20 upstream intermediate cache server capable of responding or, if none, to the URI's origin server.

21 50. On information and belief, if the responding server had the webpage content for that
22 URI and there was a match between the ETag it received in the request with the ETag it currently had
23 associated for that URI, it sent back an HTTP 304 (Not Modified) response message; this message
24 notifying the browser that the same webpage content was present at the responding server and that the
25 browser was still authorized to use that previously cached webpage base file to render the webpage.
26 On information and belief, upon receipt of the HTTP 304 response, the browser accessed the locally
27 cached webpage base file in rendering the webpage.
28

1 51. On information and belief, if the webpage base file’s associated ETag sent by the
2 browser in the conditional GET If-None-Match request did not match the associated ETag maintained
3 at the responding server (or other intermediate cache servers further upstream or the origin server) for
4 that URI, the responding server sent back an HTTP 200 response along with the new webpage base
5 file and its new ETag value. The HTTP 200 response indicated to the browser that it was not
6 authorized to use (or serve, in the case of an intermediate cache server receiving the HTTP 200
7 response) the previously cached webpage base file. In response to receiving the HTTP 200 response,
8 the browser (or intermediate cache server) was instructed to update its respective cache with the new
9 webpage base file and associated ETag. The browser subsequently used the new webpage base file
10 (and the asset file URIs contained therein) to render the webpage.

11 52. Exhibit 1 to the complaint lists specific examples of files that were, on information and
12 belief, served by or on behalf of Defendant during the relevant time period. The examples in Exhibit
13 1 include: a webpage base file served with a content-based ETag for the webpage base file; and an
14 asset file referenced by a URI with a fingerprint of the asset file contained into the URI.

15 53. On information and belief, in this manner, Defendant used (1) ETag values and (2)
16 asset files referenced by URIs with fingerprints based on the asset files’ content to control the behavior
17 of downstream intermediate cache servers and browser caches to assure that they only accessed and
18 used Defendant’s latest authorized webpage content to serve or to render its webpages.

19
20 **FIRST CLAIM FOR RELIEF**

21 **INFRINGEMENT OF U.S. PATENT NO. 6,928,442**

22 54. PersonalWeb repeats and realleges paragraphs 1–53, as if the same were fully stated
23 herein.

24 55. On August 9, 2005, United States Patent No. 6,928,442 (the “’442 patent”) was duly
25 and legally issued for an invention entitled “Enforcement and Policing of Licensed Content Using
26 Content-Based Identifiers.” PersonalWeb has an ownership interest in the ’442 patent by assignment,
27 including the exclusive right to enforce the ’442 patent within the PersonalWeb Patent Field, and
28 continues to hold that ownership interest in the ’442 patent.

1 56. Defendant has infringed at least claims 10 and 11 of the '442 patent by its manufacture,
2 use, sale, importation, and/or offer for sale of products or services, and/or controlling the distribution
3 of its webpage content in the manner described herein. Defendant's infringement is literal and/or
4 under the doctrine of equivalents and Defendant is liable for its infringement of the '442 patent
5 pursuant to 35 U.S.C. § 271.

6 57. For example, claim 10 covers "a method, in a system in which a plurality of files are
7 distributed across a plurality of computers." On information and belief, Defendant has used a system
8 of notifications and authorizations to distribute a plurality of files, *e.g.*, Defendant's files containing
9 content necessary to render its webpages, across a plurality of computers such as production servers,
10 origin servers, intermediate cache servers and endpoint caches used by browsers rendering
11 Defendant's webpages.

12 58. Claim 10 then recites the act of "obtaining a name for a data file, the name being based
13 at least in part on a given function of the data, wherein the data used by the function comprises the
14 contents of the particular file." As set forth above, on information and belief, Defendant generated or
15 otherwise obtained ETags for its webpage base file used to render its webpages using a hash function,
16 wherein the ETags were based on the contents of the particular files. Moreover, Defendant caused the
17 intermediate caches servers and endpoint caches to obtain the ETags in HTTP 200 responses sent from
18 Defendant's origin servers. On information and belief, Defendant caused intermediate cache servers
19 and its origin servers to obtain ETags in conditional GET messages from endpoint and intermediate
20 caches, as described *supra*.

21 59. Claim 10 then recites the act of "determining, using at least the name, whether a copy
22 of the data file is present on at least one of said computers." On information and belief, as set forth
23 above, Defendant has caused its origin servers and the intermediate cache servers between an endpoint
24 cache and one of its origin servers to, in response to receiving a conditional GET request with an If-
25 None-Match header, determine whether it has a file present that matches the URI in the conditional
26 GET and to compare the ETag in the conditional GET to the ETag for that URI and determine whether
27 a copy of the content having that ETag is present.

28

1 60. Claim 10 then recites the act of “determining whether a copy of the data file that is
2 present on a at least one of said computers is an unauthorized copy or an unlicensed copy of the data
3 file.” On information and belief, as set forth above, if there was a match, the origin or intermediate
4 cache server determined that the copy of the file present at the downstream intermediate cache server
5 and/or the endpoint cache was an authorized or licensed copy of the data file. Conversely, if there was
6 no match, it determined that the copy of the file present at the downstream intermediate cache server
7 and/or the endpoint cache was an unauthorized copy of the data file. Likewise, if the browser
8 determined that it had a file with a matching URI, the browser determined that it was still authorized
9 to use that file.

10 61. Defendant’s acts of infringement caused damage to PersonalWeb and PersonalWeb is
11 entitled to recover from Defendant the damages sustained by PersonalWeb as a result of Defendant’s
12 wrongful acts in an amount subject to proof at trial.

13
14 **SECOND CLAIM FOR RELIEF**

15 **INFRINGEMENT OF U.S. PATENT NO. 7,802,310**

16 62. PersonalWeb repeats and realleges paragraphs 1–53, as if the same were fully stated
17 herein.

18 63. On September 21, 2010, United States Patent No. 7,802,310 (the “’310 patent”) was
19 duly and legally issued for an invention entitled “Controlling Access to Data in a Data Processing
20 System.” PersonalWeb has an ownership interest in the ’310 patent by assignment, including the
21 exclusive right to enforce the ’310 patent within the PersonalWeb Patent Field, and continues to hold
22 that ownership interest in the ’310 patent.

23 64. Defendant has infringed at least claims 20 and 69 of the ’310 patent by its manufacture,
24 use, sale, importation, and/or offer for sale of products or services, and/or controlling the distribution
25 of its webpage content in the manner described herein. Defendant’s infringement is literal and/or
26 under the doctrine of equivalents and Defendant is liable for its infringement of the ’310 patent
27 pursuant to 35 U.S.C. § 271.

28

1 65. For example, claim 20 covers a “computer-implemented method operable in a system
2 which includes a plurality of computers.” On information and belief, Defendant used the claimed
3 computer implemented method by using a system of notifications and authorizations to control the
4 distribution of data items, such as various webpage base file, necessary to render its webpages, across
5 a plurality of computers such as production servers, origin servers, intermediate cache servers, and
6 endpoint caches.

7 66. Claim 20 then recites “controlling distribution of content from a first computer to at
8 least one other computer, in response to a request obtained by a first device in the system from a second
9 device in the system, the first device comprising hardware including at least one processor, the request
10 including at least a content-dependent name of a particular data item, the content-dependent name
11 being based at least in part on a function of at least some of the data comprising the particular data
12 item, wherein the function comprises a message digest function or a hash function, and wherein two
13 identical data items will have the same content-dependent name.” On information and belief, as set
14 forth above, Defendant has caused downstream intermediate cache servers and endpoint caches to
15 send conditional GET requests with If-None-Match headers containing ETags that are fielded by
16 upstream cache or origin servers. On information and belief, the ETags were content-dependent names
17 for a data item based on hashing the data item’s contents; and when the file’s content changed a new
18 content-dependent name was determined. On information and belief, in Defendant’s method, a first
19 computer, such as the intermediate cache server or origin server, received such conditional GET
20 requests from a second computer, such as a user browser or other intermediate cache server, regarding
21 data items, such as webpage or asset files, the requests including ETags associated with the respective
22 data items.

23 67. Claim 20 then recites “based at least in part on said content-dependent name of said
24 particular data item, the first device (A) permitting the content to be provided to or accessed by the at
25 least one other computer if it is not determined that the content is unauthorized or unlicensed,
26 otherwise, (B) if it is determined that the content is unauthorized or unlicensed, not permitting the
27 content to be provided to or accessed by the at least one other computer.” On information and belief,
28 the first computer, such as an upstream intermediate cache server or origin server, maintained a

1 plurality of ETags associated with Defendant’s asset and webpage base files. On information and
2 belief, the ETag in a request and the ETag maintained by the first computer for the particular data item
3 sought by the request were compared to determine whether the associated content present at the
4 downstream computer was still authorized to be used/served or whether new authorized content must
5 be provided thereto. If it was determined that the data item corresponding to the received ETag was
6 still authorized to be used, the first computer sent back an HTTP 304 response authorizing the
7 downstream cache server or end-user cache to access the file content already present in order to serve
8 it or to use it to render the webpage. On information and belief, if it had been determined that the data
9 item corresponding to received E-tag was no longer authorized, the first computer sent back an HTTP
10 200 response which indicated to the downstream cache server or end-user cache that was not
11 authorized to access the old content and must access the new authorized file content contained in the
12 HTTP 200 response to serve it or to use it to render the webpage.

13 68. For a further example, claim 69 covers a “system operable in a network of computers,
14 the system comprising hardware including at least a processor, and software, in combination with said
15 hardware.” On information and belief, Defendant has controlled the distribution of its website content
16 across a system that included a network of computers, such as its production servers as well as origin
17 servers, intermediate cache servers, and endpoint caches, all comprising hardware including a
18 processor. On information and belief, Defendant has utilized software, in combination with such
19 hardware, such as a web development framework, software utilized in implementing the HTTP web
20 protocol, and software used on host servers that Defendant used to serve its content.

21 69. Claim 69 then recites the system “(a) to receive at a first computer, from a second
22 computer, a request regarding a data item, said request including at least a content-dependent name
23 for the data item, the content-dependent name being based at least in part on a function of the data in
24 the data item, wherein the data used by the function to determine the content-dependent name
25 comprises at least some of the contents of the data item, wherein the function that was used is a
26 message digest function or a hash function, and wherein two identical data items will have the same
27 content-dependent name.” On information and belief, as set forth above, Defendant has caused
28 downstream intermediate cache servers and endpoint caches to send conditional GET requests with

1 URIs including fingerprints that are fielded by upstream cache or origin servers. On information and
2 belief, the URIs including fingerprints were content-dependent names for a data item calculated by
3 hashing the file's contents; and when the file's content changed a new content-dependent name was
4 determined. On information and belief, in Defendant's system, a first computer, such as the
5 intermediate cache server or origin server, received such conditional GET requests from a second
6 computer, such as a user browser, regarding data items, such as asset files, using content-dependent
7 names such as URIs including fingerprints associated with the data items.

8 70. Claim 69 then recites "(b) in response to said request: (i) to cause the content-dependent
9 name of the data item to be compared to a plurality of values; and (ii) to determine if access to the data
10 item is authorized or unauthorized based on whether or not the content-dependent name corresponds
11 to at least one of said plurality of values, and (iii) based on whether or not it is determined that access
12 to the data item is authorized or unauthorized, to allow the data item to be provided to or accessed by
13 the second computer if it is not determined that access to the data item is unauthorized." On
14 information and belief, the first computer, such as an upstream intermediate cache server or origin
15 server, maintained a plurality of URI values associated with Defendant's asset and webpage base files;
16 compared the URI value received in a conditional GET request from the second (downstream)
17 computer to that plurality of URI values; that comparison allowed the first computer to determine
18 whether the content-dependent name in the request corresponded to one of the plurality of stored URI
19 values and to determine whether access to the data item was still authorized or not. On information
20 and belief, in particular when there was a match, the first computer determined the associated content
21 present at the downstream computer was still authorized to be used/served or whether new authorized
22 content must be provided thereto. If it was determined that the data item corresponding to the received
23 URI including a fingerprint was still authorized to be used, the first computer has sent back an HTTP
24 304 response authorizing the downstream cache server or end-user cache to access the file content
25 already present in order to serve it or to use it to render the webpage.

26 71. Defendant's acts of infringement have caused damage to PersonalWeb and
27 PersonalWeb is entitled to recover from Defendant the damages sustained by PersonalWeb as a result
28 of Defendant's wrongful acts in an amount subject to proof at trial.

THIRD CLAIM FOR RELIEF

INFRINGEMENT OF U.S. PATENT NO. 7,945,544

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2
3 72. PersonalWeb repeats and realleges paragraphs 1–53, as if the same were fully stated
4 herein.

5 73. On May 17, 2011, United States Patent No. 7,945,544 (the “’544 patent”) was duly and
6 legally issued for an invention entitled “Similarity-Based Access Control of Data in a Data Processing
7 System.” PersonalWeb has an ownership interest in the ’544 patent by assignment, including the
8 exclusive right to enforce the ’544 patent within the PersonalWeb Patent Field, and continues to hold
9 that ownership interest in the ’544 patent.

10 74. Defendant has infringed at least claims 46, 48, 52, and 55 of the ’544 patent by its
11 manufacture, use, sale, importation, and/or offer for sale of products or services, and/or controlling the
12 distribution of its webpage content in the manner described herein. Defendant’s infringement is literal
13 and/or under the doctrine of equivalents and Defendant is liable for its infringement of the ’544 patent
14 pursuant to 35 U.S.C. § 271.

15 75. For example, claim 46 covers a claimed “computer-implemented method.” On
16 information and belief, Defendant uses the claimed computer implemented method by using a system
17 of notifications and authorizations to locate and control the distribution of data items, such as various
18 webpage base files and asset files, necessary to render its webpages.

19 76. Claim 46 then recites the act of “(A) for each particular file of a plurality of files:
20 (a2) determining a particular digital key for the particular file, wherein the particular file comprises a
21 first one or more parts.” On information and belief, each of Defendant’s webpages comprises one or
22 more asset files and has an associated webpage base file, the webpage base file containing the URIs
23 having fingerprints of a plurality of asset files comprising the webpage, and once the webpage base
24 files and asset files are compiled and complete, Defendant stores them on a host system. On
25 information and belief, the webpage base file’s associated ETag value is generated by applying a hash
26 algorithm to the webpage base file’s contents. On information and belief, whenever a new webpage
27 base file is generated or the webpage base file’s content changes, Defendant caused an ETag to be
28 determined and associated to the webpage base file.

1 77. Claim 46 then recites “each part of said first one or more parts having a corresponding
2 part value, the part value of each specific part of said first one or more parts being based on a first
3 function of the contents of the specific part, wherein two identical parts will have the same part value
4 as determined by the first function, and wherein the particular digital key for the particular file is
5 determined using a second function of the one or more of part values of said first one or more parts.”
6 On information and belief, prior to various asset files being stored on a host system, a fingerprint is
7 generated for each of these asset files by applying a hash function to the asset file’s contents and the
8 fingerprints are inserted into the URIs for the respective asset files. On information and belief, the
9 webpage’s ETag value is generated by applying a second hash function to the webpage base file’s
10 contents, which include the URIs of one or more of the asset files which comprise the webpage’s
11 contents. On information and belief, because the respective asset files’ URIs include the fingerprints
12 of their content, the webpage’s ETag value will change and a new associated ETag value is generated
13 to represent the webpage’s content, when the content changes and two identical webpages having the
14 identical content represented by their webpage base file will have the same ETag value.

15 78. Claim 46 then recites the act of “(a2) adding the particular digital key of the particular
16 file to a database, the database including a mapping from digital keys of files to information about the
17 corresponding files.” On information and belief, Defendant caused the origin server, intermediate
18 caches and endpoint caches to maintain databases/tables which mapped the ETag of each webpage’s
19 webpage base file to its URI, and information about the corresponding webpage, such as, for example,
20 information from cache-control headers for the webpage.

21 79. Claim 46 then recites “(B) determining a search key based on search criteria, wherein
22 the search criteria comprise a second one or more parts, each of said second one or more parts of said
23 search criteria having a corresponding part value, the part value of each specific part of said second
24 one or more parts being based on the first function of the contents of the specific part, and wherein the
25 search key is determined using the second function of the one or more of part values of said second
26 one or more parts.” On information and belief, when a downstream intermediate cache server or a
27 browser again requested a webpage of Defendant, Defendant caused it to send a conditional GET
28 request with an If-None-Match header with the webpage’s associated ETag value. On information

1 and belief, the received ETag value was determined using the second hash function of the webpage's
2 webpage base file, which included URIs including fingerprints for one or more of the asset files which
3 comprised the webpage's contents.

4 80. Claim 46 then recites "(C) attempting to match the search key with a digital key in the
5 database." On information and belief, when the responding server received the webpage's ETag value
6 in a conditional GET request with an If-None-Match header, it compared the received ETag with the
7 ETag it has maintained in a database/table corresponding to the URI of the webpage's webpage base
8 file to determine if there is matching value for that webpage.

9 81. Claim 46 then recites "(D) if the search key matches a particular digital key in the
10 database, providing information about the file corresponding to the particular digital key." On
11 information and belief, if the responding server had a matching ETag value for the webpage's webpage
12 base file, the responding server sent an HTTP 304 response, which included information about the
13 corresponding webpage, such as, for example, information from cache-control headers for the
14 webpage.

15 82. Defendant's acts of infringement have caused damage to PersonalWeb and
16 PersonalWeb is entitled to recover from Defendant the damages sustained by PersonalWeb as a result
17 of Defendant's wrongful acts in an amount subject to proof at trial.

18
19 **FOURTH CLAIM FOR RELIEF**

20 **INFRINGEMENT OF U.S. PATENT NO. 8,099,420**

21 83. PersonalWeb repeats and realleges paragraphs 1–53, as if the same were fully stated
22 herein.

23 84. On January 17, 2012, United States Patent No. 8,099,420 (the "'420 patent") was duly
24 and legally issued for an invention entitled "Accessing Data in a Data Processing System."
25 PersonalWeb has an ownership interest in the '420 patent by assignment, including the exclusive right
26 to enforce the '420 patent within the PersonalWeb Patent Field, and continues to hold that ownership
27 interest in the '420 patent.

1 85. Defendant has infringed claims 25, 26, 27, 29, 30, 32, 34–36, and 166 of the '420 patent
2 by its manufacture, use, sale, importation, and/or offer for sale of products or services, and/or
3 controlling the distribution of its webpage content in the manner recited herein. Defendant's
4 infringement is literal and/or under the doctrine of equivalents and Defendant is liable for its
5 infringement of the '420 patent pursuant to 35 U.S.C. § 271.

6 86. For example, claim 166 covers a “system comprising hardware, including at least a
7 processor, and software, in combination with said hardware.” On information and belief, Defendant
8 has controlled the distribution of its website content across a system that included hardware including
9 a processor, such as its production servers as well as origin servers, intermediate cache servers, and
10 endpoint caches; and software, in combination with such hardware, such as a web development
11 framework, software utilized in implementing the HTTP web protocol, and the software used on host
12 servers that Defendant used to serve its webpages.

13 87. Claim 166 then recites “(A) for a particular data item in a set of data items, said
14 particular data item comprising a corresponding particular sequence of bits.” On information and
15 belief, Defendant's system has controlled the distribution of webpage base files necessary to render
16 its webpages which represent particular data items, and each of these files comprise a corresponding
17 sequence of bits.

18 88. Claim 166 then recites that for the particular data item to “(a1) determine one or more
19 content-dependent digital identifiers for said particular data item, each said content-dependent digital
20 identifier being based at least in part on a given function of at least some of the bits in the particular
21 sequence of bits of the particular data item, wherein two identical data items will have the same digital
22 identifiers as determined using said given function.” On information and belief, Defendant's system
23 has applied hash functions to each of various Defendant's webpage base files to all of the bits of the
24 file's content to determine a fingerprint, an ETag, or both for the file's content; whereby two identical
25 data items have the same ETag values and the same fingerprint values. On information and belief,
26 fingerprints were included in files' URI and ETag values were associated with files' URIs.

27 89. Claim 166 then recites that for the particular data item “(a2) selectively permits the
28 particular data item to be made available for access and to be provided to or accessed by or from at

1 least some of the computers in a network of computers, wherein the data item is not to be made
 2 available for access or provided without authorization, as resolved based, at least in part, on whether
 3 or not at least one of said one or more content-dependent digital identifiers for said particular data item
 4 corresponds to an entry in one or more databases, each of said one or more databases comprising a
 5 plurality of identifiers, each of said identifiers in each said database corresponding to at least one data
 6 item of a plurality of data items, and each of said identifiers in each said database being based, at least
 7 in part, on at least some of the data in a corresponding data item.”

8 90. On information and belief, Defendant’s system has included one or more web servers
 9 with databases containing ETag values associated with the URIs for various of the webpage base files
 10 necessary to render its webpages; moreover, Defendant’s system has used a system of conditional
 11 GET requests with If-None-Match headers and HTTP 304 and HTTP 200 responses containing the
 12 ETags, as described more particularly *supra*, to ensure that downstream caches only access authorized
 13 file content to either serve that file content further downstream or to use it to render Defendant’s
 14 webpages. On information and belief, in particular, as more fully described *supra*, the system
 15 compared the ETag received in a given conditional GET request with the ETags contained in the
 16 database to selectively determine whether the requesting computer could access the file content it
 17 already had or must access newly received authorized content.

18 91. Defendant’s acts of infringement have caused damage to PersonalWeb and
 19 PersonalWeb is entitled to recover from Defendant the damages sustained by PersonalWeb as a result
 20 of Defendant’s wrongful acts in an amount subject to proof at trial.

PRAYER FOR RELIEF

23 WHEREFORE, Plaintiff PersonalWeb requests entry of judgment in its favor and against
 24 Defendant as follows:

25 a) Declaration that Defendant has infringed U.S. Patent Nos. 6,928,442, 7,802,310,
 26 7,945,544, and 8,099,420 as described in this action;

1 b) Awarding the damages arising out of Defendant’s infringement of U.S. Patent Nos.
2 6,928,442, 7,802,310, 7,945,544, and 8,099,420, together with pre-judgment and post-judgment
3 interest, in an amount according to proof;

4 c) An award of attorneys’ fees pursuant to 35 U.S.C. § 285 or as otherwise permitted by
5 law; and

6 d) For costs incurred and such other and further relief as the Court may deem just and
7 proper.

8
9 Respectfully submitted,

10 Dated: October 4, 2018

STUBBS, ALDERTON & MARKILES, LLP

11
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DEMAND FOR JURY TRIAL

Pursuant to Fed. R. Civ. P. 38(b) and Local Rule 3–6, Plaintiff PersonalWeb Technologies, LLC hereby demands a trial by jury on all issues triable in this action.

Respectfully submitted,

Dated: October 4, 2018

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