IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

OPENTV, INC.,	)	
	)	
Plaintiff,	)	
	)	C.A. No. _____
v.	)	
	)	**JURY TRIAL DEMANDED**
PINTEREST, INC.,	)	
	)	
Defendant.	)	

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff OpenTV, Inc. ("Plaintiff" or "OpenTV"), by its attorneys, for its Complaint of patent infringement against Defendant Pinterest, Inc. ("Defendant" or "Pinterest"), hereby alleges as follows:

INTRODUCTION

1. OpenTV brings an action for patent infringement under the Patent Laws of the United States, 35 U.S.C. § 1, *et seq*., to stop Pinterest from continuing its wrongful and unlicensed use of OpenTV's patented technologies for, among other things, storing, providing, managing, delivering, securing, playing, and viewing interactive content on smartphones, tablets, computers, and other devices.

2. Plaintiff and its affiliates have a long and distinguished history of innovation, and today these companies design and manufacture widely used, critically acclaimed, and award-winning digital media technologies, employ hundreds of employees in the United States and worldwide, and protect their research and development investment with a robust patent portfolio comprising thousands of patents reflecting the years of innovation and effort by numerous inventors and engineers. Plaintiff and its affiliates encourage innovation by licensing their

intellectual property portfolio but enforce their patent rights when necessary to protect their research investment and protect the fruits of the efforts of their employees from unauthorized use.

3. Pinterest's products and services, including, without limitation, its website, www.pinterest.com, its mobile application, digital advertising manager, ad delivery system, machine learning content distribution technologies, and all related methods of predicting and suggesting content to end users, make pervasive use of OpenTV's patented technology and infringe one or more of the following United States patents (the "Asserted Patents"):

- 10,419,817 ("the '817 patent") (Ex. A);
- 9,699,503 ("the '503 patent") (Ex. B);
- 7,669,212 ("the '212 patent") (Ex. C); and
- 7,055,169 ("the '169 patent") (Ex. D).

4. Plaintiff seeks damages in an amount adequate to compensate it for Pinterest's infringement, a permanent injunction barring Pinterest from continuing to infringe OpenTV's patents, and attorneys' fees and costs associated with this action.

THE PARTIES

5. Plaintiff OpenTV, Inc. is a Delaware corporation whose principal place of business in the United States is located at 5090 North 40th Street, Suite 450, Phoenix, Arizona 85018.

6. Defendant Pinterest, Inc. is a Delaware corporation with a principal place of business at 651 Brannan Street, San Fransisco, CA 94107..

JURISDICTION AND VENUE

7. OpenTV brings this action for patent infringement under the Patent Laws of the United States, 35 U.S.C. § 1, *et seq.*

8. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

9. This Court has both general and specific jurisdiction over Pinterest because Pinterest is incorporated in Delaware. In addition, Pinterest has committed acts within this District giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over Pinterest would not offend traditional notions of fair play and substantial justice. Pinterest, directly and indirectly (through vendors, service providers, customers, end users, and others), has committed and continues to commit acts of patent infringement in this District, by, among other things, providing, making, using, testing, selling, and/or licensing products and services that infringe the Asserted Patents. Pinterest has purposefully directed activities at the residents of this District, and by placing the accused instrumentalities into the stream of commerce with knowledge and intent that they would be accessed, downloaded, and/or used in this District.

10. Venue is proper in this District pursuant to 28 U.S.C §§ 1391(b) and (c) and 1400(b). Pinterest is incorporated in Delaware and therefore resides in this District.

FACTUAL BACKGROUND

I. OpenTV

11. OpenTV, and the other subsidiaries of Kudelski SA, a Swiss corporation with shares publicly traded on the SIX Swiss Exchange, make up the various companies of The Kudelski Group. The history of The Kudelski Group is one highlighted by over 70 years of innovation, award winning products, and loyal, long-term customers who entrust The Kudelski Group with their business. Today, The Kudelski Group has employees in the United States, Europe, Asia, and elsewhere, providing jobs in manufacturing, engineering, research and development, marketing,

sales, and many other specialties, with over 1,700 employees worldwide. On information and belief, The Kudelski Group maintains international headquarters in Cheseaux-sur-Lausanne, Switzerland and its U.S. headquarters in Phoenix, Arizona.

12. In 1951, Stefan Kudelski created the first company in what became The Kudelski Group and launched the now legendary "Nagra" line of portable recording devices for cinema, TV and radio recording. In 1952, a Nagra recording device was used to record an excursion to the heights of Mount Everest. Then, in 1960, a Nagra recording device was used in the exploration of the depths of ocean (specifically, The Challenger Deep) in the famous Trieste voyage (35,814 feet deep). Stefan Kudelski's recording devices, and the inventions in them, were considered revolutionary throughout the movie industry. The NAGRA III, a cinema recorder produced in 1958, began Mr. Kudelski's 20-year journey recording most Hollywood productions.[1] The Nagra devices allowed precise synchronization of audio tape with film, providing filmmakers with studio sound quality during on-location filming. And in the mid to late 1960s, Nagra recorders were used by the United States government for intelligence operations and by NASA during its Apollo mission to the moon.

13. Throughout his career, Mr. Kudelski received numerous awards and honors for his technological achievements. For example, Mr. Kudelski received four Oscars from the Academy of Motion Picture Arts and Sciences: three Scientific or Technical Awards in 1965, 1977, 1978, and the Gordon E. Sawyer Award in 1990. Mr. Kudelski also received two Emmy Awards, as well

[1] *See* Company, NagraVision Kudelski Group (November 4, 2024 at 10:22am), https://dtv.nagra.com/why-nagra (quoting Academy Award-Winning Sound Engineer, Chris Newman: "There was virtually no film made from 1961 until the early '90s that did not use the NAGRA") (last accessed November 26, 2024).

as Gold Medals from L. Warner, Audio Engineering Society, Lyra and Eurotechnica. Mr. Kudelski was also recognized by the FBI for his technology contribution in audio recording.

14. Over the next 50 years, The Kudelski Group transformed and grew its business to include encryption systems for television (1989), digital TV access solutions (1995), public access solutions (2001), pay-TV software (2009), cybersecurity (2012), artificial intelligence and big data (2016), and Internet-of-Things (2017).

15. The success of its products allowed The Kudelski Group to expand its technology into the digital television domain.

16. As part of its NagraVision division, The Kudelski Group has developed technologies to help global service providers deliver digital entertainment to consumers. The Kudelski Group's technology and intellectual property has been integrated and recognized by the world's leading technology companies such as Apple, Bloomberg, Google, the Walt Disney Company, Cisco, Hulu, Netflix, Verizon, and Yahoo.

17. In 1989, The Kudelski Group launched its first conditional access system for pay TV. Over the next decade, The Kudelski Group continued to expand its technology development in the digital TV space, providing global, universally compatible solutions to manage, organize, enhance, market, and secure digital content, regardless of whether it was transmitted over managed or unmanaged networks and broadcasted linearly or on-demand.

18. Today, digital media is one of the core businesses of The Kudelski Group. With that business priority, The Kudelski Group has become a world leader in digital security and convergent media solutions for the delivery of digital and interactive content. The Kudelski Group's innovations are continuously contributing to the evolution of the entire digital ecosystem, enabling

operators to extend their multimedia offerings across the entire digital ecosystem to numerous client devices through traditional managed networks as well as Internet delivery.

19. The Kudelski Group has also grown as a leader in the digital media domain through acquisitions of pioneering technology companies, including such notable companies as Lysis (2001), Livewire (2001), MediaGuard (2004), SmarDTV (2006), OpenTV (2007), and Conax (2014).

20. OpenTV was founded in 1996 as Thomson Sun Interactive, LLC, a joint venture of Thomson Multimedia SA and Sun Microsystems, Inc. In 1997, Thomson Sun Interactive LLC was converted into a newly-formed corporation—OpenTV. From its inception, OpenTV has been dedicated to developing and commercializing cutting-edge, patented technology required for the delivery of television and other media content to consumers through cable, satellite, and terrestrial networks, and other managed and unmanaged networks.

21. OpenTV has a long history of innovation in the field of software for set-top boxes for television sets. Within four years of its creation, OpenTV became the first interactive television middleware provider to integrate its middleware technology into more than 10 million set-top boxes worldwide—more than all other industry competitors combined. OpenTV also partnered with EchoStar's DISH Network, which was the first satellite company to provide interactive television services in the United States. OpenTV's set-top box middleware technologies were key to the successful growth of DISH Network. Today, OpenTV's software is used by companies around the world.

22. In addition to its industry-leading pay TV software solutions, OpenTV has been an innovator in web-based content delivery.

23. As a result of its ongoing commitment to interactive television and web-based content delivery, by 2004-2006, OpenTV led the industry in integrating browser software into television sets, built the first interactive shopping application for DISH Network, successfully launched real-time two-way interactive television shopping services on QVC, and provided the technology for CNN Enhanced TV, among other notable achievements. All of these innovations helped pave the way for the growing revolution in how media content is delivered and enjoyed, including over the Internet.

24. In addition to these achievements, OpenTV also developed complementary technology related, for example, to personal video recording ("PVR"), video-on-demand ("VOD"), television home networking, advanced advertising methodologies, and tools for recommending content to viewers. The industry has also long recognized OpenTV's technology contributions. For example, OpenTV's PVR was named as one of the best in its field by Seagate Technology in 2009.

25. Today, OpenTV develops software that enables intuitive and personalized viewing experiences for consumers. OpenTV's software solutions provide a variety of advanced and interactive services for digital media, including advanced user interfaces, VOD, PVR, high-definition ("HD"), interactive, and addressable advertising, and a variety of enhanced television applications.

26. The Kudelski Group products that are integrated with the OpenTV platform have won numerous industry awards, including "Best New Technology" at the 2009 DISH Network Interactive Awards for OpenTV, a TV Innovation Award in the category of "Advanced User Interface" for OpenTV's cross-device user experience in 2010, an IPTV World Forum Award for "Best Multiscreen Solution/Service" for Nagra Multiscreen in 2012, and "Best IPTV Technology"

for Nagra MediaLive and "Best Middleware" for OpenTV at IBC 2012. OpenTV's next generation middleware software, known as OpenTV5, was widely praised following the 2013 International Broadcasting Convention trade show as a stand-out product for showing "how the user interface and the overall user experience can be enhanced with 4K screens," "bring[ing] the HTML5 user experience and 4K to a new level," and for providing a "stunning" and "compelling" user interface.

27. OpenTV became a part of The Kudelski Group in 2007 through The Kudelski Group's acquisition of a controlling stake in the company. OpenTV is now a wholly owned subsidiary of Kudelski Corporate, Inc., which is a wholly-owned subsidiary of Kudelski SA.

28. The Kudelski Group devotes substantial resources to research and development, with nearly 800 employees engaged in engineering worldwide. In fact, The Kudelski Group companies have invested over $3 billion in research and development in the past 20 years.

29. To protect their investment in research and development, OpenTV and The Kudelski Group companies have garnered a robust international portfolio of over 3,000 worldwide pending and issued patents, including many related to the delivery of end-to-end secure media solutions for digital content, and continue to substantially grow their worldwide patent positions in this and other complementary technology areas.

30. These patents include key technologies related to content management and delivery systems, content recommendation engines and targeted content delivery, subscriber management systems and tools, Digital Rights Management ("DRM") and other content access control techniques, billing and payment systems, user interfaces, digital video recorder ("DVR") content storage and scheduling, end-to-end digital content security, including securing digital content within the home network, VOD content selection, advanced advertising techniques, and many others.

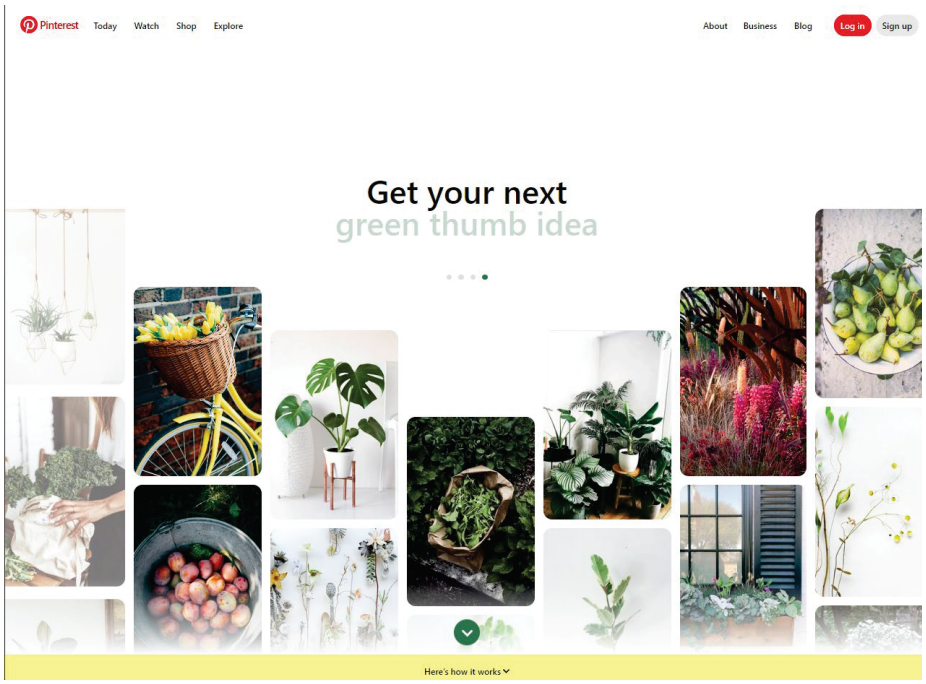
31. Companies worldwide have acknowledged the commercial importance of The Kudelski Group's patent portfolio, taking licenses to OpenTV and other patents of The Kudelski Group relevant to their businesses.

32. With the proliferation of video-based content and advanced advertising techniques on social media platforms such as Pinterest, Kudelski's inventions are now used to, for example, optimize content recommendation systems, enhance video streaming applications, and provide curated advertising recommendation and delivery functionality.

II. Pinterest

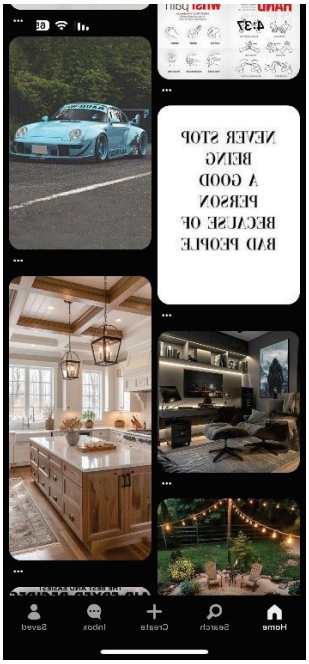
33. Pinterest is a Delaware corporation with a principal place of business in San Francisco, California.

34. Pinterest is a "visual discovery engine for finding ideas."[2] Pinterest can be accessed by either a web browser at www.pinterest.com, (the "Website"):



[2] Pinterest, "What is Pinterest," https://help.pinterest.com/en/guide/all-about-pinterest, (last accessed November 26, 2024).

or as a mobile application called "Pinterest" that can be installed on iOS, Android and Windows mobile devices, (the "Mobile App").[3]



35. Pinterest presents digital visual content, including video content, which Pinterest describes as a "Pin." Pinterest allows individuals and groups to organize their desired Pins into various "Boards." Pinterest's Website and Mobile App contain a "home feed" where users "find Pins, people and business [Pinterest] think[s] [users] will love, based on [users'] recent activity." Pinterest also claims to "show [users] Pins from the people and boards [users] choose to follow."[4]

A. The Importance of Video to Pinterest's Platform

36. According to Pinterest engineers, "Pinterest is one of the most image-heavy services online, and so it's crucial that [Pinterest] constantly work to improve the speed and quality

[3] Pinterest, "Upgrade the Pinterest app" https://help.pinterest.com/en/article/use-pinterest-in-a-mobile-browser, (last accessed November 26, 2024).
[4] Pinterest, "What is Pinterest", https://help.pinterest.com/en/article/use-pinterest-in-a-mobile-browser, (last accessed November 26, 2024).

of those images whether static, GIF or video."[5] Pinterest built its native video platform in or around 2016.[6] In addition to providing a platform for videos, Pinterest began converging GIFs to videos to improve user experience and engagement.[7]

37. In September of 2020, Pinterest introduced a concept known as story pins, allowing pinners to use videos to tell dynamic and visual stories.[8] In or around 2021, the concept of story pins evolved into Pinterest idea pins, providing pinners with a suite of new publishing tools including, video-first features.

38. Video pins were necessary for Pinterest to remain a viable competitor in the social media market. "In July of 2021, Pinterest saw a 5% decrease in users . . . [which t]hey attributed to . . . people spending less time at home after the Covid restrictions started easing up."[9] Pinterest determined that "[v]ideo [was] a necessary element in the idea pins . . . because of the consumer demand for short form video introduced by TikTok and adapted by Instagram, Snapchat, and YouTube."[10] According to one source, Pinterest's "move [to short-form video] allows Pinterest to keep up with other short-video heavy hitters such as TikTok, Instagram Reels, YouTube Shorts, and Snapchat."[11]

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[5] Pinterest Engineering, "Improving GIF performance on Pinterest," Medium, https://medium.com/pinterest-engineering/improving-gif-performance-on-pinterest-8dad74bf92f1 (last accessed November 26, 2024).
[6] *Id*.
[7] *Id*.
[8] Pinterest Newsroom, "Introducing Story Pins and new ways for creators to build and grow with Pinterest," https://newsroom-archive.pinterest.com/introducing-new-ways-for-creators-to-build-and-grow-with-pinterest, (last accessed November 26, 2024).
[9] "Short-Form Video and Pinterest – How Did it Change the Platform," Teaching Social Media, September 13, 2022, https://teachingsocialmedia.org/2022/09/13/short-form-video-and-pinterest-how-did-it-change-the-platform/, (last accessed November 26, 2024).
[10] *Id.*
[11] *Id.*

39. Pinterest's CEO and co-founder, Ben Silbermann, related the success of launching video on the platform to the company's increasing profitability: "We took important steps in 2021 with the launch of our foundational technology to deliver a video-first publishing platform. And, I'm proud to say that for the first time, we surpassed $2 billion in revenue for the year — growing 52% over the previous year — and reached our first full year of GAAP profitability."[12]

40. Pinterest also found that video pins enhanced the user experience. Specifically, Pinterest marketing consultants explain that video pins create an immersive experience that keeps users engaged for longer periods of time than static images, which strengthens Pinterest's value as an inspiration-based discovery platform. Video pins are widely viewed, saved, and shared, converting viewers into active participants in the discovery process, thus making video pins crucial to Pinterest's user experience. According to Pinterest, "video content . . . not only grabs . . . users' attention but takes them from inspiration to action."[13] Pinterest further notes that users "view videos mindfully, scrolling three times slower than they do on other social platforms," causing videos to "play[] a critical role" in converting users to buyers.[14] "When viewers are captivated by the videos they see and watch them until the end, they're more likely to remember your brand and take action, transforming viewers into potential customers." [15] Pinterest avers that video pins enhance the user experience. "In fact, 66% of Pinners [Pinterest's term to describe its users] say that videos add to their discovery experience more significantly than videos on other media

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[12] Pinterest Announces Fourth Quarter and Full Year 2022 Results, BusinessWire, February 03, 2022, https://www.businesswire.com/news/home/20220203005895/en/Pinterest-Announces-Fourth-Quarter-and-Full-Year-2021-Results, (last accessed November 26, 2024).
[13] *Id.*
[14] *Id.*
[15] *Id.*

platforms."[16] "Pinners are also 54% more likely to say that videos on Pinterest inspire them to take action."[17]

41. Pinterest has leveraged the enhanced user experience of video pins to grow its advertising revenue with its commercial customers. Pinterest instructs its users on how to create and configure video ads.[18] Pinterest offers a sophisticated suite of video advertising options:[19]

[16] Pinterest Newsroom, "Mastering the art of inspirational videos on Pinterest, https://newsroom-archive.pinterest.com/en-gb/mastering-the-art-of-inspirational-videos-on-pinterest, (last accessed on November 26, 2024).
[17] *Id.*
[18] Pinterest Business, "Video ads", https://help.pinterest.com/en/business/article/promoted-video-with-autoplay, (last accessed November 26, 2024).
[19] Pinterest Business, "Tap into high-intent shoppers with video ads on Pinterest," https://business.pinterest.com/en-gb/blog/video-ads-pinterest-high-intent-shoppers/, (November 26, 2024).

Your ads work harder here

Pinterest's suite of full-funnel video ads is designed to cater to every stage of the purchase journey, no matter your objectives. Whether aiming to drive brand lift in the upper funnel or achieve conversions in the lower funnel, there's a video solution to match.

- **Video ads:** Available in two formats: standard, which is the same size as a vertical Pin, and max-width, which covers the full width of the Pinterest mobile feed. These eye-catching videos are designed to grab attention as people scroll their feed, making them ideal for driving both awareness and consideration.
- **Idea ads:** Dive into the world of mobile-first native storytelling. With an array of creative and interactive features at your disposal, you can either take the reins or collaborate with a creator to craft a compelling narrative via our paid partnership tool.
- **Premiere Spotlight:** Want to make a splash at the moments that matter most for your brand? By using Premiere Spotlight, our newest high-impact awareness offering designed to reach Pinners at scale, brands observed a staggering 8.2x surge in Aided Brand Awareness.[6]
- **Video shopping ads:** Currently in beta, merchants have the opportunity to include a video clip in their product catalogue and promote the product as an ad.[7]

According to Pinterest, "advertisers leveraging at least two video formats saw a notable increase in various brand metrics, from a 1.4x uplift in brand awareness and favorability to a 1.2x boost in brand recall and action intent."[20] Accordingly, video pins play a crucial role in Pinterest's success as an advertising platform.

42. By incorporating video pins, Pinterest has been able to remain a viable competitor as a social media platform. Pinterest has further been able to increase its value through enhanced

[20] *Id.*

experiences for its users on one hand, and more effective advertising for its commercial customers on the other.

B. Pinterest's Use of Adaptive Bitrate Streaming

43. Pinterest engineers acknowledge that engagement with video is significantly impacting how fast the client platform performs.[21] According to Pinterest, a three second delay can cost a 13 percent decrease in views.

44. To mitigate problems with poor video quality and experience, Pinterest indicates that it uses adaptive bitrate streaming protocols (or ABR) including HTTP Live Streaming (HLS) and Dynamic Adaptive Streaming over HTTP (MPEG-DASH).[22] As described by Pinterest, these technologies work by encoding a source file into multiple streams with different bitrates. Then those streams split into smaller segments with similar duration times. The video player then seamlessly switches between the streams depending on the available bandwidth and other factors. This allows the video to still play (at a lower quality) when the signal is poor and jump to the higher quality stream when the signal strengthens.[23]

45. According to Pinterest, as of August 2024, HLS accounts for approximately 70% of video playback sessions on iOS apps, and DASH accounts for around 55% of video sessions on Android.[24] Pinterest indicates that DASH is supported by Android's ExoPlayer.[25]

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[21] Pinterest Engineering, "Optimizing video playback performance," Medium, https://medium.com/pinterest-engineering/optimizing-video-playback-performance-caf55ce310d1 (last accessed November 26, 2024).
[22] *Id*.
[23] *Id*.
[24] Pinterest Engineering, "Improving ABR Video Performance at Pinterest," Medium, https://medium.com/pinterest-engineering/improving-abr-video-performance-at-pinterest-f0ea47a6d4fc, (last accessed November 26, 2024).
[25] *Id*.

46. Pinterest utilizes ABR for delivering video content to its users.[26] Pinterest describes how this method involves encoding the content at multiple bitrates and resolutions, resulting in several rendition versions of the same video. Then during playback, players (*e.g.*, ExoPlayer) enhance the user experience by selecting the best possible quality and dynamically adjusting it based on network conditions.[27]

C. Pinterest's Website, Mobile Application, and Pin Recommendation System(s)

47. Pinterest recognizes that "[u]ser experience in modern content discovery applications critically depends on high-quality personalized recommendations. However, building systems that provide such recommendations presents a major challenge due to a massive pool of items, a large number of users, and requirements for recommendations to be responsive to user actions and generated on demand in real-time."[28]

48. To that end, Pinterest's Website and Mobile App collect data from users, such as their viewing history, location, IP address, platform and device type (*i.e.*, iOS, Windows), browser, content engagement, search queries, actions on Pins, actions on Boards, and ad engagement.[29]

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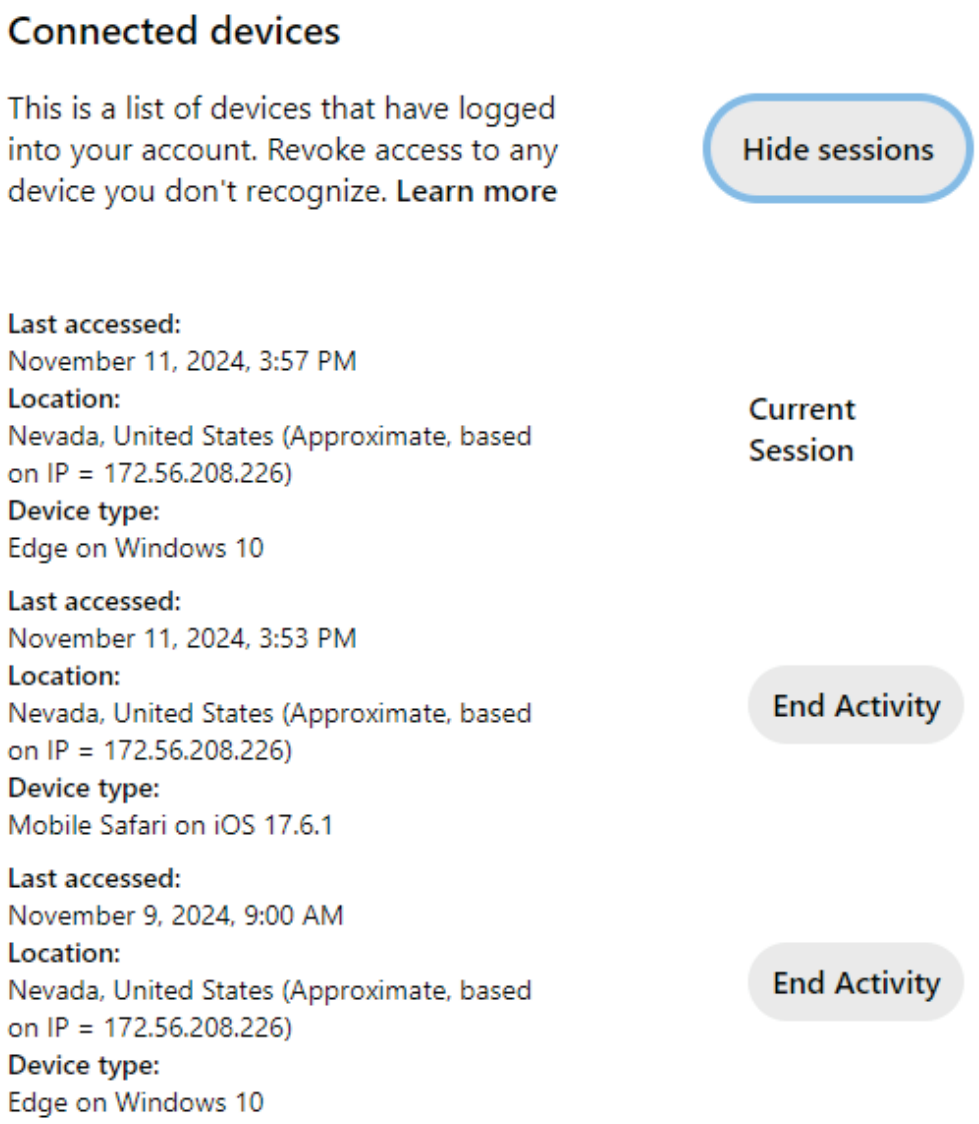
[26] *Id*.
[27] *Id*.
[28] Eksombatchai et al., *Pixie: A System for Recommending 3+ billion items to 200+ million users in real time* https://cs.stanford.edu/people/jure/pubs/pixie-www18.pdf, (last accessed November 26, 2024).
[29] Pinterest, "Technical Information We Collect When You Use Our Service," https://policy.pinterest.com/en/technical-information-we-collect-when-you-use-our-service, (last accessed November 26, 2024).



49. Pinterest informs its users that the Website and Mobile app "store [a user's] information," for various purposes, including, without limitation, the ability to recommend new content to users. For example, Pinterest explains that it uses the stored information to "[r]ecommend Pins, boards, or content [a user] might like [based on that user's] activity on [Pinterest's] services and [the user's] offsite behavior."[30]

[30] Pinterest, "Privacy Policy," https://policy.pinterest.com/en/privacy-policy, (last accessed November 26, 2024).

50. Pinterest explains to its users that it collects and uses their data to ensure the users receive relevant content. Specifically, Pinterest maintains a database of information collected from users' devices (mobile or desktop devices). Pinterest expressly informs users that "[b]y using [Pinterest's] products and services, you authorize [Pinterest] to transfer and store your information . . . for the purposes described in this policy."[31] Additionally, Pinterest informs users that "[w]hen you use [Pinterest's] website [or] mobile application, certain . . . information gets created and logged automatically." This collected information includes "information about the device you use to access [Pinterest's] services" and "'log data', [which] . . . includes . . . [a]ctions taken during session . . . [a]ccount profile information[, s]ocial contacts you authorize [Pinterest] to receive[, and] Pinterest content engagement."[32] "Pinterest content engagement" includes a user's "search queries[,] [a]ctions on pins (clicks, close-ups, likes, saves and shares of Pins)[, a]ctions on Boards (creation of boards, likes, saves, and shares of Pins)[, and c]omments."[33] Pinterest also collects data reflecting a user's engagement with ads, such as "[a]ds served to a page and likelihood you have seen them" and "[a]ctions on ads (clicks on ads, saves on pages featuring ads)."[34]

51. Pinterest describes its search and recommendation system as comprising multiple stages including a retrieval stage (*i.e.*, candidate generator stage) and a ranking stage.[35] At the retrieval stage, Pinterest describes how one or more candidate generators are used to narrow down the set of candidates to a narrower set based on some predicted scores, such as the relevance of the

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[31] Pinterest, Privacy Policy, https://policy.pinterest.com/en/privacy-policy, (last accessed November 26, 2024).
[32] *Id.*
[33] *Id.*
[34] *Id.*
[35] Pinterest Engineering, "Representation online Matters: practical end-to-end diversification in search and recommender systems," Medium, https://medium.com/pinterest-engineering/representation-online-matters-practical-end-to-end-diversification-in-search-and-recommender-cb60b547f2e0, (last accessed November 26, 2024).

items to the query and the user.[36] At the ranking stage, Pinterest describes how the goal is to find an ordering of the candidates that maximizes a combination of objectives, which may include utility metrics, diversity objectives, and additional business goals.

52. Pinterest describes how candidate generators, such as Pixie, and ranking models, such as Pinnability, provide home feed recommendations to a user.[37]

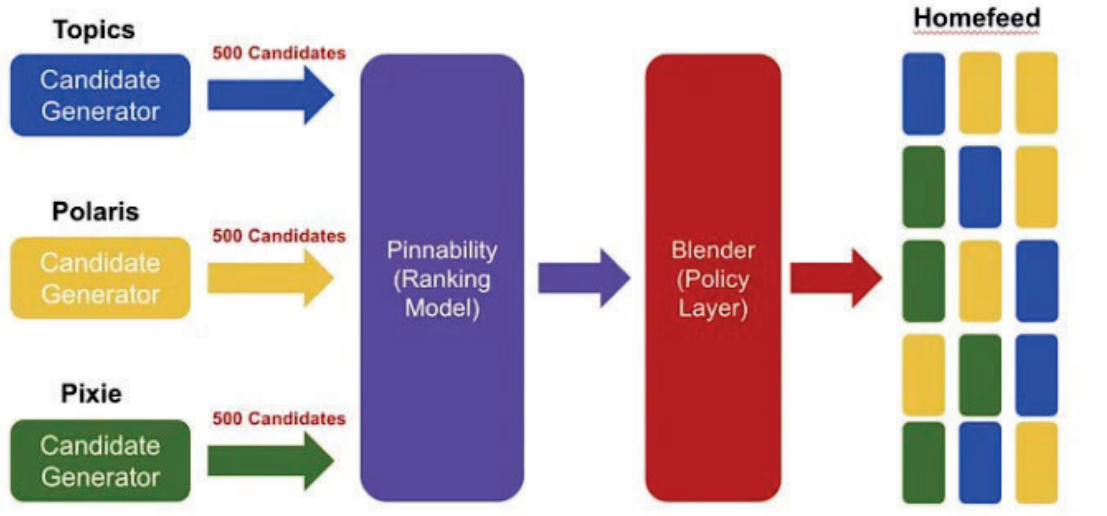

Fig. 1. Overview of current home feed recommendation pipeline. Home feed recommendation is powered by many different candidate generators. Each of them serves a unique role and has its own light-weight ranking layer.

53. Pinterest engineers describe how candidate generation is a recall-driven step that aims to efficiently fetch a set of broadly relevant Pins. This step uses recent user engagement to formulate an input representative of the Pinner's interest. The input Pin is used to fetch similar

[36] *Id.*
[37] Pinterest Engineering, "Pinterest Home Feed Unified Lightweight Scoring: A Two-tower Approach," Medium, September 9, 2021, https://medium.com/pinterest-engineering/pinterest-home-feed-unified-lightweight-scoring-a-two-tower-approach-b3143ac70b55, (November 26, 2024).

Pins, which are quickly scored based on simple heuristics (in Pixie's case, this is the visit count score).[38]

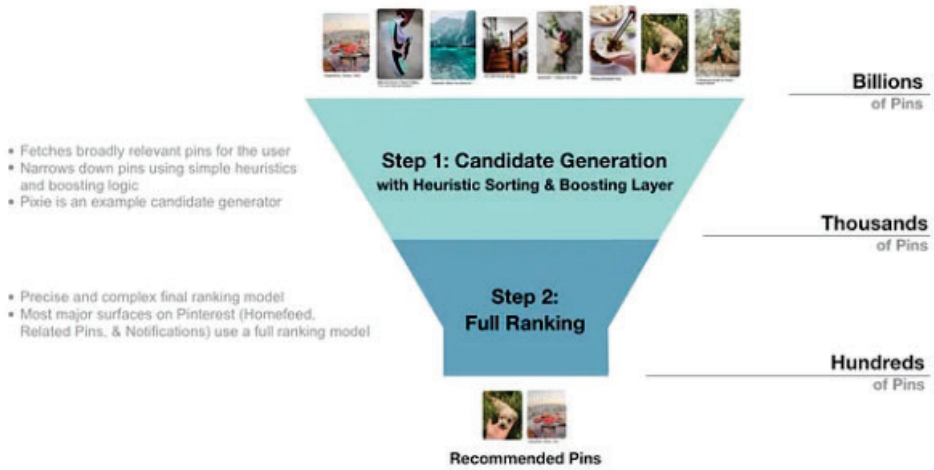

Figure 1. Number of Pins at each stage of the current Recommendation Funnel

> The first step, "Candidate Generation", is a recall-driven step that aims to efficiently fetch a set of broadly relevant Pins. Pixie is one such candidate generator. This step uses recent user engagement to formulate an input representative of the Pinner's interests. The input Pin is used to fetch similar Pins, which are quickly scored based on simple heuristics (in Pixie's case, this is the visit count score), with additional boosting logic applied for specific business needs. The Pins with the highest score are then passed to the next step of the funnel.

54. Pinterest describes Pixie as a scalable real-time graph-based recommendation system.[39]

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[38] Pinterest Engineering, "Improving the Quality of Recommended Pins with Lightweight Ranking," Medium, September 10, 2020, https://medium.com/pinterest-engineering/improving-the-quality-of-recommended-pins-with-lightweight-ranking-8ff5477b20e3, (last accessed November 26, 2024).

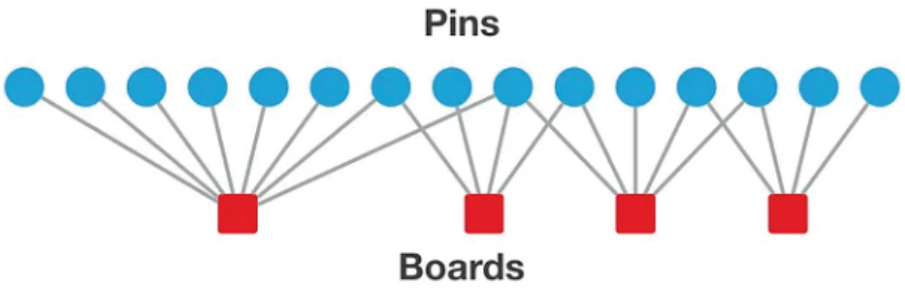
[39] Eksombatchai et al., Pixie: A System for Recommending 3+ billion items to 200+ million users in real time, April 23, 2018, https://cs.stanford.edu/people/jure/pubs/pixie-www18.pdf, (last accessed November 26, 2024).

Present work: Pixie. Here we present Pixie, a scalable real-time graph-based recommendation system deployed at Pinterest. Currently, pins recommended by Pixie represent more than 80% of all user engagement at Pinterest. In an A/B tests recommendations provided by Pixie increase per pin engagement by up to 50% higher compared to the previous Pinterest recommendation systems.

55. Additionally, Pinterest describes its Pixie technology as collecting a universe of data across an indiscriminate set of users.[40]

Pixie

We started from a bipartite graph where each edge shows that a person saved a Pin to a board.



This graph captures a huge amount of rich data from our users, and is quite large, with more than 100 billion edges and several billion nodes. Thankfully, RAM today is incredibly cheap, and big data like this is small enough to fit on readily available AWS machines. Before terabyte-scale RAM machines were available, complex distributed systems like Hadoop or Spark were needed to compute algorithms for data of this scale. Fortunately, in a way big data is actually getting smaller! Now we can load the entire graph into a single machine and traverse all of it without making any network calls. This makes real-time algorithms on densely connected graphs much easier to develop and deploy at scale, and allows us to make recommendations in real-time the moment a Pinner opens our app (instead of computing them in batch jobs the night before).

56. According to Pinterest, Pixie uses a "visit count" score to sort generated pins.[41]

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[40] Pinterest Engineering, "Introducing Pixie, an advanced graph-based recommendation system," March 31 2017, https://medium.com/pinterest-engineering/introducing-pixie-an-advanced-graph-based-recommendation-system-e7b4229b664b, (last accessed November 26, 2024).

[41] Pinterest Engineering, "Improving the Quality of Recommended Pins with Lightweight Ranking," Medium, September 10, 2020, https://medium.com/pinterest-engineering/improving-

Making Pixie recommendations even more personalized

Despite its great success across multiple major product surfaces at Pinterest, Pixie currently faces several challenges that limit it from generating even more relevant content:

1. Pixie's "visit count" score sorts the generated pins purely on graph structure; it does not take any user preferences into account. At Pinterest, we've built a bunch of features that represent user interest and pin information that may help improve personalization.

57. Pinterest documents related to Pixie further describe how Pixie's generation technique is biased based on user features.[42]

> **(1) Biasing the Pixie Random Walk.** It is important to bias the random walk in a user-specific way. This way, even for the same query set Q, recommendations will be personalized and will differ from a user to user. For example, Pinterest graph contains pins and boards with different languages and topics and from the user engagement point of view it is important that users receive recommendations in their language and on the topic of interest.
>
> We solve the problem of biasing the random walk by changing the random edge selection to be biased based on user features. The random walk then prefers to traverse edges that are more relevant to that user. One can think of these edges as having higher weight/importance than the rest of the edges in the graph. This way we bias the random walk in a user-specific way towards a particular part of the graph and let it focus on a particular subset of pins. In practice, this modification turns out to be very important as it improves personalization, quality, and topicality of recommendations, which then leads to higher user engagement.

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the-quality-of-recommended-pins-with-lightweight-ranking-8ff5477b20e3, (last accessed November 26, 2024).

[42] Eksombatchai, et al., "Pixie: A System for Recommending 3+ billion items to 200+ million users in real time," April 23, 2018, https://cs.stanford.edu/people/jure/pubs/pixie-www18.pdf, (last accessed November 26, 2024).

58. Pinterest documents describe how after candidate generation, lightweight ranking of candidate pins occurs.[43]

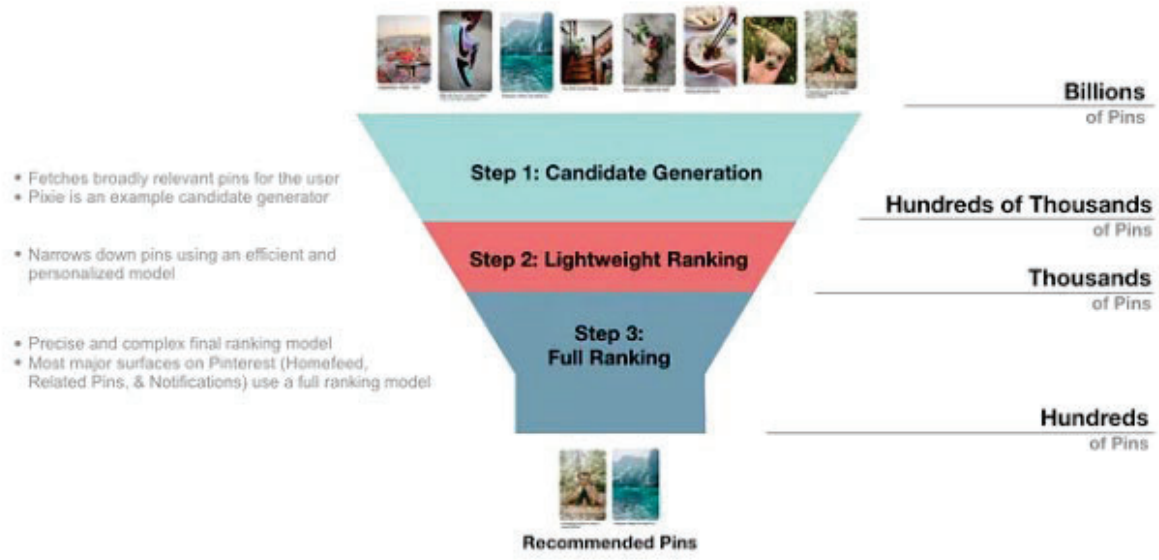

Figure 2. Recommendation Funnel after adding a Lightweight Ranking Step

59. Pinterest documents then describe how after a lightweight ranking, a full ranking occurs using ranking models.[44]

60. Pinterest describes its "Pinnability" ranking model as the collective name of the machine learning models it developed to help Pinners find the best content in their home feed.[45]

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[43] Pinterest Engineering, "Improving the Quality of Recommended Pins with Lightweight Ranking," Mediuam, September 10, 2020, https://medium.com/pinterest-engineering/improving-the-quality-of-recommended-pins-with-lightweight-ranking-8ff5477b20e3, (last accessed November 26, 2024).
[44] *Id*.
[45] *Id*.

61. At the full ranking stage, Pinterest explains that its Pinnability technology is "trained" based on the historical interaction of users with pins:[46]

Training instance generation

The basis of the Pinnability training data is the historical Pinner interaction with home feed Pins. For example, after viewing a Pin in home feed, a Pinner may choose to like, repin, click for a Pin closeup, clickthrough, comment, hide, or do nothing. We record some of the "positive actions" and "negative action" as training instances. Naturally the number of Pins viewed is often much larger than the number of Pins in which the Pinner made a positive action, so we sample the positive and negative instances at different rates. With these defined, we test thousands of informative features to improve Pinnability's prediction accuracy.

Figure 3 summarizes the three major components of our Pinnability workflow, namely training instance generation, model generation and home feed serving.

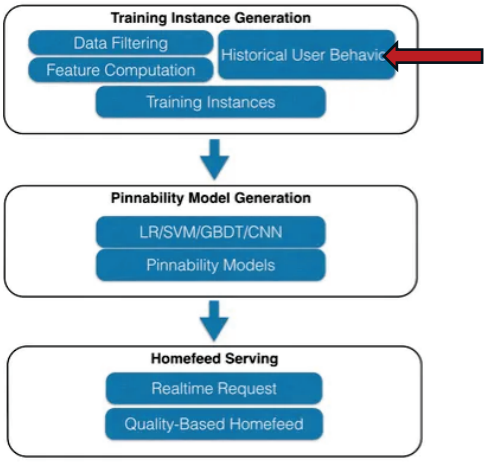

Fig 3: Pinnability pipeline overview.

[46] Pinterest Engineering, "Pinnability Machine Learning in the Home Feed," Medium, March 20, 2015, https://medium.com/pinterest-engineering/pinnability-machine-learning-in-the-home-feed-64be2074bf60, (last accessed November 26, 2024).

62. Pinterest explains that its ranking models analyze this data to assign value to Pins based on their historical popularity.[47]

> Our unique data set contains abundant human-curated content, so that Pin, board and user dynamics provide informative features for accurate Pinnability prediction. These features fall into three general categories: Pin features, Pinner features and interaction features:
>
> - Pin features capture the intrinsic quality of a Pin, such as historical popularity, Pin freshness and likelihood of spam. Visual features from Convolutional Neural Networks (CNN) are also included.

Our unique data set contains abundant human-curated content, so that Pin, board and user dynamics provide informative features for accurate Pinnability prediction. These features fall into three general categories: Pin features, Pinner features and interaction features:

- Pin features capture the intrinsic quality of a Pin, such as historical popularity, Pin freshness and likelihood of spam. Visual features from Convolutional Neural Networks (CNN) are also included.
- Pinner features are about the particulars of a user, such as how active the Pinner is, gender and board status.
- Interaction features represent the Pinner's past interaction with Pins of a similar type.

63. Pinterest engineers describe how the Pinnability model uses pretrained user embedding to model user's interest and preference, capturing a user's long-term interest by leveraging their past interaction history on Pinterest.[48]

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[47] Pinterest Engineering, "Machine Learning in the Home Feed" (March 20, 2015) https://medium.com/pinterest-engineering/pinnability-machine-learning-in-the-home-feed-64be2074bf60, (last accessed November 26, 2024).

[48] Pinterest Engineering, "How Pinterest Leverages Realtime User Actions in Recommendation to Boost Homefeed Engagement Volume," November 4, 2022, https://medium.com/pinterest-

> The Pinnability model has been using some pretrained user embedding to model user's interest and preference. For example, we use PinnerFormer (PinnerSAGE V3), a static, offline-learned user representation that captures a user's long term interest by leveraging their past interaction history on Pinterest.

64. According to Pinterest, scores from the Pinnability models represent the personalized relevance between a Pinner and the candidate Pins.[49]

> With Pinnability launched, the candidate Pins for home feed are scored using the Pinnability models. The scores represent the personalized relevance between a Pinner and the candidate Pins. Pins in home feed are prioritized by the relevance score as illustrated in Figure 2.

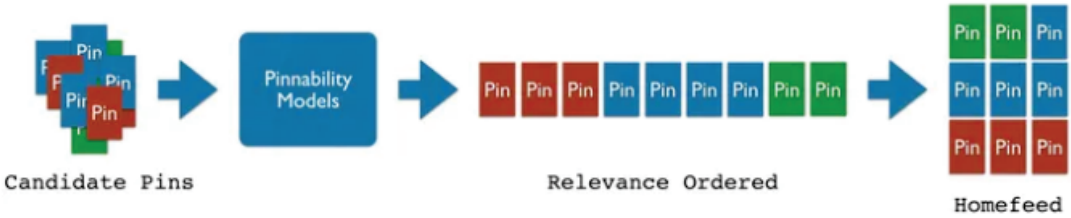

Fig 2: Home feed after Pinnability, where Pins are ordered by personalized relevance score.

65. Pinterest also describes analyzing content in the context "Group Boards," or other social contexts, wherein the data from other contributors to the Group Board (or a user's followers) are analyzed to recommend data to other members of the same board. For example, when pins are

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engineering/how-pinterest-leverages-realtime-user-actions-in-recommendation-to-boost-homefeed-engagement-volume-165ae2e8cde8 (last accessed November 26, 2024).

[49] Pinterest Engineering, "Machine Learning in the Home Feed," March 20, 2015, https://medium.com/pinterest-engineering/pinnability-machine-learning-in-the-home-feed-64be2074bf60, (last accessed November 26, 2024).

added to a group board, the pins might show up in the home feed of anyone who follows any of the members of the board.[50]

66. After retrieving and ranking content, Pinterest displays Pins in the user's home feed.[51] Pinterest describes how video pins play when at least 50% of the video Pin is in view.[52]

D. Pinterest's Website, Mobile Application, and Advertisement Recommendation Technologies

67. Pinterest monetizes its platform through a variety of ways, including advertising. As of 2022, Pinterest's ad serving system served more than 2 billion ad impressions per day and generated $2.8 billion in ad revenue.[53]

68. Pinterest offers a variety of advertising services to its business customers, including an "Ads Manager." Pinterest explains to its end-users that in order "[t]o help you see ads you're more likely to be interested in, Pinterest . . . may use information about your activity on and off Pinterest to personalize the ads you see." On the business side, Pinterest allows advertisers to "create individual ads or complex campaigns." Pinterest allows advertisers to "target [advertisements] based on people's interests, demographics, and keywords they're searching for or similarities to your existing audiences."[54]

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[50] Rachel Ngom, "Why You Need to Join Pinterest Group Boards (and how to easily get started)," January 22, 2018, https://rachelngom.com/pinterest-group-boards/, (last accessed November 26, 2024).

[51] Pinterest Engineering, "Representation Online Maters," Medium, May 25, 2023, https://medium.com/pinterest-engineering/representation-online-matters-practical-end-to-end-diversification-in-search-and-recommender-cb60b547f2e0, (last accessed November 26, 2024).

[52] Pinterest, Help Center, General, https://help.pinterest.com/en/article/video-on-pinterest, (last accessed November 26, 2024); *see also* https://help.pinterest.com/en/business/article/promoted-video-with-autoplay.

[53] Pinterest Engineering, "Redesigning Pinterest's Ad Serving Systems with Zero Downtime," June 7, 2024, https://medium.com/pinterest-engineering/redesigning-pinterests-ad-serving-systems-with-zero-downtime-3253d2432a0c, (last accessed November 26, 2024).

[54] Pinterest, Ads Manager, https://business.pinterest.com/getting-started-in-ads-manager/, (last accessed November 26, 2024).

69. Pinterest uses "the information [it] collect[s]" on users to "[d]ecide which ads to show [users] directly on Pinterest." For example, Pinterest employs an "Ads Engagement Modeling" team with the objective of building deep neural network ("DNN") models to continuously learn and adapt to user . . . behavior . . . [by] adopt[ing] users' real time behavior histories and applied deep learning algorithms to recommend appropriate ads to users."[55]

70. The Pinterest ads serving system is called "Mohawk".[56] Pinterest describes how its ad delivery system consists of several different systems, each with its own responsibilities (candidate generation, trimming, scoring, bid/budget management, indexing, content safety filtering, etc.).[57]

71. Pinterest provides advertisers with an "Ads Manager," which allows advertisers to upload ads and select desired campaign behavior (*e.g.*, demographics, location, etc.).[58] Pinterest describes how its ad delivery service is at least in part supported by Mohawk: [59]

> Mohawk, implemented in 2014, was Pinterest's first ad serving system. During its eight-year lifespan, Mohawk became one of the most complex systems at Pinterest. As of 2022, Mohawk:

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[55] Pinterest Engineering, "User Action Sequence Modeling for Pinterest Ads Engagement Modeling," Medium, March 5, 2024, https://medium.com/pinterest-engineering/user-action-sequence-modeling-for-pinterest-ads-engagement-modeling-21139cab8f4e, (last accessed November 26, 2024).

[56] Pinterest Engineering, "Redesigning Pinterest's Ad Serving Systems with Zero Downtime," June 7, 2024, https://medium.com/pinterest-engineering/redesigning-pinterests-ad-serving-systems-with-zero-downtime-3253d2432a0c, (last accessed November 26, 2024).

[57] Pinterest Engineering, "Debugging Ad Delivery At Pinterest," June 24, 2024, https://medium.com/pinterest-engineering/debugging-ad-delivery-at-pinterest-8b7b1f562afc, (last accessed November 26, 2024)

[58] Pinterest, Business, How to Use Pinterest Ads Manager, https://business.pinterest.com/getting-started-in-ads-manager/, (last accessed November 26, 2024).

[59] Pinterest Engineering, "Redesigning Pinterest's Ad Serving Systems with Zero Downtime," June 7, 2024, https://medium.com/pinterest-engineering/redesigning-pinterests-ad-serving-systems-with-zero-downtime-3253d2432a0c, (last accessed November 26, 2024).

72. As part of the Ads Manager, Pinterest features its ad delivery process as providing value to both Pinners and advertising partners by serving the highest quality ads at the most relevant moments and optimizing business outcomes for its advertising partners:[60]

Ad delivery

Our ad auction allows us to provide value to both Pinners and advertising partners by serving the highest quality ads at the most relevant moments and optimizing business outcomes for our advertising partners.

For each available ad impression, our auction system selects the best ad for that position, based on the likelihood of a desired action occurring and how much that action is worth to you. The likelihood of the action occurring depends on factors like landing page quality and targeting relevance. Your bid tells us what you'd pay for the action you choose to optimize for.

You pay only what's needed to beat the next best ad in the auction. In some cases, you may pay less than your bid. However, setting bids that are too low may restrict the delivery of your ad. To learn more about setting bids, read this article.

73. Pinterest describes how every ad campaign has three levels: Campaign, ad group, and ad. Campaigns encompass ad groups, and each ad group contains a collection of ads.[61]

74. Pinterest allows advertisers to target ads specifically to mobile devices:[62]

[60] Pinterest, Help Center, Business, https://help.pinterest.com/en/business/article/ad-delivery, (last accessed November 26, 2024).
[61] Pinterest, Help Center, Business, https://help.pinterest.com/en/business/article/campaign-structure, (last accessed November 26, 2024).
[62] Pinterest, Help Center, Business, https://help.pinterest.com/en/business/article/set-up-device-targeting, (last accessed November 26, 2024).

Add device targeting in Ads Manager

1. Log in to your Pinterest business account
2. Click ☰ at the top-left of the page
3. Under **Create**, click **Create campaign**
4. Click **Manual Campaign**, then **Get Started**
5. Click **New ad group** from the left-side navigation
6. Click **Targeting** from the left-side navigation and choose a targeting strategy
7. Select your **Budget & schedule**, **Optimization and delivery** and **Ads**
8. Review your information
9. Click **Publish**

75. Pinterest further allows ads to be targeted based on interests and keywords associated with a brand or product.[63] Additional ad targeting through Pinterest's platform is possible based on gender, location, and languages.[64]

76. Pinterest describes how "[a]udience targeting helps you reach a specific group of people by combining information about your customers with information about how people use Pinterest. You can target a group of people based on site visitors, an uploaded customer list of emails or mobile ad IDs (Android ad IDs), an engagement audience that interacted with Pins from your confirmed domain or an actalike audience that behaves similarly to one you already have."[65]

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[63] Ana Gotter, "Pinterest Ads: A Guide to Everything You Need to Know to Get Started," Ad Espresso, August 14, 2019, https://adespresso.com/blog/pinterest-ads-guide/, (last accessed November 26, 2024).
[64] *Id.*
[65] Pinterest, Help Center, Business, https://help.pinterest.com/en/business/article/audience-targeting, (last accessed November 26, 2024).

77. Pinterest describes how automated campaigns may be set up to help advertisers deliver results with less manual work.[66] In the case of automated campaigns, "[b]idding and any additional targeting, outside of age and location requirements, are completely automated based on the Pins you select and Pinner behavior."[67]

78. Pinterest also provides advertisers with the option of setting up a "collections ad."[68] A collections ad is described as an ad format with a combination of "one large, hero asset followed by three smaller, secondary assets. The main asset is known as the hero creative and the smaller, secondary assets are known as the secondary creatives. Once someone taps into a collections ad, they'll be taken to a fullscreen experience where they can see the hero creative up close and up to 24 secondary creatives."[69] An engagement audience can be selected from people who have performed any engagement action (including Pin clicks, outbound clicks, saves, comments, and video views) or optimized engagement actions based on high intention actions such as saves and outbound clicks.[70]

79. Pinterest informs its advertisers that "[o]nce [an ad is] approved, we'll start distributing your ad."[71]

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[66]Pinterest, Help Center, Business, https://help.pinterest.com/en/business/article/automated-campaigns, (last accessed November 26, 2024).
[67] *Id.*
[68]Pinterest, Help Center, Business, https://help.pinterest.com/en/business/article/collections-ads-on-pinterest, (last accessed November 26, 2024).
[69] *Id.*
[70] Pinterest, Help Center, Business, https://help.pinterest.com/en/business/article/audience-targeting, (last accessed November 26, 2024).
[71] Pinterest, Help Center, Business, https://help.pinterest.com/en/business/article/device-targeting, (last accessed November 26, 2024).

Ad review process

Once you launch your campaign, we'll review it to make sure it follows our Advertising guidelines. The campaign review process can take up to 24 hours.

If your campaign targeting goes against our advertising guidelines, we'll send you a notification in Ads Manager letting you know what needs to change so that your ad can be reviewed again for approval. Once approved, we'll start distributing your ad.

80. Pinterest promotes its ability to optimize and deliver ads to run more efficient campaigns and get the most out of an advertisers' budget.[72]

Optimize and deliver

In this final step before you launch your campaign, you can turn on extra optimizations to make sure you're getting the best results. These optimizations help you run more efficient campaigns and get the most out of your budget. As you navigate through these final decisions, Ads Manager includes tips to help you choose the best fit for your campaign.

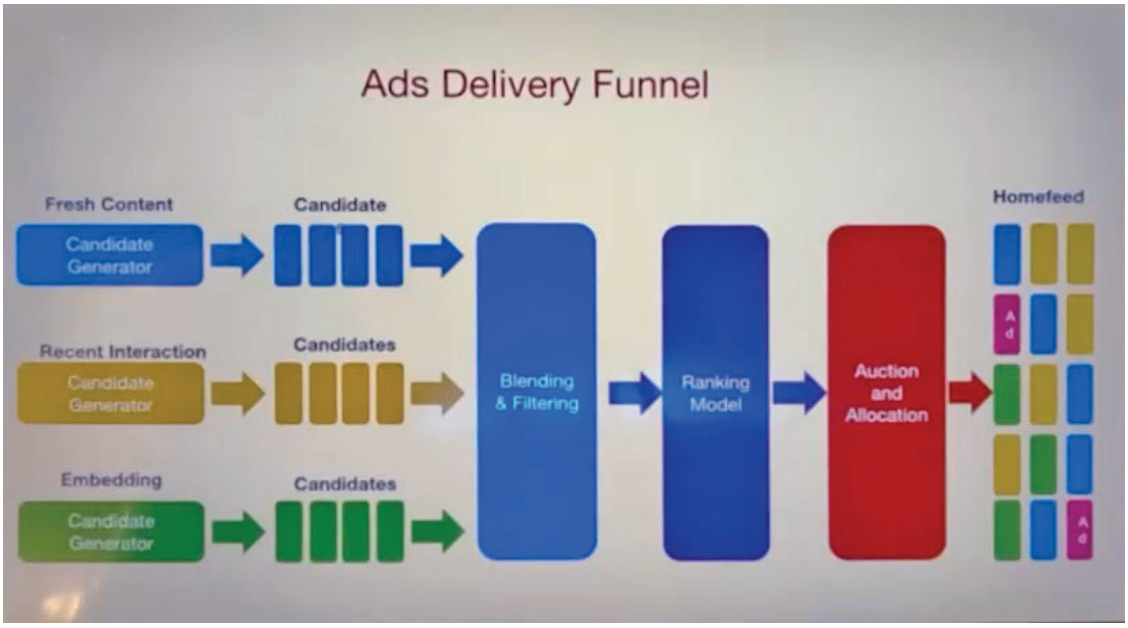
81. Pinterest documentation describes how advertisers can set up "dynamic retargeting" technology, helping advertisers reach people on Pinterest who have already visited an

[72] Pinterest, "How to use Pinterest Ads Manager," https://business.pinterest.com/getting-started-in-ads-manager/, (last accessed November 26, 2024).

advertiser's site or who have items sitting in their shopping cart.[73] Pinterest instructs users on how to set up dynamic retargeting campaign through the Ads Manager.[74]

> Dynamic retargeting helps you reach people on Pinterest who have already visited your site or who have items sitting in their shopping cart. You can retarget exact or similar products to those they engaged with while they browse on Pinterest.

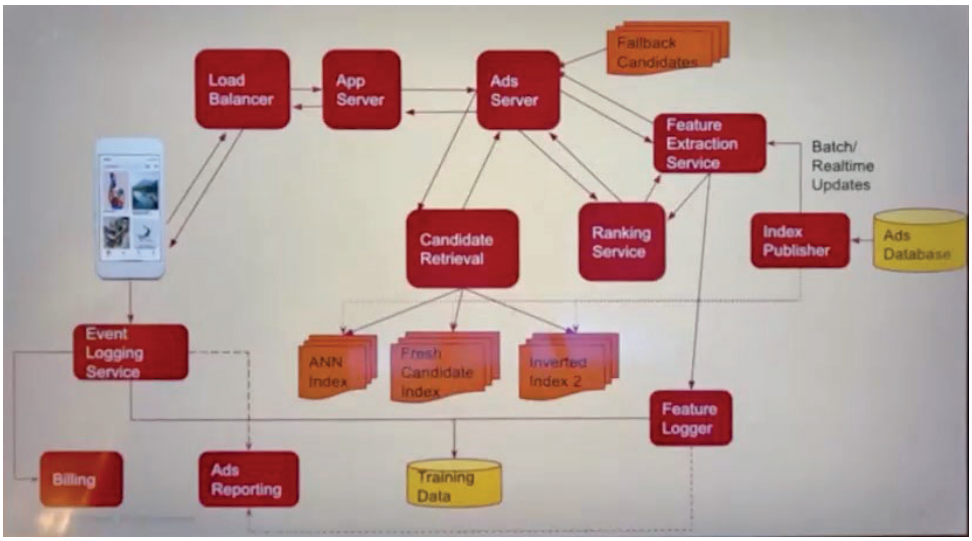
82. Pinterest describes its ads delivery funnel as a process involving candidate generation, blending and filtering, ranking, auction and allocation, and finally inserted into a user's homefeed.[75]



[73] Pinterest, Help Center, https://help.pinterest.com/en/business/article/set-up-dynamic-retargeting, (last accessed November 26, 2024).
[74] *Id.*
[75] InfoQ, "Unpacking How Ads Ranking Works @Pinterest," https://www.infoq.com/presentations/pinterest-ads/ at 13:04, (last accessed November 26, 2024).

83. Pinterest describes how its ads delivery funnel begins by extracting features for a particular user, for example, the gender, location, and/or how the particular user has interacted in the past.[76] The next step is candidate retrieval where the system tries to find the best set of candidates that it can show to the user, followed by a ranking system.[77]

84. Once an ad is delivered, Pinterest describes how its advertisement delivery service logs a user's response to an ad.[78]



85. Pinterest has described how as the user interacts with their feed, there is an event logging service, which uses a Kafka platform to log all of the events in real-time.[79]

86. Pinterest engineers describe how "[p]ersonalized recommendation is critical in the ads recommendation system because it can better capture users' interests, connect the users with the compelling products, and keep them engaged with the platform. To make the ads Click-through rate (CTR) predictions more personalized, [Pinterest's] team has adopted users' real time behavior

[76] *Id.*
[77] *Id.*
[78] *Id.*
[79] *Id.*

histories and applied deep learning algorithms to recommend appropriate ads to users."[80] "To deliver a personalized and enjoyable ad experience for its users, the Engagement Modeling team built deep neural network (DNN) models to continuously learn and adapt to user feedback and behavior, ensuring that the ads shown are highly targeted and valuable to the user."[81]

> Pinterest strives to deliver high-quality ads and maintain a positive user experience. The platform aims to show ads that align with the user's interests and intentions, while also providing them with inspiration and discovery. The Ads Engagement Modeling team at Pinterest plays a crucial role in delivering effective advertising campaigns and helping businesses reach their target audience in a meaningful way. The goal of the engagement modeling is to show users the most relevant and engaging ads based on their interests and preferences. To deliver a personalized and enjoyable ad experience for its users, the Engagement Modeling team built deep neural network (DNN) models to continuously learn and adapt to user feedback and behavior, ensuring that the ads shown are highly targeted and valuable to the user.
>
> Personalized recommendation is critical in the ads recommendation system because it can better capture users' interests, connect the users with the compelling products, and keep them engaged with the platform. To make the ads Click-through rate (CTR) predictions more personalized, our team has adopted users' real time behavior histories and applied deep learning algorithms to recommend appropriate ads to users.

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[80] Pinterest Engineering, "User Action Sequence Modeling for Pinterest Ads Engagement Modeling," Medium, https://medium.com/pinterest-engineering/user-action-sequence-modeling-for-pinterest-ads-engagement-modeling-21139cab8f4e, Mar. 5, 2024, (last accessed November 26, 2024).
[81] *Id.*

NOTICE

87. Pinterest and The Kudelski Group entities, including OpenTV, have engaged in licensing discussions for nearly four years. OpenTV, through The Kudelski Group, first informed Pinterest of its need to take a license as early as November 2020.

88. In or around May of 2021, The Kudelski Group met with Pinterest and shared claim charts and a licensing offer. The group of claim charts included a chart showing how Pinterest's video delivery system infringed U.S. Patent No. 7,055,169.

89. In or around March 15, 2023, The Kudelski Group met with Pinterest and identified Pinterest's exposure to a number of patents within The Kudelski Group patent portfolio, including OpenTV's U.S. Patent No. 7,669,212. The Kudelski Group's presentation identified the '212 patent as relevant to Pinterest's Targeted Ad Delivery.

90. On July 24, 2024, OpenTV, through The Kudelski Group, sent letters via Certified U.S. Mail to Pinterest's San Francisco and Chicago offices, again putting Pinterest on notice of its past and ongoing infringement of OpenTV's patents and other patents part of The Kudelski Group (the "Notice Letters").

91. The Notice Letters indicated that "Pinterest's method for recommending user content (including without limitation, Pinterest's retrieval and ranking diversification through its 'pin' functionality and smart feed technology based on human-curated content) infringes at least OpenTV's U.S. Patent No. 10,419,817, Claim 1." The Notice Letters also indicated that "Pinterest's 'Ad Manager' and 'Ad Deliver' technology infringe at least OpenTV's U.S. Patent No. 7,669,212, Claim 44." The Notice Letters further indicated that Pinterest's Adaptive Streaming Content Delivery Platform (and correlating HTTP Live Streaming ("HLS")) infringed at least OpenTV's U.S. Patent No. 7,044,169, Claim 1.

92. Pinterest has been on notice of infringement of at least U.S. Patent No. 10,419,817 since at least July 30, 2024 upon receiving a Notice Letter asserting infringement of claim 1 of the ’817 patent.

93. Pinterest has been on notice of infringement of at least U.S. Patent No. 7,669,212 as early as March 15, 2023, when OpenTV, through The Kudelski Group, identified the ’212 patent as being relevant to Pinterest’s Targeted Ad Delivery platform. Alternatively, Pinterest has been on notice of its infringement of the ’212 patent no later than July 30, 2024 upon receiving a Notice Letter asserting infringement of claim 44 of the ’212 patent.

94. Pinterest has been on notice of infringement of U.S. Patent No. 9,699,503 at least as of the filing and service of this Complaint.

95. Pinterest has been on notice of infringement of U.S. Patent No. 7,044,169 since at least May of 2021 when Pinterest was provided a claim chart showing how Pinterest’s video delivery system infringed U.S. Patent No. 7,055,169

THE OPENTV PATENTS

96. OpenTV is the owner of all right, title, and interest in the ’817 patent, the ’503 patent, the ’212 patent, and the ’169 patent.

The ’503 Patent and ’817 Patent

97. The ’503 patent, entitled “Smart Playlist,” was duly and legally issued on July 4, 2017, from a patent application filed September 7, 2010, with Alex Fishman and Crx K. Chai as named inventors.

98. The ’817 patent, entitled “Smart Playlist,” was duly and legally issued on September 17, 2019, from a patent application filed on June 29, 2017, with Alex Fishman and

Crx K. Chai as named inventors. The ’817 patent claims priority to U.S Pat. App. No. 12/877,034 (later issuing as the ’503 Patent), filed on September 7, 2010.

99. The ’503 and ’817 patents are directed to improvements in the fields of media and entertainment and in particular to a smart playlist system. *See* ’503 patent, 2:5-9 and ’817 patent, 2:11-15. The inventions disclosed in the ’503 and ’817 patents relate to the technical problem of curating viewable content today as found in social media, conventional media, and other online environments. This explosion of content has created what may be described as a “paradox of choice,” where the excess of choices causes a viewer’s inability to choose or discover relevant content. Ex. B (’503 patent), 1:29-33 and Ex. A (’817 patent), 1:37-39.

100. The ’503 and ’817 patents describe one approach to solving this technical problem by way of a smart playlist. The patents describe how “[d]ata is collected indiscriminately from the entire accessible community of viewers may be accumulated in a repository termed a global bucket.” *See*, *e.g.*, ’817 patent, 2:28-30. The patents then describe how “[d]ata from the global bucket may be analyzed to determine programs that appear to be most popular at the time of the analyzing, i.e., appear to be of heightened interest to viewers.” *Id*. at 2:31-34. “A certain number of programs that have been determined as most popular are compiled into a so-called hot list. The hot list may be made available to viewer, e.g., by communicating the list to the viewers’ client devices or providing an access link that can be invoked from the user’s devices.” *Id*. at 2:34-38.

101. The patents describe how “[b]efore a hot list is provided to a viewer, it may be personalized for the viewer by determining how relevant the items in the hot list are to that particular viewer and presenting the viewer only those programs that have been determined to be of high relevance to the viewer. *Id*. at 2:39-49. The patents further describe how “[t]he relevancy of a particular program to a particular viewer may be determined by associating each item in the

hot list with a score based on the viewer's profile, on the viewer's content viewing history and patterns, as well as based on information collected from the client devices of a subset of viewers who are members of the particular viewer's social network." *Id*. at 2:43-49.

102. The claims of the '817 patent overcame rejections by the examiner under 35. U.S.C. § 101. For example, in a Final Rejection, the USPTO examiner found, *inter alia*, that the claims were "directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract ideas [sic]) without significantly more. In general the claims are directed [to] abstract ideas of accessing database information (content, viewer and social network), generating a list of popular content, customizing the list to generate a playlist for individual user, and sending the playlist to display on user [a] user device ("the playlist is a subset of video content items in the database, the items are not modified nor transformed by the above processes)[.]"[82]

103. In response to the USPTO examiner's Final Rejection under 35 U.S.C. § 101, the applicants asserted the claims were not directed to an abstract idea. The applicants explained how the claimed steps were "integrated into a practical application that 'causes the client device to perform an operation for an item of the items included in the playlist.'"[83] Ex. F. The applicants further described how the claims "solve a technological problem of, for example, processing content utilization data of a plurality of client devices associated with a plurality of viewers to generate playlist data for a specific viewer and, based on generating the playlist data, automatically sending an instruction that causes a client device to perform an operation." *Id*. at 9. The applicants stated how "[t]his is a problem rooted in computer technology and arising particularly in the realm of computer networks and automation." *Id*.

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[82] Excerpts of the '817 patent file history are attached as **Ex. E**.
[83] Excerpts of the '817 patent file history are attached as **Ex. F.**

104. The USPTO examiner issued a Notice of Allowance based on, *inter alia*, the Patent Board's January 3, 2017 decision of the '817 patent parent application (now the '503 patent), and the 2019 Revised Patent Subject Matter Eligibility Guidance.[84]

105. According to the USPTO examiner, the claims of the '503 patent issued because, among other reasons, the prior art did not disclose "generating a score for each item from the list of popular content items based on the viewing history of the target viewer and on the viewing history of the viewers who are identified as social connections of the target viewer."[85]

II. The '212 patent

106. The '212 patent, entitled "Service Platform Suite Management System," was duly and legally issued on February 23, 2010, from a patent application filed on February 1, 2002 with Rachad Alao, Jose Henrard; Alain Delpuch; Vincent Dureau; Vahid Koussari-Amin; Adam Benson; Nicholas Fishwick, Waiman Lam, and Matthew Huntington as named inventors.

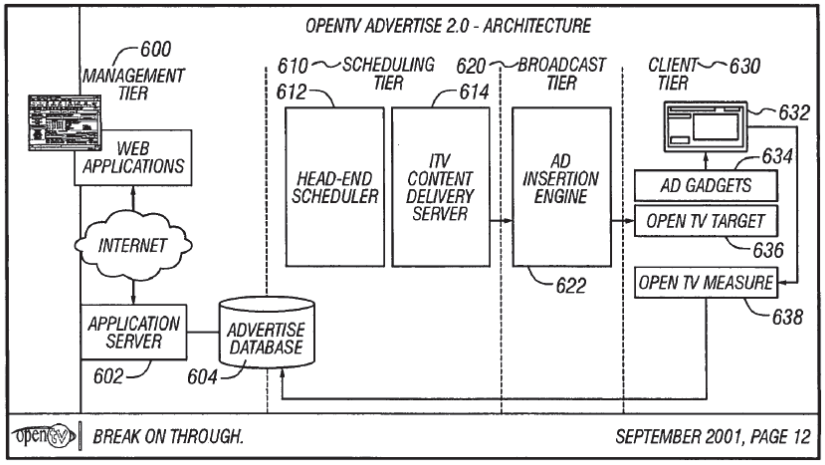
107. The patent describes how "[i]nteractive television systems can be used to provide a wide variety of services to viewers. Interactive television systems are capable of delivering typical video program streams, interactive television applications, text and graphic images, web pages and other types of information. Interactive television systems are also capable of registering viewer actions or responses and can be used for such purposes as marketing, entertainment and education." '212 patent at 1:48-55.

108. The inventions described in the '212 patent are directed to solving the technical problem of the "need for an architecture that provides a comprehensive management solution for regulation of content, advertising, and E-Commerce . . . [and the] need for a comprehensive

[84] Excerpts of the '817 patent file history are attached as **Ex. G.**
[85] Excerpts of the '503 patent file history are attached as **Ex. H**.

architecture that provides adaptive control of access, content, and scheduling in an interactive television environment." '212 patent, 2:28-34.

109. In one example embodiment, the '212 patent describes an "Advertise Architecture," which "operates across four tiers of a broadcast platform." '212 patent, 25:64-65. Figure 6 illustrates the novel structure of reciprocal data provision to create an adaptive advertising solution:



110. The first tier is labeled the "Management Tier," which uses a "Web Application Server." The Web Application Server stores information received from sales representatives from different advertisement entities in an Advertisement Database. '212 patent, 26:1-4.

111. The second tier is labeled "the Scheduling Tier." '212 patent, 26:32-34. The Scheduling Tier is comprised of a "Head-End Scheduler ("HES")" and "ITV Content Delivery Server." Advertising information, such as information on the number of subscribers watching in a specific time frame and sold advertising spots, are fed into the HES, which creates a high-level delivery plan stored in the Advertise Database. '212 patent, 26:38-40. When queried for what ads to display next, the Real Time Server of the ITV Content Delivery Server reads the delivery plan on the Advertise Database and returns a list of advertisement for the application to display next.

’212 patent, 26:42-46. Advertisements are then weighted and prioritized based on certain factors including the advertisement target. ’212 patent, 26:46-59.

112. The third tier is labeled the “Broadcast Tier.” ’212 patent, 27:15-16. The Broadcast Tier comprises an Advertisement Insertion Engine, which requests advertisements and inserts those advertisements into a broadcast stream of advertisement-enabled applications. ’212 patent, 27:16-20. The advertisement can be any form such as video or audio insert into or replace any currently displayed image of active audio track. ’212 patent, 27:20-22. Advertisements are requested regularly to provide rotation at the required frequency. ’212 patent, 27:27-28.

113. The fourth tier is labeled the “Client Tier.” ’212 patent, 27:64. This tier comprises an Ad Gadget Kit, Target, and Measure. The advertisements are sent to the Target, which selects advertisements that match a viewer profile. ’212 patent, 27:64-28:2. Selected advertisements are transferred to the Ad Gadget Kit, and displayed to the viewer. ’212 patent, 28:2-3. The Ad Gadget Kit enables applications to display a rotation of advertisements with click-through capabilities. ’212 patent, 28:3-5. The viewer may interact with the advertisement by clicking an item in the advertisement. ’212 patent, 28:5-6. “Measure” samples viewer activity for items of interest to advertisers and the sends the results to the Advertisement Database. ’212 patent, 28:10-12.

114. The ’212 patent further describes how “[a] positive response to the banner advertisement or at the user's request might trigger a partial or whole replacement of the currently executing image/audio data, for a ‘commercial’. Ad Gadget enables insertion of imagery and audio data currently being displayed and/or heard at a client device.” ’212 patent at 27:60-64.

115. The ’212 patent thus claims particular solutions to solving the technical problem of the “need for an architecture that provides a comprehensive management solution for regulation of content, advertising, and E-Commerce . . . [and the] need for a comprehensive architecture that

provides adaptive control of access, content, and scheduling in an interactive television environment." *See* '212 patent, 2:28-34.

116. Following the applicants' argument and amendment of the pending claims to add the limitation of "apply one or more rules to a client device user response to the selected one or more advertisements to predict further user interests; generate a new campaign rule based on the predicted further user interests; based on the new campaign rule, select a new advertisement to be delivered to the target", the claims were allowed by the USPTO examiner.[86] The applicants argued, for example, that the advertising manager "is configured to make a prediction and select a new advertisement based on user responses to one or more selected advertisements," by "appl[ying] rules to user responses to ads." *Id*. The USPTO examiner did not provide a reason for allowing the claims of the '212 patent.

III. The '169 patent

117. The '169 patent, entitled "Supporting common interactive television functionality through presentation engine syntax," was duly and legally issued on May 30, 2006, from a patent application filed on April 21, 2003 with Alain Delpuch, James Whitledge, Jean-Rene Menand, Emmanuel Barbier, Kevin Hausman, Debra Hengsen, and Dongmin Su as named inventors. The '169 patent claims priority to Provisional application No. 60/373,883, filed on April 19, 2002.

118. The patent describes broadcast television having an inefficient cyclical or repeating format, referred to as a "carousel." *See*, *e.g.*, '169 patent at 1:43-67. The patent describes how pieces of information, or data objects, in a carousel may be intended to be combined in a single object data stream to form a program. This program may also contain streaming data such as audio or video. *Id*. at 2:1-15. The patent is directed to fulfilling a need for a "more flexible scheme" for

[86] Excerpts of the '212 patent file history are attached as **Ex. I.**

addressing technical problems related to access of ever-wider range of data and resources, especially on networks that define different or even proprietary signaling formats. *Id*. at 2:16-29.

119. The ’169 patent describes a method and mechanism which “enable[s] content authors to use directives, such as HTML, scripting languages, or other languages[.]” *Id*. at 2:33-38. The patent further describes how “[i]n one embodiment, the directives are received by a centrally located proxy server which may be configured to receive, transcode and convey transcoded web based content to client devices.” *Id*. at 2:48-52.

120. The ’169 patent thus claims particular solutions to solving technical problems related to the proper (or any) presentation of digital audio, video and/or graphic information. In particular, the ’169 patent uses an innovative, specially programmed computer system to determine whether a digital audio, video and/or graphic presentation requires other computer-implemented resources for its presentation. If the innovative, specially programmed computer system determines that the digital audio, video and/or graphic presentation does not require other resources, it permits the presentation to be initiated. If, on the other hand, the innovative specially programmed computer system determines that additional resources are required by the digital audio, video and/or graphic presentation, it prohibits initiation of the presentation until the additional computer-implemented resources are present.

121. According to the USPTO examiner, the claims of the ’169 patent issued because, among other reasons, the prior art did not disclose all of the steps of “determining whether said one or more directives includes a prerequisite directive which indicates that acquisition of a subset of said set of resources is a prerequisite for initiating the presentation; initiating said presentation in response to determining the one or more directives do not include said prerequisite directive; and prohibiting initiation of said presentation until said subset of resources are acquired in response

to determining the one or more directives include said prerequisite directive."[87] *See* November 28, 2005 Notice of Allowance.

COUNT I: INFRINGEMENT OF U.S. PATENT NO. 9,699,503

122. The allegations of paragraphs 1-121 of this Complaint are repeated, re-alleged, and incorporated by reference as if fully set forth herein.

123. OpenTV is the owner of all rights, title, and interest in and to the '503 patent.

124. Pursuant to 35 U.S.C § 282, the '503 patent is presumed valid and enforceable.

125. Pinterest has had knowledge of the '503 patent and its infringement since at least the time of the filing and service of the Complaint in this action.

126. Pinterest has infringed, either literally or under the doctrine of equivalents, and is currently infringing, the '503 patent in violation of 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing in or into the United States without authority products, software, and/or services, including through the operation of its web-based application at www.pinterest.com, through the operation of its mobile application and/or through its content delivery methods and home feed pin recommendation system for the same.

127. Pinterest infringes at least claim 1 of the '503 patent because, for example, Pinterest's Pin Recommendation System as described at ¶¶ 47-66 satisfies each of the claim limitations either literally or under the doctrine of equivalents.

128. Pinterest induces third parties, including users, to infringe the '503 patent in violation of 35 U.S.C. § 271(b) by encouraging and facilitating them to perform actions that Pinterest knows to be acts of infringement of the '503 patent. Upon information and belief, Pinterest knows that the use of its web-based application at www.pinterest.com, its mobile

[87] Excerpts of the '169 patent file history are attached as **Ex. J**.

application, and back-end platforms designed with Pinterest's Pin Recommendation System constitutes infringement of the '503 patent. Pinterest advertises the infringing products and services, publishes specifications and promotional literature encouraging users to operate the accused products and services, creates and/or distributes user manuals for the accused products and services that provide instruction and/or encouraging infringing use, and offers support and/or technical assistance to its users that provide instructions on and/or encourage infringing use.

129. Users, pursuant to Pinterest's instructions, each directly infringe the '503 patent. Further, Pinterest encourages and facilitates its users to infringe the '503 patent by indicating that they can access video content using Pinterest services, products, and/or features. Therefore, Pinterest is also inducing the direct infringement of the '503 patent by users of Pinterest's services, products, and/or features.

130. Pinterest also contributes to infringement of the '503 patent in violation of 35 U.S.C. § 271(c). Pinterest contributes to infringement of the '503 patent by making, using, selling, offering to sell and/or importing software components incorporated with third-party content to facilitate the recommendation and delivery of content in user's home feed with knowledge that use of that software would infringe the '503 patent. The accused software components constitute a material part of the invention claimed by the '503 patent at least because they work in conjunction with third-party products or services, and they are specifically made to operate in a manner that infringes the '503 patent by providing the recommendation and delivery of content in user's home feed using, for example, its web-based application at www.pinterest.com, its mobile application, and back-end platforms designed with Pinterest's Pin Recommendation System. The accused software components are separable from Pinterest's products and are not staple articles or commodities of commerce suitable for substantial non-infringing use because they necessarily

operate in a manner that infringes the ’503 patent. Moreover, Pinterest publishes or has published information about infringing aspects of its web-based application at www.pinterest.com, its mobile application and back-end platforms designed with Pinterest’s Pin Recommendation System that are practiced using the software components that Pinterest provides. As stated above, Pinterest knew of the ’503 patent and knew that its actions would lead to infringement of that patent. Therefore, Pinterest is also contributing to the direct infringement of the ’503 patent by users of Pinterest’s services, products, and/or features.

131. Pinterest’s infringement has been and continues to be willful.

132. Pinterest’s infringement has caused and continues to cause damage to OpenTV, and OpenTV is entitled to recover damages sustained as a result of Pinterest’s wrongful acts in an amount subject to proof at trial.

133. OpenTV has suffered and continues to suffer damages and irreparable harm as a result of Pinterest’s past and ongoing infringement in an amount to be determined at trial.

134. Unless Pinterest’s infringement is enjoined, OpenTV will continue to be damaged and irreparably harmed.

135. OpenTV meets the criteria for, and is entitled to, a permanent injunction.

COUNT II: INFRINGMENT OF U.S. PATENT NO. 10,419,817

136. The allegations of paragraphs 1-135 of this Complaint are repeated, re-alleged, and incorporated by reference as if fully set forth herein.

137. OpenTV is the owner of all rights, title, and interest in and to the ’817 patent.

138. Pursuant to 35 U.S.C § 282, the ’817 patent is presumed valid and enforceable.

139. Pinterest has had the knowledge of the ’817 patent and its infringement since at least July 30, 2024 by way of Plaintiff’s July 24, 2024 letter to Pinterest.

140. Pinterest has had actual notice of its infringement of the ’817 patent under 35 U.S.C. § 287(a) since at since at least July 30, 2024.

141. Pinterest has infringed, either literally or under the doctrine of equivalents, and is currently infringing, the ’817 patent in violation of 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing in or into the United States without authority products, software, and/or services, including through the operation of its web-based application at www.pinterest.com, through the operation of its mobile application and/or through its content delivery methods and home feed pin recommendation system for the same.

142. Pinterest infringes at least claim 1 of the ’817 patent because, for example, Pinterest’s Pin Recommendation System as described at ¶¶ 47-66 satisfies each of the claim limitations either literally or under the doctrine of equivalents.

143. Pinterest induces third parties, including users, to infringe the ’817 patent in violation of 35 U.S.C. § 271(b) by encouraging and facilitating them to perform actions that Pinterest knows to be acts of infringement of the ’817 patent. Upon information and belief, Pinterest knows that the use of its web-based application at www.pinterest.com, its mobile application, and back-end platforms designed with Pinterest’s Pin Recommendation System constitutes infringement of the ’817 patent. Pinterest advertises the infringing products and services, publishes specifications and promotional literature encouraging users to operate the accused products and services, creates and/or distributes user manuals for the accused products and services that provide instruction and/or encouraging infringing use, and offers support and/or technical assistance to its users that provide instructions on and/or encourage infringing use.

144. Users, pursuant to Pinterest’s instructions, each directly infringe the ’817 patent. Further, Pinterest encourages and facilitates its users to infringe the ’817 patent by indicating that

they can access video content using Pinterest services, products, and/or features. Therefore, Pinterest is also inducing the direct infringement of the ’817 patent by users of Pinterest’s services, products, and/or features.

145. Pinterest also contributes to infringement of the ’817 patent in violation of 35 U.S.C. § 271(c). Pinterest contributes to infringement of the ’817 patent by making, using, selling, offering to sell and/or importing software components incorporated with third-party content to facilitate the recommendation and delivery of content in user’s home feed with knowledge that use of that software would infringe the ’817 patent. The accused software components constitute a material part of the invention claimed by the ’817 patent at least because they work in conjunction with third-party products or services, and they are specifically made to operate in a manner that infringes the ’817 patent by providing the recommendation and delivery of content in user’s home feed using, for example, its web-based application at www.pinterest.com, its mobile application, and back-end platforms designed with Pinterest’s Pin Recommendation System. The accused software components are separable from Pinterest’s products and are not staple articles or commodities of commerce suitable for substantial non-infringing use because they necessarily operate in a manner that infringes the ’817 patent. Moreover, Pinterest publishes or has published information about infringing aspects of its web-based application at www.pinterest.com, its mobile application and back-end platforms designed with Pinterest’s Pin Recommendation System that are practiced using the software components that Pinterest provides. As stated above, Pinterest knew of the ’817 patent and knew that its actions would lead to infringement of that patent. Therefore, Pinterest is also contributing to the direct infringement of the ’817 patent by users of Pinterest’s services, products, and/or features.

146. Pinterest’s infringement has been and continues to be willful.

147. Pinterest's infringement has caused and continues to cause damage to OpenTV, and OpenTV is entitled to recover damages sustained as a result of Pinterest's wrongful acts in an amount subject to proof at trial.

148. OpenTV has suffered and continues to suffer damages and irreparable harm as a result of Pinterest's past and ongoing infringement in an amount to be determined at trial.

149. Unless Pinterest's infringement is enjoined, OpenTV will continue to be damaged and irreparably harmed.

150. OpenTV meets the criteria for, and is entitled to, a permanent injunction.

COUNT III: INFRINGMENT OF U.S. PATENT NO. 7,669,212

151. The allegations of paragraphs 1-150 of this Complaint are repeated, re-alleged, and incorporated by reference as if fully set forth herein.

152. OpenTV is the owner of all rights, title, and interest in and to the '212 patent.

153. Pursuant to 35 U.S.C § 282, the '212 patent is presumed valid and enforceable.

154. Pinterest has had the knowledge of the '212 patent and its infringement since at least March 15, 2023 when Plaintiff presented the '212 patent to Pinterest.

155. Pinterest has had actual notice of its infringement of the '212 patent under 35 U.S.C. § 287(a) since at least March 15, 2023.

156. Pinterest has infringed, either literally or under the doctrine of equivalents, and is currently infringing, the '212 patent in violation of 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing in or into the United States without authority products, software, and/or services, including through the operation of its web-based application at www.pinterest.com, through the operation of its mobile application and/or through its content delivery methods for the same.

157. Pinterest infringes at least claim 44 of the ’212 patent because, for example, Pinterest’s Advertisement Recommendation Technologies as described at ¶¶ 67-86 satisfies each of the claim limitations either literally or under the doctrine of equivalents.

158. Pinterest induces third parties, including users, to infringe the ’212 patent in violation of 35 U.S.C. § 271(b) by encouraging and facilitating them to perform actions that Pinterest knows to be acts of infringement of the ’212 patent. Upon information and belief, Pinterest knows that the use of its web-based application at www.pinterest.com, its mobile application, and back-end platforms designed with Pinterest’s Advertisement Recommendation Technologies constitutes infringement of the ’212 patent. Pinterest advertises the infringing products and services, publishes specifications and promotional literature encouraging users to operate the accused products and services, creates and/or distributes user manuals for the accused products and services that provide instruction and/or encouraging infringing use, and offers support and/or technical assistance to its users that provide instructions on and/or encourage infringing use.

159. Users, pursuant to Pinterest’s instructions, each directly infringe the ’212 patent. Further, Pinterest encourages and facilitates its users to infringe the ’212 patent by instructing users on how to use Pinterest services, products, and/or features to set up, configure, and maintain advertising campaigns. Therefore, Pinterest is also inducing the direct infringement of the ’212 patent by users of Pinterest’s services, products, and/or features.

160. Pinterest also contributes to infringement of the ’212 patent in violation of 35 U.S.C. § 271(c). Pinterest contributes to infringement of the ’212 patent by making, using, selling, offering to sell and/or importing software components incorporated with third-party content to facilitate the setup, configuration, and maintenance of advertising campaigns with knowledge that

use of that software would infringe the ’212 patent. The accused software components constitute a material part of the invention claimed by the ’212 patent at least because they work in conjunction with third-party products or services, and they are specifically made to operate in a manner that infringes the ’212 patent by allowing advertisers to set up, configure, and maintain advertising campaigns using, for example, its web-based application at www.pinterest.com, its mobile application, and back-end platforms designed with Pinterest’s Advertisement Recommendation Technologies. The accused software components are separable from Pinterest’s products and are not staple articles or commodities of commerce suitable for substantial non-infringing use because they necessarily operate in a manner that infringes the ’212 patent. Moreover, Pinterest publishes or has published information about infringing aspects of its web-based application at www.pinterest.com, its mobile application and back-end platforms designed with Pinterest’s Advertisement Recommendation Technologies that are practiced using the software components that Pinterest provides. As stated above, Pinterest knew of the ’212 patent and knew that its actions would lead to infringement of that patent. Therefore, Pinterest is also contributing to the direct infringement of the ’212 patent by users of Pinterest’s services, products, and/or features.

161. Pinterest’s infringement has been and continues to be willful.

162. Pinterest’s infringement has caused and continues to cause damage to OpenTV, and OpenTV is entitled to recover damages sustained as a result of Pinterest’s wrongful acts in an amount subject to proof at trial.

163. OpenTV has suffered and continues to suffer damages and irreparable harm as a result of Pinterest’s past and ongoing infringement in an amount to be determined at trial.

164. Unless Pinterest’s infringement is enjoined, OpenTV will continue to be damaged and irreparably harmed.

165. OpenTV meets the criteria for, and is entitled to, a permanent injunction.

COUNT IV: INFRINGMENT OF U.S. PATENT NO. 7,055,169

166. The allegations of paragraphs 1-165 of this Complaint are repeated, re-alleged, and incorporated by reference as if fully set forth herein.

167. OpenTV is the owner of all rights, title, and interest in and to the ’212 patent.

168. Pursuant to 35 U.S.C § 282, the ’169 patent is presumed valid and enforceable.

169. Pinterest has had the knowledge of the ’169 patent and its infringement since at least October 22, 2021 when Plaintiff presented a claim chart of the ’169 patent to Pinterest.

170. Pinterest has had actual notice of its infringement of the ’169 patent under 35 U.S.C. § 287(a) since at least May of 2021.

171. Pinterest has infringed, either literally or under the doctrine of equivalents, and is currently infringing, the ’169 patent in violation of 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing in or into the United States without authority products, software, and/or services, including through the operation of its web-based application at www.pinterest.com, through the operation of its mobile application and/or through its content delivery methods for the same.

172. Pinterest infringes at least claim 1 of the ’169 patent because, for example, Pinterest’s use of adaptive bitrate streaming as described at ¶¶ 44-47 satisfies each of the claim limitations either literally or under the doctrine of equivalents.

173. Pinterest induces third parties, including users, to infringe the ’169 patent in violation of 35 U.S.C. § 271(b) by encouraging and facilitating them to perform actions that Pinterest knows to be acts of infringement of the ’169 patent. Upon information and belief, Pinterest knows that the use of its web-based application at www.pinterest.com and its mobile

application designed to facilitate streaming of video content constitutes infringement of the ’169 patent. Pinterest advertises the infringing products and services, publishes specifications and promotional literature encouraging users to operate the accused products and services, creates and/or distributes user manuals for the accused products and services that provide instruction and/or encouraging infringing use, and offers support and/or technical assistance to its users that provide instructions on and/or encourage infringing use.

174. Users, pursuant to Pinterest’s instructions, each directly infringe the ’169 patent. Further, Pinterest encourages and facilitates its users to infringe the ’169 patent by indicating that they can access video content using Pinterest services, products, and/or features. Therefore, Pinterest is also inducing the direct infringement of the ’169 patent by users of Pinterest’s services, products, and/or features.

175. Pinterest also contributes to infringement of the ’169 patent in violation of 35 U.S.C. § 271(c). Pinterest contributes to infringement of the ’169 patent by making, using, selling, offering to sell and/or importing software components incorporated with third-party content to facilitate the download and streaming of content with knowledge that use of that software would infringe the ’169 patent. The accused software components constitute a material part of the invention claimed by the ’169 patent at least because they work in conjunction with third-party products or services, and they are specifically made to operate in a manner that infringes the ’169 patent by allowing content to be downloaded and streamed using, for example, its web-based application at www.pinterest.com and its mobile application designed to facilitate streaming of video content. The accused software components are separable from Pinterest’s products and are not staple articles or commodities of commerce suitable for substantial non-infringing use because they necessarily operate in a manner that infringes the ’169 patent. Moreover, Pinterest publishes

or has published information about infringing aspects of its web-based application at www.pinterest.com and its mobile application that are practiced using the software components that Pinterest provides. As stated above, Pinterest knew of the ’169 patent and knew that its actions would lead to infringement of that patent. Therefore, Pinterest is also contributing to the direct infringement of the ’169 patent by users of Pinterest’s services, products, and/or features.

176. Pinterest’s infringement has been and continues to be willful.

177. Pinterest’s infringement has caused and continues to cause damage to OpenTV, and OpenTV is entitled to recover damages sustained as a result of Pinterest’s wrongful acts in an amount subject to proof at trial.

178. OpenTV has suffered and continues to suffer damages and irreparable harm as a result of Pinterest’s past and ongoing infringement in an amount to be determined at trial.

179. Unless Pinterest’s infringement is enjoined, OpenTV will continue to be damaged and irreparably harmed.

180. OpenTV meets the criteria for, and is entitled to, a permanent injunction.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff pray for the following relief:

A. A judgment that Pinterest has infringed one or more claims of the ’817 Patent literally and/or under the doctrine of equivalents directly and/or indirectly by inducing infringement and/or by contributory infringement;

B. A judgment that Pinterest has infringed one or more claims of the ’503 patent literally and/or under the doctrine of equivalents directly and/or indirectly by inducing infringement and/or by contributory infringement;

C. A judgment that Pinterest has infringed one or more claims of the ’212 patent literally and/or under the doctrine of equivalents directly and/or indirectly by inducing infringement and/or by contributory infringement;

D. A judgment that Pinterest has infringed one or more claims of the ’169 patent literally and/or under the doctrine of equivalents directly and/or indirectly by inducing infringement and/or by contributory infringement;

E. That for each Asserted Patent infringed by Pinterest, an award of monetary damages, including lost profits and/or a reasonable royalty pursuant to 35 U.S.C. § 284;

F. A judgment that this be determined to be an exceptional case under 35 U.S.C. § 285 and that Plaintiff be awarded its costs, disbursements, and reasonable attorneys’ fees incurred in this action under 35 U.S.C. § 285 or any other applicable law;

G. An award of enhanced damages up to treble damages for willful infringement as provided by 35 U.S.C. § 284;

H. An award of prejudgment and post-judgment interest on Plaintiff’s damages;

I. An order permanently enjoining Pinterest and its officers, agents, employees, and those acting in privity with them, from using, offering for sale, selling, or importing any product that infringes, or induces or contributes to the infringement of, the Asserted Patents;

J. That Plaintiff be granted their reasonable attorneys’ fees in this action; and

K. That this Court award Plaintiff such other and further relief as the Court deems proper.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure and D. Del. LR 38.1, Plaintiff hereby demands a trial by jury for all issues so triable.

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