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19 |

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

Palo Alto Research Center Inc.,	) Case No. 2:20-cv-10754
	)
Plaintiff,	)
	)
v.	) **COMPLAINT FOR PATENT**
	) **INFRINGEMENT**
Twitter, Inc.,	)
	) **DEMAND FOR JURY TRIAL**
Defendant.	)
	)

Plaintiff Palo Alto Research Center Inc. ("PARC" or "Plaintiff") brings this Complaint against Twitter, Inc. ("Twitter" or "Defendant") for infringement of U.S. Patent Nos. 8,489,599 (the "'599 Patent"); 9,208,439 (the "'439 Patent"); 8,606,781 (the "'781 Patent"); 8,966,362 (the "'362 Patent"); 7,043,475 (the "'475 Patent"); and 7,167,871 (the "'871 Patent") (collectively, the "PARC Patents"). Plaintiff, on personal knowledge as to its own acts, and on information and belief as to all others based on its investigation, alleges as follows:

SUMMARY OF THE ACTION

1.   This is a patent infringement suit relating to Twitter's unauthorized and unlicensed use of the PARC Patents on its websites and in its apps. The technologies claimed in the PARC Patents support many of Twitter's core functionalities, such as its personalized and targeted advertisement services; and its social network feeds and notification features.

2.   PARC has been at the forefront of technological innovation for over 50 years. In addition to inventing the first personal computer, PARC is responsible for many cutting-edge technologies we now consider indispensable to our daily lives, like the laser printer; Ethernet; the windows, pop-up menus, and icons that form today's computer "desktop"; a word processing program that led to Microsoft Word; and computer animation systems that later earned both an Emmy and an Academy Award. PARC's revered scientists and engineers are integral to its history of innovation and work tirelessly, all over the world, to continue creating transformational products for the future. In recognition of that hard work, the United States Patent and Trademark Office ("USPTO") has issued thousands of patents to PARC.

3.   Twitter's origins date back to 2006. It began as a "microblogging service" that limited messages to 140 characters, and has since turned into an expansive social media platform that now allows tweets composed of text, images, videos, advertisements, and links among other content. Today, hundreds of millions of

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1   users all over the world use Twitter as their source of breaking news and information.

2   However, with the rise of Twitter's popularity came a number of issues, including

3   how to serve targeted, relevant advertisements to users when there are millions of ads

4   and advertisers from which to choose, and challenges to the integrity of users' social

5   network feeds.

6   4.   Because PARC was at the nucleus of the idea that later birthed the

7   Internet, it anticipated many of these issues before they began to plague Twitter. And

8   PARC's ground-breaking artificial intelligence—which has been a focus of PARC

9   engineers since well before Twitter existed—forms the backbone of many of these

10   solutions, including those described in the PARC Patents. PARC brings this action to

11   put a stop to Twitter's unauthorized and unlicensed use of the PARC Patents.

THE PARTIES

I.   PARC

14   5.   PARC is a wholly-owned subsidiary of Xerox Corporation ("Xerox"),

15   with a principal place of business at 3333 Coyote Hill Road, Palo Alto, California

16   94304.

17   6.   PARC and its corporate parent, Xerox, have made some of the most

18   important technological breakthroughs of the past 100 years, including the first

19   personal computer; the advent of laser printing, Ethernet, and graphical user interfaces

20   ("GUIs"); the "desktop" metaphor ubiquitous with today's computers; object-oriented

21   programming; electronic paper; and many other technologies. Not only do PARC and

22   Xerox have a deeply-rooted past in pioneering printer and computer advancements,

23   but they have also extended that legacy to newer technologies like artificial

24   intelligence ("AI").[1] AI underlies the machine learning, computer modeling, and data

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[1] *See* Greg Nichols, *PARC is turning 50: From Ethernet and laser printing to this wild new tech*, NDNET, (March 10, 2020), https://www.zdnet.com/article/parc-is-turning-

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science tools that will help businesses solve the challenges of the 21st century related to big data, personalization, and prediction algorithms.

7.   PARC's innovations aren't limited to its computing origins. PARC develops and builds technologies far beyond its core competencies, and helps others bring their ideas to fruition. For example, PARC has worked with the U.S. Department of Defense, Department of Energy, NASA, and DARPA to meet their ambitious goals for the next generation of technology. PARC also partners with entrepreneurs and start-ups to realize their dreams. These collaborations have resulted in greener air conditioning technologies,[2] floating oceanic sensors, fiber optic sensors, solar energy, natural language search, novel medical devices, and improvements to natural gas processing. Today, PARC continues this tradition to shape the future and improve the world.

II.   DEFENDANT

8.   On information and belief, Twitter is a Delaware Corporation with its principal place of business at 1335 Market Street, San Francisco, California 94103. Twitter is a social media company, which owns and operates a microblogging and social media service.

9.   On information and belief, Twitter (including its subsidiaries) directly and/or indirectly develops, designs, manufactures, uses, distributes, markets, offers to sell and/or sells infringing products and services in the United States, including in this District, and otherwise purposefully directs infringing activities to this District in connection with its websites and applications.

50-from-ethernet-and-laser-printing-to-this-wild-new-tech/.

[2] *See Electrocaloric devices show potential for greener air conditioning*. PhysicsWorld (Oct. 1, 2020), https://physicsworld.com/a/electrocaloric-devices-show-potential-for-greener-air-conditioning/.

COMPLAINT FOR PATENT INFRINGEMENT

JURISDICTION AND VENUE

10.   This is an action arising under the patent laws of the United States, 35 U.S.C. §§ 1, *et seq*. Accordingly, this Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 (federal question) and 1338(a) (action arising under an Act of Congress relating to patents). Venue is proper in this judicial district under 28 U.S.C. §§ 1391 and 1400(b).

11.   More specifically, this action for patent infringement involves Twitter's manufacture, use, sale and/or lease, offer for sale and/or lease, of infringing technology within its websites and applications to create and deliver targeted and personalized ads; deliver personalized, context-specific content to users; identify false or misleading information; and maintain the integrity of its social network feeds (the "Infringing Products" associated with each of the PARC Patents as shown below).

12.   The Infringing Products, which are explained in exemplary detail *infra*, include Twitter's targeted and personalized advertising systems; Twitter's notification and messaging system; Twitter's comment organization system; and Twitter's systems that identify false or misleading information.

13.   On information and belief, Twitter has offices physically located in the Central District of California. Twitter lists Los Angeles as an employment location on its website.[3] On information and belief, Twitter owns and/or leases the premises where these offices are located. On information and belief, these Twitter offices are staffed by persons directly employed by Twitter, many of whom live in this District. On information and belief, Twitter employs numerous individuals whom live in and/or work within this District.

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[3]   *See, e.g. Careers*, TWITTER, https://careers.twitter.com/content/careers-twitter/en/jobs.html#location=careers-twitter%3Asr%2Foffice%2Flos-angeles   (last visited November 24, 2020).

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14.   On information and belief, Twitter has committed and continues to commit acts of infringement in violation of 35 U.S.C. § 271, and has made, used, marketed, distributed, offered for sale, sold, and/or imported its Infringing Products in the State of California, including in this District, and engaged in infringing conduct within and directed at or from this District.

15.   On information and belief, Twitter conducts its regular, established business at its offices in this District. These Twitter offices and employees develop, provide, maintain, make available, and assist others in using the Infringing Products, including customers in this District, across the United States, and across the globe. Twitter also has purposefully and voluntarily placed the Infringing Products into the stream of commerce with the expectation that the Infringing Products will be used in this District. The Infringing Products have been and continue to be distributed to and used in this District. Twitter's acts cause injury to PARC, including within this District.

16.   This Court has general and/or specific personal jurisdiction over Twitter, and venue is proper because Twitter, directly and/or in combination with its subsidiaries and/or through its agents, does continuous and systematic business in this District, including by providing its Infringing Products to residents of this District, providing its Infringing Products that it knew would be used within this District, and/or participating in the solicitation of business from residents of this District.

17.   Moreover, on information and belief, Twitter, directly or through its subsidiaries, places its Infringing Products in the stream of commerce, which is directed at this District, with the knowledge and/or understanding that such Infringing Products will be provided to customers within this District. In addition, on information and belief, Twitter, directly or through its subsidiaries, employs individuals within this District, including employees who design, develop, use, offer, or make available its Infringing Products to customers here, and maintains offices and

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1   facilities here. Twitter, directly or through its subsidiaries, operates highly-trafficked

2   commercial websites and mobile applications through which customers in this District

3   regularly use the Infringing Products.

4   18.   Venue is appropriate in this Court because PARC maintains business

5   connections in this District. PARC has partnered with various organizations to create

6   innovations that have had significant impact on this District. For instance, in

7   collaboration with the Virginia Tech Transport Institute (VTTI), PARC secured

8   funding from the Advanced Research Projects Agency–Energy (ARPA-e) section of

9   the United States Government's TRANSNET program in order to create a pilot

10 program in Los Angeles designed to save substantial amounts of energy previously

11 used on commercial transportation.[4] Other examples include PARC's work with the

12 University of California, Riverside ("UCR"), on (a) a DARPA project related to a

13 UCR AI visual security project;[5] and (b) a Department of Energy project related to the

14 production of carbon fibers. Yet another example is PARC's work with Boeing's HRL

15 Laboratories in Malibu related to diode research.

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[4] Press Release, PARC A Xerox Company, *PARC Secures ARPA-E Funding to Build Energy-Saving Travel Preferences Attractive to Individual Travelers,* PARC, https://www.parc.com/press-releases/parc-secures-arpa-e-funding-to-build-energy-saving-travel-preferences-attractive-to-individual-travelers/ (last visited November 24, 2020).

[5] UC Riverside News, *UC Riverside computer scientists receive grant to improve security of visual artificial intelligence*, https://news.ucr.edu/articles/2020/07/27/uc-riverside-computer-scientists-receive-grant-improve-security-visual (last visited November 24, 2020).

COMPLAINT FOR PATENT INFRINGEMENT

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FACTUAL BACKGROUND

I.   PARC'S HISTORY OF INNOVATION

19.   PARC has spent more than 50 years investing in and developing ground-breaking technology. From revolutionary laser printer and Ethernet innovations to transformational AI, PARC and Xerox have been at the forefront of every major technological advancement in the computer world.

20.   In 1970, PARC was born. PARC was originally tasked with creating computer-related products, and it delivered. In 1971, PARC created laser printers, which developed into a multibillion dollar printing business for Xerox. In 1973, PARC designed the first personal computer called the "Alto" and a system of linked devices, which it coined "Ethernet." In 1975, PARC debuted the first GUIs, and eventually influenced both Microsoft and Apple in their first attempts at personal computing. As a result, PARC has earned the moniker of "the smartest think tank on the planet."[6]

21.   PARC continues to create innovative products today, and helps others pioneer the future of science and technology. It lends custom research and development services, technology, expertise, and best practices to several Fortune 500 and Global 1000 companies, small startups, and numerous government agencies. These partnerships have resulted in game-changing solutions to electric grid reliability,[7] climate change, infrastructure maintenance, and other industries.[8] PARC's

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[6] *See* Nicole C. Wong, *Xerox PARC's legacy continues on,* East Bay Times, (Jan. 8, 2007) https://www.eastbaytimes.com/2007/01/08/xerox-parcs-legacy-continues-on-3/.

[7] Press Release, PARC A Xerox Company, The U.S. Department of Energy's Office of Electricity (OE) Selects PARC, Con Edison, and GE to Improve Grid Reliability (July 29, 2019) https://www.parc.com/press-releases/the-u-s-department-of-energys-office-of-electricity-oe-selects-parc-con-edison-and-ge-to-improve-grid-reliability/.

[8] *See Xerox Provides MaaS Services in LA and Denver*, Drive Sweden, (June 7, 2016)

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1 efforts have created $1 trillion in new industries, generated more than $60 billion in
2 start-ups and spin-offs, and resulted in over 6,000 patents.

3 **II.   TWITTER HAS LONG BENEFITED FROM ITS USE OF PARC'S**
4 **PATENTED TECHNOLOGIES**

5   22.   Twitter generates substantially all of its revenue from selling advertising.
6 In the fourth quarter of 2019, Twitter reported ad revenue of $885 million. This ad
7 revenue made up 80.45% of Twitter's total quarterly revenue and is reflective of its
8 importance to Twitter's financial success. These revenues allow Twitter to provide a
9 "free" social network to users, maintain and expand its infrastructure, pay its bills, and
10 turn an immense profit.[9]

11   23.   Twitter's traffic—much of which relates to Twitter's infringement as
12 outlined in this Complaint—is increasing despite the COVID-19 pandemic. Since the
13 pandemic began, Twitter has experienced a surge of monetizable Daily Active Users
14 (mDAUs). In the third quarter of 2020 alone, Twitter reported a total of 187 million
15 mDAUs, up 29% from the previous year.[10]

16   24.   In its most recent earnings call, Twitter's CEO Ned Segal noted Twitter's
17 "strength [in advertising revenue] throughout the quarter." He attributed Twitter's
18 strong advertising revenue to the necessity of businesses "to engage our much larger

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21 https://www.drivesweden.net/en/xerox-provides-maas-services-la-and-denver.

22 [9] *Twitter's Ad Revenue Rises 12% As Users Reach 152M,* MOBILE MARKETER,
23 https://www.mobilemarketer.com/news/twitters-ad-revenue-rises-12-as-users-reach-
   152m/571886/#:~:text=Brief%3A,the%20quarterly%20billion%2Ddollar%20mark
24 (last visited November 24, 2020).

25 [10]   https://www.digitalinformationworld.com/2020/10/twitters-latest-report-about-
26 its.html#:~:text=In%20the%20first%20quarter%20of,new%20mDAUs%20joined%20
   the%20platform.

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audience [about] … increased or delayed product launches."[11] He explained that there was fairly consistent daily growth over the last three weeks of the third quarter, which is "perhaps a good demonstration of how we can perform when so many events and product launches, all of which typically fall in that window[,] are driving more people and advertisers to Twitter."[12]

25.   Predictions state that Twitter should see sustained growth in users and engagement through the end of this year as a number of events result in more news flow and engagement, and as the platform remains synonymous with real-time news.[13]

26.   Between generating its largest source of income, and being the solution to one of its most prevalent criticisms in the past few years, Twitter's unauthorized and unlicensed use of the PARC Patents has substantially contributed to Twitter's financial success.

FIRST CLAIM FOR RELIEF

INFRINGEMENT OF U.S. PATENT NO. 8,489,599

27.   Plaintiff realleges and incorporates by reference the allegations of paragraphs 1-26 of this Complaint.

28.   The '599 Patent is valid and enforceable under United States Patent Laws.

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[11] *Twitter Inc. (TWTR) Q3 2020 Earnings Transcript,* THE MOTLEY FOOL. (Oct. 29, 2020) https://www.digitalinformationworld.com/2020/10/twitters-latest-report-about-its.html#:~:text=In%20the%20first%20quarter%20of,new%20mDAUs%20joined%20the%20platform.

[12] *Id.*

[13] Marty Shtrubel, *Twitter Q3 Results on Tap This Week; 5-Star Analyst Weighs in.* NASDAQ (Oct. 26, 2020) https://finance.yahoo.com/news/twitter-q3-results-tap-week-010449891.html?.

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29.   PARC owns, by assignment, all right, title, and interest in and to the '599 Patent, including the right to collect for past damages.

30.   A copy of the '599 Patent is attached as Exhibit A.

The '599 Patent

31.   The '599 Patent describes, among other things, a method and apparatus for creating and presenting content based on contextual information. In one embodiment, the '599 Patent describes receiving and using contextual information about a user to determine a context associated with the user. The '599 Patent further describes using this context to determine if a trigger condition is met, and, if so, presenting content to a user. The '599 Patent also describes that the user's response may be monitored, and an action may be taken depending on the user's response.

32.   By 2008, PARC recognized that although there was a proliferation of mobile devices (including phones, PDA, and laptops), "these mobile devices are not capable of learning and understanding the behavior of their users." '599 Patent at 1:19-22, 1:41-43. Indeed, as the '599 Patent notes:

> these mobile devices cannot determine when and how best to provide
> their users with information or suitable entertainment content, because
> they do not take into account the activities that their users are involved in.

Id. at 1:43-46.

33.   To address these issues, in one embodiment, the '599 Patent "provide[s] a content management system for organizing and delivering packages of audio and visual content to a user in response to activities being performed by the user, and in response to a number of environmental factors associated with the user." *Id.* at 3:51-55.

34.   The invention of the '599 Patent works, for example, by "receiv[ing] a set of contextual information with respect to the user, and processes the contextual

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1 information to determine a context which is associated with an activity being

2 performed by the user." *Id.* at Abstract.

3   35.   This contextual information can come "from a number of input sources

4 (*e.g.*, a global positioning system (GPS) device, or an accelerometer), which reflects

5 basic information associated with the user." *Id.*at 4:33-36; *see also id.* at 4:36-46,

6 6:23-7:2. The '599 Patent describes that the preferred system embodiment can

7 "determine a context associated with a user and/or operating conditions of the mobile

8 device based on contextual information." *Id.* at 7:30-33; *see also id.* at 7:33-45. The

9 system "can be programmed to infer specific contexts about the user based on

10 contextual information." *Id.* at 7:46-48; *see also id.* at 7:48-59.

11   36.   One embodiment of the '599 Patent further describes that if the user's

12 context or activity "satisfy a trigger condition," the system "selects content from a

13 content database ... to present to the user." *Id.* at Abstract. These triggers can be pre-

14 defined, including in relation to specific content. *Id.* at 3:60-4:6. Different content can

15 be presented in different contexts. *Id.* at 8:39-50.

16   37.   The '599 Patent's "FIG. 3 presents a flow chart illustrating a process for

17 delivering context-based content to a user in accordance with an embodiment of the

18 present invention[]":

19   The content management system begins by receiving contextual

20   information (operation 310), and processing the contextual information to

21   determine a context (operation 320). Next, the content management

22   system determines whether the context satisfies a trigger condition

23   (operation 330). If so, the content management system selects content

24   from the content database based on the context (operation 340), and

25   presents the selected content to the user (operation 350).

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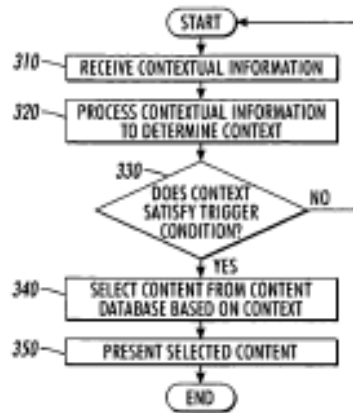
FIG. 3

Id. at 18:53-63, Fig. 3.

38.   Depending on "an expected response from the user," an embodiment of the '599 Patent "can perform an action responsive to a user response or interaction with the presentation of content." *Id.* at 12:50-51, 12:66-13:1.

'599 Patent Allegations

39.   Twitter designed, implemented, and currently uses a variety of advertising tools, including "targeting," to target ads for its social media platform. *See* https://business.twitter.com/en/advertising/targeting.html.   Twitter notes that its "platform shows people relevant ads based on how likely they are to engage with the ad and the brand's goals," and that advertisers can "hone in on your audience by using our powerful targeting tools to get your brand and message in front of the right people, when they're most receptive." *Id.* Twitter provides targeting options, including location   and   device   type.   https://business.twitter.com/en/help/campaign-setup/campaign-targeting/geo-gender-and-language-targeting.html   (explaining targeting   options);   https://business.twitter.com/en/help/campaign-setup/campaign-targeting/device-carrier-and-new-mobile-user-targeting.html (same).

40.   On information and belief after reasonable investigation, Twitter's targeted advertising tools ("'599 Infringing Products") infringe the '599 Patent.

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1   Twitter operates a method for delivering context-based content to a first user. For

2   instance, Twitter offers detailed targeting to target ads to users based on user location,

3   or whether the user is on certain type of device. *See, e.g.*,

4   https://business.twitter.com/en/help/campaign-setup/campaign-targeting/geo-gender-

5   and-language-targeting.html (explaining Twitter's detailed targeting options);

6   https://business.twitter.com/en/help/campaign-setup/campaign-targeting/device-

7   carrier-and-new-mobile-user-targeting.html (same).

8   41.   Twitter receives at least one content package, wherein the content

9   package includes at least one content piece and a set of rules associated with the

10   content package, wherein the set of rules includes a trigger condition and an expected

11   response, and wherein the trigger condition specifies a context that triggers a

12   presentation of the content piece. For instance, Twitter receives ad campaigns

13   containing ads and targets for ads. Twitter ad targets include location and device

14   conditions such as a user's location or a user's type of device (including OS,

15   manufacturer, and more) that trigger presenting an ad to the user as well as whether

16   the user is expected to see, click, view, or otherwise interact with the ad. *See, e.g.*,

17   https://business.twitter.com/en/help/campaign-setup/campaign-targeting/geo-gender-

18   and-language-targeting.html (explaining Twitter's detailed targeting options);

19   https://business.twitter.com/en/help/campaign-setup/campaign-targeting/device-

20   carrier-and-new-mobile-user-targeting.html (explaining Twitter's detailed targeting

21   options);   https://business.twitter.com/en/help/campaign-measurement-and-

22   analytics/conversion-tracking-for-websites.html?ref=btc-analytics.html   (explaining

23   how Twitter charges for advertising events) ;

24   https://business.twitter.com/en/advertising/analytics.html   (detailing Twitter's

25   available analytics).

26   42.   Twitter receives a set of contextual information with respect to the first

27   user, processes the contextual information to determine a current context for the first

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user, determines whether the current context satisfies the trigger condition, and, in response to the trigger condition being satisfied, presents the content piece to the first user. For instance, Twitter receives information about its users, including information about each user's location (whether through GPS or other information) and type of device. Twitter processes that information to determine the user's location and device type. Twitter serves and presents ads to the user after determining that the user accessed Twitter, for instance, with the required device type or from the required location. *See, e.g., See* https://business.twitter.com/en/help/campaign-setup/campaign-targeting/geo-gender-and-language-targeting.html (describing Twitter's location targeting options); https://business.twitter.com/en/help/campaign-setup/campaign-targeting/device-carrier-and-new-mobile-user-targeting.html (same); https://help.twitter.com/en/safety-and-security/privacy-controls-for-tailored-ads (describing the type of device data Twitter connects); https://help.twitter.com/en/safety-and-security/twitter-location-services-for-mobile (same); https://oursocialtimes.com/increase-your-twitter-ad-performance-with-tailored-audiences/ (describing Twitter's location targeting options).

43.   Twitter receives a response from the first user corresponding to the presented content piece, and determines whether the received response matches the expected response. For instance, Twitter tracks the user's clicks, views, and other responses to the presented ad, and determines whether the user's response is what the advertiser will pay for. As one example, Twitter's advertising platform allows advertisers to choose whether to be charged when someone clicks an ad link. *See, e.g.,* https://business.twitter.com/en/help/campaign-measurement-and-analytics/conversion-tracking-for-websites.html?ref=btc-analytics.html (explaining how Twitter charges advertisers); https://business.twitter.com/en/help/campaign-measurement-and-analytics/campaign-dashboard.html (same);

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1 https://business.twitter.com/en/advertising/analytics.html   (detailing   Twitter's
2 available analytics).

3   44.   Twitter performs an action based on an outcome of the determination.
4 For instance, Twitter charges an advertiser if the user clicks, views, or otherwise
5 responds to the presented ad, and further improves its targeting by tracking user
6 responses to ads and modifying its practice such that an ad's quality score is changed.
7 The more positive interactions with an ad, the higher the ad's quality score, and vice
8 versa. As another example, Twitter enables advertisers to view analytic metrics about
9 how   users   responded   to   the   advertisement.   *See,   e.g.,*
10 https://business.twitter.com/en/help/campaign-measurement-and-analytics/conversion-
11 tracking-for-websites.html?ref=btc-analytics.html (explaining how Twitter charges
12 advertisers);   https://business.twitter.com/en/help/campaign-measurement-and-
13 analytics/campaign-dashboard.html   (same);
14 https://business.twitter.com/en/help/overview/ads-pricing.html (describing Twitter's
15 ad   pricing);   https://business.twitter.com/en/help/troubleshooting/bidding-and-
16 auctions-faqs.html   (explaining   concepts   such   as   "quality   score");
17 https://business.twitter.com/en/advertising/analytics.html   (detailing   Twitter's
18 available analytics)..

19   45.   Twitter has infringed and is infringing, individually and/or jointly, either
20 literally or under the doctrine of equivalents, at least claims 1, 12, and 19 of the '599
21 Patent in violation of 35 U.S.C. §§ 271, *et seq.*, directly and/or indirectly, by making,
22 using, offering for sale, selling, offering for lease, leasing in the United States, and/or
23 importing into the United States without authority or license, the '599 Infringing
24 Products.

25   46.   Twitter has been, and currently is, an active inducer of infringement of
26 one or more claims of the '599 Patent under 35 U.S.C. § 271(b). On information and
27 belief, one or more of the '599 Infringing Products of Twitter directly and/or

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indirectly infringe (by induced infringement) at least claims 1, 12, and 19 of the '599 Patent, literally and/or under the doctrine of equivalents.

47.   This Complaint will serve as notice to Twitter of the '599 Patent and its infringement should Twitter contend that it did not previously have knowledge thereof.

48.   Twitter intentionally encourages and aids at least its users, including advertisers and website and app users, to directly infringe the '599 Patent.

49.   Twitter provides the '599 Infringing Products and instructions to its users such that they will use the '599 Infringing Products in a directly infringing manner. Twitter markets the '599 Infringing Products to its users and provides instructions to its users on how to use the functionality of the '599 Patent on its websites and elsewhere. *See,   e.g.*,   https://business.twitter.com/en/advertising/targeting.html; https://business.twitter.com/en/help/campaign-setup/campaign-targeting/geo-gender-and-language-targeting.html;   https://business.twitter.com/en/help/campaign-setup/campaign-targeting/device-carrier-and-new-mobile-user-targeting.html; https://help.twitter.com/en/safety-and-security/privacy-controls-for-tailored-ads; https://help.twitter.com/en/safety-and-security/twitter-location-services-for-mobile; https://business.twitter.com/en/help/campaign-measurement-and-analytics/conversion-tracking-for-websites.html?ref=btc-analytics.html; https://business.twitter.com/en/help/campaign-measurement-and-analytics/campaign-dashboard.html;   https://business.twitter.com/en/advertising/analytics.html; https://business.twitter.com/en/help/overview/ads-pricing.html; https://business.twitter.com/en/help/troubleshooting/bidding-and-auctions-faqs.html; https://business.twitter.com/en/advertising/analytics.html.

50.   Twitter users directly infringe by using the '599 Infringing Products in their intended manner. Twitter induces such infringement by providing the '599 Infringing Products and instructions to enable and facilitate infringement. On

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1 information and belief, Twitter specifically intends that its actions will result in

2 infringement of the '599 Patent or has taken deliberate actions to avoid learning of

3 infringement.

4   51.   Additional allegations regarding Twitter's knowledge of the '599 Patent

5 and willful infringement will likely have evidentiary support after a reasonable

6 opportunity for discovery.

7   52.   Twitter's infringement of the '599 Patent is willful and deliberate,

8 entitling PARC to enhanced damages and attorneys' fees.

9   53.   Twitter's infringement of the '599 Patent is exceptional and entitles

10 PARC to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C.

11 § 285.

12   54.   PARC has been damaged by Twitter's infringement of the '599 Patent

13 and will continue to be damaged unless Twitter is enjoined by this Court. PARC has

14 suffered and continues to suffer irreparable injury for which there is no adequate

15 remedy at law. The balance of hardships favors PARC, and public interest is not

16 disserved by an injunction.

17

18   55.   PARC is entitled to recover from Twitter all damages that PARC has

19 sustained as a result of Twitter's infringement of the '599 Patent, including without

20 limitation, lost profits and/or not less than a reasonable royalty.

21   **SECOND CLAIM FOR RELIEF**

22   **INFRINGEMENT OF U.S. PATENT NO. 9,208,439**

23   56.   Plaintiff realleges and incorporates by reference the allegations of

24 paragraphs 1-55 of this Complaint.

25   57.   The '439 Patent is valid and enforceable under United States Patent

26 Laws.

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28   17

1 58.   PARC owns, by assignment, all right, title, and interest in and to the '439

2 Patent, including the right to collect for past damages.

3 59.   A copy of the '439 Patent is attached as Exhibit B.

4 **The '439 Patent**

5 60.   The '439 Patent describes, among other things, a method and system for

6 collecting mobile device contextual information and updating recommendation

7 systems for activities or items of interest to a user. In one embodiment, the '439 Patent

8 describes receiving mobile device data collected through detectors related to the

9 device's surroundings. The '439 Patent further describes using that data to modify a

10 context graph that stores information about a device user's behavior. The '439 Patent

11 also describes sending a notification when certain changes to the context graph are

12 made.

13 61.   By 2013, PARC recognized that although "mobile devices equipped with

14 technology to detect physical surroundings [had] become more pervasive in our

15 everyday lives," using this additional information was difficult as it "takes

16 considerable time and expense to develop such context-aware systems." '439 Patent at

17 1:14-33. The '439 Patent therefore sought to "solve the problem of efficiently

18 developing context aware systems by providing a generic contextual intelligence

19 platform that may be adapted for specific applications." *Id.* at 2:49-52. "Such a

20 contextual intelligence system facilitates real-time processing of contextual

21 information and support[s] contextual application development for Web and mobile

22 applications." *Id.* at 2:53-55.

23 62.   To achieve its goals, the '439 Patent "provides a system for providing

24 user information to a recommender." *Id.* at Abstract. In one embodiment, the '439

25 Patent system "receives, from a mobile device, event data derived from contextual

26 data collected using detectors that detect the mobile device's physical surroundings"

27 *Id.* The system then "modifies [a] context graph based on the event data" and

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1   "determines that the modification to the context graph matches [a] registration, and

2   sends a notification of context graph change to [a] recommender." *Id.*

3   63.   In one '439 Patent embodiment, "[c]ontextual data describes a computing

4   context detected by a mobile device client, such as physical surroundings and/or

5   application and/or operating system context" *Id.* at 2:60-62. "The client-side

6   architecture collects contextual data by detecting a computing context including

7   physical surroundings, application, and operating system context." *Id.* at 3:1-3. This

8   collection may be done "using detectors such as a GPS, an accelerometer, and/or a

9   compass." *Id.* at 3:49-51; *see also id.* at 4:31-40. The client-side may determine high-

10   level events (*e.g.*, "a user reading email") and low-level events (*e.g.*, walking, button

11   push, screen capture) based on information collected from the device. *Id.* at 3:4-22.

12   The client can then "transmit both high-level events and low-level events to the server

13   via an event posting interface 302 and/or a RESTful WebAPI." *Id.* at 5:42-44. "The

14   server-side architecture stores the contextual data and uses the contextual data to

15   modify a graph containing user behavior and interest information." *Id.* at 2:62-65.

16   64.   In one embodiment, the '439 Patent describes that "[t]he context graph

17   includes information about user behavior and/or user interests." *Id.* at 1:41-43. "The

18   context graph stores generic user model information that may be adapted for

19   application-specific user models...." *Id.* at 5:32-34. One exemplary context graph "is a

20   per-user, in-memory, graph-based model that stores facts and assertions about user

21   behavior and actions. Context graph 406 is a database of information about the user."

22   *Id.* at 7:28-31. This context graph can be used, for instance, by "recommenders [to]

23   modify implementation-specific user models based on the data received from the

24   context graph, and make recommendations based on the information-specific user

25   models." *Id.* at 6:67-7:4.

26   65.   As one example, the '439 Patent describes that "the system may notify

27   recommenders of context graph changes." *Id.* at 7:55-56. This context graph

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1 information, and changes to the graph, can be used by recommenders to "generate

2 and/or modify recommendations." *Id.* at 8:6-11.

3 ### '439 Patent Allegations

4 66.   Twitter designed, implemented, and currently uses a variety of

5 advertising tools, such as "targeting," to target ads for its social media platform. *See*

6 https://business.twitter.com/en/advertising/targeting.html. Twitter notes that its

7 "platform shows people relevant ads based on how likely they are to engage with the

8 ad and the brand's goals," and that advertisers can "hone in on your audience by using

9 our powerful targeting tools to get your brand and message in front of the right people,

10 when they're most receptive." *Id.* Twitter provides targeting options, including

11 location. https://business.twitter.com/en/help/campaign-setup/campaign-targeting/geo-

12 gender-and-language-targeting.html (explaining targeting options).

13 67.   On information and belief after reasonable investigation, Twitter's

14 targeted advertising tools ("'439 Infringing Products") infringe the '439 Patent.

15 Twitter receives, from a mobile device, event data derived from contextual data

16 collected using detectors that detect a physical context surrounding the mobile device.

17 For instance, Twitter receives device data and data collected using GPS, WiFi, and

18 other location-tracking devices within the user's mobile phone. From that data,

19 Twitter derives the user's location and device type, among other things. *See, e.g.*,

20 https://help.twitter.com/en/safety-and-security/twitter-location-services-for-mobile

21 ("Enabling precise location through Twitter's official apps allows Twitter to collect,

22 store,   and   use   your   precise   location,   such   as   GPS   information.");

23 https://business.twitter.com/en/help/campaign-setup/campaign-targeting/geo-gender-

24 and-language-targeting.html (explaining Twitter's location targeting options).

25 68.   Twitter modifies a context graph that stores facts and assertions about a

26 user's behavior and interests using the event data. For instance, Twitter uses

27 recent/current device type and location data (along with other information) to modify

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and update the Twitter context graph over time. This context graphs stores facts and assertions about the user's behavior and interests, including location history, links clicked on, what they tweet or follow, likes, dislikes, and more. *See, e.g.*, https://help.twitter.com/en/safety-and-security/twitter-location-services-for-mobile (explaining that Twitter collects location and other data); https://business.twitter.com/en/help/campaign-setup/campaign-targeting/geo-gender-and-language-targeting.html (explaining Twitter's detailed targeting options); https://help.twitter.com/en/safety-and-security/privacy-controls-for-tailored-ads (explaining the information that Twitter collects); https://blog.twitter.com/engineering/en_us/topics/insights/2020/graph-ml-at-twitter.html (describing that Twitter has graph-based neural networks that can contain hundreds of millions of nodes and billions of edges).

69.   Twitter, in response to determining that there exists a registration for notification of changes that matches the modification to the context graph, sends a notification of context graph change to a recommender. For instance, Twitter advertisers may elect to be notified of changes to the Twitter context graph via Twitter sending notifications of the changes to the advertiser by serving advertisements or customizing ad content when event data, such as user location and device type, processed into the Twitter context graph, indicates the user is within a location or contains a device type for which an advertisement has been targeted for delivery. *See, e.g.,*   https://business.twitter.com/en/help/campaign-setup/campaign-targeting/geo-gender-and-language-targeting.html (explaining Twitter's detailed targeting options).

70.   Twitter has infringed and is infringing, individually and/or jointly, either literally or under the doctrine of equivalents, at least claims 1, 7, and 13 of the '439 Patent in violation of 35 U.S.C. §§ 271, *et seq.*, directly and/or indirectly, by making, using, offering for sale, selling, offering for lease, leasing in the United States, and/or

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1 importing into the United States without authority or license, the '439 Infringing

2 Products.

3   71.   Twitter has been, and currently is, an active inducer of infringement of

4 one or more claims of the '439 Patent under 35 U.S.C. § 271(b). On information and

5 belief, one or more of the '439 Infringing Products of Twitter directly and/or

6 indirectly infringe (by induced infringement) at least claims 1, 7, and 13 of the '439

7 Patent, literally and/or under the doctrine of equivalents.

8   72.   This Complaint will serve as notice to Twitter of the '439 Patent and its

9 infringement should Twitter contend that it did not previously have knowledge

10 thereof.

11   73.   Twitter intentionally encourages and aids at least its users, including

12 advertisers and website and app users, to directly infringe the '439 Patent.

13   74.   Twitter provides the '439 Infringing Products and instructions to its users

14 such that they will use the '439 Infringing Products in a directly infringing manner.

15 Twitter markets the '439 Infringing Products to its users and provides instructions to

16 its users on how to use the functionality of the '439 Patent on its websites and

17 elsewhere. *See,   e.g.,*   https://business.twitter.com/en/advertising/targeting.html;

18 https://business.twitter.com/en/help/campaign-setup/campaign-targeting/geo-gender-

19 and-language-targeting.html;   https://help.twitter.com/en/safety-and-security/privacy-

20 controls-for-tailored-ads;

21 https://blog.twitter.com/engineering/en_us/topics/insights/2020/graph-ml-at-

22 twitter.html;   https://help.twitter.com/en/safety-and-security/twitter-location-services-

23 for-mobile.

24   75.   Twitter users directly infringe by using the '439 Infringing Products in

25 their intended manner. Twitter induces such infringement by providing the '439

26 Infringing Products and instructions to enable and facilitate infringement. On

27 information and belief, Twitter specifically intends that its actions will result in

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infringement of the '439 Patent or has taken deliberate actions to avoid learning of infringement.

76.   Additional allegations regarding Twitter's knowledge of the '439 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

77.   Twitter's infringement of the '439 Patent is willful and deliberate, entitling PARC to enhanced damages and attorneys' fees.

78.   Twitter's infringement of the '439 Patent is exceptional and entitles PARC to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

79.   PARC has been damaged by Twitter's infringement of the '439 Patent and will continue to be damaged unless Twitter is enjoined by this Court. PARC has suffered and continues to suffer irreparable injury for which there is no adequate remedy at law. The balance of hardships favors PARC, and public interest is not disserved by an injunction.

80.   PARC is entitled to recover from Twitter all damages that PARC has sustained as a result of Twitter's infringement of the '439 Patent, including without limitation, lost profits and/or not less than a reasonable royalty.

THIRD CLAIM FOR RELIEF

INFRINGEMENT OF U.S. PATENT NO. 8,966,362

81.   Plaintiff realleges and incorporates by reference the allegations of paragraphs 1-80 of this Complaint.

82.   The '362 Patent is valid and enforceable under United States Patent Laws.

83.   PARC owns, by assignment, all right, title, and interest in and to the '362 Patent, including the right to collect for past damages.

84.   A copy of the '362 Patent is attached as Exhibit C.

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The '362 Patent

85. The '362 Patent describes, among other things, a method and system for disseminating tagged content over networks. In one embodiment, the '362 Patent describes receiving tagged content where the tag indicates an action to be performed along with a recipient. The '362 Patent further describes processing the tagged content to determine the action to be performed along with the recipient. The tagged content is then disseminated to the recipient.

86. In 2007, PARC recognized that "current dissemination mechanisms, such as email, networked file systems, document management systems, or workflow systems suffer from several limitations," including that "a user is typically required to manually extract the specific content to be shared." '362 Patent at 1:15-18, 1:21-22. Furthermore, the '362 Patent notes that this "manual process not only is cumbersome, but also makes it difficult to reestablish context for the information or to incorporate responses into the original content when the recipient replies with comments or changes to the shared content." *Id.* at 1:24-28.

87. To address these problems, the '362 Patent "provides a system that facilitates content dissemination." *Id.* at 1:42-43. The '362 Patent does so by "allow[ing] a user to add a tag to a first document, wherein the tag indicates an operation to be performed on a portion of the document. The system then processes the tag and performs the operation on the document portion based on the tag." *Id.* at 1:44-46.

88. The invention of the '362 Patent works, for example, by "allow[ing] a user to add a tag to a first document, wherein the tag indicates an operation to be performed on a portion of the document." *Id.* at Abstract. Thereafter, the '362 invention "processes the tag and performs the operation on the document portion based on the tag" *Id.* The invention of the '362 Patent is advantageous because it may (1) "reduce the amount of information the recipient needs to consider"; (2) "facilitate

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dissemination of only a portion of a sensitive document"; and (3) "lower[] the barrier to and overhead of information exchange." *Id.* at 3:21-49.

89.   In one '362 Patent embodiment, "an exemplary architecture that facilitates in-document tagging" is disclosed. *Id.* at 7:64-66. Tags can be used to, for instance, share content with another person or group or "to implement other functions, such as annotation services." *Id.* at 8:24-36, 8:57-67. Users may insert tags by using "a visual representation, such as a drop-down menu, of ready-to-use tags" or by "add[ing] to and/or edit[ing] existing tags." *Id.* at 11:16-21. Furthermore, "a tag can be formulated in natural language instead of in syntactical specifications." *Id.* at 9:7-8.

90.   The '362 Patent further describes that the tags are processed. This processing can be triggered implicitly or explicitly, including "at pre-determined times…or when the user performs certain operations." *Id.* at 8:4-14. Once processed, the tagged documents may be disseminated. *Id.* at 8:4-7. As the '362 Patent describes, "a number of communication services can be used to deliver the content." *Id.* at 8:17-18.

'362 Patent Allegations

91.   Twitter designed, implemented, and currently uses a system for allowing users to tag other users or groups, including "replies" and/or "mentions," over its social media platform. *See* https://help.twitter.com/en/using-twitter/mentions-and-replies. Twitter notes that "[w]hen you reply to someone else, your Tweet will show the message 'Replying to...' when viewed in your profile page timeline. When someone replies to one of your Tweets you will see 'Replying to you' above the Tweet and you will receive a notification in your Notifications tab." *Id.* Twitter further explains that "[a] mention is a Tweet that contains another person's username anywhere in the body of the Tweet," and that it "collect[s] these messages, as well as all your replies, in your Notifications tab." *Id.*; *see also* https://twitter.com/notifications/mentions (showing a user's mentions).

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92.   On information and belief after reasonable investigation, Twitter's conversation and notification system ("'362 Infringing Products") infringes the '362 Patent. Twitter facilitates content dissemination. For instance, Twitter facilitates the sharing of a variety of content, including text, images, video, advertisements, and more, amongst users. *See, e.g.*, https://twitter.com/home (showing a user's home feed); https://twitter.com/notifications/mentions (showing a user's mentions).

93.   Twitter receives, within a document editing system, a user input comprising one or more tags to insert inline within a document, wherein the document is formulated in a natural language and wherein a respective tag is at least partly formulated in natural language and is visible to the user, and indicates an action to be performed on a partial portion of the document and a receiving entity corresponding to the action. For instance, Twitter receives, within its conversation and notification system, user tweets, retweets, or replies that include content such as text, picture, or video, and "mentions" of another user. The tweet, retweet, or reply is formulated in a natural language, and the "mention" is at least partly formulated in natural language and is visible to the user inline within the tweet, retweet, or reply. The inclusion of a "mention" in a tweet, retweet, or reply indicates that the tweet, retweet, or reply should, for example, be shared with the mentioned user(s) via their respective notifications tab. *See, e.g.*, https://help.twitter.com/en/using-twitter/mentions-and-replies (discussing mentions and replies, including how to mention and reply to other users).

94.   Twitter processes the one or more tags according to one or more rules to determine both the action to be performed on the partial portion of the document and the receiving entity. For instance, Twitter processes the one or more "mentions" according to one or more rules when determining to (a) share tweets, retweets, or replies that contain a "mention" to the mentioned user's notifications tab and/or (b) post the tweets, retweets, or replies that contain a mention onto a user's timeline.

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Similarly, Twitter determines the receiving entity by creating a link to the mentioned user within the tweets, retweets, or replies. *See, e.g.,* https://help.twitter.com/en/using-twitter/mentions-and-replies (discussing mentions and replies, including how to mention and reply to other users).

95.   Twitter disseminates the document portion indicated by the one or more tags to the corresponding receiving entity to facilitate performing the action specified in the one or more tags on the document portion. For instance, Twitter posts the tweets, retweets, or replies onto the mentioned user's notifications tab and/or timeline. Twitter also sends the mentioned user a notification that they have been mentioned in a tweet, retweet, or reply through mobile notifications. *See, e.g.,* https://help.twitter.com/en/using-twitter/mentions-and-replies (discussing mentions and replies, including how to mention and reply to other users); *see also* https://help.twitter.com/en/managing-your-account/notifications-on-mobile-devices (discussing Twitter's notification methods); https://twitter.com/notifications/mentions (location within Twitter where users can go to see recent "mentions" of their user profile).

96.   Twitter has infringed and is infringing, individually and/or jointly, either literally or under the doctrine of equivalents, at least claims 1, 12, and 23 of the '362 Patent in violation of 35 U.S.C. §§ 271, *et seq.*, directly and/or indirectly, by making, using, offering for sale, selling, offering for lease, leasing in the United States, and/or importing into the United States without authority or license, the '362 Infringing Products.

97.   Twitter has been, and currently is, an active inducer of infringement of one or more claims of the '362 Patent under 35 U.S.C. § 271(b). On information and belief, one or more of the '362 Infringing Products of Twitter directly and/or indirectly infringe (by induced infringement) at least claims 1, 12, and 23 of the '362 Patent, literally and/or under the doctrine of equivalents.

COMPLAINT FOR PATENT INFRINGEMENT

98.   This Complaint will serve as notice to Twitter of the '362 Patent and its infringement should Twitter contend that it did not previously have knowledge thereof.

99.   Twitter intentionally encourages and aids at least its users, including advertisers and website and app users, to directly infringe the '362 Patent.

100.   Twitter provides the '362 Infringing Products and instructions to its users such that they will use the '362 Infringing Products in a directly infringing manner. Twitter markets the '362 Infringing Products to its users and provides instructions to its users on how to use the functionality of the '362 Patent on its websites and elsewhere. *See, e.g.*, https://help.twitter.com/en/using-twitter/mentions-and-replies; https://help.twitter.com/en/managing-your-account/notifications-on-mobile-devices; https://twitter.com/home; https://twitter.com/notifications/mentions.

101.   Twitter users directly infringe by using the '362 Infringing Products in their intended manner. Twitter induces such infringement by providing the '362 Infringing Products and instructions to enable and facilitate infringement. On information and belief, Twitter specifically intends that its actions will result in infringement of the '362 Patent or has taken deliberate actions to avoid learning of infringement.

102.   Additional allegations regarding Twitter's knowledge of the '362 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

103.   Twitter's infringement of the '362 Patent is willful and deliberate, entitling PARC to enhanced damages and attorneys' fees.

104.   Twitter's infringement of the '362 Patent is exceptional and entitles PARC to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

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COMPLAINT FOR PATENT INFRINGEMENT

1   105. PARC has been damaged by Twitter's infringement of the '362 Patent

2   and will continue to be damaged unless Twitter is enjoined by this Court. PARC has

3   suffered and continues to suffer irreparable injury for which there is no adequate

4   remedy at law. The balance of hardships favors PARC, and public interest is not

5   disserved by an injunction.

6

7   106. PARC is entitled to recover from Twitter all damages that PARC has

8   sustained as a result of Twitter's infringement of the '362 Patent, including without

9   limitation, lost profits and/or not less than a reasonable royalty.

10   **FOURTH CLAIM FOR RELIEF**

11   **INFRINGEMENT OF U.S. PATENT NO. 8,606,781**

12   107. Plaintiff realleges and incorporates by reference the allegations of

13   paragraphs 1-106 of this Complaint.

14   108. The '781 Patent is valid and enforceable under United States Patent

15   Laws.

16   109. PARC owns, by assignment, all right, title, and interest in and to the '781

17   Patent, including the right to collect for past damages.

18   110. A copy of the '781 Patent is attached as Exhibit D.

19   **The '781 Patent**

20   111. The '781 Patent describes, among other things, a method and system for

21   personalized search based on a user's profile and search history. In one embodiment,

22   the '781 Patent describes receiving queries from identifiable users. The '781 Patent

23   further describes retrieving the users' histories (including information previously

24   accessed by the users within a repository), and identifying user profiles that include

25   keywords relevant to the users' histories. The histories are used to determine a

26   "proximal neighborhood" of previously-unseen information with some relationship to

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1   the previously accessed information, at which point search results that contain the

2   previously-unseen information may be determined.

3   112.   In 2005, PARC recognized that "[s]earch engines provide a view into the

4   wealth of constantly changing resources available over the web," and that

5   "[c]onventional personalized search systems facilitate the retrieval of previously

6   accessed information by personalizing the search results based on a user profile." '781

7   Patent at 1:18-23. Yet, the '781 Patent notes that "these systems are not focused on

8   discovering new-unseen information relevant to the user's current information

9   retrieval goals." *Id.* at 1:30-32.

10   113.   To address this problem, the '781 Patent provides an "invention [to]

11   determine personalized search results." *Id.* at 1:38-39. The '781 Patent does so

12   through the use of user profiles that include a user's history and information linked to

13   that history, which permits the return of relevant, previously-unseen search results. *Id.*

14   at 1:39-51.

15   114.   The invention of the '781 Patent, for example, retrieves a user's search

16   history after a user initiates a query. *Id.* at 2:40-42. By looking at a user's history of

17   previously-accessed documents, an embodiment of the '781 Patent identifies a user

18   profile, including keywords, "based on the documents in the user history." *Id.* at 2:41-

19   42, 2:58-61.

20   115.   In one '781 Patent embodiment, "[a] proximal neighborhood of

21   documents is determined based on the user history," where "the documents in the

22   proximal neighborhood have not yet been seen by the user." *Id.* 2:45-47, 2:55-57.

23   "The proximal neighborhood comprises documents linked within a threshold link

24   distance of previously accessed documents," where the threshold link distance is

25   variable. *Id.* at 2:45-52.

26   116.   The '781 Patent further describes that, for instance, "[t]he user query is

27   applied to the documents within the proximal neighborhood," and that "[t]he search

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1   result reflects documents topically related to the user's previous search history but

2   which are further focused by the terms of the current user query." *Id.* at 3:33-37. As

3   the '781 Patent notes, "[t]hese topically related, but as yet unseen documents are

4   likely to be useful to the user." *Id.* at 10:35-36.

5   **'781 Patent Allegations**

6   117.   Twitter   designed,   implemented,   and   currently   uses   a   variety   of

7   advertising tools, such as "targeting," to target ads for its social media platform. *See*

8   https://business.twitter.com/en/advertising/targeting.html.   Twitter   notes   that   its

9   "platform shows people relevant ads based on how likely they are to engage with the

10 ad and the brand's goals," and that advertisers can "hone in on your audience by using

11 our powerful targeting tools to get your brand and message in front of the right people,

12 when they're most receptive." *Id.* Twitter provides a plurality of advertising targeting

13 methods including keyword, conversation, interest, follower, and look-alike, all of

14 which lets advertisers "connect with the people that matter the most to your business"

15 *Id.*

16   118.   On   information   and   belief   after   reasonable   investigation,   Twitter's

17 targeted advertising tools ("'781 Infringing Products") infringe the '781 Patent.

18 Twitter   provides   personalized   search.   For   instance,   Twitter   provides   targeted

19 advertising   tools   that   use   tailored   audiences   to   serve   ads.   *See,   e.g.*,

20 https://business.twitter.com/en/advertising/targeting.html   (describing   Twitter's

21 detailed   targeting);   https://blog.twitter.com/en_us/a/2014/an-update-to-tailored-

22 audiences-introducing-new-audience-list-upload-audience-manager-and.html

23 (describing Twitter's audience manager and look-alike only targeting).

24   119.   Twitter receives a query from a user and identifies the user. For instance,

25 Twitter receives a query from a user every time the user performs an action (*e.g.*,

26 opening a Twitter app or going to a Twitter website; tweeting, retweeting, or replying;

27 interacting with tweets, retweets, and replies; and other actions in a Twitter app or on

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a Twitter website), which Twitter uses to customize ads. Twitter identifies the user in order to provide a custom response, such as a home timeline that includes personalized ads targeted to that particular user. *See, e.g.,* https://business.twitter.com/en/help/troubleshooting/how-twitter-ads-work.html (discussing how Twitter ads work); https://help.twitter.com/en/using-twitter/twitter-timeline (explaining what users see in their home timeline).

120.   Twitter retrieves a user history for the user comprising access patterns identifying linked information elements previously accessed by the user within an information repository. For instance, Twitter retrieves historical user activity, such as who a user follows; what a user tweets, searches, views, or interacts with; what accounts a user interacts with; the user's profile and location; what websites a user visits; what apps are downloaded on the user's device; a user's demonstrated interests; what ads the user has interacted with; what type of device the user is accessing Twitter from, and browser-related information, among other things. *See, e.g.,* https://business.twitter.com/en/help/troubleshooting/how-twitter-ads-work.html (discussing how Twitter ads work); https://business.twitter.com/en/help/campaign-setup/campaign-targeting/keyword-targeting.html (discussing Twitter's keyword targeting).

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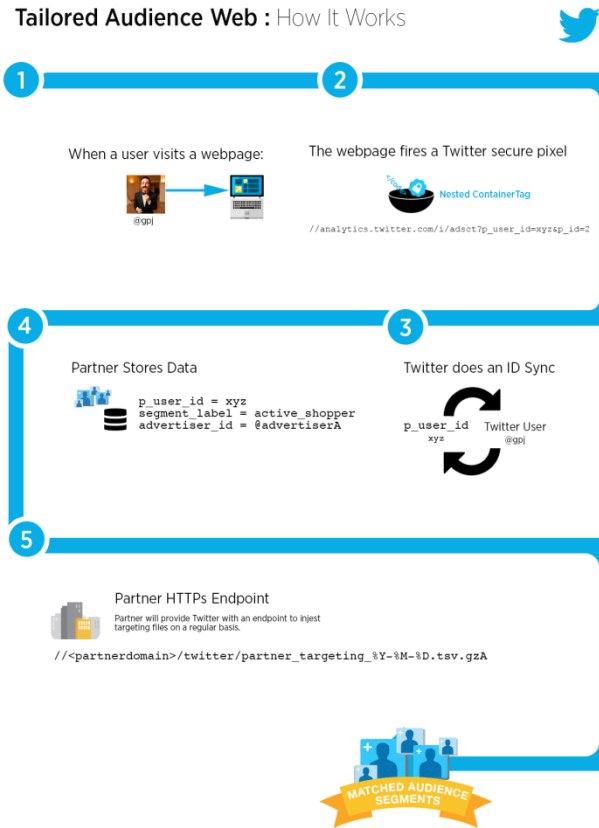
https://developer.twitter.com/en/docs/twitter-ads-api/audiences/overview   (discussing Twitter's Ads API).

121.   Twitter identifies a user profile comprising keywords relevant to the access patterns in the user history. For instance, Twitter user profiles store keywords relevant to the user's history, such as what pages/accounts (which also have associated keywords) the user has liked, followed, or otherwise interacted with; what words are used in the user's search queries, recent tweets, and tweets the user has recently interacted with; the user's profile, demonstrated interests, and location; and what ads they have clicked on or seen. Twitter also tracks users outside of Twitter—including a user's website visits, downloaded apps, and browser-related information—and ties users' non-Twitter activity to Twitter user profiles. *See, e.g.,* https://business.twitter.com/en/help/troubleshooting/how-twitter-ads-work.html (discussing how Twitter ads work); https://business.twitter.com/en/help/campaign-

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setup/campaign-targeting/keyword-targeting.html   (discussing   Twitter's   keyword

targeting).

https://developer.twitter.com/en/docs/twitter-ads-api/audiences/overview   (discussing
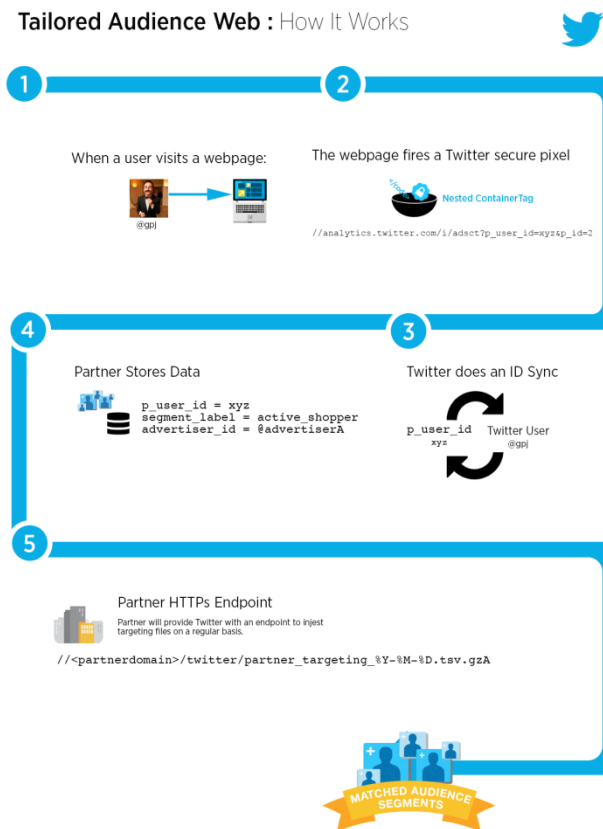
Twitter's Ads API).

    122.   Twitter determines a proximal neighborhood using the user history in the user profile, wherein the proximal neighborhood comprises only linked information elements previously unseen by the user that are within a threshold distance of the linked information elements in the user history. For instance, Twitter uses the user history to determine whether to serve any unseen ads to a user who is in an advertiser's target or look-alike audience. Twitter does this, for example, when Twitter advertisers build audiences for their advertisements using keyword targeting, interest targeting, conversation targeting, event targeting, engagement targeting, follower targeting, device or platform targeting, and/or when advertisers build look-

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alike audiences based on characteristics of users who have already liked the advertiser's page. Twitter's look-alike audiences have a "confidence score" set between 0 100 by advertisers depending on the desired similarity of targeted users. Twitter also offers an ad campaign frequency cap option, which means that Twitter tracks ads a user has seen or not seen. Twitter therefore gives its advertisers an ability to create a tailored audience based on their preferences and set the number of times, including just once, that a user will see the same ad using a frequency cap option. As a result, the proximal neighborhood of ads includes only previously-unseen ads that are within a particular confidence score of the linked information elements in the user history. *See, e.g.,* https://business.twitter.com/en/help/campaign-measurement-and-analytics/conversion-tracking-for-websites.html?ref=btc-analytics.html (discussing Twitter's conversion tracking); https://business.twitter.com/en/advertising/analytics.html (detailing Twitter's available analytics); https://developer.twitter.com/en/docs/twitter-ads-api/audiences/overview (discussing Twitter's Ads API, including the concept of a "confidence score"); https://business.twitter.com/en/advertising/targeting.html (discussing available targeting options for creating an audience); https://business.twitter.com/en/help/campaign-setup/campaign-targeting/conversation-targeting.html (discussing conversation targeting); https://business.twitter.com/en/help/campaign-setup/campaign-targeting/event-targeting.html (discussing event targeting); https://business.twitter.com/en/help/campaign-setup/campaign-targeting/tweet-engager-targeting.html (discussing Tweet engager targeting); https://business.twitter.com/en/help/campaign-setup/campaign-targeting/keyword-targeting.html (discussing keyword targeting); https://business.twitter.com/en/help/campaign-setup/campaign-targeting/tv-targeting.html (discussing movies and TV targeting);

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https://business.twitter.com/en/help/campaign-setup/campaign-targeting/interest-and-follower-targeting.html (discussing interest and follower targeting); https://business.twitter.com/en/help/campaign-setup/campaign-targeting/device-carrier-and-new-mobile-user-targeting.html (discussing device and platform targeting); https://blog.twitter.com/en_us/a/2014/an-update-to-tailored-audiences-introducing-new-audience-list-upload-audience-manager-and.html (describing Twitter's audience manager and look-alike only targeting).

Audience rules

Include

People who match

App activity audience	Frequency		Lookback (optional)
Choose one ⌄	Greater or equal to ⌄	1 time ⌄	- ⌄

+ Narrow audience

+ Add people

Exclude

People who match

App activity audience	Frequency		Lookback (optional)
Choose one ⌄	Greater or equal to ⌄	1 time ⌄	- ⌄

+ Narrow audience

https://business.twitter.com/en/help/campaign-setup/campaign-targeting/custom-audiences/app-activity.html.

123.   Twitter applies the query to the unseen linked information elements in the proximal neighborhood and determines search results comprising the unseen linked information elements that match the query. For instance, when Twitter receives the user's query as described above, it determines which ads to serve that particular user. When an advertiser sets an ad frequency cap of 1, the ads must be previously unseen by that particular user. Thus, when creating the user's home timeline or other

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Twitter information to be displayed to that particular user, Twitter will locate previously unseen ads for the user. The previously unseen ads may be selected based on the ads' content being similar to content in that user's history or based on other user history information being similar to that of others who have positively interacted with the advertiser (*e.g.*, have installed the advertiser's app, have been identified as an existing customer, or have already seen other ads). *See, e.g.*, https://blog.twitter.com/en_us/a/2014/an-update-to-tailored-audiences-introducing-new-audience-list-upload-audience-manager-and.html (describing Twitter's audience manager and look-alike only targeting); http://insights.marinsoftware.com/publishers/twitter/3-creative-ways-to-use-and-target-lookalikes-using-twitter-ads/ (describing how to use Twitter's look-alike only targeting).

Audience rules

Include

People who match   ×

App activity audience   Frequency   Lookback (optional)

Choose one   ∨   Greater or equal to   ∨   1 time   ∨   –   ∨

+ Narrow audience

+ Add people

Exclude

People who match   ×

App activity audience   Frequency   Lookback (optional)

Choose one   ∨   Greater or equal to   ∨   1 time   ∨   –   ∨

+ Narrow audience

https://business.twitter.com/en/help/campaign-setup/campaign-targeting/custom-audiences/app-activity.html.

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124.   Twitter has infringed and is infringing, individually and/or jointly, either literally or under the doctrine of equivalents, at least claims 1 and 19 of the '781 Patent in violation of 35 U.S.C. §§ 271, *et seq.*, directly and/or indirectly, by making, using, offering for sale, selling, offering for lease, leasing in the United States, and/or importing into the United States without authority or license, the '781 Infringing Products.

125.   Twitter has been, and currently is, an active inducer of infringement of one or more claims of the '781 Patent under 35 U.S.C. § 271(b). On information and belief, one or more of the '781 Infringing Products of Twitter directly and/or indirectly infringe (by induced infringement) at least claims 1 and 19 of the '781 Patent, literally and/or under the doctrine of equivalents.

126.   This Complaint will serve as notice to Twitter of the '781 Patent and its infringement should Twitter contend that it did not previously have knowledge thereof.

127.   Twitter intentionally encourages and aids at least its users, including advertisers and website and app users, to directly infringe the '781 Patent.

128.   Twitter provides the '781 Infringing Products and instructions to its users such that they will use the '781 Infringing Products in a directly infringing manner. Twitter markets the '781 Infringing Products to its users and provides instructions to its users on how to use the functionality of the '781 Patent on its websites and elsewhere. *See, e.g.*, https://business.twitter.com/en/advertising/targeting.html; https://blog.twitter.com/en_us/a/2014/an-update-to-tailored-audiences-introducing-new-audience-list-upload-audience-manager-and.html; https://business.twitter.com/en/help/troubleshooting/how-twitter-ads-work.html; https://business.twitter.com/en/help/campaign-setup/campaign-targeting/keyword-targeting.html; https://developer.twitter.com/en/docs/twitter-ads-api/audiences/overview; https://business.twitter.com/en/help/campaign-measurement-

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and-analytics/conversion-tracking-for-websites.html?ref=btc-analytics.html;   ;
https://business.twitter.com/en/advertising/analytics.html;
https://developer.twitter.com/en/docs/twitter-ads-api/audiences/overview;
https://blog.twitter.com/en_us/a/2014/an-update-to-tailored-audiences-introducing-new-audience-list-upload-audience-manager-and.html;
https://business.twitter.com/en/help/campaign-setup/campaign-targeting/conversation-targeting.html;   https://business.twitter.com/en/help/campaign-setup/campaign-targeting/event-targeting.html;   https://business.twitter.com/en/help/campaign-setup/campaign-targeting/tweet-engager-targeting.html;
https://business.twitter.com/en/help/campaign-setup/campaign-targeting/keyword-targeting.html;   https://business.twitter.com/en/help/campaign-setup/campaign-targeting/tv-targeting.html;   https://business.twitter.com/en/help/campaign-setup/campaign-targeting/interest-and-follower-targeting.html;
https://business.twitter.com/en/help/campaign-setup/campaign-targeting/device-carrier-and-new-mobile-user-targeting.html;
https://business.twitter.com/en/help/campaign-setup/campaign-targeting/custom-audiences/app-activity.html.

129.   Twitter users directly infringe by using the '781 Infringing Products in their intended manner. Twitter induces such infringement by providing the '781 Infringing Products and instructions to enable and facilitate infringement. On information and belief, Twitter specifically intends that its actions will result in infringement of the '781 Patent or has taken deliberate actions to avoid learning of infringement.

130.   Additional allegations regarding Twitter's knowledge of the '781 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

COMPLAINT FOR PATENT INFRINGEMENT

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131. Twitter's infringement of the '781 Patent is willful and deliberate, entitling PARC to enhanced damages and attorneys' fees.

132. Twitter's infringement of the '781 Patent is exceptional and entitles PARC to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

133. PARC has been damaged by Twitter's infringement of the '781 Patent and will continue to be damaged unless Twitter is enjoined by this Court. PARC has suffered and continues to suffer irreparable injury for which there is no adequate remedy at law. The balance of hardships favors PARC, and public interest is not disserved by an injunction.

134. PARC is entitled to recover from Twitter all damages that PARC has sustained as a result of Twitter's infringement of the '781 Patent, including without limitation, lost profits and/or not less than a reasonable royalty.

FIFTH CLAIM FOR RELIEF

INFRINGEMENT OF U.S. PATENT NO. 7,043,475

135. Plaintiff realleges and incorporates by reference the allegations of paragraphs 1-134 of this Complaint.

136. The '475 Patent is valid and enforceable under United States Patent Laws.

137. PARC owns, by assignment, all right, title, and interest in and to the '475 Patent, including the right to collect for past damages.

138. A copy of the '475 Patent is attached as Exhibit E.

The '475 Patent

139. The '475 Patent describes, among other things, a method and system for clustering user sessions using "multi-modal information" and "proximal information." In one embodiment, the '475 Patent invention begins by selecting a number of user paths in a collection of content portions. It then determines both multi-modal and

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proximal information for content portions associated with each user path. The '475 Patent combines the multi-modal and proximal information to form a user profile, and clusters multi-modal and proximal information of user profiles based on similarity. In other words, the '475 Patent uses certain data associated with a user's path when traversing web pages in order to create a user profile. The information is then clustered based on similarity. As a result, the '475 Patent can tailor information delivery to users.

140.   By 2002, PARC recognized that "the World Wide Web has become the information repository of choice for both corporations and individual users." '475 Patent at 1:22-23. As the '475 Patent notes, information about how "users travers[e] their document collections or web sites" can be "used to tailor the delivery of information." *Id.* at 1:29-32. Although certain existing products could trace a user's path through the Internet like a map, they could not consider "the multiple modes of information…available" to create user types and thus deliver tailored information. *Id.* at 1:53-54.

141.   The '475 Patent solves this problem through "devices, systems and methods for clustering user sessions using multi-modal information and proximal information." *Id.* at 1:58-60.

142.   In one '475 Patent embodiment, "a plurality of user paths are selected in a collection of content portions." *Id.* at 1:61-62. Each user path is generated as "the user traverses the [web] site" from one web page to another. *Id.* at 5:37-43. "[T]he content portions 110, 120 and 130 may be web pages in the Internet," and "[e]ach content portion 110, 120 and 130 contains one or more contents that may be of interest to a user." *Id.* at 3:17-20.

143.   The '475 Patent further describes that, in one embodiment, "for each path," both multi-modal and proximal information "for content portions associated with the user path [are] determined." *Id.* at 1:62-67. Multi-modal information may

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"include the content feature vector, the uniform resource locator feature vector, the inlink feature vector and the outlink feature vector for the content portion." *Id.* at 4:63-5:1. A "content feature vector reflects the content of the words contained by each document or web page in the path" *Id.* at 8:60-62. Proximal information may be determined, for example, from text associated with a link. *Id.* at 15:43-46. "Proximal terms represent information cues that convey information," and "may include portions of the text 202 surrounding the link 204" or "cue words from the text surrounding the image link." *Id.* at 4:16-21, 4:45-46.

144. The '475 Patent also describes that "the multi-modal information for content portions and the proximal information for content portions associated with the user path are combined to form a user profile." *Id.* at 2:1-4. For example, "[t]he multi modal vector allows different types of information representing the document collection to be combined and operated upon using a unified representation." *Id.* at 6:20-23. Feature vectors and proximate cues can be "concatenated to form a single multi-modal vector that represents the content portion" or "the feature vectors and the proximal cue vectors having the selected measure of similarity with the cluster center vectors based on the feature vector and the proximal cue vector similarity function are averaged." *Id.* at 5:3-6, 10:11-14.

145. The '475 Patent further describes that "the multi-modal information and proximal information of user profiles are clustered based on similarity." *Id.* at 2:4-6. As the '475 Patent notes, "any or all of bases for determining similarity between the proximal cue feature vector, the content feature vector, the uniform resource locator feature vector, the inlink feature vector, the outlink feature vector and the information need feature vector may be changed. As discussed above, any technique for selecting a similarity function may be used." *Id.* at 13:21-26.

’475 Patent Allegations

146. Twitter designed, implemented, and currently uses a variety of advertising tools, such as "targeting," to target ads for its social media platform. *See* https://business.twitter.com/en/advertising/targeting.html. Twitter notes that its "platform shows people relevant ads based on how likely they are to engage with the ad and the brand's goals," and that advertisers can "hone in on your audience by using our powerful targeting tools to get your brand and message in front of the right people, when they're most receptive." *Id.* Twitter provides advertisers with the ability to create custom audiences, which "target your existing followers and customers to create relevant re-marketing campaigns." https://business.twitter.com/en/help/campaign-setup/campaign-targeting/custom-audiences.html.

147. On information and belief after reasonable investigation, Twitter's targeted advertising tools ("'475 Infringing Products") infringe the '475 Patent. Twitter clusters user sessions using multi-modal information and proximal information. For instance, Twitter enables tailored audience marketing campaigns for targeted advertising using content keywords, links that users click, and information located near the links or within the links. *See, e.g.,* https://business.twitter.com/en/help/campaign-setup/campaign-targeting/custom-audiences.html (discussing Twitter's custom audiences, and noting that "Custom Audiences target your existing followers and customers to create relevant re-marketing campaigns"); https://business.twitter.com/en/help/campaign-setup/campaign-targeting.html (discussing various audience features, including "Conversation targeting[,] Event targeting[,] Tweet Engager targeting[,] Keyword targeting[,] Movies and TV show targeting[, and] Interest and follower look-alikes targeting").

148. Twitter selects a plurality of user paths in a collection of content portions. For instance, Twitter selects user paths that the users take through Twitter's content,

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including users' post engagement actions (such as likes, retweets, link clicks, tweet shares, etc.) for each ad each user has seen or clicked on, and each first instance view of an ad. *See, e.g.*, https://business.twitter.com/en/help/campaign-setup/campaign-targeting/tweet-engager-targeting.html (discussing Twitter's tweet engager targeting); https://developer.twitter.com/en/docs/twitter-ads-api/campaign-management/overview/targeting (discussing Twitter's API for targeting).

149. For each user path, Twitter determines multi-modal information for content portions associated with the user path. For instance, Twitter determines which keywords are associated with what content. Twitter tracks keywords entered by a user during search or post activities. In addition, Twitter tracks what links users click on. *See, e.g.*, https://business.twitter.com/en/help/campaign-setup/campaign-targeting/keyword-targeting.html (discussing Twitter's keyword targeting).
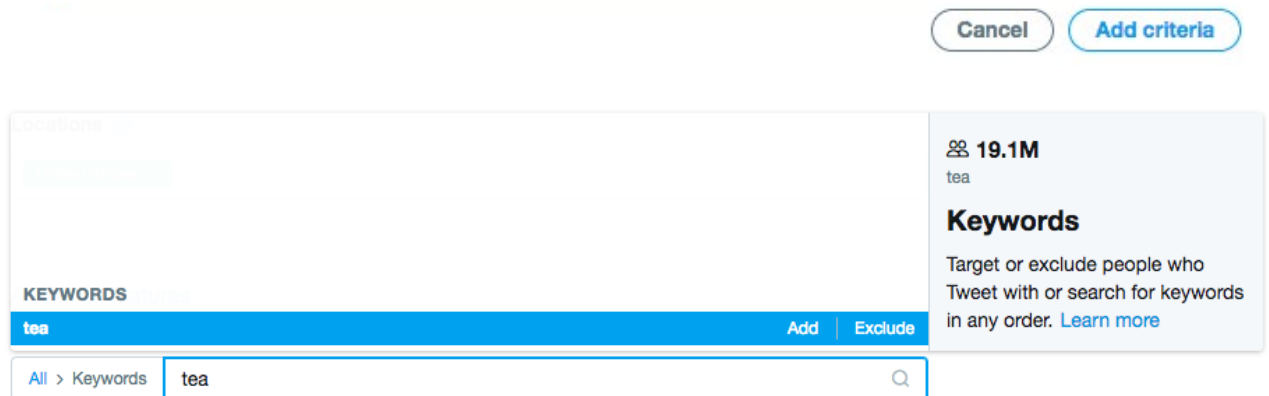
Id.

150. For each user path, Twitter determines proximal information for content portions associated with the user path. For instance, Twitter tracks and stores hashtags users write or interact with within tweets and advertisements. In addition, Twitter monitors tracking information embedded in hyperlinks users click both within Twitter and external to Twitter using Twitter Pixels. Further, Twitter tracks whether users engaged with a "call-to-action" campaign by monitoring when users take a predetermined action when presented with particular content such as an

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advertisement. This allows for the use of their activity for detection of a target group for ad content. *See, e.g.*, https://business.twitter.com/en/help/campaign-setup/campaign-targeting/tweet-engager-targeting.html (discussing Twitter's tweet engager targeting); https://business.twitter.com/en/help/campaign-setup/campaign-targeting/keyword-targeting.html (discussing Twitter's keyword targeting).

151. Twitter also combines the multi-modal information for content portions and the proximal information for content portions associated with the user path to form a user profile having a unified representation. For instance, Twitter combines data about each user across devices. This information includes content the user navigated through, what keywords are in or associated with that content, what links the user clicked on, tracking information within those links, and descriptive textual information shown with the links. In addition, Twitter combines multi-modal and proximal information to identify topics of interest that Twitter believes are relevant to a user. Twitter also uses Twitter Pixels to track user engagement on third party sites after they click a link on the Twitter website or app. Twitter links this data to users' Twitter @handle, which results in a profile for each user. Twitter offers ad target groups, selectable by the advertiser, built based on the combined user profile data, which can be used to serve ads to those profiles based on their preferences matching to the tailored audience. *See, e.g.*, https://developer.twitter.com/en/docs/twitter-ads-api/campaign-management/overview/targeting (discussing Twitter's API for targeting); https://twitter.com/en/privacy (discussing how Twitter captures personal information and determines topics of interest).

"Primary" Types	Other Types
Followers	Locations
Tailored Audiences	Gender
Interests	Languages
Keywords	Devices and platforms
TV	Age

Targeting criteria will be combined for your ad group such that:

- "Primary" Targeting Types will get **U**'d (i.e. put in a logical union).
- Other Targeting Types will get **AND**'d.
- Same types will get **OR**'d.

Id.;   https://business.twitter.com/en/help/campaign-setup/campaign-targeting/custom-audiences.html (discussing Twitter's custom audience targeting).

152.   Twitter clusters multi-modal information and proximal information of user profiles based on similarity. For instance, Twitter clusters keywords, links of user profiles, links users click, tracking information associated with those links, and other collected user data to create audiences of users who have similar characteristics based on demographics, interests, behaviors, followers, retweets, clicks, and tweets, among other things. *See, e.g.*, https://business.twitter.com/en/help/campaign-setup/campaign-targeting/interest-and-follower-targeting.html (discussing Twitter's interest and follower targeting); https://business.twitter.com/en/advertising/targeting.html (discussing all available methods of audience targeting on Twitter).
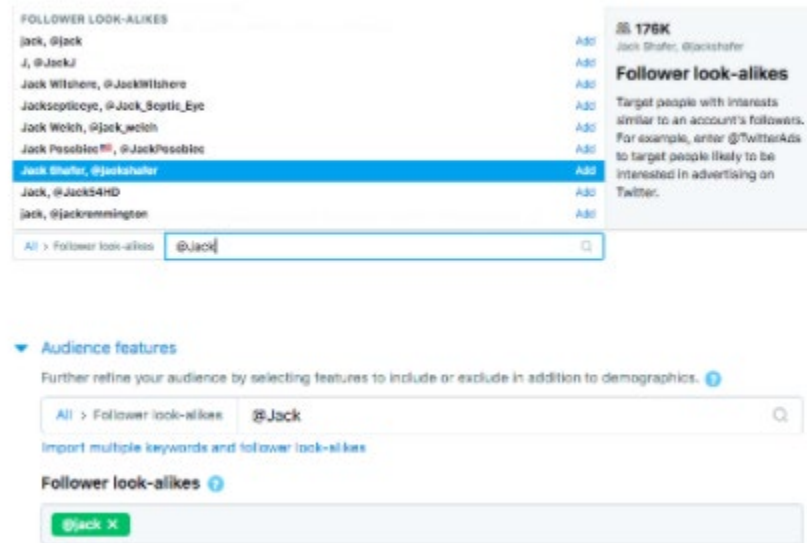
Id.

153.   Twitter has infringed and is infringing, individually and/or jointly, either literally or under the doctrine of equivalents, at least claims 1 and 10 of the '475 Patent in violation of 35 U.S.C. §§ 271, *et seq.*, directly and/or indirectly, by making, using, offering for sale, selling, offering for lease, leasing in the United States, and/or importing into the United States without authority or license, the '475 Infringing Products.

154.   Twitter has been, and currently is, an active inducer of infringement of one or more claims of the '475 Patent under 35 U.S.C. § 271(b). On information and belief, one or more of the '475 Infringing Products of Twitter directly and/or indirectly infringe (by induced infringement) at least claims 1 and 10 of the '475 Patent, literally and/or under the doctrine of equivalents.

155.   This Complaint will serve as notice to Twitter of the '475 Patent and its infringement should Twitter contend that it did not previously have knowledge thereof.

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156.   Twitter intentionally encourages and aids at least its users, including advertisers and website and app users, to directly infringe the '475 Patent.

157.   Twitter provides the '475 Infringing Products and instructions to its users such that they will use the '475 Infringing Products in a directly infringing manner. Twitter markets the '475 Infringing Products to its users and provides instructions to its users on how to use the functionality of the '475 Patent on its websites and elsewhere. *See, e.g.*, https://business.twitter.com/en/advertising/targeting.html; https://business.twitter.com/en/help/campaign-setup/campaign-targeting/custom-audiences.html; https://business.twitter.com/en/help/campaign-setup/campaign-targeting.html https://business.twitter.com/en/help/campaign-setup/campaign-targeting/tweet-engager-targeting.html; https://developer.twitter.com/en/docs/twitter-ads-api/campaign-management/overview/targeting; https://business.twitter.com/en/help/campaign-setup/campaign-targeting/keyword-targeting.html; https://business.twitter.com/en/help/campaign-setup/campaign-targeting/interest-and-follower-targeting.html.

158.   Twitter users directly infringe by using the '475 Infringing Products in their intended manner. Twitter induces such infringement by providing the '475 Infringing Products and instructions to enable and facilitate infringement. On information and belief, Twitter specifically intends that its actions will result in infringement of the '475 Patent or has taken deliberate actions to avoid learning of infringement.

159.   Additional allegations regarding Twitter's knowledge of the '475 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

160.   Twitter's infringement of the '475 Patent is willful and deliberate, entitling PARC to enhanced damages and attorneys' fees.

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161. Twitter's infringement of the '475 Patent is exceptional and entitles PARC to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

162. PARC has been damaged by Twitter's infringement of the '475 Patent and will continue to be damaged unless Twitter is enjoined by this Court. PARC has suffered and continues to suffer irreparable injury for which there is no adequate remedy at law. The balance of hardships favors PARC, and public interest is not disserved by an injunction.

163. PARC is entitled to recover from Twitter all damages that PARC has sustained as a result of Twitter's infringement of the '475 Patent, including without limitation, lost profits and/or not less than a reasonable royalty.

SIXTH CLAIM FOR RELIEF

INFRINGEMENT OF U.S. PATENT NO. 7,167,871

164. Plaintiff realleges and incorporates by reference the allegations of paragraphs 1-163 of this Complaint.

165. The '871 Patent is valid and enforceable under United States Patent Laws.

166. PARC owns, by assignment, all right, title, and interest in and to the '871 Patent, including the right to collect for past damages.

167. A copy of the '871 Patent is attached as Exhibit F.

The '871 Patent

168. The '871 Patent describes, among other things, a system and method of determining the reliability of a document based on its textual contents. In one embodiment, the '871 Patent describes a system that extracts document content feature values based on the document's textual contents, and processes them to determine the reliability of the document. To make the reliability determination, the system may use a trained model, statistical processes, and/or metric-regression

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algorithms. Furthermore, the reliability decision under the '871 Patent may also consider the document author's background, any association of the author with a particular institution, and other cues affecting the document's reliability.

169.   By 2002, PARC recognized that the proliferation of information available on the Internet came at a cost:

> A notoriously difficult problem in using large heterogeneous document collections, such as the World Wide Web (the "Web"), is that it is not easy to recognize which documents, for example, which web pages and web documents, provide reliable authoritative information about a subject.

'871 Patent at 1:13-18.

170.   This problem has recently gained significant notoriety with the proliferation of misinformation on social media websites. As the '871 Patent states, "[t]he fact that a text is widely referenced may not by itself assure that it is authoritative." *Id.* at 2:10-12. "[L]arge amount[s] of misinformation," especially for high-value information like medical issues and informational news, have exacerbated the issue such that PARC set about to solve it. *Id.* at 2:12-15. Rather than determining reliability based on the popularity or wide-spread circulation of Internet-based information, PARC invented a method and system for analyzing the text of the document itself for cues of its reliability. *Id.* at 2:30-41.

171.   To assess a document's reliability, in one embodiment the '871 Patent uses a set of document content features—such as punctuation, certain words or text, hyperlinks, images, document length, readability, author background, institutional affiliation of the author, etc.—that may be present in a web document. *Id.* at 6:47-58; 9:41-46; Figs. 3, 5. The document content features "may vary according to the specific application, training data, particular web-based document features and the like." *Id.* at 7:16-18.

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172.   The invention of the '871 Patent, in one embodiment, determines values associated with the document content features based on the document's text, and those values are used to determine the reliability of the document. For example, the '871 Patent system "determines a set of document content feature values for a document by processing one or more of the selected document content features." *Id.* at 7:20-23. The processing may be implemented as "one or more of parsing and mathematical processes or methods." *Id.* at 7:26-28.

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173.   In one embodiment, the '871 Patent then "determines a document's textual authoritativeness value using the one or more determined document content feature values." *Id.* at 7:43-46. The authoritativeness decision is made by a computer model that is "trained on a large sample of documents." *Id.* at 6:39-41. The training of the computer model "may not be entirely automatic. Rather, instructions…may be manually or automatically executed." *Id.* at 9:3-8.

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174.   The trained computer model in one embodiment of the '871 Patent may implement "one or more statistical processes or techniques" to make an authoritativeness decision. *Id.* at 7:51-53. These processes and techniques may include a variety of statistical, regression, or classification processes, such as a metric-regression algorithm, a boosted decision tree algorithm, an AdaBoost algorithm model, an ordinal regression process, or a multi-class classification process, among others. *Id.* at 7:58-8:13.

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175.   The authoritativeness decision, which indicates whether the information in the document is reliable, is then output by the system. *Id.* at 3:4-6.

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'871 Patent Allegations

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176.   Twitter uses a variety of computer algorithms and tools—called "machine learning"—to detect network and Twitter Feed manipulation. *See* https://blog.twitter.com/en_us/topics/company/2019/Twitter-acquires-Fabula-AI.html. This machine learning is leveraged "across natural language processing (NLP),

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recommendations systems, reinforcement learning, and graph deep learning."
https://venturebeat.com/2019/06/03/twitter-acquires-fabula-ai-a-machine-learning-startup-that-helps-spot-fake-news/. Twitter's machine learning studies millions of tweets, retweets, and likes shared on Twitter. *See* https://blog.twitter.com/en_us/topics/company/2019/Twitter-acquires-Fabula-AI.html. The technology then "allocat[es] an authenticity score." https://venturebeat.com/2019/06/03/twitter-acquires-fabula-ai-a-machine-learning-startup-that-helps-spot-fake-news/. As a result, Twitter's machine-learning "reduce[s] abuse on Twitter," "detect[s] potential policy violations," and "send[s] more flagged Tweets to agents for review." https://s22.q4cdn.com/826641620/files/doc_financials/2019/q3/Q3-2019-Shareholder-Letter.pdf.

177.   Twitter has been public in its efforts to combat the sharing of misinformation. In June 2019, Twitter acquired Fabula AI, a machine learning startup that identifies misinformation. https://venturebeat.com/2019/06/03/twitter-acquires-fabula-ai-a-machine-learning-startup-that-helps-spot-fake-news/. On February 4, 2020, the company put forth a press release stating that it would put warning labels on tweets with deceptively edited forms of media or remove them altogether. https://blog.twitter.com/en_us/topics/company/2020/new-approach-to-synthetic-and-manipulated-media.html.

178.   In addition, Twitter has taken steps to automate its processes as it relates to misinformation surrounding the COVID-19 pandemic. As of April 1, 2020, Twitter's automated systems challenged more than 1.5 million accounts that targeted discussions around COVID-19 with spam or manipulative behavior. https://blog.twitter.com/en_us/topics/company/2020/new-approach-to-synthetic-and-manipulated-media.html.

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179.   Twitter also uses its automatic review system to flag tweets that violate Twitter's terms of service. As of April 2020, more than 51% of tweets that violate the Terms of Service are now automatically flagged by machine learning systems, with the ultimate goal of having over 90% of violating tweets removed automatically. https://www.fastcompany.com/90528941/twitter-automatically-flags-more-than-half-of-all-tweets-that-violate-its-rules.

180.   When Twitter deems a tweet "harmful," "misleading," "synthetic," "manipulated," "disputed," or "unverified," Twitter also provides labels and warning messages   for   those   tweets. https://blog.twitter.com/en_us/topics/product/2020/updating-our-approach-to-misleading-information.html.   In   some   cases   Twitter   will   remove   misleading information:

	Moderate	Severe
Misleading Information	Label	Removal
Disputed Claim	Label	Warning
Unverified Claim	No action	No action*

Propensity for Harm

Id.

181.   On information and belief after reasonable investigation, Twitter's machine-learning tools and algorithms used to protect the integrity of user's social media feeds and to stop the spread of false/misleading news, accounts, advertising, or other misinformation ("'871 Infringing Products") infringe the '871 Patent. Twitter operates a method for determining an authoritativeness of a document having a plurality of document content features. For instance Twitter operates machine-learning

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tools and algorithms that determine the authoritativeness of tweets, retweets, advertisements, and other features of their social media platform. For example, Twitter operates a machine-learning system to identify harmful, misleading, synthetic, manipulated, disputed, or unverified tweets. The tweets, retweets, advertisements, and other features include a plurality of document content features, such as text, punctuation, account names, images, videos, hyperlinks, text characteristics, and readability. *See, e.g.,* https://twitter.com/home.

182.   Twitter determines a set of document content feature values of a document based on textual contents in the document, the document providing information regarding a subject. For instance, tweets, retweets, advertisements, and other features provide information on a subject. Twitter determines a set of document content feature values based on the text of the tweets, retweets, advertising, and other features. For example, Twitter determines values associated with the text of a tweet, retweet, or advertisement, and/or the falsity of text, photos, and videos contained in a tweet,   retweet,   or   advertisement.   *See,   e.g.,* https://blog.twitter.com/en_us/topics/product/2020/updating-our-approach-to-misleading-information.html   (describing   Twitter's   approach   to   misleading information);   https://blog.twitter.com/en_us/topics/company/2019/Twitter-acquires-Fabula-AI.html (describing Twitter's acquisition of "Fabula AI to strengthen its machine   learning   expertise");   https://venturebeat.com/2019/06/03/twitter-acquires-fabula-ai-a-machine-learning-startup-that-helps-spot-fake-news/ (describing Twitter's acquisition   of   "Fabula   AI,   a   machine   learning   startup"); https://s22.q4cdn.com/826641620/files/doc_financials/2019/q3/Q3-2019-Shareholder-Letter.pdf (describing Twitter's metrics, including related to misinformation).

183.   Twitter determines the authoritativeness of the document based on the determined set of document content feature values using a trained document textual authority   model.   For   instance,   Twitter   determines   whether   a   tweet,   retweet,

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advertisement, or other feature is false or contains misinformation based on the values described above. Twitter uses machine learning, which studies millions of tweets, retweets, and likes to uncover patterns, extract signals, and determine an authenticity score. *See, e.g.,* https://blog.twitter.com/en_us/topics/company/2019/Twitter-acquires-Fabula-AI.html (describing Twitter's acquisition of "Fabula AI to strengthen its machine learning expertise"); https://venturebeat.com/2019/06/03/twitter-acquires-fabula-ai-a-machine-learning-startup-that-helps-spot-fake-news/ (describing Twitter's acquisition of "Fabula AI, a machine learning startup"); https://s22.q4cdn.com/826641620/files/doc_financials/2019/q3/Q3-2019-Shareholder-Letter.pdf (describing Twitter's metrics, including related to misinformation).

184.   Twitter determines the authoritativeness by determining a reliability of the document, where the reliability is indicative of whether the information, as provided in the document, is reliable regarding the subject. For instance, Twitter determines whether a tweet, retweet, advertisement, or other feature is reliable regarding the subject by determining their authenticity using an "authenticity score." *See, e.g.,* https://blog.twitter.com/en_us/topics/company/2019/Twitter-acquires-Fabula-AI.html (describing Twitter's acquisition of "Fabula AI to strengthen its machine learning expertise"); https://venturebeat.com/2019/06/03/twitter-acquires-fabula-ai-a-machine-learning-startup-that-helps-spot-fake-news/ (describing Twitter's acquisition of "Fabula AI, a machine learning startup"); https://s22.q4cdn.com/826641620/files/doc_financials/2019/q3/Q3-2019-Shareholder-Letter.pdf (describing Twitter's metrics, including related to misinformation).

185.   Twitter outputs the determined authoritativeness in association with the document. For instance, Twitter outputs an "authenticity score." *See, e.g.,* https://blog.twitter.com/en_us/topics/company/2019/Twitter-acquires-Fabula-AI.html (describing Twitter's acquisition of "Fabula AI to strengthen its machine learning expertise"); https://venturebeat.com/2019/06/03/twitter-acquires-fabula-ai-a-machine-

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learning-startup-that-helps-spot-fake-news/ (describing Twitter's acquisition of "Fabula AI, a machine learning startup"); https://s22.q4cdn.com/826641620/files/doc_financials/2019/q3/Q3-2019-Shareholder-Letter.pdf (describing Twitter's metrics, including related to misinformation). Twitter also "flag[s] Tweets to agents for review," and provides labels and warning messages associated with tweets/retweets/advertisements as shown below. *See, e.g.,* https://s22.q4cdn.com/826641620/files/doc_financials/2019/q3/Q3-2019-Shareholder-Letter.pdf (describing Twitter's metrics, including related to misinformation); https://blog.twitter.com/en_us/topics/product/2020/updating-our-approach-to-misleading-information.html (describing Twitter's approach to misleading information).

Id.

186.   Twitter has infringed and is infringing, individually and/or jointly, either literally or under the doctrine of equivalents, at least claims 1, 16, and 21 of the '871 Patent in violation of 35 U.S.C. §§ 271, *et seq.*, directly and/or indirectly, by making, using, offering for sale, selling, offering for lease, leasing in the United States, and/or importing into the United States without authority or license, the '871 Infringing Products.

1   187.   Twitter has been, and currently is, an active inducer of infringement of
2 one or more claims of the '871 Patent under 35 U.S.C. § 271(b). On information and
3 belief, one or more of the '871 Infringing Products of Twitter directly and/or
4 indirectly infringe (by induced infringement) at least claims 1, 16, and 21of the '871
5 Patent, literally and/or under the doctrine of equivalents.

6   188.   This Complaint will serve as notice to Twitter of the '871 Patent and its
7 infringement should Twitter contend that it did not previously have knowledge
8 thereof.

9   189.   Twitter intentionally encourages and aids at least its users, including
10 advertisers and website and app users, to directly infringe the '871 Patent.

11   190.   Twitter provides the '871 Infringing Products and instructions to its users
12 such that they will use the '871 Infringing Products in a directly infringing manner.
13 Twitter markets the '871 Infringing Products to its users and provides instructions to
14 its users on how to use the functionality of the '871 Patent on its websites and
15 elsewhere. *See, e.g.*, https://blog.twitter.com/en_us/topics/product/2020/updating-our-
16 approach-to-misleading-information.html;
17 https://blog.twitter.com/en_us/topics/company/2019/Twitter-acquires-Fabula-AI.html;
18 https://blog.twitter.com/en_us/topics/product/2020/updating-our-approach-to-
19 misleading-information.html.

20   191.   Twitter users directly infringe by using the '871 Infringing Products in
21 their intended manner. Twitter induces such infringement by providing the '871
22 Infringing Products and instructions to enable and facilitate infringement. On
23 information and belief, Twitter specifically intends that its actions will result in
24 infringement of the '871 Patent or has taken deliberate actions to avoid learning of
25 infringement.

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192.   Additional allegations regarding Twitter's knowledge of the '871 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

193.   Twitter's infringement of the '871 Patent is willful and deliberate, entitling PARC to enhanced damages and attorneys' fees.

194.   Twitter's infringement of the '871 Patent is exceptional and entitles PARC to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

195.   PARC has been damaged by Twitter's infringement of the '871 Patent and will continue to be damaged unless Twitter is enjoined by this Court. PARC has suffered and continues to suffer irreparable injury for which there is no adequate remedy at law. The balance of hardships favors PARC, and public interest is not disserved by an injunction.

196.   PARC is entitled to recover from Twitter all damages that PARC has sustained as a result of Twitter's infringement of the '871 Patent, including without limitation, lost profits and/or not less than a reasonable royalty.

PRAYER FOR RELIEF

WHEREFORE, PARC prays for a judgment in its favor and against Twitter and respectfully requests the following relief:

1.   A judgment declaring that Twitter has infringed one or more claims of each of the PARC Patents in this litigation pursuant to 35 U.S.C. §§ 271(a) and/or 271(b);

2.   An injunction pursuant to 35 U.S.C. § 283 permanently enjoining Twitter, its officers, directors, attorneys, agents, servants, employees, parties in privity with, and all persons in active concert or participation with, any of the foregoing, from continued acts of infringement, contributing to infringement, or inducing infringement of the PARC Patents in this litigation;

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3.   A judgment requiring Twitter to make an accounting of damages resulting from Twitter's infringement of the PARC Patents in this litigation;

4.   A judgment awarding PARC its damages resulting from Twitter's infringement of the PARC Patents in this litigation, and increasing such damages pursuant to 35 U.S.C. § 284 because of the willful and deliberate nature of Twitter's conduct;

5.   A judgment requiring Twitter to pay PARC's costs, expenses, and pre-judgment and post-judgment interest for Twitter's infringement of each of the PARC Patents in this litigation;

6.   A judgment finding that this is an exceptional case and awarding PARC's attorneys' fees pursuant to 35 U.S.C. § 285; and

7.   Such other relief as the Court deems just and proper.

DATED: November 25, 2020   Respectfully submitted,

MCKOOL SMITH, P.C.

BY _/s/ Alan P. Block_____
ALAN P. BLOCK

ATTORNEYS FOR PLAINTIFF
PALO ALTO RESEARCH CENTER INC.

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DEMAND FOR JURY TRIAL

2   In accordance with Rule 38 of the Federal Rules of Civil Procedure and Local

3   Rule CV-38-1, Plaintiff respectfully demands a jury trial of all issues triable to a jury.

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5   DATED: November 25, 2020   Respectfully submitted,

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     MCKOOL SMITH, P.C.
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9   BY _/s/ *Alan P. Block* _

10   ALAN P. BLOCK

11   ATTORNEYS FOR PLAINTIFF
     PALO ALTO RESEARCH CENTER INC.
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COMPLAINT FOR PATENT INFRINGEMENT

MCKOOL SMITH, P.C.