

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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**HOME DEPOT USA, INC., and  
HOME DEPOT SOLUTIONS LLC**  
Petitioner,

v.

**INNOVAPORT, LLC**  
Patent Owner.

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Case IPR2024-00011

U.S. Patent No. **9,990,670**

Issue Date: June 5, 2018

Title: APPARATUS AND METHOD FOR PROVIDING  
PRODUCT LOCATION INFORMATION TO CUSTOMERS IN A STORE

**DECLARATION OF DON TURNBULL, PHD**

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## INDEX OF EXHIBITS

| Exhibit No. | Description                                                                                                                                                                                               |
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| 1001        | U.S. Patent No. 9,990,670 (“ <b>670 patent</b> ”)                                                                                                                                                         |
| 1002        | [RESERVED]                                                                                                                                                                                                |
| 1003        | File History of 670 patent                                                                                                                                                                                |
| 1004        | U.S. Patent No. 7,231,357 (“ <b>Shanman</b> ”)                                                                                                                                                            |
| 1005        | U.S. Patent No. 6,123,259 (“ <b>Ogasawara</b> ”)                                                                                                                                                          |
| 1006        | U.S. Patent No. 6,084,528 (“ <b>Beach</b> ”)                                                                                                                                                              |
| 1007        | <a href="https://www.uscourts.gov/statistics/table/na/federal-court-management-statistics/2023/06/30-1">https://www.uscourts.gov/statistics/table/na/federal-court-management-statistics/2023/06/30-1</a> |
| 1008        | <i>Innovaport LLC v. Home Depot U.S.A., Inc.</i> , No. 3:23-cv-00225, Dkt. 1 (W.D. Wis. April 11, 2023)                                                                                                   |
| 1009        | <i>Innovaport LLC v. Home Depot U.S.A., Inc.</i> , No. 3:23-cv-00225, Dkt. 16 (W.D. Wis. Aug. 4, 2023)                                                                                                    |
| 1010        | <i>Innovaport LLC v. Target Corp.</i> , No. 3:22-cv-00425, Dkt. 18 (W.D. Wis. Nov. 2, 2022))                                                                                                              |
| 1011        | <i>Innovaport LLC v. Best Buy Co., Inc.</i> , No. 3:23-cv-00016, Dkt. 27 (W.D. Wis. June 28, 2023)                                                                                                        |
| 1012        | <i>Innovaport LLC v. Target Corp.</i> , No. 3:22-cv-00425, Dkt. 1 (W.D. Wis. Aug. 4, 2022))                                                                                                               |
| 1013        | <i>Innovaport LLC v. Best Buy Co., Inc.</i> , No. 3:23-cv-00016, Dkt. 1 (W.D. Wis. Jan. 6, 2023)                                                                                                          |
| 1014        | <i>Innovaport LLC v. IKEA North America Services, LLC et al.</i> , No. 2:21-cv-00789, Dkt. 1 (E.D. Wis. June 25, 2021)                                                                                    |
| 1015        | <i>Innovaport LLC v. IKEA North America Services, LLC et al.</i> , No. 2:21-cv-00789, Dkt. 31 (E.D. Wis. Sept. 8, 2022)                                                                                   |
| 1016        | <i>Innovaport LLC v. IKEA North America Services, LLC et al.</i> , No. 2:21-cv-00789, Dkt. 41 (E.D. Wis. Jan. 26, 2023)                                                                                   |
| 1017        | Alternative Service of Complaint Acceptance Email (May 5, 2023)                                                                                                                                           |
| 1018        | Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation” dated June 21, 2022                                                                    |
| 1019        | <i>Innovaport LLC v. Target Corp.</i> , No. 3:22-cv-00425, Dkt. 38 (W.D. Wis. Sept. 28, 2023))                                                                                                            |
| 1020        | U.S. Patent No. 7,010,498 (“ <b>Berstis</b> ”)                                                                                                                                                            |
| 1021        | Jennifer Rowley, <i>Multimedia kiosks in retailing</i> , 23 INT’L J. OF RETAIL & DISTRIB. MGMT. 5: 32-40 (1995) (“ <b>Rowley</b> ”)                                                                       |

| Exhibit No. | Description                                                                                                                                                                                                                                                                                                                    |
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| 1022        | James R. Otto & Q. B. Chung, <i>A Framework for Cyber-enhanced Retailing: Integrating E-Commerce Retailing with Brick-and-Mortar Retailing</i> , 10 ELEC. MKTS. 3: 185-191 (2000)                                                                                                                                              |
| 1023        | Review and Assessment of Information Kiosk Systems, U.S. Dep't of Transp. (March 1997)                                                                                                                                                                                                                                         |
| 1024        | Greg Kearsley, <i>Public Access Systems: Bringing Computer Power to the People</i> (1994)                                                                                                                                                                                                                                      |
| 1025        | Lucy A. Tedd, <i>OPACs through the Ages</i> , LIBR. REV. 43: 27-37 (1994)                                                                                                                                                                                                                                                      |
| 1026        | Bo Doub, <i>Community Memory: Precedents in Social Media and Movements</i> , Computer History Museum, February 26, 2016, <a href="https://computerhistory.org/blog/community-memory-precedents-in-social-media-and-movements/">https://computerhistory.org/blog/community-memory-precedents-in-social-media-and-movements/</a> |
| 1027        | <i>Apple iBook G3/300 (Original/Clamshell) Specs</i> , EveryMac.com, <a href="https://everymac.com/systems/apple/ibook/specs/ibook.html">https://everymac.com/systems/apple/ibook/specs/ibook.html</a>                                                                                                                         |
| 1028        | File History of U.S. Patent No. 9,489,690                                                                                                                                                                                                                                                                                      |
| 1029        | [RESERVED]                                                                                                                                                                                                                                                                                                                     |
| 1030        | U.S. Patent No. 6,029,141 (“ <b>Bezos</b> ”)                                                                                                                                                                                                                                                                                   |
| 1031        | U.S. Patent No. 5,345,501 (“ <b>Shelton</b> ”)                                                                                                                                                                                                                                                                                 |
| 1032        | U.S. Patent No. 8,787,933 file history                                                                                                                                                                                                                                                                                         |

## 670 PATENT LIST OF CLAIMS IN CONTENTION

| Claim | Limitation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| 1pre  | A method of providing product location information within a store, the method comprising the steps of:                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 1a    | providing at least one information storage device including a database, wherein the at least one information storage device is configured to be at least indirectly in communication with at least one other device that includes at least one user interface, and wherein at least one of the at least one information storage device and the at least one other device with respect to which the at least one information storage device is configured to be at least indirectly in communication is or includes a mobile device, |
| 1b    | wherein the at least one information storage device includes both product location information and additional product-related information linking a product with another product in a cross-referential manner                                                                                                                                                                                                                                                                                                                      |
| 1c    | receiving a product location inquiry signal regarding the product, the product location inquiry signal being at least indirectly based upon a product location inquiry received by way of the at least one user interface                                                                                                                                                                                                                                                                                                           |
| 1d    | processing the product location inquiry signal at a signal processing device to determine a processed product location inquiry signal                                                                                                                                                                                                                                                                                                                                                                                               |
| 1e    | querying the at least one information storage device to obtain portions of the product location information and additional product-related information in response to the processed product location inquiry signal                                                                                                                                                                                                                                                                                                                 |
| 1f    | providing a product location information signal that is at least indirectly responsive to the processed product location inquiry signal                                                                                                                                                                                                                                                                                                                                                                                             |
| 1g    | wherein the product location information signal is configured to enable, at least indirectly, a providing of an output signal at an output device as a response to the product location inquiry that includes location information concerning the product and also provides at least one suggestion related to the other product                                                                                                                                                                                                    |
| 2     | The method of claim 1, wherein the product location information signal is configured to enable, at least indirectly, the providing of the                                                                                                                                                                                                                                                                                                                                                                                           |

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|    | output signal at the least one user interface, which includes the output device in addition to an input device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 4  | Claim 4. The method of claim 2, wherein the at least one user interface includes a mobile user interface.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 6  | Claim 6. The method of claim 4, wherein the product location information signal is configured to enable, at least indirectly, the at least one user interface to provide information concerning one or more products that are being specially promoted or that are located close by the at least one user interface.                                                                                                                                                                                                                                                                                                                                                             |
| 7  | Claim 7. The method of claim 4, wherein the product location information signal is configured to enable, at least indirectly, the providing of the output signal so that the output signal provides at least one further suggestion to a customer in accordance with one or more customer preferences.                                                                                                                                                                                                                                                                                                                                                                           |
| 8  | Claim 8. The method of claim 4, wherein the product location information signal is configured to enable, at least indirectly, the at least one user interface to provide further additional product-related information, and wherein the further additional product-related information includes at least one of: product promotion information; a current stock of the product; a price of the product; a presence or absence of the product within the store; a time at which the product should be available at the store if the product is currently absent from the store; and an alternate way of obtaining the product if the product is currently absent from the store. |
| 9  | Claim 9. The method of claim 8, wherein the further additional product-related information relates to either the time at which the product should be available at the store if the product is currently absent from the store, or the alternate way of obtaining the product if the product is currently absent from the store.                                                                                                                                                                                                                                                                                                                                                  |
| 10 | Claim 10. The method of claim 8, wherein the further additional product-related information relates to either the current stock of the product, or the presence or absence of the product within the store.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 12 | Claim 12. The method of claim 4, further comprising one or both of: receiving an additional inquiry signal that relates to something other than a product location-type inquiry; or obtaining identification                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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|    | information concerning the customer that at least in part allows for the providing of an additional suggestion to the customer.                                                                                                                                                                                                                                                                                                                                                                                                 |
| 14 | Claim 14. The method of claim 1, wherein either (a) the mobile device is able to provide at least some of the information to the at least one user interface, or (b) at least a first one of the at least one user interface is in wireless communication with either a central hub or at least a second one of the at least one user interface, or (c) one or more words associated with the product location inquiry received by way of the at least one user interface are determined by way of a voice recognition process. |

1. I, Dr. Don Turnbull, have been engaged by Home Depot U.S.A, Inc. as an independent expert in this action. I expect to testify concerning the subjects outlined in this report.

2. As part of that engagement, I have been asked to provide analysis and expert opinions on U.S. Pat. No. 9,990,670 (the “670 Patent”).

3. I am being compensated for the time I have spent on this matter at the rate of \$775 per hour. My compensation does not depend in any way upon the outcome of this proceeding.

4. In reaching the conclusions described herein, I have considered the documents and materials identified in the Index of Exhibits that is attached to this report, in addition to any materials cited in this report. My opinions are also based upon my education, training, research, knowledge, and personal and professional experience.

5. Based on my review of the 670 Patent and its prosecution history, the other materials I have considered, and my knowledge and experience, my opinions are as follows:

- Claims 1, 2, 4, 6-10, 12, and 14 are unpatentable due to obvious based on Shanman in view of the knowledge of a POSITA
- Claims 1, 2, 4, 6-10, 12, and 14 are unpatentable due to obvious based on Ogasawara in view of Beach

- Claim 9 is unpatentable due to obvious based on Ogasawara and Beach in further view of Shanman

## **I. BACKGROUND AND QUALIFICATIONS**

### **A. Qualifications**

6. A full description of my educational background, professional achievements, qualifications, and publications in the past 30+ years are set forth more fully in my curriculum vitae, which is attached to this Declaration as Exhibit

A. Here, I provide a brief summary of my background and qualifications.

7. I am an accomplished researcher and creator of innovative, patented and trade-secreted technologies related to information retrieval, e-commerce, personalization, mobile interfaces, behavioral modeling, content organization, and analytics. I am also the author of numerous academic publications, including: a textbook on Web-based information seeking (*i.e.*, how people search and browse the Internet) and knowledge work (*i.e.*, how technology enables people to create and work together); articles on human-computer interaction design, personalization for Web information retrieval and recommender systems; and numerous definitive works on information architecture methodologies, software interface design, and software development.

8. My experience includes helping software companies, from small startups to large corporations, create new technologies and applications. To advise

these companies, I research and monitor academic and industry technology developments to keep up-to-date regarding advances in the field. I am also aware of the history of software development from my professional and academic experience over the past 30 years.

9. I also have experience and knowledge working with graphical user interfaces, such as on mobile apps, and their integration into assisting users in their environment. I have also taught a number of software design and development courses at the graduate level including mobile systems, networked multimedia, interaction design, the semantic web and data analytics among others. In particular, I have been heavily involved with computing systems that collect data on user behavior (such as selecting content in an interactive computing environment) and use that data to make browsing and searching information easier. I have presented at numerous industry and academic conferences on information systems development, mobile technologies, search systems, and personalization, including on data collection and evaluation of user interactions and analytics.

10. I received my undergraduate degree at the University of Texas at Arlington in 1988, with an emphasis in computer science. Upon graduating, I took a position at a small software company in Dallas that developed expert systems software that automated the processing and using digital documents for either print or screen, based on a sets of programmatic rules and heuristics.

11. In 1993, I moved to Atlanta to work in an emerging, exciting area of software called CASE (Computer Aided Software Engineering). I designed and programmed software that helped other programmers build their own software applications. Since I had researched and built document-oriented applications, and had an understanding of hypermedia and hypertext, I also worked on specific applications that helped people build more modern graphical user interface (GUI) applications that could run on Windows or Macintosh systems, and still connect to traditional corporate computer systems, such as mainframes and database servers. I also designed document authoring and editing applications to compile interactive, multimedia hypertext systems within the GUI operating systems. These systems provided software users interactive, pop-up help in a graphical browser window that included hyperlinks and a search function, much like the emerging Web browser applications and interfaces. As part of my work, I used and prototyped applications in the first World Wide Web browser on the NeXT Computer. The NeXT Web browser, the first Web browser, provided the framework and interface for what we use now as more advanced Web browsers, and displayed documents as their authors wanted them, with a WYSIWYG interface as well as links to other documents that could be hosted anywhere over the world accessible via the internet.

12. I returned to graduate school in 1994 at the Georgia Institute of Technology (“Georgia Tech”) in a new graduate-only research department that focused on Internet technologies. This was when the Internet had started to become very popular, and my own work with hypertext, graphical interactive Web browsers and application programming had already prepared me to move in this research direction. As a graduate student at Georgia Tech, I worked on several projects that focused on hypermedia design and the Internet. In late 1994, I configured and ran a very early Web site (approximately the 8500th site on the Web). This early Web site with Web pages programmed to work as an interactive survey, which utilized a database system and email-processing application working in concert with the interactive Web browser. I also worked on a new kind of automated, agent-like Internet search tool, which (while not ready for commercial use) illustrated many ideas related to smarter Internet searching and understanding user preferences to present recommended resources. In early 1995, I also worked with a research team at Georgia Tech that developed a modified NCSA Mosaic Web browser that offered a Graphic History View of browsing history in a separate window, which featured a tree-like structure of the links followed on Web pages, including thumbnail graphics of each Web page in the background.

13. My master’s thesis at Georgia Tech focused on a method and system to automatically generate large interactive hypermedia Web through stored

multimedia Web content in a database, which could be used to “publish” a subset of pages onto the Web, based on a query or filtering criteria. In 1995, I earned an M.S. in Information Design and Technology from the Georgia Institute of Technology with my thesis, entitled “Object- Oriented Information Development: A Methodology and System for Large-Scale Hypertext Documents.”

14. After Georgia Tech, I went to IBM’s first U.S. Internet group, where I was a Lead Technical Architect and worked on several related projects that dealt with graphical user interfaces, interactive multimedia and networked systems using Internet technology. I also contributed to designs and advised on numerous other ongoing Internet-focused projects at IBM, including Web site development tools for eCommerce small business Web sites, large enterprise (intranet) Web sites including portals, as well as the foundations for a Web site usability practice at IBM to evaluate Web use of IBM software and server-based applications.

15. In 1997, pursuant to my doctoral studies at the University of Toronto, I researched Internet technologies including Web browser functionality, protocols, and interfaces that are still used today not only on desktop computers, but also in mobile devices and other inter-networked hardware and software including services. I also designed and developed a desktop client application, WebTracker, that observed and compiled Web browser usage data, which required an in-depth

knowledge of desktop operating systems, application-level programming and user interaction data collection.

16. In 2000, I was a principal at a startup that researched, developed and patented methods, interfaces and systems for analyzing and personalizing Web searching and browsing. This startup was acquired by Google in 2002.

17. Later in 2002, at the University of Toronto, I finished my doctoral dissertation, entitled “Knowledge Discovery in Databases of Web Use: A Search for Informetric and Behavioral Models of Web Information Seeking.” I also returned to Texas and accepted a faculty position at the University of Texas at Austin. As an assistant professor, I continued to pursue my research and taught graduate students on advances in subjects such as Web Information Retrieval Evaluation & Design (search), Information Architecture (including the history of hypertext and multimedia systems), Interaction Design & Human Computer Interaction (HCI), Web Analytics, the Semantic Web, and Knowledge Management systems. All of my courses focused on using interactive computer systems in networked environments to empower people to interact with and use via their computing environments.

18. During my time at the University of Texas, I conducted a variety of research projects, published numerous academic papers, and presented at academic and industry conferences. The projects included analyzing network

traffic data, developing mobile device applications and interfaces, as well as qualitative and quantitative user behavior data collection and analytics. In addition to my work on campus, I also provided consulting advice on system design to companies outside the university, including small technology startups as well as large corporations such as Microsoft and Motorola.

19. I currently work with various software companies—from small startups to large corporations—to create new technologies and applications. In this role, I continue to monitor academic and industry advances in information systems. In over 30 years as a developer, professor, researcher, and software architect, I have read, and become familiar with, a large part of the rich history of development and design work in the field of computer science. As a software developer and designer, I personally witnessed and contributed to the early development of personal computers with graphical user interfaces, Web-based systems, and Web site development, as well as the growth of mobile networked computing. I have designed and built applications and systems for research and commercial uses, with a focus on practical, business-oriented tools. My work has used data in novel and transformative ways to move commerce from the real world to the Internet, thereby aiding the growth of e-commerce systems for finding, recommending, and sharing items to purchase.

20. In sum, I have extensive experience—as a developer and researcher—relating to computing devices and network-based systems. I have developed tools to collect, organize, and store user interaction data, and implement systems that can leverage user data to make using computing devices smarter and easier.

## **B. Technology Background**

21. There is a long history of technology improving retail business operations, especially in the last 100 years—from mechanical cash registers to computers, including software for inventory management, pricing, logistics, and customer service. As information technology became more ubiquitous, it became more widespread and functional as well. As the computer revolution became more personal (i.e., personal computers), it was naturally an outlet for people to use in communicating and sharing information. One of the first publicly-available computer systems was *Community Memory*, a personal computer placed in a record store in Berkeley California in the early 1970s that among other functions, let customers share music recommendations. EX1026. Tedd’s publication, “OPACs through the Ages,” shows that other public use of computers were in settings such as libraries with their Online Public Access Catalogs (OPACs) becoming widespread by the 1980s that enabled a library patron to directly interact with a computer to look up a book, check to see if it the library has the book, then

see if the book is available and finally see the book's location (call number) – all in a few keystrokes. EX1025. As people became more familiar with computers broadly, the use of computing expanded into a variety of realms in public settings, including the aforementioned libraries, but also museums, airports, shopping malls and of course retail stores too. *See generally*, INNOVAPORT-DEFS-PA\_0000602 at 605 (Ch. 1, Introduction).

22. Computing transformed how people could participate themselves in the process of shopping as the advent of supermarkets and other retail businesses allowed direct access to items in a store and ready access to information about items such as prices (price tags, sales and specials) and organizing items for comparison and selection. Cash registers provided faster check-outs, and the trend to enable more direct consumer involvement expanded to letting customers manage their own shopping. With the introduction of the personal computer in the 1980s, in-store technology became profitable to deploy compared to additional staff. As customers learned how to use personal computers themselves (typing, searching, selecting, reading search results) many stores deployed interactive computer kiosks to enable “self-serve” shopping.

23. Retail organizations embraced personal computing and kiosks and extended their reach into the existing back-end inventory and catalog information systems already in popular use by the 1980s. These back-end/back-office systems

included databases, often multiple-databases, networked to each other to provide logistics, inventory, customer service and accounting functions well-known in the retail industry. These ideas progressed into the 1990s and 2000s.

24. In 1994, Kearsley published a book titled *Public Access Systems* that provides an overview of different systems such as ATMs, Points of Sale units, and information kiosks that were common at least five years before the priority date of the Asserted Patents. EX1024. Kearsley acknowledges that “public access systems usually provide information or services that require access to a database.” Kearsley also indicates it was well-known that public access systems could be connected to databases for consumers to access. *See id.*, Ch. 2 “The Technology,” Ch. 4 “Database Design.”

25. Kearsley further points out that Point of Sale systems, systems storing product information, were “primarily designed to increase sales in a retail environment.” *Id.*, at 6. And that “[i]n many cases, they simply provide information about products or services.” *Id.* Kearsley also states that “[m]any POS systems are intended to help the customer select the appropriate product or service.” *Id.*, at 7. They also can provide item location information. *Id.* Kearsley discloses the VideOcart system where “VideOcart displays store specials, coupons, recipes, nutrition information, and an item locator. As shoppers move through the

supermarket, triggering devices tell the cart where it is so that it can display message relevant to that aisle.” *Id.*, Figure 1-7.

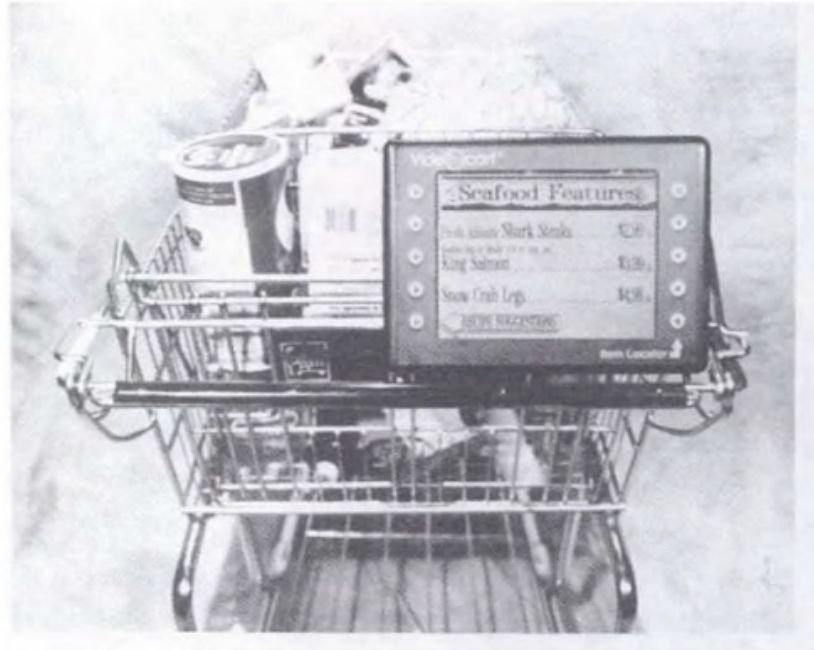


**Figure 1-7. VideOcart brings POS to grocery shoppers.**

26. In 1995, Jenifer Rowley, then Head of the School of Management and Social Sciences at the Edge Hill College of Higher Education in the U.K., authored a review about the applications of multimedia kiosks in the *International Journal of Retail & Distribution Management*. EX1021. Rowley noted that multimedia kiosks “can be used [in retail stores] to provide information and advice on goods and services and to allow the customer to execute transactions associated with, for instance, purchasing goods and services.” *Id.*, at 32. Rowley also teaches that these kiosks “may be standalone or networked through to a larger computer system.” *Id.* Rowley states that as early as 1995, kiosks were used to “compare items; find

detailed product information, including whether it is necessary to purchase associated item,” “determine whether a product is in stock,” and to “locate details of substitute items if a given product is not in stock.” *Id.*, at 33. Rowley also teaches that kiosks could “be located in-store or elsewhere” and that multiple retailers were experimenting with in-store kiosks which were shown to increase sales. *Id.* Rowley further notes that by 1995, standalone in-store kiosks could already “provide[] a guide to the location of products in a store.” *Id.*, at 36.

27. In 1997, a report by the U.S. Department of Transportation summarized current technology and products in industry titled “Review of Assessment of Information Kiosk Systems” (the “DoT Report”). EX1023. This DoT Report gives “[a]n Overview of Kiosk Technology” in the transportation sector and notes that:

*One of the best applications of traveler information systems being deployed and tested by transportation agencies are Kiosks - a network of small, light structures that impart information about transit routes and real time traffic reports, tourism, and other data. Kiosks are typically set up as a single central pillar. Travel information is usually presented on a video display. Some kiosks contain a printer that can produce selected hard copy, such as a trip plan. Information is entered through virtual push buttons, which are displayed visually on the screen (touchscreen). A virtual keypad and keyboard can be displayed for complex data entry. Information is displayed on the screen using a combination of text and still or animated pictures.*

*The major components of a kiosk system may include a server(s), operator workstation, telecommunications equipment, PC,*

*touchscreen monitor, printer, speakers, and a modem or Integrated Services Digital Network (ISDN).*

*As a traveler information system technology, kiosks may serve three functions: data gathering, data fusion and processing, and data dissemination.*

*Id.*, at 9.

28. The DoT Report lists numerous kiosk systems that were deployed as of its publication, establishing that kiosk technology was not theoretical, but widespread and conventional as shown in Table 1. *Id.*, at 12.

Table 1  
List of Kiosk Projects

| Project Description                                   | Responsible Agency                                                                             | Contact Person                        |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------|
| Information Kiosk                                     | Ann Arbor Transportation Authority, Ann Arbor MI                                               | Greg Cook<br>(313) 677-3902           |
| Travelink                                             | Metropolitan Atlanta Rapid Transit Authority, Atlanta GA/ Georgia Department of Transportation | Todd Long<br>(404) 651-8475           |
| Traveler Assistance Network                           | Baltimore Mass Transit Administration, Baltimore, MD                                           | David Hill<br>(410) 333-3437          |
| Information Kiosks                                    | Regional Transportation District, Denver, CO                                                   | Lou Ha<br>(303) 299-6265              |
| Houston Smart Commuter                                | Metropolitan Transit Authority of Harris County (Houston Metro), Houston, TX                   | S. Venkat Raman<br>(713) 881-3030     |
| Los Angeles Smart Traveler                            | California Department of Transportation, Public Transit Branch Los Angeles, CA                 | Cliff Loveland<br>(916) 654-9970      |
| Travlink Project                                      | Minnesota Department of Transportation, Minneapolis/St. Paul, MN                               | Marilyn Remer<br>(612) 582-1601       |
| Multimedia Kiosks                                     | New Jersey Transit, Newark, NJ                                                                 | Lou Wassong<br>(201) 378-6906         |
| Smart Interactive Kiosks                              | Metropolitan Transportation Authority - New York City Transit, New York, NY                    | Angelita Hutchinson<br>(718) 694-3232 |
| Information Kiosks                                    | Seattle Metro, Seattle, WA                                                                     | Catherine Bradshaw<br>(206) 684-1770  |
| National Capital Region Traveler Information Showcase | Washington Area Metro Agency, Washington, D.C., et al.                                         | Karen Lamb<br>(202) 962-2790          |

29. Additionally, the DoT Report states that database connectivity was a well-known need for kiosks in that the “system architecture design should include

a server to provide connectivity to the kiosks and other databases (i.e., FDOT, Weather Channel, AVL, CIS, TOS) and a PC-based operator workstation to serve as the primary operator interface to the system.” *Id.*, at 41. The DoT Report further states that “[t]he link between the kiosk server and other databases is critical to system performance. Thus, each kiosk unit should have a local database that is always connected to the server, so that real time data is constantly available to the kiosks.” *Id.* The DoT report also asserts that “[t]he software should be written in a format to insure complete transferability of data to and from other databases.” *Id.*

30. In 2000, Otto describes a framework based on numerous real-world examples (e.g. DELL Computer and Kmart) that includes best practices for both e-commerce and brick-and-mortar retailing. EX1022. Otto describes a kiosk simply as “any type of publicly accessible Internet or Intranet access located in a public place” in the context of physical store retail practices. *Id.*, at 4. Otto continues by describing a set of phases (product/service search, comparison shopping, product selection, negotiation of terms, placement of order, authorization of payment, receipt of product and customer service and support), with each phase being supported by information systems that include kiosks and back-office systems including databases with product information and pricing made available to an in-store customer using a kiosk. *Id.*

31. Naturally, as computing became more widespread than even personal computers with the launch and subsequent ubiquity of the mobile smartphone, businesses extended their in-store kiosk functionality to each potential customer's own smartphone allowing "cross-device" shopping experiences which improved in-store shopping customer experience.

### **C. Materials Reviewed**

32. In preparing this declaration, I have reviewed and/or considered at least the documents cited in the List of Exhibits, and the documents referenced in this declaration. I have also reviewed the entire prosecution history of the 670 Patent.

## **II. RELEVANT LEGAL STANDARDS**

33. I am not an attorney. For the purposes of this declaration, I have been informed about certain aspects of the law that are relevant to forming my opinions. My understanding of the law is as follows.

34. Petitioner's counsel has informed me that a patent claim may be "anticipated" if each element of that claim is present either explicitly or inherently in a single prior art reference, and that the elements should be arranged in the reference as in the claim. Petitioner's counsel has informed me that for a claimed limitation to be inherently present, the prior art reference need not expressly

disclose the limitation, so long as the claimed limitation necessarily flows from a disclosure in the reference.

35. Petitioner's counsel has informed me that a patent claim can be considered to have been obvious to a person of ordinary skill in the art at the time of the claimed invention. This means that, even if all of the requirements of a claim are not found in a single prior art reference, the claim is not patentable if the differences between the prior art and the subject matter in the claim would have been obvious to a person of ordinary skill in the art at the time of the claimed invention.

36. Petitioner's counsel has informed me that a determination of whether a claim would have been obvious should be based upon several factors, including, among others: (i) the level of ordinary skill in the art at the time of the claimed invention; (ii) the scope and content of the prior art; (iii) what differences, if any, existed between the subject matter of the claimed invention and the prior art; and (iv) secondary considerations of non-obviousness.

37. Petitioner's counsel has informed me that a single reference can render a patent claim obvious if any differences between that reference and the claims would have been obvious to a person of ordinary skill in the art.

Alternatively, the teachings of two or more references may be combined in the same way as disclosed in the claims, if such a combination would have been

obvious to one having ordinary skill in the art. In determining whether a combination based on either a single reference or multiple references would have been obvious, it is appropriate to consider, among other factors:

- a. whether the teachings of the prior art references disclose known concepts combined in familiar ways, and when combined, would yield predictable results;
- b. whether a person of ordinary skill in the art could implement a predictable variation, and would see the benefit of doing so;
- c. whether the claimed elements represent one of a limited number of known design choices, and would have a reasonable expectation of success by those skilled in the art;
- d. whether a person of ordinary skill would have recognized a reason to combine known elements in the manner described in the claim;
- e. whether there is some teaching or suggestion in the prior art to make the modification or combination of elements claimed in the patent; and/or
- f. whether the innovation applies a known technique that had been used to improve a similar device or method in a similar way.

38. Petitioner's counsel has informed me that in considering obviousness, I should keep in mind that a person of ordinary skill in the art has ordinary creativity and is not an automaton.

39. Petitioner's counsel has also informed me that in considering obviousness, it is improper to determine obviousness using the benefit of hindsight derived from the patent being considered.

40. Petitioner's counsel has informed me that it is elementary patent law that a patent application is entitled to the benefit of the filing date of an earlier filed application only if the disclosure of the earlier application provides support for the claims of the later application, as required by 35 U.S.C. § 112. Petitioner's counsel has informed me that when a priority claim involves a chain of priority documents, each application in the chain leading back to the earlier application must comply with the written description requirement of 35 U.S.C. § 112. Petitioner's counsel has informed me that, to satisfy the written description requirement of 35 U.S.C. § 112, the disclosure of the earlier filed application must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, the inventor was in possession of the invention. Petitioner's counsel has informed me that a prior application that merely renders the later-claimed invention obvious is not sufficient to meet the written description requirement—it must describe the claimed invention with all its limitations. Similarly, petitioner's counsel has informed me that it is not sufficient for purposes of the written description requirement of § 112 that the disclosure, when combined with the knowledge in the art, would lead one

to speculate as to modifications that the inventor might have envisioned, but failed to disclose.

41. Petitioner's counsel has informed that even when each element may be individually described in the specification, the lack of adequate description of their combination renders those claimed combinations invalid under Section 112. Petitioner's counsel has informed me that it is not enough that applicant show where each claimed element resides in the earliest filed application but applicant must also provide support for the linkage of the claimed elements creating the embodiment. Petitioner's counsel has informed that a patent owner cannot show written description support by picking and choosing claim elements from different embodiments that are never linked together in the specification. Petitioner's counsel has informed that a description that merely renders the invention obvious does not satisfy the written description requirement.

### **III. THE 670 PATENT**

#### **A. Overview of the 670 Patent**

42. The 670 Patent is entitled "Apparatus and Method For Providing Product Location Information To Customers In A Store," and claims priority back to an October 9, 1999 provisional filing. EX1001, [54], [60]. The 670 Patent relates to providing product location and other information to customers using a server and a client. EX1001, 1:14-16.

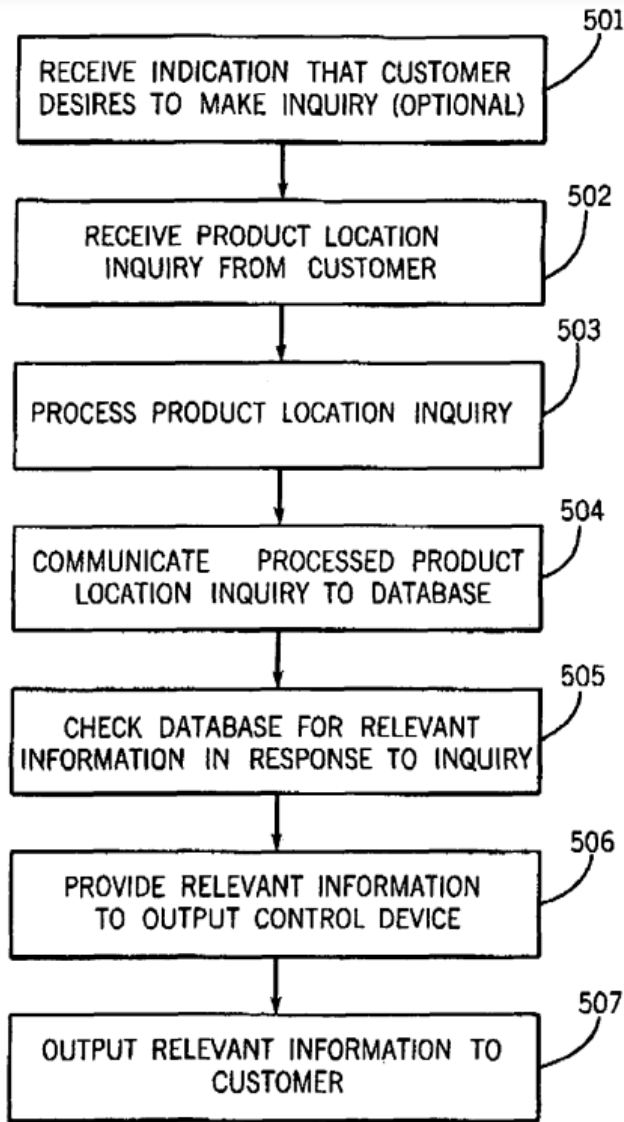


FIG. 5

EX1001, FIG. 5.

### **B. Overview of the 670 patent's File History**

43. Nearly two years after prosecuting the 670's parent, U.S. Patent No. 9,489,690, the Patent Owner (PO) filed the exact same preliminary amendment in the 670 that it did in the 690. EX1028, 58-60; EX1003, 59-61. In both instances,

not only did PO, prior to the start of substantive examination, cancel claims 1-19, it submitted the identical lone claim, method claim 20. EX1028, 59; EX1003, 60. Unsurprisingly, the same examiner issued the identical non-final rejection but for the 670 having a statutory double patenting rejection. See IPR2024-00022 III.B for substantive analysis; Compare EX1028, 76-80, with EX1003, 82-87. PO responded by making substantially similar edits to the 670 as it did the 690—only varying in prose and the terms “at least indirectly” and “processed”. Compare EX1028, 84-86, with EX1003, 91-93. Other than the recitations of the aforementioned claim differences, and a conclusory double patenting remark, PO’s Remarks/Arguments are identical. See IPR2024-00022 III.B for substantive analysis; Compare EX1028, 87-96, with EX1003, 94-103. Then again, similar to the 690, PO added 17 claims two months after the Notice of Allowance that were included in the 670 patent.

### **C. Person of Ordinary Skill in the Art**

44. In my opinion, a person of ordinary skill in the art (“POSITA”) at the time of the alleged invention of the 670 patent (October 9, 1999) would have had a bachelor’s degree in computer science or information systems, such as software engineering or a similar course of study and at least 2 years of practical experience working in interactive multimedia information retrieval systems or equivalent qualifications through some combination of education, training, and experience.

Additional education/experience in a relevant field may compensate for a deficit in one of the other aspects of the requirements.

**D. Claim Construction**

45. I have been informed that the Challenged Claims are interpreted using the same claim construction standard that is used to construe the claim in a civil action in federal district court.

46. I do not contend that its proposed constructions are complete constructions of these limitations or the claims for any other purpose, including for issues that have been raised in the related litigation.

47. I have construed any claim terms not listed below according to their plain and ordinary meaning to a POSITA at the time of the 670 Patent.

**1. “linking a product with an other product in a cross-referential manner” (claim 1)**

48. Based on my review of the intrinsic evidence, it is my opinion that this term should be construed according to its plain and ordinary meaning, which is “data linking a product to a different product.” In the Target litigation, Patent Owner filed a motion for summary judgment asserting that the construction of this term should be “data linking a product to a different *type* of product.” EX1019, 18-19 (emphasis added).

49. The intrinsic evidence does not support Patent Owner’s inclusion of “type” in the construction. The specification includes an example that “the system,

in response to an inquiry regarding the location of product Y, can respond by stating ‘Product Y is located in aisle 3. Product Z, which is on sale, is also located in aisle 3.’” EX1001, 15:49-55. During prosecution of the 670 Patent and its parent, U.S. Patent No. 9,489,690 (both claim priority to Provisional Patent Application No. 60/158,444 and share a specification), the Patent Owner distinguished Berstis stating:

rather than concerning operation in which at least one suggestion is provided regarding another product in response to the receipt of a product location inquiry concerning a specific product from a customer within a store, Berstis instead appears to concern providing product location information in regard to products that ‘match’ products that were previously-determined to be of interest . . . .

EX1003, 101, EX1028, 94. Patent Owner stated that “the Applicant has not been able to find within Berstis any disclosure or suggestion of providing at least one suggestion regarding any product differing from a product that was previously-determined as being of interest.” *Id.* As shown by the intrinsic evidence, there is no support for limiting this term to require a different type of product. Instead, the plain language and intrinsic evidence support a claim construction that requires “data linking a product to a different product.”

50. Regardless, in my opinion, the below grounds show that the claims are invalid under either construction.

## 2. “product location inquiry” (claim 1)

51. In my opinion, this term should be construed according to its plain and ordinary meaning—that is, “an inquiry that results in a response including a product location.” In computer applications, and in particular computer systems such as those contemplated in this patent in which devices that are physically separated will communicate over some wired or wireless medium, it is typical for the communications between those devices to be conducted according to a defined set of protocols. These protocols standardize signals between devices and standardize the data communicated as well. It is also typical for a protocol to be defined in such a way that the rules (such as the order of data communicated) provide additional definition (such as the format of the data communicated) are to establish information exchange without regard as to the significance of the communications, i.e. data is data within the rules of the protocol. For example, in a practical implementation of a system where one device will communicate a request for particular information such as a product location, a product price, and/or other information concerning a product, the protocol would typically define a message with a format that would include an order and format for data that indicates the type(s) of information requested, such as an SKU or UPC code that identifies a product. Both the data inquiry and the data in response are typically terse and designed to avoid wasted bandwidth. The data might be as simple as a number that

identifies a particular message type (e.g., message inquiry data of type “10,” which could be included in a message header), or could be a brief string of text like “GET.” The devices involved in the communication have a shared understanding of the significance of the protocol and therefore the data inquiries and replies. For example, “10” or “GET” or any other data might signify a request for location, and/or price, and/or any other information about the product(s) associated with the operand. The information returned in response to the inquiry, rather than the literal content of the inquiry itself, is therefore the surest indication of the nature of the inquiry. Accordingly, an inquiry that results in a response that includes a location is a location inquiry, and may also be a price inquiry and another type of inquiry depending on what other information may be returned in response, regardless of the literal content of the inquiry message. Moreover, a data structure or database would be typical for storage of information such as product name, product location, product price or product availability and database applications also use terse, standardized requests (like “SELECT”) and result formats in order to provide consistent and accurate operations. This also means that while the format or syntax of the inquiry or the response themselves may also be terse, they indicate an inquiry simply by their use.

52. In the Target litigation, Patent Owner filed a motion for summary judgment asserting that the construction of this term should be a “keyword search.”

EX1019, 58. Though not an express claim construction, Patent Owner argues that a product location inquiry cannot be a preprogrammed list, but instead must be a real-time inquiry. *Id.*, 58-59.

53. Based on my review of the intrinsic evidence, it is my opinion that a POSITA would know that the intrinsic evidence does not support Patent Owner's inclusion of keywords<sup>1</sup> or real-time in the construction. Keywords do not appear as a requirement for a product location inquiry in the specification or the prosecution history. And, though the prosecution history does include discussion by Patent Owner regarding real-time responses to inquiries (EX1003, 99-100), there is nothing in the plain language of this limitation that supports requiring inquiries or responses in real-time. Moreover, the statements during prosecution do not rise to the level required for prosecution history disclaimer because the discussion of real time in the prosecution history is not clear and unambiguous. Absent a disclaimer, there is no way to interpret the "product location inquiry" limitation, whether considering the words individually or as a whole, as including a real-time requirement. Even Patent Owner's proposed construction of "keyword search" does not include a real-time requirement. Moreover, there is nothing about "keyword search" that limits the time at which the keywords are picked or entered into the system.

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<sup>1</sup> It is also not clear what is meant by "keywords" in PO's construction.

54. Regardless, in my opinion, the below grounds show that the claims are invalid under either construction.

**E. Non-Functional Descriptive Material**

55. I have been informed that a claim limitation is directed toward printed matter, also sometimes referred to as non-functional descriptive material, when it claims only the content of the information. I have been informed that a limitation directed toward printed matter is not entitled to any patentable weight if the printed matter bears no functional relationship to the substrate/product on which it appears.

56. In my opinion, the Challenged Claims recite many instances of non-functional descriptive material that are not entitled to patentable weight. An example of such non-functional descriptive material is the italicized recitation in [1g], which recites “wherein the product location information signal is configured to enable, at least indirectly, a providing of an output signal at an output device as a response to the product location inquiry that *includes location information concerning the product and also provides at least one suggestion related to the other product.*” The italicized portion of this recitation is printed matter because it is directed only to the content of the information, i.e., the suggestion related to the other product. This printed matter bears no functional relationship to the medium on which it is recorded, i.e., the computer display. Accordingly, this recitation is

not entitled to any patentable weight. I identify other recitations in the challenged claims that are not entitled to patentable weight for similar reasons below.

#### **IV. OVERVIEW OF THE PRIOR ART REFERENCES**

##### **A. EX1004- Shanman**

57. U.S. Patent No. 7,231,357 to Shanman et al. (“Shanman”) is entitled “System and method for the targeted distribution of discount coupons over a network.” EX1004, [10], [54], [76]. Shanman was filed on April 19, 1999, and issued on June 12, 2007. EX1004, [22], [45]. Shanman is prior art under at least 35 U.S.C. § 102(e). Shanman does not appear in the file history of the Challenged Patent and thus was not considered by the patent examiner during prosecution. EX1003.

58. Shanman relates to a customer selecting items or entering its shopping list items into a mobile device which are transmitted to a server, and in response, the mobile device receives a file from the server containing the locations and promotional information for those items, and targeted promotional information either concerning related products or other items based on customer preferences or history. EX1004, Abstract, FIG. 3, FIG. 5, 6:5-7:65, 8:11-22.

59. The Shanman mobile device is a called a “client” and “consumer data processing unit,” which is “implement[ed] on any type of handheld devices, wristwatch-type computing devices, cellular or satellite communication devices,

computers, televisions, telephones, and the like.” EX1004, 6:5-8, 24:17-21. The server, called the coupon server, receives the request from—and responds to—the mobile device over a network; the “coupon server is located remotely from the consumer data processing units” and is “responsive to a connection with the consumer data processing unit.” EX1004, 6:13-21. The disclosed network includes the internet through cellular and wireless local area networks. Shanman’s disclosed network includes the internet through cellular and wireless local area networks, and more broadly “includ[es] local and wide area networks, private networks, on-line subscription services, on-line database services, public networks including the internet and the World Wide Web, television networks, satellite networks, and wireless networks.” EX1004, 11:53-58.

60. In Shanman, the user makes inquiries and can “select particular goods” via a user interface, “by means of predetermined keyboard entries, mouse clicks, voice commands, or the like,” on the mobile device. EX1004, 8:63-65. The server processes the requests and has a memory containing the requested information including the location of the products. Shanman discloses “the coupon server transmits a file” that “identif[ies] the aisle location in the selected retail outlet of the goods selected by the consumer.” EX1004, Abstract. In Shanman, the server responds to the mobile device with this information so the mobile device

can display this location information of “the selected goods” on the same “display monitor” on which the user made the selection, EX1004, 16:9-12. EX1004, FIG. 5.

SHOPPING LIST FOR YOUR SELECTED SUPERMARKET

|                    | <u>Aisle No.</u> |
|--------------------|------------------|
| Flour              | 4                |
| Yeast              | 4                |
| Cake Mix           | 4                |
| Baking Accessories | 4                |
| Bottled Tea        | 5                |
| Bottled Water      | 5                |
| Soda               | 5                |
| Bread Crumbs       | 6                |
| Hamburger Rolls    | 6                |
| White Bread        | 6                |
| Bar Soap           | 3                |
| Body Cream         | 3                |
| Conditioner        | 3                |
| Mouthwash          | 3                |
| Razors             | 3                |
| Shampoo            | 3                |
| Apples             | 2                |
| Bananas            | 2                |
| Broccoli           | 1                |
| Cabbage            | 1                |
| Carrots            | 1                |
| Cauliflower        | 1                |
| Chicken            | 9                |
| Cold Cuts          | 9                |
| Hot Dogs           | 9                |
| Lamb Chops         | 9                |

FIGURE 5

61. Shanman’s server also responds with targeted advertising and promotional material. EX1004, 4:45-53. This “targeted distribution of... promotional information and purchase incentives” is “enable[d]” by user preferences and history, including “information concerning consumers’ purchasing habits, interests, preferred brands, and other data,” EX1004, 5:20-59. EX1004, 7:47-65, 10:15-46. Shanman discloses this additional information can also concern competing goods related to the selections, with an example of “competitive pricing or availability information,” EX1004, 7:47-65. EX1004, 17:35-49, 22:3-8. Shanman also discloses this promotional information is displayed on the user

interface along with the requested information; for example, “goods which are selected by the user are also highlighted to distinguish from non-selected goods.”

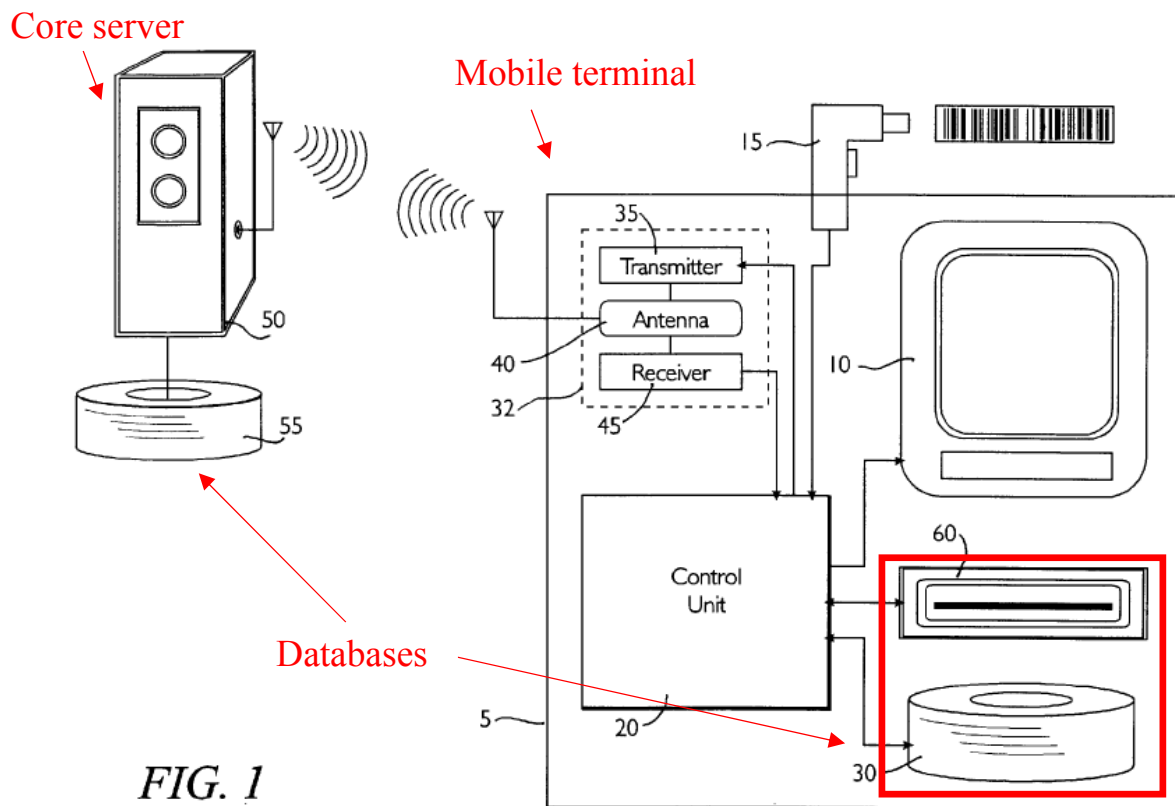
EX1004, 16:18-22.

**B. EX1005- Ogasawara**

62. U.S. Patent No. 6,123,259 to Ogasawara (“Ogasawara”) is entitled “Electronic Shopping System Including Customer Relocation Recognition.” EX1005, [54], [75]. Ogasawara was filed April 30, 1998, issued on September 26, 2000, and assigned to Fujitsu, an industry leader in technology solutions for the industry. EX1005, [22], [45]. It is prior art under at least 35 U.S.C. §§ 102(a), 102(b), and 102(e). Ogasawara does not appear in the file history of the Asserted Patents and thus was not considered by the patent examiner during prosecution. EX1003.

63. Ogasawara relates “generally to an electronic information display and customer location recognition,” in particular “to a computer based system for locating a customer’s position within a shopping store and displaying product and location information on a customer operated mobile terminal.” EX1005, 1:6-11. Ogasawara’s mobile terminal includes a user interface. Ogasawara describes that a “[p]ressure sensitive (touch screen) technology may be incorporated into the display 10 so that a shopper may access the mobile terminal 5 by merely touching certain portions of the screen” and “a numeric or alpha-numeric button or keypad

arrangement may be provided in combinations with the display 10,” EX1005, 4:61-67. EX1005, 10:13-24, 14:66-15:28. Ogasawara’s mobile terminal 5 may be either hand-held or mounted on a shopping cart, includes a built-in barcode scanner, and is configured to communicate with a store central computer 50 by means of an individually addressable RF communication transceiver. EX1005, 2:32-34.



EX1005, Fig. 1 (annotations added). Ogasawara’s system includes a database, which can be stored in a storage device at the store central computer 50, and a copy can also be stored in a storage device in the mobile terminal 5. EX1005, 6:60-7:18. The database includes “[a] merchandise item database, comprising at least a Price

Look Up Table is organized into the store central computer's memory and is configured to include identification indicia for each item of merchandise, such as brand name, generic name, price and the like and also includes location information for each item of store merchandise." EX1005, 2:41- 45.

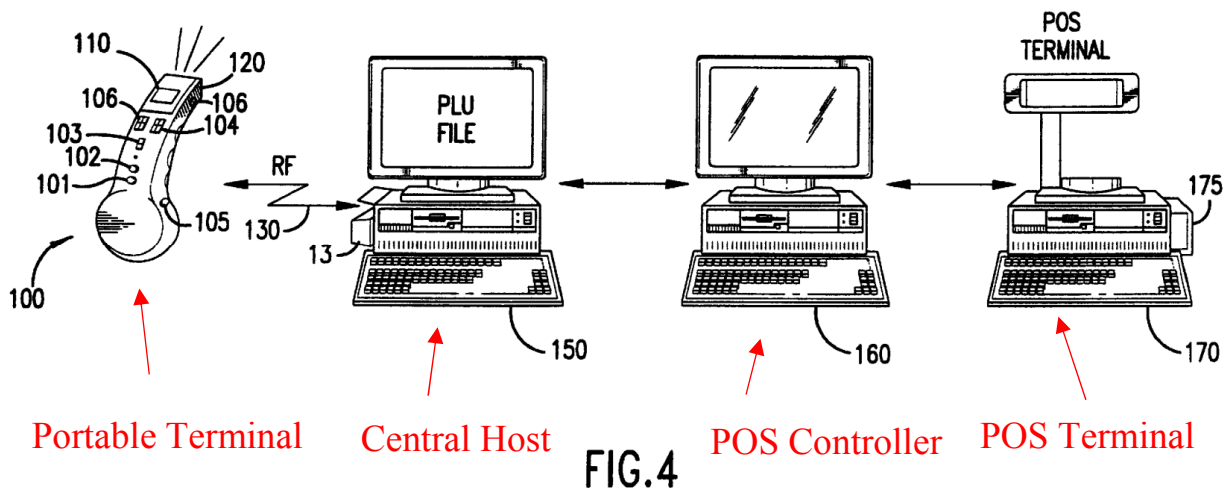
64. Ogasawara's system directs a customer along a path through the store to the location of each desired product on a customer's shopping list, and the customer scans each product when they arrive at its location. Ogasawara discloses, "[a]s a customer scans the bar code of a particular item, the store central computer accesses that item's location and assigns that particular location to be the customer's current location." EX1005, 2:46-50. The system processes the contents of the customer's shopping list and chooses the closest item to the customer's current location as the desired destination item. The direction and distance information, such as aisle and shelf number, is then displayed on the mobile terminal's display panel. EX1005, 2:55-60. Customers are allowed to "move[] through a store in a more efficient manner" because they "no longer need to search through the entire store to find a particular item of merchandise, but are instead directed to each next desired merchandise item along the shortest shopping path." EX1005, 1:52-55. Ogasawara also provides "[r]eplenishment items [and] recommended promotional items" "for a next desired destination item based on the customer's current location" on the customer's recommended routing. EX1005,

1:56-58. In addition to providing directions or location to a shopper on the basis of shopping lists, a customer location recognition feature is able to respond to customer prompts to further make inquiries about the location and direction of any specific item in the store. EX1005, 6:54-59.

**C. EX1006 - Beach**

65. U.S. Patent No. 6,084,528 to Beach et al. (“Beach”) is entitled “Intranet scanning terminal system” and issued on July 4, 2000. EX1006, [54], [45]. It is prior art under at least 35 U.S.C. §§ 102(a), 102(b), and 102(e). Beach does not appear in the file history of the Challenged Patent and thus was not considered by the patent examiner during prosecution. EX1003.

66. Beach relates “generally to an improved portable data terminal,” in particular “to a system for communicating information over wireless communication network using the portable terminal.” EX1006, 1:12-15. In Beach, “the portable terminal 100 communicates over a wireless communication network 130 . . . a controller 150 which functions as the central host to the portable terminal 100.” EX1006, 6:36-40.



EX1006, Fig. 4 (annotations added). Beach teaches “the central host is provided with a database of available electronic coupons.” EX1006, 13:15-16. Beach further states, “[u]pon scanning of the code on a selected merchandise item 260, a display 244 on the bar code reader 240 displays product information such as price, product name, quantity and nutritional information.” EX1006, at 8:5-9. Beach also states, “[t]he customer selection of items is made through a graphical use interface which simulates a store layout, i.e., aisles with items in them as they are stacked within the store.” EX1006, 15:4-7. After a consumer has selected several items for purchase, the portable terminal downloads information from the central controller and displays it; thus, providing the consumer confirmation that items have been scanned for purchase. EX1006, 11:12-19. In Beach, the graphical user interface “simulates a store layout, i.e., aisles with items in them as they are stacked within the store.” EX1006, 15:5-9. “This permits the user to find items they know are located in certain aisles of the store.” *Id.* Additionally, Beach discloses “portable

terminals could be used to provide information pertaining to recommended accessories which would match a selected item by providing cost, location.”

EX1006, 16:52-55.

**D. EX1030 - Bezos**

67. U.S. Patent No. 6,029,141 to Bezos (“Bezos”) is entitled “Internet-Based Customer Referral System,” was filed on June 27, 1997, and issued on February 22, 2000, and is assigned to Amazon Technologies, Inc. It is prior art under at least 35 U.S.C. § 102(e). Bezos does not appear in the file history of the Challenged Patent and thus was not considered by the patent examiner during prosecution. EX1003.

68. Bezos relates to a software system for enabling an Internet sales entity (“merchant”) to sell goods in cooperation with other websites (“associates”). EX1030, 1:50-55. The associates recommend and market products within their expertise on their websites that—through the unique IDs of the product and the associate, via links or otherwise—the customer’s ultimately purchase from the merchant. *Id.* 3:8-25, 1:62-2:19. In turn, the merchant pays the associate a commission for the referrals that result in actual purchases. *Id.*

**E. EX1031 - Shelton**

69. U.S. Patent No. 5,345,501 to Shelton (“Shelton”) is entitled “Telephone Central Office Based Method of and System For Processing Customer

Orders,” was issued on September 6, 1994, and is assigned to Bell Atlanta Network Services, Inc., (now Verizon). It is prior art under at least 35 U.S.C. §§ 102(a), 102(b), and 102(e). Shelton does not appear in the file history of the Challenged Patent and thus was not considered by the patent examiner during prosecution. EX1003.

70. Shelton relates to a “telephone central office switch based system for forwarding customer requests to a vendor site and processing orders comprises, in addition to the standard central office switch, a voice response unit (VRU) controlled by an adjunct computer for sending to the telephone of a customer an audible instruction message followed by audible response messages in reply to customer prompts entered by telephone. The VRU/adjunct includes not only data storage for voice messages but also has a separate data storage capacity for storing a data base of customer identification and vendor inventory information. The adjunct computer is in communication with a host computer at each vendor site. The host downloads inventory and customer identification information to the adjunct, and the adjunct uploads information to create and activate an order at the host. To complete the transaction, the host updates inventory information and downloads back to the adjunct.” EX1031, Abstract.

**V. GROUND 1: SHANMAN RENDERS OBVIOUS CLAIMS 1, 2, 4, 6-10, 12 AND 14**

**A. Claim 1**

71. As shown below, in my opinion, Shaman in view of the knowledge of a POSITA renders claim 1 obvious.

**1. [1pre] A method of providing product location information within a store, the method comprising the steps of:**

72. In my opinion, the preamble is disclosed or rendered obvious by Shanman. *See* §IV.A; EX1004, 5:3-19, 16:23-32. Shanman discloses “in response to the selection of goods, the coupon server transmits to the consumer computer a file . . . identifying the aisle location in the selected retail outlet of the goods selected by the consumer.” EX1004, Abstract.

73. To the extent that “within a store” means that the recipient of the location information must be within a store when the location information is received, in my opinion, a POSITA would have understood, or found it obvious, that Shanman discloses a server and client device within the same store. This is because, while Shanman discloses some embodiments in which the server and client device are geographically separated, Shanman also discloses other embodiments in which the server and the client device communicate with each other via a local area network (“LAN”). EX1004, Abstract, 7:37-65, 8:11-42, 11:35-65 (“the present invention applies to any type of network, including local . . . area networks”). In my opinion, a POSITA would have understood a LAN to

pertain to a network of devices located in close geographical proximity to each other such as in a same building and, because it is unlikely that the server would be located in a customer's home, a POSITA would have found it obvious to locate the LAN including the server 10 and client 12 in a store (e.g., a grocery store).

2. **[1a] providing at least one information storage device including a database, wherein the at least one information storage device is configured to be at least indirectly in communication with at least one other device that includes at least one user interface, and wherein at least one of the at least one information storage device and the at least one other device with respect to which the at least one information storage device is configured to be at least indirectly in communication is or includes a mobile device;**

74. In my opinion, Shanman discloses this limitation. Shanman discloses providing a server 10 that includes at least one information storage device ("the memory of the coupon server") including a database ("one or more databases are set up on . . . the coupon server"). EX1004, 6:5-57, 11:35-58, 13:62-14:1, 15:22-31, 19:19-21, Figs. 2, 3. Shanman discloses at least one other device (e.g., clients 12). EX1004, 6:5-57, 11:35-58, 12:24-40, 13:4-14:21, 14:26-31, 24:17-21, Figs. 1, 2. Shanman discloses the clients (also referred to in Shanman as "consumer data processing units") as mobile devices by stating that "the teachings of the present invention are equally applicable for use in devices such as . . . cellular and satellite communications devices . . . handheld computers, wristwatch-type computing devices," EX1004, 11:35-58. EX1004, 2:42-57, 14:26-33, 24:8-21. The clients

have at least one user interface (“user input device”), i.e., a client device 21 includes a keyboard 22, a mouse 23, and a display 24. EX1004, 6:5-57, 8:63-65, 13:4-42, 16:66-17:4, 22:9-12, and Fig. 2. The server and client are in communication with one another. Shanman discloses “[a] coupon server is located remotely from the consumer data processing units and comprises . . . a processing unit having communication means selectively connectable over communication medium to the at least one consumer data processing unit, and being responsive to a connection with a consumer data processing unit,” EX1004, 6:5-57. EX1004, 11:35-58, 23:65-24:4, Fig. 1.

**3. [1b] wherein the at least one information storage device includes both product location information and additional product-related information linking a product with another product in a cross-referential manner;**

75. In my opinion, Shanman renders obvious this limitation. *See* [1a]. Shanman’s server’s memory (“information storage device”) contains the physical layout of goods in the selected retail outlet, including aisle information (“product location information”). *See* [1a]; EX1004, Abstract, 7:47-65, 8:11-27, 15:22-31, Fig. 5. Shanman’s server memory also contains additional product-related information linking a product with another product in a cross-referential manner, including “brands, type of goods, category of goods,” EX1004, 21:13-30, “consumer interests and purchasing habits,” EX1004, 10:39-46, “competing brands,” EX1004, 10:16-28, “competitive source,” EX1004, 22:3-8, “brand

preferences,” EX1004, 5:37-59, “a different brand of the same type of goods,” EX1004, 7:47-65, and “another brand,” EX1004, 21:35-42. EX1004, 9:30-36, 10:16-28.

76. In my opinion, a POSITA would have understood that the information storage device on the server includes additional product-related information linking a product with another product in a cross-referential manner because it is constructed to be capable of being “indexed by any one of a multitude of identifiers, such as any element of consumer identifying indicia, or any element of selected information, such as preferred retail outlets, preferred brands, type of goods, [and] category of goods.” EX1004, 21:13-30. This includes linking products by category (i.e., data linking a product to a different product) and location (i.e., data linking a product to a different type of product) within the store. Shanman discloses “[i]nstructional text 104 and targeted advertising text 106 accompany the list of goods.” EX1004, 15:19-54. In my opinion, a POSITA would have understood that the Shanman database includes cross-referential linking between products because Shanman discloses that the products are indexed (i.e., linked and cross-referenced) by brand, type, and category.

77. In my opinion, a POSITA would have understood that Shanman discloses additional linking between products in the database in a cross-referential manner. Specifically, in my opinion, a POSITA would have understood that

Shanman discloses that the database links products using cross-references to allow for cross-promotional coupons to be sent to the user. Shanman discloses that “selections of goods made by the consumer are transmitted to the coupon server . . . [a]dditional promotional information and purchase incentives may also be sent, such as coupons for competing brands of selected goods,” EX1004, 10:16-28, and “[i]n addition, purchase incentives in addition to selected coupons may be targeted based upon a consumer’s coupon selections, EX1004, 10:39-56.

78. Shanman further discloses that a customer may be provided with, in addition to the location of a desired good, additional information including “a different brand of the same type of goods may be purchased at increased savings.” EX1004, 7:49-65. In my opinion, it would have been obvious to a POSITA that if the memory in Shanman’s server is configured to provide information to a customer about a desired good A that includes information about a different good B of the same type and different brand, then the memory in Shanman’s server would also be configured to provide information about a desired good B that includes information about competing good A. In my opinion, it would further have been obvious to a POSITA to accomplish this functionality by linking good A with good B in a cross-referential manner because linking products in a cross-referential manner was well known to a POSITA at the time of the 670 Patent. For

example, Beach discloses that “[e]ssential items could also be **linked to** or marked with alternative products.” EX1006, 15:49-50 (emphasis added).

**4. [1c] receiving a product location inquiry signal regarding the product, the product location inquiry signal being at least indirectly based upon a product location inquiry received by way of the at least one user interface;**

79. In my opinion, Shanman discloses this limitation. *See* [1a]. Shanman discloses the server receiving a product location inquiry signal from the client based upon a product location inquiry received by way of the user interface. EX1004, 8:63-65, 22:9-12. Alternatively, there is also a product location inquiry signal created by the user interface to the client’s digital signal processor (43) upon receipt of a user inquiry on the user interface.

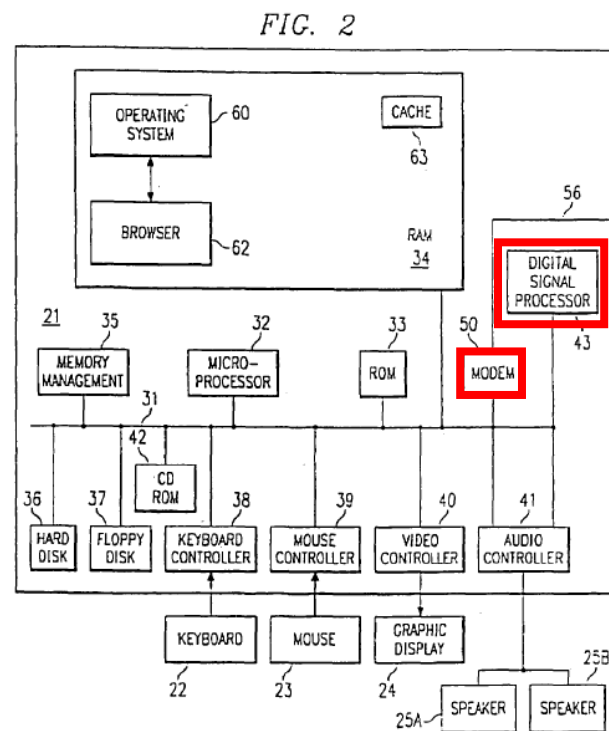
80. Shanman discloses “receiving a product location inquiry signal regarding the product . . . by way of the at least one user interface” by teaching that the “consumer may select particular goods by means of predetermined keyboard entries, mouse clicks, voice commands, or the like, made by use of the user input device.” EX1004, 8:63-65, 22:9-12. The product location inquiries from the “user interface” occur by the user “selecting goods from an itemized list.” EX1004, 5:3-19. Alternatively, a user “may...enter their shopping list.” EX1004, 15:63-66. The server in Shanman responds to user inquiry signals from the client (shopping list) with a shopping list that includes product location. EX1004, 7:29-37, 6:5-28, 7:21-29, 15:36-54, 16:5-38, 18:36-47. More specifically, Shanman discloses “the

location of the selected goods within the selected retail outlet together with discount coupons corresponding to the selected goods,” EX1004, 5:3-19, and the “shopping list may optionally include the actual location of the selected goods, in the selected retail outlet, such as their aisle number in the selected retail outlet,” EX1004, 8:11-22. In my opinion, a POSITA would have understood that the user requests are product location inquiries, because Shanman discloses responding to user input with product locations.

81. In my opinion, a POSITA would have understood, or found it obvious, that Shanman’s disclosure of a system that uses a LAN for communication between the client and server discloses receipt of product location inquiry in real time, while the user is shopping because “the present invention applies to any type of network, including local and wide area networks,” EX1004, 11:35-65, and “the teachings of the present invention are equally applicable for us in devices such as . . . cellular and satellite communications devices . . . handheld computers, [and] wristwatch-type computing devices,” EX1004, 11:46-58. EX1004, Abstract, 7:37-65, 8:11-42, Indeed, portable computers with wireless local area network access were available before the 670 Patent. *See, e.g.*, EX1027.

**5. [1d] processing the product location inquiry signal at a signal processing device to determine a processed product location inquiry signal;**

82. In my opinion, Shanman discloses this limitation, and Shanman in view of the knowledge of a POSITA renders this limitation obvious. *See* [1a], [1c]. In Shanman, the client includes a “data processing unit [i.e., signal processing device] having communication means connectable over a communication medium to at least a coupon server,” meaning that the signal processing device (the digital signal processor 43 and/or modem 50) that processes the consumer’s inquiry (i.e., packetizes, modulates, or otherwise processes the information for transmission) to create a signal that is sent to the coupon server. *See* [1c]; EX1004, 6:5-28.



EX1004, Fig. 2 (annotation added). Digital signal processor 43 is disclosed in both the server and the client. EX1004, 11:9-13.

83. Shanman provides a second disclosure of this limitation in that the signal sent from the consumer data processing unit including the customer's inquiry is processed by the coupon server to determine a product location inquiry signal to be used for accessing the server memory. Shanman discloses "[a] coupon server . . . comprises . . . a processing unit having communication means . . . to the at least one consumer data processing unit, and being responsive to a connection with a consumer data processing unit." EX1004, 6:13-28. In this regard, in my opinion, a POSITA would have understood and/or have found obvious that the signal received from the consumer data processing unit could not be used directly to retrieve the desired product location information from the server memory and that Shanman's server would use digital signal processor 43 to determine a processed product location inquiry signal.

84. In both scenarios, Shanman discloses that the consumer's product location information inquiry is processed to determine a product location inquiry signal because product location is returned. EX1004, 7:29-37. Specifically, Shanman discloses that such an inquiry's processing is "responsive to the selections of goods made by the consumer to download to the consumer data processing unit a file containing a list of the selected goods. . .[and a] shopping list

may optionally include the actual location of the selected goods, in the selected retail outlet, such as their aisle number in the selected retail outlet.” EX1004, 8:11-22). Shanman also discloses that “the coupon server transmits to the consumer computer . . . a file containing data identifying the aisle location in the selected retail outlet of the goods selected by the consumer.” EX1004, Abstract. In my opinion, a POSITA would have understood that a customer inquiry that includes a request for product location is a product location inquiry signal.

**6. [1e] querying the at least one information storage device to obtain portions of the product location information and additional product-related information in response to the processed product location inquiry signal;**

85. In my opinion, Shanman discloses this limitation. *See* [1a], [1b], [1d]. Shanman discloses a system that allows users to query a server’s database for product location information and additional-product related information. EX1004, Abstract, 7:37-65, 8:11-42. Shanman further discloses “[a] coupon server that . . . comprises . . . a processing unit having communication means . . . to the at least one consumer data processing unit...responsive to a connection with a consumer data processing unit,” that processes the received location inquiry signal, as processed by both the client and the coupon server, to query the database, to which the response is product location information and additional product-related information. EX1004, 6:13-28. Shanman discloses “the data processing unit of the coupon server is responsive to the selections of goods made by the consumer to

download to the consumer data processing unit a file containing a list of the selected goods.” EX1004, 8:11-22. Shanman also discloses “the consumer optionally receives a customized shopping list corresponding to the selected goods together with any applicable coupons.” *Id.* Shanman also discloses the ability to “download[] a customized shopping list to the consumer data processing unit which may include a list of the selected goods along with their location in the selected retail outlet.” EX1004, 16:23-32. It also discloses “[t]he database...serves the shopping list program.” EX1004, 23:10-24. In my opinion, a POSITA would have understood that Shanman discloses querying the database on the information storage device for the product location and additional information. Shanman discloses that this obtained additional product-related information is the information that links the product with another product in a cross-referential manner because Shanman’s server returns information concerning the “an other” product too. *See* [1b]. For example, “[c]ompetitive pricing or availability information may also be provided.” EX1004, 7:51-65. In my opinion, a POSITA would have understood that the competitive or targeted item (“an other item”) information is returned as part of the product location inquiry. As discussed above in Section [1b], in my opinion, it would have been obvious to a POSITA to implement this Shanman functionality by including cross-referential links between

two products so that each product's additional product-related information references the other product.

86. In my opinion, a POSITA would have understood that the consumer device's production location inquiry signal is received at the server as a query of the server's database to obtain and product location information and additional product-related information.

**7. [1f] providing a product location information signal that is at least indirectly responsive to the processed product location inquiry signal;**

87. In my opinion, Shanman discloses this limitation. *See* [1d], [1e]. In response to the signal generated as a result of the consumer's inquiry, Shanman's server transmits the requested data back to the consumer device ("product location information signal"). Shanman discloses "the coupon server transmits to the consumer computer . . . a file containing data identifying the aisle location in the selected retail outlet of the goods selected by the consumer." EX1004, Abstract. In my opinion, a POSITA would have understood that the server's response to the client is a product location information signal because the communication includes the requested product location.

8. **[1g] wherein the product location information signal is configured to enable, at least indirectly, a providing of an output signal at an output device as a response to the product location inquiry that includes location information concerning the product and also provides at least one suggestion related to the other product.**

88. In my opinion, Shanman discloses this limitation. *See* [1b], [1f]. Upon receipt of the product location information signal from the server, the client provides an output signal to an output device, namely the display 24 (“outputting in . . . electronic form”). EX1004, 7:29-37. Shanman discloses “[t]he consumer’s selection of a retail outlet and one or more items of goods from the displayed list of goods results in the downloading to the consumer data processing unit for viewing . . . of a ‘shopping list’ which includes the identity of the selected goods and optionally shows the location in the selected retail outlet of the selected goods, and optionally other information such as store layout, retail price, itemized discount, total discount, estimated discount, and the existence of available coupons.” EX1004, 7:51-60. In my opinion, the “includes location information concerning the product and also provides at least one suggestion related to the other product” is non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is recorded. *See* III.E. Regardless, Shanman discloses the output displaying multiple suggestions related to a different product, including “[a]dditional promotional information and purchase

incentives. . . for competing brands of selected goods, coupons offered by other national and/or local merchants, ad banners for national or local advertisers, and the like” to be “display[ed] on the consumer processing unit,” EX1004, 10:15-46. EX1004, 10:25-28, 10:51-56; 16:5-38.

**B. Claim 2. The method of claim 1, wherein the product location information signal is configured to enable, at least indirectly, the providing of the output signal at the least one user interface, which includes the output device in addition to an input device.**

89. As shown above, it is my opinion that Claim 1, from which this claim depends, is obvious over Shanman. In my opinion, Shanman discloses Claim 2’s limitations, therefore Claim 2 is obvious. *See* §V.A, [1a], [1f], [1g], FIG. 5. The display 24 (the output device) of client 10 is included by the user interface of the client 10. EX1004, 6:5-57, 13:25-42, Figs. 2, 5. In Shanman, the consumer data processing units allows selection of the goods by mouse click then displays the shopping list including aisle information *on the same display* the selection was made on. *Id.*

**C. Claim 4. The method of claim 2, wherein the at least one user interface includes a mobile user interface.**

90. As shown above, it is my opinion that Claim 2, from which this claim depends, is obvious over Shanman. In my opinion, Shanman discloses Claim 4’s limitations, therefore Claim 4 is obvious. *See* §V.B, §V.A., [1a]. Shanman discloses mobile devices. In Shanman, “the teachings of the present invention are

equally applicable for uses in devices such as . . . telephones, cellular and satellite communications devices and the like, handheld computers, wristwatch-type computing devices.” EX1004, 11:46-52. The mobile devices have a user interface (“user input device”), i.e., a client device 21 includes a keyboard 22, a mouse 23, and a display 24. EX1004, 6:5-57, 8:63-65, 13:4-42, 16:66-17:4, 22:9-12, and Fig. 2.

**D. Claim 6. The method of claim 4, wherein the product location information signal is configured to enable, at least indirectly, the at least one user interface to provide information concerning one or more products that are being specially promoted or that are located close by the at least one user interface.**

91. In my opinion, this claim recites non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is recorded. *See* III.E. Regardless, as shown above, it is my opinion that Claim 4, from which this claim depends, is obvious over Shanman. In my opinion, Shanman discloses Claim 6’s limitations, therefore Claim 6 is obvious. *See* §V.C, §V.B, [1b], [1g]. Shanman’s mobile user interface displays products that are being specially promoted. Shanman discloses “[c]ompetitive pricing or availability information may also be provided . . .to inform the consumer that the same goods are available at a lower cost elsewhere, or that a different brand of the same type of goods may be purchased at an increased savings,” EX1004, 7:51-65, and “targeted

promotion information to users, to serve targeted purchase incentives for one brand of product to attract customers of another brand (as identified by the consumer profile),” EX1004, 21:13-42. EX1004, 9:30-36. In my opinion, a POSITA would have understood that the product location information signal enables providing the information about products that are being specially promoted on the user interface.

92. Shanman discloses displaying information based on actual product location in the store (FIG. 4A), so when the user selects a region or category within the store, an itemized list of those competing goods located nearby will be displayed (FIG. 4B) (“various brands and sizes of American Cheese”) for selection along with targeted advertising text (106). EX1004, 15:34-54. In my opinion, a POSITA would have understood, or found obvious, that Shanman’s teaching of displaying product information based on actual location within the store discloses providing information regarding products that are close by when the user used these features on a mobile device within the store. *See* [1c]. Further, Shanman discloses a “virtual shopping center” where the user can view the goods on the monitor as they are viewed in store. EX1004, 7:66-8:10, 25:4-19. For the same reasons, in my opinion, a POSITA would have understood that this virtual shopping experience and a user simultaneously using the virtual shopping experience while in-store to view cross-promotional information close to the user interface displays the products close by the user interface.

- E. Claim 7. The method of claim 4, wherein the product location information signal is configured to enable, at least indirectly, the providing of the output signal so that the output signal provides at least one further suggestion to a customer in accordance with one or more customer preferences.**

93. As shown above, it is my opinion that Claim 4, from which this claim depends, is obvious over Shanman. In my opinion, Shanman discloses Claim 7's limitations, therefore Claim 7 is obvious. *See* §V.C, §VI.A, [1g]. In my opinion, the "further suggestion to a customer in accordance with one or more customer preferences" is non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is recorded. *See* III.E. Each of "additional promotional information," EX1004, 5:20-36, 10:15-46, "purchase incentives," EX1004, 10:15-46, and "coupons offered by other national and/or local merchants," *id.*, is a suggestion as required by limitation [1g] or a further suggestion as required by this claim. Shanman discloses that the signal output to the display can provide two or more of these suggestions, and that these suggestions can be based on a customer's historical profile and/or "consumer interests." EX1004, 10:15-46.

- F. Claim 8. The method of claim 4, wherein the product location information signal is configured to enable, at least indirectly, the at least one user interface to provide further additional product-related information, and wherein the further additional product-related information includes at least one of: product promotion information; a current stock of the product; a price of the product; a presence or absence of the product within the store; a time at which the product should be available at the store if the product is currently absent from the store; and an alternate way of obtaining the product if the product is currently absent from the store.**

94. In my opinion, this claim recites non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is recorded. *See* III.E. Regardless, as shown above, it is my opinion that Claim 4, from which this claim depends, is obvious over Shanman. In my opinion, Shanman discloses Claim 8's limitations, therefore Claim 8 is obvious. *See* §V.C, §V.B, [1b], [1g]. The product location information signal enables the client 10 to provide product-related information. *See* §V.B. The product location information signal contains further additional product-related information that includes:

- “[P]roduct promotion information”: “the coupon server transmits to the consumer computer a file containing electronic coupons corresponding to one or more of the selected goods and a file containing data identifying the aisle location in the selected retail outlet,” EX1004,

Abstract; “different brand of the same type of goods may be purchased at an increased savings,” EX1004, 7:47-65;

- “[A] **current stock of the product**”: “name and inventory of goods,” EX1004, 6:33-54; “including inventory data,” EX1004, 13:62-14:1;
- “[A] **price of the product**”: “retail price,” EX1004, 7:51-60;
- “[A] **presence or absence of the product within the store**”: “list of goods actually sold at the selected retail outlet,” EX1004, 6:44-54; “list of the goods offered for sale by that retail outlet,” EX1004, 15:19-24; “physical layout and inventory of goods at the selected retail outlet are displayed on the consumer data processing unit,” EX1004, 25:4-9;
- “[A] **time at which the product should be available at the store if the product is currently absent from the store.**” I have been informed that conditional limitations are not entitled to patentable weight in a method claim, and in my opinion, this limitation is conditional due to the recitation of “if the product is currently absent from the store.”

Regardless, in my opinion, it was well-known to a POSITA to have this information available in a database. For example, both Shelton and the 933 Patent’s file history (a parent of the 690 Patent) show that this information was well-known at the time of the 690 Patent. Shelton discloses “programming of the adjunct computer to store...[information

regarding] ‘out of stock’ vendor inventory” and “the estimated date of arrival of the depleted stock item,” EX1031, 3:1-6, claims 11, 39, while the 933 Patent’s file history states that “anticipat[ing] when a product should be available and input signals between communication devices has been common knowledge,” EX1032, 73. In my opinion, a POSITA would have found it obvious to modify Shanman’s database to include this information. In my opinion, a POSITA would have been motivated to make this combination because the information would aid a customer in obtaining the items on the shopping list. EX1032, 73;

- **“[A]n alternate way of obtaining the product if the product is currently absent from the store.”** I have been informed that conditional limitations are not entitled to patentable weight in a method claim, and in my opinion, this limitation is conditional due to the recitation of “if the product is currently absent from the store.” Regardless, in my opinion, a POSITA would have found Shanman’s disclosure of maintaining inventory for a plurality of retail outlets and providing the ability to select the other stores renders obvious an alternate method of obtaining an absent product. For example, Shanman discloses “the same goods are available at a lower cost elsewhere,” EX1004, 7:47-8:10, the ability to “select various choices from a list of alternatives,” EX1004, 17:40-54,

and “a plurality of participating retail outlets, including inventory data,”

EX1004, 13:59-14:1.

- G. Claim 9. The method of claim 8, wherein the further additional product-related information relates to either the time at which the product should be available at the store if the product is currently absent from the store, or the alternate way of obtaining the product if the product is currently absent from the store.**

95. In my opinion, this claim recites non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is recorded. *See* III.E. I have also been informed that conditional limitations are not entitled to patentable weight in a method claim, and, in my opinion, this is a conditional limitation due to the recitation of “if the product is currently absent from the store.” Regardless, as shown above, it is my opinion that Claim 8, from which this claim depends, is obvious over Shanman. In my opinion, Shanman discloses Claim 9’s limitations, therefore Claim 9 is obvious. *See* §V.F (last two bullet points).

- H. Claim 10. The method of claim 8, wherein the further additional product-related information relates to either the current stock of the product, or the presence or absence of the product within the store.**

96. In my opinion, this claim recites non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is

recorded. *See* III.E. Regardless, claim 8, from which this claim depends, is obvious over Shanman. In my opinion, Shanman discloses claim 10's limitations, so claim 10 is obvious. *See* §V.F (second and fourth bullet points).

**I. Claim 12. The method of claim 4, further comprising one or both of: receiving an additional inquiry signal that relates to something other than a product location-type inquiry; or obtaining identification information concerning the customer that at least in part allows for the providing of an additional suggestion to the customer.**

97. As shown above, it is my opinion that Claim 4, from which this claim depends, is obvious over Shanman. In my opinion, Shanman discloses Claim 12's limitations, therefore Claim 12 is obvious. *See* §V.C. In my opinion, the “that relates to something other than a product location-type inquiry” and “that at least in part allows for the providing of an additional suggestion to the customer” are non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is recorded. *See* III.E. Regardless, Shanman discloses an additional non-location inquiry signal for the server to obtain identification information concerning the customer—a user request for registration forms is an additional inquiry that relates to something other than a product location-type inquiry; it is for the user to provide—and the system to obtain—customer identification information. EX1004, 9:40-10:15. Shanman discloses “consumer data processing unit [passes] a request for the HTML documents.” *Id.* Shanman

also discloses creating a user profile through “fill-in forms” and “fill-in form tags,” which is an inquiry from the user for forms to provide registration information and discloses obtaining identification information concerning the customer. EX1004, 8:28-65, 17:40-18:3. Specifically, Shanman discloses an “example” where “one such technique for creating a consumer profile is through the use of HTML ‘fill-in’ form tags,” EX1004, 23:52-64, and “[i]nformation may be acquired from the user by means of any known process, such as by HTML fill-in forms,” EX1004, 9:30-10:15. In my opinion, a POSITA would have understood that the user requesting forms to provide registration information and the consumer data processing unit sending a request for the registration form is an inquiry that is different than a product location inquiry.

98. Shanman also discloses obtaining identification information concerning the customer through “personal identification number (‘PIN’), Network IDs (known as ‘IP address’), and client IDs (known as ‘cookies’)” EX1004, 5:20-6:4, 9:30-36, 14:26-47. Shanman assigns this identification information to a user’s profile in the process of “creating a database of user profiles.” EX1004, 5:37-49. Shanman discloses “information acquired from the consumer data processing unit is preferably stored on the coupon server and used to build historical profiles of individual consumers, to serve out highly targeted purchase incentives and other promotional information based on consumer profiles.” EX1004, 9:30-36. A user’s

“interests and purchasing habits” and “preferences” are included in this profile. *See* §V.C., [1b]. Shanman’s user profile enables providing an additional suggestion to the customer. EX1004, 8:28-65, 21:31-22:8. Shanman elaborates “[w]hen a user who has made such choices contacts the same server at a later date, the server assembles information for downloading to the user in accordance with the previously-selected choices,” EX1004, 17:40-18:3, and “[b]ased on the consumer profile, the server can serve out information targeted to the consumers interest, as revealed by the fill-in form,” EX1004, 23:52-64.

**J. Claim 14. The method of claim 1, wherein either (a) the mobile device is able to provide at least some of the information to the at least one user interface, or (b) at least a first one of the at least one user interface is in wireless communication with either a central hub or at least a second one of the at least one user interface, or (c) one or more words associated with the product location inquiry received by way of the at least one user interface are determined by way of a voice recognition process.**

99. As shown above, it is my opinion that Claim 1, from which this claim depends, is obvious over Shanman. In my opinion, Shanman discloses claim 14’s limitations, therefore claim 14 is obvious. With respect to (a), to the extent “provides” means output, Shanman discloses its consumer data processing unit user interface has a monitor that displays at least some of the information. *See* §V.A, §V.B.

100. To the extent “provides” means processes the data, Shanman discloses its consumer data processing unit contains an executable program, HTML

formatted fill-in forms, and a web browser. EX1004, 17:4-8; 18:20-54; 22:9-29; 24:22-36. In my opinion, a POSITA would have understood that the consumer data processing unit therefore processes some of the information at its user interface.

101. To the extent “provides” means offers some information from its own storage, Shanman discloses its consumer data processing unit storing an executable program with goods sold at select retail outlets but can access the server for additional information such as coupons. EX1004, 17:4-18:19. Shanman elaborates “the program may then be executed by the consumer on the consumer data processing unit to make selections . . . and then connected to the coupon server over the network to obtain the pertinent coupons.” *Id.* In my opinion, a POSITA would have understood that the consumer data processing unit is able to provide at least some of the information to its display (user interface).

102. With respect to (b), Shanman’s client is a user interface in wireless communication with a server. *See* [1a]. In my opinion, a POSITA would have understood that the server of Shanman is disclosure of a central hub.

103. With respect to (c), Shanman discloses receiving product location inquiries by voice command. *See* [1c]; EX1004, 8:63-65. 22:9-12.

**VI. GROUND 2: OGASAWARA AND BEACH RENDER OBVIOUS CLAIMS 1, 2, 4, 6-10, 12 AND 14**

**A. Claim 1**

104. As shown below, in my opinion, Ogasawara in view of Beach renders Claim 1 obvious.

**1. [1pre] A method of providing product location information within a store, the method comprising the steps of:**

105. In my opinion, Ogasawara discloses the preamble under any reasonable construction of “within a store.” *See* §IV.B; EX1005, 1:8-10 (“a computer based system for locating a customer’s position within a shopping store and displaying product and location information”), Abstract, 2:8-13, Fig. 8.

**2. [1a] providing at least one information storage device including a database, wherein the at least one information storage device is configured to be at least indirectly in communication with at least one other device that includes at least one user interface, and wherein at least one of the at least one information storage device and the at least one other device with respect to which the at least one information storage device is configured to be at least indirectly in communication is or includes a mobile device**

106. In my opinion, Ogasawara discloses this limitation, and Ogasawara in view of Beach renders this limitation obvious. Ogasawara discloses providing an information storage device (“store central computer’s memory”) including a database (“merchandise item database 55”) and another device (“mobile terminal”) that includes a user interface (“touch screen”). EX1005, Abstract, 2:27-46 (“electronic personal shopping systems that includes a mobile terminal which may

be either hand-held or mounted on a shopping cart”), 4:36-67, 5:19-6:10, Figs. 1, 6. The information storage device (“store central computer’s memory”) is configured to be in communication with the mobile terminal through the server (as shown by the antennas):

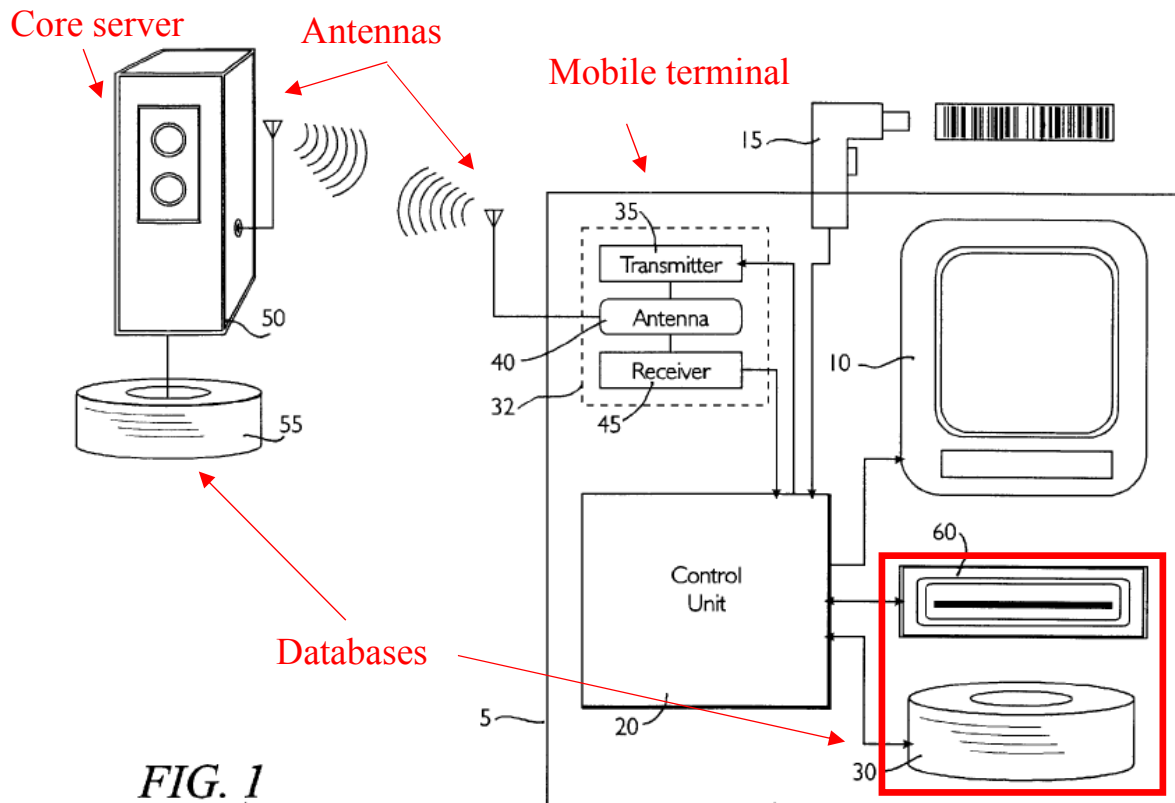


**FIG. 1**

EX1005, Fig. 1 (annotations added), 3:58-63. Ogasawara discloses a “mobile terminal is further configured to communicate with a store central computer by means of an individually addressable RF communication transceiver,” EX1005, 2:32-36, and “the mobile personal shopping terminal 5 communicates . . . with a retail store’s core server 50 for purposes of accessing the retail facility’s database

55,” EX1005, 5:19-6:11. The customer is able to use Ogasawara’s disclosure in real-time in the store. Ogasawara discloses “a customer location recognition feature of the personal shopping system which is able to recognize a customer’s *current location in a retail facility*,” EX1005, 6:41-44 (emphasis added)), and “a plurality of RF transceivers may be located at periodic intervals *throughout the retail facility* and connected to the core server 50 through a local-area-network (LAN),” EX1005, 5:62-65 (emphasis added).

107. Ogasawara further discloses that the mobile device includes a user interface. EX1005, 10:13-24, 14:66-15:28. Ogasawara discloses “[p]ressure sensitive (touch screen) technology may be incorporated into the display 10 so that a shopper may access the mobile terminal 5 by merely touching certain portions of the screen” and “a numeric or alpha-numeric button or keypad arrangement may be provided in combinations with the display 10.” EX1005, 4:61-67. Ogasawara discloses “[o]btaining information relating to various purchased items is performed by a universal product code (UPC) bar code scanner 15, connected to input UPC bar codes to the mobile terminal 5.” EX1005, 5:1-4.

108. Ogasawara further discloses that the information storage device (store central computer’s memory) includes a merchandise item database, including a Price Lookup Table, which is an “item database is resident in a memory location of the store computer,” EX1005, 19:25-27. EX1005, 2:41-46, 6:60-7:1, 8:1-34. Figs.

1, 6, 7. In my opinion, a POSITA would have understood that database 55 and core server 50 are discussed in Ogasawara as the “store central computer,” which is a device. To the extent it is alleged that store central computer is not a “device” that includes both database 55 and core server 50, in my opinion it would have been obvious to a POSITA to integrate the database and the server into a single device.

**3. [1b] wherein the at least one information storage device includes both product location information and additional product-related information linking a product with another product in a cross-referential manner;**

109. In my opinion, Ogasawara discloses this limitation, and Ogasawara in view Beach renders this limitation obvious. *See* [1a]. Ogasawara discloses that the information storage device (“store central computer’s memory”) includes a merchandise item database, comprising at least a Price Lookup Table that includes product location information and additional product information (e.g., brand name, generic name) that links products in a cross-referential manner. EX1005, Abstract, 2:41-46, 3:42-48, 6:60-7:67, Figs. 6, 7. Ogasawara discloses an example where “[a] specific product location would be associated with the generic term ‘spice’ . . . the item information field 312 provides a means of linking the location information field 314 of the location table 350 to any particular one of the items listed in the product table 300A in order that any item’s location information may be accessed and displayed.” EX1005, 8:1-34. In my opinion, a POSITA would

have understood Ogasawara's disclosure of links between "generic" and "specific" entries in the database discloses cross-referential links between products.

110. Ogasawara further discloses linking or associating a product in the customer's profile in the database with "recommended replenishment items," EX1005, Abstract, or "recommended promotional items," EX1005, 3:38-48, in a cross-referential manner. Ogasawara discloses that "[a] closest promotional item to the customer's calculated current location is then identified as the desired destination item and the mobile terminal displays those directions to the customer." EX1005, 3:45-48. In my opinion, it would have been obvious to a POSITA to implement the identification of the closest promotional item disclosed in Ogasawara by including cross-referential links between two products so that each product's additional product-related information references the other product.

111. Ogasawara's database disclosures<sup>2</sup> disclose, or render obvious, "additional product-related information linking a product with an other product in a cross-referential manner" because, in my opinion, a POSITA would have understood, or found obvious, that database functionality provides functionality to link products together based on the information within ("additional product-related information").

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<sup>2</sup> See, e.g., Abstract ("store database"), 1:26-27 ("database includes a list of items of merchandise in the store"), 2:41("merchandise item database").

112. In the event someone alleges that Ogasawara does not disclose linking a product with another product in a cross-referential manner, in my opinion a POSITA would have found it obvious to modify Ogasawara to include that feature based on Beach. *See* §IV.C.

113. It was well-known in the art and customary for a product database to include links between products in a cross-referential manner. For example, Beach discloses links between products in a cross-referential manner to offer product-specific alternatives. EX1006, 15:49-50 (“[e]ssential items could also be **linked to** or marked with alternative products” (emphasis added)). In my opinion, a POSITA would have understood that it would be obvious to modify Ogasawara to include product-specific “alternatives” using a cross-reference link in the database as taught by Beach.

114. In addition, Beach discloses that it was known that products are regularly associated with different types of products. EX1006, 14:24-27. Beach teaches “if the customer’s prior purchase record indicates that the customer usually buys charcoal with hot dogs or hamburgers, the terminal may also ask the customer if he needs ‘Charcoal.’” EX1006, 14:24-27. In my opinion, a POSITA would have understood that it would be obvious to modify Ogasawara to cross-link a product with other types of products that are regularly bought together using a cross-reference link in the database as taught by Beach.

115. Beach, Ogasawara, and the 670 Patent are analogous art, as they all relate to interactive multimedia information retrieval systems. EX1001, 9:2-5; EX1005, 4:61-67; EX1006, 9:5-8. In my opinion, a POSITA would have understood that it would be obvious to modify Ogasawara to include product-specific “alternatives” and/or other types of products using a cross-reference link in the database as taught by Beach.

116. In light of Ogasawara’s disclosure of including “a shopping list or a recommended replenishment item list,” EX1005, Abstract, in my opinion a POSITA would have been motivated to combine Ogasawara with Beach in order to improve the offering of Ogasawara by also providing product-specific alternatives and/or other types of products to the customer for those lists that are related to the desired product. Moreover, the feature of linking two products as product-specific alternatives and/or related/associated products to each other in a cross-referential manner enables the customer to navigate through products in the store more efficiently and find alternative products quickly. In my opinion a POSITA would have had a reasonable expectation of success in so doing because linking two items in a database was well-known to a POSITA at the time of the 670 Patent and involved no more than routine skill.

4. **[1c] receiving a product location inquiry signal regarding the product, the product location inquiry signal being at least indirectly based upon a product location inquiry received by way of the at least one user interface;**

117. In my opinion, Ogasawara discloses this limitation, and Ogasawara in view Beach renders this limitation obvious. *See* [1a]. For example, the mobile terminal enables a customer to make inquiries regarding the location of a product using the touchscreen and the mobile terminal as well as the server 50 receiving those inquiries made by the customer. EX1005, 6:54-59. Ogasawara discloses “the customer location recognition feature is able to respond to customer prompts, by which a *customer may further make inquiries about the location* and direction of *any specific item* in the retail facility.” EX1005, 8:55-9:7 (emphasis added). A POSITA would have understood, or found obvious, Ogasawara’s keypad (“user interface”) that “may be provided in combination with the display 10 in order to define an input device” discloses receiving a product location inquiry by keyword search. EX1005, 4:65-67.

118. In my opinion, a POSITA would have found obvious for the Ogasawara system to display location along with additional product information in response to scanning a UPC bar code on the product. As such, scanning the UPC bar code would be a product location inquiry. Ogasawara teaches that “the customer scans an item’s UPC bar code, provided either on the product itself or in a convenient location on the display shelf proximate the item.” EX1005, 8:57-60. It

would have been obvious to use this functionality developed for in-store customers to help employees stock or return products to the correct locations in the store.

119. In my opinion, a POSITA would have understood, or found it obvious, that Ogasawara discloses a system that receives the product location inquiry in real-time, while the user is shopping, because Ogasawara expressly states that “a customer may further make inquiries about the location” after scanning the UPC on a product. EX1005, 6:54-59.

**5. [1d] processing the product location inquiry signal at a signal processing device to determine a processed product location inquiry signal**

120. In my opinion, Ogasawara discloses this limitation. *See* [1c]. The mobile terminal is a signal processing device that receives the inquiry from the user and creates a signal (i.e., processes for RF transmission) that it sends to the store central computer/core server 50 that is a product location inquiry signal. EX1005, 6:54-59, 8:61-66. Ogasawara discloses a “wireless communication transceiver 32 provides the mobile terminal’s control unit 20 with means for communicating with the retail facility core server 50 through an RF signal link” and “the mobile personal shopping terminal 5 communicates, via RF energy, with a retail store’s core server 50 for purposes of accessing the retail facility’s database 55.” EX1005, 5:1-60.

121. Ogasawara provides a second disclosure of this limitation where the signal, including the user's inquiry sent to the server by the mobile terminal is processed by the server to determine a product location inquire signal to be used for accessing the memory of the store central computer/core server 50. In this regard, in my opinion, a POSITA would have understood and/or have found obvious that the signal received from the mobile terminal could not be used directly to retrieve the desired product location information from the memory of the store central computer/core server 50, and that the store central computer/core server 50 would need to determine how to generate the necessary signal for doing so.

**6. [1e] querying the at least one information storage device to obtain portions of the product location information and additional product-related information in response to the processed product location inquiry signal**

122. In my opinion, Ogasawara discloses this limitation, and Ogasawara in view Beach renders this limitation obvious. *See* [1a], [1d]. Ogasawara discloses querying the store central computer's memory in response to a product location inquiry signal to obtain location and other product-related information. EX1005, 2:41-46, 6:54-59, 8:1-9:7, 9:3-15, 5:42-46. Ogasawara further discloses the following: "a customer may further make inquiries about the location and direction of any specific item in the retail facility," EX1005, 6:54-59; "the item information field 312 provides a means of linking the location information field 314 of the

location table 350 to any particular one of the items listed in the product table 300A in order that any item's location information may be accessed and displayed by a shopper's operation of the mobile personal shopping terminal," EX1005, 8:1-9:7; "once a match is made between a scanned item's SKU code and an SKU field of an item entry, the core server 50 accesses the item entry and transmits the information contained therein to the mobile terminal. At the same time, the store's core server accesses the item's product location information from its associated product location information file entry," EX1005, 9:3-15; and, "the mobile personal shopping terminal 5 communicates, via RF energy, with a retail store's core server 50 for purposes of accessing the retail facility's database 55," EX1005, 5:42-46. Products are linked in the database with a "recommended promotional item," EX1005, 3:38-48, or a "recommended replenishment item," EX1005, Abstract, in a cross-referential manner. Ogasawara describes "[a] closest promotional item to the customer's calculated current location is then identified as the desired destination item and the mobile terminal displays those directions to the customer." EX1005, 3:45-48. In my opinion, a POSITA would understand that the recommended promotional item information is obtained when a product location inquiry occurs. As discussed above in Section [1b], in my opinion, it would have been obvious to a POSITA to implement the identification of the closest promotional item disclosed in Ogasawara by including cross-referential links

between two products so that each product's additional product-related information references the other product.

123. Moreover, in my opinion, a POSITA would have found it obvious to modify Ogasawara to include that feature in the query based on Beach. *See* [1b]. Beach discloses "if the customer's prior purchase record indicates that the customer usually buys charcoal with hot dogs or hamburgers, the terminal may also ask the customer if he needs 'Charcoal.'" EX1006, 14:24-27. In my opinion, a POSITA would have understood that it would be obvious to modify Ogasawara to provide information about other types of products that are regularly bought together when a query is made.

**7. [1f] providing a product location information signal that is at least indirectly responsive to the processed product location inquiry signal;**

124. In my opinion, Ogasawara discloses this limitation. *See* [1d], [1e]. Ogasawara's server responds to the processed product location inquiry signal with an information signal that contains product location information. EX1005, 5:1-46, 6:54-59, 8:1-9:7, 9:8-44. Specifically, Ogasawara states "the mobile personal shopping terminal 5 communicates, via RF energy, with a retail store's core server 50 for purposes of accessing the retail facility's database 55," EX1005, 5:1-46, and "the customer's source location (location-a) is processed with respect to a desired item's destination location (location-b) by . . . the core server which

calculates direction and distance of the targeted desired item relative to the customer's current source location.” EX1005, 9:8-44.

8. **[1g] wherein the product location information signal is configured to enable, at least indirectly, a providing of an output signal at an output device as a response to the product location inquiry that includes location information concerning the product and also provides at least one suggestion related to the other product.**

125. In my opinion, Ogasawara discloses this limitation, and Ogasawara in view Beach renders this limitation obvious. *See* [1f]. Ogasawara discloses that the mobile terminal provides an output signal to an output device that can show “[d]irection and distance information, i.e. aisle and shelf number, is displayed on the mobile terminal display's panel” (e.g., “LCD display panel”). EX1005, 2:59-60. In my opinion, a POSITA would have understood, or at least found it obvious, that the display of information on the display of the mobile device requires the output of a signal to the display.

126. In my opinion, the “includes location information concerning the product and also provides at least one suggestion related to the other product” is non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is recorded. *See* III.E. Regardless, Ogasawara's display includes both product location information and a suggestion related to another product, such as “[r]eplenishment items, recommended

promotional items and items contained on a general shopping list ... based on the customer's current location," EX1005, 3:55-58, and after "a closest promotional item to the customer[]...is identified as the desired destination item...the mobile terminal displays those directions to the customer," EX1005, 3:45-48.

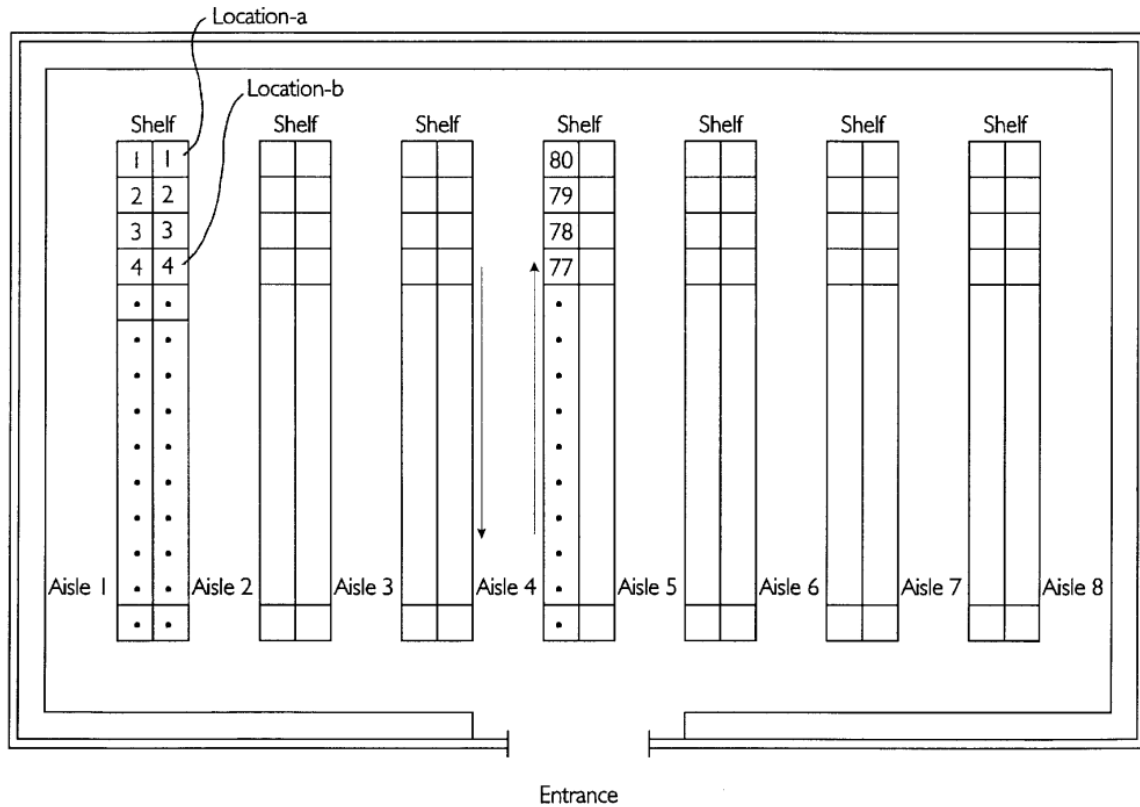


**FIG. 8**

*Id.*, Fig. 8 (showing product locations).

127. As discussed above, in my opinion, a POSITA would have been motivated to combine Ogasawara with Beach to include cross-referential links between products in the Ogasawara database to enable offering products that are alternatives to the one in the consumer inquiry. *See* [1b]. In the proposed

combination, querying the database for an item includes a response with the product location and suggestions on product alternatives and promotions for other products, based on the cross-referential information stored in the database.

**B. Claim 2. The method of claim 1, wherein the product location information signal is configured to enable, at least indirectly, the providing of the output signal at the least one user interface, which includes the output device in addition to an input device.**

128. As shown above, it is my opinion that Claim 1, from which this claim depends, is obvious over Ogasawara/Beach. In my opinion, Ogasawara discloses Claim 2's limitations, therefore Claim 2 is obvious. *See* §VI.A, [1a], [1g].

Ogasawara's product location information signal is configured to enable the providing of the output signal at the mobile terminal's user interface. Ogasawara's mobile terminal includes an output device (e.g., "LCD display panel") that includes a user interface, such as a "touch screen" that is "incorporated into the display." EX1005, 4:62-64.

**C. Claim 4. The method of claim 2, wherein the at least one user interface includes a mobile user interface.**

129. As shown above, it is my opinion that Claim 2, from which this claim depends, is obvious over Ogasawara/Beach. In my opinion, Ogasawara discloses Claim 4's limitations, therefore Claim 4 is obvious. *See* §VI.B. Ogasawara's user interface ("touch screen") includes a mobile user interface with a "[p]ressure sensitive (touch screen) technology may be incorporated into the display 10 so that

a shopper may access the mobile terminal 5 by merely touching certain portions of the screen” and “a numeric or alpha-numeric button or keypad arrangement may be provided in combinations with the display 10.” EX1005, 4:61-67. EX1005, 10:13-24, 14:66-15:28.

**D. Claim 6. The method of claim 4, wherein the product location information signal is configured to enable, at least indirectly, the at least one user interface to provide information concerning one or more products that are being specially promoted or that are located close by the at least one user interface.**

130. In my opinion, this claim recites non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is recorded. *See* III.E. Regardless, as shown above, it is my opinion that Claim 4, from which this claim depends, is obvious over Ogasawara/Beach. In my opinion, Ogasawara discloses claim 6’s limitations, therefore claim 6 is obvious. *See* §VI.C, §VI.A, [1f]. Ogasawara’s product location information signal, *see* [1f], is configured to enable, at least indirectly, the at least one user interface (“touch screen”) on the mobile terminal to provide information concerning one or more products that are specially promoted or that are located close by the at least one user interface. EX1005, 6:44-47, 3:45-48. Ogasawara teaches “on the basis of a customer’s current location...suitable directions or location indicia to promotional items which are located on store shelves most proximate to the customer’s current

location” are provided, EX1005, 6:44-47, and “[a] closest promotional item to the customer’s calculated current location is then identified as the desired destination item and the mobile terminal displays those directions to the customer,” EX1005, 3:45-48.

**E. Claim 7. The method of claim 4, wherein the product location information signal is configured to enable, at least indirectly, the providing of the output signal so that the output signal provides at least one further suggestion to a customer in accordance with one or more customer preferences.**

131. As shown above, it is my opinion that Claim 4, from which this claim depends, is obvious over Ogasawara/Beach. In my opinion, Ogasawara discloses claim 7’s limitations, therefore claim 7 is obvious. *See* §VI.C, §VI.A, [1g]. In my opinion, the “further suggestion to a customer in accordance with one or more customer preferences” is non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is recorded. *See* III.E. Regardless, in the proposed combination, querying the database of an item includes a response with the product location, suggestions on product alternatives, and promotions for other products, based on the cross-referential information stored in the database. Each product alternative or promotion (EX1006, 14:49-50) for other products is a suggestion (EX1005, 3:42-48, 3:55-58) as required by limitation [1g] or a further suggestion as required by this claim. Ogasawara discloses that the

signal output to the display can provide these suggestions, and that these suggestions can be based on a customer's historical profile and/or "consumer interests," such as "a customer's food preferences, drink preferences," EX1005, 10:15-56, or relate to "a sale product that the customer would be interested in purchasing...to ensure[] the customer will not miss out on the saving offered by the store," EX1005, 16:7-11. In my opinion, a POSITA would have understood Ogasawara's disclosure of storing the customer's food and drink preferences and disclosure of advertising to the customer based on what the customer is "interested in purchasing" is disclosure the Ogasawara's output includes a further suggestion to a customer in accordance with their customer preferences.

**F. Claim 8. The method of claim 4, wherein the product location information signal is configured to enable, at least indirectly, the at least one user interface to provide further additional product-related information, and wherein the further additional product-related information includes at least one of: product promotion information; a current stock of the product; a price of the product; a presence or absence of the product within the store; a time at which the product should be available at the store if the product is currently absent from the store; and an alternate way of obtaining the product if the product is currently absent from the store.**

132. In my opinion, this claim recites non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is recorded. *See* III.E. Regardless, as shown above, it is my opinion that Claim 4,

from which this claim depends, is obvious over Ogasawara/Beach. In my opinion, Ogasawara discloses Claim 8's limitations, therefore Claim 8 is obvious. *See* §VI.C, [1a], [1e]. Ogasawara's mobile terminal further displays additional product information including:

- “[S]ale or promotion information regarding a sale or promotion relating to the product”: “even if a customer fails to notice a sign or an advertisement about a sale product that the customer would be interested in purchasing, the recommendation of such products on the customer's display unit ensures that the customer will not miss out on the savings offered by the store,” EX1005, 16:6-11; “[r]eplenishment items, recommended promotional items and items contained on a general shopping list are all candidates for a next desired destination item based on the customer's current location,” EX1005, 3:55-58; “[a] closest promotional item to the customer's calculated current location is then identified as the desired destination item and the mobile terminal displays those directions to the customer,” EX1005, 3:45-48;
- “[A] current stock of the product”: “status of current store inventory . . . the quantity of that item may be decremented in the database so that a current running total inventory may be maintained,” EX1005, 5:43-56;

- “[A] **price of the product**”: “each item entry includes a price field 306,” EX1005, 7:34-35; “[u]p-to-date pricing information,” EX1005, 5:43-56;
- “[A] **presence or absence of the product within the store**”: “status of current store inventory,” EX1005, 5:43-56;
- “[A] **time at which the product should be available at the store if the product is currently absent from the store.**” I have been informed that conditional limitations are not entitled to patentable weight in a method claim, and in my opinion, this limitation is conditional due to the recitation of “if the product is currently absent from the store.” Regardless, in my opinion, it was well-known to a POSITA to have this information available in a database. For example, both Shelton and the 933 Patent’s file history (a parent of the 690 Patent) show that this information was well-known at the time of the 690 Patent. Shelton discloses “programming of the adjunct computer to store...[information regarding] ‘out of stock’ vendor inventory” and “the estimated date of arrival of the depleted stock item,” EX1031, 3:1-6, claims 11, 39, while the 933 Patent’s file history states that “anticipat[ing] when a product should be available and input signals between communication devices has been common knowledge,” EX1032, 73. A POSITA would have found obvious to provide the customer with a time at which the product should be available at the store if the product is currently

absent from the store based on Ogasawara's teaching of reducing opportunity loss. Ogasawara discloses "[o]ppportunity loss is a serious problem for retail stores since it suggests that another store is successfully competing for business in certain areas." EX1005, 16:24-26. A POSITA would have understood and found obvious that informing the customer of the time when the product would be available would help reduce the chances that a customer would go to a competing store.

- **“[A]n alternate way of obtaining the product if the product is currently absent from the store.”** I have been informed that conditional limitations are not entitled to patentable weight in a method claim, and in my opinion, this limitation is conditional due to the recitation of “if the product is currently absent from the store.” Regardless, in my opinion, a POSITA would have found obvious to provide the customer an alternate way of obtaining the product such as allowing the customer to order the product for delivery (*see, e.g.*, Bezos (EX1030, Abstract)) based on Ogasawara's teaching of reducing opportunity loss. Additionally, Ogasawara discloses using a customer's “home personal computer” and the system storing a customer's “home address.” EX1005, 10:13-18, 10:52-53. In my opinion, a POSITA would have understood, or found obvious, that these disclosures

provide an alternate way of obtaining the product such as allowing the customer to order the product for delivery.

**G. Claim 9. The method of claim 8, wherein the further additional product-related information relates to either the time at which the product should be available at the store if the product is currently absent from the store, or the alternate way of obtaining the product if the product is currently absent from the store.**

133. In my opinion, this claim recites non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is recorded. *See* III.E. I have been informed that conditional limitations are not entitled to patentable weight in a method claim, and in my opinion, this limitation is conditional due to the recitation of “if the product is currently absent from the store.” Regardless, as shown above, it is my opinion that Claim 8, from which this claim depends, is obvious over Ogasawara/Beach. *See* §VI.F. In my opinion, Ogasawara discloses claim 9’s limitations, therefore claim 9 is obvious. *See* §VI.F (last bullet).

**H. Claim 10. The method of claim 8, wherein the further additional product-related information relates to either the current stock of the product, or the presence or absence of the product within the store.**

134. In my opinion, this claim recites non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is

recorded. *See* III.E. Regardless, claim 8, from which this claim depends, is obvious over Ogasawara/Beach. In my opinion, Ogasawara discloses claim 10's limitations, so claim 10 is obvious. *See* §VI.F (second and fourth bullet points).

**I. Claim 12. The method of claim 4, further comprising one or both of: receiving an additional inquiry signal that relates to something other than a product location-type inquiry; or obtaining identification information concerning the customer that at least in part allows for the providing of an additional suggestion to the customer.**

135. As shown above, it is my opinion that Claim 4, from which this claim depends, is obvious over Ogasawara/Beach. In my opinion, Ogasawara discloses claim 12's limitations, therefore claim 12 is obvious. *See* §VI.C. In my opinion, the “that relates to something other than a product location-type inquiry” and “that at least in part allows for the providing of an additional suggestion to the customer” are non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is recorded. *See* III.E. Regardless, Ogasawara allows receiving an inquiry signal that relates to something other than the product location-type inquiry, such as “allowing the customer to request recommendation of a particular item.” EX1005, 13:38-39. Ogasawara also discloses non-location inquiries; for example, “an inquiry is made as to whether or not there are any remaining items in the replenishment item table left to examine,”

EX1005, 14:55-57, or an “inquiry is made as to whether or not the maximum purchase interval has been exceeded, EX1005, 14:58-59.

136. Additionally, Ogasawara’s customer is identified by a unique terminal or a unique customer ID. In particular, Ogasawara discloses obtaining identification information concerning the customer at the at least one user interface because Ogasawara’s customer is identified by a “unique terminal ID,” EX1005, 10:30-31, “each terminal is assigned a unique terminal ID,” EX1005 or a “unique customer ID which may be used by the mobile terminal as unique identification flag.” EX1005, 10:33-34. The customer ID allows Ogasawara to provide additional suggestions/recommendations to the customer based on stored information about the customer. Ogasawara discloses “once the mobile personal shopping terminal makes initial contact with the retail facility’s core server [it] transmits the customer ID and profile information,” EX1005, 15:56-59, and “recommendations are based on information contained in the customer’s profile . . . obtained from the customer’s ID card,” EX1005, 15:54-56.

- J. Claim 14. The method of claim 1, wherein either (a) the mobile device is able to provide at least some of the information to the at least one user interface, or (b) at least a first one of the at least one user interface is in wireless communication with either a central hub or at least a second one of the at least one user interface, or (c) one or more words associated with the product location inquiry received by way of the at least one user interface are determined by way of a voice recognition process.**

137. As shown above, it is my opinion that Claim 1, from which this claim depends, is obvious over Ogasawara/Beach. In my opinion, Ogasawara discloses claim 14's limitations, therefore claim 14 is obvious. *See* §VI.A, [1a]. With respect to (a), Ogasawara's mobile device is able to provide some of the information at the user interface using its local copy of the PLU table. EX1005, 7:1-18. Ogasawara discloses the "PLU Table, as hosted by the mobile terminal's local storage unit (30 of FIG. 1), is a mirror image of a virtual PLU Table hosted by the store's core server." EX1005, 7:1-18. To the extent that "able to provide" means display, Ogasawara's mobile device displays some of the information to the user interface. EX1005, 4:61-67. Ogasawara discloses "[p]ressure sensitive (touch screen) technology may be incorporated into the display 10 so that a shopper may access the mobile terminal 5 by merely touching certain portions of the screen." EX1005, 4:61-67. To the extent "able to provide" requires the mobile device to process the data, Ogasawara discloses the mobile device processes some of the information displayed on the user interface. "[T]he mobile device is then able to calculate a direction and distance to a desired destination item based on the customer's current

location and the location information assigned to the destination item in the merchandise item database.” EX1005, 2:50-54. The mobile device is also “able to offer suggestions on promotional item.” EX1005, 2:24.

138. With respect to (b), Ogasawara further discloses that the user interface is in wireless communication with a central hub. Ogasawara teaches “[c]ommunication between the mobile personal shopping terminal 5 and the external information source terminal is implemented by a wireless communication”), EX1005, 5:19-2, and “[t]he mobile terminal may then transmit the shopping list to the store central computer using the RF communication transceiver,” EX1005, 2:65-3:1. In my opinion, a POSITA would have understood that the store central computer of Ogasawara is disclosure of a central hub.

## **VII. GROUND 3: OGASAWARA, BEACH, AND SHANMAN RENDER OBVIOUS CLAIM 9**

- A. Claim 9. The method of claim 8, wherein the further additional product-related information relates to either the time at which the product should be available at the store if the product is currently absent from the store, or the alternate way of obtaining the product if the product is currently absent from the store.**

139. In my opinion, this claim recites non-functional descriptive material that is not entitled to patentable weight because it is directed only to the content of the information and bears no functional relationship to the substrate on which it is recorded. *See* III.E. I have been informed that conditional limitations are not entitled to patentable weight in a method claim, and in my opinion, this limitation

is conditional due to the recitation of “if the product is currently absent from the store.” Regardless, as shown above, it is my opinion that Claim 8, from which this claim depends, is obvious over Ogasawara/Beach. *See* §VI.F. In my opinion, Ogasawara in view of Beach in further view of Shanman renders this claim obvious. Shanman discloses an alternate way of obtaining the product if the product is currently absent from the store. *See* §V.G.

140. Shanman, Beach, Ogasawara, and the 670 Patent are analogous art, as they all relate to interactive multimedia information retrieval systems. *See* §IV.A; EX1001, 9:2-5; EX1005, 4:61-67; EX1006, 9:5-8. In my opinion, a POSITA would have been motivated to further combine Ogasawara/Beach with Shanman in order to improve the offering of Ogasawara by not limiting Ogasawara’s additional product-related information to products found only in a single store, but allowing customers to optimize their shopping by getting product information from multiple competitive stores. For example, Shanman teaches showing information relating to products such as “the same goods are available at a lower cost elsewhere,” EX1004, 7:47-8:10, permitting a customer to “select choices from a list of alternatives,” EX1004, 17:40-54, or “a plurality of participating retail outlets, including inventory data,” EX1004, 13:59-14:1. In my opinion, a POSITA would have had a reasonable expectation of success in so doing because adding such

information to the database at the time of the 670 Patent involved no more than routine skill.

141. In my opinion, a POSITA would have found obvious “the alternate way of obtaining the product if the product is currently absent from the store” based on the combination of Ogasawara and Beach in view of Shanman’s disclosure of maintaining inventory for “a plurality of participating retail outlets,” EX1004, 13:59-14:1, and providing the ability to select either the other stores, “the same goods...at a lower cost elsewhere,” EX1004, 7:47-8:10, or “select choices from a list of alternatives,” EX1004, 17:40-54, render obvious an alternate method of obtaining an absent product.

## **VIII. SECONDARY CONSIDERATIONS**

142. I am not aware of any relevant information related to secondary considerations of obviousness. For example, I am not aware of any attempt to commercialize the claimed technology in a product or through licensing. To the extent Patent Owner comes forward with any such information, I will consider it.

## **IX. AVAILABILITY FOR CROSS-EXAMINATION**

143. 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 and that cross-examination will take place

within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during a time as mutually agreed between the parties.

## **X. RIGHT TO SUPPLEMENT**

144. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises. This declaration represents only those opinions that I have formed to date. I reserve the right to revise, supplement, and/or amend my opinions stated herein based on new information that becomes available to me and on my continuing analysis of the materials already provided.

## **XI. CONCLUSION**

145. I may utilize the documents cited and/or listed herein, or portions of those documents, as exhibits at any hearing or trial in this proceeding. I may further prepare and use exhibits that summarize portions of my testimony or key terms or concepts presented therein, or other demonstrative exhibits, at any hearing or trial in this proceeding.

146. I reserve the right to supplement my testimony and this report in response to any judicial determinations, in response to the arguments expressed by the Patent Owner or the opinions of the Patent Owner's experts in this proceeding, and/or in light of additional evidence or testimony brought forth at trial or otherwise brought to my attention after the date of my signature below.

147. I hereby declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct, and that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I understand that willful false statements are punishable by fine or imprisonment or both. *See* 18 U.S.C. § 1004.

Dated: November 27, 2023

  
\_\_\_\_\_  
Dr. Don Turnbull

# EXHIBIT A

# Don Turnbull, Ph.D.

## Overview

Software developer, designer and researcher with over 30 years' experience. Contributor to multiple commercially successful consumer and enterprise applications including Artificial Intelligence-drive applications, Data-centric systems, Search systems, Content Management Systems, CASE tools, desktop utilities, Mobile applications, and ecommerce Web sites. Accomplished researcher and creator of innovative, patented and trade-secreted technologies related to information retrieval, behavioral modeling, user interfaces, content organization and analytics. Author of numerous academic publications including: a book on Web-based information seeking and knowledge work, articles on human-computer interaction design, personalization for information retrieval and recommender systems, as well as numerous definitive works on information architecture methodologies, designs and implementations.

## Principal – InfoTheory/Don Turnbull, ULC

2002-ongoing

Advising software companies, design agencies and information services corporations on the research and development of systems architectures, data science activities and human-computer interaction. Directing the design of multi-platform applications (desktop and mobile) for consumer-oriented information systems including Web, smartphone and tablet interfaces, information architectures and ecommerce recommendation systems as well as advising on future development based on data-centric architectures and for re-designing existing systems in use.

Analyzing intellectual property, patent portfolios and innovative technologies to author reports, research software architecture and software development methods, create new IP, advise intellectual asset development, as well as serve as an expert in patent-related cases with prior art, infringement, or validation issues.

Consulted with architectural engineering practice to design a software platform to classify, aggregate and operationalize a wide set of parametric environmental data including sensor networks, geographic and map data, governmental energy datasets and resources, weather behavior and real estate statistics to visualize and enable engineers to plan, design and construct energy efficient systems from individual building to city scale.

Designed and prototyped information retrieval systems and application programming interfaces for consumer and enterprise search systems involving indexing, tagging and faceted-metadata methods. Created techniques and organization schemes to instrument systems for collection and analysis of empirical behavioral data logs from Web site usage and user-generated content. Developed data models and interaction strategies for consumer and vertical channel mobile devices for information retrieval, storage and management.

Advised and coordinated a very large, multiple partner contract systems development effort as the technical architect for a back-office ecommerce enterprise portal that included vendor tool selection, managing and negotiating among partners for project management and strategic goal definition. Devised and configured analytics standards and tools, as well as implementing analysis results to provide guidelines for site information architecture and user experience designs.

Designed and directed creation of a knowledge management system to provide efficient development workflow, search functionality and knowledge discovery from intranet information sources including the design and deployment of enterprise wikis, blogs, social networking and workgroup collaboration tools, source code version control and office documents including (OLAP) reporting and financial applications. Lead efforts to build upon open source applications and protocols including novel interface designs, autonomous agents and collaborative filtering to improve information access and use in the organization.

**Consulting Partner – Aqua M&A****2019 - present**

Advising and mentoring companies with disruptive IP for emerging and high-growth markets. Applying specialized domain experience in areas of Computer Science including Artificial Intelligence, Data Science and Distributed Systems to evaluate and instruct on technology innovation.

**Advisor – Singulos Research Inc.****2019 - present**

Providing strategy, planning, and technical evaluation of applied Machine Learning solutions for Augmented Reality Dynamic Object Comprehension. Guiding intellectual property invention and providing tactical analysis.

**Advisor – ThinkCX****2016 - present**

Directing research efforts for large-scale machine learning platform for collecting, measuring, and predicting user behavior across mobile and networked devices and geo-locational activity traces. Advised on strategic use and extension for a social media analysis framework for user behavior prediction. Advising on the startup process, general technology and inventing as well as patent inventions.

**Advisor – University of Texas at Austin Technology Incubator****2009-2011 & 2013 - ongoing**

Mentor and Advisor with the University of Texas at Austin, Austin Technology Incubator and IC<sup>2</sup> (Innovation, Creativity and Capital) Institute to engage local and international technology companies (primarily software startups) in advancing research, providing strategic expertise, intellectual property evaluation, market assessment and assisting in designing products for market.

**Research Computer Scientist – Tapstream****2013**

Researched and invented novel systems and designs in desktop and mobile computing, data science, user modeling and analytics domains to produce intellectual property for existing and future technologies. Investigated the state of the art and the competitive landscape for software services and advising directions for future product development.

**Principal Data Scientist & Architect – Wyley Interactive****2012-2013**

Researched and developed algorithms, data sets and software architectures for a mobile games discovery, recommendation, and rewards system. Created intellectual property including system designs, algorithms, and computational methods for patent-pending systems. Wrote and coordinated research grants and other funding programs.

Architected an empirical business intelligence analytics platform for understanding and predicting user acquisition, monetization strategy, app distribution, gameplay telemetry, operation costs and social interaction in the mobile gaming space.

**Assistant Professor – University of Texas at Austin****2002-2009**

Created and taught graduate-level courses and development labs in Information Architecture, Interaction Design & Human Computer Interaction (HCI), Web Analytics, Web Information Retrieval Evaluation & Design (search), the Semantic Web and Knowledge Management systems. Investigated very large-scale data mining systems and algorithms (including Web use data for personalization), interface designs for multimedia access and Web search engines. Co-Principal Investigator for Web content classification and collaborative filtering system (the OpenChoice Project) including system architecture, algorithm evaluation, interface design and user coordination. Conducted and collaborated on Information Retrieval system development for blog analysis and topic distillation tasks including spam detection and initial sentiment analysis.

Explored search engine technologies (multimedia, indexing, interaction), search engine optimization (natural organic search, personalized search, sponsored advertising search) as well as creation and empirical analysis of behavioral model of search user experience towards improving the search process.

Advised graduate students and managed research team efforts for information technology research and development including Semantic Web applications, mobile device interfaces, Content Management Systems, Web browser software analysis, Web accessibility evaluation, Web link mining and analytics, information architecture design methodologies, and Web advertising plans and tools.

**Director of Advanced Development – Outride, Inc. (acquired by Google, Inc.) 2000-2001**

Created and Coordinated intellectual property assets including patent applications and licensed patents from Xerox PARC as well as original work developed at Outride. Authored multiple patents relating to personal relevance models for information retrieval, information privacy and e-commerce systems in networked and mobile environments. Worked with attorneys to manage, track, develop and revise patent portfolio. Authored several trade-secreted technologies, patent applications and at least one patent (7,089,237) for interfaces and systems that display content for commerce activities in mobile and/or networked environments which could include desktop, smartphone, tablet or set-top devices.

Initiated and managed Competitive Intelligence efforts to scan for emerging technologies including research reviews, attending conferences and analyzing competitor technologies. Organized intelligence resources for engineering and legal purposes to protect and augment existing intellectual property. Maintained the Competitive Intelligence database as a knowledge management activity and served as a technical strategic advisor for business partners.

Acted as research advisor for all corporate data mining, interface designs and usability studies activities. Worked closely with User Interface design team to design product specifications for an application to search the Web; manage bookmarks; view and search Web use history; and interact with a directory of Web-based resources. Designed high-level technical architecture and interface for a Web browsing privacy application to enable users to control and edit data collected about their Web use activities.

Managed Metrics project with vendors to provide a value proposition for Outride technology for business development. Selected an external testing agency; designed the initial tests; determined evaluation criteria; selected competing technologies; designed data collection methods; analyzed test data; and edited the final report. This extremely successful project served as a key asset in demonstrating Outride technology to investors, business partners and industry analysts and additionally used extensively in press releases and corporate product literature.

**Research Scientist & WebTracker Development Lead – University of Toronto 1997-2000**

Planned and implemented a 16-month study to develop a comprehensive understanding of corporate Internet use utilizing a synthesis of data collection and analysis methods including an initial survey questionnaire; software to collect use data gathered with a custom-developed Web tracking application; and interviews with study participants.

Analyzed data using qualitative and quantitative methods to test hypotheses of new models of Information Seeking and Information Retrieval behavior. Used study results to make recommendations on improving organizational Knowledge Management and individual Web use techniques, as well as to design new software tools to coordinate and leverage organizations' intranet and Internet use.

Designed and prototyped *WebTracker*: a client-side data collection instrument for transparently logging Web browser use. Researched data collection methods, instruments for Internet protocols and network-enabled client applications. Automated the data mining of WebTracker logs with customized analysis tools to build both individual and aggregate models of Web use. Initiated consortium with other research institutes to expand WebTracker use.

**Lead Technical Architect: Internet Applications – IBM Interactive Media Group 1996**

Designed and authored specifications for hybrid (CD-ROM and Internet) *World Book-IBM Interactive Multimedia Encyclopedia* involving data formats, user interface, indexing structures and versioning controls. Researched and co-developed patented the TRUE/IP protocol for registering, updating and exchanging client-server information via the Internet. Prototyped large-scale collection and analysis of client application and Internet use data.

**Knowledge Management Researcher – AT&T 1995**

Designed and constructed ISO 9000-compliant Web-based Knowledge Management system for corporate technical information. Researched and developed an iterative methodology to develop, organize and publish interactive documents using object-oriented content classification and user-centered design principles. Trained technical staff in this new methodology including coursework and system templates.

**Sr. Information Developer – MicroHelp, Inc. 1994-1995**

Programmed Microsoft Windows utility software application including file metadata analysis and duplication detection algorithms. Designed and prototyped user interface for *UnInstaller for Windows* (the best-selling utility in 1994, over 4 million sold). Conducted usability studies including designing test scenarios; user modeling; monitoring and recording test data; and analyzing resulting data. Developed scripts to automatically generate hypertext documentation from print documentation. Designed and programmed interactive multimedia applications to demonstrate software products.

**Technical Editor – Macmillan/SAMS Publishing 1994**

Edited object-based visual programming and software development books for technical accuracy, initially for *ObjectView*, a product I designed for KnowledgeWare. Wrote and tested programming examples and database overview chapters used in various publications.

**Methodologist – KnowledgeWare, Inc. 1991-1994**

Managed project team through development cycle of Computer-Aided Software Engineering (CASE) tools including finalizing requirements, organizing development team, running status meetings, reviewing documentation, testing, prioritizing development issues and designing future enhancements. Used industry standard software engineering methodologies and frameworks (including Information Engineering and Rapid Application Development) for large-scale software projects.

Researched software engineering methodologies to design methods and technologies for next generation CASE tools. Implemented designs included an object-based interface builder and large-scale hypertext information authoring and content management applications using graphical objects, with SGML (GML) formatting and semantics, WYSIWYG editing as well as link management. Designed and reviewed all graphical user interfaces for compliance. Created all corporate usability and interface design standards including task analysis methods to improve products.

**Education****Ph.D. Information Studies - University of Toronto, 2002**

Dissertation: "Knowledge Discovery in Databases of Web Use: A Search for Informetric and Behavioral Models of Web Information Seeking"

**M.S. Information, Design & Technology - Georgia Institute of Technology, 1995**

Thesis: "Object-Oriented Information Development: A Methodology and System for Large-Scale Hypertext Documents"

**B.A. General Studies - University of Texas at Arlington, 1988**

Knowledge Engineering (Computer Science & Cognitive Science)

**Books**

Choo, C. W., Detlor, B. & Turnbull, D. (2000) Web Work: Information Seeking and Knowledge Work on the World Wide Web. The Netherlands: Kluwer Academic Publishers.

**Book Chapters**

Dillon, A., & Turnbull, D. (2010) Information Architecture. Encyclopedia of Library and Information Science, 2010, (3rd Ed.). Taylor & Francis.

Dillon, A., & Turnbull, D. (2006) Information Architecture. Encyclopedia of Library and Information Science, 2006. Taylor & Francis.

Turnbull, D. (2005). World Wide Web Information Seeking. In K. E. Fisher, S. Erdelez (Eds.), Theories of Information Behavior. Medford, New Jersey: Information Today, Inc.

**Selected Journal Articles**

Turnbull, D., & Bright, L. F. (2008). Advertising Academia with Sponsored Search: An Exploratory Study Examining the Effectiveness of Google AdWords at the Local and Global Level. International Journal of Electronic Business, 6(2), 149-171.

Pitkow, J., Schutze, H., Cass, T., Cooley, R., Turnbull, D., Edmonds, A., et al. (2002). Personalized Search: A Contextual Computing Approach May Prove a Breakthrough in Personalized Search Efficiency. Communications of the ACM, 45(9), 50-55.

Edmonds, K. A. A., Bluestein, J. J., & Turnbull, D. (2006). A Personal Information and Knowledge Infrastructure Integrator. Journal of Digital Information, 5(1).

Choo, C. W., Detlor, B., & Turnbull, D. (2000). Information Seeking on the Web: An Integrated Model of Browsing and Searching. First Monday, 5(2).

**Selected Conference Papers (refereed)**

Turnbull, D. (2007). Rating, Voting & Ranking: Designing for Collaboration & Consensus. Paper presented at the Association of Computing Machinery Computer Human Interface Conference (SIGCHI), San Jose, CA.

Turnbull, D. (2006, May 23, 2006). Methodologies for Understanding Web Use with Logging in Context. Paper presented at The 15th International World Wide Web Conference, Edinburgh, Scotland.

Dillon, A., Kleinman, L., Bias, R., Choi, G. O., & Turnbull, D. (2004). Reading and Searching Digital Documents: An Experimental Analysis of the Effects of Image Quality on User Performance and Perceived Effort. Proceedings of the American Society for Information Science and Technology Annual Meeting, 2004. Information Today, 267-273.

Choo, C. W., Detlor, B., & Turnbull, D. (2000). Working the Web: An Empirical Model of Web Use. Paper presented at the 33rd Hawaii Intl. Conference on System Science (HICSS), Maui, HI.

Turnbull, D. (1999). Interacting with Recommender Systems. Paper presented at the ACM SIGCHI (Computer-Human Interface) Workshop on Recommender Systems, Pittsburgh, PA.

Choo, C. W., Detlor, B., & Turnbull, D. (1999). Information Seeking on the Web - An Integrated Model of Browsing and Searching. Paper presented at the Proceedings of the 62nd Annual Meeting of the American Society of Information Science, Washington, D.C.

Choo, C. W., Detlor, B., & Turnbull, D. (1998). A Behavioral Model of Information Seeking on the Web - Preliminary Results of a Study of How Managers and IT Specialists Use the Web. Paper presented at the Proceedings of the 61st Annual Meeting of the American Society of Information Science, Pittsburgh, PA.

**Selected Conference Presentations, Panels & Posters (refereed)**

- Turnbull, D. (2010). Quantitative Information Architecture. Presented at the American Society of Information Science & Technology Information Architecture Summit, Phoenix, AZ.
- Turnbull, D. & Tolva, J. (2010). Metropolitan Information Architecture. Presented at the American Society of Information Science & Technology Information Architecture Summit, Phoenix, AZ.
- Turnbull, D. (2009) Information Technology Diversity: Disruptive Technologies, Innovation & Management. Presented at the American Society of Information Science and Technology Annual Meeting, Vancouver, British Columbia, Canada.
- Turnbull, D. (2009) Behavioral Checklist for Information Architecture. at the American Society of Information Science & Technology Information Architecture Summit, Memphis, TN.
- Turnbull, D. & Bright, L.F. (2008) Advertising & Awareness with Sponsored Search: an exploratory study examining the effectiveness of Google AdWords at the local and global level. Presented at the American Society of Information Science and Technology Annual Meeting, Columbus, OH.
- Detlor, B., Turnbull, D., Mackenzie, M. and Smith, J.P., (2007) The complexity and value of managing in the digital environment. Proceedings of the American Society for Information Science and Technology, 44(1), pp.1-3.
- Turnbull, D., Mackenzie, M., & Edmonds, A. (2007). eManagement in the Dynamic Digital Environment. Paper presented at the World Congress on Management of eBusiness, Toronto, Ontario.
- Turnbull, D. (2007). Hide and Seek: The Information Architecture & Design for working with filtered content in the OpenChoice filtering project. Presented at the American Society of Information Science & Technology Information Architecture Summit, Las Vegas, NV.
- Turnbull, D., Campbell, D. G., & Fast, K. V. (2007). The Grand Challenges in Information Architecture. Presented at the American Society of Information Science & Technology Information Architecture Summit, Las Vegas, NV.
- Turnbull, D. (2006). Setting the Agenda for IA Research. Presented at the Information Architecture Summit, Vancouver, BC Canada.
- Turnbull, D., & Efron, M. (2006). OpenChoice: A Platform for Web Content Classification & Filtering. Paper presented at the 15th International World Wide Web Conference Open Source Workshop, Edinburgh, Scotland.
- Turnbull, D., Dillon, A., Morville, P., Kaplan, N., Froehlich, T. J., & Robins, D. (2005). The Process of Curriculum Development for Information Architecture. Presented at the American Society of Information Science & Technology Information Architecture Summit, Montreal, Quebec, Canada.
- Turnbull, D., Detlor, B., Mackenzie, M., & Edgar, B. (2005). How technology can move in concert with organizational change. Presented at the American Society of Information Science and Technology Annual Meeting, Charlotte, NC.
- Turnbull, D., Mackenzie, M., & Edgar, B., Hersberger, J.A. & Kasten, J. (2004). Finding and Managing Social Networks as Functions of Technology Use: Applying Quantitative Methods to Determine Communities of Practice. Presented at the American Society of Information Science and Technology Annual Meeting, Providence, RI.
- Turnbull, D. (2004). XIA: Xtreme Information Architecture. Paper presented at the American Society of Information Science & Technology Information Architecture Summit, Austin, TX.
- Jobst, J., & Turnbull, D. (2004). Joint Evolution of Web Browsers and Online Information Architecture. Presented at the American Society of Information Science & Technology Information Architecture Summit, Austin, TX.

Burkart, J., Turnbull, D., Vigil, A., Switzky, A., Miranda, D., & Liaw, L. (2004). XIA@UT: An Extreme Makeover. American Society of Information Science & Technology Information Architecture Summit. Feb. 28, 2004. Paper presented at the American Society of Information Science & Technology Information Architecture Summit, Austin, TX.

Turnbull, D. (1998). Data Mining Web Use: Discovering Patterns and Models of Web Information Seeking Behavior using WebTracker Software Application. Paper presented at the IBM Center for Advanced Studies Conference '98 (CASCON 98), Toronto, ON.

### **Selected Conference Workshops (refereed)**

Turnbull, D. (2006, November 4) The Effects of Information Overload on Information Seeking & Use. Workshop paper for the American Society of Information Science and Technology Annual Meeting, SIG USE workshop. Austin, TX.

Turnbull, D. (2006, May 23) OpenChoice: A Platform for Web Content Classification & Filtering. Open Source Workshop at the 15th International World Wide Web Conference. Edinburgh, Scotland.

Turnbull, D. (2003, Oct 18) New Approaches for Studying and Building Information Seeking Models: A Possible Hybrid Approach. SIGUSE Workshop on Information Seeking theory for the American Society of Information Science and Technology (ASIST) 2003 Annual Meeting, Long Beach, CA.

### **Selected Invited Talks & Panels**

Turnbull, D. (2011, October 31). New Directions in Taxonomy (Conference Keynote). KMWorld Enterprise Search Summit/Taxonomy Boot Camp, Washington D.C.

Turnbull, D. (2011, March 12). Left Brain Search = Google, Right Brain Search = X?. South by SouthWest Interactive, Austin, TX.

Turnbull, D. (2010, July 13). Quantitative UX. Toronto UX Irregulars. Toronto, ON.

Turnbull, D. (2010, June 28). Semantic Discovery: Making Search Better. Semantic Web Vancouver. Vancouver, BC.

Turnbull, D. (2010, June 22). Quantitative Information Architecture. Vancouver User Experience Group. Vancouver, BC.

Turnbull, D. (2009). Agile UX. IxDA Austin, Austin, TX.

Turnbull, D. (2008, February 21). Making Search Better in Interactive Media. New University of Lisbon (FCSH/UNL). Lisbon, Portugal.

Turnbull, D. (2008, February 26). Making Search Better with Personalization and Informetrics. Faculty of Engineering, University of Porto (FEUP). Porto, Portugal.

Turnbull, D. (2006, March 12). Tagging 2.0. South by SouthWest Interactive, Austin, TX.

Turnbull, D. (2005, March 13). Leveraging and Augmenting Solipsism. South by SouthWest Interactive, Austin, TX.

Turnbull, D. (2004, March 14). Revolutionary Search Technologies. South by SouthWest Interactive, Austin, TX.

Turnbull, D. (2004, March 11). Designing for Pervasive Computing. Austin Mobility Roundtable, the Third Annual Meeting of the Global Mobility Roundtable, Austin, TX.

Turnbull, D. (1998). Leveraging Web Use for Business Intelligence: Discovering Patterns and Classes of WWW Users. IBM Centre for Advanced Studies Research Forum, Toronto, ON.

**Other Publications**

Turnbull, D. and Hirsh, S. (Eds) (2021) 84<sup>th</sup> Annual Meeting of the Association for Information Science and Technology, Industry Series Proceedings. John Wiley & Sons, Inc.

Bagheri, E., Cheung J., and Turnbull, D. (Eds) (2018) 31<sup>st</sup> Canadian Conference on Artificial Intelligence, Industry Track Proceedings. Springer Intl Publishing Subseries on Lecture Notes in Computer Science.

Turnbull, D., Jansen, B. J., Hawkey, K., Kellar, M., & Edmonds, K. A. A. (2007). Introduction to Logging Traces of Web Activity special issue. IEEE Journal of Web Engineering, 6(3), 193-195.

Turnbull, D. (1998). Data Mining Web Use: Discovering Patterns and Models of Web Information Seeking Behavior using WebTracker Software Application. IBM Center for Advanced Studies Conference '98 (CASCON 98), Toronto, ON.

**Selected Professional Associations and Committees**

- Association for Computing Machinery (ACM)
  - SIGCHI Conferences Program Committees and Reviewer
  - SIGIR Conference on Human Information Interaction and Retrieval
  - UIST Symposium on User Interface Software and Technology
  - SIGCHIIR Conference on Human Information Interaction and Retrieval – Industry Day Chair
- Association for Information Science and Technology (ASIS&T)
  - Industry Series Co-Chair
  - Special Interest Groups Lead and Co-Chair
- Association for the Advancement of Artificial Intelligence (AAAI)
- Canadian Artificial Intelligence Association – Chair of Industry Track
- Institute of Electrical and Electronics Engineers (IEEE)
- Python Software Foundation
- World Wide Web Consortium
  - WWW Conferences Program Committees
  - WWW Conference Browsers and User Interfaces Co-Chair
  - W3C Web Characterization Activity

**Fellowships, Scholarships and Grants**

- University of Texas Dean's Fellowships 2003, 2006, 2007 & 2008
- IMLS - OpenChoice Classifier & Social Filtering Engine 2005-2007
- Temple Foundation Fellowship 2004 & 2005
- University of Texas at Austin Teaching Fellowship 2004
- Google Search Appliance Research Grant 2003
- University of Texas at Austin John P. Common Teaching Fellowship 2003
- Microsoft ClearType Research Grant 2003
- University of Toronto Open Fellowship 1997, 1998 & 1999.
- Mary H. Beatty Fellowship 1996

**Patents and Patent Applications**

Turnbull, Don & Muxworthy, Derek & Nielsen Aaron David (applied 2018). System and Method For Measuring And Predicting User Behavior Indicating Satisfaction And Churn Probability. US Patent Application 16/288,014. Assignee: ThinkCX

Turnbull, Don & LaPierre, Larry (applied 2012). Method to Deconstruct Computer Games into Alternative Slices and System to Enable Event Definitions, Achievements and Rewards via a Central Application or Interface Platform. US Provisional Patent # 61/679,605. Assignee: Wyley Interactive.

Turnbull, Don & Schuetze, Hinrich (applied 2001, granted 2006). Interface and system for providing persistent contextual relevance for commerce activities in a networked environment. US Patent # 7,089,237. Assignee: Google, Inc.

**Cases (involving Reports, Declarations, In-Court Appearances, Testimony or Depositions) (retaining party in bold)**

1. Speedtrack, Inc. v. Wal-Mart Stores, Inc. and **Endeca Technologies, Inc.**, et al. U.S. District Court for the Northern District of California, Case No. 4:06-cv-07336-PJH.
2. **Bid for Position, LLC** v. AOL, LLC, U.S. District Court for the Eastern District of Virginia, Case No. 2:07-cv-00582-JBF-TEM.
3. SFA Systems, LLC v. **Amazon.com, Inc.**, et al. U.S. District Court for the Eastern District of Texas Tyler Division, Case No. 6:11-cv-00052-LED.
4. Softview LLC v. **Motorola Mobility Inc.**, et al. U.S. District Court for the District of Delaware, Case No. 1:10-cv-00389-LPS.
5. Rotatable v. **Rackspace, US, Inc., et al.** U.S. District Court for the Eastern District of Texas Marshall Division and Inter Partes Review, USPTO PTAB. Docket: 47015.115.
6. **National Association of Realtors** v. Data Distribution Technologies. USPTO PTAB Case No. IPR2016-01075
7. Global Sessions LP and Global Sessions Holdings SRL v. **Comerica, TD, et al.** U.S. District Court for the Western District of Texas, Case Nos.: 1:13-CV-688-SS; 1:13-CV-692-SS, 1:13-CV-691-SS.
8. Enterprise Systems Technologies, S.A.R.L. v. **Apple Inc.**, USPTO PTAB and Civil Action Nos.: 14-cv-765-LPS.
9. Enterprise Systems Technologies, S.a.r.l. v. Microsoft (**Apple, HTC & Google** as interveners). International Trade Commission Case No. 337-TA-925.
10. **Apple Inc., Eventbrite Inc., and Starwood Hotels & Resorts Worldwide, Inc., et al.** v. Ameranth, Inc., USPTO PTAB CBM2015-0008, CBM2015-00080, CBM2015-00082, CBM2015-00096, and CBM2015-00097.
11. Queen's University at Kingston v. **Samsung Electronics Co, LTD.** Inter Partes Review, USPTO PTAB Case No. IPR2015-00583.
12. **Express Mobile, Inc.** v. BigCommerce, U.S District Court for the Easter District of Texas Marshall Division, Case No. 2:17-cv-00130.
13. **Express Mobile, Inc.** v. eGrove Systems Corporation, U.S. District Court of Delaware, Case No. 1:17-cv-703-RGA.
14. Traxcell Technologies, LLC v. **AT&T Corp. and AT&T Mobility, LLC, Verizon Wireless Personal Communications LP and T-Mobile USA, Inc.**, Case Nos. 2:17-cv-00718, 2:17-cv-00719, 2:17-cv-00720 and 2:17-cv-00721.
15. Seven Networks, LLC. v. **Google, LLC**, U.S. District Court for the Eastern District of Texas Marshall Division, Case No. 2:17-CV-442-JRG.
16. Fintiv v. **Apple, Inc.**, Western District of Texas, Austin Division, Case No. 6:18-CV-372-ADA.
17. Roku, Inc. v. **Universal Electronics, Inc.**, Inter Partes Review, USPTO PTAB Case No. IPR2019-01615.

18. **Quibi Holdings, LLC** v. JBF Interlude 2009., Inter Partes Review, USPTO PTAB Case Nos. IPR2020-01547 and IPR2020-01549.
19. EcoFactor, Inc. v. **Google, LLC**, U.S. District Court for the Western District of Texas Waco Division, Case No. 6:20-CV-00075.
20. Eolas Technologies Inc. v. Amazon.com Inc, et al. including **Google, LLC**, U.S. District Court for the Northern District of California, Case No. 17-cv-03022-JST.
21. MasterObjects, Inc. v. **Amazon.com Inc**, U.S. District Court for the Northern District of California San Francisco Division, Case No. 5:20-cv-08103-WHA (KAW).
22. Roku, Inc. v. **Universal Electronics, Inc.**, Inter Partes Review, USPTO PTAB Case Nos. IPR2021-00455 and IPR2021-00758.
23. **American Airlines, Inc.** v. Sabre Holdings Corporation, et al. District Court of Tarrant County, Texas, 236<sup>th</sup> Judicial District. Case No. 236-326225-21.
24. **Twitter, Inc.** v. Palo Alto Research Center, Inc., Inter Partes Review, USPTO PTAB Case Nos. IPR2021-01398, IPR2021-01430 and IPR2021-01458.
25. Leadfactors, LLC v. **Cisco Systems, Inc.** Superior Court of The State of California, County of Santa Clara. Case No. 1:13 CV 247926.
26. Almondnet, Inc and Intent IQ, LLC v. **Microsoft Corporation**. USPTO PTAB and Western District of Texas, Waco Division. Case Nos. 6:21-cv-00897-ADA, IPR2022-01324, IPR2022-01319.