

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

INNOVAPORT, LLC
Patent Owner.

Case IPR2024-00096

U.S. Patent No. **8,775,260**

Issue Date: July 8, 2014

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

DECLARATION OF DON TURNBULL, PHD

TABLE OF CONTENTS

	Page
INDEX OF EXHIBITS	vii
260 PATENT LIST OF CLAIMS IN CONTENTION	ix
I. Background and Qualifications	2
A. Qualifications	2
B. Technology Background	9
C. Materials Reviewed	16
II. Relevant Legal Standards	16
III. The 260 Patent	20
A. Overview of the 260 Patent	20
B. Overview of the 260 Patent’s File History	21
C. Person of Ordinary Skill in the Art	22
D. Claim Construction Under 37 C.F.R. § 42.104(b)(3)	22
1. “product location inquiry” (claim 1)	23
2. “linking the product with another product in a cross-referential manner” (claim 15)	26
E. Non-Functional Descriptive Material	27
IV. Overview of the Prior Art References	28
A. EX1004 – Shanman	28
B. EX1005 - Ogasawara	31
C. EX1006 - Beach	34
D. EX1029 - Tran	35
V. Ground 1: Shanman Renders Obvious Claims 1-4, 6, 7, 9, 11, AND 15-17	36
A. Claim 1	36
1. [1pre] A method of providing product location information within a store, the method comprising:	36
2. [1a] affixing at least a first input device at a first location within the store, so that the first input device is substantially stationary;	38

3.	[1b] providing an inventory information unit having a database containing product location information and additional product-related information including product availability information;	39
4.	[1c] obtaining a product location inquiry at the first input device, wherein the first input device includes a receiver, and the product location inquiry is a voice signal received by the receiver;.....	40
5.	[1d] processing the product location inquiry at a signal processing device to determine a product location inquiry signal;	41
6.	[1e] querying a database to obtain product location information in response to the product location inquiry signal;.....	45
7.	[1f] providing an information signal in response to the product location inquiry signal, the information signal at least sometimes including at least a first portion of the product location information and also depending at least sometimes upon a first portion of the product availability information; and	46
8.	[1g] providing an output signal at an output device, the output signal being a response to the product location inquiry, and being based upon the information signal, ...	48
9.	[1h] whereby, when the product availability information indicates that a product is unavailable at a location, the information signal is configured so that the output signal does not provide an indication that the product is available at the location.....	49
B.	Claim 2: The method of claim 1, wherein the additional product-related information includes product promotion information.....	49
C.	Claim 3: The method of claim 1, further comprising: determining an availability within the store of a product to which the product location inquiry pertains.....	50
D.	Claim 4: The method of claim 1, wherein the first input device includes a user interface with a keyboard entry device.	51
E.	Claim 6	51
2.	[6pre] The method of claim 1, further comprising:	51

3.	[6a] updating at least some of the product location information to reflect changes in inventory occurring within the store;	51
4.	[6b] recording information relating to the inquiry and analyzing the information relating to the inquiry; and	52
5.	[6c] comparing information regarding the product location inquiry with additional information concerning products sold at the store.	55
F.	Claim 7	59
2.	[7pre] A method of providing product location information within a store, the method comprising:	59
3.	[7a] affixing at least a first input device at a first location within the store, so that the first input device is substantially stationary;	59
4.	[7b] providing a database containing product location information and additional product-related information including product availability information;	59
5.	[7c] obtaining an inquiry at the first input device;	59
6.	[7d] processing the inquiry at a processing device to determine an inquiry signal;	59
7.	[7e] querying a database to obtain product location information in response to the inquiry signal;	59
8.	[7f] providing an information signal in response to the inquiry signal, the information signal at least sometimes including at least a first portion of the product location information and also depending at least sometimes upon a first portion of the product availability information;	60
9.	[7g] providing an output signal at an output device, the output signal being a response to the inquiry and being based upon the information signal, ...	60
10.	[7h] whereby, when the product availability information indicates that the product is unavailable at a location, the information signal is configured so that the output signal does not provide an indication that the product is available at the location; and	60
11.	[7i] comparing information regarding the inquiry with additional, information concerning products sold at the store..	60

G.	Claim 9	60
2.	[9pre] A method of providing product location information regarding locations of products within a store to customers within the store, the method comprising:.....	60
3.	[9a] affixing a plurality of user interfaces respectively at respective positions within the store in a substantially stationary manner;.....	61
4.	[9b] receiving input signals representative of inquiries from the customers in the store at the user interfaces, wherein each of the user interfaces includes a memory unit;	62
5.	[9c] conducting periodic communications between the user interfaces and a hub that is at least indirectly in communication with each of the user interfaces and that is capable of accessing at least one database;.....	65
6.	[9d] querying the at least one database to obtain product location information and additional product-related information;.....	66
7.	[9e] providing portions of the product location information from the hub to the respective memory units of each of the user interfaces; and	67
8.	[9f] providing output signals to the customers in the store via the user interfaces, the output signals being responses to the inquiries represented by the input signals, the responses being based upon the portions of the product location information...	68
H.	Claim 11: The method of claim 9, further comprising: determining an availability within the store of a first of the products to which a first of the product location inquiries pertains.	71
I.	Claim 15	71
2.	[15pre] A method of providing product location information within a first store, the method comprising:	71
3.	[15a] providing a hub that is at least indirectly in communication with each of a plurality of user interfaces, and that is capable of accessing at least one database, the at least one database including both product location information and additional product-related information, ...	71

4.	[15b] wherein the additional product-related information includes: information concerning a quantity of a first product within the store; information concerning a price of the product; information concerning an availability or unavailability of the product within the store; and information linking the product with another product in a cross-referential manner;	73
5.	[15c] periodically engaging in the communication with each of the user interfaces, wherein the engaging in the communication includes:	77
6.	[15d] receiving inquiry signals from the user interfaces;	77
7.	[15e] querying the database to obtain portions of the product location information in response to the inquiry signals; and....	77
8.	[15f] providing information signals in response to the inquiry signals for receipt by the user interfaces, wherein the information signals include portions of both the product location information and the additional product-related information, whereby the user interfaces are able to provide output signals based upon the information signals;	77
9.	[15g] wherein at least some of the communication is wireless communication.	78
J.	Claim 16: The method of claim 15, wherein at least one of the user interfaces is provided by a mobile device.	78
K.	Claim 17. The method of claim 16, wherein at least one of the user interfaces is substantially stationary, and wherein the at least one of the user interfaces provided by the mobile device is utilized by a customer within the store.	78
VI.	Ground 2: Ogasawara and Beach Render Obvious Claims 15 AND 16	78
A.	Claim 15:	78
1.	[15pre] A method of providing product location information within a first store, the method comprising:	79
2.	[15a] providing a hub that is at least indirectly in communication with each of a plurality of user interfaces, and that is capable of accessing at least one database, the at least one database including both product location information and additional product-related information, ...	79

3.	[15b] wherein the additional product-related information includes: information concerning a quantity of a first product within the store; information concerning a price of the product; information concerning an availability or unavailability of the product within the store; and information linking the product with another product in a cross-referential manner;	82
4.	[15c] periodically engaging in the communication with each of the user interfaces, wherein the engaging in the communication includes:	86
5.	[15d] receiving inquiry signals from the user interfaces;	87
6.	[15e] querying the database to obtain portions of the product location information in response to the inquiry signals; and....	87
7.	[15f] providing information signals in response to the inquiry signals for receipt by the user interfaces, wherein the information signals include portions of both the product location information and the additional product-related information, whereby the user interfaces are able to provide output signals based upon the information signals;	88
8.	[15g] wherein at least some of the communication is wireless communication.	91
B.	Claim 16: The method of claim 15, wherein at least one of the user interfaces is provided by a mobile device.	91
VII.	Secondary Considerations	92
VIII.	Availability for Cross-Examination	92
IX.	Right To Supplement.....	93
X.	Conclusion	93

INDEX OF EXHIBITS

Exhibit No.	Description
1001	U.S. Patent No. 8,775,260 (“ 260 patent ”)
1002	Declaration of Don Turnbull PhD (this document)
1003	260 Patent file history
1004	U.S. Patent No. 7,231,357 (“ Shanman ”)
1005	U.S. Patent No. 6,123,259 (“ Ogasawara ”)
1006	U.S. Patent No. 6,084,528 (“ Beach ”)
1007	https://www.uscourts.gov/statistics/table/na/federal-court-management-statistics/2023/06/30-1
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 (“ Berstis ”)
1021	Jennifer Rowley, <i>Multimedia kiosks in retailing</i> , 23 INT’L J. OF RETAIL & DISTRIB. MGMT. 5: 32-40 (1995) (“ Rowley ”)

Exhibit No.	Description
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, https://computerhistory.org/blog/community-memory-precedents-in-social-media-and-movements/
1027	<i>Apple iBook G3/300 (Original/Clamshell) Specs</i> , EveryMac.com, https://everymac.com/systems/apple/ibook/specs/ibook.html
1028	File History of U.S. Patent No. 9,489,690
1029	U.S. Patent No. 6,157,935 (“ Tran ”)
1030	[RESERVED]

260 PATENT LIST OF CLAIMS IN CONTENTION

Claim	Limitation
1pre	A method of providing product location information within a store, the method comprising:
1a	affixing at least a first input device at a first location within the store, so that the first input device is substantially stationary;
1b	providing an inventory information unit having a database containing product location information and additional product-related information including product availability information;
1c	obtaining a product location inquiry at the first input device, wherein the first input device includes a receiver, and the product location inquiry is a voice signal received by the receiver;
1d	processing the product location inquiry at a signal processing device to determine a product location inquiry signal;
1e	querying a database to obtain product location information in response to the product location inquiry signal;
1f	providing an information signal in response to the product location inquiry signal, the information signal at least sometimes including at least a first portion of the product location information and also depending at least sometimes upon a first portion of the product availability information; and
1g	providing an output signal at an output device, the output signal being a response to the product location inquiry, and being based upon the information signal,
1h	whereby, when the product availability information indicates that a product is unavailable at a location, the information signal is configured so that the output signal does not provide an indication that the product is available at the location.
2	The method of claim 1, wherein the additional product-related information includes product promotion information.
3pre	The method of claim 1, further comprising:
3a	determining an availability within the store of a product to which the product location inquiry pertains.

4	The method of claim 1, wherein the first input device includes a user interface with a keyboard entry device.
6pre	The method of claim 1, further comprising:
6a	updating at least some of the product location information to reflect changes in inventory occurring within the store;
6b	recording information relating to the inquiry and analyzing the information relating to the inquiry; and
6c	comparing information regarding the product location inquiry with additional information concerning products sold at the store.
7pre	A method of providing product location information within a store, the method comprising:
7a	affixing at least a first input device at a first location within the store, so that the first input device is substantially stationary;
7b	providing a database containing product location information and additional product-related information including product availability information;
7c	obtaining an inquiry at the first input device;
7d	processing the inquiry at a processing device to determine an inquiry signal;
7e	querying a database to obtain product location information in response to the inquiry signal;
7f	providing an information signal in response to the inquiry signal, the information signal at least sometimes including at least a first portion of the product location information and also depending at least sometimes upon a first portion of the product availability information;
7g	providing an output signal at an output device, the output signal being a response to the inquiry and being based upon the information signal,
7h	whereby, when the product availability information indicates that the product is unavailable at a location, the information signal is configured so that the output signal does not provide an indication that the product is available at the location; and
7i	comparing information regarding the inquiry with additional, information concerning products sold at the store.

9pre	A method of providing product location information regarding locations of products within a store to customers within the store, the method comprising:
9a	affixing a plurality of user interfaces respectively at respective positions within the store in a substantially stationary manner;
9b	receiving input signals representative of inquiries from the customers in the store at the user interfaces, wherein each of the user interfaces includes a memory unit;
9c	conducting periodic communications between the user interfaces and a hub that is at least indirectly in communication with each of the user interfaces and that is capable of accessing at least one database;
9d	querying the at least one database to obtain product location information and additional product-related information;
9e	providing portions of the product location information from the hub to the respective memory units of each of the user interfaces; and
9f	providing output signals to the customers in the store via the user interfaces, the output signals being responses to the inquiries represented by the input signals, the responses being based upon the portions of the product location information.
11pre	The method of claim 9, further comprising:
11a	determining an availability within the store of a first of the products to which a first of the product location inquiries pertains.
15pre	A method of providing product location information within a first store, the method comprising:
15a	providing a hub that is at least indirectly in communication with each of a plurality of user interfaces, and that is capable of accessing at least one database, the at least one database including both product location information and additional product-related information,
15b	wherein the additional product-related information includes: information concerning a quantity of a first product within the store; information concerning a price of the product; information concerning an availability or unavailability of the product within the store; and information linking the product with another product in a cross-referential manner;

15c	periodically engaging in the communication with each of the user interfaces, wherein the engaging in the communication includes:
15d	receiving inquiry signals from the user interfaces;
15e	querying the database to obtain portions of the product location information in response to the inquiry signals; and
15f	providing information signals in response to the inquiry signals for receipt by the user interfaces, wherein the information signals include portions of both the product location information and the additional product-related information, whereby the user interfaces are able to provide output signals based upon the information signals;
15g	wherein at least some of the communication is wireless communication.
16	The method of claim 15, wherein at least one of the user interfaces is provided by a mobile device.
17	The method of claim 16, wherein at least one of the user interfaces is substantially stationary, and wherein the at least one of the user interfaces provided by the mobile device is utilized by a customer within the store.

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. 8,775,260 (the “260 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 260 patent and its prosecution history, the other materials I have considered, and my knowledge and experience, my opinions are as follows:

- Claims 1-4, 6, 7, 9, 11, 15-17 are unpatentable due to obvious based on Shanman in view of the knowledge of a POSITA
- Claims 15-16 are unpatentable due to obvious based on Ogasawara in view of Beach

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 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.” EX1024, 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.

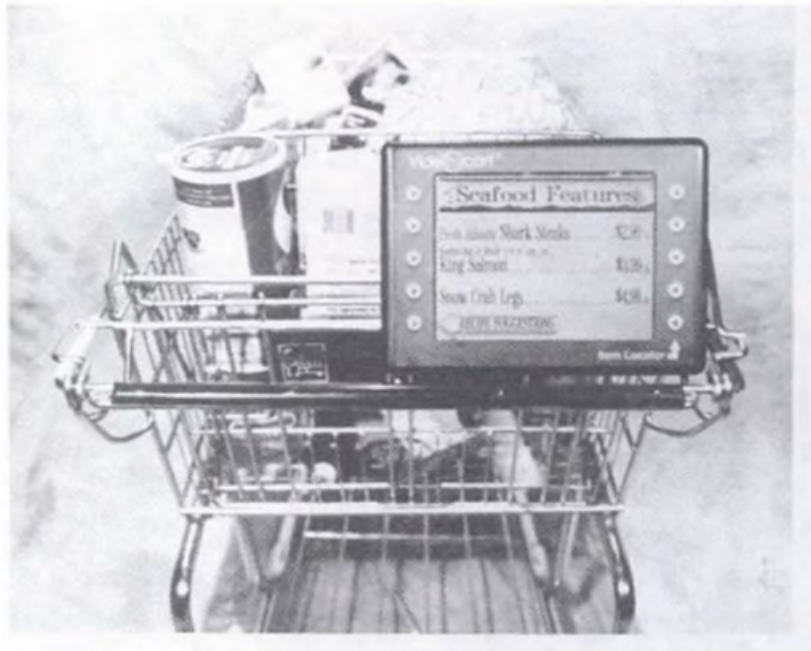


Figure 1-7. VideOcart brings POS to grocery shoppers.

26. In 1995, Jennifer 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. The 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 (313) 677-3902
Travelink	Metropolitan Atlanta Rapid Transit Authority, Atlanta GA/ Georgia Department of Transportation	Todd Long (404) 651-8475
Traveler Assistance Network	Baltimore Mass Transit Administration, Baltimore, MD	David Hill (410) 333-3437
Information Kiosks	Regional Transportation District, Denver, CO	Lou Ha (303) 299-6265
Houston Smart Commuter	Metropolitan Transit Authority of Harris County (Houston Metro), Houston, TX	S. Venkat Raman (713) 881-3030
Los Angeles Smart Traveler	California Department of Transportation, Public Transit Branch Los Angeles, CA	Cliff Loveland (916) 654-9970
Travlink Project	Minnesota Department of Transportation, Minneapolis/St. Paul, MN	Marilyn Remer (612) 582-1601
Multimedia Kiosks	New Jersey Transit, Newark, NJ	Lou Wassong (201) 378-6906
Smart Interactive Kiosks	Metropolitan Transportation Authority - New York City Transit, New York, NY	Angelita Hutchinson (718) 694-3232
Information Kiosks	Seattle Metro, Seattle, WA	Catherine Bradshaw (206) 684-1770
National Capital Region Traveler Information Showcase	Washington Area Metro Agency, Washington, D.C., et al.	Karen Lamb (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 260 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, therefore 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 260 PATENT

A. Overview of the 260 Patent

42. The 260 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 260 patent relates to providing product location and other information to customers within a store using a server and a client. EX1001, Abstract.

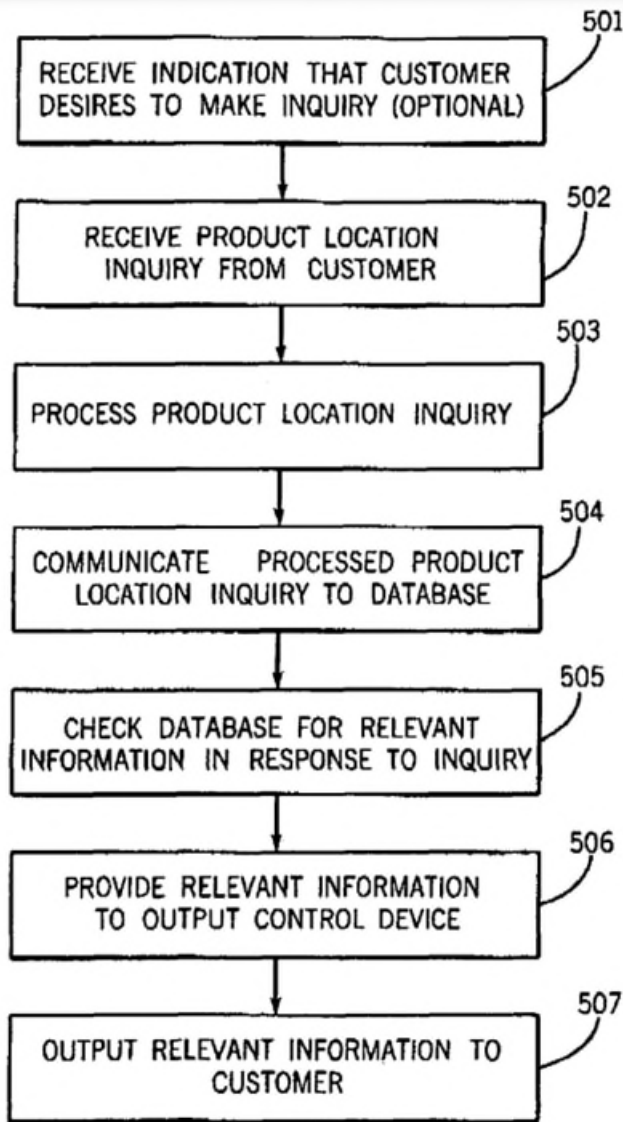


FIG. 5

EX1001, Fig. 5.

B. Overview of the 260 Patent's File History

43. The Examiner rejected claims 1-3, inter alia, over Gupta. EX1003, 74.

In its response, the Patent Owner ("PO") amended the claims and argued that the invention is not limited to a specific system and "can, but need not, involve

complicated wireless technologies such as “RF link” or “infrared (IR) transmission.” *Id.* at 82. By so doing, the applicant made clear that the claims should be broadly construed to include wireless communications between the input device used by the customer and the inventory information unit with the database.

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 260 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 Under 37 C.F.R. § 42.104(b)(3)

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 term not listed below according to its plain and ordinary meaning to a POSITA at the time of the 260 patent.

1. “product location inquiry” (claim 1)

48. 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.

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

50. Based on my review of the intrinsic evidence, it is my opinion that it does not support PO’s inclusion of keywords¹ 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 of the later-filed ’690 patent does include discussion by Patent Owner regarding real-time responses to inquiries, EX1028, 92-93, 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 PO’s proposed construction of “keyword search” does not include a real-time

¹ It is also not clear what is meant by “keywords” in PO’s construction.

requirement. Moreover, there is nothing about “keyword search” that limits the time at which the keywords are picked or entered into the system.

51. In my opinion, the below grounds show that the claims are invalid under either construction.

2. “linking the product with another product in a cross-referential manner” (claim 15)

52. In my opinion, 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).

53. The intrinsic evidence does not support PO’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, 15:36-42. During prosecution of a later patent (U.S. Patent No. 9,489,690, for which I also offered an opinion in an earlier-filed IPR and which claims priority to the 260 patent), the Applicant 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 ...

EX1028, 94. The Applicant 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.”

54. 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. 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 in claim 2, which recites “wherein the additional product-related information includes product promotion information.”

This recitation is directed toward printed matter because it is directed only to the content of the information, i.e., the “product promotion information.” This recitation of printed matter is not entitled to any patentable weight because it bears no functional relationship to the substrate/product on which it is recorded, *i.e.*, the memory and/or computer display. The display and/or the memory merely serves as support for the printed matter, and the recited information is independent of the computer display and/or memory. 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 the same or similar reasons below.

IV. OVERVIEW OF THE PRIOR ART REFERENCES

A. EX1004 – Shanman

56. 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]. I have been informed that 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.

57. Shanman relates to a customer selecting items or entering its shopping list items into a handheld 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.

58. The Shanman handheld mobile device is 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. In Shanman, 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, 6:13-28. 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.

59. 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.

<u>SHOPPING LIST FOR YOUR SELECTED SUPERMARKET</u>	
	<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

60. 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, 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, 17:35-49, 22:3-8. Shanman also discloses that 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

61. 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]. I have been informed that Ogasawara 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 690 Patent and thus was not considered by the patent examiner during prosecution. EX1003.

62. 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 which can include a "[p]ressure sensitive (touch screen) technology ... 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 ... 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 15, and is configured to communicate with a store central computer 50 by means of an individually addressable RF communication transceiver. EX1005, 2:32-34.

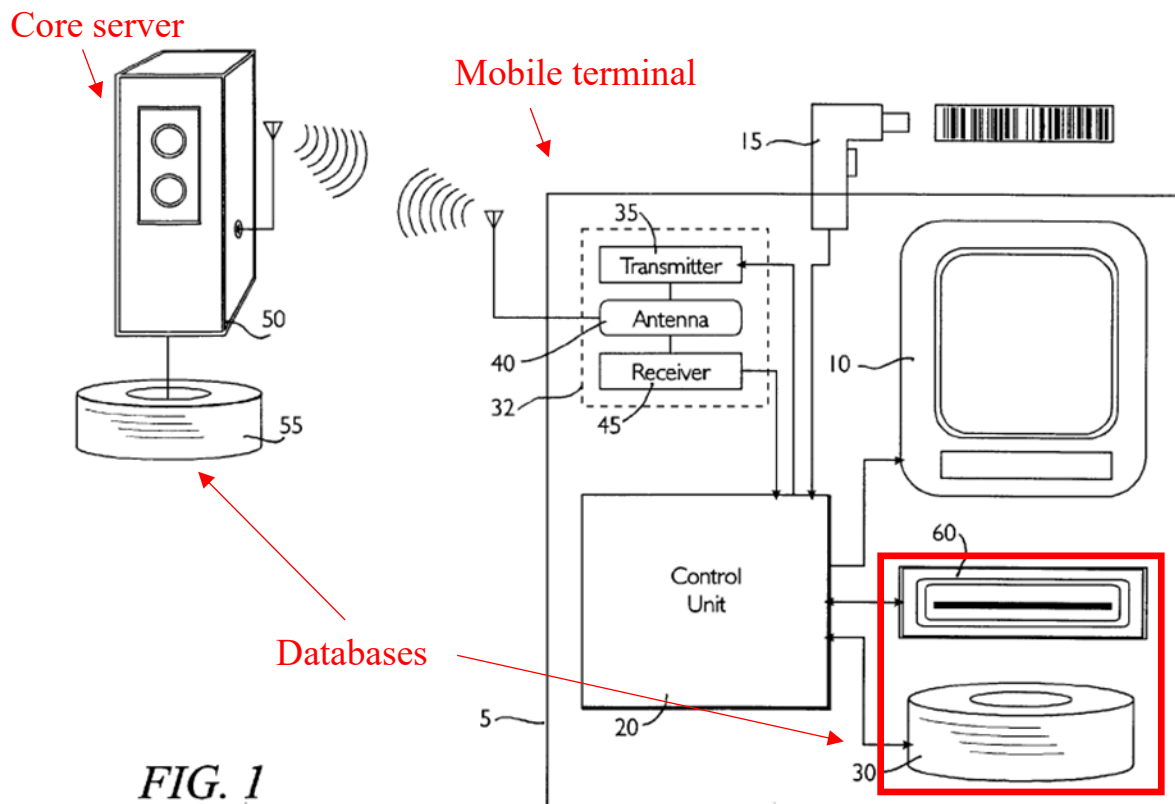


FIG. 1

EX1005, Fig. 1 (red annotations added).

63. Ogasawara's store central computer 50 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. Ogasawara discloses, "[a]s a customer scans the bar code of a particular item, the store central computer accesses that item's location information 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. In Ogasawara, 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, 3:56-58.

C. EX1006 - Beach

64. U.S. Patent No. 6,084,528 to Beach et al. (“Beach”) is entitled “Intranet Scanning Terminal System,” was issued on July 4, 2000, and is assigned to Symbol Technologies, a leading vendor in the computing and retail product management hardware and software. EX1006, [54], [45]. I have been informed that Beach 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 260 patent and thus was not considered by the patent examiner during prosecution. EX1003.

65. 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.

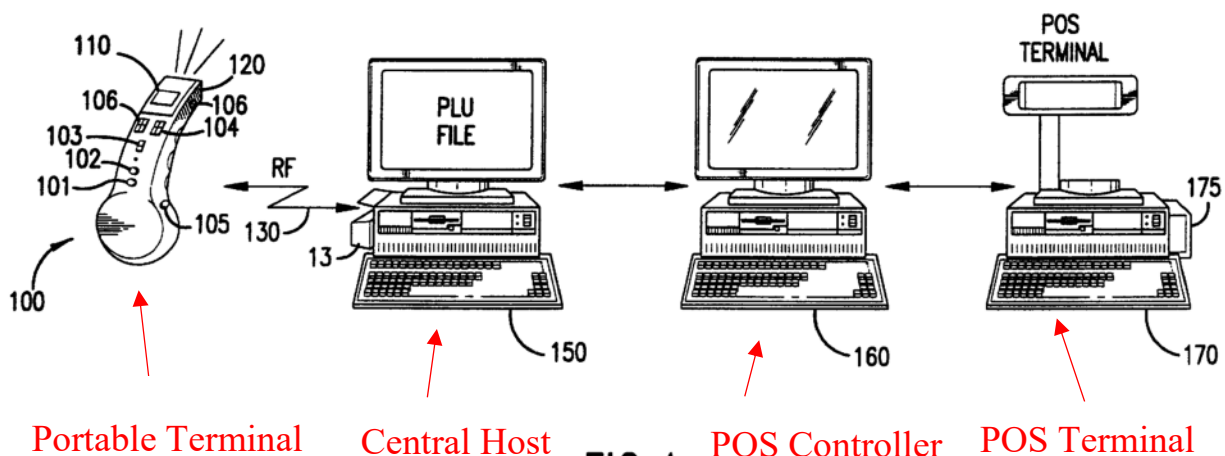


FIG.4

EX1006, Fig. 4 (annotations added). “[T]he central host is provided with a database of available electronic coupons.” EX1006, 13:15-16. “Upon 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. “The 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.” EX1006, 15:5-9. 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. EX1029 - Tran

66. U.S. Patent No. 6,157,935 to Tran et al. (“Tran”) is entitled “Remote Data Access and Management System” was issued on December 5, 2000, and was assigned to XXENT Corp, (Palm, Inc., an early innovator in mobile hardware such

as Personal Digital Assistants and the PalmOS software) and now assigned to Qualcomm, Inc., a leading vendor in the mobile computing hardware and software. EX1029, [11], [45], [54]. I have been informed that Tran is prior art under at least 35 U.S.C. § 102(e). Tran does not appear in the file history of the Challenged Patent and thus was not considered by the patent examiner during prosecution. EX1003. Tran relates a portable computer system including a processor, program storage device and an input recognizer and accessories, including a voice capture unit, and scanner among others, to enable data capture capabilities and a GPS for location-based actions. The portable computer system also communicates with another computer over the internet or other type of network using wireless media or over a landline. Additionally, Tran describes a database application on the portable device that can receive data from the internet and features a “smart search engine interface” to locate information. EX1029, 2:53-3:39.

V. GROUND 1: SHANMAN RENDERS OBVIOUS CLAIMS 1-4, 6, 7, 9, 11, AND 15-17

A. Claim 1

67. As shown below, it is my opinion that Shanman 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:

68. In my opinion, the preamble is disclosed or rendered obvious by Shanman. To the extent that “within a store” means that the product location

information must specify where within a store the product is located, Shanman discloses the preamble. *See, e.g.*, EX1004, Abstract (“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.”), 5:3-19, 16:23-32.

69. To the extent that “within a store” means that the recipient of the location information must be within a store when the product 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. 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. A POSITA would have found it unlikely that the server would be located in a customer’s home. In contrast, a POSITA would have found it obvious to locate the LAN including the server 10 and client 12 in a store, such as a grocery store. Locating the server in the store would reduce costs for the store owner, for

example by eliminating the need to pay rent in order to house the server in some other building where the customer and server could be on the same LAN as taught in Shanman.

2. [1a] affixing at least a first input device at a first location within the store, so that the first input device is substantially stationary;

70. In my opinion, Shanman discloses this limitation. Shanman discloses a client 12. EX1004, 6:5-57, 12:24-40, 13:4-14:21, 14:26-31, 24:17-21, Figs. 1, 2. Shanman discloses the client—consumer data processing units—as both substantially stationary and mobile devices by stating that “the teachings of the present invention are equally applicable for use in devices such as televisions (e.g., so-called interactive TV), telephones, cellular and satellite communications devices . . . handheld computers, wristwatch-type computing devices, and any other type of data transmission and receiving device capable of achieving connectivity with a server,” EX1004, 11:35-58. EX1004, 2:42-57, 14:26-33, 24:8-21; *see also* 12:34-32 and Fig. 1 (disclosing a personal computer, which, in my opinion, a POSITA would have understood to be a stationary device, as clients/consumer data processing units). In my opinion, a POSITA would have found it obvious that the stationary client device be located in a store on the same LAN as the server as discussed above in [1pre]. In my opinion, a POSITA would also have found it obvious to affix a client device 21 to a location within the store

to, e.g., prevent the computer from being accidentally knocked down or stolen. The consumer data processing unit/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, Fig.

2. Shanman's client device 21 is also capable of inputting voice commands.

Shanman teaches "[t]he 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 (emphasis added). In my opinion, a POSITA would have understood or found it obvious that Shanman's input device would include a microphone for inputting voice commands. The claimed "user input device" may be either the client 12 or the microphone of client 12 (which, by being virtue of being a part of and/or connected to the client 12, would also be substantially stationary and affixed to a first location within the store).

3. [1b] providing an inventory information unit having a database containing product location information and additional product-related information including product availability information;

71. In my opinion, Shanman discloses this limitation. Shanman discloses providing an inventory information unit (e.g., "server" 10). EX1004, 6:5-57, 11:35-58, 12:24-40, 13:4-14:21, 14:26-31, 24:17-21, Figs. 1, 2. The server 10 has a database, as Shanman discloses "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. The database 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. The database also contains additional product-related information including product availability information, “including inventory data,” EX1004, 13:62-14:1, “name and inventory of goods,” EX1004, 633:54, “list of goods actually sold at the selected retail outlet,” EX1004, 6:44-54, “list of goods offered for sale by that retail outlet,” EX1004, 15:19-24, “physical layout and inventory of the goods at the selected retail outlet [that] are displayed on the consumer data processing unit,” EX1004, 25:4-9.

4. [1c] obtaining a product location inquiry at the first input device, wherein the first input device includes a receiver, and the product location inquiry is a voice signal received by the receiver;

72. In my opinion, Shanman discloses this limitation. *See* [1a]. Shanman discloses the “consumer may select particular goods by . . . voice commands . . . made by use of the user input device.” EX1004, 8:63-65. 22:9-12. In my opinion, a POSITA would have understood or found it obvious that the user input device includes a microphone that produces an output signal representative of a user’s voice command (a “voice signal”) that is received by a device in Shanman’s client 12 such as an analog-to-digital (A-D) converter (a “receiver”) to convert the voice signal to a digitized voice signal. This digitized voice signal is a product location inquiry because Shanman’s server 10 responds to it (or to a further-processed

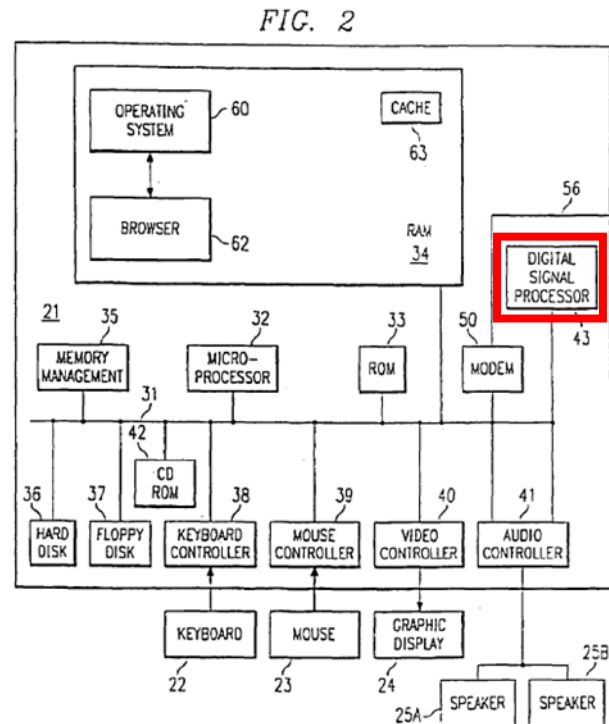
version of it) with a product location. EX1004, 7:29-37, 6:5-28, 7:21-29, 15:36-54, 16:5-38, 18:36-47. Shanman discloses “the location of the selected goods within the selected retail outlet together with discount coupons corresponding to the selected goods,” EX1004, 5:3-19, and a “shopping list may 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.

73. In my opinion, a POSITA would have understood, or found it obvious, that Shanman discloses a system that receives the product location inquiry in real time, while the user is shopping. EX1004, Abstract, 7:37-65, 8:11-42. Specifically, Shanman states “the present invention applies to any type of network, including local . . . area networks.” EX1004, 11:35-65. In my opinion, a POSITA would have understood a local area network to pertain to a network of devices including Shanman’s server 10 and consumer data processing units/client devices 12 located in the store.

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

74. In my opinion, Shanman discloses this limitation, and Shanman alone or together with the knowledge of a POSITA renders this limitation obvious. *See* [1a], [1c]. In Shanman, the client includes a consumer “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 processes the consumer’s inquiry to create a product location inquiry signal that is sent to the coupon server. EX1004, 6:5-28.



EX1004, Fig. 2 (annotation added).

75. As discussed above, in my opinion, a POSITA would have understood or found it obvious that the user’s voice command signal from a microphone would be input to a receiver such as an A-D converter. In my opinion, a POSITA would have further understood or found it obvious that the digitized signal from that receiver would be processed using well-known voice recognition techniques in, e.g., the digital signal processor 43 or the microprocessor 32, to determine the content of the user’s voice command. EX1029, 15:46-16:18. I note that there is no

teaching in the 260 patent of how to perform voice recognition on spoken words, and the 260 patent admits that “[a]ny one of a number of voice recognition programs or circuits or other mechanisms known to those skilled in the art may be employed in voice recognition and response unit 302 to perform this voice recognition function.” EX1001, 7:53-57. This is consistent with my opinion that this technology was well-known at the time of the 260 patent. If it were not, it is my opinion that claims 1-6 of the 260 patent would be unpatentable because they would not enable a POSITA how to make and use the invention.

76. Shanman also provides a second disclosure of this limitation where a 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. EX1004, 6:13-28. Shanman discloses that “[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.” *Id.* Shanman also discloses “the selected information acquired from the consumer data processing unit,” EX1004, 8:66-9:2, and “[s]elections of goods made by the consumer are transmitted to the coupon server for use by a server-resident process,” EX1004, 10:17-28. 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 need to process the received signal in order to generate the necessary signal for doing so.

77. In both scenarios, Shanman discloses that the consumer's product location information inquiry (i.e., the signal output by the microphone resulting from the user's voice command) is processed to determine a signal which is a product location inquiry signal because a product location is returned in response to that signal. EX1004, 7:29-37. Specifically, Shanman discloses that such an inquiry's processing is "responsive to the selections of the 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." 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.

6. [1e] querying a database to obtain product location information in response to the product location inquiry signal;

78. In my opinion, Shanman discloses this limitation. *See* [1d]. In response to a product location inquiry signal resulting from a consumer's inquiry, the server queries the database located in server memory, which responds with product location information. *See* [1c]. The coupon server processes the received signals to query the database to provide the product location information. EX1004, 8:11-22, 7:37-65, 8:11-42. Shanman 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." EX1004, 6:13-28. Shanman also discloses "download[ing] 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, Abstract. In my opinion, a POSITA would have understood that the client's product location inquiry signal is received at the server as a query of the server's database to obtain product location information.

7. **[1f] providing an information signal in response to the product location inquiry signal, the information signal at least sometimes including at least a first portion of the product location information and also depending at least sometimes upon a first portion of the product availability information; and**

79. In my opinion, Shanman discloses and/or renders obvious this limitation. *See* [1b], [1d], [1e]. In response to the signal generated as a result of the consumer's inquiry, Shanman's server transmits the product location to the consumer device. 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. The transmission of this product location constitutes "providing an information signal in response to the product location inquiry signal" as recited in this limitation.

80. I have been informed by counsel for Petitioner the remainder of [1f] including "*sometimes* including at least a first portion of the product location information" and "depending at least *sometimes* upon a first portion of the product availability information" are akin to conditional limitations that are not entitled to patentable weight. In any event, in my opinion, Shanman discloses them.

81. **"the information signal at least sometimes including at least a first portion of the product location information":** In my opinion, a POSITA would have understood that the server's response to the client includes at least a first portion of the product location information because the communication includes

the requested product location (i.e., the product's location is at least a first portion of the product location information stored in the database).

82. **“the information signal . . . also depending at least sometimes upon a first portion of the product availability information”:** If “depending” means rely on, the information signal at least sometimes depends on the product availability information at least because the information signal includes availability information. Shanman discloses “the monitor of the consumer data processing unit may display a customized list of goods *available*,” EX1004, 15:1-16:32 (emphasis added), “[c]ompetitive pricing or *availability* information may also be provided,” EX1004, 7:60-65 (emphasis added), “[b]ased on the selection of a retail outlet...the consumer is provided with a customized list of goods *available* in the selected retail outlet,” EX1004, 8:58-62 (emphasis added). If “depending” means controls the outcome of, the information signal also at least sometimes depends on the product availability information because Shanman's system includes the ability to transmit an information signal that results in only displaying the goods actually sold at the selected outlet. Shanman teaches the information signal “transmit[s] for display on the consumer data processing unit a file containing retail outlet data including the list of goods actually sold at the selected retail outlet.” EX1004, 6:5-57. Further, in my opinion, a POSITA would have understood, or found obvious, that the location is a function of availability—meaning when the product is not

available at the selected store, the information signal indicates another location, such as showing that a produce is “available at a lower cost elsewhere,” EX1004, 7:47-65, or “data for a plurality of participating retail outlets,” EX1004, 13:50-14:1.

8. [1g] providing an output signal at an output device, the output signal being a response to the product location inquiry, and being based upon the information signal,

83. In my opinion, Shanman discloses this limitation. *See* [1b], [1f]. Upon receipt of the response from the server (“information signal”), 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. This output signal is based on the information signal because it includes the product location from the information signal.

9. [1h] whereby, when the product availability information indicates that a product is unavailable at a location, the information signal is configured so that the output signal does not provide an indication that the product is available at the location.

84. In my opinion, due to the recitation of “when,” this is a conditional limitation, which I have been informed is not entitled to patentable weight in method claims. Regardless, Shanman discloses and/or renders obvious this limitation. *See* [1f], [1g]. Shanman’s server 10 contains availability and location information. *See* [1b]. The information signal depends on product availability information. *See* [1f]. Shanman discloses that, when a product is unavailable, its output signal does not provide an indication that the product is available at the location because it only transmits the goods actually sold at the selected outlet. Shanman further discloses that it “transmit[s] for display on the consumer data processing unit a file containing retail outlet data including the list of goods actually sold at the selected retail outlet.” EX1004, 6:5-57. Further, in my opinion, a POSITA would have found obvious to not display the location of unavailable inventory, especially given the data stored on the server in Shanman.

B. Claim 2: The method of claim 1, wherein the additional product-related information includes product promotion information.

85. 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 1, from which this claim depends, is obvious over Shanman. In my opinion, Shanman discloses claim 2's limitation, therefore claim 2 is obvious. *See* §V.A, [1b]. The information signal contains further additional product-related information that includes product promotion information. Shanman discloses "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. Shanman further discloses "[i]n response to the consumer's submission of the selected goods, the server searches its memory for any available coupons pertaining to the selected goods." EX1004, 16:5-32.

C. Claim 3: The method of claim 1, further comprising: determining an availability within the store of a product to which the product location inquiry pertains.

86. 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 3's limitation, therefore claim 3 is obvious. *See* §V.A, [1b], [1f], [1h]. Shanman determines an availability within the store of a product to which the product location inquiry pertains because the information signal responding to the inquiry includes availability information. *Id.* Furthermore, in my opinion, a POSITA would have understood, or found obvious, that because the request was made in

real-time from within the store, that the user was making a location and availability information inquiry regarding that particular store “to which the product location inquiry pertains.” *See* [1c].

D. Claim 4: The method of claim 1, wherein the first input device includes a user interface with a keyboard entry device.

87. 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 4’s limitation, therefore claim 4 is obvious. *See* §V.A, [1a]. Shanman discloses its first input device (“user input device”) has a keyboard. Shanman discloses “[t]he consumer may select particular goods by means of predetermined keyboard entries . . . by use of the user input device.” EX1004, 8:63-65.

E. Claim 6

88. As shown below, it is my opinion that Shanman in view of the knowledge of a POSITA renders claim 6 obvious.

2. [6pre] The method of claim 1, further comprising:

89. In my opinion, the preamble is disclosed and/or rendered obvious by Shanman. *See* §V.A.

3. [6a] updating at least some of the product location information to reflect changes in inventory occurring within the store;

90. In my opinion, Shanman discloses this limitation. *See* [1b], [1f].
Shanman discloses that the information on its server, including inventory

information, is periodically updated. Specifically, Shanman discloses “[t]he internal memory of the coupon server is adequately large for storing . . . inventory data . . . and physical layout of the goods for sale, which must be periodically updated.” EX1004, 13:62-14:1. Shanman also discloses the shopping list information “is provided by participating retail outlets and is periodically updated to reflect changes in the layout of the respective retail outlet.” EX1004, 9:10-19. In my opinion, a POSITA would have understood or at least found obvious that because the information signal depends on the inventory information, and the server information is periodically updated, that the product location information reflects changes in inventory occurring within the store. *See* [1f].

4. [6b] recording information relating to the inquiry and analyzing the information relating to the inquiry; and

91. In my opinion, Shanman discloses this limitation. *See* [1b].

Additionally, Shanman teaches “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 selected goods . . . the shopping list may optionally include the actual location of the selected goods.” EX 1004, 8:12-15. Shanman also discloses “[a]fter monitoring the consumer’s selections, the selected information acquired from the consumer data processing unit is transmitted to the coupon server for *storage* and *analysis*.” EX1004, 8:66-

9:2 (emphasis added). The consumer's selections are product location inquires as discussed above because they result in responses including a product location.

“recording information relating to the inquiry”:

92. In my opinion, Shanman discloses recording information relating to the inquiry. Shanman discloses a “consumer data processing unit . . . comprises a tracking program for monitoring keyboard events,” EX1004, 22:9-14, and “monitor[ing] the consumer's selection of . . . goods,” *id.* Shanman also discloses recording additional information relating to the inquiry: “historical profiles,” EX1004, 9:30-36; “consumer purchasing habits,” EX1004, 19:14-33; “user interests,” “previously expressed . . . interest,” “previous choices,” “previous selections,” and “previous interactions,” EX1004, 21:13-22:49; and “selected goods,” EX1004, 19:34-49.

93. These previous location inquiries are stored on the server. EX1004, Shanman discloses a user's prior selections are “remembered” and stored with the consumer identifying data to establish a user's historic profile. Shanman discloses “the selection of goods from the shopping list downloaded from the consumer, in addition to the client profile database, may be part of a Web resource that appears to automatically ‘remember’ the consumer's previous interactions,” EX1004, 22:30-49. Shanman further discloses “[w]hen the consumer later returns to that page, the user ID . . . or the network or client ID . . . is used to automatically

highlight or fill in the previous selections.” *Id.* Shanman also discloses “[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, 17:47-50.

“analyzing the information relating to the inquiry”:

94. Shanman discloses serving out highly targeted information based on a user’s history. Shanman teaches “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, and “coupons and other purchase incentives may be served on a targeted basis depending on individual consumer interests and purchasing habits,” EX1004, 10:16-46. Shanman also discloses “this information may be used to *analyze* the demand for particular products . . . and, importantly, for the targeted distribution of promotional information to individual consumers,” EX1004, 5:37-59 (emphasis added), and “[a]*nalysis* of the data on a user-indexed basis would facilitate the determination of individual user interests and purchasing habits,” EX1004, 21:13-42 (emphasis added). In my opinion, a POSITA would have understood that Shanman disclosing its server building historical profiles of its

users to serve highly targeted purchase incentives discloses analyzing the information relating to the inquiry.

5. [6c] comparing information regarding the product location inquiry with additional information concerning products sold at the store.

95. In my opinion, Shanman discloses and/or renders obvious this limitation. *See* [1b], [1c], [1d]. As discussed above in [1c] and [1d], the product location inquiry is a voice signal output by a microphone that is processed in order to obtain the user's spoken words. Those spoken words are information related to the product location inquiry. In order to return results, such as names and locations of products sold in the store as discussed in [1e], corresponding to those words spoken by the user, in my opinion, a POSITA would have understood, or found obvious, that those words would be compared with additional information concerning products sold at the store such as the names and inventory of products sold at the store. Said differently, the spoken words(s) ("information regarding the product location inquiry") would be compared to the database information ("additional information concerning products sold at the store") to return relevant results to populate the shopping list. Indeed, Shanman discloses using SQL (structured query language, which is a standard language for relational database management systems), which, in my opinion, a POSITA would have understood includes relevance-based searching. EX1004, 20:20.

96. In my opinion, beyond providing relevant search results for the queried product, Shanman also provides targeted information concerning other products sold at the store based on the comparison of the product location inquiry and additional information concerning products sold at the store. *See* §V.E.3. Shanman discloses its server storing voluminous information regarding products available at participating retail outlets. Specifically, Shanman discloses “[t]he internal memory of the coupon server is adequately large for storing . . . data for identifying a plurality of participating retail outlets, including inventory data, name, geographic location, and physical layout of goods for sale.” EX1004, 13:63-14:1. This additional information also includes analysis data based on profiles. *See* §V.E.3. Products on the server are linked based at least on this additional information, 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, 10:39-46. Shanman then—based on this information—discloses providing additional promotional information and purchase incentives beyond the inquired-for product. Shanman further discloses “purchase incentives in addition to the selected coupons may be targeted based upon a consumer’s . . . historic profile”

and “other purchase incentives may be served on a targeted basis depending upon individual consumer interests.” EX1004, 10:15-46. In my opinion, a POSITA would have understood, or found obvious, that Shanman’s server enables comparing information regarding the product location inquiry with additional information concerning products sold at the store to provide relevant purchase incentives.

97. Shanman’s database can further link products by indexing the additional information. Shanman discloses the additional information may be “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. EX1004, 15:19-54. 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, or found obvious, that the indexing of products by Shanman’s server (i.e., a POSITA would have understood these to include database relationships) enables comparing information regarding the product location inquiry with additional information concerning products sold at the store. As an example, Shanman discloses a “consumer may be

given the opportunity to receive coupons for a competing brand,” in addition to the sought after item. EX1004, 17:35-39. In my opinion, a POSITA would have understood, or found obvious, this example shows that both the Shanman system (compared the sought after product to additional products sold at the store—provided a relevant coupon, and that the user can compare the item it sought against the competing good).

98. Therefore, in my opinion, a POSITA would have understood, or found obvious, that to provide cross-promotional coupons to be sent to the user in a response to a product location inquiry, Shanman discloses comparing information regarding the product location inquiry with additional information concerning products sold at the store because the targeted promotional information concerning the other products sold at the store relates (as explained above) to the product location inquiry. For example, Shanman discloses “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. Also, Shanman discloses “purchase incentives in addition to selected coupons may be targeted based upon a consumer’s coupon selections.” EX1004, 10:39-56.

99. Additionally, in my opinion, a POSITA would have found obvious that the end user can perform this limitation by comparing the promotional

information concerning other products with the information concerning the requested product.

F. Claim 7

100. As shown below, it is my opinion that Shanman in view of the knowledge of a POSITA renders claim 7 obvious.

2. [7pre] A method of providing product location information within a store, the method comprising:

101. In my opinion, Shanman discloses this limitation. *See* [1pre].

3. [7a] affixing at least a first input device at a first location within the store, so that the first input device is substantially stationary;

102. In my opinion, Shanman discloses this limitation. *See* [1a].

4. [7b] providing a database containing product location information and additional product-related information including product availability information;

103. In my opinion, Shanman discloses this limitation. *See* [1b].

5. [7c] obtaining an inquiry at the first input device;

104. In my opinion, Shanman discloses this limitation. *See* [1c], §V.D., §V.G.3-4.

6. [7d] processing the inquiry at a processing device to determine an inquiry signal;

105. In my opinion, Shanman discloses this limitation. *See* [1d].

7. [7e] querying a database to obtain product location information in response to the inquiry signal;

106. In my opinion, Shanman discloses this limitation. *See* [1e].

8. **[7f] providing an information signal in response to the inquiry signal, the information signal at least sometimes including at least a first portion of the product location information and also depending at least sometimes upon a first portion of the product availability information;**

107. In my opinion, Shanman discloses this limitation. *See* [1f].

9. **[7g] providing an output signal at an output device, the output signal being a response to the inquiry and being based upon the information signal,**

108. In my opinion, Shanman discloses this limitation. *See* [1g].

10. **[7h] whereby, when the product availability information indicates that the product is unavailable at a location, the information signal is configured so that the output signal does not provide an indication that the product is available at the location; and**

109. In my opinion, Shanman discloses this limitation. *See* [1h].

11. **[7i] comparing information regarding the inquiry with additional, information concerning products sold at the store.**

110. In my opinion, Shanman discloses this limitation. *See* [6c].

G. Claim 9

111. As shown below, it is my opinion that Shanman in view of the knowledge of a POSITA renders claim 9 obvious.

2. **[9pre] A method of providing product location information regarding locations of products within a store to customers within the store, the method comprising:**

112. In my opinion, Shanman discloses the preamble. *See* [1pre], §V.A.

3. [9a] affixing a plurality of user interfaces respectively at respective positions within the store in a substantially stationary manner;

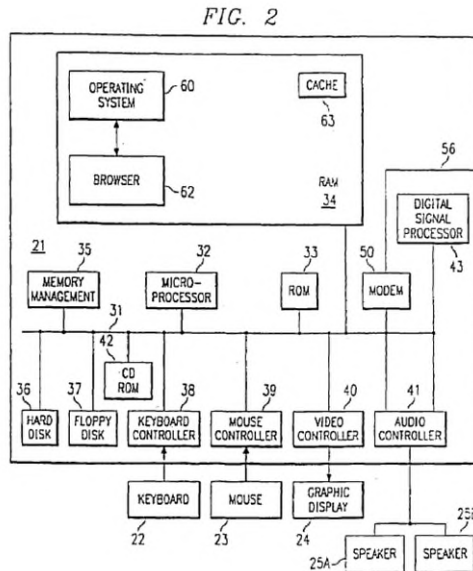
113. In my opinion, Shanman discloses this limitation. *See* [1pre], [1a] (The user input device/consumer data processing unit is the “user interface”). Shanman discloses providing a plurality of user interfaces via teaching “the consumer data processing *units* comprise client computers.” EX1004, 6:29-32 (emphasis added). In my opinion, a POSITA would have found it obvious to implement Shanman using multiple user interfaces inside the store at different positions, so that customers would be able to conveniently access user interfaces to view the data at different positions in the store. For example, a POSITA would have found it obvious for a store to have one or even a plurality of user interfaces near the entrance of the store (each of which would have a different respective position because they cannot occupy the same physical space) for customers to use when they enter the store, and to have additional user interfaces in different positions throughout the store for a customer to use if, for example, the customer suddenly remembers that they wish to purchase an additional item but does not know whether the store carries the item and/or where in the store the item is located.

4. [9b] receiving input signals representative of inquiries from the customers in the store at the user interfaces, wherein each of the user interfaces includes a memory unit;

114. In my opinion, Shanman discloses this limitation. *See* [1c], [1d], [9a].

Shanman discloses 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. These inquiries at the user interface occur by “a user input device to permit a consumer to make one or more selections from choices displayed on the display monitor.” EX1004, 6:5-13, 5:3-19. Alternatively, a user “may...[be] prompt[ed]...to enter their own shopping list.” EX1004, 15:63-66. In my opinion, a POSITA would have understood that the user’s selections or entries on the user interfaces are inquiries.

115. Input signals representative of these customer inquiries are generated at the keyboard controller 38 and/or the mouse controller 39. EX1004, 13:25-34, Fig. 2. Shanman discloses “[t]he keyboard controller 38 provides the hardware interface for the keyboard 22, the [mouse] controller 39 provides the hardware interface for the mouse (or other hand-operated input implement) 23, the video controller 40 provides the hardware interface for the display 24.” *Id.* The keyboard, mouse, and display are collectively the user interface. *See* [1a]. Shanman discloses a “input device (in the case of a computer mouse, selection is made by ‘clicking’ on the displayed goods).” EX1004, 16:5-8.



EX1004, Fig. 2.

116. The input signals generated by the keyboard controller 38 and mouse controller 39 are then received by the client at its BIOS within ROM 33. EX1004, 13:9-15. Shanman discloses “the basic input-output system (BIOS) which controls basic hardware operations such as the interaction and the disk drives and the keyboard.” *Id.*, Fig. 2.

117. Shanman also discloses that its server (“hub”) receives input signals representative of inquiries because the server responds with the inquired for information. EX1004, 7:29-37, 6:5-28, 7:21-29, 15:36-54, 16:5-38, 18:36-47. In my opinion, a POSITA would have understood that the server of Shanman is disclosure of a central hub. Shanman discloses “[i]n response to the selection of goods, the coupon server transmits to the [client] . . . a file containing data identifying the aisle location int the selected retail outlet,” EX1004, Abstract, and

“the location of the selected goods within the selected retail outlet together with discount coupons corresponding to the selected goods,” EX1004, 5:3-19. Shanman further discloses 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. In my opinion, a POSITA would have understood that Shanman discloses its server receiving input signals representative of inquiries from the customers in the store at the user interfaces because Shanman discloses its server responding to the inquiries.

118. In my opinion, a POSITA would have understood, or found it obvious, that Shanman discloses a system where these inquiries are made in real time, while the user is shopping because, as discussed in [1c] above, Shanman discloses that the server 10 and consumer data processing units/clients 12 (which can be televisions or personal computers and which are substantially stationary and affixed in the store as discussed above in [1a] and [9a]) communicate via a local area network. EX1004, Abstract, 7:37-65, 8:11-42, 12:24-32, Fig. 1 (disclosing client devices as personal computers). Shanman further discloses “the present invention applies to any type of network, including local . . . area networks,” EX1004, 11:35-65, and “the teachings of the present invention are equally applicable for use in devices such as televisions (e.g., so-called interactive TV) . . .

and any other type of data transmission and receiving device capable of achieving connectivity with a server,” EX1004, 11:46-58.

119. The clients 21 include RAM 34, Cache 63, ROM 33, Hard Disk 36, Floppy Disk 37, CD ROM 42 (“memory unit”). EX1004, 13:4-42, 17:4-8, Fig 2.

5. [9c] conducting periodic communications between the user interfaces and a hub that is at least indirectly in communication with each of the user interfaces and that is capable of accessing at least one database;

120. In my opinion, Shanman discloses and/or renders obvious this limitation. *See*, [1b] (the server 10 has a database), [9b] (server (“hub”) and client (contains “user interface”) have communication means), [6a] (“inventory data ... and physical layout of the goods for sale, which must be periodically updated”). Shanman further discloses an executable program is downloaded to the client, as it “could be permanently stored on the consumer data processing units.” EX1004, 17:8-13. Shanman also discloses “[t]he program can be downloaded along with a list of selected retail outlets and goods sold in those outlets.” EX1004, 17:17-19. When using the program, the client communicates with the server whenever a selection is made. Specifically, “selection of one or more retail outlets causes the program to communicate with another process to obtain and display a list of selectable goods available in the designated retail outlets,” and “[s]election of goods by the consumer causes the program to communicate with the server.” EX1004, 17:28-33. “Irrespective of the manner in which the program is executed

and stored, the basic operations, functions and transmission of information to the coupon server is essentially the same.” EX1004, 17:23-26. Additionally, because Shanman discloses that its server is periodically updated, in my opinion, a POSITA would have understood that when information is stored on the client, Shanman discloses/or renders obvious that the hub and the client conduct periodic communications to update the inventory on the client. EX1004, 17:23-26.

6. [9d] querying the at least one database to obtain product location information and additional product-related information;

121. In my opinion, Shanman discloses this limitation. *See* [1e]. The server queries its database, which responds with both product location information and coupon information (additional product-related information). EX1004, 16:13-17. Shanman discloses “[i]n response to the consumer’s submission of the selected goods, the server searches its memory for any available coupons pertaining to the selected goods.” *Id.* The “coupon server...comprises...a processing unit having communication means...to the at least one consumer data processing unit, and [is] responsive to” and processes the received signals to query the database to provide the product information including location, EX1004, 6:13-28. EX1004, 8:11-22. Shanman also discloses “a customized shopping list [downloaded] 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. Shanman discloses a

method that queries a server's database for product location information and additional product-related information. EX1004, Abstract, 7:37-65, 8:11-42.

7. [9e] providing portions of the product location information from the hub to the respective memory units of each of the user interfaces; and

122. In my opinion, Shanman discloses this limitation. *See* [1f], [9c].

Shanman discloses the server downloads the location information to the clients. Specifically, Shanman discloses “[b]ased on the consumer selections and the consumer identifying indicia, a server resident process locates and downloads to the consumer data processing unit for display . . . a shopping list identifying the selected goods, the location of such goods in the selected retail outlet.” EX1004, 8:28-42. In my opinion, a POSITA would have understood that at least because the list is “downloaded to” the client, that it is provided to the respective memory unit.

123. Further, and as discussed in [9c], when the clients run the program, product location information is stored on the clients. *See* [9c]. This information is periodically updated, so, in my opinion, a POSITA would have understood, or found obvious, that when the store information is updated, the server (“hub”) will broadcast portions of the product location information from the hub to the respective memory units of each of the user interfaces by way of an update.

124. Further, Shanman discloses that when the method is accomplished by an executable stored on the client, the “customized shopping list” is provided to the

respective memory unit of the client. EX1004, 17:33-35. “Selection of goods by the consumer causes the program to communicate with the server to locate and download . . . a customized shopping list.” *Id.* A customized shopping list includes “the location in a select retail outlet of the goods selected by the consumer.”

EX1004, 1:14-20. In my opinion, a POSITA would have understood that the client downloading the customized shopping list provides location information to the respective memory unit.

125. Additionally, in my opinion, a POSITA would have understood, or found obvious, that the executable permanently stored on the client could include product location information that could be downloaded with the “list of selected retail outlets and goods sold in those outlets.” EX1004, 17:17-19.

8. **[9f] providing output signals to the customers in the store via the user interfaces, the output signals being responses to the inquiries represented by the input signals, the responses being based upon the portions of the product location information.**

126. *See* [1g], [9b]. In my opinion, Shanman discloses that output signals are provided via the user interface in real time while a customer is shopping in the store based upon the product location information because the monitor on the consumer data processing unit that was used to select the items for inquiry also displays their location and the requisite additional information. EX1004, 15:1-16:33. Shanman discloses “the monitor of the consumer data processing unit may

display a customized list of goods available in the selected retail outlet” and “[t]he shopping list may be in tabular form listing the selected goods and the aisle in the retail outlet at which the goods are located, or may be in the form of a store layout diagram (similar to FIG. 4B) indicating the location of the selected goods.” *Id.*

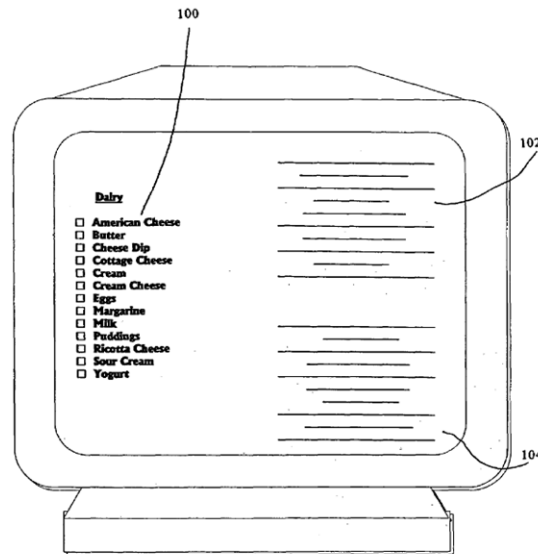


FIGURE 4B

EX1004, Fig. 4B (showing monitor displaying user-selectable shopping list).

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

EX1004, Fig. 5, 15:1-16:33. Figure 5 shows “[a]n example of a shopping list.” *Id.*

In my opinion, a POSITA would have understood, or found obvious, the display of information on a display requires the provision of output signals to the display 24 by the video controller 40.

127. In my opinion, a POSITA would have understood, or found obvious, that Shanman’s disclosure of local area networks discloses providing output signals to customers in the store in real time. *See* [9b]. Additionally, Shanman discloses “the techniques of the invention apply equally whether the user accesses a local area network.” EX1004, 23:65-24:4.

**H. Claim 11: The method of claim 9, further comprising:
determining an availability within the store of a first of the
products to which a first of the product location inquiries
pertains.**

128. In my opinion, Shanman renders this claim obvious. *See* §V.A, §V.C, §V.G.

I. Claim 15

129. As shown below, it is my opinion that Shanman in view of the knowledge of a POSITA renders claim 15 obvious.

**2. [15pre] A method of providing product location information
within a first store, the method comprising:**

130. In my opinion, Shanman discloses the preamble. *See* [1pre].

**3. [15a] providing a hub that is at least indirectly in
communication with each of a plurality of user interfaces,
and that is capable of accessing at least one database, the at
least one database including both product location
information and additional product-related information,**

131. In my opinion, Shanman discloses this limitation. *See* [1a], [1b], [9a], [9c]. Shanman discloses providing a hub and user devices (e.g., “server” 10 and “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. The clients each include 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. The hub is in communication with the plurality of user interfaces. Shanman teaches “[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, 11:35-58, 23:65-24:4, Fig. 1.

132. The server 10 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. In my opinion, a POSITA would have understood that a server would be able to access its own memory that includes a database.

133. Shanman discloses using “one or more databases that are set up on either the coupon server or another location,” meaning they need not be located on the coupon server. EX1004, 19:14-33. Shanman also teaches “multiple databases could be used to store and process the information.” EX1004, 23:6-9. Shanman also discloses accessing a database by “direct connection to a resource located on a server (i.e., a database).” EX1004, 21:1-12. “The teachings of the present invention are applicable to many different types of networks, including computer networks, and may also be used, for instance, in conjunction with direct online connections to databases,” EX1004, 11:35-38, including “on-line database services,” *id.* Additionally, Shanman discloses database access by CGI and JDBC. EX1004,

22:49-56. In my opinion, a POSITA would have understood these means disclose providing the hub access to the database(s).

134. The databases include both product location information and additional product-related information. *See* [1b]. “The internal memory of the coupon server is adequately large for storing . . . inventory data . . . and physical layout of the goods for sale, which must be periodically updated.” EX1004, 13:62-14:1.

4. **[15b] wherein the additional product-related information includes: information concerning a quantity of a first product within the store; information concerning a price of the product; information concerning an availability or unavailability of the product within the store; and information linking the product with another product in a cross-referential manner;**

135. In my opinion, the recitation of what the “further additional product-related information includes” 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 and/or renders obvious this limitation. *See* [15pre], [15a]; *see also*:

- **“information concerning a quantity of a first product within the store”:** “including inventory data,” EX1004, 13:62-14:1; “name and inventory of goods,” EX1004, 6:33-54;

- **“information concerning a price of the product”:** “retail price,” EX1004, 7:51-60; “coupons,” EX1004, Abstract; (“retail price”), Abstract (“coupons”));
- **“information concerning an availability or unavailability 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; and
- **“information linking the product with another product in a cross-referential manner”:** “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; “another brand,” EX1004, 21:35-42; EX1004, 9:30-36, 10:16-28, 10:39-46.

In my opinion, a POSITA would have further understood, or found obvious, that Shanman’s disclosure of alternatives discloses storing information that linked the

product with another (“select choices from a list of alternatives”) in a cross-referential manner. EX1004, 17:40-54.

136. In addition to the fourth and final bullet in the above paragraph, 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. EX1004, 15:19-54. Shanman discloses “[i]nstructional text 104 and targeted advertising text 106 accompany the list of goods.” *Id.* 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.

137. In my opinion, 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 when “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 “purchase incentives in addition to selected coupons may be targeted based upon a consumer’s coupon selections,” EX1004, 10:39-56.

138. To the extent that it is determined that Shanman does not disclose “information linking the product with another product in a cross-referential manner,” Shanman renders it obvious in my opinion. For example, Shanman 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 '260. For example, Beach discloses “[e]ssential items could also be **linked to** or marked with alternative products.” (emphasis added)).

EX1006, 15:49-50.

5. **[15c] periodically engaging in the communication with each of the user interfaces, wherein the engaging in the communication includes:**

139. In my opinion, Shanman renders this limitation obvious. *See* [1c], [9b], [9c].

6. **[15d] receiving inquiry signals from the user interfaces;**

140. In my opinion, Shanman renders this limitation obvious. *See* [1c], §V.D., 9[b].

7. **[15e] querying the database to obtain portions of the product location information in response to the inquiry signals; and**

141. In my opinion, Shanman renders this limitation obvious. *See* [1e].

8. **[15f] providing information signals in response to the inquiry signals for receipt by the user interfaces, wherein the information signals include portions of both the product location information and the additional product-related information, whereby the user interfaces are able to provide output signals based upon the information signals;**

142. In my opinion, Shanman renders this limitation obvious. *See* [1f], [1g], [9f], §V.B.

9. [15g] wherein at least some of the communication is wireless communication.

143. In my opinion, Shanman discloses this limitation. The disclosed network “include[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. The network in Shanman is inclusive of cellular and wireless local area networks.

J. Claim 16: The method of claim 15, wherein at least one of the user interfaces is provided by a mobile device.

144. In my opinion, Shanman renders this claim obvious. *See* §V.I., [1a].

K. Claim 17. The method of claim 16, wherein at least one of the user interfaces is substantially stationary, and wherein the at least one of the user interfaces provided by the mobile device is utilized by a customer within the store.

145. In my opinion, Shanman renders this claim obvious. *See* §V.I., §V.J., [1a], [9b].

VI. GROUND 2: OGASAWARA AND BEACH RENDER OBVIOUS CLAIMS 15 AND 16

A. Claim 15:

146. As shown below, it is my opinion that Ogasawara in view of Beach renders claim 15 obvious.

1. [15pre] A method of providing product location information within a first store, the method comprising:

147. In my opinion, Ogasawara discloses the preamble under any reasonable construction of “within a first store,” including a construction under which “within a first store” specifies a particular location within a store in which a product is located and under which “within a first store” specifies a location in which the customer is located when the product location is received. 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. [15a] providing a hub that is at least indirectly in communication with each of a plurality of user interfaces, and that is capable of accessing at least one database, the at least one database including both product location information and additional product-related information,

148. In my opinion, Ogasawara discloses this limitation. Ogasawara discloses providing claimed “hub” (Ogasawara’s “store central computer,” an embodiment of which is the core server 50 in Fig. 1) that is capable of accessing a database (Ogasawara’s “merchandise item database 55”, which is illustrated in Fig. 1 as a mass storage memory device using the same symbol as the “local storage apparatus 30” of Fig. 1, which is described as, *inter alia*, a “hard disk drive”). EX1005, Abstract, 2:27-46, 4:36-67, 5:9-6:10, Figs. 1, 6. Ogasawara further discloses that the hub is in communication with a plurality of mobile terminals 5 (each being or including a claimed “user interface”) via RF communications.

Ogasawara also discloses “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.

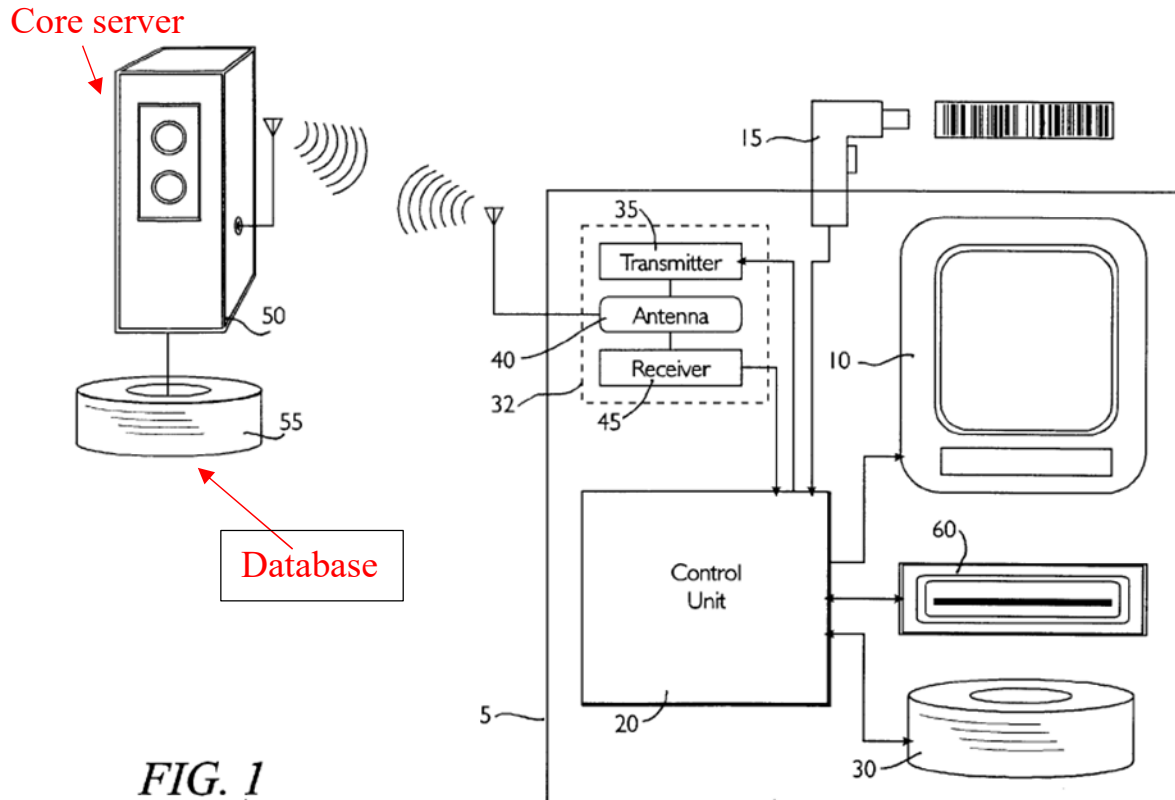


FIG. 1

EX1005, Fig. 1 (red annotations added).

149. Ogasawara’s database 55 includes a Product Look-up Table (“PLU”) as shown in Fig. 6:

PLU Table

302 SKU	304 ITEM Information Brand Name Generic Name	306 Price	310 Location Information
00001	(Brand Name) Apples	\$1.99	Location-a
00002	(Brand Name) Tissues	\$2.99	Location-b
00003	(Brand Name) Spice	\$4.99	Location-c
00004	(Brand Name) Spice	\$3.29	Location-c
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

300

FIG. 6

EX1005, 2:41-46, 6:60-7:1, 8:1-34. Ogasawara discloses “the item database is resident in a memory location of the store computer,” EX1005, 19:25-27, and “the PLU table contains an entry for each and every item stocked by the store,” EX1005, 7:555-57.

150. The PLU in the database 55 includes “product location information entry 310” which “is associated with the merchandise specific information set 300, such that each item entry comprising the merchandise information set is associated with a specific location entry.” EX1005, 7:44-47.

151. The PLU in the database 55 also includes “additional product-related information” such as current stock and price. This includes “each item entry includes a price field 306,” EX1005, 7:34-35, and “[u]p-to-date pricing information, as well as the status of current store inventory are illustrative of the type of information comprising the retail facility database 55...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.

3. **[15b] wherein the additional product-related information includes: information concerning a quantity of a first product within the store; information concerning a price of the product; information concerning an availability or unavailability of the product within the store; and information linking the product with another product in a cross-referential manner;**

152. In my opinion, Ogasawara discloses and, in combination with Beach, renders obvious this limitation. *See* [15a]. Ogasawara’s database 55 includes the following additional product-related information:

- **“information concerning a quantity of a first product within the store”:** “Up-to-date pricing information, as well as the status of current store inventory are illustrative of the type of information comprising the retail facility database 55 . . . 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;

- **“information concerning a price of the product”**: The PLU in Ogasawara’s database 55 includes the price for each product, as “each item entry includes a price field 306.” EX1005, 7:34-35; *see also* Fig. 6;
- **“information concerning an availability or unavailability of the product within the store”**: See first bullet point above. The quantity of a product in the store indicates its availability or unavailability.
- **“information linking the product with another product in a cross-referential manner”**: Ogasawara discloses cross-referential identification indicia for each product (e.g., brand name, generic name). Figs. 6, 7; EX1005, Abstract, 2:41-46, 3:42-48, 6:60-7:67. Ogasawara further discloses “[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 understand Ogasawara’s disclosure of links between “generic” and “specific” entries in the database discloses cross-referential links between products. Ogasawara further discloses

linking or associating a product in the customer's profile in the database with a recommended promotional item in a cross-referential manner. Ogasawara also discloses "[b]ased on the customer's personal profile, either the mobile terminal or the store central computer develops recommended promotional items which a customer with that profile would likely purchase. 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, 3:42-48. In my opinion, it would have been obvious to a POSITA to implement the closest promotional item disclosed in Ogasawara by including cross-referential links between two products.

153. In the event Patent Owner argues that Ogasawara does not disclose product location availability information, in my opinion, a POSITA would have found it obvious to modify Ogasawara to include that feature based on Beach. It was well-known in the art and customary to provide information regarding products availability (e.g., whether the product is in stock). For example, Beach discloses providing responses if an item is not available. EX1006, 14:29-31. Specifically, Beach discloses "[t]he item prompts would also be turned off in the event the central host determines that the product is out of stock." *Id.* In my

opinion, a POSITA would have found it obvious to modify Ogasawara to utilize voice capability to for product inquiry via a voice signal. In my opinion, Beach, Ogasawara, and the 260 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 light of Ogasawara's disclosure of providing ("an entry for each and every item of merchandise stocked by the store," EX1005, 7:53-57), 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 the customer with information regarding whether an item is available. In my opinion, a POSITA would have had a reasonable expectation of success in so doing because incorporating information regarding product availability was well-known to a POSITA at the time of the 260 patent and involved no more than routine skill.

154. In the event Patent Owner argues 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. 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 "[e]ssential items could also be **linked to** or marked with alternative products" in a cross-referential manner to offer product-specific alternatives. EX1006, 15:49-50 (emphasis added). In my opinion, a POSITA

would understand that it would be obvious to modify Ogasawara to include product-specific “alternatives” using a cross-reference link in the database.

155. 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 to the customer for those lists. Moreover, the feature of linking two products as product-specific alternatives to each other in a cross-referential manner enables the customer to navigate through products in the store more efficiently and finding 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 260 Patent and involved no more than routine skill.

4. [15c] periodically engaging in the communication with each of the user interfaces, wherein the engaging in the communication includes:

156. In my opinion, Ogasawara discloses this limitation. *See* [15a]; *see also* [15e]-[15f] below. In my opinion, a POSITA would understand that the communications described in [15e]-[15f] below are periodic in the sense that they occur from time to time as a result of customer use of Ogasawara’s system.

5. [15d] receiving inquiry signals from the user interfaces;

157. In my opinion, Ogasawara discloses this limitation. *See* [15a].

Ogasawara discloses that the mobile terminal enables a customer to make inquiries regarding the location of a product. EX1005, 8:62-65. Specifically, Ogasawara states, “[i]n one embodiment of the invention, when a customer desires to purchase an item, or to initialize the customer location recognition feature of the mobile terminal, 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, using the UPC bar code scanner 15 provided on the mobile terminal. The items UPC code is processed by the mobile terminals control unit which may extract a particular items SKU code from the UPC code and transmits the item's SKU number to the retail facility's core server (50 of FIG. 1) by means of its internal RF transceiver circuitry.” *Id.* Ogasawara also discloses “the customer location recognition feature is able to respond to customer prompts, by which a *customer may further make inquiries “the location and direction of any specific item* in the retail facility.” EX1005, 6:54-59 (emphasis added); *see also* 8:55-9:7.

6. [15e] querying the database to obtain portions of the product location information in response to the inquiry signals; and

158. In my opinion, Ogasawara discloses or renders obvious this limitation. *See* [15a]. Ogasawara discloses querying a database in response to an inquiry

signal to obtain product location and direction information. EX1005, 2:41-46, Specifically, Ogasawara discloses “a customer may further make inquiries about the location and direction of any specific item in the retail facility,” EX1005, 6:54-59, and “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. Ogasawara also discloses “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.

7. **[15f] providing information signals in response to the inquiry signals for receipt by the user interfaces, wherein the information signals include portions of both the product location information and the additional product-related information, whereby the user interfaces are able to provide output signals based upon the information signals;**

159. In my opinion, Ogasawara discloses this limitation. *See* [15d] Ogasawara discloses providing information signals in response to the inquiry signals for receipt by the user interfaces (“mobile terminals”). EX1005, 9:9-11. Specifically, Ogasawara discloses “the core server 50 . . . transmits the information contained therein to the mobile terminal.” *Id.* Ogasawara discloses the information signals include both product location information and information about the

direction of a product. EX1005, 2:41-46. Ogasawara specifies “a customer may further make inquiries about the location and direction of any specific item in the retail facility,” EX1005, 6:54-59, and “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, 9:8-15. The direction information is a type of “additional product-related information.” To the extent that this limitation is construed as requiring one of the types of “additional product-related information” recited in [15b], in my opinion, a POSITA would have found it obvious to include, *e.g.*, price information from the PLU in addition to the location information from the PLU for the product. In my opinion, a POSITA would have been motivated to do so in order to provide for greater customer satisfaction and convenience. In my opinion, a POSITA would have had a reasonable expectation of success in making this modification as it involves only minimal skill.

160. Ogasawara also discloses that the mobile terminal provides an output signal to an output device (*e.g.*, “LCD display panel”). “Direction and distance information, *i.e.* aisle and shelf number, is displayed on the mobile terminal display’s panel.” EX1005, 2:59-60. Ogasawara also teaches “[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. In order to display this information, a POSITA would have understood that the LCD display panel is necessarily driven by a signal (the “output signal”), or at least would have found this obvious.

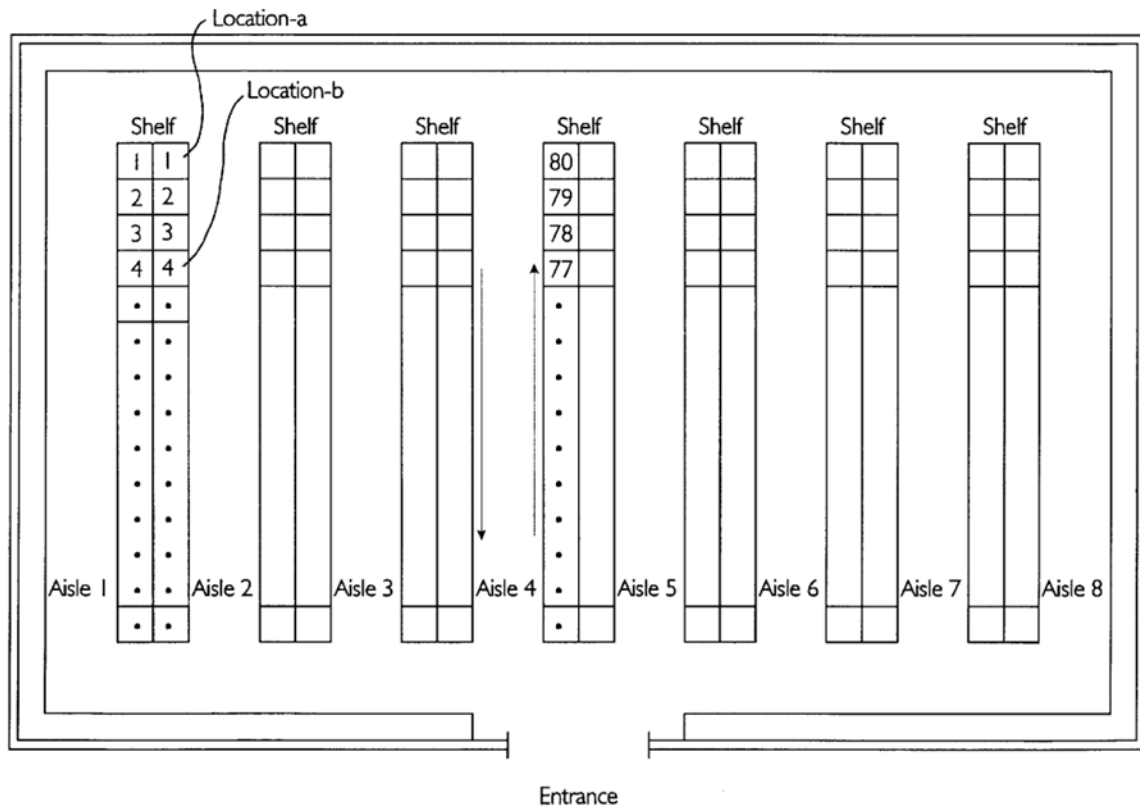


FIG. 8

Id., Fig. 8 (showing directions from one product location to another).

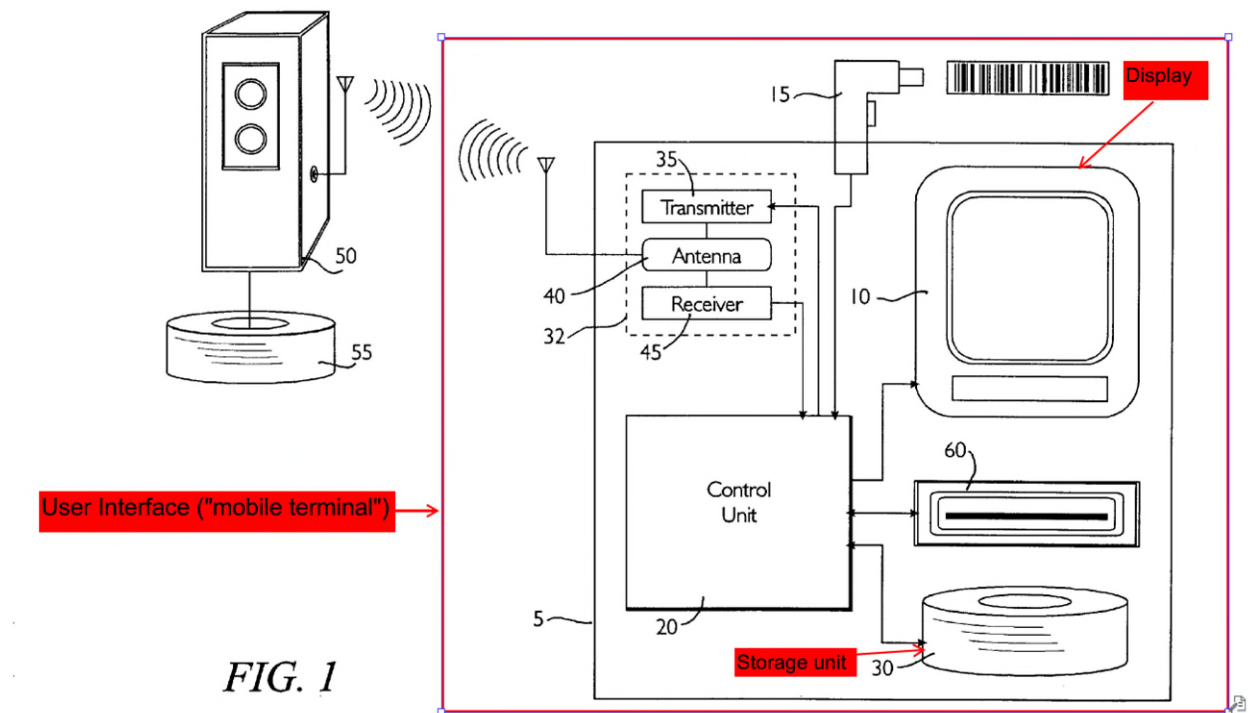
8. [15g] wherein at least some of the communication is wireless communication.

161. In my opinion, Ogasawara discloses this limitation. Ogasawara discloses that the user interface is in wireless communication with the hub. Specifically, Ogasawara discloses “[c]ommunication between the mobile personal shopping terminal 5 and the external information source terminal is implemented by a wireless communication,” EX1005, 5:19-21, 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 understand that the store central computer of Ogasawara is disclosure of a central hub.

B. Claim 16: The method of claim 15, wherein at least one of the user interfaces is provided by a mobile device.

162. As shown above, it is my opinion that Claim 15, from which this claim depends, is obvious over Ogasawara in view of Beach. In my opinion, Ogasawara discloses claim 16’s limitation, therefore claim 16 is obvious. *See* §VI.A. Ogasawara’s user interface is provided by the mobile terminal. 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. Ogasawara further

discloses “[d]irection and distance information, i.e. aisle and shelf number, is displayed on the mobile terminal display’s panel.” EX1005, 2:59-60.



EX1005, Fig. 1 (annotations added).

VII. SECONDARY CONSIDERATIONS

163. 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.

VIII. AVAILABILITY FOR CROSS-EXAMINATION

164. 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.

IX. RIGHT TO SUPPLEMENT

165. 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.

X. CONCLUSION

166. 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.

167. 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.

168. 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 28, 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-secrated 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 IC² (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) 84th 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) 31st 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, 236th 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.