

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LULULEMON ATHLETICA CANADA INC. and LULULEMON USA INC.
Petitioners,

v.

NIKE, INC.,
Patent Owner.

Patent: 10,232,220

DECLARATION OF DR. HENRY H. HOUEH, PH.D.

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1. My name is Henry Houh. I have been retained regarding an *inter partes* review proceeding involving U.S. Patent No. 10,232,220. Specifically, I have been asked to analyze how a person of ordinary skill in the art (“POSITA”) would have understood certain references before August 9, 2010, and whether a POSITA would have combined them. I identify the references that I considered and describe my opinions regarding them in this declaration. I understand that this declaration will be submitted as an exhibit to a petition for *inter partes* review of the ’220 patent.

2. I have personal knowledge of the facts and opinions set forth in this declaration and believe them to be true. If called upon to do so, I would testify competently thereto. I have been warned that willful false statements and the like are punishable by fine or imprisonment, or both.

3. I am being compensated for my time at my standard consulting rate. I am also being reimbursed for expenses that I incur during my work. My compensation does not depend on the results of my study and analysis, the substance of my opinions, or the outcome of any proceeding involving the Challenged Claims. I have no financial interest in the outcome of this matter or in any litigation involving the ’220 patent.

I. Qualifications

4. I am currently employed by Houh Consulting Inc. as an independent technical consultant. I also founded Einstein’s Workshop, a company that provides

supplemental science, technology, engineering, and mathematics (“STEM”) education to children of all ages.

5. My professional career has spanned more than 25 years. As set forth in my curriculum vitae, a copy of which is submitted as Exhibit A, during these years I have gained extensive experience in web sites, communications systems, networking, distributed systems, protocols and audio/video communications.

6. I was awarded a Ph.D. degree in Electrical Engineering and Computer Science in February 1998 from the Massachusetts Institute of Technology (MIT). I also received a Master of Science (M.S.) in Electrical Engineering and Computer Science (February 1991), a Bachelor of Science in Electrical Engineering and Computer Science (June 1989) and a Bachelor of Science in Physics (February 1990) from MIT.

7. I first worked in the area of communications in 1987 when I worked at AT&T Bell Laboratories as part of a five-year dual degree program at MIT. At Bell Labs, I first worked in a group supporting core telephony switching functions, then later I joined the Optical Computing group. In graduate school, I joined the Advanced Network Architecture (ANA) group at the Laboratory for Computer Science (LCS) at MIT, then headed by Prof. David Tennenhouse and senior research scientist David Clark. Dr. Clark is generally considered to be one of the fathers of the Internet Protocol, having acted as chief protocol architect for the development of

the Internet. My research and work experience in distributed systems, networking, and network architecture dates back to around 1991 when I joined ANA.

8. Later, when Prof. Tennenhouse formed his own research group, the Telemedia Network Systems (TNS) group, I joined TNS. The TNS group built a high-speed gigabit network and applications which ran over the network, such as remote video capture, processing, and display on computer terminals. I designed the core networking hardware and software, including the high-speed data links and the device drivers for the network interface cards.

9. TNS's research activities focused on high speed networking and the types of applications that require increased network bandwidth and computing power. One of the applications I investigated was live streaming video, and real-time processing of such video. My work was focused around the transport, switching, and routing of data (including video and audio streams), and the integration of TNS's network into the computing environment, including the protocols, IP/ATM integration, operating system software and device drivers. TNS created a computing environment where it was possible to stream audio/video live, and also created software processing modules to further process video to perform advanced functions such as green screening, scene change detection, motion detection, compression, video blending and video overlay, among the many features – all in real-time while displaying the processed video live. While the Internet at the

time did not have the capability for such applications to be widely deployed, my group at TNS researched what would be possible when the required network and computing power became available. As discussed above, my Ph.D. thesis work focused on studying the routing resources required to route streams of video through the network, proposing several alternative labeling strategies to speed up network routing, especially for popular applications such as web traffic.

10. During the early part of my graduate studies, a time when there were perhaps a hundred or so web servers in existence, I set up a web server on one of our lab computers, and created content rich web pages for my research group and my research activities. Eventually, I, together with others I was working with, added live video demonstrations to TNS's web site. TNS's web site was one of the first several hundred web servers to exist, and the first to offer live video demonstrations initiated from the web site to a user's remote computer. I helped to build the web pages that initiated these video sessions via a web interface. I started and maintained the "Commercial Sites Index," a listing of all the companies on the web. I later sold this list to OpenMarket, then a leader in web servers and eCommerce servers.

11. Vice-President Al Gore visited our group in 1996 and received a demonstration of – and remotely drove – a radio controlled toy car with a wireless video camera mounted on it; the video was encoded by TNS-designed hardware,

streamed over the TNS-designed network and displayed using TNS-designed software.

12. I authored or co-authored at least twelve papers and conference presentations on my group's research at TNS. I also co-edited TNS's final report on its gigabit networking research effort. Some of my papers about web site development were presented at the first World-Wide Web conference held in 1994 at CERN in Geneva, Switzerland. CERN is the birthplace of the Web, and the conference was chaired by Tim Berners-Lee, the inventor of the World-Wide Web. When Tim Berners-Lee formed the World Wide Web Consortium at the MIT LCS in order to manage the progression of web protocols and standards, I assisted him in obtaining the consortium's domain names and setting up the consortium's web server.

13. While I was an undergraduate senior, I became a teaching assistant (normally a role at MIT reserved for graduate students) for a core electrical engineering/computer science course, Computation Structures. Later, as a graduate student, I became head teaching assistant for the course. After graduating, I was invited to guest lecture and work with several MIT courses, including in circuit design and web application development. I also worked with a team of students mentoring them on their web application development project.

14. I started a web consulting business in 1994 and won contracts to set up and manage web sites for various companies, including Bay Networks and Data Communications Magazine. Our customers at the time were concerned about web server load, and how to scale their web sites in case the load became unmanageable for a single web server. My company investigated many methods of load balancing and distributing the load over multiple servers. My web company also created software for staging updates to the web site and pushing approved changes into production through a system of multiple servers.

15. I have also participated in various Internet Engineering Task Force (IETF) working groups, and attended IETF meetings in the mid-to-late 1990s.

16. I defended and submitted my Ph.D. thesis, titled "Designing Networks for Tomorrow's Traffic," in January 1998. As part of my thesis research, I analyzed local-area and wide-area flows to show a more efficient method for routing packets in a network, based on traffic patterns at the time. My thesis also addressed real-time streamed audio and video.

17. From 1997 to 1999, I was a Senior Scientist and Engineer at NBX Corporation, a start-up that made business telephone systems for streaming packetized audio over data networks instead of using traditional telephone lines. NBX was later acquired by 3Com Corporation, and the phone system I worked on at NBX was widely used by numerous businesses. As part of my work at NBX, I

designed the core audio reconstruction algorithms for the telephones, as well as the packet transmission algorithms. I also designed and validated the core packet transport protocol used by the phone system.

18. The NBX system also supported TAPI, the Telephony Application Programming Interface, thus allowing other computer programs to integrate with our system telephony features. The NBX system was among the first to support a web-browser interface to control features of the telephone by using a remote application that issued remote controls to the central controller. The web server in the NBX system accessed a back-end database which stored all the data related to the configuration and operation of the NBX system. Accessing the system controller's web server produced a representation of the telephone and allowed users to set speed dials and other features of the user's physical telephone such as a call forwarding number. The user could also access and initiate various telephone functions through the interface, such as initiating a conference call or initiating call forwarding.

19. The NBX system included an automated attendant and various IVR features including menu-driven call routing. It also supported routing calls to and ringing all the telephones in a user group, or ringing sequentially through the phones for a group of users. Two of the company founders and I obtained U.S. Patent No. 6,967,963, entitled "Telecommunication method for ensuring on-time delivery of packets containing time-sensitive data," as a result of part of the work I did at NBX.

20. From 1999-2004, I was employed by Empirix or its predecessor company, Teradyne. Empirix was a leader in test tools for telecommunications protocols and systems, providing functional testing tools as well as load testing tools. From 2000-2001, I conceived and built a test platform for testing Voice-over-IP (VoIP). The first application on this new test platform was a cloud emulator for simulating the effects of transmitting VoIP over a busy network.

21. My later work at Empirix involved software and services for testing complex web sites, such as those run by Dell (a full e-commerce web site for configuring and ordering computers) and H&R Block (a web site for filing income taxes for which users provided input for the tax application running on back-end servers). The software emulated individual users exercising the complex features of a web site. I was the architect for my division's next-generation web testing product, and helped write a Javascript interpreter for this product. In order to design a next-generation solution, I had to be familiar with the various features utilized by the thousands of customers' web sites that our software had to interact with. I also worked on certain products and services used in the call center market, for instance the "Hammer" tool used to automate calls through a call center, to test if the Automatic Call Distributor (ACD) or the Interactive Voice Response units were performing within specific operational parameters. One of my patents (U.S. Patent

No. 7,590,542) resulted from work I did with the vice president of engineering and two lead engineers of the call center division.

22. I worked at BBN Technologies from 2004 to 2009. BBN Technologies, formerly known as Bolt, Beranek and Newman, was a pioneer of the Internet and a long-established leader in speech recognition and natural language processing. BBN received the first contract to build components of a packet switched network as part of the ARPANET, a U.S. Department of Defense effort funded through the Advanced Projects Research Agency (ARPA). While this effort preceded my time at BBN by many years, BBN continued to maintain a strong presence in network research and development, including in wireless networking, device discovery, and protocols for a “body area network.”

23. In 2006, as part of my role at BBN Technologies, I helped found PodZinger Inc., now known as RAMP Inc. PodZinger utilized BBN’s speech recognition algorithms to search through the spoken words inside audio and video. After managing the creation of the initial prototype system, PodZinger built out a full web-based streaming audio and video search solution when I was the Vice President of Operations and Technology there. The web site had a full load-balanced back end that provided search and indexing solutions for our hosted multimedia (audio and video) content.

24. I also worked on commercializing a service offered by BBN to monitor call centers and provide analytical data on each call. The business became known as AVOKE Analytics and provided call center analytics for large organizations such as Dell and the Centers for Medicare and Medicaid Services (CMMS). For a time, during the rollout of the Affordable Care Act (though I was no longer working at BBN), AVOKE Analytics gathered data and provided call-by-call analytics for every call made to the CMMS main call center.

25. Within BBN, I created a social networking website, called “GroupOf” that focused on privately sharing content with people within specific circles. A user could upload photographs to the website for sharing, as well as comment on user postings and photographs. The website was purchased by Eons, Inc., a social networking web site company founded by Jeff Taylor who had previously founded Monster.com, the job search site, where I became the Chief Technology Officer. Eons was venture-funded, including investments from CRV (also funded Twitter and Ring), Sequoia Capital (also funded Google, Apple, NVIDIA, and Uber), and General Catalyst (also funded Airbnb and Snap).

26. In 2012, I founded Einstein’s Workshop, a science, technology, engineering and math enrichment program for kids of all ages. The Workshop teaches programming, robotics, “making” (akin to creating, building and tinkering), engineering, 3D CAD, mobile application development and many other subjects.

Einstein's Workshop teaches a variety of programming classes from Scratch to Java. We also teach game development for mobile devices, for which I evaluated a number of mobile application programming environments. I also developed a robotics programming class in which robots could be programmed to be autonomous or under direct wireless control.

27. Einstein's Workshop also created and developed BlocksCAD, a 3D CAD system for kids and adults. BlocksCAD is used world-wide and has more than 110,000 registered users and 350,000 total users. BlocksCAD is being used in maker spaces worldwide and is integrated into school curriculum in various school systems in the U.S. at elementary, middle and high school levels. BlocksCAD was spun out into a separate company that was part of the LearnLaunch business accelerator program for educational technologies, MIT Playlabs 2018 and the 2018 MassChallenge Boston Cohort. BlocksCAD also received Phase 1 SBIR funding.

28. I have been awarded several United States patents, and I have several patent applications pending, including U.S. Patent No. 6,967,963, which originated in the work I did at NBX, and is titled "Telecommunication method for ensuring on-time delivery of packets containing time-sensitive data." A full list of my U.S. Patents, European Patents and Patent Publications is included in my attached C.V.

29. Additional details of my work experience, awards and honors, and publications that may be relevant to the opinions I am expressing are set forth in my C.V. attached as Exhibit A to the end of my declaration.

II. Materials Considered

30. In performing my analysis and forming the opinions below, I considered the '220 patent (Ex. 1001), its prosecution history, and other materials listed as exhibits to the petition in this IPR (1004-1013).

III. Understanding of Relevant Legal Principles

31. I am not a lawyer, and I will not provide any legal opinions. Rather, I have been asked to provide my technical opinions based on how a person of ordinary skill in the art would have understood various references before the '220 patent's August 9, 2010, priority date. Although I am not a lawyer, I have been advised to apply certain legal standards in forming my opinions.

A. Claim Construction Standard

32. I understand that claim terms are given their ordinary and customary meaning, as they would be understood by a person of ordinary skill in the relevant art in the context of the patent's entire disclosure and prosecution history. A claim term, however, will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the claim term in the specification. In that case, the claim term will receive the definition set forth in the patent.

B. Anticipation and Obviousness

33. I understand that a patent claim is invalid if it is anticipated or obvious in view of the prior art. I further understand that invalidity of a claim requires that the claim be anticipated or obvious from the perspective of a person of ordinary skill in the art at the time the invention was made.

34. I have been informed that a patent claim is invalid if it would have been obvious to a person of ordinary skill in the art. In analyzing the obviousness of a claim, I understand the following factors may be taken into account: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims; (3) the level of ordinary skill in the art; and (4) any so called “secondary considerations” of non-obviousness if they are present. I am not aware of any evidence of secondary considerations of non-obviousness relevant to the ’220 patent. I reserve the right to supplement this Declaration if Patent Owner introduces evidence of secondary considerations of non-obviousness.

35. I have been informed that a claim can be obvious in light of a single prior art reference or multiple prior art references. I further understand that exemplary rationales that may support a conclusion of obviousness include:

- combining prior art elements according to known methods to yield predictable results;

- simple substitution of one known element for another to obtain predictable results;
- use of known technique(s) to improve similar devices (methods or products) in the same way;
- applying a known technique to a known device (method or product) ready for improvement to yield predictable results;
- “obvious to try” – choosing from a finite number of identified, predictable solutions with a reasonable expectation of success;
- known work in one field of endeavor may prompt variations of the work for use in either the same field or a different field based on design incentives or other market forces if the variations are predictable to a person of ordinary skill in the art; and
- some teaching, suggestion, or motivation in the prior art that would have led a person of ordinary skill in the art to modify the prior art reference or to prior art reference teachings to arrive at the claimed invention.

36. I have been informed that, in considering obviousness, I may not use hindsight reasoning derived from the patent-at-issue.

IV. Background

A. Technical Background

37. In the 2009/2010 time frame, web servers were often built using a web application framework. Such frameworks integrated with a back-end database. The database stored information such as user profiles, passwords, and any data used for presentation of web pages, such as user content for a social network site, or product descriptions, pricing, ratings and reviews for an e-commerce site.

38. In these frameworks, templates for individual pages were created using a markup language that incorporated HTML along with custom tags that referred to specific items within the database, and that could also invoke customized back-end code to perform data processing. When the page was accessed, the framework processed the webpage template, performed database queries, executed back-end code, and merged the results into a webpage that was delivered to the requesting user. For example, a tag in the template could specify inserting a user's first name from their user profile database record into a phrase to be presented as part of the web page, such as "Welcome back, Henry." Such a page would be dynamically generated on the fly using the template combined with information from the database.

39. The web application frameworks allowed users to send data to the web server by the use of web page form (such as when entering user profile information

or posting a comment on a page) to enter information to be posted to a web server. Users could also upload files (such as a photo) to be posted to the web server. The frameworks stored such data into the appropriate entries in the database, and files could be processed and stored in the database itself or in the web server's file system, with a reference to the file location stored in the database. Such uploads from a web page used standard web protocols such as the "POST" method in the HyperText Transfer Protocol ("HTTP").

B. Overview of the '220 Patent

40. The '220 patent is a United States patent numbered 10,232,220. (Ex. 1001.) It is titled "MONITORING FITNESS USING A MOBILE DEVICE" and was originally filed on October 9, 2017. (*Id.*) In broad terms, the '220 patent describes recording and uploading exercise data to a page of a social networking site. I summarize some, but not all, of the '220 patent's embodiments below.

1. The '220 Patent's Hardware

41. The '220 patent discloses three devices: athletic information monitoring device 201, athletic information collection and display device 501, and athletic data display configuration device 601. Device 201 "measure[s] athletic information corresponding [to] a user's athletic activity." (Ex. 1001, 11:26-27; *see also id.*, 11:60-12:13, Fig. 3.) It transmits the measured data to device 501, (*id.*, 16:4-23), which then transmits it to device 601, (*id.*, 17:1-27.) Device 601 includes

an “athletic data display configuration module 603 [that] may ... store the athletic data in the athletic data storage 607” (*Id.*, 17:50-52.) The ’220 patent depicts device 601’s modules in Figure 6, shown below.

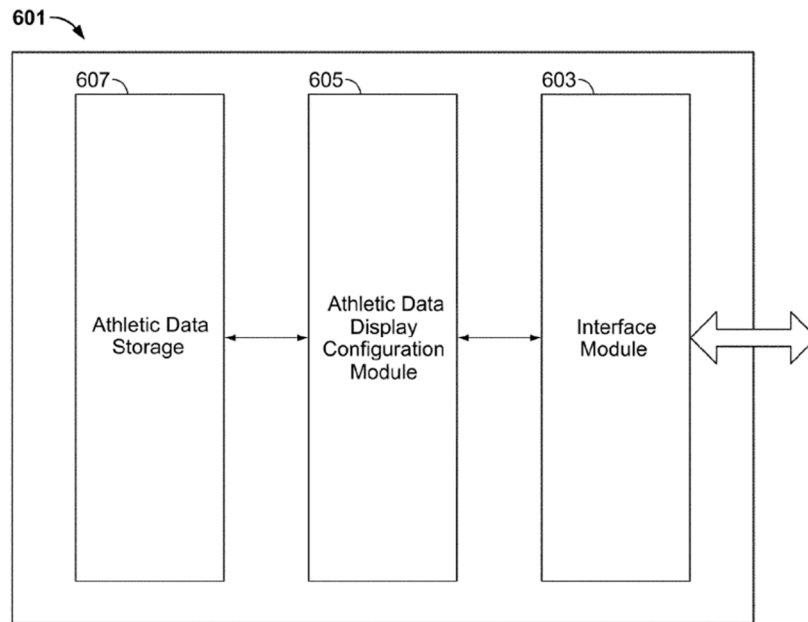


FIG. 6

(*Id.*, Fig. 6.)

42. The ’220 patent’s athletic data display configuration device 601 is a computer. Johnson explains that “the display device ... may be implemented using one or more application-specific integrated circuits ... more typically, however, components of various examples of the invention will be implemented using a programmable computing device” (*Id.*, 9:30-34.) Specifically, it discloses that “a computer 101 ... can be used to implement various embodiments” (*Id.*, 9:39-41; *see also id.*, 9:4-24.) Johnson’s Figure 1 shows computer 101’s architecture:

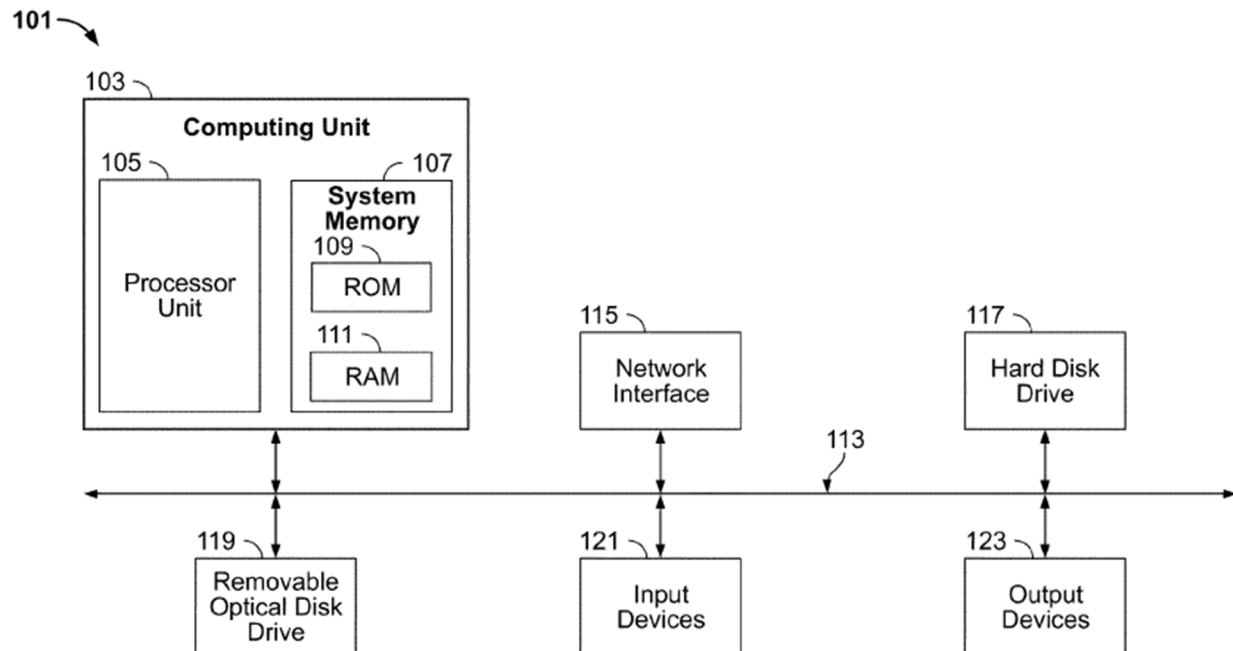


FIG. 1

(*Id.*, Fig. 1.)

43. As shown above, computer 101 includes conventional computer components. It includes a “processing unit 105,” which “may be any type of processing device for executing software instructions, but will conventionally be a microprocessor device.” (*Id.*, 9:44-46.) It also includes “system memory 107,” “read-only memory (ROM) 109,” and “random access memory (RAM) 111.” (*Id.*, 9:46-52, Fig. 1.) It discloses storing “software instructions for execution by the processing unit 105” in ROM and RAM. (*Id.*, 9:51-52.)

2. The '220 Patent's Software Interfaces

44. The '220 patent describes a conventional system in which a user uses a personal computer to view and interact with webpages hosted on a remote server. For example: “[W]hen a user wishes to view the information relating to his or her athletic activities []or the athletic activities of another ... the user submits this request to the athletic information collection and display device 501,” (*id.*, 17:59-63), which can be a “a desktop or laptop personal computer ...[,]” (*id.*, 15:63-64.) The user’s request “is then provided to an athletic data display module 509” within device 501. (*Id.*, 17:66-67.)

45. “[M]odule 509 may be implemented using a conventional browser program” or “a purpose-specific software tool.” (*Id.*, 18:17-24.) “[I]f the athletic data display module 509 is implemented by a simple browser, then [it] may serve as a ‘thin client’ for the athletic data display configuration module 605.” (*Id.*, 18:54-57.) In this embodiment, “all of the data display configuration functions may be performed by ... module 605.” (*Id.*, 18:57-59.) In other words, the '220 patent discloses that a user can view data configured by device 601’s athletic data display configuration module 605 through a web browser 509 displayed on personal computer 501.

46. Users can both view and interact with the interfaces configured by device 601. For example, the '220 patent depicts an interface in Figure 68B:

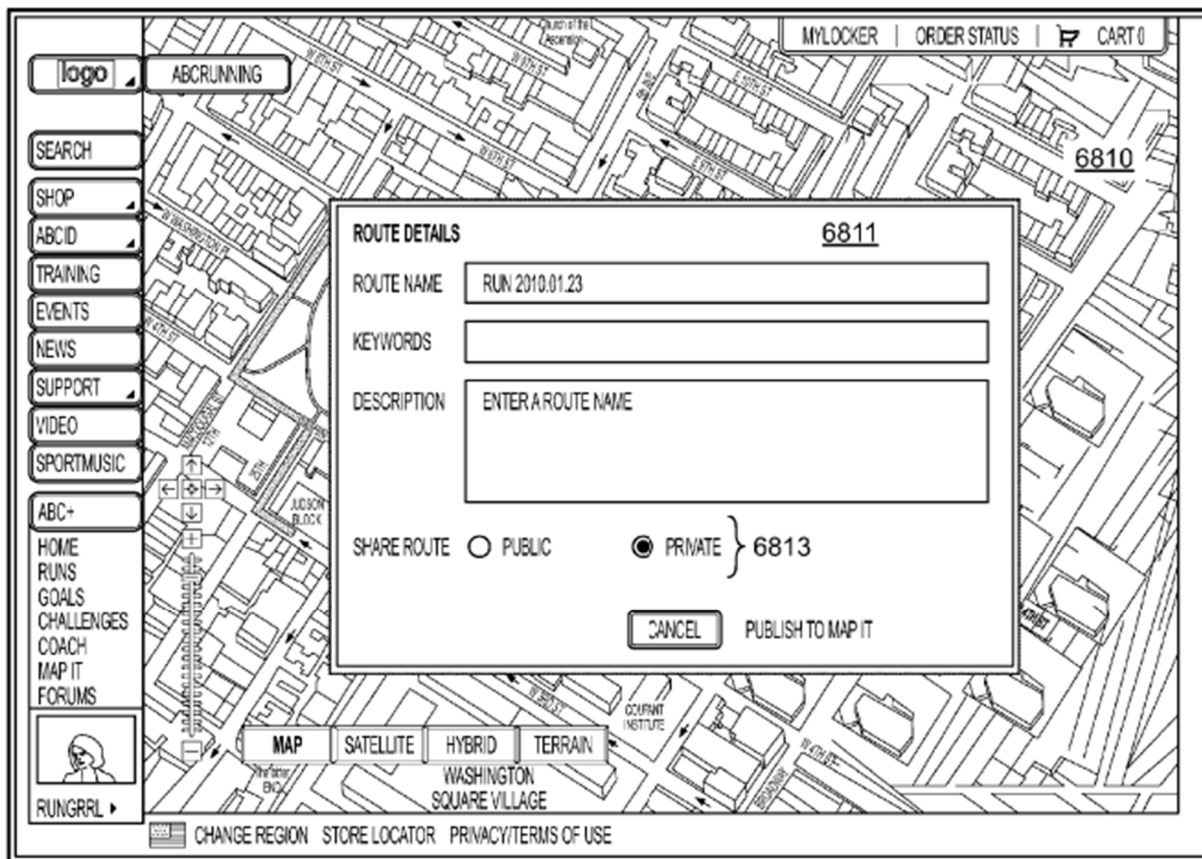


FIG. 68B

(*Id.*, Fig. 68B.) As shown in Figure 68B, users can choose whether to publish their activity by selecting either “PUBLIC” or “PRIVATE” in the “SHARE ROUTE” field. (*Id.*, 61:30-33.) Thus, “[w]orkout sharing may ... including sharing a route and that a user is currently using, has completed, or has created for future activity ... through various outlets including ... a social network or outlet such as FACEBOOK and TWITTER.” (*Id.*, 47:52-58.)

47. The '220 patent depicts other interfaces, including in Figures 54A and 77. Both of those interfaces also show sharing options that users can select to indicate whether they want to publicize their athletic activity data to others.

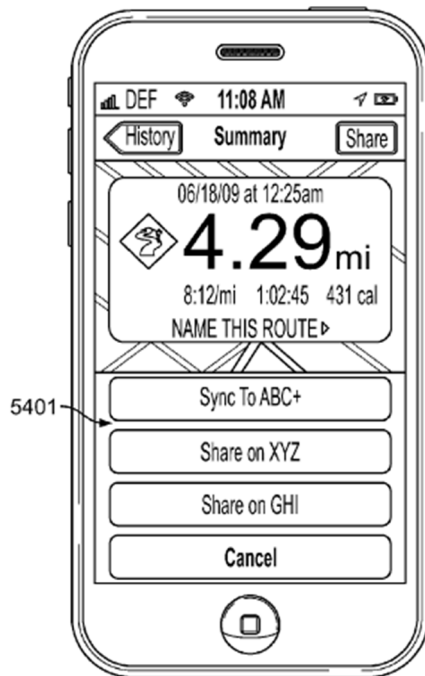


FIG. 54A

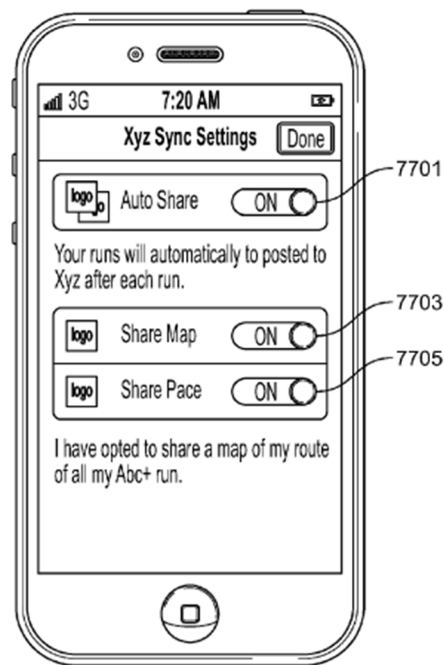


FIG. 77

(*Id.*, Figs. 54A, 77.)

C. '220 Patent Prosecution History

48. I reviewed the prosecution history of the '220 patent. I did not see anything in the prosecution history of the '220 patent that affected my opinions in this declaration.

V. Level of Skill in the Art

49. In my opinion, a person of ordinary skill in the art ("POSITA") for the technology of the '220 patent would have had at least (1) bachelor's degree in engineering, computer science, industrial engineering, biomechanics, or a related field, and (2) at least two years of experience researching, developing, designing and/or testing fitness or physiological sensors, wearable devices, physiological or

biomechanical devices, remotely-controlled systems or interfaces, and/or network-based applications and/or equipment, or the equivalent experience or education.

50. The foregoing level of education and experience would have provided a POSITA with adequate background to understand the '220 patent's technology. As I explained above, the '220 patent describes a straightforward system in which a device records data and uploads it to a website. This is basic computer science.

VI. Claim Construction

51. I have been instructed to perform my analysis with the understanding that the terms of the Challenged Claims should be afforded their plain and ordinary meaning. However, should Patent Owner and/or Patent Owner's expert choose to construe additional claim terms or challenge the ones herein, I reserve the right to provide my opinion regarding Patent Owner's construction(s) as well as the meaning that a POSITA would have ascribed to those claim terms.

VII. The Prior Art

52. I was asked to review each of Johnson, Sutton, the Plus 3 Website Pages, and Fry. I provide a brief description summarizing my understanding of each reference below.

A. Johnson

53. Johnson is a United States Patent Publication numbered US 2010/0273610. (Ex. 1004.) In broad terms, Johnson relates to “the collection and display of athletic information.” (*Id.*, ¶ 5.)

54. There is extensive overlap between Johnson and the ’220 patent. Figures 1-6 of both references appear identical. (*Compare* Ex. 1001, Figs. 1-6 with Ex. 1004, Figs. 1-6.) So do large portions of each reference’s specification. (*Compare* Ex. 1001, 8:41-18:67, with Ex. 1004, ¶¶ 57-92.) Thus, although I have already described some of Johnson’s disclosure above in my discussion of the ’220 patent, I do so again below.

1. Johnson’s Hardware

55. Johnson discloses three devices: athletic information monitoring device 201, athletic information collection and display device 501, and athletic data display configuration device 601. Device 201 “measure[s] athletic information corresponding [to] a user’s athletic activity.” (Ex. 1004, ¶ 68; *see also id.*, ¶ 69, Fig. 3.) It transmits the measured data to device 501, (*id.*, ¶ 82), which then transmits it to device 601, (*id.*, ¶ 86.) Device 601 includes an “athletic data display configuration module 603 [that] may ... store the athletic data in the athletic data storage 607” (*Id.*, ¶ 88.) Johnson depicts device 601’s modules in Figure 6, shown below.

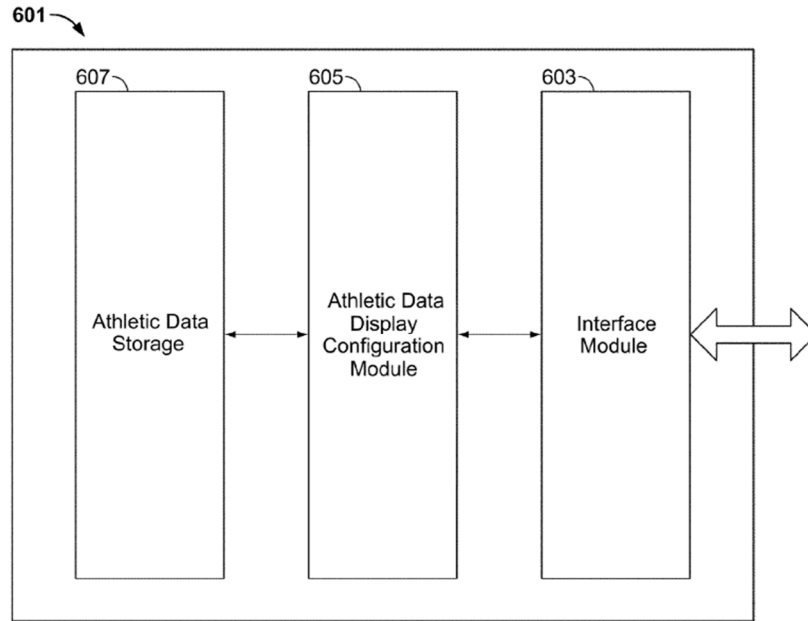


FIG. 6

(*Id.*, Fig. 6.)

56. Johnson’s athletic data display configuration device 601 is a computer. Johnson explains that “the display device ... may be implemented using one or more application-specific integrated circuits ... more typically, however, components of various examples of the invention will be implemented using a programmable computing device” (*Id.*, ¶ 60.) Specifically, it discloses that “a computer 101 ... can be used to implement various embodiments” (*Id.*, ¶ 61; *see also id.*, ¶ 59.) Johnson’s Figure 1 shows computer 101’s architecture:

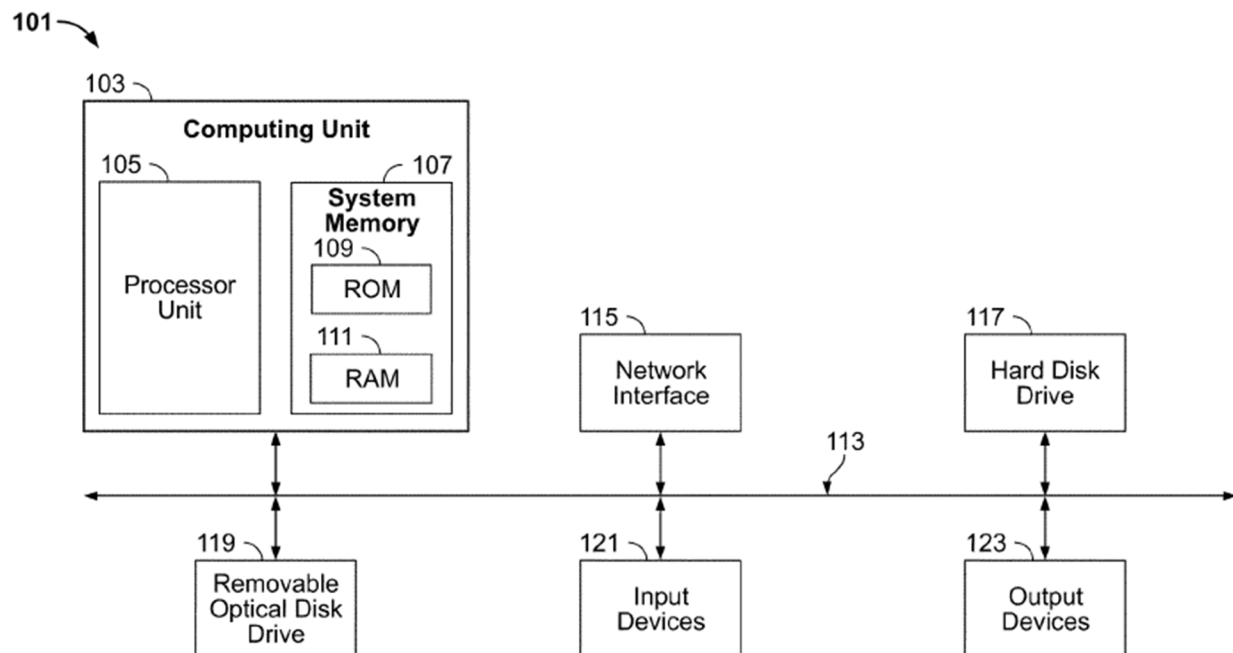


FIG. 1

(*Id.*, Fig. 1.)

57. As shown above, computer 101 includes conventional computer components. It includes a “processing unit 105,” which “may be any type of processing device for executing software instructions, but will conventionally be a microprocessor device.” (*Id.*, ¶ 61.) It also includes “system memory 107,” “read only memory (ROM) 109,” and “random access memory (RAM) 111.” (*Id.*, ¶ 61, Fig. 1.) Johnson discloses storing “software instructions for execution by the processing unit 105” in ROM and RAM. (*Id.*, ¶ 61.)

58. In the following paragraphs 31-47, I describe some of device 601’s functions. A POSITA would have understood that Johnson’s device 601 performs

each of those functions according to software instructions stored in its memory and executed by its processor. Further, even setting aside Johnson's disclosure of computer 101, a POSITA would have understood that Johnson's device 601 has both a processor and software instructions stored in memory because it performs each function.

2. Johnson's Interfaces

59. Johnson discloses a conventional system in which a user uses a personal computer to view and interact with webpages hosted on a remote server. For example: "[W]hen a user wishes to view the information relating to his or her athletic activities []or the athletic activities of another ... the user submits this request to the athletic information collection and display device 501," (*id.*, ¶ 89), which can be a "a desktop or laptop personal computer ...[,]" (*id.*, ¶ 81.) The user's request "is then provided to an athletic data display module 509" within device 501. (*Id.*, ¶ 89.)

60. "[M]odule 509 may be implemented using a conventional browser program" or "a purpose-specific software tool." (*Id.*, ¶ 90.) "[I]f the athletic data display module 509 is implemented by a simple browser, then [it] may serve as a 'thin client' for the athletic data display configuration module 605." (*Id.*) In this embodiment, "all of the data display configuration functions may be performed by ... module 605." (*Id.*) In other words, Johnson discloses that a user can view data configured by device 601's athletic data display configuration module 605 through

a web browser 509 displayed on personal computer 501. A POSITA would have understood that, for a user to view the data on a webpage, device 601 would retrieve it from data storage 607 and transmit it to the webpage displayed on personal computer 501. (*See id.*, ¶ 88 (“As will be discussed in more detail below, the athletic data display configuration module 605 also will retrieve athletic data from the athletic data storage 607, and configure the retrieved athletic data for display through one or more user interface in a manner that is meaningful to a user”).)

61. Johnson’s users can both view and interact with the interfaces configured by device 601. As I explain below, Johnson describes interfaces in the form of social networking website pages. A POSITA would have understood that other users could view data posted to those interfaces because making information available to others is a main purpose of social networking websites.

a. Interface 1700

62. Johnson depicts interface 1700 in Figure 17, shown below.

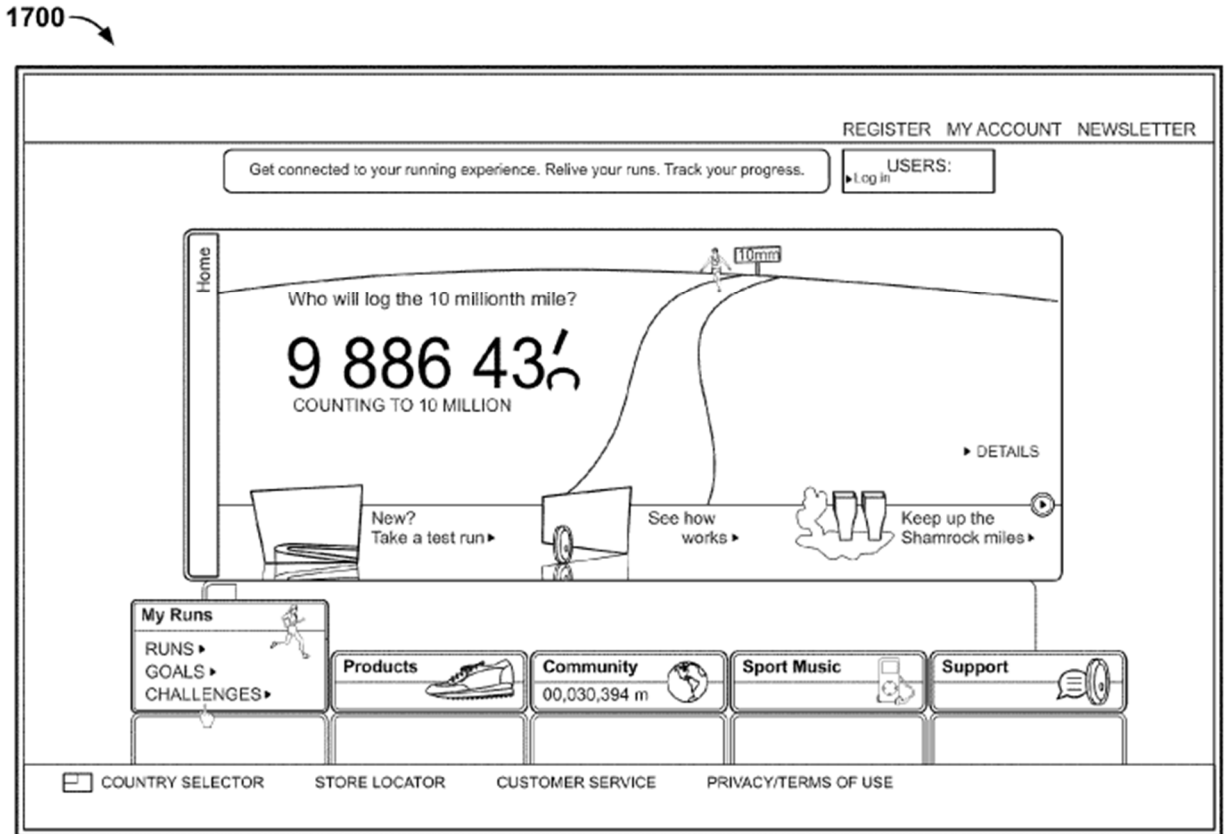


FIG. 17

(*Id.*, Fig. 17.)

63. A POSITA viewing interface 1700 would recognize it as a page of a social networking site. At the top of the interface are “REGISTER” and “MY ACCOUNT” buttons. (*Id.*) The row of text beneath those buttons includes the phrase “Get connected to your running experience” and a “Log In” feature for “USERS.” (*Id.*) Figure 17 depicts the interface displaying a “Home” page that includes a question, “Who will log the 10 millionth mile?” (*Id.*) The bottom of the

interface includes “My Runs” and “Community” tabs. (*Id.*) The “Community” tab includes text stating “00,030,394 m” and an image of a globe, communicating that the social network has 30,394 members around the globe. In view of these features, a POSITA would have had no doubt that interface 1700 depicts a social networking site.

b. Interface 1400

64. Johnson depicts interface 1400 in Figure 14A, shown below.

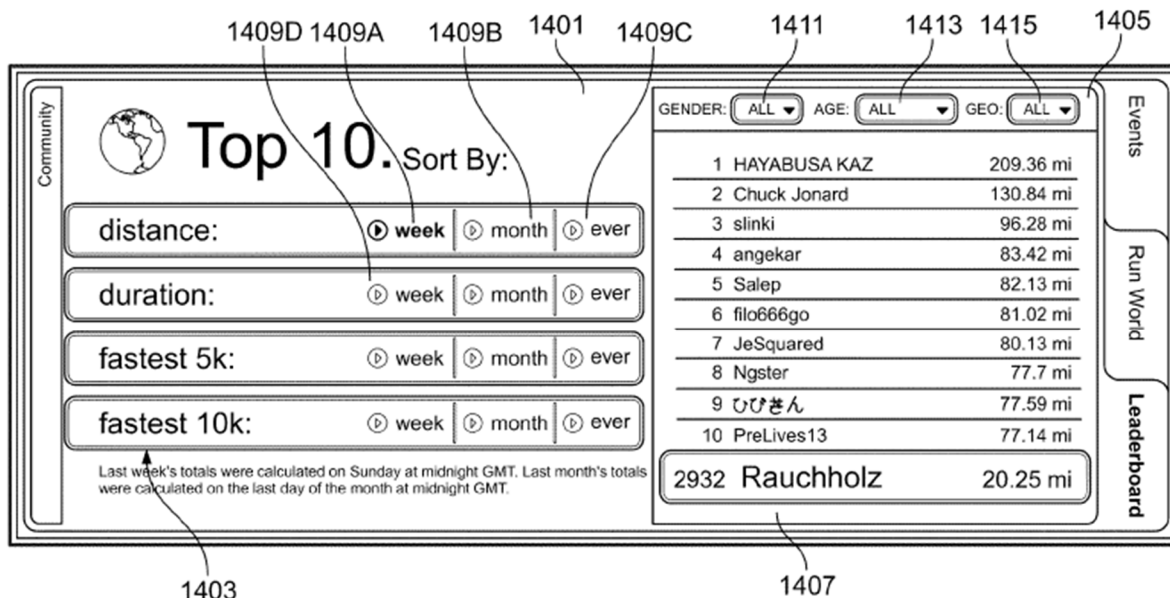


FIG. 14A

(*Id.*, Fig. 14A.) A POSITA would have understood from the word “Community” on the lefthand side of interface 1401 that interface 1401 is the “Community” page of interface 1700. (*Id.*)

65. Figure 14A shows the “Leaderboard” tab of interface 1401. (*Id.*) Interface 1401’s leaderboard is an example of an “interactive comparison[] of a

user's athletic data with other users” (*Id.*, ¶¶ 131-32.) For example, Figure 14A depicts interface 1401 as it would appear to user Rauchholz. (*See id.*, Fig. 14A, ¶ 134.) Specifically, user Rauchholz can see how far other users ran during the preceding week. (*Id.*)

66. Users can limit whether other users can view their data on this leaderboard: “the participating users may be only those users who agree in advance to have their data shared with other users” (*Id.*, ¶ 135.) A POSITA would have understood that device 601 receives the users’ agreement “to have their data shared with others” because its software, “athletic data display configuration module 605[,] generate[s] and display[s] the user interface 1401 illustrated in FIG. 14A” and needs to know which users’ data to display to perform that function. (*Id.*, ¶ 132.) Further, a POSITA would have understood that, in the embodiment in which athletic data display module 509 is only a “thin client” for athletic data display configuration module 605, athletic data display configuration module 605 would receive the user’s agreement because that module would do everything besides displaying the interface to the user. (*Id.*, ¶ 92.)

67. In summary, a POSITA would have understood that, for Johnson’s leaderboard embodiment, device 601 transmits user data to interface 1401’s leaderboard following receipt of the user’s agreement to share their data.

c. Interface 2100

68. Johnson depicts interface 2100 in Figure 21:

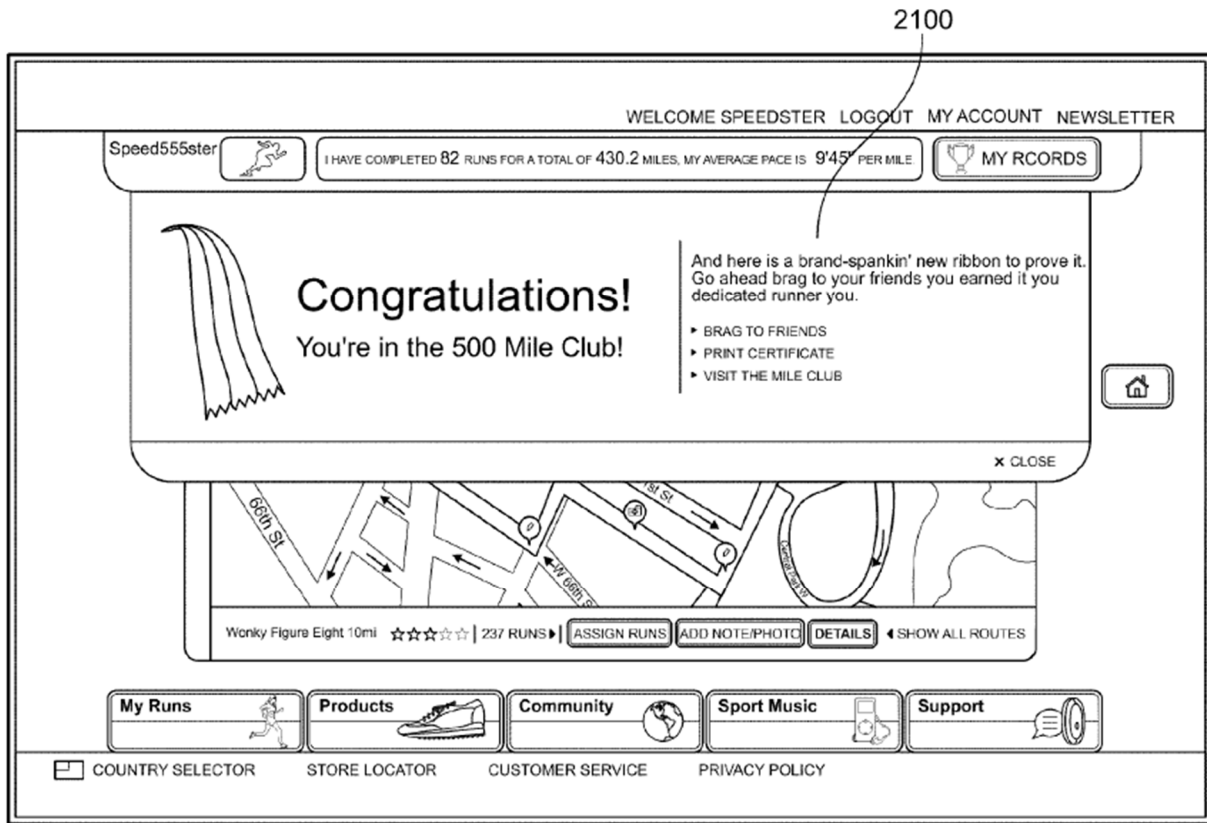


FIG. 21

(*Id.*, Fig. 21.) A POSITA would have understood that interface 2100 is another page of the social networking site shown in interface 1700. As indicated by the banner and the “LOGOUT” button near the top of the page, interface 2100 depicts a “My R[E]CORDS” tab configured for user Speed555ster while Speed555ster is logged in to the social networking site. (*Id.*)

69. Interface 2100 includes a “BRAG TO FRIENDS” button. A POSITA would have understood that, if a user clicked on module 509’s depiction of that button, module 605 would receive the user’s selection of “BRAG TO FRIENDS.”

For instance, a POSITA would have understood that, in the embodiment in which athletic data display module 509 is only a “thin client” for athletic data display configuration module 605, athletic data display configuration module 605 would receive the user’s selection because that module would do everything besides displaying the interface to the user. (*Id.*, ¶ 92.) A POSITA also would have understood from the text of “BRAG TO FRIENDS” that, by clicking on that button, the user would make the fact that they ran 500 miles visible to other users.

d. Interface 4300

70. Johnson depicts interface 4300 in Figure 43:

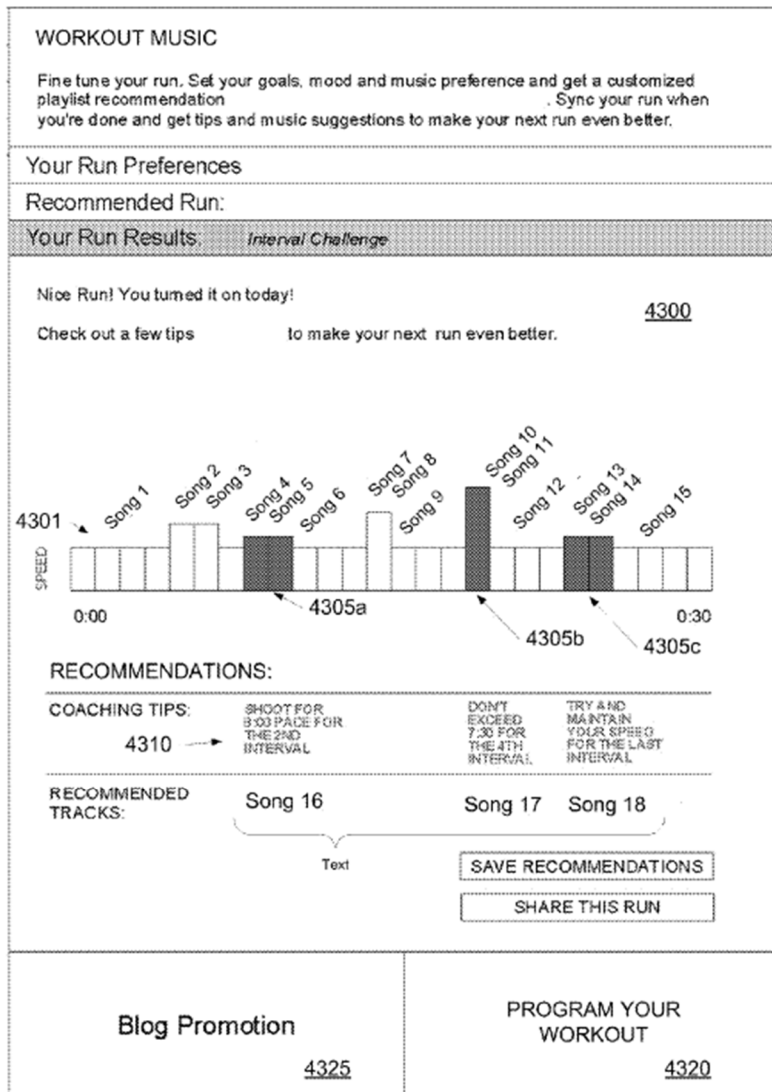


Fig. 43

(*Id.*, Fig. 43.) The lower left-hand corner of interface 4300 includes a “Blog Promotion” button. (*Id.*) There is also a “SHARE THIS RUN” button in the lower right-hand portion of the interface. (*Id.*)

71. A POSITA would have understood that, if a user clicked on either button, athletic data display configuration module 605 would receive that input because that module’s purpose is to configure interfaces in response to user input.

(*See e.g., id.*, ¶¶ 91, 95.) Further, a POSITA would have understood that, in the embodiment in which athletic data display module 509 is only a “thin client” for athletic data display configuration module 605, and where module 605 performs every data display configuration function other than displaying the interface to the user, athletic data display configuration module 605 would receive the user’s selection. (*Id.*, ¶ 92.) A POSITA also would have understood from the text of “SHARE THIS RUN” and “Blog Promotion” that, by clicking on either button, device 601 would transmit the user’s data from memory to a public page of the social networking site. (*See id.*, ¶ 88.)

e. Interface 2900

72. Johnson depicts interface 2900 in Figure 29.

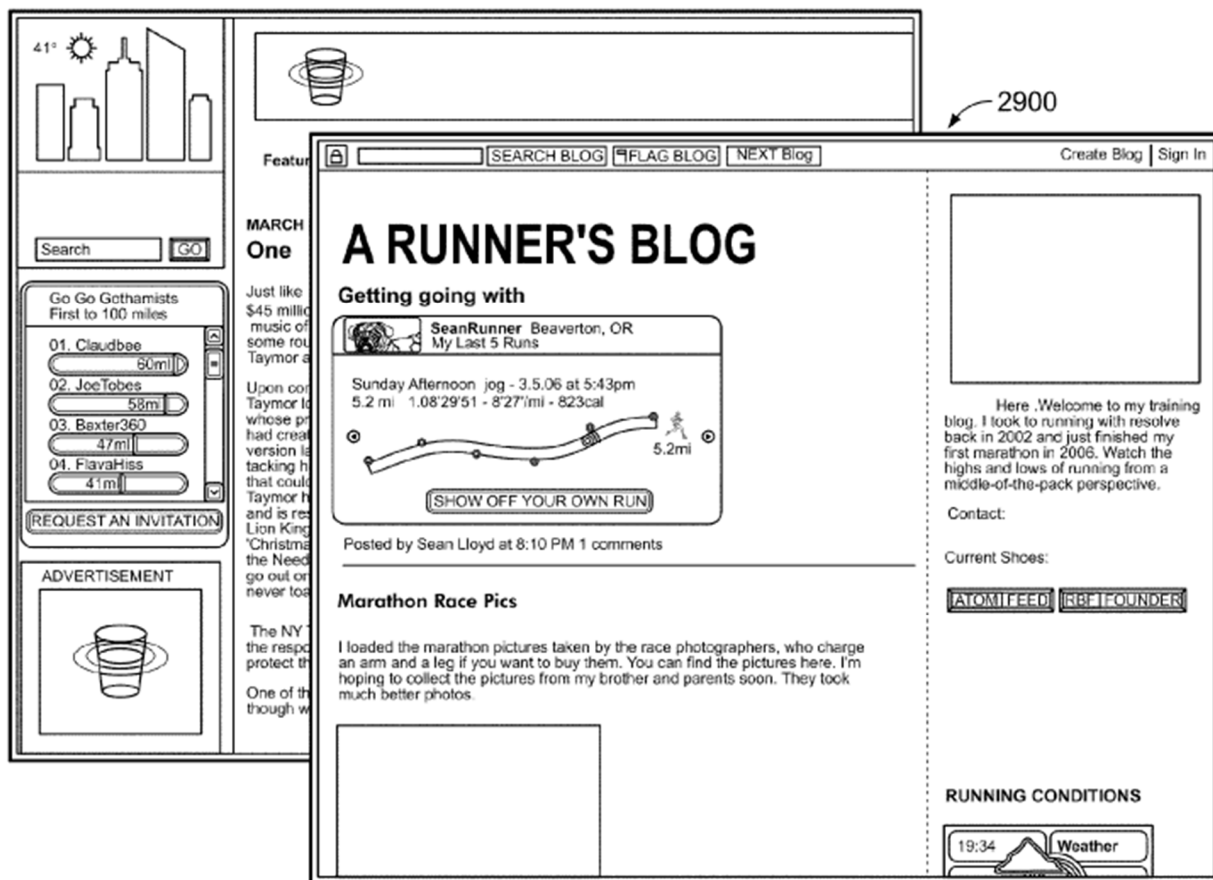


FIG. 29

(*Id.*, Fig. 29.) A POSITA further would have understood from the presence of the blog in Figure 29 that device 601 had transmitted user data from storage to the user's blog. (*See id.*, ¶ 88.) For instance, Johnson discloses in paragraph 183 of its specification: "The user may further be provided options 4320 and 4325 to program a workout (e.g., a new workout) or to post comments or a report about the completed workout, respectively." (*Id.*, ¶ 183.)

73. The upper-right hand corner of interface 2900 includes a "sign in" button. (*Id.*) A POSITA would have recognized that the presence of a "sign in" button indicates that Figure 29 shows interface 2900 as it would appear to someone

who had not yet logged in to the blog website. In other words, a POSITA would have understood that anyone can view interface 2900 as it is depicted in Figure 29 regardless of whether they have log on credentials for the blog website.

74. Figure 29 also shows, directly beneath the blog promotion, text that states, “1 comments.” (*Id.*, Fig. 29.) Relatedly, Johnson discloses: “Blog 2900 may include ... the ability for blog 2900 viewers to post feedback.” (*Id.*, ¶ 167.) A POSITA would have understood from these disclosures that blog 2900’s viewers can comment on it.

75. In my experience, web designers typically allow viewers to “comment” on webpages by providing viewers with text fields in which the viewer can type their comment. Thus, a POSITA viewing Johnson’s Figure 29 would have understood that whoever commented on the blog promotion shown in that figure did so by typing their comment into a text field displayed on the blog.

B. Sutton

76. Sutton is a United States Patent Application Publication numbered US 2009/0150178. (Ex. 1005.) It is titled “METHOD AND SYSTEM FOR TRACKING PHYSICAL METRICS IN A SOCIAL COMMERCE SYSTEM” and was published on June 11, 2009. (*Id.*)

1. Sutton's System

77. Sutton discloses “an exemplary system for tracking the physical metrics of a user” in Figure 1A, shown below. (*Id.*, ¶ 28.)

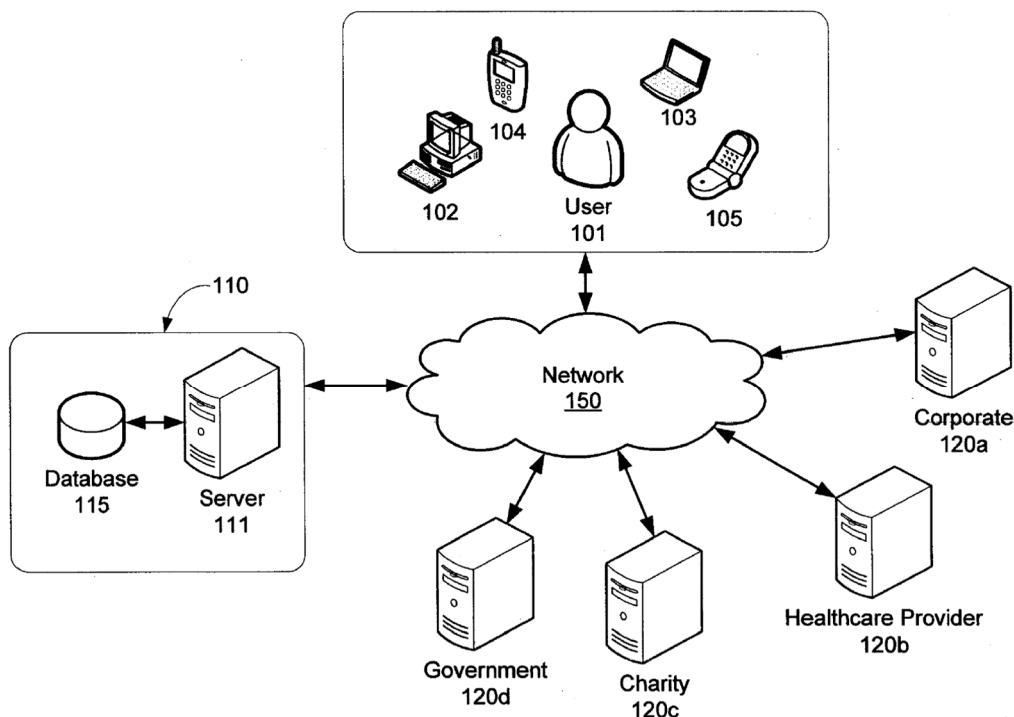


FIG. 1A

(*Id.*, Fig. 1A.) In Figure 1A, “[u]ser 101 represents an individual or a group of individuals using the present system and method.” (*Id.*, ¶ 28.) Devices 102-105, which include computers, phones, and a “device 104,” allow user 101 to record their athletic activity. (*Id.*, ¶¶ 30, 52, 71.)

78. In some embodiments, user 101 sends data to system 110 across network 150 from one of devices 102-105. (*See id.*, ¶¶ 30, 52, 71, Fig. 1A.) System 110 is an “activity and biometric tracking system 110” and “has a server 111 and a

database 115.” (*Id.*, ¶ 28.) “Server 111 ... represents a collection of servers, for example, a Web server, a file server, a data aggregation server, a data processing server, etc.” (*Id.*) System 110 stores user information, including user 101’s “personal profile, exercise data, analysis data, and other user related data as well as user 101’s activity data” in database 115. (*Id.*) Sutton depicts “exemplary data types stored in a database” in Figure 2, shown below. (*Id.*, ¶ 11.)

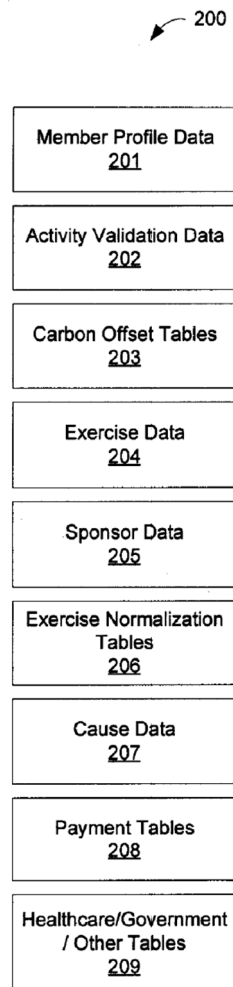


FIG. 2

(*Id.*, Fig. 2.)

79. Sutton depicts “exemplary modes of data transmission according to one embodiment” in Figure 1B, shown below. (*Id.*, ¶ 10.)

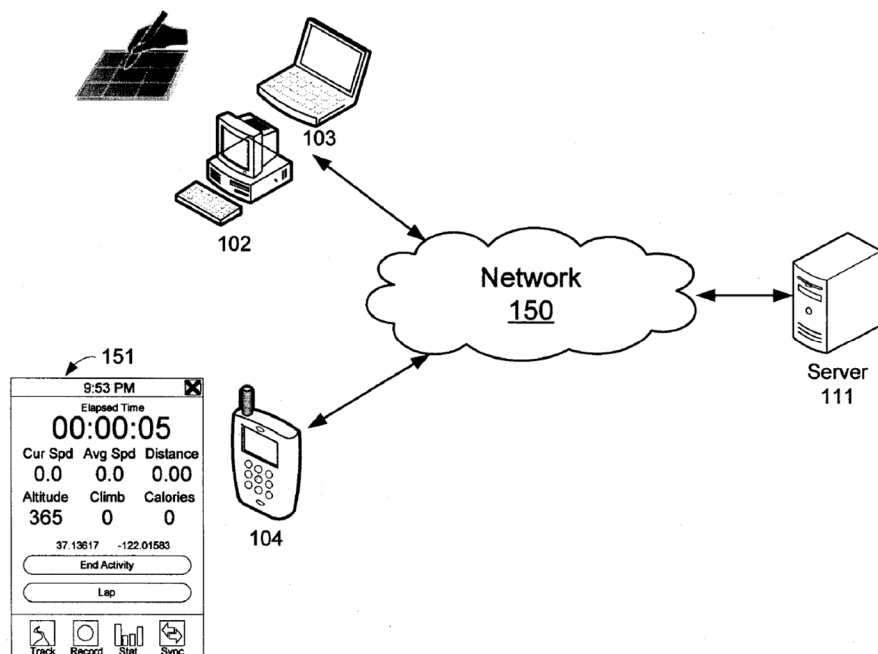


FIG. 1B

(*Id.*, Fig. 1B.) As shown in the Figure 1B, device 104 included a display “providing various information (e.g., current speed, average speed, distance, altitude, climb, calories)[,]” elapsed time, and GPS coordinates. (*Id.*, ¶ 30, Fig. 1B.) It also included “Track,” “Record,” “Stat,” and “Sync” buttons. (*Id.*, Fig. 1B.) A POSITA would have understood that “Stat” likely refers to past workout statistics and that “Sync” likely refers to Sutton’s manual device transfer embodiment.

80. A POSITA would have recognized that device 104 is a computer. As I described in the previous paragraph, device 104 has conventional computer

components, such as a display, keys, and computational functions like recording and displaying information. (*See id.*, Fig. 1B.) Device 104 also transmits data over a wireless network, which is another conventional computer feature. (*See id.*, ¶ 30.)

81. Sutton’s Figure 11 “illustrates an exemplary computer architecture 1100 for use with the present system” (*Id.*, ¶ 94.) That architecture “may be used to implement activity and biometric tracking system 110” (*Id.*, ¶ 94.) A POSITA would have understood that it also could be used to implement the other computers disclosed in Sutton, including device 104.

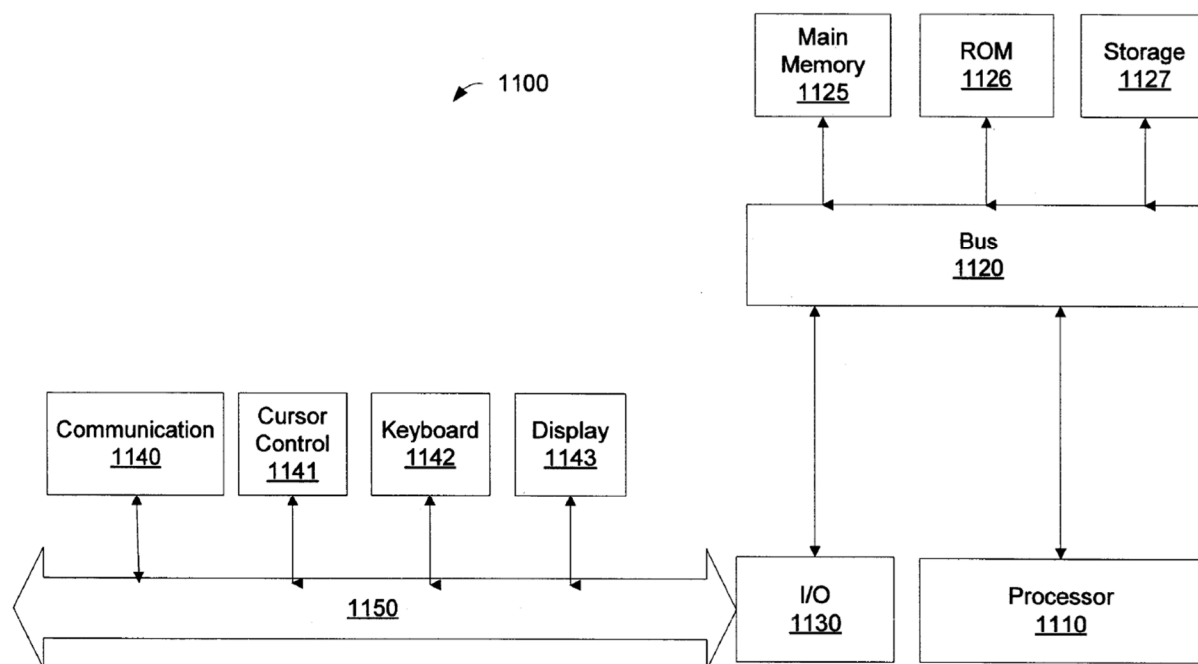


FIG. 11

(*Id.*, Fig. 11.)

82. Architecture 1100 includes conventional computer components, including a processor 1110, a system bus 1120, main memory 1125, read-only

memory 1126, and data storage 1127. (*Id.*, Fig. 11, ¶ 94.) Main memory 1125 is “random access memory (RAM) or other dynamic storage device 1125” (*Id.*, ¶ 94.) Data storage 1127 can include, for example, “flash memory [or] a magnetic disk or optical disk” (*Id.*, ¶ 95.)

83. Sutton states that each of main memory 1125, read-only memory 1126, and data storage 1127 can store software instructions for execution by processor 1110. (*Id.*, ¶¶ 94-95.) It further states that “a variety of programming languages may be used to implement the teachings of the invention as described herein.” (*Id.*, ¶ 26.) A POSITA would have understood from these disclosures that instructions stored in memory cause devices 102-105 and system 110 perform their functions.

84. In the following paragraphs, I describe some of device 104 and system 110’s functions. Setting aside the foregoing disclosures, a POSITA also would have understood from these functions that device 104 and system 110 are computers that perform their respective functions according to software instructions stored in memory and executed by processors.

2. Sutton’s Recording & Uploading Functions

85. Sutton discloses processes for uploading athletic data to a social networking site. The “[d]ata transfer methods are categorized into three main themes: manual transfer, manual device transfer, and automatic device transfer.” (*Id.*, ¶ 60.) It depicts the three transfer methods in the flowchart shown below. (*Id.*)

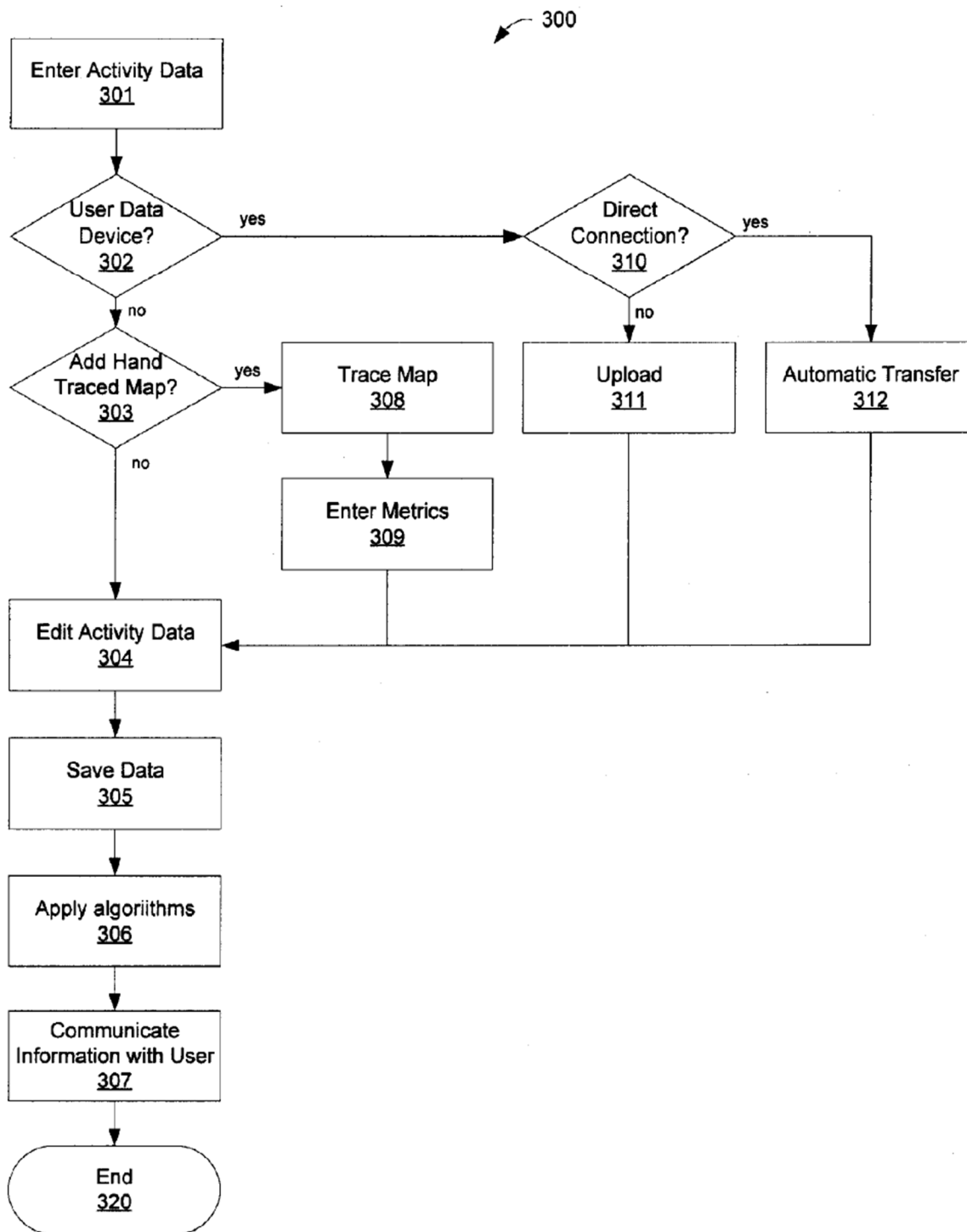


FIG. 3

(*Id.*, Fig. 3.)

a. Manual Transfer Embodiment

86. Sutton’s manual transfer starts at transfer step 301 with a user manually entering data into a form. (*Id.*, ¶ 60.)¹ Sutton discloses: “User 101 may use a PC, a phone or any other data entry device to enter his/her activity data.” (*Id.*, ¶ 73.) Users can manually enter activity data into an “exemplary data entry form” shown in Figure 9. (*Id.*; *see also id.*, ¶¶ 61, 85.)

87. As shown below, Figure 9’s exemplary data form includes a privacy field where users can select “Public” or “Private.” (*Id.*, Fig. 9.) If a user selects “Public,” then Sutton’s system makes the activity “visible to the Plus 3 Network community.” (*Id.*) If the user selects “Private,” then Sutton’s system will make the activity “visible only to [the user].” (*Id.*)

¹ Sutton states in a later paragraph that a “user 101 logs data with a device at decision point 303.” (Ex. 1005, ¶ 74.) This appears to be a typo. Figure 3 states that at step 303, Sutton’s system checks whether a user wishes to enter a “hand traced map.” (*Id.*, Fig. 3.) A POSITA would have understood that Sutton refers to step 301 in paragraph 74, not step 303.

900

Enter Activity By Hand
✕

Activity Name
Morning Run

Sport
Running ▼

Description
A five mile run from the house into the park and around the school yard.

Start Date / Time:
11/20/2008 09:30 AM ▼

Total Time (hours: minutes: seconds)
00 ▼ 35 ▼ 00 ▼

Total Distance
5 miles ▼

Course Rating ★★☆☆☆

Privacy
☒ Public (visible to the Plus 3 Network community)
☐ Private (only visible to me)

Save activity

Back to my activities

FIG. 9

(*Id.*, Fig. 9.)

88. Sutton also discloses that users can “enter[] metrics on a traced map” during a manual transfer. (*Id.*, ¶ 60.) In Figure 5, Sutton depicts a map including data entered by a user. (*Id.*, ¶ 63.) Based on the overlap between Figures 5 (below) and 9 (above), including the activity name, sport, description, time / timestamp, total time, and distance fields, a POSITA would have understood that a user entered the metrics shown next to Figure 5’s map via Figure 9’s exemplary form.

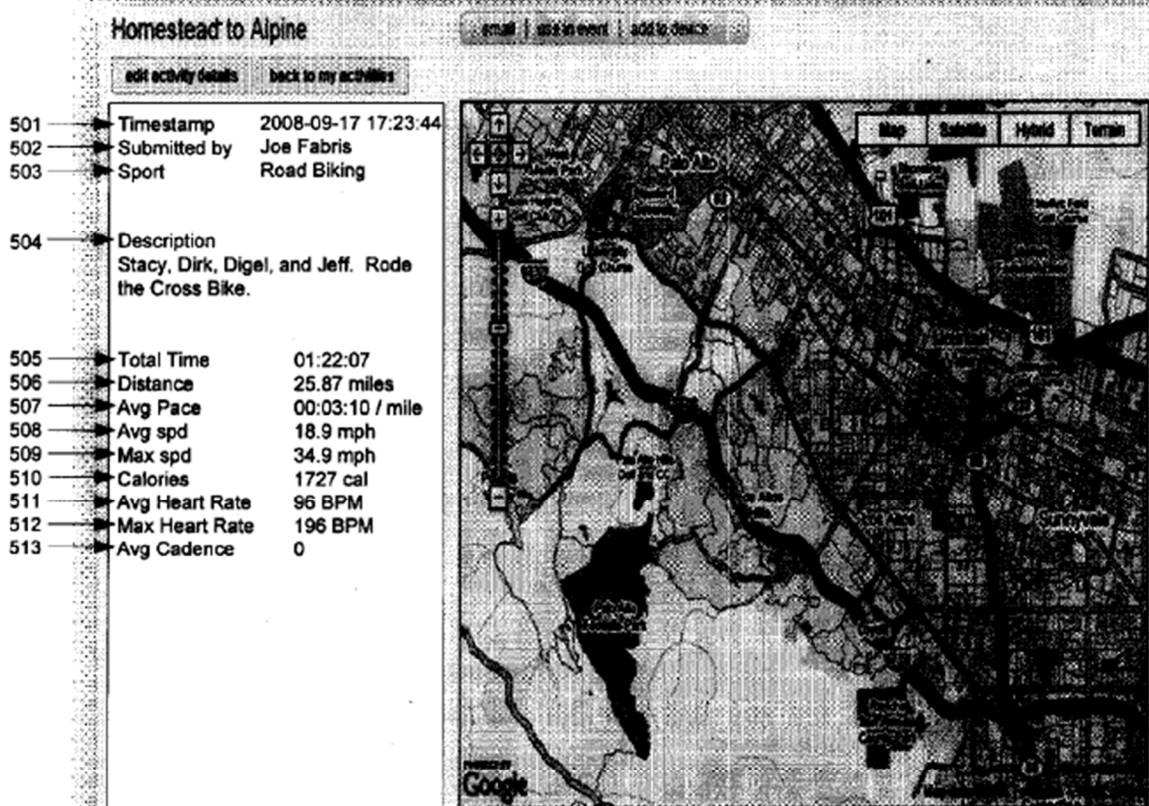


FIG. 5

(*Id.*, Fig. 5.)

89. After a user manually enters their data into the exemplary form shown in Figure 9, “[t]he user provided data is stored in database 115 ...” in transfer step 305. (*Id.*, ¶ 61.) Next, in transfer step 307, “server 111 [can] communicate[] with user 101 to ask for confirmation of data upload and transfer” (*Id.*, ¶ 61.) Ultimately, server 111 transmits a user’s workout information to a “page at <http://www.plus3networks.com>” (*Id.*, Fig. 4, ¶ 62.) Thus, Sutton discloses an

embodiment in which server 111 transfers recorded data from database 115 to a website.

90. A POSITA would have understood from Sutton that server 111 uploads the entered user data to a page of a social networking site. “www.plus3networks.com” is a misspelling of www.plus3network.com, which I understand is a real social networking site. (*See* Ex. 1006 at 9 (“Plus 3 Network is a mobile, GPS-enhanced social network that connects people with corporate sponsors and worthwhile causes on a lasting journey of personal fitness and charitable giving”).)

91. Even setting aside Exhibit 6’s disclosure, Sutton provides contextual clues from which a POSITA would have understood that “www.plus3networks.com” refers to a social networking site. For instance, Sutton states: “The present system and method provides tools for interactive connections with other users, sharing activities, comparing activities, posting virtual competitions and results, and other leaderboards.” (Ex. 1005, ¶ 85; *see also id.*, ¶¶ 86-93, Figs. 4, 5, 9, 10.) It discloses that users of that social networking site would “create[] a personal profile and upload[] his/her GPS tracked exercise efforts.” (*Id.*, ¶ 90.) It states that users of that site “can be dynamically tracked and connected if they desire.” (*Id.*, ¶ 86; *see also* ¶ 87, 92.) In view of these disclosures, a POSITA would have understood that system 110 publicizes a user’s workout information on

their profile page of the social networking site in response to a user selecting the “Public” sharing option selection shown in Sutton’s Figure 9.

b. Manual & Automatic Device Transfer Embodiments

92. In the manual and automatic device transfer embodiments, a user tracks their athletic activity with a device (such as device 104) and then uploads the recorded athletic activity data to system 110. (*See id.*, ¶¶ 30, 60.) Sutton explains: “If the user-provided data is generated from a user 101’s device, the user 101’s device is checked to determine if it has a direct connection to server 111 (310).” (*Id.*, ¶ 60.) If so, “user 101’s data is automatically transferred (312), otherwise [it is] uploaded either by user 101 or by an application program (not shown) that transfers the data to server 111 (311).” (*Id.*)

93. It would have been obvious to modify the manual device transfer and automatic device transfer embodiments to include a user making a privacy selection of either public or private. First, it would have been obvious to modify Sutton’s manual device transfer embodiment so that a user selected public or private at transfer step 304. Sutton discloses that, at step 304, “[u]ser 101 enters sport category and other required or optional fields to complete data entry.” (*Id.*, ¶ 61.) It would have been trivial for a POSITA to include Figure 9’s “Privacy” field as one such field. The user could, for example, view the field on device 104’s display and make their selection using device 104’s buttons:



(*Id.*, Fig. 1B (cropped).)

94. Second, it would have been obvious to modify Sutton’s automatic device transfer embodiment so that a user would select “public” or “private” before starting a workout. Sutton discloses “real-time” data transfer and sharing. (*See id.*, ¶¶ 75, 87.) It would not make sense for a user to instruct system 110 to share their data to a social networking site after real-time sharing began. A POSITA therefore would have required a user to make that selection *before* starting their workout. For example, a POSITA could have required a user to fill out the same form shown in Sutton’s Figure 9, except that the POSITA would omit the “Start Data / Time,” “Total Time,” “Total Distance,” and “Course Rating” fields from the form because the user would not yet have performed the activity.

900

Enter Activity By Hand
✕

Activity Name
Morning Run

Sport
Running ▼

Description
A five mile run from the house into the park and around the school yard.

Start Date / Time:
11/20/2008 09:30 AM ▼

Total Time (hours: minutes: seconds)
00 ▼ 35 ▼ 00 ▼

Total Distance
5 miles ▼

Course Rating ★★☆☆☆

Privacy
☒ Public (visible to the Plus 3 Network community)
☐ Private (only visible to me)

Save activity

Back to my activities

FIG. 9

(*Id.*, Fig. 9 (annotated).) The user could, for example, view the modified version of the form shown in Figure 9 on device 104's display and make their privacy selection using device 104's buttons.

95. In either of the manual device transfer or automated transfer embodiments, after receiving user's selection of public or private, device 104 would send that selection to system 110. Device 104 would also—as usual—send user athletic activity data to system 110, which would store the data in database 115. (*Id.*, ¶ 60.) Then, just as in the manual transfer embodiment, and in response to a user's selection of public received from device 104, server 111 would send the user's

workout information from database 115 to a network page of a social networking site. (*See supra* ¶ 62.)

96. A POSITA would have described the steps outlined in paragraph 67, above, as device 104 transmitting athletic activity data to a page of a social networking site. This is (and has been for as long as I can remember) a common way to refer to commanding one device to move data to another. For example, if I wanted to send an email to one my colleagues, I would click “send” in my email program’s user interface. My laptop would transmit my email to a server with an instruction to send it to my colleague. The server would react by sending it on to my colleague’s laptop or to one or more other servers and then eventually to my colleague’s laptop. If a POSITA were to describe these steps of my laptop sending an email to my colleague, they would have simply said that my laptop transmitted my email to my colleague’s laptop.

97. Finally, a POSITA would have been motivated to modify Sutton’s system as described above to implement Sutton’s feature of allowing users to “be dynamically tracked and connected if they desire.” (Ex. 1005, ¶ 86.) A POSITA would have recognized the importance of providing users with the choice of whether to share their athletic activity data because Sutton repeatedly referred to doing so. (*See, id.*, ¶ 86, Fig. 9.) Allowing a user to make their sharing option selection via

device 104 would be convenient for a user already using device 104 to track athletic activity.

C. Plus 3 Website Pages

1. The Plus 3 Website Pages' Contents

98. The Plus 3 Website Pages are pages 5, 7, 9-10, 12-14, and 16-19 of Ex. 1006. Ex. 1006 is a declaration by Nathaniel E. Frank-White. (Ex. 1006 at 1.) From Mr. Frank-White's declaration, I understand that the Plus 3 Website Pages are images of webpages as they existed in December of 2008. (*Id.* at 1-19.)

99. The Plus 3 Website pages include images of five different URLs: plus3network.com/, www.plus3network.com/user/signup, www.plus3network.com/home/about_us, www.plus3network.com/user/privacy, and www.plus3network.com/user/tou. (*Id.* at 5, 7, 9-10, 12-14, 16-19.) I have summarized each of these pages below.

100. plus3network.com/. (*Id.* at 5.) This page includes "Sign in" fields and a "Sign Up" link. It also depicts some features of the website, including "Track + Log," "Community," and "Rewards."

101. www.plus3network.com/user/signup. (*Id.* at 7.) This page includes fields for a user to enter their name, password, email address, and zip code.

102. www.plus3network.com/home/about_us. (*Id.* at 9-10.) This page states that "Plus 3 Network is a mobile, GPS-enhanced social network that connects

people with corporate sponsors and worthwhile causes on a lasting journey of personal fitness and charitable giving.” (*Id.* at 9.) It also identifies people named “Rick Sutton” and “Joe Fabris” as Plus 3 Network’s “Founder / President & CEO” and “Founder / Product Marketing,” respectively. *Id.* These people have the same first and last names as Sutton’s inventors. (Ex. 1005 at 1.)

103. www.plus3network.com/user/privacy. (Ex. 1006 at 12-14.) This page sets out plus3network.com’s privacy policy as of December 2008. (*Id.* at 12.) It also describes four of plus3network.com’s key features.

104. First, the Privacy page explains that users can comment on other user’s activities:

Your Name: Your name is displayed throughout the Site and is therefore available to the public. Other people can see your name when they visit your Profile Page, when you come up in search results, when you post public content, when you post comments, on another member’s site, or provide feedback, etc. Therefore, people will be able to personally identify your activities on the Site.

(*Id.*)

105. Second, the Privacy page explains, in general terms, when and how plus3network.com shares user data with other users. (*Id.*) For example, in the

second bullet under the sub header, “2. The Way Plus 3 Uses Information,” the page states that users can control whether the site shares their profile with other users:

You have the ability to make your profile Public or Private. When the option is set to Public, your profile, as noted below, can be seen attached to your activities ... When your profile is set to Private, Users cannot see your profile data details.

(*Id.* at 12.)

106. Third, the Privacy page states that users can control whether the site shares their activities with other users:

Activity Privacy: You also have the ability to set an Activity to Public or Private. If the Activity is set to Public it can be viewed, with your name attached, by all Users, and depending on your personal Public/Private setting, Users may be able to see your Profile. If an Activity is set to Private, it is not displayed to other Users and only you can see it.

(*Id.*)

107. Fourth, the Privacy page states that users may see other users’ location data:

Activities – Geographic Data: Please be aware that when you post an activity, either one you have uploaded from a data collection device,

such as a GPS, or one that you have entered by hand (collectively, “Location Data”), Users may see the route you have covered, including your start and end points, which may include your residence or place of work.

(*Id.*)

108. www.plus3network.com/user/tou. (*Id.* at 16-19.) This page describes plus3network.com’s terms of use as of December 2008. Like the Privacy page, it also describes some of plus3network.com’s features. For example, it explains that users can “remove your User Content from the site at any time.” (*Id.* at 17.) “User Content” means “all content that you upload, publish or display ... on or through the Services or the Site, or transmit to or share with other Users” (*Id.*)

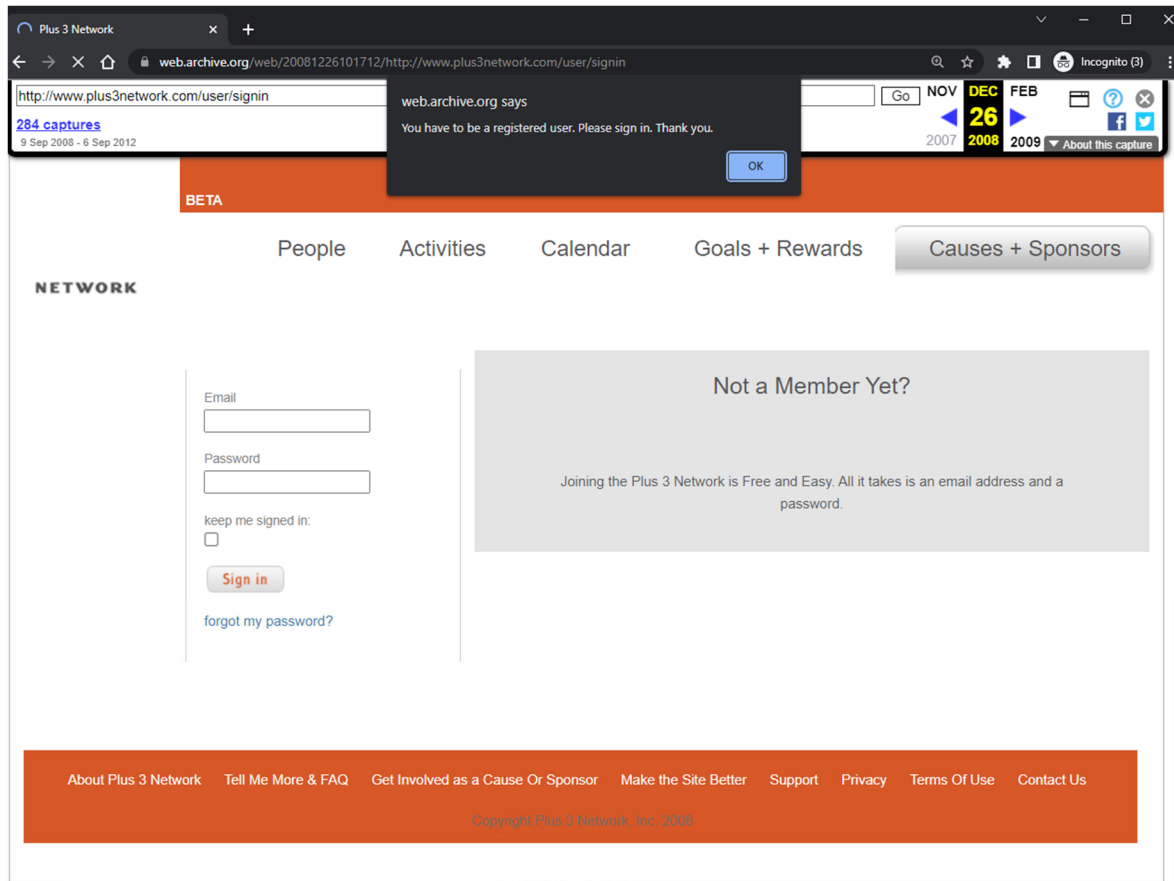
2. Accessibility of the Plus 3 Website Pages

109. I was asked to consider whether the Plus 3 Website Pages were publicly accessible in 2008. In my opinion, a POSITA exercising reasonable diligence could have located the Plus 3 Website Pages in 2008. I have four bases for my opinion.

110. First, the contents of the Plus 3 Website Pages are consistent with publicly accessible webpages. For example, sign on and sign up pages are necessarily publicly accessible because users require access to those pages to sign on to a website or sign up for an account. Further, in my experience, websites typically display about and policy pages on public portions of their websites.

111. Second, the Plus 3 Website Pages were probably publicly accessible because the Internet Archive imaged them. According to the Internet Archive website's help page, which is shown in Exhibit 1012 and available at <https://help.archive.org/help/wayback-machine-general-information/>, "the Archive collects web pages that are publicly available. We do not archive pages that require a password to access, pages that are accessible when a person types into and sends a form, or pages on secure servers." (Ex. 1012 at 2.)

112. The Internet Archive's statement that it only archives public webpages is consistent with my own observations. For instance, I navigated to the Internet Archive's December 26, 2008, capture of the [plus3network.com](http://www.plus3network.com), available at <https://web.archive.org/web/20081226013004/http://www.plus3network.com/>. When I clicked on the "People" button at the top of that archived page, the Internet Archive redirected me to its archived copy of www.plus3network.com/user/signin. That page displayed the following pop up on my computer screen:



The fact that the Internet Archive could not display portions of the plus3network.com website requiring sign in suggests to me that the portions of the website that it had captured were publicly available.

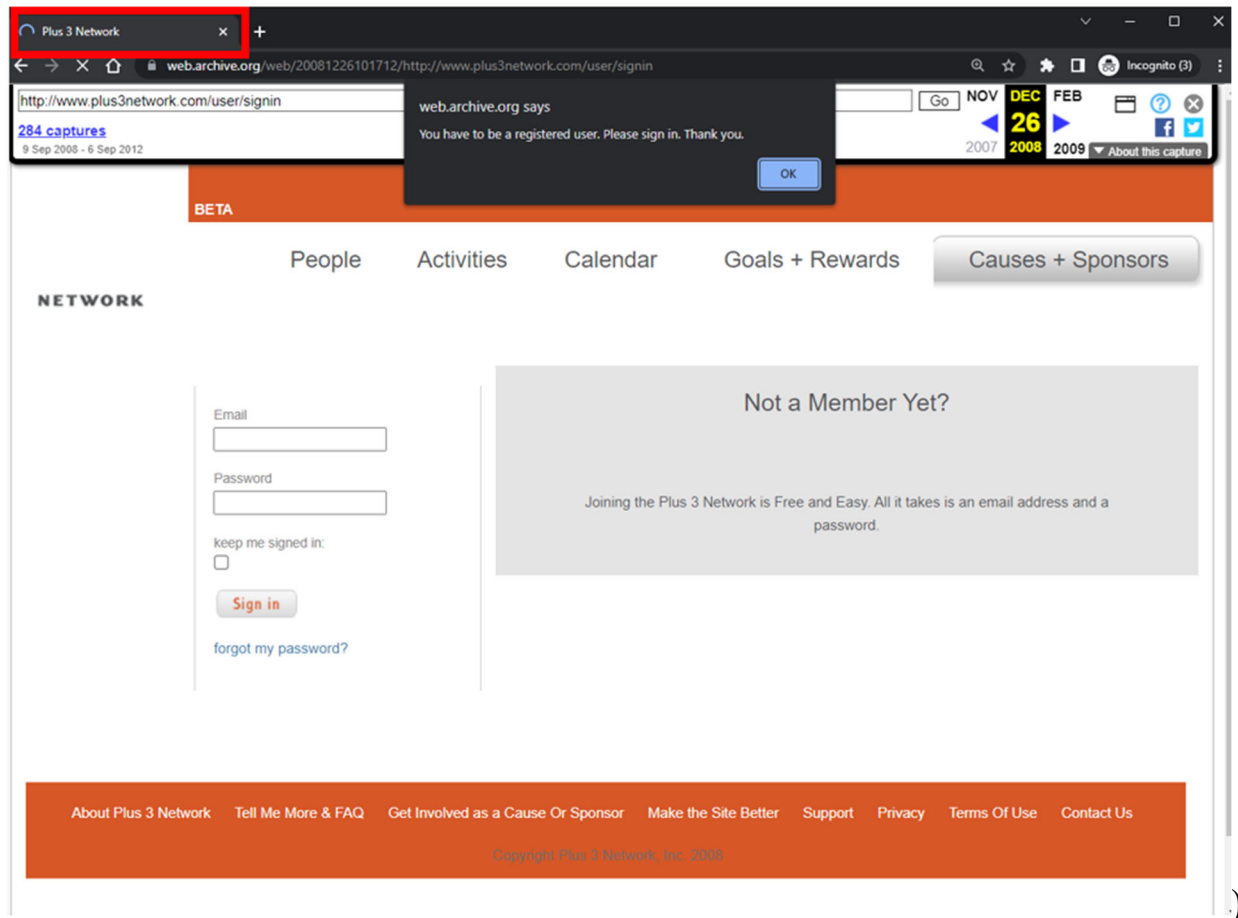
113. Third, it is likely that, in 2008, a POSITA could have found the Plus 3 Website pages using an Internet search engine. Search engines, such as Google, typically index webpages using tags that reflect a webpage's contents. For example, if Google were to index plus3network.com, it might tag that page in its search index with the tag "Plus 3 Network." (In fact, "Plus 3 Network" appears as the title of the Sign On page in the source code for that page (view-

source:https://web.archive.org/web/20081226013004/http://www.plus3network.com/) as shown below:

18

<title>Plus 3 Network</title>

That title is also written in the tab for the webpage as shown in this screenshot:



Then, when a POSITA searched for “Plus 3 Network” in Google’s search engine, Google would return plus3network.com as a search result. A POSITA interested in social networks might have thought to search for “Plus 3 Network” after reading about the network in Sutton. (See Ex. 1005, Fig. 9 (“Plus 3 Network community”).)

114. I confirmed that, if a POSITA ran such a search today, they would locate plus3network.com. In an incognito tab in Google's Chrome browser, I searched for "Plus 3 Network." The first search result that Google returned was plus3network.com. Thus, it is conceivable that a POSITA could have found plus3network.com by running the same search in 2008.

115. Fourth, it seems likely that the Plus 3 Network's operators would have tried to publicize plus3network.com in 2008. In October 2008, the New York Times explained in an article shown in Exhibit 1013 and available at <https://www.nytimes.com/2008/10/21/technology/start-ups/21twitter.html>: "Like the value of the telephone network or the Internet itself, the value of Twitter [a social network] increases with the number of users. So growth is its top priority" (Ex. 1013 at 3.) Based on that logic, if Plus 3 Network's operators wanted the Plus 3 Network to increase in value, they probably would have wanted to promote the network as widely as possible to add as many users as possible.

D. Fry

116. Fry is a Tweet dated January 5, 2009:

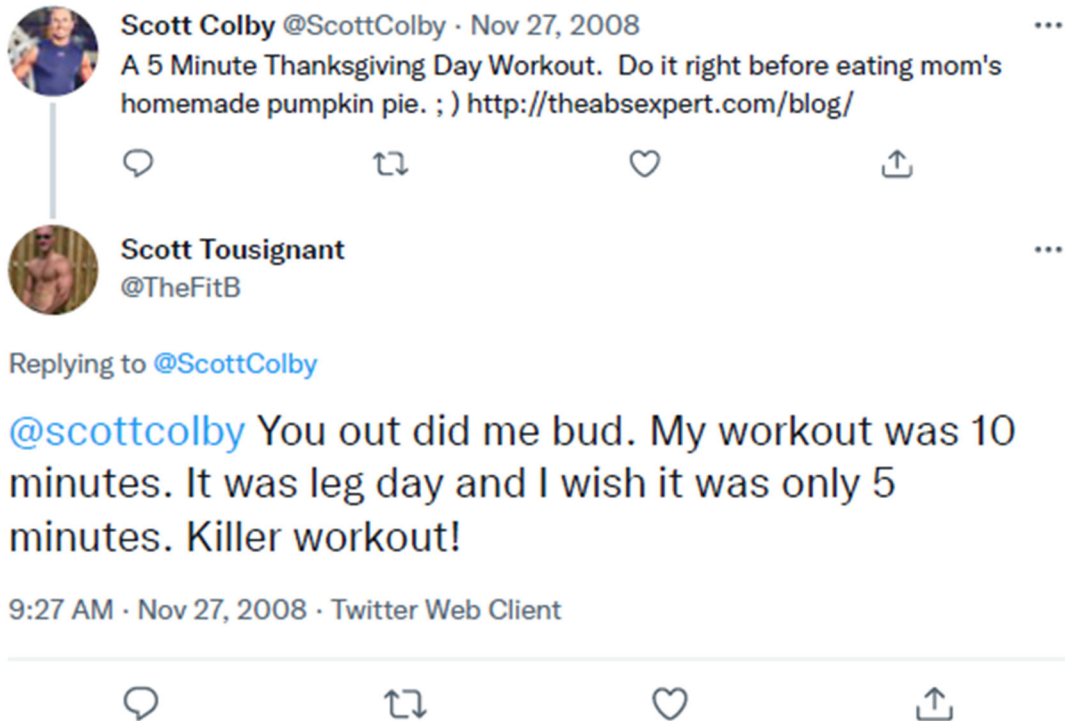


(Ex. 1007.)

117. As an experiment, I tried locating Ms. Fry’s tweet using search terms that a POSITA might have used if they had wanted to find tweets relating to athletic content. In Twitter’s advanced search engine’s “All of these words” field, I typed “score 30 min”. Then, to simulate what a POSITA would have found on or around January 5, 2009, I limited my search to dates “To” January 6, 2009. That search returned Ms. Fry’s tweet shown in Ex. 1007, among other tweets. The URL for Twitter’s advanced search engine is <https://twitter.com/search-advanced?lang=en>. I understand from Mr. Frank-White’s declaration that a POSITA could have accessed Twitter’s advanced search engine in 2008. (See Ex. 1006 at 25.)

E. Tousignant, Marcus, Fry II, and Prasatik

118. Tousignant is a tweet dated November 27, 2008, by Twitter user @TheFitB:



(Ex. 1008.)

119. Marcus is a tweet dated July 9, 2009:



(Ex. 1009.)

120. Fry II is tweet dated July 11, 2009:



(Ex. 1010.)

121. Prasatik is a tweet dated July 18, 2009:



(Ex. 1011.)

VIII. Obviousness Combinations

A. Sutton & the Plus 3 Website Pages

1. Motivation to Combine

122. In my opinion, a POSITA would have been motivated to combine Sutton and the Plus 3 Website pages because both references describe a single system, an exercise-themed social network called the “Plus 3 Network” and related hardware.

123. For instance, Sutton refers to the Plus 3 Network three times in its specification. First, Sutton refers to “http://www.plus3networks.com” in its Figure 4. (Ex. 1005, Fig. 4.) That is a misspelling of the Plus 3 Network’s website, www.plus3network.com. (Ex. 1006 at 12 (“www.Plus3Network.com”).) Second, Sutton states, “Every day, you and all of Plus 3 are Making It Count.” (Ex. 1005, Fig. 4.) Third, Sutton states that if a user sets an activity to “Public,” then the activity will be “visible to the Plus 3 Network community.” (*Id.*, Fig. 9.) After reading these disclosures in Sutton, a POSITA would have been motivated to look at the Plus 3 Network’s website.

124. The Plus 3 Website Pages also refer to Sutton. The About page identifies Rick Sutton and Joe Fabris as “Founder / President & CEO” and “Founder / Product Marketing,” respectively. (Ex. 1006 at 9.) Those are Sutton’s inventors. (Ex. 1005 at 1.) The Plus 3 Website pages describe collecting user information with “data collection device[s]” and then using it to “raise funds for charitable causes.” (Ex. 1006 at 12, 13.) Sutton describes the same feature. (*See e.g.*, Ex. 1005, ¶ 42.)

125. Thus, a POSITA who read Sutton and the parts of www.plus3network.com imaged as the Plus 3 Website Pages would have had no doubt that both Sutton and those website pages refer to the same system and would have freely drawn from both references. A POSITA would have expected the

combination to succeed because a POSITA would have understood that it already had succeeded in the form of the Plus 3 Network.

2. How a POSITA Would Have Combined Sutton and the Plus 3 Website Pages

126. Below I provide four examples of how a POSITA would have combined Sutton and the Plus 3 Website Pages.

127. First, a POSITA would have combined the Plus 3 Website Pages' disclosure of a sharing option with Sutton's manual device transfer and automatic device transfer embodiments. The Plus 3 Website Pages describe a "Public" sharing option selection configured to allow recorded athletic activity to be shared: "You also have the ability to set an Activity to Public or Private. If the Activity is set to Public it can be viewed, with your name attached, by all Users" (Ex. 1006 at 12.) A POSITA would have implemented this modification as I explained in paragraphs 91-95 of my report, above. (*See supra* ¶¶ 91-95.)

128. Second, a POSITA would have combined the Plus 3 Website Pages' commenting feature with Sutton's social networking site (which, again, was the Plus 3 Network's website, www.plus3network.com). (*See* Ex. 1005, Fig. 4.) The Plus 3 Website Pages state that users could "post comments[] on another member's site." (Ex. 1006 at 12.) It would have been trivial for a POSITA to configure Sutton's Web server 111 to allow commenting. For example, a POSITA could have simply provided a text field on each user's profile page where other users could leave

messages. Doing so would have been as simple as tweaking the stored webpage template for user profile pages and storing and connecting the submitted data to data structures in the back end of the website.

129. Third, a POSITA would have combined the Plus 3 Website Pages' disclosure of removing content with Sutton's social networking site (again, www.plus3network.com). (See Ex. 1005, Fig. 4.) The Plus 3 Website Pages state that users could remove [their] User Content from the Site at any time," where "User Content" included "all content that you upload, publish or display ... on or through the Services or the Site, or transmit to or share with other Users" (Ex. 1006 at 17.) Removing shared workout information is a natural extension of Sutton's disclosure that users can edit their data "if a correction of the previously entered data is required." (Ex. 1005, ¶ 63.)

130. It would have trivial for a POSITA to implement this modification. For example, a POSITA could have modified the stored webpage template for user profile pages to include a "delete" button underneath activities. It would have been obvious to allow a user to view the webpage on the same device through which the user uploaded their data in the first place. The user could then select "delete" using that device, the device would transmit the delete request to the web server 111, and web server 111 would remove the deleted activity and all linked activity such as comments from the user's profile page.

131. Fourth, a POSITA would have combined the Plus 3 Website Pages disclosure of route sharing with Sutton's system. The Plus 3 Website Pages state: "[W]hen you post an activity ... Users may see the route you have covered, including your start and end points, which may include your residence or place of work." (Ex. 1006 at 12.) It would have been trivial for a POSITA to add the Plus 3 Website Pages' route sharing feature Sutton because Sutton already discloses uploading and sharing a "trace map of user activity" as shown in Figure 5, (Ex. 1005, ¶ 63, Fig. 5), during data transmission, (*id.*, ¶ 60, Fig. 3; *see also id.*, Fig. 9.)

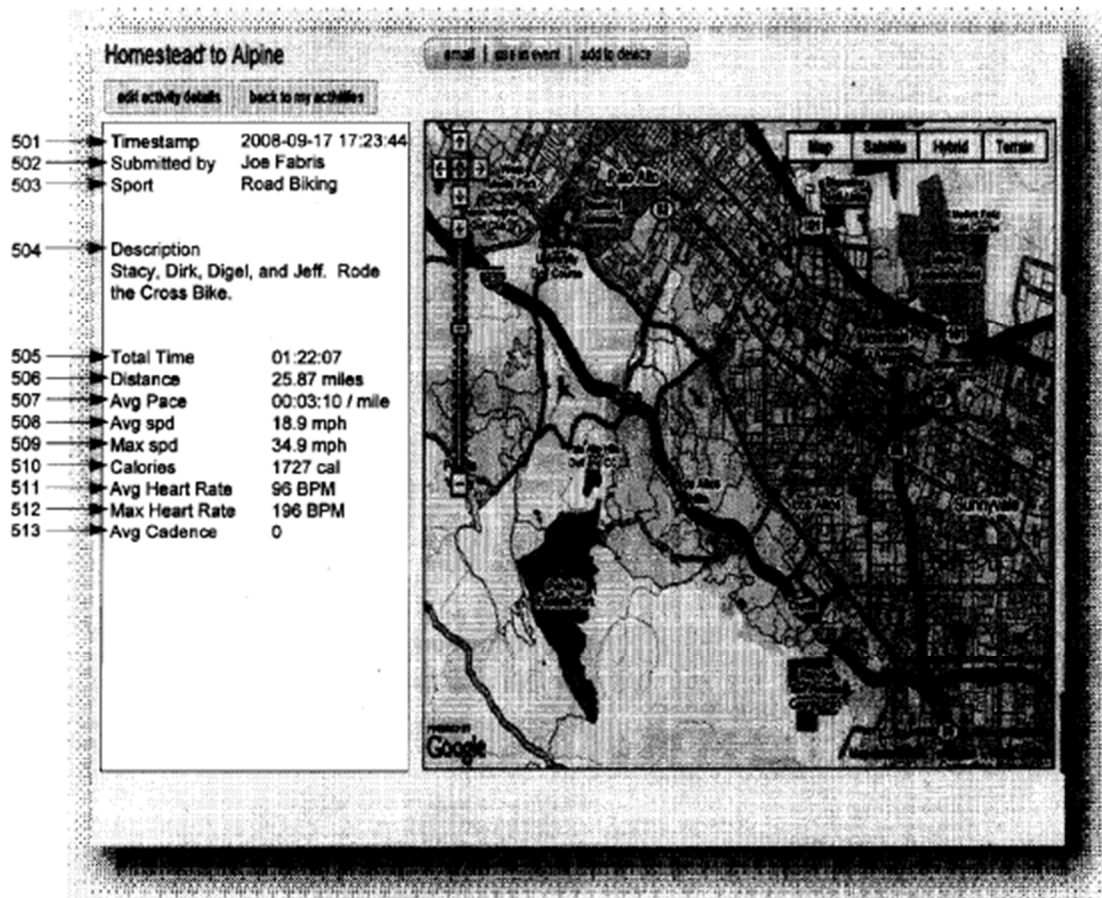
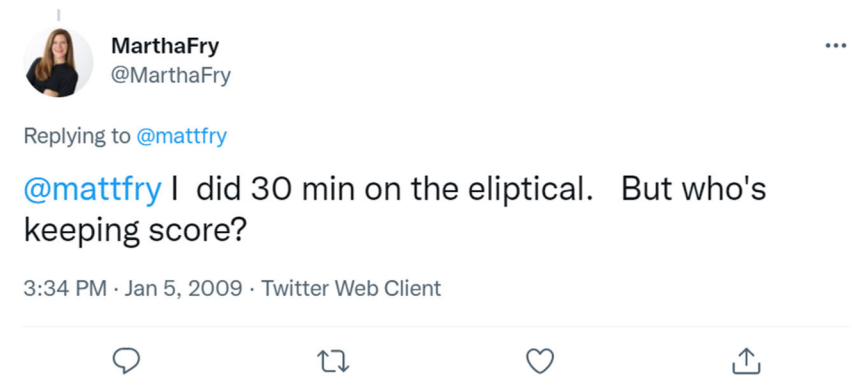


FIG. 5

(*Id.*, Fig. 5.)

B. Sutton & Fry

132. In my opinion, a POSITA would have been motivated to combine Sutton and Fry. Sutton describes a system including a social network, the Plus 3 Network. (*See, e.g.*, Ex. 1005, Figs. 4, 9.) Fry illustrates a feature of a social network: tagging other users in a post about one's own athletic activity. (Ex. 1007.) The fact that Ms. Fry tweeted about her own workout and tagged another user in her tweet suggests that social network users value tagging other users in posts about their own athletic activity.



(Ex. 1007.)

133. Ms. Fry was not the only Twitter user to tag others in a post about their own workout around late 2008 and early-to-mid 2009. As shown below, Exhibits 1008-1011 depict similar tweets:



Scott Colby @ScottColby · Nov 27, 2008

...

A 5 Minute Thanksgiving Day Workout. Do it right before eating mom's homemade pumpkin pie. ;) <http://theabsexpert.com/blog/>



Scott Tousignant
@TheFitB

...

Replying to @ScottColby

@scottcolby You out did me bud. My workout was 10 minutes. It was leg day and I wish it was only 5 minutes. Killer workout!

9:27 AM · Nov 27, 2008 · Twitter Web Client



David Marcus ✓
@davidmarcus

...

Just ran 4 miles with @hillferguson - feels great!

6:56 PM · Jul 9, 2009 · Twitter Web Client



MarthaFry
@MarthaFry

...

Just ran 6 miles with @amiegray & @tammyrandlett!
We made it! Yeah! <http://twitpic.com/9znzi>

5:11 AM · Jul 11, 2009 · Twitter Web Client



Czech Mark
@mprasatik

...

Ran 3 miles with @trainstrong. Good time and the last workout before swiss bike tour.

5:11 AM · Jul 18, 2009 · Twitter Web Client



(Exs. 1008-1011.) Based on Fry and the foregoing tweets, a POSITA would have recognized that people like to tag others, including others with whom they worked out, in social media posts about their own workouts. A POSITA thus would have been motivated to add such a feature to Sutton's system.

134. It would have been trivial to combine Sutton with Fry. Sutton already describes a user entering text into a "Description" field in "an exemplary data entry form." (Ex. 1005, ¶ 73, Fig. 9.) It also discloses a device 104, which is a "data entry device [for] enter[ing] his/her activity data." (*Id.*, ¶ 73.) A user could tag another user via Sutton's hardware by, for example, typing the other user's username on a keyboard in the manual transfer embodiment or on device 104's keys in the manual device transfer and automatic data transfer embodiments. A POSITA could have configured Sutton's system to transmit the tag along with all the other workout data to a network page of a social networking site. (*See, e.g., id.*, ¶ 62, Fig. 4.)

In signing this Declaration, I recognize that the Declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case. If required, I will appear for cross-examination at the appropriate time.

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and that these statements were made with knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code.

Dated: November 6, 2022



Dr. Henry H. Houh

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Education

Massachusetts Institute of Technology, Cambridge, MA

- PhD in Electrical Engineering and Computer Science, February 1998. “Designing Networks for Tomorrow's Traffic,” thesis supervised by Professor David Tennenhouse and Professor John Guttag. GPA 4.7/5.0
- Master of Science in Electrical Engineering and Computer Science, February 1991. “Demonstration of a laser repetition rate multiplier,” thesis. GPA 4.5/5.0
- Bachelor of Science in Electrical Engineering and Computer Science, June 1989. “Boundary element analysis of arbitrarily shaped dielectric structures,” thesis. GPA 4.7/5.0
- Bachelor of Science in Physics, February 1990. GPA 4.7/5.0

MITx, Cambridge, MA

- September 2020 – present: Enrolled in Statistics and Data Science MicroMasters program, a sequence of five MIT-offered graduate-level courses in statistics and machine learning, culminating in a MicroMasters certificate, expected 2022. Have completed four of five required courses.

Experience

BlocksCAD Inc. (H3XL spin-out)

- 2014 - present: Founder and member of Board of Directors. BlocksCAD is a visual Computer-Aided Design (CAD) program, designed to teach children mathematics and geometric visualization. BlocksCAD is being used in U.S. schools and worldwide in maker spaces, with 350,000+ users. BlocksCAD was selected to be part of the LearnLaunch 2017 Boost Accelerator, the MIT Play Labs 2018 Summer Accelerator, and the MassChallenge 2018 Boston Cohort. Recipient of DARPA DSO grant in 2014, and SBIR grant from the USDA in 2019.

H3XL Inc. d/b/a Einstein's Workshop (formerly Lexington Robotics)

- 2009 - present: Founder and President. Started local league providing science and engineering education programs based on LEGO Mindstorms, LEGO WeDo, and FIRST LEGO League. In 2012, grew program into a full science, technology, engineering and math enrichment program and creative/maker space, in 7,000 square feet of space. Serve 2,000+ kids and families annually. As of end of 2021, have delivered an estimated 220,000 student-instruction-hours of

STEM courses. Principle Investigator for 2-year DARPA grant to improve 3D Computer Aided Design tool developed in-house for the purposes of teaching 8 year olds and up 3D CAD.

Houh Consulting Inc. / Independent Consultant

- 2009 - present: Technical consultant specializing in Social Networking, Web 2.0, Web Site Development, Data Networking, Optical Networking, Telecommunications, Media Streaming and Voice Over IP. Clients include: Akin Gump Strauss Hauer & Feld LLP, Arnold & Porter Kaye Scholer LLP, BBN, Baker Botts LLP, Barnes & Thornburg LLP, BBN Technologies, Beus Gilbert McGroder PLLC, Bracewell LLP, Christensen O'Connor Johnson Kindness PLLC, Cooley LLP, Covington & Burling LLP, Cozen O'Connor P.C., DLA Piper, Davis Polk & Wardwell LLP, Desmarais LLP, Duane Morris LLP, Erise IP, P.A., Faegre Baker Daniels LLP, Finnegan, Henderson, Farabow, Garrett & Dunner, LLP, Fish & Richardson P.C., Goldman Ismail Tomaselli Brennan & Baum LLP, Haynes and Boone, LLP, Kaye Scholer, Kellogg Huber Hanson Todd Evans & Figel PLLC, Kirkland & Ellis LLP, Klarquist Sparkman, LLP, McCarthy Tetrault LLP, McGuireWoods LLP, Morgan, Lewis & Bockius LLP, Munger Tolles & Olson LLP, Orrick, Herrington & Sutcliffe LLP, O'Melveny & Myers LLP, Orrick, Herrington & Sutcliffe LLP, Paul Hastings LLP, Paul, Weiss, Rifkind, Wharton & Garrison LLP, Perkins Coie LLP, Quinn Emanuel Urquhart & Sullivan, LLP, Sidley Austin LLP, Smith Baluch LLP, Sterne, Kessler, Goldstein & Fox PLLC, Troutman Sanders LLP, Venable LLP, Weil, Gotshal & Manges LLP, Wiley Rein LLP, Wilmer Cutler Pickering Hale and Dorr LLP, and Winston & Strawn LLP.

Eons

- 2008 - 2009: Chief Technology Officer. Created product that Eons acquired from BBN Technologies. Integrated BBN product with Eons social networking platform and significantly increased the Eons group creation rate. Helped evaluate advertisement platform offerings and rolled out the "Boom Network" advertising network. Eons raised \$32 million from General Catalyst Partners, Charles River Ventures, Sequoia Capital, and Intel Capital.

BBN Technologies

- 2007 - 2008: Delta Division, Vice President of Technology. Grew "Boomerang" counter-sniper project engineering team and significantly de-risked \$10 million worth of product deliveries. Boomerang was a significant asset leading to the acquisition of BBN by Raytheon in 2009. Created new business plan and grew team; launched new fully-featured social networking web site in 5 months. Served as lead expert witness in patent infringement lawsuit, resulting in \$58 million jury award to client; verdict for patents I testified on were upheld on appeal which resulted in a \$120 million settlement.
- 2004 - 2007: Delta Division, Director of Technology, responsible for commercializing IP and creating new businesses. Hired and grew division's initial engineering team. Wrote three business plans, two of which are funded and active. For call center business plan, acted as general manager, hiring and managing engineering team, inside sales team, and identifying and recruiting a new general manager. Identified and recruited other key employees to Delta Division, including senior members of team leading to successful internal sales growth and spin-outs of projects. Contracted by BBN to BBN spin-out PodZinger as VP of Operations and

Technology. Identified sales team for counter-sniper system, leading to \$10 million dollars of new sales within 6 months and \$100+ million in additional orders in the following two years.

PodZinger Inc. (BBN spin-out, also known as EveryZing and now RAMP)

- 2006: Vice President of Operations and Technology. Significantly upgraded capability of consumer-facing search site and redeployed web site from company to co-location facility. Identified key portions of infrastructure for upgrading and cost reduction. Helped write business plan, evaluating advertisement models of revenue. Hired in operations replacement and phased back to BBN.

Commonwealth Capital

- 2004: Entrepreneur-in-residence (informally), performed technical due diligence on business plans, brainstormed ideas for new businesses with venture partner. With venture partner, left for portfolio company BBN to form core of commercialization team.

Empirix, Inc./Teradyne, Inc.

- 2001 - 2004: Chief Technologist, Engineering Manager, Web Application Test Group. Researched potential new product areas; developed product plan and prototype. Responsible for three new and existing products. Managed off-shore development team. Chief architect for all web testing products. Re-architected core testing product, helped write javascript interpreter. Provided technical vision for core product.
- 2000 - 2001: Chief Technologist, Communication Infrastructure Test Group. Responsible for incorporating new technology internally, tracking new technologies, technical evaluation of partnerships and potential acquisitions. Helped develop division strategy. Developed plans which formed core capabilities for successful new products introduced in 2004-5.
- 2000 - 2001: Engineering Manager, Communications Infrastructure Test Group. Execution of new product plan developed in prior role. Grew team from four existing engineers to team of over 30 on immediate team and over 40 on project. Delivered new platform in one year. Platform and derivatives accounted for large portion of booked products for the division within 2 years and is currently (2008) a key portion of new product offerings.
- 2000: Empirix was formed as a spin-out of Teradyne in January 2000. Reported to CEO in carve-out of Empirix from Teradyne.
- 1999: (Teradyne) Director of Business Development, Software Test Units. Reported directly to Chairman of the Board/Founder and then to general manager of software test unit (6 divisions of Teradyne). Evaluated and researched acquisition and partnership candidates. Internally assessed technology position in market and gaps in product lines. Worked with senior division staff to develop new product strategies. Attended internal Teradyne divisional board meetings. Chairman served as my mentor.

3Com Corporation/NBX Corporation

- 1999: Software Engineer 5. Continued work after 3Com acquisition of NBX. Built cross-division relationships for new products and research directions. NBX was acquired by 3Com in March 1999.

- 1997 - 1999: (NBX) Senior Scientist and Engineer. Work in IP Telephony. Architected next-generation product. Protocol design and validation for core protocol now used tens of millions of times daily. Led team in integration of IP protocols into current product. Designed audio reconstruction algorithms. Developed applications for bug analysis and diagnosis of system problems. Implementation of network simulator. Work on collaborative projects with external partners. Worked to identify gaps in product. Representative at numerous trade shows. Innovated novel methods of using product.

MIT Department of Electrical Engineering and Computer Science, Cambridge, MA

- 1991 - 1998: Research assistant, Telemedia Network Systems Group. Design, development, and implementation of Gigabit ATM network for distributed multimedia system. Studied host interface design issues. ATM network simulation.
- Spring 1989, Fall 1990, Spring 1995: Teaching assistant, Computation Structures digital systems course. (Spring 1995 Head TA)
- 1988 - 1989: Head laboratory teaching assistant for Computation Structures. Responsibilities included writing and revising lab assignments, and maintaining the lab.
- 1987: Laboratory teaching assistant for Computation Structures.
- 1987: Design, construction, and programming of 16-bit computer.

Agora Technology Group, Incorporated

- 1994 - 1996: Founder and CEO. Conceived and oversaw development of targeted advertising-supported Web sites. Responsible for company's vision and direction. Attended the first two WWW Conferences, presenting a workshop and paper at the first, and appearing on the "Commercialization and Economics of the Web" panel and chairing the "Where Commercial Services and the Web Are Headed" panel at the second. Sold company intact; is currently an operating stand-alone company.

AT&T Bell Laboratories, Holmdel, NJ

- 1989 - 1990: Implementation of cascadable all-optical fiber logic gate. Modelocking of all-fiber erbium laser. Construction of modelocked laser repetition rate booster. Strong optics laboratory and fiber optic experience.
- Summer 1988, 1987: Research in integrated optics. Analysis of rectangular waveguides using microwave modeling. Fabrication of integrated optical components.

Honors

- MIT Alumni Association Great Dome Award, 2010, Baker 60th Anniversary Reunion Co-Chair (highest group award given by MIT Alumni Association)
- MIT Alumni Association Presidential Citation Award (now known as Great Dome), 2008, Member of MIT Chairman's Salon committee
- MIT Alumni Association Bronze Beaver Award, 2007 (highest individual award given by MIT Alumni Association)
- MIT Alumni Association Volunteer Honor Roll, February 2004
- MIT Alumni Association Lobdell Award, 1999

- Boston Museum of Science Gold Pin for 1000 hours of Volunteer Service, April 1999
- MIT Alumni Association Presidential Citation Award (now known as Great Dome), 1997, Member of Alumni Online Communications Committee

Patents and Patent Publications

- U.S. Patent #9,697,231, H. Houh, J. Stern, R. Spina, M. Meteer, “Methods and apparatus for providing virtual media channels based on media search,” July 4, 2017.
- U.S. Patent #9,697,230, H. Houh, J. Stern, “Methods and apparatus for dynamic presentation of advertising, factual, and informational content using enhanced metadata in search-driven media applications,” July 4, 2017. See also WO2007056485.
- U.S. Patent #7,975,296, L. Apfelbaum, H. Houh, T. Mayberry and G. Friedman, “Automated security threat testing of web pages,” July 5, 2011. See also US20030159063, WO2003067405.
- U.S. Patent #7,877,736, H. Houh and J. N. Stern, “Computer language interpretation and optimization for server testing,” January 25, 2011. See also US20050138104, WO2005043300.
- U.S. Patent #7,801,910, H. Houh and J. N. Stern, “Method and apparatus for timed tagging of media content,” September 21, 2010. See also US20070112837, US20090222442, WO2007056535.
- U.S. Patent #7,590,542, D. C. Williams, W. C. Hand, H. Houh, A. R. Seeley, “Method of Generating Test Scripts Using a Voice-Capable Markup Language,” September 15, 2009. See also EP1530869, US20030212561, WO2003096663.
- U.S. Patent #6,967,963, H. H. Houh, P. Anderson, C. Gadda, “Telecommunication method for ensuring on-time delivery of packets containing time-sensitive data,” November 22, 2005. See also EP1060400, WO2000033092, CA2318774.
- U.S. Patent #5,144,375, M. C. Gabriel, H. H. Houh, N. A. Whitaker, “Sagnac Optical Logic Gate,” September 1, 1992. Also issued as European Patent # EP0456422, July 23, 1997, German Patent #DE69126913, August 28, 1997
- U.S. Patent Application Publication No. 20020015387, “Voice Traffic Packet Capture and Analysis Tool for a Data Network” (Abandoned in 2007)
- U.S. Patent Application Publication No. 20020016708, “Method and Apparatus for Utilizing a Network Processor as Part of a Test System” (Abandoned in 2007)
- U.S. Patent Application Publication No. 20020016937, “Method and Apparatus for Utilizing a Network Processor as Part of a Test System.” (Abandoned in 2007) See also WO2002011413.
- U.S. Patent Application Publication No. 20070106646, “User-directed navigation of multimedia search results” (Abandoned in 2009)
- U.S. Patent Application Publication No. 20070106660, “Method and apparatus for using confidence scores of enhanced metadata in search-driven media applications” (Abandoned in 2009)
- U.S. Patent Application Publication No. 20070106685, “Method and apparatus for updating speech recognition databases and reindexing audio and video content using the same” (Abandoned in 2015)
- U.S. Patent Application Publication No. 20070118873, “Methods and apparatus for merging media content” (Abandoned in 2015)
- U.S. Patent Application Publication No. 20090222442, “User-directed navigation of multimedia search results” (Abandoned in 2016)

- U.S. Patent Application 11/395,732, “Search snippet creation for audio and video data” (Abandoned in 2009)
- U.S. Patent Application 11/774,931, “Methods and apparatus for managing a social networking web site”
- U.S. Patent Application 11/774,947, “Methods and apparatus for organizing media files”
- U.S. Patent Application 11/774,956, “Methods and apparatus for managing an online event”
- U.S. Provisional Patent Application 61/086,909, “Measuring and ranking relationship activity”
- U.S. Provisional Patent Application 61/086,914, “Detecting media object commonality”
- U.S. Provisional Patent Application 61/086,904, “Message categorization based on message characteristics”
- U.S. Provisional Patent Application 61/086,905, “Photo tagging to request action”

Trials, Testimony and Depositions

- Case No. 1:06CV682 (CMH/BRP), Verizon vs. Vonage, U.S. District Court for the Eastern District of Virginia, filed expert report, was deposed and testified at trial.
- Case No. 1:08CV157 (CMH/TRJ), Verizon vs. Cox, U.S. District Court for the Eastern District of Virginia, was deposed and testified at trial.
- Case No. 5:09-cv-476, Two-Way Media vs. AT&T, U.S. District Court for the Western District of Texas, filed expert report, testified at trial.
- Case No. 2:10-cv-248 (RAJ/FBS), ActiveVideo Networks vs. Verizon, U.S. District Court for the Eastern District of Virginia, filed expert report and was deposed as an expert witness.
- Case No. 1:11-cv-00880-TSE-JFA, Bear Creek Technologies, Inc. vs. Verizon Services Corp., et al, U.S. District Court for the Eastern District of Virginia, was deposed as an expert witness.
- Case No. 3:10-CV-298-BBC, AlmondNet, Inc. vs. Microsoft Corp., U.S. District Court for the Western District of Wisconsin, filed expert report.
- Case No. 6:10-cv-00597, Guardian Media Technologies, Ltd. Vs. AT&T Operations, Inc. et al., U.S. District Court for the Eastern District of Texas, Tyler Division, filed expert report.
- Case No. ESCV2010-02282C, The Octopus Solution LLC v. Gary Brown et al., Essex, MA Superior Court, testified at trial.
- Investigation No. 337-TA-882, In the matter of Certain digital media devices, including televisions, Blu-ray disc players, home theater systems, tablets and mobile phones, components thereof and associated software, U.S. International Trade Commission, filed expert reports, was deposed and testified at hearing.
- Investigation No. 337-TA-995, In the matter of Certain communications or computing devices, and components thereof, U.S. International Trade Commission, filed expert reports, and was deposed.
- Case No. 8:12-cv-122-LES-TDT, Prism Technologies LLC v. AT&T Mobility LLC, U.S. District Court for the District of Nebraska, filed expert report, was deposed and testified at trial.
- Case No. 11-2684 (JWL), Sprint Communications Co., L.P., v. Comcast Cable Communications, LLC, et al., U.S. District Court for the District of Kansas, filed expert report and was deposed.
- Case No. 11-2686 (JWL), Sprint Communications Co., L.P., v. Time Warner Cable, Inc., et. al., LLC, et al., U.S. District Court for the District of Kansas, filed expert report, was deposed, and testified at trial.
- Case No. 12-487 (SLR), Cox Communications, Inc., et al., v. Sprint Communications Company L.P., et al., U.S. District Court for the District of Delaware, filed expert report and was deposed.

- Case IPR 2014-00039, Microsoft Corporation v. B.E. Technology LLC, U.S. Patent No. 6,628,314. Submitted declaration and cross-examined in deposition.
- Case IPR 2014-00086, Apple, Inc. v. Evolutionary Intelligence, LLC, U.S. Patent No. 7,010,536. Submitted declaration and cross-examined in deposition.
- Case No. 6:11-CV-421, Stragent, LLC v. Intel Corporation, U.S. District Court for the Eastern District of Texas, Tyler Division, deposited and testified at trial as a fact witness.
- IPR2014-01366, IPR2014-01367, IPR2014-01368, Samsung et al. v. Straight Path, submitted IPR declarations and was deposited.
- IPR2015-1006, IPR2015-1007, Cisco v. Straight Path, submitted IPR declarations.
- IPR2014-01457, IPR2014-01459, Microsoft v. Biscotti, submitted IPR declaration and was deposited.
- IPR2016-00302, Apple v. Nonend, submitted IPR declaration.
- IPR2014-00812, Yelp and Twitter v. Evolutionary Intelligence, submitted IPR declaration.
- IPR2015-00307, Cisco v. AIP, submitted IPR declaration.
- Microsoft v. Acacia, submitted IPR declaration.
- IPR2015-00342, AT&T Mobility LLC and Cellco Partnership d/b/a Verizon Wireless v. Solocron, submitted IPR declaration.
- Mediatube v. Bell Canada, Canadian Federal Court, submitted expert report and testified at trial.
- CBM2016-00036, Google v. At Home Bondholder's Liquidating Trust, submitted CBM declaration.
- IPR2016-01198, IPR2016-01201, Apple, Inc. v. VoIP-Pal.com, Inc., submitted IPR declaration and was deposited.
- Case No. 3:14-cv-2824-VC, Trend Micro Incorporated v. Rpost Holdings, Inc., et al, submitted expert report and was deposited
- Akamai v. Limelight Networks, IPR2016-01631, IPR2016-01711, IPR2017-00249, IPR2017-00349, submitted IPR declarations and was deposited
- Hyperlync Technologies v. Verizon Sourcing, No. 650151/2015 New York Supreme Court, submitted declaration and was deposited
- Cascades Streaming Technologies v. Big Ten Networks, submitted expert reports and was deposited
- Klaustech, Inc. v. Google LLC., Case No. 4:10-CV-05899-JSW (N.D. Cal.), submitted expert report and was deposited
- Cisco v. Uniloc, IPR2017-00198, IPR2017-00058, submitted IPR declarations and was deposited.
- Cisco v. Uniloc, IPR2017-00597, submitted IPR declaration and was deposited
- Twitter v. Youtoo Technologies, LLC, IPR2017-01133, IPR2017-01131, submitted IPR declarations and was deposited
- Taser International Inc. (now Axon Enterprise, Inc.) v. Digital Ally Inc., IPR2017-00375, submitted IPR declaration and was deposited
- Taser International Inc. (now Axon Enterprise, Inc.) v. Digital Ally Inc., IPR2017-00376, IPR2017-00515, IPR2017-00775, submitted IPR declarations
- HTC Corporation v. IPA Technologies, IPR2018-00306, IPR2018-00307, submitted IPR declaration
- Hulu v. Soundview, IPR2018-00864, IPR2018-01023, submitted IPR declarations and was deposited
- XpertUniverse v. Cisco, 3:17-cv-3848, U.S. District Court for Northern District of California, submitted declaration in support of claim construction and was deposited
- Improved Search v. Microsoft, C.A. No. 16-cv-650-JFB-SRF (Del.), submitted declaration in support of claim construction

- Apple v. Uniloc, IPR2018-00361, IPR2018-00394, IPR2018-00395, IPR2019-00700, IPR2019-00701, IPR2019-01667, submitted IPR declarations
- LG Electronics v. Uniloc, submitted IPR declaration
- SRC Labs and Saint Regis Mohawk Tribe v. Microsoft, 2:18-cv-00321-JLR, U.S. District Court for Western District of Washington at Seattle, submitted declaration in support of claim construction and was deposed
- Verizon Wireless v. Barkan Wireless IP Holdings LP, submitted IPR declarations
- Verizon Wireless and Samsung Electronics America Inc. v. Barkan Wireless IP Holdings LP, IPR2019-199, IPR2019-200, IPR2019-234, IPR2019-631, IPR2019-632, submitted IPR declarations
- Samsung Electronics America Inc. v. Barkan Wireless IP Holdings LP, IPR2019-100, submitted IPR declaration
- Cisco Systems Inc. v. Meetrix IP LLC, IPR2019-539, IPR2019-540, IPR2019-541, IPR2019-542, IPR2019-543, IPR2019-544, submitted IPR declarations
- GMG Products LLC v. Traeger Pellet Grills LLC, PGR2019-24, PGR2019-34, PGR2019-35, PGR2019-36, submitted PGR declaration and was deposed
- Uniloc 2017 LLC v. Google LLC, 2:18-cv-00502-JRG-RSP, U.S. District Court for the Eastern District of Texas, Marshall Division, submitted declaration in support of claim construction
- Microsoft Corporation v. Uniloc 2017 LLC, IPR2020-00102, IPR2020-00103, submitted IPR declarations
- Microsoft Corporation and HP Inc. v. Synkloud Technologies, LLC, IPR2020-00316, IPR2020-01031, IPR2020-01032, IPR2020-01269, IPR2020-01270, IPR2020-01271, submitted IPR declarations
- Seven Networks, LLC v. Apple Inc, 2:19-cv-115-JRG, U.S. District Court for the Eastern District of Texas, Marshall Division, submitted declaration in support of claim construction
- Unified Patents Inc. v. Ortiz & Associates Consulting, LLC, IPR2019-00743, submitted IPR declaration
- Uniloc 2017 LLC v. Apple Inc., 3:19-cv-01905-JD, U.S. District Court for the Northern District of California, San Francisco Division, submitted declaration in support of claim construction and was deposed
- ClearPlay Inc. v. Dish Network LLC et al.; 2:14-cv-00191, U.S. District Court for the District of Utah, Central Division, submitted expert report and re-examination declarations
- AMC Networks, Inc. et al v. Sound View Innovations, LLC, IPR2020-00482, submitted IPR declaration
- Case No. 1:17-cv-01734-RGA, Sprint Communications Co., L.P., v. Charter Communications, Inc., et al., U.S. District Court for the District of Delaware, filed expert report and was deposed.
- CommScope Technologies LLC et al. v. Barkan Wireless IP Holdings LP et al., IPR2020-00827, IPR2020-00829, IPR2020-00831, IPR2020-00833, IPR2020-00835, IPR2020-00838, submitted IPR declarations
- Cisco Systems Inc. v. Monarch Networking Solutions LLC, IPR2020-01226, submitted IPR declaration
- CoolTV Network.com v. Blackboard, Inc., Facebook, Inc., International Business Machines Corporation, Kaltura, Inc., Limelight Networks, Inc., Microsoft Corporation, Ooyala, Inc., Snap, Inc., and Trapelo Corp., submitted declaration in support of claim construction and was deposed
- Facebook, Inc. v. Onstream Media Corporation, IPR2020-01507, IPR2020-01508, IPR2020-01525, IPR2020-01527, IPR2020-01528, submitted IPR declarations
- Hisense Co LTD. v. Maxell, LTD, IPR2020-01598, IPR2020-01600, submitted IPR declarations
- Microsoft Corp. v. O'Brien, IPR2021-00015, submitted IPR declaration and was deposed

- Sable Networks Inc. v. Cisco Systems, Inc., WA:20-CV-00288-ADA, U.S. District Court for the Western District of Texas, Waco Division, submitted declaration in support of claim construction
- Peloton Interactive, Inc. v. Icon Health and Fitness Inc et al., IPR2021-00342, submitted IPR declaration
- Hulu, LLC v. SITO Mobile R&D IP, LLC et al., CBM2020-00028, IPR2020-00158, IPR2020-00206 , IPR2020-00219 , IPR2020-00265 , IPR2020-00298 , IPR2020-00304 , IPR2020-00308 , submitted CMB and IPR declarations and was deposed
- Twitter, Inc. and Google LLC v. B.E. Technology, LLC, IPR2021-00482, IPR2021-00483, IPR2021-00484, IPR2021-00485, submitted IPR declarations
- MG Freesites LTP v. ScorpCast, LLC, IPR2021-00511, submitted IPR declaration
- Avionte, LLC v. Sandeep Acharya, Samar Basnet, and Aqore LLC, Arbitration, Hon. Jeffrey Keyes (Ret.)
- Microsoft Corporation v. WSOU Investments, LLC d/b/a Brazos Licensing and Development, IPR2021-00751, submitted IPR declaration
- SAP America, Inc. v. Express Mobile, Inc., IPR2021-01144, IPR2021-01145, IPR2021-01146, submitted IPR declarations
- StratosAudio Inc. v. Hyundai Motor America, 6:20-cv-01125-ADA, U.S. District Court for the Western District of Texas, Waco Division, submitted claim construction declaration and was deposedPeloton Interactive, Inc. v. Ifit Health and Fitness Inc, IPR2022-00029, IPR2022-00030, submitted IPR declarations and was deposed
- Investigation No. 337-TA-1263, In the matter of Certain televisions, remote controls, and components thereof, U.S. International Trade Commission, filed expert reports, was deposed, and testified at hearing
- Alexander Stross v. Netease, Inc., et al., U.S. District Court (Central District of California), Case 2:20-cv-00861-AB(JC), filed expert reports, and was deposed
- Ralph Ledergerber v. Netease, Inc., et al., U.S. District Court (Central District of California), Case 2:20-cv-00862-AB(JC), filed expert reports and was deposed
- John Walmsley v. Netease, Inc., et al., U.S. District Court (Central District of California), Case 2:20-cv-00863-AB(JC), filed expert reports and was deposed
- Bernhard Kuhmstedt v. Netease, Inc., et al., U.S. District Court (Central District of California), Case 2:20-cv-02044-AB(JC), filed expert reports and was deposed
- Netflix, Inc. v. CA, Inc., IPR2021-01319, submitted IPR declaration and was deposed
- F45 Training Pty Ltd. v. Body Fit Training USA Inc., C.A. No. 20-1194 (LPS) (D. Del.), filed expert report
- Apple v. Fintiv, submitted IPR declarations
- Estech Systems, Inc. v. Howard Midstream Energy Partners d/b/a Howard Energy Partners, C.A. No. 6:20-cv-777-ADA (Western District of Texas, Waco Division), filed expert reports and was deposed
- Echelon Fitness Multimedia, LLC. v. Peloton Interactive, Inc., IPR2020-01187, submitted IPR declaration and was deposed
- Microsoft Corporation v. SurfCast, Inc., submitted IPR declarations
- MemoryWeb, LLC v. Samsung Electronics Co., LTD. and Samsung Electronics America, Inc., Case No. 6:21-cv-00411-ADA (Western District of Texas, Waco Division), filed declaration and was deposed

Publications

- "IP switching: server driven flow classification," H. H. Houh, *Proceedings of the Washington University Workshop on Integration of IP and ATM*, November 1996.
- "Aurora at MIT," D. D. Clark, H. H. Houh, and D. L. Tennenhouse, Editors, *MIT Laboratory for Computer Science Technical Report 673*, December 1995.
- "ViewStation Applications: Implications for Network Traffic," C. J. Lindblad, D. Wetherall, W. Stasior, J. F. Adam, H. H. Houh, M. Ismert, D. Bacher, B. Phillips, and D. L. Tennenhouse, *IEEE Journal of Selected Areas in Communications*, 1995.
- "The VuNet Desk Area Network: Architecture, Implementation, and Experience," H. H. Houh, J. F. Adam, M. Ismert, C. J. Lindblad, and D. L. Tennenhouse, *IEEE Journal of Selected Areas in Communications*, 13 (4), May, 1995.
- "Reducing the Complexity of ATM Host Interfaces," H. H. Houh and D. L. Tennenhouse, *Hot Interconnects II Symposium Proceedings*, Stanford, August 11-12, 1994.
- "Media-intensive data communications in a 'desk-area' network," J. F. Adam, H. H. Houh, M. Ismert, and D. L. Tennenhouse, *IEEE Communications*, August 1994.
- "ViewStation Applications: Intelligent Video Processing Over A Broadband Local Area Network," C. J. Lindblad, D. J. Wetherall, W. Stasior, B. Phillips, D. Bacher, J. Adam, H. Houh, M. Ismert, and D. L. Tennenhouse, *Proceedings of the 1994 USENIX Symposium on High-Speed Networking*, Oakland, CA, August 1994.
- "The Media Gateway: Live Video on the World Wide Web," H. H. Houh, C. J. Lindblad, J. Soo, D. L. Tennenhouse, and D. J. Wetherall, *Workshop at the 1994 World Wide Web Conference*, Geneva, Switzerland, May 1994.
- "Active Pages: Intelligent Nodes on the World Wide Web," H. H. Houh, C. J. Lindblad, and D. J. Wetherall, *Proceedings of the 1994 World Wide Web Conference*, Geneva, Switzerland, May 1994.
- "Wavelength Division vs. Code Division Access Methods for Optical Networks," H. H. Houh, *Area Exam Paper*, May 1993.
- "Experience with the VuNet: A Network Architecture for a Distributed Multimedia System," J. F. Adam, H. H. Houh, D. L. Tennenhouse, *Proceedings of the 18th Conference on Local Computer Networks*, pp. 70-76, September 1993.
- "The VudBoard: A Simple DMA Interface," H. H. Houh, *Proceedings of the 4th Gigabit Minijam*, January 1994.
- "A Software-Oriented Approach to the Design of Media Processing Environments," D. L. Tennenhouse, J. Adam, D. Carver, H. Houh, M. Ismert, C. Lindblad, W. Stasior, D. Weatherall, D. Bacher, and T. Chang., submitted to the *International Conference on Multimedia Computing and Systems*, May 1994.
- "A Network Architecture for Distributed Multimedia Systems," J. F. Adam, H. H. Houh, M. Ismert, and D. L. Tennenhouse, submitted to the *International Conference on Multimedia Computing and Systems*, May 1994.
- "The Viewstation Collected Papers," D. L. Tennenhouse, J. Adam, C. Compton, A. Duda, D. Gifford, H. Houh, M. Ismert, C. Lindblad, W. Stasior, R. Weiss, D. Wetherall, D. Bacher, D. Carver, and T. Chang, *MIT Laboratory for Computer Science Technical Report, MIT/LCS/TR-590*, November 1993.
- "The Viewstation Collected Papers II," W. F. Stasior, D. L. Tennenhouse, J. F. Adam, D. R. Bacher, H. H. Houh, M. Ismert, C. J. Lindblad, B. M. Phillips, D. J. Wetherall, *MIT Laboratory for Computer Science Technical Report, MIT/LCS/TR-696*, April 1996.
- "A System's Perspective of the Sagnac Fiber Logic Gates and Their Possible Applications," A. Huang, N. Whitaker, C. Gabriel, H. Avramopoulos, P. M. W. French, H. H. Houh, and I. Chuang, *Applied Optics*, September 10, 1994

- “Complete Switching in a Three-Terminal Sagnac Switch,” H. Avramopoulos, P. M. W. French, M. C. Gabriel, H. H. Houh, N. A. Whitaker, T. Morse, IEEE Phot. Tech. Lett. **3** (3), 235
- “Complete Switching in a Three-Terminal Sagnac Switch,” H. Avramopoulos, P. M. W. French, M. C. Gabriel, H. H. Houh, N. A. Whitaker, IEEE/LEOS Annual Meeting, Paper PDP-13, November 1990
- “All-optical phase-locked oscillator,” N. A. Whitaker, Jr., H. H. Houh, H. Avramopoulos, T. F. Morse, IEEE/LEOS Annual Meeting, Paper ELT2.4/MOO3, November 1990
- “Passive modelocking of an all-fiber erbium laser,” H. Avramopoulos, H. H. Houh, N. A. Whitaker, M. C. Gabriel, T. F. Morse, IEEE/LEOS Conference on Optical Amplifiers and their Applications, Paper PDP-8, August 1990
- “Transverse modes, waveguide dispersion, and 30ps recovery in submicron GaAs/AlAs microresonators,” J. L. Jewell, S. L. McCall, A. Scherer, H. H. Houh, N. A. Whitaker, A. C. Gossard, and J. H. English, Appl. Phys. Lett. **55** (1), July 3, 1989

Leadership, Activities and Interests

- Leadership
 - Discovery Museums (Acton, MA)
 - Science and Technology Advisory Council, 2012 - present
 - MIT Alumni Association Board of Directors
 - National Selection Committee, 3 year term, 2020 – 2023
 - K-12 STEM Initiatives Co-chair, 2013 – 2017
 - Awards Committee Chair, 2012 – 2014
 - Awards Committee, 3 year term, 2011 – 2014
 - Vice President, 2 year term, 2004 – 2006
 - Alumni Ad-Hoc Committee, Chair, 2005-2006
 - Board Member, 2 year term, 1997 – 1999
 - MIT Club of Boston
 - Board of Directors, 2006 - 2011
 - K-12 Initiatives Chair, 2009 - 2012
 - VP of Communications, MIT Club of Boston, 2003 - 2006
 - Past-President, MIT Club of Boston, 2002 - 2003
 - President, MIT Club of Boston, 2001 - 2002
 - President-Elect, MIT Club of Boston, 2000 - 2001
 - VP of Programs, MIT Club of Boston, 1999 - 2000
 - Activities Super-Chair, MIT Club of Boston, 1998 - 1999
 - MIT Enterprise Forum of Cambridge, Inc.
 - Past Chair, 2009 – 2011
 - In-NOW-vation Co-chair, 2010
 - Chair, 2007 - 2009
 - Vice Chair, 2005 - 2007
 - Executive Board Member, 2002 - 2011
 - Winter Workshop Co-Chair, February 2007 - conceived idea for conference, which sold-out and produced largest attendance numbers in recent memory
 - Spring Workshop Co-Chair, Spring 2004
 - Membership Committee Chair, Fall 2003 - 2006
 - 25th Anniversary Dinner Chair, Fall 2003

- As Membership Chair and Board Member, started Special Interest Groups in 2004; a SIG won the MIT Presidential Citation award, the MIT Alumni Association's highest award for organizations, in 2006
- o Estabrook Elementary School PTA
 - Advisory committee to the superintendent on PCB issue, 2010-2011
 - 4th Grade after-school science program co-organizer, 2010-2012
 - 4th and 5th Grade before-school Math Olympiad co-organizer, 2009-2013
 - 5th Grade BBQ and Yearbook Committee, 2011, 2013
 - Family Math Night volunteer, 2008-2012
- o Tau Beta Pi National Engineering Honor Society
 - Advisor, MA B Chapter at MIT, 2003 - present
 - District Director (National Officer), Tau Beta Pi, New England Area, 1991 - 2003
 - President, MA B Chapter at MIT, Fall 1988 - Spring 1989
 - Laureate award, 1989
- o MIT Class of 1989
 - Secretary, five consecutive 5 year terms, 1989 - 2014
 - 30-year Reunion Committee, 2019
 - 25-year Reunion Committee, 2014
 - 20-year Reunion Committee and Gift Committee, 2009
 - 15-year Reunion Committee and Gift Committee, 2004
 - 10-year Reunion Committee and Gift Committee, 1999
 - 5-year Reunion Committee, 1994
 - Interim Treasurer, 1993 - 1994
 - Instituted annual senior class career fair, now raising over \$100,000 annually for senior class activities, Fall 1988
- o Strong, consistent record of leadership dating to high school
- Acting
 - o '21' (Sony Pictures), credited as "Chinatown Dealer," 2007, Kevin Spacey's movie about the MIT Blackjack Team inspired by "Bringing Down the House" by Ben Mezrich, opened nationwide on March 28, 2008. 21 was the number one movie in US for two weeks and number one globally for one week. 21 also topped the DVD sales, Blu-ray sales and DVD rental charts.
 - o Spring Lake Theater Company, first New York-area off-broadway production of "A Chorus Line," played role of Mark, Summer 1990
- Former member of the MIT Blackjack team
- Producer for 10,000 Maniacs' 2013 album "Music from the Motion Picture"
- Executive Producer for 10,000 Maniacs' 2015 album "Twice Told Tales"
- Violist, violist, harpist, guitarist, singer, actor: played in many amateur/semi-professional groups including Reading Symphony Orchestra, MIT Summer Philharmonic Orchestra, Freisinger Chamber Orchestra, Merrimack Valley Philharmonic, Longwood Symphony, MIT Symphony, and Somerville Community Chorus
- Violist, "Coming Home" album by Karen Phillips, 2014
- Google Scholar citations: 1914, h-index: 21, i10-index: 26 (since 2016: 649/13/13)
- Erdos-Bacon number of 7
- Erdos-Bacon-Sabbath number of 11