Mirror Worlds Technologies, LLC v. Facebook Inc. Doc. 312

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

MIRROR WORLDS TECHNOLOGIES, LLC,

Plaintiff,

- against -

FACEBOOK, INC.,

Defendant.

17-cv-3473 (JGK)

OPINION AND ORDER

JOHN G. KOELTL, District Judge:

The plaintiff, Mirror Worlds Technologies, LLC ("Mirror Worlds") brought this patent infringement suit against Facebook, Inc., alleging that three systems within Facebook's social media platform infringe three patents owned by Mirror Worlds.

Mirror Worlds owns U.S. Patent Nos. 6,006,227, 7,865,538, and 8,255,439, "which describe and claim systems and methods for presenting and storing data in time-ordered streams on a computer system." Mirror Worlds Techs., LLC v. Facebook, Inc., 800 F. App'x 901, 902 (Fed. Cir. 2020).[1] The '227 patent issued from an application filed in 1996. The '538 and '439 patents claim priority to the '227 patent.

The '227 patent states that, as of its priority date, conventional computers used hierarchical directories to store

[1] Unless otherwise noted, this Opinion and Order omits all alterations, citations, footnotes, and internal quotation marks in quoted text.

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and organize data. '227 patent, col. 1, lines 21-30.[2] When creating a new document under that conventional system, users were required to name the document and choose a storage location within a pre-existing directory structure. Id. The patent states that this system had several disadvantages, including: needless overhead, file names that were often meaningless to the user, and requiring the user to remember a given document's name as well as where that document was stored. See id., col. 1, lines 40-59. As an alternative system, the '227 patent describes storing documents in a chronologically ordered "stream." Id., col. 1, lines 4-6.

The '227 patent defines a "stream" as "a time-ordered sequence of documents that functions as a diary of a person or an entity's electronic life. Every document created and every document sen[t] to a person or entity is stored in a main stream." Id., col. 4, lines 6-10. A stream contains documents from the past and present, and also could contain "documents allotted to future times and events, such as[] reminders, calendar items, and to-do lists." Id., col. 4, lines 18-21. The patent explains that "[a] document can contain any type of data," including "pictures, correspondence, bills, movies, voice mail and software programs." Id., col. 4, lines 16-18.

[2] As the parties did in their briefs, the Court will refer primarily to the specification of the '227 patent. Unless otherwise noted, citations to the '227 patent apply to all three patents at issue. See ECF No. 241, at 3 n.2; ECF No. 288, at 5 n.3.

In addition to a "main stream," which contains every document in a given computer system, the patent describes "substreams." A substream is a "subset" of the main stream. Id., col. 5, lines 16-17. A user may create a substream by applying a filter to the documents in the main stream, for example "all emails I've sent to Schwartz." See id., col. 4, lines 50-51. Substreams are "dynamic" and "persistent" in that they will, at the user's request, collect applicable information as it is added to the main stream, and substreams will continue to exist "until destroyed by the user." See id., col. 5, lines 1-13. Each substream document is in the main stream, and the same document can exist in multiple substreams. Id., col. 5, lines 14-19.

Both the '538 and '439 patents incorporate by reference the patent application that issued as the '227 patent. '538 patent, col. 1, lines 14-16; '439 patent, col. 1, lines 15-17. The specifications of the '538 patent and the '439 patent are "nearly identical." Compl., ECF No. 1 ¶ 9.

Each of the claims asserted by Mirror Worlds contains a "main stream" or "main collection" limitation and a "substream" or "subcollection" limitation. Mirror Worlds Techs., 800 F. App'x at 903.[3] "The parties agree that the 'main stream' has two properties: first, it includes every data unit received or

[3] The '439 patent uses the term "main collection" instead of the term "main stream." E.g., '439 patent, claim 1. The parties dispute whether these terms are synonymous. The term "main collection" does not appear in the '227 patent or the '538 patent.

generated by the 'computer system'; second, it is a time-ordered sequence of data units." Id.

Mirror Worlds contends that three Facebook systems infringe the asserted claims: "News Feed," "Timeline," and "Activity Log." "News Feed provides a scrolling display (or 'feed') that provides stories that might be of interest to a viewing user, for example, if friends of the user posted comments or photos, uploaded videos, or performed other actions." ECF No. 241, at 13. Timeline "allows a user to share information such as text, images, photos, videos, and other types of data, with other users on Facebook." Tang Decl., ECF No. 250-17 ¶ 4. "'Activity Log' is similar to Timeline in that it can provide a list of actions that occurred on Facebook that pertain to a particular user." Id. ¶ 6.

Mirror Worlds contends that the following Facebook components satisfy the main stream/main collection and computer system limitations: in News Feed, Mirror Worlds alleges that the Multifeed System (the backend infrastructure for News Feed) meets the computer system limitation, and that the Multifeed Leaves (a storage system for keeping track of recent user actions) meets the main stream/main collection limitation. In both Timeline and Activity Log, Mirror Worlds alleges that the Timeline backend system meets the computer system limitation, and that the TimelineDB (Timeline database) meets the main

stream/main collection limitation. See Mirror Worlds Techs., 800 F. App'x at 905-06; ECF No. 288, at 4; Mirror Worlds' Response to Facebook's Statement of Material Facts ("Mirror Worlds' RTSMF"), ECF No. 288-1, at 12-13.

Mirror Worlds asserts claims 13, 14, and 17 of the '227 patent. These claims recite:

> 13. A method which organizes each data unit received by or generated by a computer system, comprising the steps of:
>
> generating a main stream of data units and at least one substream, the main stream for receiving each data unit received by or generated by the computer system, and each substream for containing data units only from the main stream;
>
> receiving data units from other computer systems;
>
> generating data units in the computer system;
>
> selecting a timestamp to identify each data unit;
>
> associating each data unit with at least one chronological indicator having the respective timestamp;
>
> including each data unit according to the timestamp in the respective chronological indicator in at least the main stream; and
>
> maintaining at least the main stream and the substreams as persistent streams.
>
> 14. The method of claim 13, wherein each timestamp is selected from the group consisting of: past, present, and future times.
>
> 17. The method of claim 13, wherein each data unit includes textual data, video data, audio data and/or multimedia data.

'227 patent, col. 16.

Mirror Worlds asserts claim 1 of the '538 patent and claim 1 of the '439 patent. Claim 1 of the '538 patent recites:

> 1. A method of operating a computer system comprising:
>
> providing the computer system with documents from diverse applications in respective formats unique to the respective applications;
>
> causing the computer system to automatically, without user interaction and without requiring a user to designate directory structures or other pre-imposed document categorizations structures, store the provided documents as a time-ordered main stream of documents associated with respective automatically generated time indicators;
>
> said time-ordered main stream being unbounded to thereby accommodate documents associated with time indicators related to past, present and future times;
>
> said time-ordered main stream requiring no fixed beginning or end and being maintained and being selectively retrievable and searchable by the computer system;
>
> said computer system maintaining the main stream live and responsive to subsequent events by automatically incorporating therein new documents as provided to the computer system while maintaining the thus expanded main stream time-ordered;
>
> providing selected search criteria;
>
> causing said computer system to search said time-ordered main stream according to said search criteria and use search results to create a time-ordered substream of documents from the main time-ordered stream;
>
> further causing said computer system to maintain said substream live and responsive to subsequent events by automatically incorporating therein new document provided to the computer system that meet the search

criteria while maintaining the thus expanded substream time-ordered;

displaying at least selected portion of the live main stream or substream on computer display means as a display reflecting the time-ordered nature thereof;

automatically showing on the display means a display of a glance view of a displayed document in response to touching with a cursor a screen area associated with the document;

said glance view being an abbreviated version of the document and indicative of content thereof; and

said showing of the glance view occurring essentially instantaneously in response to said touching with the cursor of the screen area associated with the document.

Claim 1 of the '439 patent recites:

1. A method of operating a computer system comprising:

providing the computer system with documents in respective formats according to respective different applications through which the provided documents are generated or modified, which formats differ from one of the document to another for at least some of said provided documents, said provided documents being delivered to the computer system or generated by the computer system;

storing at least some of the documents provided to the computer system in computer storage;

said computer system being configured to automatically generate and store in computer storage respective representations related to the documents provided thereto, thereby forming a main collection of document representations;

said computer automatically generating and storing said main collection of document representations without requiring a user to designate a directory structure, a physical location for storage of document representations or corresponding documents, or another

pre-imposed document categorization structure for each of said document representations or documents;

said automatically generated and stored document representations being in a consistent format despite differences in format from one to another of the documents corresponding thereto;

said automatically generated and stored representations of said documents including respective automatically generated time indicators associated with the documents corresponding to said representations;

said automatically generated and stored representations of said documents further including respective automatically generated information relating the document representation to the respective documents provided to and stored in said computer system;

said automatically generated and stored main collection of document representations being unbounded in time and size and being configured to include documents associated with time indicators related to future times as well as to past and present times;

said automatically generated and stored main collection of document representations requiring no fixed beginning or end and being non-transitory and selectively searchable by the computer system;

providing selected search criteria;

causing said computer system to perform a first search of at least said main collection of document representations according to selected first search criteria, to provide first search results, and to utilize said first search results to generate a first sub-collection of document representations related to a respective sub-collection of the documents provided to the computer system;

selectively causing the computer system to display on a computer screen graphical depictions of only a first portion of said first subcollection of document representations generated by utilizing said first

search results, said first portion corresponding to only a portion of the documents provided to and stored in the computer system;

said first portion of said first document sub-collection of document representations corresponding to a multi-document portion of the documents provided to and stored in said computer system;

said computer system being configured to maintain at least one of said the main collection of document representations and said first sub-collection of document automatically responsive to events subsequent to the providing of said first search results such that additional document representations corresponding to additional documents provided to the computer system subsequent to an initial display of said first portion of the first sub-collection of document representations and meeting said selected search criteria are automatically included in a subsequent display of graphical depictions of one or more portions of said first sub-collection of document representations;

said additional document representations also including automatically generated respective time indicators associated with the documents subsequently provided to the computer system;

automatically showing on the computer screen a display of a glance view of a displayed document depiction while continuing to show on the screen plural displayed graphical depictions of respective plural document representations;

said glance view being an abbreviated version of the document corresponding to the graphical depiction and being indicative of content thereof; and

said showing of the glance view occurring in response to a user designating a displayed document representation by interacting with a screen area currently associated with the graphical depiction, without requiring the user to click on the designated screen area in order to enable such showing of the glance view.

In addition to the main stream/main collection limitation, the asserted claims of the '538 and '439 patents require the display of a "glance view," or a preview, of a document that the user interacts with. '538 patent, col. 16, lines 55-60; '439 patent, col. 17, lines 34-41.

I.

Facebook previously moved for summary judgment on the issue of non-infringement before discovery was completed, and the Court granted that motion in a Memorandum Opinion and Order dated August 11, 2018. 320 F. Supp. 3d 538 (S.D.N.Y. 2018). The Court concluded that the Multifeed Leaves and the TimelineDB (the accused main streams) could not be main streams because the record established that the accused computer systems receive data from TAO (a storage system which stands for "The Associations and Objects") that does not enter the Multifeed Leaves or the TimelineDB. See id. at 547-49. The Federal Circuit Court of Appeals held that conclusion was erroneous and declined to affirm the grant of summary judgment on alternative grounds urged by Facebook. See 800 F. App'x at 909-11. Accordingly, the court of appeals reversed and remanded, noting that its ruling was "without prejudice to otherwise-appropriate consideration of non-infringement contentions on remand, especially once the record is fully developed." Id. at 910. Discovery in this case has now closed, and Facebook has filed a new motion for summary

judgment relying, in part, on additional grounds of non-infringement.

There are several motions before the Court. Facebook has brought another motion for summary judgment, making three arguments in particular: (1) the asserted claims are ineligible for patent protection under 35 U.S.C. § 101; (2) Facebook does not infringe any of the asserted claims; and (3) there was no willful infringement in this case. See ECF No. 241. Mirror Worlds has brought a motion for partial summary judgment of no invalidity based on Facebook's prior art defenses. See ECF No. 233. Both parties have brought motions to exclude certain opinions of the opposing party's experts. See ECF Nos. 223, 228, 236, 246. Finally, there are fully-briefed claim construction disputes before the Court, which the court of appeals clarified are open on remand. See 800 F. App'x at 911; ECF Nos. 103-1, 108, 110.

For the reasons explained below, Facebook's motion for summary judgment is **granted in part and denied in part**. The Court will focus primarily on Facebook's motion for summary judgment, and will discuss the other outstanding motions to the extent they are relevant in resolving Facebook's motion for summary judgment.

II.

"The court shall grant summary judgment if the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(a); see also Celotex Corp. v. Catrett, 477 U.S. 317, 322-23 (1986). "[T]he trial court's task at the summary judgment motion stage of the litigation is carefully limited to discerning whether there are any genuine issues of material fact to be tried, not to deciding them. Its duty, in short, is confined at this point to issue-finding; it does not extend to issue-resolution." Gallo v. Prudential Residential Servs., Ltd. P'ship, 22 F.3d 1219, 1224 (2d Cir. 1994). The moving party bears the initial burden of "informing the district court of the basis for its motion" and identifying the matter that "it believes demonstrate[s] the absence of a genuine issue of material fact." Celotex, 477 U.S. at 323. The substantive law governing the case will identify which facts are material, and "[o]nly disputes over facts that might affect the outcome of the suit under the governing law will properly preclude the entry of summary judgment." Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 248 (1986).

In determining whether summary judgment is appropriate, the court must resolve all ambiguities and draw all reasonable inferences against the moving party. See Matsushita Elec. Indus.

Co., Ltd. v. Zenith Radio Corp., 475 U.S. 574, 587 (1986). With respect to the issues on which summary judgment is sought, if there is any evidence in the record from any source from which a "reasonable inference" could be drawn "in favor of the non-movant," summary judgment is improper. Roche Palo Alto LLC v. Apotex, Inc., 531 F.3d 1372, 1377 (Fed. Cir. 2008). The nonmoving party must "point to an evidentiary conflict created on the record," and may not rely only on "mere denials or conclusory statements." Armco, Inc. v. Cyclops Corp., 791 F.2d 147, 149 (Fed. Cir. 1986); see also Fed. R. Civ. P. 56(c).

III.

Facebook argues that all the asserted claims claim ineligible subject matter under 35 U.S.C. § 101.

Section 101 of the Patent Act, which defines the subject matter eligible for patent protection, provides: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101. The Supreme Court has held that "this provision contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable." Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208, 216 (2014) (quoting Ass'n for

Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576, 589 (2013)).

The "concern that drives this exclusionary principle [is] one of pre-emption." Id. "Laws of nature, natural phenomena, and abstract ideas are 'the basic tools of scientific and technological work.' 'Monopolization of those tools through the grant of a patent might tend to impede innovation more than it would tend to promote it,' thereby thwarting the primary object of the patent laws." Id. (quoting Myriad, 569 U.S. at 589, and Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc., 566 U.S. 66, 71 (2012)). However, courts must "tread carefully in construing this exclusionary principle" because, "[a]t some level, 'all inventions embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.'" Id. at 217 (quoting Mayo, 566 U.S. at 71).

In Alice, the Supreme Court reaffirmed the two-step framework set out in Mayo for analyzing patent eligibility under § 101. At the first step, the court asks whether the claims at issue are directed to a patent-ineligible concept. If so, the court proceeds to step two and asks whether the claims provide an "inventive concept"—that is, "an element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the

ineligible concept itself.'" Id. at 217-18 (quoting Mayo, 566 U.S. at 73).

A.

Facebook argues that the asserted claims "are directed to the abstract idea of organizing information in a time-ordered manner." ECF No. 241, at 8. Facebook cites the specification of the '227 patent, which states that the claimed invention is "a new model and system for managing personal electronic information which uses a time-ordered stream as a storage model and stream filters to organize, locate, summarize and monitor incoming information." '227 patent, col. 3, lines 62-65. Facebook also cites a line of Federal Circuit cases holding that collecting, analyzing, and displaying information is an abstract idea. See, e.g., Elec. Commc'n Techs., LLC v. ShoppersChoice.com, LLC, 958 F.3d 1178, 1182 (Fed. Cir. 2020) (abstract idea of "gathering, storing, and transmitting information"); Intellectual Ventures I LLC v. Cap. One Fin. Corp., 850 F.3d 1332, 1340 (Fed. Cir. 2017) (abstract idea of "collecting, displaying, and manipulating data"); Content Extraction and Transmission LLC v. Wells Fargo Bank, Nat'l Ass'n, 776 F.3d 1343, 1347 (Fed. Cir. 2014) ("The concept of data collection, recognition, and storage is undisputedly well-known. Indeed, humans have always performed these functions.").

Mirror Worlds argues that the asserted claims are "directed to the way in which computers name, organize, and retrieve electronic documents and distinguish the way in which conventional computers had done so." ECF No. 288, at 6 (quoting Apple, Inc. v. Mirror World Techs., LLC, No. CBM2016-00019 (P.T.A.B. May 26, 2016) ("PTAB Decision"), ECF No. 289-4, at 15). Mirror Worlds argues that the asserted claims are patent-eligible and not directed to an abstract idea because they are directed to improving computer functionality. See Alice, 573 U.S. at 225; Enfish, LLC v. Microsoft Corp., 822 F.3d 1327, 1335-36 (Fed. Cir. 2016). Mirror Worlds also notes that a federal district court and the Patent Trial and Appeal Board ("PTAB") previously concluded that the claims of the '227 patent are patent-eligible under § 101. See Mirror Worlds Techs., LLC v. Apple Inc., No. 6:13-cv-419, 2015 WL 6750306, at *10 (E.D. Tex. July 7, 2015); PTAB Decision, at 17-18.

"The Supreme Court has suggested that claims purporting to improve the functioning of the computer itself, or improving an existing technological process might not succumb to the abstract idea exception." Enfish, 822 F.3d at 1335. The cases construing the "abstract idea" exception in the computer context therefore draw a distinction between (1) claims that are directed to improving computer functionality, and (2) claims that are

directed to "a process that qualifies as an 'abstract idea' for which computers are invoked merely as a tool." Id. at 1335-36.

Enfish made clear that the court may ask whether the asserted claims are directed to improving computer functionality at Alice step one. See id. Enfish also made clear that, while improvements to computer-related technology "such as a chip architecture, an LED display, and the like" are "undoubtedly not abstract," "[s]oftware can make non-abstract improvements to computer technology just as hardware improvements can." Id. at 1335. The court in Enfish also stated that, because there is no "definitive rule to determine what constitutes an 'abstract idea' sufficient to satisfy" Alice step one, "both [the Federal Circuit] and the Supreme Court have found it sufficient to compare claims at issue to those claims already found to be directed to an abstract idea in previous cases." Id. at 1334.

In Enfish, the asserted claims related to a self-referential computer database structure. The self-referential database improved upon the prior art "relational" model by (1) including all data entities in a single table rather than providing each type of data in a separate table, and (2) defining a table's columns by rows in that same table. See id. at 1330-32. The patents in Enfish taught that these design improvements allowed for faster searching of data, more effective storage of certain types of data, and more flexibility

in configuring a database. See id. at 1333. The court concluded that the asserted patents were not directed to an abstract idea at Alice step one; rather, they were "directed to a specific improvement to the way computers operate, embodied in the self-referential table." Id. at 1336. The court emphasized the patents' disparagement of the prior art relational model. See id. at 1337. The court also found that the invention's "ability to run on a general-purpose computer" did not "doom[] the claims" because the claims were directed to improving computer functionality, unlike the claims in cases such as Alice that "can readily be understood as simply adding conventional computer components to well-known business practices." Id. at 1338.

The claims asserted in this case are similar, even though their focus is broader than the claims at issue in Enfish. The claims asserted here are also aimed at improving the storage and retrieval of data on a computer. The patents teach that conventional operating systems were cumbersome, difficult to navigate, and carried several disadvantages: users had to store new information in fixed categories, archiving was not automatic, and "the historical context of a document [was] lost because no tracking of where, why and how a document evolves [was] performed." '227 patent, col. 1, lines 42-52. The claimed invention attempts to solve these problems by storing documents

in a computer system in time-ordered streams. See id., col. 2, lines 13-16. Because the claimed invention stores all data units in a time-ordered main stream, the user is not required to store documents in a pre-imposed directory structure, documents are automatically archived, and the user can see how a document has evolved over time. The claimed operating system also allows the user to avoid the "unneeded overhead" of naming a file and choosing a storage location whenever a file is created. See id., col. 1, lines 42-44; id., col. 2, lines 20-24 (under the claimed operating system, "the storage of the files is handled automatically and file names are only used if a user chooses to invent such names"). This is similar to the way in which the patents in Enfish improved upon the functionality of prior art computer systems. See 822 F.3d at 1333 ("[W]hereas deployment of a relational database often involves extensive modeling and configuration of the various tables and relationships in advance of launching the database, Enfish argues that the self-referential database can be launched without such tasks and instead configured on-the-fly."). The asserted claims seek to improve upon traditional computer operating systems by storing and retrieving data in a more efficient way. Accordingly, the claims are directed to improving computer functionality.[4]

[4] The two prior decisions that considered the patent eligibility of the '227 patent reached the same conclusion. The PTAB Decision, relying on Enfish and DDR Holdings, LLC v. Hotels.com, L.P., 773 F.3d 1245 (Fed. Cir. 2014),

Facebook argues that "[t]he asserted claims fall squarely within the oft-cited line of Federal Circuit cases repeatedly invalidating claims directed to collecting, analyzing, and displaying information." ECF No. 241, at 9. This is not so. The claims in the cases cited by Facebook used the computer as a tool to collect and analyze data for some purpose other than improving computer functionality. See, e.g., ShoppersChoice.com, 958 F.3d at 1181 ("providing advance notification of the pickup or delivery of a mobile thing"); SAP Am., Inc. v. InvestPic, LLC, 898 F.3d 1161, 1164-67 (Fed. Cir. 2018) (statistical method for analyzing financial data); Intellectual Ventures I, 850 F.3d at 1339-40 (method for editing specific type of computer documents); Electric Power Grp., LLC v. Alstom S.A., 830 F.3d 1350, 1351-53 (Fed. Cir. 2016) ("systems and methods for performing real-time performance monitoring of an electric power grid"). Those claims, like the claims in Alice, used computers to perform a process or task that itself qualified as an

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emphasized that the '227 patent sought to solve problems "that arose specifically in the realm of computer operating systems" and "that did not exist in the pre-computer world." PTAB Decision, at 15-17. The district court in Mirror Worlds Techs. v. Apple, 2015 WL 6750306, concluded that the '227 patent was directed to an abstract idea but that the asserted claims contained a sufficient "inventive concept" at Alice step two. See id. at *8-10. However, the district court also concluded that the '227 patent was "directed to improving computer technology," id. at *8, and the district court's decision came before the Federal Circuit Court of Appeals clarified in Enfish that claims may be deemed patent-eligible at step one because they are directed to improving computer functionality. Accordingly, both decisions that have considered the patentability of the '227 patent under § 101 support the conclusion that the asserted claims are patent-eligible because they are directed to improving computer functionality.

abstract idea. The asserted claims in this case, by contrast, are directed to improving how computers "carry out one of their basic functions of storage and retrieval of data." Id. at 1354.

Facebook also argues that the claims are "directed at using computers to solve a human problem of storing and organizing information." ECF No. 241, at 10. But "describing the claims at such a high level of abstraction and untethered from the language of the claims all but ensures that the exceptions to § 101 swallow the rule." Enfish, 822 F.3d at 1337; see also Alice, 573 U.S. at 217 ("[W]e tread carefully in construing this exclusionary principle [of laws of nature, natural phenomena, and abstract ideas] lest it swallow all of patent law."). It is true that storing and organizing information is a human problem that exists independent of computers. But the asserted claims are directed to a specific improvement in the way that computers store and retrieve data; the patents articulate, and attempt to overcome, challenges created by traditional prior art operating systems that are specific to the computer context. See DDR Holdings, LLC v. Hotels.com, L.P., 773 F.3d 1245, 1257–59 (Fed. Cir. 2014) (concluding that the claims at issue were patent-eligible under § 101 because "the claimed solution is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks").

Accordingly, the asserted claims are directed to improving computer functionality. Facebook fails to distinguish Enfish in a meaningful way or to explain why the prior decisions holding the '227 patent patent-eligible under § 101 are mistaken. And while Facebook emphasizes the breadth of the claim language and its lack of technological details, this is due—at least in part—to the breadth of the problem that the claims aim to solve and the fact that data storage and retrieval are fundamental aspects of computer functionality. Moreover, Facebook points to no cases where claims directed to improving computer functionality were found ineligible under § 101 due to a lack of implementation details or for any other reason.[5]

Because the claims are directed to improving computer functionality, the claims are not directed to an abstract idea at Alice step one and the Court need not reach step two. See Enfish, 822 F.3d at 1339.[6]

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[5] At argument, Facebook relied on Berkheimer v. HP Inc., 881 F.3d 1360 (Fed. Cir. 2018). In Berkheimer, the court of appeals explained that the use of a "parser" to transform a data structure from source code to object code was an abstract idea without evidence that this transformation improved computer functionality in some way. See id. at 1367. The asserted claims in this case, however, describe a stream-based operating system that is directed to improving computer functionality.

[6] The Court concludes that all the asserted claims are directed to improving the way in which computers store and retrieve data. Claims 14 and 17 of the '227 patent, which depend on independent claim 13, are substantially similar to claim 13. Claim 14 simply clarifies that past, present, and future timestamps can be selected, and claim 17 clarifies that all types of data may be included in the time-ordered streams. See '227 patent, col. 16, lines 26-28, 38-40. Claim 1 of the '538 patent and claim 1 of the '439 patent are also substantially similar to claim 13 of the '227 patent. While these claims recite an additional "glance view" limitation that provides an "abbreviated version of the document corresponding to the graphical depiction and being

IV.

The Court turns next to the issue of infringement and the parties' related claim construction disputes.

Infringement analysis is a two-step process: "The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly construed claims to the device accused of infringing." Markman v. Westview Instruments, Inc., 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc), aff'd, 517 U.S. 370 (1996); see also N. Am. Container, Inc. v. Plastipak Packaging, Inc., 415 F.3d 1335, 1344 (Fed. Cir. 2005).

A.

Claim construction, the first step in infringement analysis, is a matter of law. See Markman, 52 F.3d at 979. "It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude." Phillips v. AWH Corp., 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc). "A court construing a patent claim seeks to accord a claim the meaning it would have to a person of ordinary skill in the art at the time of the invention."

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indicative of content thereof," '538 patent, col. 16, lines 55-60; '439 patent, col. 17, lines 34-41, both claims focus on the stream-based, time-ordered storage and retrieval of data on a computer. "[B]ecause all the claims are substantially similar," addressing each claim separately for the purposes of § 101 is unnecessary. Content Extraction and Transmission LLC v. Wells Fargo Bank, Nat'l Ass'n, 776 F.3d 1343, 1348 (Fed. Cir. 2014). Accordingly, claim 13 of the '227 patent is representative of all the asserted claims for purposes of the § 101 analysis, and all the asserted claims are directed to improving computer functionality.

Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc., 381 F.3d 1111, 1116 (Fed. Cir. 2004) (collecting cases). "The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation." Phillips, 415 F.3d at 1313. "[T]he words of a claim are generally given their ordinary and customary meaning." Id. at 1312.

"[T]he person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." Id. at 1313. In deciding issues of claim construction, "the court looks to those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean. Those sources include the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." Id. at 1314. "[T]he context of the surrounding words of the claim also must be considered in determining the ordinary and customary meaning of those terms." Id. "[W]hile extrinsic evidence can shed useful light on the relevant art, . . . it is less significant than the intrinsic record in determining the legally operative meaning of claim language." Id. at 1317.

"Only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy." Eon Corp. IP Holdings v. Silver Spring Networks, 815 F.3d 1314, 1318-19 (Fed. Cir. 2016). The parties agree that all the asserted claims recite a main stream or main collection limitation, which requires Mirror Worlds to identify a stream that is inclusive of every data unit received or generated by the alleged computer system. There are two disputed terms, however, that must be decided in order to resolve Facebook's motion for summary judgment on non-infringement: "data unit" and "main collection."

"Data unit" is in issue because the parties' infringement dispute hinges on whether the Multifeed Leaves and the TimelineDB, the alleged main streams/main collections, include every data unit received or generated by the alleged computer systems (the Multifeed System and the Timeline backend system, respectively). To determine whether the alleged main streams/main collections include every data unit received or generated by the alleged computer systems, the Court must first clarify what is and what is not a "data unit."

Facebook contends that "data unit" means "document." First, Facebook points to the prosecution history of the '227 patent, which is "designated as part of the 'intrinsic evidence,'" Phillips, 415 F.3d at 1317. Facebook cites a 1999 amendment

submitted by the patentees in which the patentees sought to "clarify key terms" with express definitions. See ECF No. 109-1, at FBMW_00097563.[7] In this amendment, the patentees state: "A 'data unit' is a 'document' because a 'document can contain any type of data.'" Id.[8] The amendment went on to use the terms "documents" and "data units" interchangeably. See, e.g., id. ("a time-ordered sequence of documents (data units)"). Facebook notes that "The patentee is held to what he declares during the prosecution of his patent." Gillespie v. Dywidag Sys. Int'l, USA, 501 F.3d 1285, 1291 (Fed. Cir. 2007). Facebook also notes that, in connection with a covered business method ("CBM") review of the '227 patent, Mirror Worlds stated that "The broadest reasonable construction of 'data unit' is 'document.'" ECF No. 103-3, at 61; see also Aylus Networks, Inc. v. Apple, Inc., 856 F.3d 1353, 1359-60 (Fed. Cir. 2017) (doctrine of prosecution disclaimer applies to statements made in post-issuance proceedings).

Mirror Worlds contends that "data unit" means "an item of information that is of direct user interest." Mirror Worlds

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[7] By its text, the 1999 amendment sought to clarify "key terms in the amended claims." ECF No. 109-1, at FBMW_00097563 (emphasis added). The asserted independent claim 13 is one of the claims that was amended, see id. at FBMW_00097555, and, in any event, the '227 patent provides no basis for defining "data unit" differently across different claims. See Phillips, 415 F.3d at 1314 ("[C]laim terms are normally used consistently throughout the patent[.]").

[8] The patentees were quoting the then-current version of the specification. This language appears in the final specification. '227 patent, col. 4, lines 16-18 ("A document can contain any type of data including but not limited to pictures, correspondence, bills, movies, voice mail and software programs.").

argues that "document," Facebook's proposed construction, has two deficiencies: (1) it fails to account for the fact that data unit only encompasses information that is of direct user interest; and (2) it fails to clarify that a data unit can include video, audio, and multimedia data as opposed to only textual data.

Mirror Worlds' first contention is without merit. First, it finds no support in the claim language or the specification. While the specification does make clear that the invention seeks to provide a system for organizing and managing "personal electronic information," '227 patent, col. 3, lines 62-63, the patent's overarching aim of displaying information that is interesting to the user cannot be crammed into the term "data unit." Displaying information that is of interest to the user is a goal of the invention writ large; it is not captured in these two words. A person of ordinary skill in the art would not understand "data unit" to refer only to those units of data that happen to interest a particular user at a particular time.[9]

Second, the doctrine of prosecution disclaimer precludes Mirror Worlds' construction. In their preliminary response filed in connection with a CBM review, the patentees disputed the petitioner's indefiniteness challenge by disclaiming the very

[9] Nor would a person of ordinary skill in the art interpret "data unit" to refer only to data that is of direct interest to a "user" in the generic sense, as the patentees once argued. See ECF No. 103-3, at 72.

construction that they urge this Court to adopt. See ECF No. 103-3, at 65-66 ("The definitions of 'data unit' in both the specification and prosecution history do not include the narrowing limitation that forms the basis of Petitioner's indefiniteness challenge—i.e., 'an item of information that is of direct user interest in the user's timeline.'"). This is a "clear and unmistakable" disavowal of the "direct user interest" limitation, and Aylus makes clear that the patentees cannot argue claims "one way in order to maintain their patentability and in a different way against accused infringers." 856 F.3d at 1360.[10] Even apart from the doctrine of disclaimer, the patentees persuasively argued in their preliminary response that the '227

[10] While Aylus specifically held that the doctrine of prosecution disclaimer applies to statements made in inter partes review ("IPR") proceedings, the logic of Aylus and the policy behind prosecution disclaimer apply equally to CBM proceedings. Applying prosecution disclaimer in this case will "promote the public notice function of the intrinsic evidence and protect the public's reliance on definitive statements made during" CBM proceedings. Aylus, 856 F.3d at 1360. Further in support of applying the doctrine in this case is the fact that the patentees argued to the PTAB that "document" is the best interpretation of "data unit," not merely the broadest reasonable interpretation ("BRI"). See, e.g., ECF No. 103-3, at 64 ("Consistent with the implicit definition of 'data unit' in the '227 specification, the patent applicant explicitly defined 'data unit' as a 'document' during prosecution."). Mirror Worlds appears to argue that the Court should not consider Mirror Worlds' statement in its CBM preliminary response because the BRI standard governed claim construction in the CBM review. This argument is unpersuasive because the BRI standard governed claim construction in IPR proceedings when Aylus was decided in 2017. See Celgene Corp. v. Peter, 931 F.3d 1342, 1349 n.8 (Fed. Cir. 2019) (noting that the revised claim construction standard for IPR proceedings applies only to petitions filed on or after November 13, 2018). Mirror Worlds points to no cases undermining the holding of Aylus. And while counsel for Mirror Worlds states that "the patent owner's statements were always expressly made under the BRI standard, and were expressly distinguished from the Phillips standard," ECF No. 310, at 2, that is simply not true. As the quoted text from the preliminary response demonstrates, Mirror Worlds repeatedly argued in the preliminary response that the patentees—explicitly during prosecution and implicitly in the language of the '227 patent—defined "data unit" as "document" without any narrowing limitation.

patent defines the term "data unit" as "document" by implication because "the patentee uses 'data unit' throughout the entire specification in a manner consistent with, and as a synonym for, 'document.'" ECF No. 103-3, at 63 (citing Irdeto Access, Inc. v. Echostar Satellite Corp., 383 F.3d 1295, 1301 (Fed. Cir. 2004)). Accordingly, the doctrine of prosecution disclaimer applies and, furthermore, the intrinsic evidence does not support Mirror Worlds' "of direct user interest" limitation.[11]

[11] The Court also agrees with Facebook that Mirror Worlds' proposed construction is "confusing," "subjective," and would render the term "data unit" indefinite because different users have different opinions about what information is of direct interest, and even the same user may be interested in different information at different times. See ECF No. 108, at 3. While the court in Mirror Worlds Techs., LLC v. Apple Inc., No. 6:13-cv-419, 2015 WL 179072, at *3 (E.D. Tex. Jan. 14, 2015) accepted the "of direct user interest" limitation, this Court disagrees with that construction. The Court does not find a basis for this limitation in the language of the patent. The district court in Texas concluded that the "of direct user interest" limitation "arose during prosecution in an examiner interview and is thus expressly supported." Id. (citing a January 19, 1999 interview summary by the patent examiner). But the 1999 amendment, which was made in direct response to the January 19, 1999 interview, is more important to the construction of the claim term than the interview summary prepared by the examiner. In the amendment, the patentees stated that the "primar[y]" amendment in light of the January 19, 1999 interview was to clarify that "'each data unit received by or generated by the computer system' is received by the 'main stream'. In other words, all the data units, without regard to whether a data unit was generated internally or externally, are of significance to the user." ECF No. 109-1, at FBMW_00097562-63. This language appears to emphasize that all the information contained in the computer system is included in the main stream, regardless of its source. This language does not appear to add a new "of direct user interest" limitation to the term "data unit." The amendment goes on: "[S]ubstreams allow a user to determine the events of direct user interest from the stream of data units of significance to the user (main stream)." Id. at FBMW_00097563 (emphasis added). This contrast between substreams and the main stream makes clear that the substream is the layer in which the user has the opportunity to filter information that is of direct interest. The main stream, on the other hand, contains all information that is received or generated by the computer system, without any selection criteria from the user. The language of the patent provides no basis for concluding that only data "of direct user interest" is included in the computer system, and a person of ordinary skill in the art would not understand "data unit" to be so limited. And, given the opportunity to amend

Mirror Worlds' other contention—that "document" fails to clarify that a data unit can include video, audio, and multimedia data—has more force. The specification makes clear that "A document can contain any type of data including but not limited to pictures, correspondence, bills, movies, voice mail and software programs." '227 patent, col. 4, lines 16-18. Indeed, Facebook does not dispute that "data unit" encompasses any type of data, not merely textual data. The Court agrees with Mirror Worlds that "an item of information" is clearer in this respect than "document." Accordingly, the Court construes "data unit" as "an item of information."[12]

The second disputed term is "main collection." The term "main collection" appears only in the '439 patent. Facebook argues that "main collection" means "main stream." Mirror Worlds argues that, in claim 1 of the '439 patent, "main collection" means "main collection of document representations."[13]

The Court agrees with Facebook. "Main collection" is a coined term with no established meaning in the field. See Gray Decl., ECF No. 108-1 ¶ 133. The specification of the '439 patent

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the claim language in light of the January 19, 1999 interview, the patentees expressly defined "data unit" as "document," without any limiting language.

[12] The Court "need not accept the constructions proposed by either party." Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Canada (U.S.), 687 F.3d 1266, 1274 (Fed. Cir. 2012).

[13] In its claim construction brief, Mirror Worlds urges a different construction of "main collection" for claims 9, 19, and 20 of the '439 patent. However, only claim 1 of the '439 patent is at issue. Facebook's Statement of Material Facts, ECF No. 241-1 ¶ 2; Mirror Worlds' RTSMF ¶ 2. Accordingly, the Court will only consider Mirror Worlds' proposed construction for claim 1.

does not use the term "main collection." But, like the '227 patent, the '439 specification discusses "time-ordered streams" and a "stream-based" operating system. See '439 patent, title; id., col. 1, line 67-col. 2, line 1.[14] The '439 patent also explicitly incorporates the '227 patent application in its entirety, which discusses main streams at length. See id., col. 1, lines 15-17. And as Facebook notes, "claim drafters can [] use different terms to define the exact same subject matter." Curtiss-Wright Flow Control Corp. v. Velan, Inc., 438 F.3d 1374, 1380 (Fed. Cir. 2006). The '439 patent uses the terms "stream" and "collection" interchangeably. See '439 patent, col. 12, lines 39-42 (emphasis added) ("Top-Down streams are more permanent, generally more administrative streams or collections of information . . . ."). The '227 patent also uses these terms interchangeably. See '227 patent, col. 5, lines 16-17 ("A substream, in other words, is a 'subset' of the main stream document collection."); id., col. 6, lines 11-13 ("Each view of a stream is implemented as a client of the server and provides the user with a 'viewpoint' interface to document collections, that is, streams."). Because the patents use the terms "stream" and "collection" interchangeably, "main stream" and "main

[14] See also '439 patent, abstract (emphasis added) ("A st[r]eam-based document storage and retrieval system accepts documents that are in diverse formats and come from diverse application, automatically creates document model objects describing these documents in a consistent format and associating time stamps with the documents to automatically create a main stream in chronological order.").

collection" are synonymous. Neither the specification of the '439 patent (which does not use the term "main collection" at all) nor the claim language provides a basis for concluding otherwise.

Mirror Worlds argues that "The patentees expressly used 'main collection' when referring to documents or document representations, and a 'main stream' when referring to data units." ECF No. 103-1, at 11. But this is plainly untrue. See, e.g., '227 patent, col. 5, lines 14-19 (emphasis added) ("Although a document may belong to any number of substreams, the document also enters and remains on the main stream. A substream, in other words, is a 'subset' of the main stream document collection. In other words, a way of looking at the main stream so as to exclude certain documents temporarily."). The '439 patent's use of the word "document" instead of "data unit" is of no moment because the patentees, in the prosecution history of the '227 patent, expressly stated that these terms are synonymous. ECF No. 109-1, at FBMW_00097563.

Mirror Worlds also argues that "main collection" cannot mean "main stream" because claim 1 of the '439 patent does not require characteristics that the parties agree describe a stream, namely: (1) being time-ordered; (2) functioning "as a diary of a person or entity's electronic life" that has "three main portions: past, present, and future," and (3) including

"every data unit received by or generated by the computer system." ECF No. 103-1, at 11. But any construction of "main collection" that lacked these characteristics would be impermissibly untethered to the specification. Because "main collection" is a coined term with no "established meaning to one of ordinary skill in the art," it must be interpreted in light of the specification and "cannot be construed broader than the disclosure in the specification." Indacon, Inc. v. Facebook, Inc., 824 F.3d 1352, 1357 (Fed. Cir. 2016). The '439 specification clearly states that the invention incorporates the characteristics of a stream. See, e.g., '439 patent, col. 1, line 67-col. 2, line 3 ("The system is stream-based in that it creates time-ordered streams of information items or assets, beginning with the oldest and continuing through current and on to future items."); id., col. 2, line 67-col. 3, line 2 (emphasis added) ("One can search on any word or phrase, as every word in every document is indexed, on document types and metadata, and on time-related data[.]"). The patentees' use of an undefined, coined term in the claim language cannot broaden the invention described in the specification. See Retractable Techs., Inc. v. Becton, Dickinson and Co., 653 F.3d 1296, 1305 (Fed. Cir. 2011) (construction must "tether the claims to what the specifications indicate the inventor actually invented").

"Main collection" also cannot lack the characteristics of a stream because those characteristics are what set the invention apart from the prior art that the specification disavows. "Where the general summary or description of the invention describes a feature of the invention and criticizes other products that lack that same feature, this operates as a clear disavowal of these other products." Edwards Lifesciences LLC v. Cook Inc., 582 F.3d 1322, 1333 (Fed. Cir. 2009). The specification of the '439 patent, like the '227 specification, specifically disavows the "traditional storage and retrieval systems" that were not time-ordered. '439 patent, col. 1, lines 49-67. Mirror Worlds' construction fails because it seeks to capture, through claim construction, the non-time-ordered systems the specification specifically disavows.[15]

Accordingly, the Court construes "main collection" in claim 1 of the '439 patent as "main stream." Because the Court construes "main collection" as "main stream," the analysis below concerning the main stream limitation applies with equal force to all the patents at issue.

[15] Similarly, the fact that claim 1 of the '439 patent contains vague language leaving open the possibility that the "main collection" includes "at least some," but not necessarily all, of the documents in the computer system, '439 patent, col. 16, line 29, does not save Mirror Worlds' construction because "the specifications tell us otherwise." Retractable Techs., 653 F.3d at 1305; see '439 patent, col. 3, line 1 ("every word in every document is indexed"); id., abstract (emphasis added) (the system "automatically create[s] a main stream in chronological order").

B.

The second step of infringement analysis "is comparing the properly construed claims to the device accused of infringing." Markman, 52 F.3d at 976. Mirror Worlds alleges that three Facebook features infringe the asserted patents: News Feed, Timeline, and Activity Log.

Mirror Worlds pursues a theory of "literal infringement." "To establish literal infringement, every limitation set forth in a claim must be found in an accused product, exactly." Advanced Steel Recovery, LLC v. X-Body Equipment, Inc., 808 F.3d 1313, 1319 (Fed. Cir. 2015). "Summary judgment of noninfringement is proper when no reasonable jury could find that every limitation recited in a properly construed claim is found in the accused device either literally or under the doctrine of equivalents." Id. at 1317. "The absence of even a single limitation of [the asserted claims] from the accused device precludes a finding of literal infringement." Kahn v. Gen. Motors Corp., 135 F.3d 1472, 1477 (Fed. Cir. 1998).

1.

Within News Feed, Mirror Worlds alleges that the Multifeed System (the backend infrastructure for News Feed) is the "computer system," and that the Multifeed Leaves (a storage system for keeping track of recent user actions) is the "main stream." Accordingly, to prove infringement, Mirror Worlds must

show that the Multifeed Leaves includes every data unit received or generated by the Multifeed System. Facebook argues that it is entitled to summary judgment of non-infringement because the record conclusively establishes that the Multifeed System contains data units that are not contained in the Multifeed Leaves. Facebook bears the burden at this stage because it is the party moving for summary judgment.

Facebook's theory of non-infringement with respect to News Feed focuses primarily on the Multifeed Aggregator. The Multifeed Aggregator is part of the Multifeed System. Mao Decl., ECF No. 250-16 ¶¶ 6-7. Facebook argues that the Multifeed Aggregator receives several categories of information that are not stored in the Multifeed Leaves. The Court will address these categories of information in turn.

Coefficient

Facebook argues that the Multifeed Aggregator receives information known as "coefficient scores" from the "Coefficient service." ECF No. 241, at 15. "A coefficient score provides a numerical weight that describes the strength of the relationship between the user and a particular friend." Mao Decl. ¶ 12. "The [Multifeed] Aggregator uses these coefficient scores to potentially boost candidate stories relating to friends with whom the user has a closer relationship." Id. Yun Mao, an

Engineering Director at Facebook who leads the Feed and Stories Infrastructure Team, unequivocally testified that coefficient scores are received by the Multifeed Aggregator, and that coefficient scores "are not stored in or received from the [Multifeed] Leaves." Id.

Mirror Worlds responds that "record evidence shows that the 'coefficient score' Facebook alleges is 'received' by the Multifeed Aggregator is not received as part of the write pathway for writing data to the Leaves." Mirror Worlds' RTSMF ¶ 44. In support of this proposition Mirror Worlds cites a broad statement from Gregory Marra, Facebook's director of product management: "I understand that leaves are where information from News Feed are stored." Id. (citing Tsuei Decl., Ex. 7, ECF No. 290-2, at 83). Because this general statement does not address coefficient scores or how data is written to the Multifeed Leaves or the Multifeed System, it is insufficient to create a dispute of material fact.

Mirror Worlds also cites Exhibits 27, 28, and 30 to the Tsuei Declaration. Id. Together, Exhibits 27 and 30 demonstrate that the "Tailer" is used to write data to the Multifeed Leaves. See Tsuei Decl., Ex. 27, ECF No. 290-19, at FBMW_00118300 ("[The Tailer] is the input data pipeline that gets user actions to the storage layer [the Leaves] in real time."); id., Ex. 30, ECF No. 290-22, at FBMW_00136009 (diagram showing "Tailers" writing into

"Feed Leaf"). Exhibit 28, ECF No. 290-20, at 1, does not discuss the Tailer in particular, but states that "When a user takes any action on Facebook, there are two independent pipelines that record this action (i.e. a UserAction) to the Leaves."

Mirror Worlds' argument appears to be that information cannot be in the Multifeed System (the alleged computer system) unless it is "received through the Tailer[]." ECF No. 288, at 18. This argument finds no support in the record. Facebook has offered specific evidence that the Multifeed Aggregator (part of the Multifeed System, the alleged computer system) receives data (coefficient scores) that is not contained in the Multifeed Leaves (the alleged main stream). Even if the record established that there is only one path for information to get into the Multifeed Leaves (which it does not, see Ex. 28; Balakrishnan Rpt., ECF No. 250-19 ¶ 204), it would not necessarily follow that there is only one path for information to get into the Multifeed System. Mirror Worlds points to no evidence demonstrating that the Tailer is the only pathway into the Multifeed System or the Multifeed Aggregator in particular. Accordingly, Mirror Worlds' attempt to show that there is only one data pipeline into the Multifeed Leaves, even if successful, would not create a dispute of material fact.

Mirror Worlds likewise misses the mark by arguing that "Facebook has presented no evidence that the information

identified in its motion . . . is user data received by the Tailer[]." ECF No. 288, at 19. Facebook does not need to show that the data it points to is received by the Tailer to prove non-infringement. Facebook need only prove that there is data in the Multifeed System that is not contained in the Multifeed Leaves. Moreover, Mirror Worlds' insistence that Facebook point specifically to "user data" that is contained in the alleged computer system but not the alleged main stream is misleading. The patents are clear that the main stream must contain every data unit (of whatever type) that is received or generated by the computer system. See, e.g., '227 patent, col. 16, lines 9-10 ("A method which organizes each data unit received by or generated by a computer system"); id., col. 4, lines 8-10 ("Every document created and every document sen[t] to a person or entity is stored in a main stream."); ECF No. 109-1, at FBMW_00097563 ("A 'data unit' is a 'document' because a 'document can contain any type of data.'").[16] As Facebook correctly notes, "That the Multifeed Leaves store user actions (e.g., provided by the Tailer[]) is in no way inconsistent with the Multifeed Aggregator receiving additional information beyond

[16] See also '538 patent, claim 1 (reciting a "main stream"); '439 patent, claim 1 (reciting a "main collection," which the Court has construed as "main stream"); id., abstract ("main stream"); Omega Eng'g, Inc. v. Raytek Corp., 334 F.3d 1314, 1334 (Fed. Cir. 2003) ("[W]e presume, unless otherwise compelled, that the same claim term in the same patent or related patents carries the same construed meaning.").

user actions that is not stored in the Multifeed Leaves." ECF No. 300, at 4-5.[17]

Finally, Mirror Worlds argues that coefficient scores being included in the Multifeed Aggregator but not the Multifeed Leaves does not prove non-infringement because coefficient scores are "queries," and therefore not "data units" within the meaning of the asserted patents. See ECF No. 288, at 15-16, 19-20. First, Mirror Worlds has presented no evidence that coefficient scores should be considered "queries." Even if a query is involved in getting coefficient scores from the Coefficient service to the Multifeed Aggregator, the record is clear that a coefficient score is an item of information that the Multifeed Aggregator "receives and relies on." Mao Decl. ¶ 12. The coefficient score is not simply a request made to or from the Multifeed Aggregator. Moreover, Mirror Worlds' argument fails under the Court's construction of "data unit." A query is plainly "an item of information," which is also consistent with Mirror Worlds' argument that "data unit" includes any type of data.

[17] Mirror Worlds' "user data" argument also fails to the extent it is based on Mirror Worlds' construction of the term "data unit." First, for the reasons explained above, "data unit" does not contain an "of direct user interest" limitation. Second, Mirror Worlds explicitly argues in its claim construction brief that "data unit" should be construed to clarify that "data unit" can refer to data in any format (that is, textual or otherwise). The Court accepted that argument in construing "data unit" to mean "an item of information." Accordingly, there is no subject matter or format limitation built into the term "data unit."

Facebook has established that the Multifeed Aggregator (part of the Multifeed System, the alleged computer system) receives coefficient scores, which are items of information that are not contained in the Multifeed Leaves. Mirror Worlds has offered no evidence to the contrary. Accordingly, the News Feed system does not infringe the asserted patents, and Facebook is entitled to summary judgment of non-infringement with respect to News Feed.

AdFinder

Facebook also argues that the Multifeed Aggregator receives information from a system called "AdFinder," and that this information is not stored in the Multifeed Leaves. ECF No. 241, at 15-16; Mao Decl. ¶¶ 9-10, 16; Facebook's Statement of Material Facts ("Facebook's SMF"), ECF No. 241-1 ¶¶ 47-48; Balakrishnan Rpt. ¶¶ 226, 229, 544-45, 563-64.

AdFinder generates advertisements relevant to a particular user and provides those ads to the Multifeed Aggregator. Mao Decl. ¶ 16. Mr. Mao declared:

> The interactions between AdFinder and the Multifeed Aggregator involve the exchange of hundreds of pieces of information that did not come from (and were not stored in) the Multifeed Leaves, but other separate and distinct storage systems within Facebook. The candidate stories generated by the Multifeed Aggregator corresponding to these advertisements thus incorporate information that came from AdFinder and that was not stored in the Multifeed Leaves.

Id. Accordingly, there is unequivocal evidence in the record that the Multifeed Aggregator receives information from AdFinder that is not contained in the Multifeed Leaves.

Mirror Worlds cites no evidence to the contrary. Mirror Worlds cites deposition testimony from Facebook engineer Mainak Mandal, Mirror Worlds' RTSMF ¶ 47[18] (citing Tsuei Decl., Ex. 15, ECF No. 290-9, at 107-08), but this testimony supports Facebook. Mr. Mandal testified that there are two types of stories in a user's feed—"ad stories" and "organic stories." Tsuei Decl., Ex. 15, at 107-08. He further testified that the organic stories ("any story that is not an ad") "come from Multifeed Leaves," while the ad stories are "generated on AdFinder." Id. at 108. This testimony supports Facebook's argument that the Multifeed Aggregator contains information from AdFinder that is not stored in the Multifeed Leaves.[19]

The remainder of Mirror Worlds' response to Facebook's Statement of Material Fact regarding AdFinder is identical to Mirror Worlds' response concerning Coefficient service. Compare

[18] Mirror Worlds' RTSMF ¶¶ 47 and 48, which both address AdFinder, are identical in substance.

[19] Mirror Worlds next cites deposition testimony from Mr. Mao. Mirror Worlds' RTSMF ¶ 47 (citing Tsuei Decl., Ex. 48, ECF No. 290-35, at 41). This testimony supports the distinction Mr. Mandal drew between ad stories and organic stories. See Tsuei Decl., Ex. 48, at 41 ("[organic content is] actually not—not from the ads bracket"). Mirror Worlds also cites the deposition testimony of Facebook's expert, Dr. Ravin Balakrishnan. RTSMF ¶ 47 (citing Tsuei Decl., Ex. 17, ECF No. 290-11, at 197-200). This testimony does not help Mirror Worlds because Dr. Balakrishnan simply reiterates that ads are not "organic content." Tsuei Decl., Ex. 17, at 199-200.

Mirror Worlds' RTSMF ¶ 47, with id. ¶ 44. The sources that are duplicated from ¶ 44 fail to create a dispute of material fact for the same reasons explained with respect to Coefficient service: the sources do not address AdFinder in particular, and Facebook does not need to show that the information from AdFinder is "received as part of the write pathway for writing data to the Leaves," id. ¶ 47, to prove non-infringement. The thrust of Facebook's argument is that the information from AdFinder is not contained in the Leaves.

Also for the reasons explained with respect to Coefficient service, Mirror Worlds' argument that the information the Multifeed Aggregator receives from AdFinder does not consist of "data units" fails. Under the Court's construction of "data unit," there is no "of direct user interest" limitation, and it is plain that the Multifeed Aggregator receives items of information from AdFinder.[20] Accordingly, Facebook has established that the Multifeed Aggregator receives information from AdFinder that is not stored in the Multifeed Leaves.

Ego

Ego is a Facebook system that "generates recommendations, for example, identifying other Facebook users whom the current

[20] Mirror Worlds does not argue, as it did with respect to coefficient scores, that information from AdFinder is merely part of a query, and therefore not a data unit. See ECF No. 288, at 19.

user may wish to become friends ('People You May Know'), or Groups or Pages that might be of interest to the current user." Mao Decl. ¶ 17. As with information from AdFinder, Mr. Mao declares: "The recommendation information provided by Ego to the Multifeed Aggregator did not come from (and are not stored in) the Multifeed Leaves, and thus, the candidate stories generated by the Multifeed Aggregator to reflect those recommendations incorporate information that was not stored in the Multifeed Leaves." Id.; see also Facebook's SMF ¶ 49; Balakrishnan Rpt. ¶¶ 236, 540, 563, 565.

Mirror Worlds cites no evidence to the contrary. Indeed, Mirror Worlds' RTSMF ¶ 49 is identical to ¶ 47 (the response concerning AdFinder), except the words "information from Ego" replace the words "information from AdFinder." Mirror Worlds cites no record evidence to dispute that the Multifeed Aggregator receives information from Ego that is not stored in the Multifeed Leaves. For the reasons explained above, Mirror Worlds' arguments that (1) Facebook has not shown that information from Ego is received "as part of the write pathway for writing data to the Leaves," Mirror Worlds' RTSMF ¶ 49, and (2) the information from Ego is not a "data unit" (either because it is part of a query or because it is not "of direct user interest") also fail. Accordingly, Facebook has established

that the Multifeed Aggregator receives information from Ego that is not stored in the Multifeed Leaves.

TAO, Recent Interactions, and ReadState

Facebook also argues that user information from TAO, as well as recent interaction information and information called the "ReadState," is received by the Multifeed Aggregator but not contained in the Multifeed Leaves. However, there are issues of fact that preclude these categories of data from being a basis for summary judgment of non-infringement.

TAO is a "data store that provides access to objects and their associations with other objects." Bronson Decl., ECF No. 123 ¶ 20.[21] Facebook argues that three categories of user information that are not stored in the Multifeed Leaves are received by the Multifeed Aggregator from TAO: "(1) a list of 'Friends' of the user for whom the News Feed is being prepared; (2) the list of 'Pages' on Facebook that the user has liked, and (3) the list of 'Groups' the user has joined." ECF No. 241, at 14. Mirror Worlds, however, points to a Facebook document concerning the Multifeed System that states: "A user's friends, pages, liked, and other actions are also stored in the leaves."

[21] "Generally, the content Facebook users see is an amalgamation of 'objects' and 'associations,' which are two classes of data. Users, pictures, and comments are types of objects, while associations describe the relationship between objects. For example, if user 'Alice' posts a comment on Facebook, an 'authorship' association would connect Alice and the comment." Mirror Worlds Techs., 800 F. App'x at 904.

Tsuei Decl., Ex. 27, at FBMW_00118300. The same document states that the Multifeed Leaves "indexes all user actions." Id. (emphasis added); see also id. ("all of a user's recent Actions and Objects will be indexed"). This record evidence is sufficient to create a dispute of material fact as to whether lists of the user's friends, pages liked, and groups joined are stored in the Multifeed Leaves.

Facebook also argues that the Multifeed Aggregator receives "recent interaction information" ("such as posts the user recently liked or videos the user recently watched") that is not stored in the Multifeed Leaves. ECF No. 241, at 15; Mao Decl. ¶ 15. But, as explained in the previous paragraph, Mirror Worlds cites record evidence to the effect that the Multifeed Leaves indexes "all user actions," which is sufficient to raise a dispute of material fact as to whether recent interaction information is stored in the Multifeed Leaves.

Finally, Facebook argues that the Multifeed Aggregator receives information called the "ReadState," "which informs the Aggregator which stories were already recently presented to the user." ECF No. 241, at 15; see also Mao Decl. ¶ 14. There is record evidence that ReadState indexes all stories that a user has seen along with those stories' "respective timestamps and view duration." Tsuei Decl., Ex. 30, at FBMW_00136001. What stories a user views, and for how long a user views those

stories, could plausibly be considered "user actions," which record evidence suggests are indexed in the Multifeed Leaves. Any ambiguity regarding whether "all user actions" includes the Readstate information must be resolved in favor of Mirror Worlds at this stage.

Accordingly, summary judgment of non-infringement cannot be granted based on (1) the data that Facebook alleges is sent to the Multifeed Aggregator by TAO, (2) recent interaction information, or (3) ReadState.

In sum, with respect to News Feed, while Facebook is not entitled to summary judgment of non-infringement based on data received from TAO, recent interaction information, or ReadState, Facebook is entitled to summary judgment of non-infringement on three independent bases: the record conclusively establishes that the Multifeed Aggregator (part of the Multifeed System, the alleged computer system) receives information from (1) Coefficient service, (2) AdFinder, and (3) Ego that is not stored in the Multifeed Leaves (the alleged main stream).

2.

Mirror Worlds alleges that two Facebook features in addition to News Feed infringe the asserted patents: Timeline and Activity Log. The parties treat Timeline and Activity Log together because they are supported by the same backend infrastructure. See ECF No. 241, at 16-17; ECF No. 288, at 12

n.6; Tang Decl. ¶ 2. The Court will likewise discuss these two features together. For purposes of Timeline and Activity Log, Mirror Worlds alleges that the Timeline backend system is the computer system, and that the TimelineDB is the alleged main stream. See Facebook's SMF ¶¶ 36-37; Mirror Worlds' RTSMF ¶¶ 36-37. Accordingly, to prove infringement, Mirror Worlds must show that the TimelineDB includes every data unit received or generated by the Timeline backend system.

The TimelineDB is "a database used within Facebook to keep track of certain types of actions taken by users on Facebook." Tang Decl. ¶ 9. The "Timeline Aggregator" is part of the Timeline backend system. Id. ¶ 7. The Timeline Aggregator, which is used by both the Timeline and Activity Log features, "deliver[s] a list of user engagements (or user actions) that pertain to a particular user." Id. ¶ 8. Similar to its argument regarding News Feed, Facebook argues that the Timeline Aggregator (part of the alleged computer system) receives information that is not contained in the TimelineDB (the alleged main stream). The Court will address each disputed set of information in turn.

Background User Information

Facebook argues that the Timeline Aggregator receives "extensive information about the user for whom the Timeline or

Activity Log pertains including the user's birthday, list of family members, list of children, list of places previously lived, education history, among other information," from "at least two different storage systems"—TAO and UDB (user database). ECF No. 241, at 16. The record contains unequivocal evidence that this background user information is received by the Timeline Aggregator and is not stored in the TimelineDB. Yifei Tang, an engineering manager at Facebook on the Timeline team, declared:

> The Timeline Aggregator component implements a complex process that requires the Aggregator to receive and rely on an extensive amount of information that is not stored in the TimelineDB. For example, the "front end" . . . constructs a request to the Timeline Aggregator that supplies the Aggregator with a number of pieces of information relating to the user in question, including the user's birthday, list of family members, list of children, list of places previously lived, education history, along with other information about that user. This information received by the Aggregator is not stored in the TimelineDB but was instead obtained from "TAO" and "UDB" (user database), storage systems that are separate and distinct from the TimelineDB.

Tang Decl. ¶ 10; see also Balakrishnan Rpt. ¶¶ 307-09.

Mirror Worlds attempts to create an issue of fact with respect to this clear evidence, but none of its attempts are sufficient. Mirror Worlds cites various exhibits that purportedly stand for the propositions that the TimelineDB "is a backend system that persists all actions by users and pages and indexes them chronologically" and that "everything relating to

[the user]" is contained in the TimelineDB. See ECF No. 288, at 4, 12-13; Koskinen Decl., ECF No. 145 ¶ 74. But the documents cited for these propositions actually refer to "Timeline" (the backend system writ large), not the TimelineDB. See Tsuei Decl., Ex. 37, ECF No. 290-29, at FBMW_00007832; id., Ex. 35, ECF No. 290-27, at FBMW_00098325. Counsel for Mirror Worlds and Mirror Worlds' expert, Dr. Eric Koskinen, simply changed the subjects of the quoted sentences.[22] Because these documents do not describe the TimelineDB, they do not stand for the proposition that the TimelineDB contains all background user information contained in the Timeline backend system.

Mirror Worlds also cites evidence that there is a path from TAO to the TimelineDB. See id., Ex. 24, ECF No. 290-16, at FBMW_00000211. But this does not establish that all data from TAO is contained in the TimelineDB; nor does it establish that background user information in particular (birthday, list of family, places lived, etc.) is stored in the TimelineDB. And while Mirror Worlds points to snippets of the testimony of

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[22] In other portions of their papers, counsel for Mirror Worlds and Dr. Koskinen demonstrate an understanding of this distinction. See Mirror Worlds' RTSMF ¶ 36 ("Mirror Worlds contends that the 'computer system' for its theory of infringement by Facebook's Timeline and Activity Log features is the 'Timeline Backend' system."); id. ¶ 37 ("Mirror Worlds contends the TimelineDB is a 'main stream[.]'"); ECF No. 288, at 4 (arguing that "the Timeline Backend system stores in the TimelineDB all user data that may appear in Timeline or Activity Log in time-order"); Koskinen Decl. ¶ 26 ("The Timeline backend system includes the "TimelineDB"). This distinction was also made clear by the court of appeals. See Mirror Worlds Techs., 800 F. App'x at 904 ("The Timeline back-end system includes the TimelineDB database and an Aggregator.").

Jeffrey Huang, Director of Engineering at Facebook, none of those snippets contradict the clear testimony of Mr. Tang that the Timeline Aggregator receives background user information that is not contained in the TimelineDB. Tang Decl. ¶ 10.

For example, Mirror Worlds cites testimony from Mr. Huang that casts some doubt as to whether TAO is properly referred to as a storage system. E.g., Huang Depo., ECF No. 290-4, at 37 (TAO is "an interface to fetch data, but I wouldn't necessarily say that it is a way to store the data."). However, whether TAO is properly referred to as a storage system is not a material fact. "Only disputes over facts that might affect the outcome of the suit under the governing law will properly preclude the entry of summary judgment." Anderson, 477 U.S. at 248. Facebook has adduced clear evidence that the Timeline Aggregator receives background user information that is not stored in the TimelineDB. Mirror Worlds points to no evidence to the contrary. It is not material whether TAO (1) stores the background user information and delivers that information to the Timeline Aggregator, or (2) is an interface that is responsible for sending the background user information to the Timeline Aggregator.[23] Accordingly, this dispute is one of terminology and does not affect the outcome of the non-infringement dispute.

[23] Nathan Bronson, a Facebook engineer who helped implement TAO, explained that, "when News Feed, Timeline, Activity Log [and other features] seek to retrieve objects such as photos and comments from Facebook's data store, it

Mirror Worlds also cites a diagram illustrating a portion of the accused system, and emphasizes that the diagram "show[s] no interaction between UDB, TAO or Coefficient with the Aggregator." ECF No. 288, at 14 (citing Tsuei Decl., Ex. 26, ECF No. 290-18, at FBMW_00014972). But this diagram does not appear to depict TAO at all. It is undisputed that TAO exists, and the record is clear that the Timeline and Activity Log features could not function without TAO. See, e.g., Huang Depo. at 128 ("[S]o in any form of rendering Timeline or Activity Log you have to have TAO."). Moreover, when counsel for Mirror Worlds confronted Mr. Huang at his deposition with diagrams such as this one that do not explicitly reference TAO, Mr. Huang explained (1) that references to data sources that TAO can fetch from, such as UDB, could be understood as references to TAO; and (2) that the diagrams alluded to focus on specific aspects of the Timeline service that do not include the role of TAO, see id. at 128 ("[TAO is] not part of this diagram because these are very infra, very backend heavy documents and diagrams. . . . just because it's not there doesn't mean it doesn't exist."); id. at 130 (A: "The diagrams that we've been looking at, again,

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is TAO that retrieves and delivers an up-to-date version of those objects to the features." "In cases where the data associated with an object is very large, such as for photos and videos, an object is stored in TAO that contains enough information to fetch the full contents from a separate system specially optimized for that data type. For most objects, TAO stores all of the data directly . . . ." Bronson Decl. ¶¶ 4, 21-22. This description confirms that TAO acts both as a storage system and as a go-between that fetches data for the accused features from elsewhere.

are very zoomed in on a specific piece of --" Q: "Mr. Huang, it's a 'yes' or 'no' question."). Accordingly, the lack of interaction between the Timeline Aggregator and UDB or TAO in any particular diagram does not create a dispute of material fact.

Mirror Worlds also relies on statements by its expert, Dr. Koskinen. But those conclusions are not supported by the evidence in the record. See, e.g., Koskinen Rpt., ECF No. 279-1 ¶ 114 (stating without citing any evidence that the TimelineDB is a "main stream"). Moreover, Dr. Koskinen's statements rely on documents where Dr. Koskinen has simply changed the subject of the quoted sentence from "Timeline" to "the TimelineDB." Compare, e.g., id. ¶ 115 ("TimelineDB is a 'time-ordered index for all time[.]'"), with Tsuei Decl., Ex. 54, ECF No. 290-37, at slide 5 ("Timeline: Time-ordered index for all time"). Dr. Koskinen's conclusory statements are not supported by the underlying documents and are therefore not entitled to any weight.

Mirror Worlds appears to argue that data cannot enter the Timeline backend system (the accused computer system) unless that data goes through what Mirror Worlds asserts is the designated path for writing data into the TimelineDB (the

accused main stream).[24] This argument, like Mirror Worlds' argument concerning the Tailer and the Multifeed System, finds no support in the record. Facebook has presented evidence that data is received by the Timeline Aggregator that is not contained in the TimelineDB. E.g., Tang Decl. ¶ 10. The testimony of Mr. Huang (and other sources relied on by Mirror Worlds) only speak to how data is written into the TimelineDB. But even if Mirror Worlds could demonstrate that there is only one pathway for writing data into the TimelineDB, Mirror Worlds has presented no evidence that there is only one pathway for writing data into the Timeline backend system or the Timeline Aggregator in particular. To prove non-infringement, Facebook does not need to show that the data that is included in the Timeline Aggregator is received as part of the pathway for writing data into the TimelineDB. Rather, Facebook need only show that data received by the Timeline Aggregator is not included in the TimelineDB, and Facebook has done so. Accordingly, Mirror Worlds' argument concerning the write pathway to the TimelineDB fails to create a dispute of material fact.

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[24] See ECF No. 288, at 14 ("Timeline utilizes a write path to store 'user data'—to 'persist activities'—in the TimelineDB, and a separate read path to 'get activities.' Writing user data to the backend requires specific function calls. Facebook has presented no evidence that any of its newly-identified information is subject to any such function call . . . ."); Mirror Worlds' RTSMF ¶ 51 (emphasis added) ("[R]ecord evidence shows that the information . . . Facebook alleges is 'received' by the Timeline Aggregator is not received at all, or received as part of the write pathway for writing data to the TimelineDB.").

The court of appeals found that summary judgment was not warranted on the record of the first summary judgment motion with respect to TAO and the Timeline and Activity Log features. See 800 F. App'x at 908-09. Most of the court of appeals' discussion of this issue focused on Facebook's failure to provide definitive evidence that the Timeline Aggregator receives the asserted evidence from TAO. That defect in Facebook's argument has been cured because there is now unequivocal evidence that the Timeline Aggregator receives background user information from TAO. See Tang Decl. ¶ 10; Balakrishnan Rpt. ¶¶ 307-09.

The court of appeals also highlighted evidence suggesting that the frontend, rather than the Timeline Aggregator, receives the data from TAO referenced by Facebook. See 800 F. App'x at 909. The court of appeals cited Mr. Huang's testimony that "it's really the web tier that I consider the frontend that then, you know, needs to go to TAO to actually fetch any of the content." Id. (quoting Huang Depo., at 29-30). In light of the fully-developed record, this testimony does not create a dispute of material fact. That the frontend queries TAO, and that the frontend receives data from TAO, is not inconsistent with the Timeline Aggregator receiving background user information from TAO. Mr. Huang did not testify that the frontend is the only destination to which TAO sends data. Moreover, there is record

evidence specifically establishing that TAO sends background user information to the Timeline Aggregator. See Tang Decl. ¶ 10; Balakrishnan Rpt. ¶¶ 307-09. Finally, this testimony does not reflect at all on the relationship between UDB and the Timeline Aggregator. Because Facebook has provided evidence that background user information that is not stored in the TimelineDB is received by the Timeline Aggregator from both TAO and UDB, this testimony does not create a dispute of material fact as to whether the Timeline Aggregator receives background user information that is not contained in the TimelineDB.

As it argued with respect to the News Feed feature, Mirror Worlds argues that, even if the Timeline Aggregator receives background user information that is not contained in the TimelineDB, that would not establish non-infringement because background user information does not consist of "data units." Mirror Worlds' RTSMF ¶ 51. This argument fails. The background user information consists of items of information.

Accordingly, the record establishes that the Timeline Aggregator receives background user information that is not contained in the TimelineDB. Facebook is entitled to summary judgment of non-infringement with respect to the Timeline and Activity Log features on this basis.

Major Life Events

Facebook also argues that the Timeline Aggregator receives a list of a user's major life events, such as graduations, marriages, or moving to a new city. See ECF No. 241, at 17; Facebook's SMF ¶ 52. Facebook points to unequivocal evidence that this major life event information is received by the Timeline Aggregator from TAO or UDB, and that this data is not stored in the TimelineDB. Tang Decl. ¶ 11; see also Balakrishnan Rpt. ¶¶ 254, 256-57, 307, 317, 337.

Mirror Worlds' RTSMF ¶ 52 is identical to its RTSMF ¶ 51, other than replacing background user information with "major life events." Accordingly, for all the reasons explained in connection with background user information, Mirror Worlds has failed to create a dispute of material fact as to whether the Timeline Aggregator receives major life event information that is not contained in the TimelineDB. None of the sources cited by Mirror Worlds in its RTSMF ¶ 52, on their own or taken together, establish either that the TimelineDB contains major life event information, or that the Timeline Aggregator does not receive major life event information. Mirror Worlds' argument that this information does not consist of "data units" also fails because this information meets the Court's construction of "data unit."

Therefore, Facebook is entitled to summary judgment of non-infringement with respect to Timeline and Activity Log for the

independent reason that it has proven beyond reasonable dispute that the Timeline Aggregator receives major life event information that is not contained in the TimelineDB.

Coefficient

Finally, Facebook argues that the Timeline Aggregator receives information from the Coefficient service (discussed above with respect to News Feed) that is not contained in the TimelineDB. See ECF No. 241, at 16-17; Facebook's SMF ¶ 53. Facebook again points to unequivocal testimony that this information, which is used by the Timeline Aggregator to identify a user's degree of engagement with other users, is not stored in the TimelineDB. Tang Decl. ¶ 12; see also Balakrishnan Rpt. ¶¶ 246, 300-01, 307-09, 313.

Mirror Worlds' RTSMF ¶ 53 is identical to its RTSMF ¶¶ 51-52, except for inserting the phrase "coefficient score" in place of background user information or major life events. Accordingly, for all the reasons explained in connection with background user information, Mirror Worlds has failed to create a dispute of material fact as to whether the Timeline Aggregator receives data from the Coefficient service that is not contained in the TimelineDB. Mirror Worlds' argument that this information does not consist of "data units" fails here as well.

Therefore, Facebook is entitled to summary judgment of non-infringement with respect to Timeline and Activity Log on the independent basis that the Timeline Aggregator receives data from the Coefficient service that is not contained in the TimelineDB.

To sum up regarding Timeline and Activity Log: Facebook is entitled to summary judgment of non-infringement with respect to these two features because Facebook has proven that the Timeline Aggregator receives the following data that is not contained in the TimelineDB: (1) background user information; (2) major life event information; and (3) coefficient data. Each of these sets of information constitutes an independent basis entitling Facebook to summary judgment of non-infringement with respect to Timeline and Activity Log.

3.

The absence of a "main stream" and "main collection"[25] in the accused features means that Facebook is entitled to summary judgment of non-infringement with respect to all the asserted claims. Facebook also urges an additional ground of non-infringement with respect to the asserted claims of the '538 and '439 patents: namely, that none of the accused Facebook features contain a "glance view" limitation.

[25] The '227 patent and the '538 patent explicitly recite a main stream limitation, see '227 patent, claim 13; '538 patent, claim 1. The '439 patent contains a "main collection" limitation, which the Court has construed to be equivalent to a main stream limitation. See '439 patent, claim 1.

Claim 1 of the '538 patent and claim 1 of the '439 patent each contain a "glance view" limitation. See '538 patent, col. 16, lines 55-60; '439 patent, col. 17, lines 34-41. The patents explain that the glance view is intended to "make searching for and working with a document more intuitive." '538 patent, col. 3, lines 44-45; see also '439 patent, col. 3, lines 46-47. The glance view provides a preview of a document to a user who is scrolling through a stream of documents, "such as a thumbnail image of the first page of the document, a WAV or MP3 preview of an audio file, [] an animated GIF preview of a video file," or "text summaries." '538 patent, col. 7, lines 20-26; see also id., col. 2, lines 62-63; '439 patent, col. 7, lines 23-29. Claim 1 of both patents requires the glance view to be "an abbreviated version of the document" being depicted and "indicative of content thereof." '538 patent, col. 16, lines 59-60; '439 patent, col. 17, lines 39-41.[26] The patents also explain that the glance view appears in response to "touching with a cursor a screen area associated with the document." '538 patent, col. 16, lines 57-58; see also '439 patent, col. 17, lines 42-47.

Mirror Worlds contends that the glance view limitation of the asserted claims of the '538 and '439 patents is satisfied by

[26] Mirror Worlds says this "summary" limitation only appears in the specification, ECF No. 288, at 22, but that is plainly not true. Mirror Worlds simply ignores the claim language that says the glance view must be "an abbreviated version of the document" and "indicative of content thereof."

a Facebook functionality in which the user can "hover" the user's cursor over a profile link (such as a link associated with a Page on Facebook). Facebook's SMF ¶ 61; Mirror Worlds' RTSMF ¶ 61. Facebook has offered evidence demonstrating that this hover functionality does not meet the glance view limitation. See Tang Decl. ¶¶ 15-19. Specifically, Facebook has shown that its hover functionality (or the "contextual dialog box," id. ¶ 14) provides only information about the source or author of the selected link, not information about the content of any underlying document. See id. ¶ 16. Facebook illustrates that two stories from the same author relating to completely different topics will yield the same contextual dialog box. See id. ¶¶ 17-18. Moreover, Mr. Tang declares that the content of the underlying story or document is not even provided to the source code responsible for creating the contextual dialog box. Id. ¶ 19. Accordingly, the contextual dialog box does not display—or even take into account—the content of the underlying document, and so it is not "an abbreviated version of the document" or "indicative of content thereof," '538 patent, col. 16, lines 59-60; '439 patent, col. 17, lines 39-41.

Mirror Worlds points to screenshots that allegedly illustrate that the contextual dialog box does provide information about the content of the underlying document. See ECF No. 288, at 23; Koskinen Rpt. ¶¶ 179, 184, 189, 194, 199,

361, 366, 371, 378, 384 (reproducing same three screenshots). Dr. Koskinen copied these screenshots from the Complaint. Id. ¶ 179. The Complaint alleges that these three screenshots came from third-party websites. Compl., at 30-32.

Facebook argues that all of Dr. Koskinen's testimony relying on these third-party materials should be excluded. The Court agrees. One of the screenshots was taken from a YouTube video that no longer exists and was never produced. See Balakrishnan Rpt. ¶ 443. Dr. Koskinen admits that he was not involved in creating any of the screenshots, and he testified that he could not tell when the images were taken, when they were archived, whether they had been cropped, or even what user action prompted the creation of the asserted glance view. See Koskinen Depo., ECF No. 227-4, at 116, 119-20, 127, 129, 131.

These screenshots are not independently admissible because they cannot be authenticated. See Fed. R. Evid. 901. Mirror Worlds offers no evidence to support a finding that these screenshots are what they purport to be. Instead, Mirror Worlds invokes Federal Rule of Evidence 703, which allows an expert to rely on inadmissible facts or data "[i]f experts in the particular field would reasonably rely on those kinds of facts or data in forming an opinion on the subject." It is plainly unreasonable for a technical expert to rely on unauthenticated, undated screenshots in forming an opinion. See Bd. of Trustees

of AFTRA Ret. Fund v. JPMorgan Chase Bank, N.A., No. 09-cv-686, 2011 WL 6288415, at *9-10 (S.D.N.Y. Dec. 15, 2011) (screenshot unreliable basis for expert opinion "where the expert does not know the source of the documents and cannot guarantee its reliability"). Relying on the screenshots in this case is especially unreasonable because Dr. Koskinen cannot verify what user action produced the asserted glance view, and Dr. Koskinen had access to the source code for the accused feature.[27]

Accordingly, Facebook's motion to exclude the opinions of Dr. Koskinen that rely on unauthenticated screenshots purporting to demonstrate the accused glance view functionality is **granted**. Mirror Worlds presents no admissible evidence to create a dispute of material fact as to whether Facebook's contextual dialog box indicates the content of the underlying story or document. Facebook's evidence establishes that its hover functionality does not meet the glance view limitation. Therefore, summary judgment of non-infringement as to the asserted claims of the '538 and '439 patents is appropriate on this basis as well.

[27] The cases cited by Mirror Worlds are not to the contrary. RMail Ltd. v. Amazon.com, Inc., No. 2:10-cv-258, 2019 WL 10375642, at *2 (E.D. Tex. June 12, 2019) involved a screenshot offered to prove notice of infringement, not a screenshot relied on by an expert to show infringement. The screenshots in ICON Internet Competence Network B.V. v. Travelocity.com LP, No. 3:11-cv-1131, 2013 WL 655024, *4 (N.D. Tex. Feb. 22, 2013) were offered to show prior disclosure of an expert's theory. The screenshots in DE Techs., Inc. v. Dell, Inc., No. 7:04-cv-628, 2007 WL 1112406, at *29 (W.D. Va. Apr. 9, 2007) were offered to illustrate the functionality of a prior art system. None of these cases involve a challenge to an expert's use of unauthenticated screenshots to demonstrate infringement.

V.

The Court need not reach the remainder of the parties' disputes. Because the Court concludes that there was no infringement of the asserted patents as a matter of law, this was necessarily not an "egregious" case of willful infringement warranting enhanced damages. See Halo Elecs., Inc. v. Pulse Elecs., Inc., 579 U.S. 93, 104 (2016). The Court need not reach the remainder of Facebook's motion to exclude certain opinions of Dr. Koskinen, ECF No. 223 (that is, all of the motion except the section regarding "glance view") because the remaining opinions are not relevant to the Court's summary judgment ruling. The Court does not need to reach Facebook's motion to exclude the opinions of Mr. Bergman, ECF No. 228, because those opinions relate only to damages. The Court need not reach Mirror Worlds' motion for partial summary judgment of no invalidity based on Facebook's prior art defenses, ECF No. 233, because the Court grants Facebook's motion for summary judgment of non-infringement. The Court need not reach Mirror Worlds' motion to exclude certain opinions of Facebook's expert witnesses, ECF No. 236, because the Court did not need to consider (1) Facebook's invalidity theories based on prior art, or (2) Dr. Balakrishnan's opinions regarding the summary of Mirror Worlds' prior infringement accusations in deciding Facebook's motion for summary judgment. Finally, the Court need not reach Mirror

Worlds' motion to strike certain opinions of Mr. Bokhart, ECF No. 246, because those opinions relate only to damages.

CONCLUSION

The Court has considered all of the arguments raised by the parties. To the extent not specifically addressed above, the arguments are either moot or without merit. For the reasons explained above, Facebook's motion for summary judgment is **granted in part and denied in part.** The Court concludes that the asserted claims are patent-eligible under § 101, and that there was no infringement in this case as a matter of law. The evidence establishes that no reasonable juror could find that Facebook infringed the patents at issue.

The Clerk is directed to enter judgment dismissing this case. The Clerk is also directed to close all pending motions and to close this case.

SO ORDERED.

Dated: **New York, New York**
March 2, 2022

John G. Koeltl
United States District Judge