

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.
Petitioner,

v.

EVOLUTIONARY INTELLIGENCE, LLC,
Patent Owner

Patent No. 7,010,536

Issued: March 7, 2006

Filed: January 28, 1999

Inventor: Michael De Angelo

Title: SYSTEM AND METHOD FOR CREATING AND MANIPULATING
INFORMATION CONTAINERS WITH DYNAMIC REGISTERS

Inter Partes Review No. IPR2014-00086

Declaration of Henry Houh Regarding

U.S. Patent No. 7,010,536

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

Dated: October 22, 2013

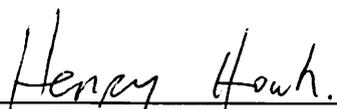

Henry Houh

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Appendix A: List of Materials Considered

I. INTRODUCTION

A. Engagement

1. I have been retained by counsel for Apple Inc. (“Apple”) as an expert witness in the above-captioned proceeding. I have been asked to provide my opinion about the state of the art of the technology described in U.S. Patent No. 7,010,536 (“the ’536 patent”) and on the patentability of the claims of this patent. The following is my written declaration on these topics.

B. Background and Qualifications

2. My Curriculum Vitae is submitted herewith as Exhibit 1004.
3. I received a Ph.D. in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology in 1998. I also received a Master of Science degree in Electrical Engineering and Computer Science in 1991, a Bachelor of Science Degree in Electrical Engineering and Computer Science in 1990, and a Bachelor of Science Degree in Physics in 1989.
4. As further indicated in my C.V., I have worked in the electrical engineering and computer science fields, including web search and web server development, on several occasions. As part of my doctoral research at MIT from 1991-1998, I worked as a research assistant in the Telemedia Network Systems (TNS) group at the Laboratory for Computer Science. The TNS group built a high speed gigabit network and applications which ran over the network, such as remote video capture, processing, segmentation and search on computer terminals. In

addition to helping design the core network components, designing and building the high speed links, and designing and writing the device drivers for the interface cards, I also set up the group's web server, which at the time was one of the first several hundred web servers in existence.

5. I authored or co-authored twelve papers and conference presentations on our group's research. I also co-edited the final report of the gigabit networking research effort with the Professor (David Tennenhouse) and Senior Research Scientist of the group (David Clark), who is generally considered to be one of the fathers of the Internet Protocol.

6. I started building web servers in 1993, having set up the web server for the MIT Telemedia, Networks, and Systems Group, to which I belonged. It was one of the first several hundred web servers in existence, and went on to provide what was likely one of the first live Internet video sessions initiated from a web site. I co-authored papers on our web server video system and on database-backed web sites for which I attended the first World Wide Web conference to present.

7. From 1997 to 1999, I was a Senior Scientist and Engineer at NBX Corporation, a start-up that made business telephone systems that streamed packetized audio over data networks instead of using traditional phone lines. NBX was later acquired by 3Com Corporation, and the phone system is still available

and being used at tens of thousands of businesses or more. As part of my work at NBX, I designed the core audio reconstruction algorithms for the telephones, as well as the packet transmission algorithms. I also designed and validated the core packet transport protocol used by the phone system. The protocol is used millions of times daily currently. Two of the company founders and I received US Patent No. 6,697,963 titled “Telecommunication method for ensuring on-time delivery of packets containing time sensitive data,” for some of the work I did there.

8. Starting in 2001, I was architect for the next generation of web testing product by Empirix known as e-Test Suite. e-Test Suite is now owned by Oracle Corporation. e-Test provided functional and load testing for web sites. e-Test emulated a user's interaction with a web site and provided web developers with a method of creating various scripts and providing both functional testing (e.g., did the web site provide the correct response) and load testing (e.g., could the web site handle 5000 users on its web site simultaneously). Among Empirix’s customers was H&R Block, who used e-Test Suite to test the tax filing functionality of their web site as whether the web site could handle a large expected load prior to the filing deadline.

9. Around 2006, I helped create a search engine for audio and video which could be searched based on spoken word content. Our system used speech recognition and natural language processing to create a search index of audio and

video files posted publicly on the Internet. Today, at RAMP Inc., the project has grown to a product that is used by media outlets such as ABC, CBS, NBC, Fox, and Reuters.

10. Around 2008-2009, while I was Chief Technology Officer at Eons, a venture backed company founded by Jeff Taylor, who also founded the hiring web site Monster.com, Eons launched an advertising network. Eons built a network of sites on which advertisements could be placed, fulfilled client advertisement purchases, and tracked delivery of clients' advertisements. In addition, we utilized the Solr search platform in order to index the millions of items of content added by Eons members, in order to make them searchable.

11. I have also continued to develop web sites for various business projects, as well as setting up web sites on a volunteer basis for various groups that I am associated with.

12. I am the author of several publications devoted to a wide variety of technologies in the fields of electrical engineering and computer science. These publications are listed on my C.V. (Ex. 1004).

C. Compensation and Prior Testimony

13. I am being compensated at a rate of \$575 per hour for my study and testimony in this matter. I am also being reimbursed for reasonable and customary expenses associated with my work and testimony in this investigation. My

compensation is not contingent on the outcome of this matter or the specifics of my testimony.

14. I have testified in Federal District Court three times. Most recently, I testified in the Two-Way Media LLC v. AT&T Inc. matter in the Western District of Texas. I have also testified in the Verizon v. Vonage and Verizon v. Cox matters, both in the Eastern District of Virginia.

D. Information Considered

15. My opinions are based on my years of education, research and experience, as well as my investigation and study of relevant materials. In forming my opinions, I have considered the materials I identify in this report and those listed in Appendix A.

16. I may rely upon these materials and/or additional materials to respond to arguments raised by the Patent Owner. I may also consider additional documents and information in forming any necessary opinions — including documents that may not yet have been provided to me.

17. My analysis of the materials produced in this investigation is ongoing and I will continue to review any new material as it is provided. This report represents only those opinions I have formed to date. I reserve the right to revise, supplement, and/or amend my opinions stated herein based on new information and on my continuing analysis of the materials already provided.

II. LEGAL STANDARDS FOR PATENTABILITY

18. In expressing my opinions and considering the subject matter of the claims of the '536 patent, I am relying upon certain basic legal principles that counsel has explained to me.

19. First, I understand that for an invention claimed in a patent to be found patentable, it must be, among other things, new and not obvious from what was known before the invention was made.

20. I understand the information that is used to evaluate whether an invention is new and not obvious is generally referred to as "prior art" and generally includes patents and printed publications (e.g., books, journal publications, articles on websites, product manuals, etc.).

21. I understand that in this proceeding Apple has the burden of proving that the claims of the '536 patent are anticipated by or obvious from the prior art by a preponderance of the evidence. I understand that "a preponderance of the evidence" is evidence sufficient to show that a fact is more likely true than it is not.

22. I understand that in this proceeding, the claims must be given their broadest reasonable interpretation consistent with the specification. The claims after being construed in this manner are then to be compared to the information in the prior art.

23. I understand that in this proceeding, the information that may be

evaluated is limited to patents and printed publications. My analysis below compares the claims to patents and printed publications that are prior art to the claims.

24. I understand that there are two ways in which prior art may render a patent claim unpatentable. First, the prior art can be shown to “anticipate” the claim. Second, the prior art can be shown to have made the claim “obvious” to a person of ordinary skill in the art. My understanding of the two legal standards is set forth below.

A. Anticipation

25. I understand that the following standards govern the determination of whether a patent claim is “anticipated” by the prior art.

26. I have applied these standards in my evaluation of whether claims 2-14 and 16 of the ‘536 patent would have been anticipated by the prior art.

27. I understand that the “prior art” includes patents and printed publications that existed before the earliest filing date (the “effective filing date”) of the claim in the patent. I also understand that a patent will be prior art if it was filed before the effective filing date of the claimed invention, while a printed publication will be prior art if it was publicly available before that date.

28. I understand that, for a patent claim to be “anticipated” by the prior art, each and every requirement of the claim must be found, expressly or

inherently, in a single prior art reference as recited in the claim. I understand that claim limitations that are not expressly described in a prior art reference may still be there if they are “inherent” to the thing or process being described in the prior art. For example, an indication in a prior art reference that a particular process complies with a published standard would indicate that the process must inherently perform certain steps or use certain data structures that are necessary to comply with the published standard.

29. I understand that it is acceptable to consider evidence other than the information in a particular prior art document to determine if a feature is necessarily present in or inherently described by that reference.

B. Obviousness

30. I understand that a claimed invention is not patentable if it would have been obvious to a person of ordinary skill in the field of the invention at the time the invention was made.

31. I understand that the obviousness standard is defined in the patent statute (35 U.S.C. § 103(a)) as follows:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

32. I understand that the following standards govern the determination of whether a claim in a patent is obvious. I have applied these standards in my evaluation of whether claims 2-14 and 16 of the '536 patent would have been considered obvious in January of 1998.

33. I understand that to find a claim in a patent obvious, one must make certain findings regarding the claimed invention and the prior art. Specifically, I understand that the obviousness question requires consideration of four factors (although not necessarily in the following order):

- The scope and content of the prior art;
- The differences between the prior art and the claims at issue;
- The knowledge of a person of ordinary skill in the pertinent art; and
- Whatever objective factors indicating obviousness or non-obviousness may be present in any particular case.

34. In addition, I understand that the obviousness inquiry should not be done in hindsight, but must be done using the perspective of a person of ordinary skill in the relevant art as of the effective filing date of the patent claim.

35. I understand the objective factors indicating obviousness or non-obviousness may include: commercial success of products covered by the patent

claims; a long-felt need for the invention; failed attempts by others to make the invention; copying of the invention by others in the field; unexpected results achieved by the invention; praise of the invention by the infringer or others in the field; the taking of licenses under the patent by others; expressions of surprise by experts and those skilled in the art at the making of the invention; and the Patent Owner proceeded contrary to the accepted wisdom of the prior art.

36. I understand the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. I also understand that an example of a solution in one field of endeavor may make that solution obvious in another related field. I also understand that market demands or design considerations may prompt variations of a prior art system or process, either in the same field or a different one, and that these variations will ordinarily be considered obvious variations of what has been described in the prior art.

37. I also understand that if a person of ordinary skill can implement a predictable variation, that variation would have been considered obvious. I understand that for similar reasons, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using that technique to improve the other device would have been obvious unless its actual application yields unexpected

results or challenges in implementation.

38. I understand that the obviousness analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, but instead can take account of the “ordinary innovation” and experimentation that does no more than yield predictable results, which are inferences and creative steps that a person of ordinary skill in the art would employ.

39. I understand that sometimes it will be necessary to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art. I understand that all these issues may be considered to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.

40. I understand that the obviousness analysis cannot be confined by a formalistic conception of the words “teaching, suggestion, and motivation.” I understand that in 2007, the Supreme Court issued its decision in *KSR Int’l Co. v. Teleflex, Inc.* where the Court rejected the previous requirement of a “teaching, suggestion, or motivation to combine” known elements of prior art for purposes of an obviousness analysis as a precondition for finding obviousness. It is my understanding that *KSR* confirms that any motivation that would have been known to a person of skill in the art, including common sense, or derived from the nature

of the problem to be solved, is sufficient to explain why references would have been combined.

41. I understand that a person of ordinary skill attempting to solve a problem will not be led only to those elements of prior art designed to solve the same problem. I understand that under the *KSR* standard, steps suggested by common sense are important and should be considered. Common sense teaches that familiar items may have obvious uses beyond the particular application being described in a reference, that if something can be done once it is obvious to do it multiple times, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. As such, the prior art considered can be directed to any need or problem known in the field of endeavor in January of 1998 and can provide a reason for combining the elements of the prior art in the manner claimed. In other words, the prior art does not need to be directed towards solving the same problem that is addressed in the patent. Further, the individual prior art references themselves need not all be directed towards solving the same problem.

42. I understand that an invention that might be considered an obvious variation or modification of the prior art may be considered non-obvious if one or more prior art references discourages or lead away from the line of inquiry disclosed in the reference(s). A reference does not “teach away” from an invention

simply because the reference suggests that another embodiment of the invention is better or preferred. My understanding of the doctrine of teaching away requires a clear indication that the combination should not be attempted (*e.g.*, because it would not work or explicit statements saying the combination should not be made.

43. I understand that a person of ordinary skill is also a person of ordinary creativity.

44. I further understand that in many fields, it may be that there is little discussion of obvious techniques or combination, and it often may be the case that market demand, rather than scientific literature or knowledge, will drive design trends. When there is such a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within their technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious. The fact that a particular combination of prior art elements was “obvious to try” may indicate that the combination was obvious even if no one attempted the combination. If the combination was obvious to try (regardless of whether it was actually tried) or leads to anticipated success, then it is likely the result of ordinary skill and common sense rather than innovation.

III. THE '536 PATENT

A. Prosecution History Of The '536 Patent and Effective Filing Date of the '536 Patent

45. I understand that the '536 patent issued from U.S. Application No. 09/284,113, filed January 28, 1999.

46. I understand that the '704 application claims priority to Provisional Application No. 60/073,209, filed January 30, 1998.

47. I have therefore used January 30, 1998, as the earliest effective filing date of the '536 patent claims in my analysis.

B. The Person Of Ordinary Skill In The Art

48. A person of ordinary skill in the art in the field of the '536 patent would have been someone with a good working knowledge of computer programming, data structures, and object oriented programming. The person would have gained this knowledge either through an undergraduate education in computer science or comparable field, in combination with training or several years of practical working experience.

IV. General Issues Related to My Patentability Analysis

49. As I explain in more detail below, I believe claims 2-14 and 16 of the '536 patent are either anticipated or would have been considered obvious by a person of ordinary skill in the art based on a number of prior art references, particularly when the claims are given their broadest reasonable interpretation

consistent with the specification.

A. The Claims of the ‘536 Patent I Am Addressing in this Report

50. The claims of the ‘536 patent that I am addressing in this report (*i.e.*, 2-14 and 16) are reproduced below.

Claim 2 of the ‘536 patent reads:

2. An apparatus for transmitting, receiving and manipulating information on a computer system, the apparatus including a plurality of containers, each container being a logically defined data enclosure and comprising:

(a) an information element having information;

(b) a plurality of registers, the plurality of registers forming part of the container and including

(c) a first register for storing a unique container identification value,

(d) a second register having a representation designating space and governing interactions of the container with other containers, systems or processes according to utility of information in the information element relative to an external-to-the-apparatus three-dimensional space,

(e) an active space register for identifying space in which the container will act upon other containers, processes, systems or gateways,

(f) a passive register for identifying space in which the container can be acted upon by other containers, processes, systems or gateways,

(g) a neutral space register for identifying space in which the container may interact with other containers, processes, systems, or gateways; and

(h) a gateway attached to and forming part of the container, the gateway controlling the interaction of the container with other containers, systems or processes.

Claim 3 of the '536 patent reads:

3. The apparatus of claim 1 or 2, wherein the plurality of registers includes at least one container history register for storing information regarding past interaction of the container with other containers, systems or processes, the container history register being modifiable.

Claim 4 of the '536 patent reads:

4. The apparatus of claim 1 or 2, wherein the plurality of registers includes at least one system history register for storing information regarding past interaction of the container with different operating system and network processes.

Claim 5 of the '536 patent reads:

5. The apparatus of claim 1 or 2, wherein the plurality of registers includes at least one predefined register, the

predefined register being a register associated with an editor for user selection and being appendable to any container.

Claim 6 of the '536 patent reads:

6. The apparatus of claim 1 or 2, wherein the plurality of registers includes a user-created register, the user-created register being generated by the user, and being appendable to any container.

Claim 7 of the '536 patent reads:

7. The apparatus of claim 1 or 2, wherein the plurality of registers includes a system-defined register, the system-defined register being set, controlled and used by the system, and being appendable to any container.

Claim 8 of the '536 patent reads:

8. The apparatus of claim 1 or 2, wherein the plurality of registers includes at least one acquire register for controlling whether the container adds a register from other containers or adds a container from other containers when interacting with them.

Claim 9 of the '536 patent reads:

9. The apparatus of claim 1 or 2, wherein the gateway includes means for acting upon another container, the means for acting upon another container using the plurality of registers to determine whether and how the container acts upon other

containers.

Claim 10 of the '536 patent reads:

10. The apparatus of claim 1 or 2, wherein the gateway includes means for allowing interaction, the means for allowing interaction using the plurality of registers to determine whether and how another container can act upon the container.

Claim 11 of the '536 patent reads:

11. The apparatus of claim 1 or 2, wherein the gateway includes means for gathering information, the means for gathering information recording register information from other containers, systems or processes that interact with the container.

Claim 12 of the '536 patent reads:

12. The apparatus of claim 1 or 2, wherein the gateway includes means for reporting information, the means for reporting information providing register information to other containers, systems or processes that interact with the container.

Claim 13 of the '536 patent reads:

13. The apparatus of claim 1 or 2, wherein the gateway includes an expert system including rules defining the interaction of the container with other containers, systems or processes.

Claim 14 of the '536 patent reads:

14. The apparatus of claim 1 or 2, wherein the information

element is one from the group of text, graphic images, video, audio, a digital pattern, a process, a nested container, bit, natural number and a system.

Claim 16 of the '536 patent reads:

16. An apparatus for transmitting, receiving and manipulating information on a computer system, the apparatus including a plurality of containers, each container being a logically defined data enclosure and comprising:

- (a) an information element having information;
- (b) a plurality of registers, the plurality of registers forming part of the container and including
- (c) a first register for storing a unique container identification value,
- (d) a second register having a representation designating time and governing interactions of the container with other containers, systems or processes according to utility of information in the information element relative to an external-to-the-apparatus event time, and
- (e) at least one acquire register for controlling whether the container adds a register from other containers or adds a container from other containers when interacting with them; and
- (f) a gateway attached to and forming part of the container,

the gateway controlling the interaction of the container with other containers, systems or processes.

B. Interpretation of Certain Claim Terms

51. I understand that in an *inter partes* review proceedings, claims are to be given their broadest reasonable interpretation in view of the specification.

52. I also understand that, where a patent applicant explicitly defines a term to mean something in the patent disclosure, that definition should be used when evaluating the claims. An explicit definition will be something like “a ‘foo’ means ‘a widget that is 4 inches wide by 6 inches long.’”

53. I understand that if no explicit definition is provided for a term in the patent specification, the claim terms must be given their plain meaning unless that would be plainly inconsistent with how the term is being used in the claim or the patent specification.

i. Container

54. The ‘536 patent explains that a “container” is “a logically defined data enclosure which encapsulates any element or digital segment (text, graphic, photograph, audio, video, or other), or set of digital segments, or referring now to FIG. 3C, any system component or process, or other containers or sets of containers.” Ex. 1001, 8:64-9:2. It continues by stating a container “at minimum includes in its construction a logically encapsulated portion of cyberspace, a register and a gateway” and that it “at minimum

encapsulates a single digital bit, a single natural number or the logical description of another container, and at maximum all defined cyberspace, existing, growing and to be discovered, including but not limited to all containers, defined and to be defined in cyberspace.”

Ex. 1001, 9:2-9. It also states a container “contains the code to enable it to interact with the components enumerated in 2A, and to reconstruct itself internally and manage itself on the network 201.”

Ex. 1001, 9:9-12.

55. I believe the broadest reasonable construction of “container” therefore encompasses a logically defined data structure that contains a whole or partial digital element (e.g., text, graphic, photograph, audio, video, or other), or set of digital segments, or any system component or process, or other containers or sets of containers.

ii. Register

56. The ‘536 patent states:

Registers **120** are user or user-base created or system-created values or ranges made available by the system 10 to attach to a unique container, and hold system-set, user-set, or system-evolved values. Values may be numeric, may describe domains of time or space, or may provide information about the container 100, the user, or the system 10. Registers 120 may be active, passive or interactive and may evolve with system use. Ex. 1001 at 14:23-30.

57. The '536 patent also indicates that “[c]ontainer registers 120 are interactive dynamic values appended to the logical enclosure of an information container 100 and serve to govern the interaction of that container 100 with other containers 100, container gateways 200 and the system 10, and to record the historical interaction of that container 100 on the system 10.” Ex. 1001 at 9:14-19. The '536 patent observes that “Container registers 120 may be values alone or contain code to establish certain parameters in interaction with other containers 100 or gateways 200.” Ex. 1001, 9:19-23.

58. The broadest reasonable construction of “register” thus would encompass a value or code associated with a container.

59. The '536 patent claims recite several kinds of registers (e.g., a first register, second register, an active time register, a passive time register, a neutral time register, an active space register, a passive [space] register, a neutral space register, a container history register, a system history register, a predefined register, a user-created register, system-defined register, and an acquire register). The context used each claim provides guidance regarding the nature of each register being referred to (e.g., by specifying the kinds of information that may be stored in the register or how the register might be used). Each of these registers is discussed in connection with application of prior art to it below.

iii. Gateway

60. The '536 patent does not expressly define the term "gateway."

However, its usage of this term indicates that the term is being used generally to refer to an interface between processes, system components and data files (e.g., "container" or "registers"). For example, the '536 patent observes:

Gateways gather and store container register information according to system-defined, system-generated, or user determined rules as containers exit and enter one another, governing how containers system processes or system components interact within the domain of that container, or after exiting and entering that container, and governing how containers, system components and system processes interact with that unique gateway, including how data collection and reporting is managed at that gateway. Ex. 1001 at 4:58-66.

61. The '536 patent also states that "Container gateways 200 are logically defined gateways residing both on containers 100 and independently in the system 10" and "Gateways 200 govern the interactions of containers 100 within their domain, and alter the registers 120 of transiting containers 100 upon ingress and egress." Ex. 1001, 9:23-28. *See also* Ex. 1001, 15:44-49.

62. The broadest reasonable construction of "gateway" thus would encompass code that governs interactions between containers and that can alter registers associated with containers.

C. Prior Art References

63. I understand that a U.S. patent is a formally published document, and that I may rely on the dates in the patent as to when the patent was filed and when it was granted.

64. I understand that for printed publications, questions can arise whether it was publicly disseminated and when that occurred.

65. I believe based on my personal experiences that each of the publications I refer to below was publicly disseminated without any restrictions before January of 1998, and often a year or more before that date.

1. Exhibit 1006 – U.S. Patent No. U.S. Patent No. 5,836,529 to Gibbs

66. Exhibit 1006 (Gibbs) is a copy of United States Patent No. 5,836,529 to Gibbs.

67. I understand that because Gibbs was filed on October 31, 1995, which is prior to January 30, 1998, the earliest possible effective filing date of the '536 patent, it is prior art the claims of the '536 patent under 35 U.S.C. § 102(e).

V. Patentability Analysis of Claims 2-14 and 16 of the '536 Patent in view of U.S. Patent No. 5,836,529 (Gibbs)

68. As explained in more detail below, the systems and methods described in Gibbs anticipate and would have made obvious to a person of ordinary skill in the art claims 2-14 and 16 of the '536 patent.

A. Overview of Gibbs

69. Gibbs describes a railroad transportation management system. As Gibbs explains:

The present invention is an object based railroad transportation network management system and method. The system and method automatically maintains a highly structured railroad system information database and generates multiply nested maps, tables, charts and alerts for providing varying levels of real-time perspective on an operating railroad system. These levels of perspective range from a "system-wide" view needed by executives, senior managers and planners to an individualized and detailed report needed by a customer service representative, a train master or a dispatcher. In addition, the system automatically generates alert signals according to customizable warning criteria whenever a variance from planned operation has occurred.

Exhibit 1006 (Gibbs) at 3:65-4:10.

70. The management system operates on a computer system such as that shown in Figure 1 of Exhibit 1006 (Gibbs). The various portions of the computer system are connected via a local area network. Ex. 1006 (Gibbs) at 5:12-14 (“The central computer 26 forms a nexus of a local area network preferably configured in a conventionally known star network.”).

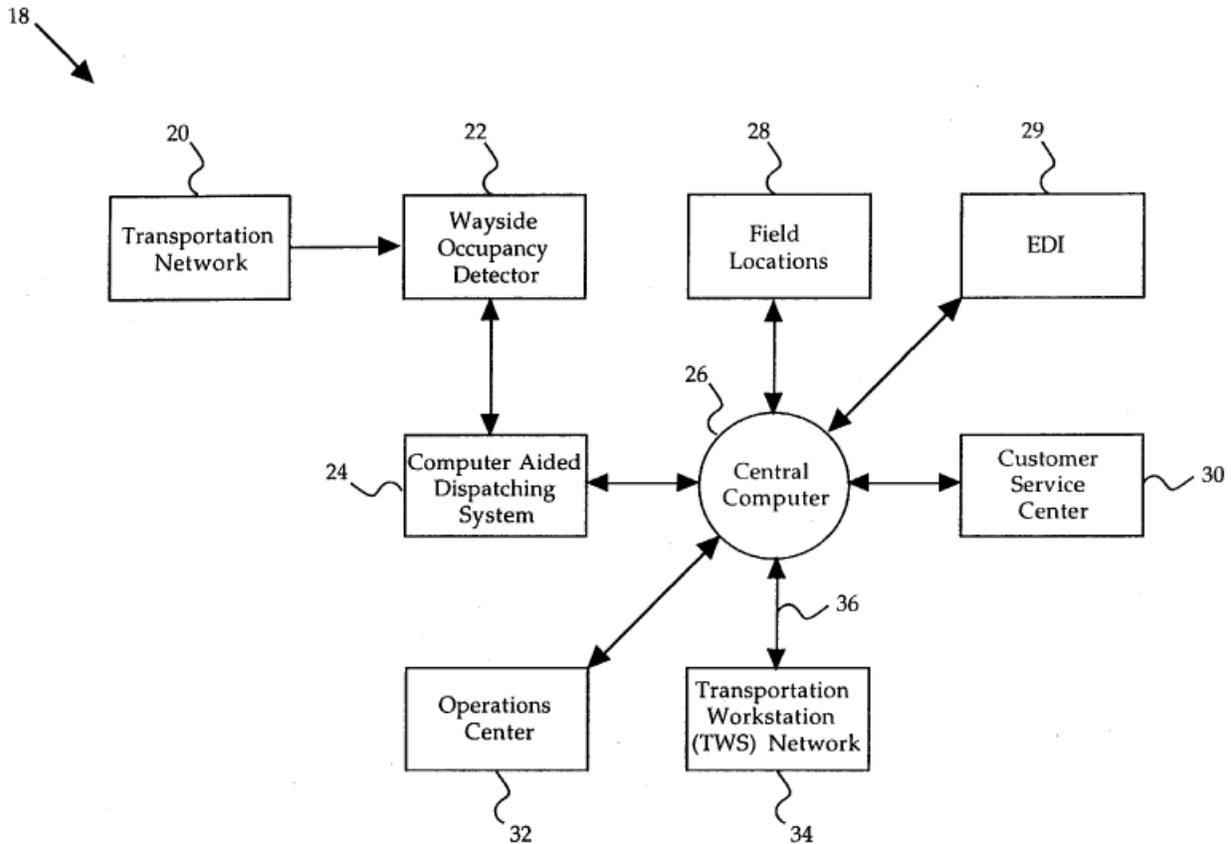


Fig. 1

Ex. 1006 (Gibbs) at Figure 1. *See also* Ex. 1006 (Gibbs) at 5:14-20 (“The central computer 26 acts as a hub, to which the computer-aided dispatching system 24, the set of field locations 28, the EDI 29, the customer-service center 30, the operations center 32 and the TWS network 34 are preferably coupled to form nodes.”).

71. The transportation workstation network is made up of transportation workstations (TWS) connected to a network which connects to the central computer via a gateway. This network is show in Ex. 1006 (Gibbs) at Figure 2:

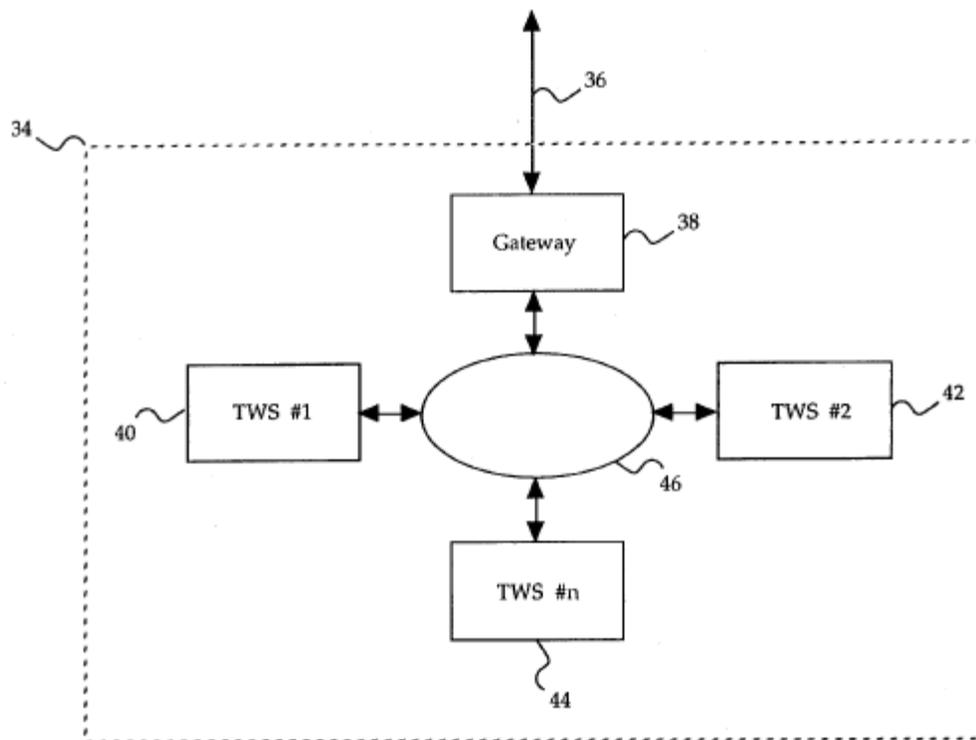


Fig. 2

72. The transportation workstation runs on a machine containing an operating system such as OS/2 by IBM and includes a graphical user interface and network interface. Other operating systems may also be used with the system. Ex. 1006 (Gibbs) at 6:32-39 (“The operating system 68 preferably includes a multitasking capability, a graphical user interface and a local area network interface. OS/2, an operating system sold by International Business Machines Inc. (IBM), fits the above preferences and is preferably employed in the present invention. Those skilled in the art will recognize however, that other operating systems can also be employed within the TWS 40.”).

73. This system is object oriented, and, accordingly, utilizes objects which represent the various components of a railroad system, including train objects, locomotive objects, terminal objects, and other objects.

The present invention's preferred embodiment in an object oriented programming environment is also highly advantageous because the real world resources within the transportation network (i.e. trains, terminals, crews, locomotives, etc.) lend themselves to an object-oriented programming paradigm. For instance, a real world train is defined by a large number of data items (i.e. its position, its cargo, its estimated time of arrival, etc.) that change as the train progresses along its route. Thus, a train object, which references and automatically updates such train related data items, advantageously provides a single source for other objects within the transportation network to obtain information about the train's status and performance.

Ex. 1006 (Gibbs) at 4:24-37.

74. The objects used in Gibbs include mobile transport objects, such as trains, and fixed transport objects such as terminals. Ex. 1006 (Gibbs) at 7:1-5 (“The transport object library 64 is preferably comprised of a set of mobile transport objects representing geographically dynamic transports and a set of fixed transport objects representing geographically static transports.”).

75. Gibbs lists possible mobile transport objects such as “a train object 72, a locomotive object 74, a crew object 78, a car object 80, an end-of-train device object 82 and a computerized train control object 89.” Ex. 1006 (Gibbs) at 7:5-8.

76. Gibbs lists possible fixed transport objects such as “a terminal object 70, a yard object 76, a shop object 84, a division object 86, a coal zone object 87, and a transportation network object 88.” Ex. 1006 (Gibbs) at 7:12-15.

77. The railroad management system has a number of libraries which contain the various types of objects used by the system. The transport object library contains both mobile and fixed transport objects, and is located on a storage device within the railroad management system. Ex. 1006 (Gibbs) at 6:66-7:5 (“Referring now to FIG. 5, a block diagram of the preferred embodiment of the transport object library 64 within the storage device 56 is shown. The transport object library 64 is preferably comprised of a set of mobile transport objects representing geographically dynamic transports and a set of fixed transport objects representing geographically static transports.”). A diagram of a possible transport object library is below:

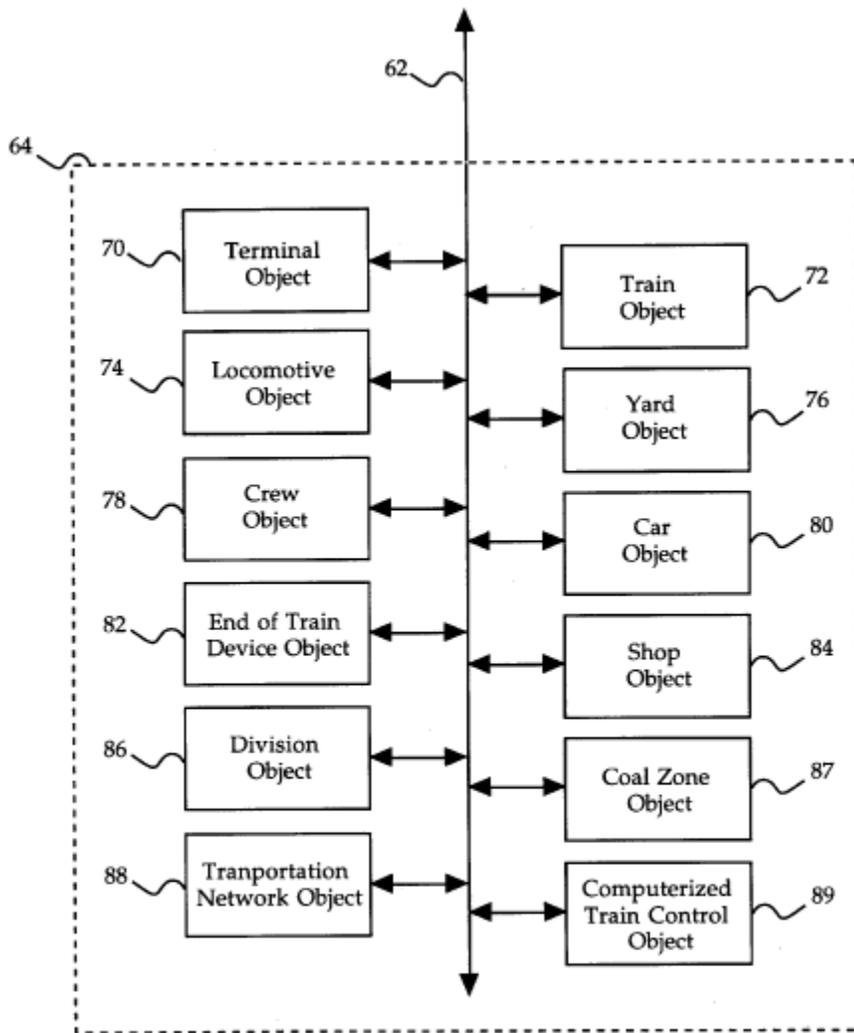


Fig. 5

Ex. 1006 (Gibbs) at Figure 5.

78. Each object described by Gibbs is a separate entity within the system and contains data and program instructions. Ex. 1006 (Gibbs) at 7:21-27 (“Each of the transport objects (70 through 89) preferably comprise a set of references to a transport object data structure 98, described in detail in FIG. 7 below, and program instructions. The transport objects (70 through 89) are treated by the processing

unit 48 as discrete entities within an object-oriented programming structure as conventionally known in the art.”).

79. Each object stores data items. As Gibbs explains:

The transport objects (70 through 89) are preferably comprised of program instructions and data items, whose data items are stored within the transport object data structure 98. As discussed above, the program instructions within each of the transport objects (70 through 89) preferably comprise routines for obtaining and updating each of the transport object's (70 through 89) respective data items. What follows is a listing of the specific data items preferably acquired and updated by each of the transport objects (70 through 89) and where the data items are preferably stored within the transport object data structure 98.

Ex. 1006 (Gibbs) at 10:26-37.

80. Gibbs provides a high level overview of each type of transport object in the system. For example, Gibbs provides a brief introduction of the terminal object, the train object, the locomotive object, the yard object, the crew object, and the car object:

The data item obtained and stored by each of the transport objects (70 through 89) are now introduced. The terminal object 70 maintains data items for a set of terminals on the transportation network 20, each preferably comprising a grouping of rail stations and railpoints for a specified geographic area. The train object 72 maintains data items for

a set of trains located between various geographic on-signal points and pulling various types of goods and commodities. The locomotive object 74 maintains data items for a set of locomotives located between various geographic on-signal points that pull varying numbers of cars. The yard object 76 maintains data items for a set of yards comprising a system of tracks branching from a common lead or ladder track, with defined limits, used for switching, making-up trains or storing cars. The crew object 78 maintains data items for a set of crews distributed throughout the transportation network 20 and comprising a set of workers who effect the movement of trains. The car object 80 maintains data items for a set of cars each optimized for carrying a particular type of load and pulled by a locomotive.

Ex. 1006 (Gibbs) at 7:37-56.

81. Each transport object contains a number of sections that store various attributes of the object, including “locational attributes,” “labeling attributes,” “consist attributes,” and “timing attributes.” As Gibbs explains:

Referring now to FIG. 7, a block diagram of a preferred embodiment of a transport object data structure 98 within the transport object library 64 is shown. The data structure 98 comprises a first data field for storing the transport object's (70 through 89) locational attributes 100, a second data field for storing the transport object's (70 through 89) labeling attributes 102, a third data field for storing the transport object's (70 through 89) consist attributes 104 and a fourth data field for storing the transport object's (70 through 89) timing attributes 106. The actual data items that the transport objects (70 through 89) store

within each of the data fields 100, 102, 104, 106 and the data items retrieved to effect the maps in the map object library 92 and the reports in the report object library 96 is described in detail below.

Ex. 1006 (Gibbs) at 9:28-10:4.

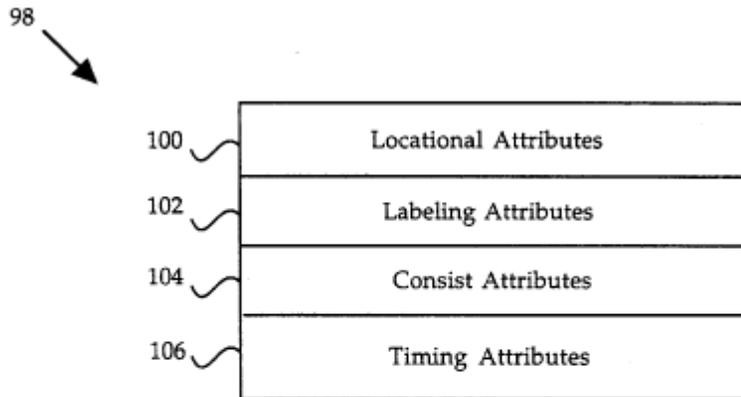


FIG. 7

Ex. 1006 (Gibbs) at Figure 7.

82. Within the labeling attributes section, each object in the Gibbs system stores a unique ID corresponding to the physical equipment or facility represented by that object. For instance, each train object contains a “unique train ID.” Ex. 1006 (Gibbs) at 10:49. *See also* Ex. 1006 (Gibbs) at 10:42 (“unique terminal ID”), 11:7-8 (“unique crew location ID”), 11:9 (“unique terminal ID”), 11:10 (“unique yard ID”), 11:22 (“unique car identification”), 11:31 (“end-of-train device unique

ID”), 11:37-38 (“unique shop ID”), 11:51-52 (“a coal zone name and a unique ID”).

83. Within the locational attributes, each object contains values that correspond to the physical location of the physical equipment or facility to which it refers. For instance, each train object contains “a geographic location, a division code and a name of the corridor” for the physical train with which it is associated. Ex. 1006 (Gibbs) at 10:46-48 (“Each train referenced by the train object 72 comprises: within the locational attributes data field 100 a geographic location, a division code and a name of the corridor.”).

84. One way this physical location can be updated within the object is through wayside occupancy detectors, which are scattered throughout the railroad network. The computer system is connected via a computer-aided dispatch system to these detectors, which are used to provide the computer system with the current locations of objects, such as trains, in the railroad system. As Gibbs explains:

The wayside occupancy detector 22 is also well known in the art and detects when a train has passed a particular geographic latitude and longitude on the transportation network 20. A very large number of wayside occupancy detectors 22, perhaps on the order of ten-thousand or more, are distributed throughout the transportation network 20. The wayside occupancy detector 22 is coupled to the computer aided dispatching system 24 and transmits a train detection signal to the computer aided dispatching system 24. Each time a train passes the

wayside occupancy detector 22, the train detection signal is sent to the computer aided dispatching system 24; otherwise, no train detection signal is sent. When the computer aided dispatching system 24, also well known in the art, receives the train detection signal, the computer aided dispatching system 24 stores the train detection signal in a register, determines a last train in an area around the wayside occupancy detector 22 and associates the train detection signal with the last train in the area. The computer aided dispatching system 24 then generates a train location signal containing the latitude/longitude of the wayside occupancy detector 22 which thus pinpoints the location of last train in the area. The computer aided dispatching system 24 then transfers this latitude/longitude information to the central computer 26.

Ex. 1006 (Gibbs) at 4:55-5:12.

85. Each transport object also stores other data for each type of object. In objects representing physical trains, for example, additional information might include the train name, the number of cars in the train, the length of the train, the train direction, the train's terminal of origin, the train's destination terminal, and a late train indicator. As Gibbs describes in more detail:

Each train referenced by the train object 72 comprises: within the locational attributes data field 100 a geographic location, a division code and a name of the corridor; within the labeling attributes data field 102 a unique train ID, an on-signal station name and a train name; within the consist attributes data field 104 a commodity carried

code, a number of loaded cars, a number of empty cars, a weight in tons, a number of cars that carry automobiles, a number of top-only flat cars, a length of the train, a government permission number, a number of engines on the train, a type of crew and a power required to pull the train; and within the timing attributes data field 106 a train direction, a late train indicator, an on-signal time, a projected elapsed time, an actual elapsed time, crew's estimated time of arrival at next terminal, a crew's aggregate work hours, a train's terminal of origin and a train's terminal destination.

Ex. 1006 (Gibbs) at 10:46-61.

86. In addition to data, each transport object contains programs and routines for obtaining and providing data to and from other objects, such as a map or report object. Gibbs explains the details of these programs and routines:

The program instructions within each of the transport objects (70 through 89) respectively comprise routines for obtaining data items from the central computer 26 preferably every 30 minutes or upon a specific user request and storing the data items within the transport object data structure 98. The transport object's (70 through 89) program instructions effect this data retrieval by sending an information request through the network I/O port 54 and the gateway 38 to the central computer 26 and receiving the requested information via the same path.”)

Ex. 1006 (Gibbs) at 7:27-36. *See also* Ex. 1006 (Gibbs) at 10:30-37 (“As discussed above, the program instructions within each of the transport objects (70

through 89) preferably comprise routines for obtaining and updating each of the transport object's (70 through 89) respective data items.”).

87. In addition to the transport object library, Gibbs also describes a service object library, which in turn contains a map object library, a report object library, and a context menu object. Ex. 1006 (Gibbs) at 8:18-20 (“The service object library 66 comprises a context menu object (CMO) 90, a map object library 92 and a report object library 96.”).

88. The context menu object described by Gibbs is an object which provides the primary means for the user to control the railroad management system. Gibbs explains:

The CMO 90 is comprised of both programming instructions and data items and is treated by the processing unit 48 as a discrete entity within the object-oriented programming structure. The CMO 90 is a primary interface for receiving the user's commands from the input device 50. The CMO 90 preferably generates multiple lists of user selectable menu items and activates and monitors a set of preferably point-and-click icons on the output device 52, thus enabling the user to directly activate each of the objects within the map object library 92 and the report object library 96. Details of the CMO's 90 actual operation is discussed below.

Ex. 1006 (Gibbs) at 8:20-31.

89. The map object library contains a variety of map objects which are used to generate maps in response to a user's request through the context menu object. The map objects can include a transportation network map object, a train map object, a terminal map object, and other types of map objects. Gibbs describes the content of the map object library:

The map object library 92 comprises a transportation network map object 400, a train map object 404, a terminal map object 406, a coal car map object 408, a locomotive map object 410 and a computerized train control map object 412. Each of the map objects (400 through 412) are preferably objects, comprising both program instructions and data items, that are treated by the processing unit 48 as discrete entities within an object-oriented programming structure as conventionally known in the art.

Ex. 1006 (Gibbs) at 8:44-53.

90. Each map object contains routines and program which collect data from other objects in the system in order to generate a map requested by the user.

Gibbs generally explains how the data is gathered:

The program instructions within each of the map objects (400 through 412) preferably comprise routines for obtaining and retaining data items from the transport objects (70 through 89) and then respectively generating or modifying an appropriate map in response to a user request received from the CMO 90. The map object's (400 through 412) program instructions effect this map generation or modification

by sending an information request to an appropriate set of transport objects and after receiving the requested information, generating or modifying the user requested map.

Ex. 1006 (Gibbs) at 8:53-63.

91. The maps are displayed on an output device to the user. For instance, Gibbs describes displaying the transportation network map described below on the output device:

After which, the transportation network map object 400 organizes and connects the various railpoints to form the map on the output device 52. To generate a particular division within the map, the transportation network map object 400 prompts the user to select the particular division and then retrieves the boundaries of the particular division selected from the division object's 86 locational attributes data field 100. Next the transportation network map object 400 uses the division's boundaries to generate the particular division on the output device 52 using the same routine discussed above to generate the map of a portion of the transportation network 20. To incrementally zoom in or out on various portions of the map the transportation network map object 400 prompts the user for a zoom increment and therefrom creates a set of zoom boundaries. The transportation network map object 400 then uses the zoom boundaries to generate the particular division on the output device 52 using the same routine discussed above to generate the map of a portion of the transportation network 20. Subsequently the transportation network map object 400 generates the zoomed map on the output device 52.

Ex. 1006 (Gibbs) at 12:59-13:12.

92. The transportation network map object is a representative example. This map object is used to generate a map of the railroad transportation network, which includes a representation of the railroad infrastructure within a user-selected area. Gibbs describes the operation of this object:

The transportation network map object 400 generates a variety of maps in response to criteria selected by the user. To generate a map of a portion of the transportation network 20, the transportation network map object 400 prompts the user to select the map's boundaries. Next, the transportation network map object 400 requests from the transportation network object's 88 locational attributes data field 100 a latitude and longitude for each of a set of corner railpoints and intersection railpoints and a distance and direction between each of the railpoints that fall within the map's boundaries. After which, the transportation network map object 400 organizes and connects the various railpoints to form the map on the output device 52.

Ex. 1006 (Gibbs) at 12:49-61.

93. The user can limit the geographical boundaries of this map, and thus limit the objects, such as trains, displayed within. Gibbs describes this “zooming” ability:

To generate a particular division within the map, the transportation network map object 400 prompts the user to select the particular division and then retrieves the boundaries of the particular division

selected from the division object's 86 locational attributes data field 100. Next the transportation network map object 400 uses the division's boundaries to generate the particular division on the output device 52 using the same routine discussed above to generate the map of a portion of the transportation network 20. To incrementally zoom in or out on various portions of the map the transportation network map object 400 prompts the user for a zoom increment and therefrom creates a set of zoom boundaries. The transportation network map object 400 then uses the zoom boundaries to generate the particular division on the output device 52 using the same routine discussed above to generate the map of a portion of the transportation network 20. Subsequently the transportation network map object 400 generates the zoomed map on the output device 52.

Ex. 1006 (Gibbs) at 12:61-13:12.

94. An example map which the system might display to the user is shown in Ex. 1006 (Gibbs) at Figure 8a:

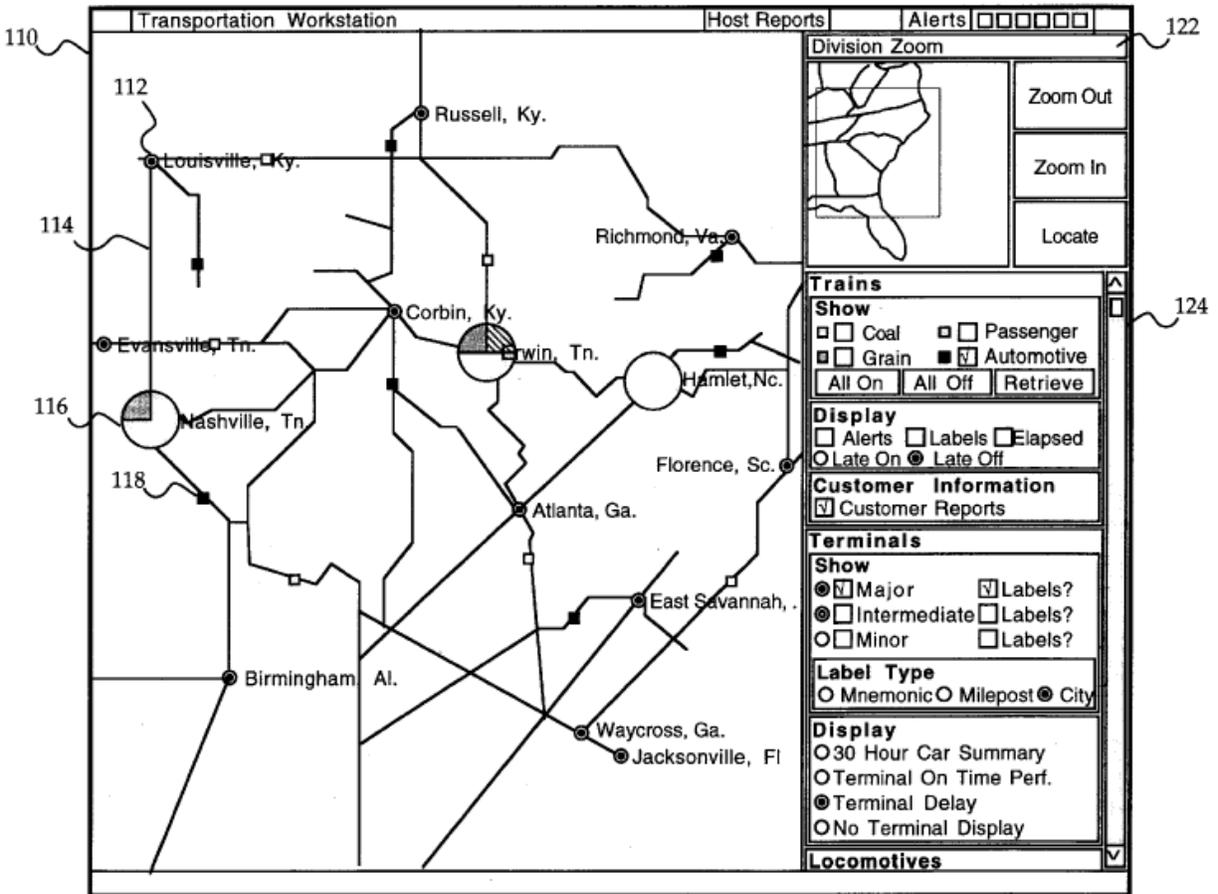


Fig. 8a

Ex. 1006 (Gibbs) at Figure 8a.

95. Another type of train object described by Gibbs is a train map object, which displays representations of physical trains on a map using the appropriate train transport objects. Gibbs describes how a train map object operates:

The train map object 404 selectively generates on the output device 52 a variety of graphical information related to a set of trains. To locate a specific train on the map, the train map object 404 prompts the user to specify a train by one of the train's labeling attributes. The train map

object 404 then compares the specified labeling attribute with the data items in the train object's 72 labeling attributes data field 102 and retrieves the train's latitude and longitude from the train object's 72 locational attributes data field 100 if there is a match. Subsequently, the train map object 404 highlights the selected train on the map.

Ex. 1006 (Gibbs) at 13:13-23.

96. The report object library contains report objects which are used to generate reports in response to user requests received through the context menu object. Each report objects contains routines and program instructions through which it can gather data from transport objects and generate an appropriate report.

Ex. 1006 (Gibbs) at 9:31-36 (“The program instructions within each of the report objects (414 through 420) preferably comprise routines for obtaining and retaining data items from the transport objects (70 through 89) and then respectively generating an appropriate report in response to a user request received from the CMO 90.”). The reports are generated on the output device to the user. *See, e.g.*, Ex. 1006 (Gibbs) at 16:31-33 (“Next the train report object 414 presents the aforementioned information in a report on the output device 52.”).

97. Each report object contains routines and program which collect data from other objects in the system in order to generate a report requested by the user. Gibbs generally explains how the data is gathered:

The program instructions within each of the report objects (414 through 420) preferably comprise routines for obtaining and retaining data items from the transport objects (70 through 89) and then respectively generating an appropriate report in response to a user request received from the CMO 90. The report object's (414 through 420) program instructions effect this report generation by sending an information request to an appropriate set of transport objects and after receiving the requested information, generating the user requested report.

Ex. 1006 (Gibbs) at 9:31-40.

98. One example of a report object is the train report object. This object can be used to display a variety of information to the user, including a graphical output showing a train, the cars of that train, and the contents of each car. Gibbs describes this graphical representation of a “train consist report”:

To generate a train consist report, the train report object 414 prompts the user to select a particular train. The train report object 414 then retrieves from the train object's 72 and the car object's 80 locational attributes data field 100, labeling attributes data field 102 and consist attributes data field 104 the train's identification, control number, from city/state, to city/state, message type, time stamp, loads, empties, tons, length, planned blocks, actual blocks, a number of cars, an order of cars, a type of car, contents of a car, and destination of a car. After which the train report object 414 presents the aforementioned information in a report on the output device 52. The train report object

414 also presents an idealized but sequentially accurate graphical representation of the selected train using the number of cars, the order of cars, the type of car, the contents of a car, and the destination of a car data items. This enable users to see the actual positioning of the cars within the selected train as a series of color coded rectangles lined up in a row and labeled with each car's unique ID.

Ex. 1006 (Gibbs) at 16:53-17:4.

99. The user can also generate a terminal status report, which includes, among other things, the number of trains in the arrival yard as well as the number of trains in the departure yard. Ex. 1006 (Gibbs) at 18:9-18 (“To generate a terminal status report, the terminal report object 416 prompts the user to select a particular terminal and retrieves from the terminal object's 70 or the train object's 72 locational attributes data field 100, labeling attributes data field 102, consist attributes data field 104 and timing attributes data field 106 trains in the arrival yard, current shift information, a measure of work, trains in the departure yard and trains due in eight hours. Subsequently the terminal report object 416 presents the aforementioned information in a report.”).

100. The user can also generate reports on other objects, such as terminals, coal cars, and locomotives. Ex. 1006 (Gibbs) at 17:14-18:30 (terminal report object), 18:31-19:3 (coal report object), 19:4-31 (locomotive report object).

101. A transport object, such as a train object, contains historical data, including performance data, that can be used by report and map objects to display information to the user. As Gibbs explains:

The present invention is particularly advantageous over the prior art because of its ability to automatically generate graphical status and performance indicators from both historical and real-time data, thereby aiding users ranging from executives to clerks in the areas of planning, sales, optimum blocking, scheduling, revenue collection, shipment, customer management and report generation.

Ex. 1006 (Gibbs) at 4:18-24. *See also* Ex. 1006 (Gibbs) at 4:33-37 (“Thus, a train object, which references and automatically updates such train related data items, advantageously provides a single source for other objects within the transportation network to obtain information about the train’s status and performance.”), 2:41-47 (“The present invention automatically maintains a transportation network database; automatically generates transportation network status statistics, performance statistics, and warning signals for user-selectable transports within a user-selectable geographic region; and outputs graphical representations of the generated statistics and the warning signals.”).

102. The railroad management system retrieves the performance data with parameters provided by the user in order to determine whether to display the information, or a warning regarding the information, to the user. The process of

comparing the historical and performance data to user parameters is explained by

Gibbs:

In step 616, the map object (400 through 412) or report object (414 through 420) retrieves the transport's real-time status and performance data, as kept updated by the transport's respective transport object (70 through 89), in the manner discussed above. In step 618, the map object (400 through 412) or report object (414 through 420) compares the data retrieved in step 616 with the selected criteria specified in either step 606 or step 610, in the manner discussed above. In step 620, if the answer in step 618 is yes, the map object (400 through 412) or report object (414 through 420) adds the selected transport's identification (ID) to an output list. Else, if the answer in step 618 is no, the method proceeds to step 622, where the map object (400 through 412) or report object (414 through 420) determines whether the data retrieved in step 616 conforms with the warning criteria specified in step 612. In step 624, if the answer in step 622 is yes, the map object (400 through 412) or report object (414 through 420) activates an alert signal, preferably comprising both a visual and an audible warning on the output device 52, as is described above, and records the retrieved real-time status and performance data which conforms to the warning criteria in the storage device 56 for later retrieval.

Ex. 1006 (Gibbs) at 22:25-47.

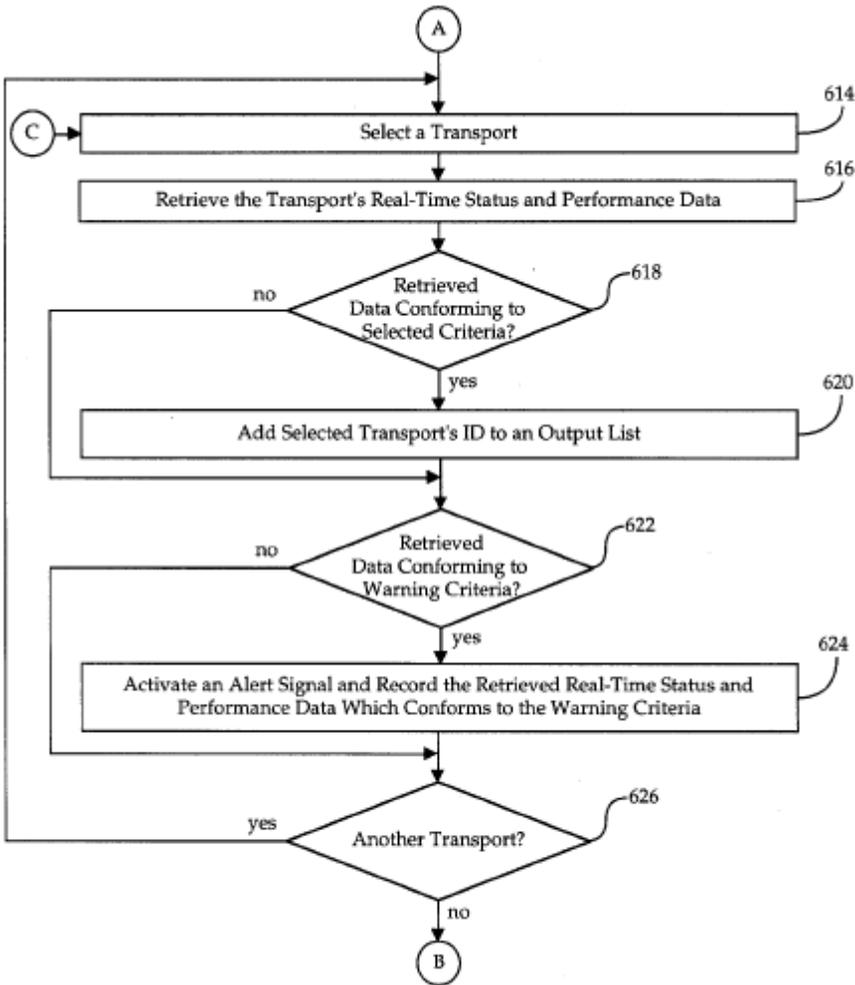


Fig. 9b

Ex. 1006 (Gibbs) at Figure 9b.

103. A system user can set up alerts and warnings which will be automatically displayed to the user when specified conditions are met. Gibbs explains these warning as follows:

The required system and method would not only provide varying levels of detail dependent upon the needs of the particular user, but would also automatically generate alerts, warnings and/or alarms

should a monitored resource deviate from its expected status or performance. Such computer implemented alerts, warnings and alarms are critical to the railroad transportation networks operation due to the high costs associated with late trains, unavailable locomotives and empty cars, just to name a few.

Ex. 1006 (Gibbs) at 2:26-35.

104. Both the map and report objects monitor a set of warning criteria for the various transport objects which are included in the selected maps and reports. This warning criteria can either be user-defined or system-defined. Ex. 1006 (Gibbs) at 22:16-21 (“In step 612, either the map object (400 through 412) or the report object (414 through 420) retrieves either a system-defined or user-defined set of status and performance warning criteria referencing those data items that the map object (400 through 412) or the report object (414 through 420) monitors, as was discussed above.”).

105. The system includes an output device which can display both visible and audible warnings. Ex. 1006 (Gibbs) at 6:3-7 (“The output device 52 is preferably a conventional display monitor for receiving and selectively displaying information to the user in response to commands from the processing unit 48. The output device 52 may also include an audible alert warning capability.”). *See* Ex. 1006 (Gibbs) at 22:36-47 (“Else, if the answer in step 618 is no, the method proceeds to step 622, where the map object (400 through 412) or report object (414

through 420) determines whether the data retrieved in step 616 conforms with the warning criteria specified in step 612. In step 624, if the answer in step 622 is yes, the map object (400 through 412) or report object (414 through 420) activates an alert signal, preferably comprising both a visual and an audible warning on the output device 52, as is described above, and records the retrieved real-time status and performance data which conforms to the warning criteria in the storage device 56 for later retrieval.”)

106. The map and report objects are used to generate these warnings and alerts via, among other things, real-time data. As Gibbs explains:

Also, each of the map objects (400 through 412) and report objects (414 through 420) selectively generates alerts in response to user selected warning criteria. To generate an alert, the map object (400 through 412) or the report object (414 through 420) prompts the user to specify a value or range of values for any selected map or report data item, preferably coinciding with the data item's nominal or expected performance. After which, the map object (400 through 412) or the report object (414 through 420) monitors the real-time value of the data item. If the data item deviate from the user specified value or range of nominal or expected values, an alert signal is generated and the map object (400 through 412) or report object (414 through 420) warns the user of the variance by preferably both an audible and a visual signal on the output device 52.

Ex. 1006 (Gibbs) at 12:33-48. This process is also described in more detail in Ex. 1006 (Gibbs) at 22:13-55.

B. Comparison of Gibbs to Claims 2-14 and 16 of the ‘536 Patent

2. Claim 2

107. Gibbs describes a system and process for monitoring and managing the operation of a railroad system. *See* ¶ 69, *above*. This railroad management system operates on a computer system and its components are connected via a network. This network transmits messages to and from devices, such as wayside occupancy detectors deployed in the railroad network, to a central computer system. *See* ¶¶ 70, 75, *above*.

108. The system is object oriented and uses objects to represent important aspects of a railroad system such as trains, car, locomotives and tracks. *See* ¶¶ 73-75, *above*.

109. The railroad management system also uses objects to display and transmit information to the user, such as through maps and reports. *See* ¶¶ 89, 96, *above*. The railroad management system also describes a control management object, which allows the user to provide instructions to the management system. *See* ¶¶ 88, *above*. These objects are stored in object libraries within the computer system. *See* ¶¶ 77, 87, *above*.

110. The objects used by the Gibbs railroad management system are examples of logically defined data enclosures, and exemplify the “containers” claimed in claim 2 of the ‘536 patent.

111. Gibbs thus shows “[a]n apparatus for transmitting, receiving and manipulating information on a computer system, the apparatus including a plurality of containers, each container being a logically defined data enclosure and comprising:” as specified by claim 2. See ¶¶ 107-110, *above*.

112. The Gibbs railroad management system utilizes a large number of objects, each having large amounts of data which qualifies as information. For instance, Gibbs describes a train object, a locomotive object, a car object, a crew object, a terminal object, a yard object, a shop object, a coal zone object, and many other objects. See ¶¶ 75-76, *above*.

113. Each object in the railroad management system has at least four distinct types of data: locational attributes, labeling attributes, consist attributes, and timing attributes. See ¶ 81, *above*. These attributes can include information such as a unique ID, the physical location of the object, and object specific data. See ¶¶ 82-84. The object specific data varies by object, but for a train, for example, the object might contain information such as the train name, the number of cars in the train, the length of the train, the train direction, the train’s terminal of origin, and the train’s destination terminal. See ¶ 85, *above*.

114. Gibbs thus shows “*an information element having information*” as specified in claim 2. See ¶¶ 112-113, *above*.

115. As mentioned above, each object in the Gibbs system is a separate entity within the system and contains a number of different data fields divided into at least four separate types of information. See ¶ 78-81, *above*. The individual data fields include information such as an object’s unique ID, the physical location of the physical equipment or facility to which it refers, a train name, a train length, the number of cars in the train, and the train direction. Each different object type has different data fields representing different information about the real world object to which it refers. See ¶¶ 82-85, *above*.

116. These objects are stored within object libraries, which reside on the computer system running the Gibbs railroad management system. See ¶¶ 77, 87, *above*.

117. Gibbs thus shows “*a plurality of registers, the plurality of registers forming part of the container and including*” as specified in claim 2. See ¶¶ 115-116, *above*.

118. The objects used in Gibbs railroad management system each have a unique ID which corresponds to the physical equipment or facility that is associated with the object. See ¶ 82, *above*.

119. Gibbs thus shows “*a first register for storing a unique container identification value*” as specified in claim 2. See ¶ 118, *above*.

120. Each object in the system contains a field with a value representing the location of the corresponding physical equipment or facility. The railroad management system uses location detectors such as wayside occupancy detectors to transmit location information from physical equipment and enter that information into the appropriate object for that equipment. See ¶¶ 83-84, *above*.

121. The physical railroad network and the equipment and facilities that make it up are all located within a three-dimensional space located outside the railroad management system.

122. The transport objects interact with the map and report objects to display information relating to the physical equipment and facilities that the transport objects represent. For instance, the user can zoom the map he wants to see in or out. This zooming requires the map object to determine which transport objects are within the selected map area. In another example, the user can request a train report which will display each car in a train along with those cars’ content. This requires the report object to interact with the appropriate train and car transport objects. See ¶¶ 86, 89-95, 96-98, *above*.

123. A user can also use the context menu object to interact with map and report objects by inputting information and setting parameters for those objects.

See ¶ 88, above.

124. Gibbs thus shows “*a second register having a representation designating space and governing interactions of the container with other containers, systems or processes according to utility of information in the information element relative to an external-to-the-apparatus three-dimensional space*” as specified in claim 2. *See ¶¶ 120-123, above.*

125. The user can set up alerts and warnings which are automatically displayed to the user when specified conditions regarding particular objects are met. *See ¶¶ 103-106, above.* Gibbs describes monitoring the value of a data item in real time in order to properly trigger the audible or visual alert. *See ¶ 106, above.*

126. One data item that can be included in a map or report is the physical location of a train. *See ¶¶ 90-94, above.* Thus, the user can set a warning or alarm to continuously monitor a train’s physical location. If this location exceeds the parameters set by the user, the railroad management system will generate an audible or visual alarm. *See ¶¶ 103-106, above.*

127. Thus, the alerts will directly trigger action through the railroad management system's output device in response to a parameter such as an object's location exceeding a boundary set by the user.

128. The map object also actively displays the location of each type of train that is selected by the user for display. This location is updated whenever the train's location is updated. *See ¶¶ 94-95, above.*

129. Gibbs thus shows "*an active space register for identifying space in which the container will act upon other containers, processes, systems or gateways*" as specified in claim 2. *See ¶¶ 125-128, above.*

130. I also note that if, for some reason, it is found that Gibbs does not expressly show that warnings or alerts are not being actively displayed in response to the physical location of equipment within the railroad network, I believe that doing so would have been obvious to a person of ordinary skill in 1998.[hhh – I didn't think this was necessary – see 3:19-23, 3:66-4:4, 4:8-10 and 6:6-7, maybe it's the response to physical location part this is for]

131. For example, a person of ordinary skill in the art would have recognized that Gibbs described basing such an alert or warning on any type of data that was contained within a transport, map, or report object. As each transport object contains a field representing the physical location of its corresponding

physical equipment, the person would have recognized that the alert or warning could be based on that physical location.

132. Thus, a person of ordinary skill would have considered displaying an alert or warning based on the physical location of equipment rendered an obvious design choice, and thus would understand Gibbs to disclose “*an active space register for identifying space in which the container will act upon other containers, processes, systems or gateways*” as specified in claim 2. See ¶¶ 130-131, *above*.

133. A user can generate a map which only contains part of the railroad network. The user does this by restricting the geographic boundaries of the map, or zooming in. When the user is zoomed in, the map object responsible for displaying the map accesses and display transport objects that are within the geographic boundaries. See ¶ 93, *above*.

134. The report objects in the Gibbs railroad management system record information based on the location of various transport objects. For instance, a train report object can generate a report which lists each car associated with a specific train. The report further lists the contents of each car. Finally, a graphical representation of the entire train, with each car and its contents, can be displayed to the user. See ¶ 98, *above*.

135. The cars and their contents are recorded into the consist report based on their location, which is attached to the train for which the report was requested.

136. Similarly, a user can generate a terminal status report which contains the number of trains that are in both the arrival and departure yards of a terminal. *See* ¶ 99, *above*. Thus, the transports objects for those trains are selected based on their physical locations, e.g., in either the arrival or departure yards.

137. Gibbs thus shows “*a passive register for identifying space in which the container can be acted upon by other containers, processes, systems or gateways*” as specified in claim 2. *See* ¶¶ 133-136, *above*.

138. Gibbs describes instances in which transport, map, and report objects intersect. For instance, a train consist report display a graphical image that shows the location of multiple cars, and the contents of those cars, within a train object. Thus, the train object and the car objects intersect via the report object. *See* ¶ 98, *above*.

139. Also, the description of the “active register” in ¶¶ 125-132, *above*, that identifies where a container can act, and the “passive register” in ¶¶ 133-137, *above*, that identifies where a container can be acted upon, also will inherently describe where a container may “interact.” *See* ¶¶ 125-137, *above*.

140. Gibbs thus shows “*a neutral space register for identifying space in which the container may interact with other containers, processes, systems, or gateways*” as specified in claim 2. *See* ¶¶ 138-139, *above*.

141. Each object in the railroad management system has program instructions and routines which allow it to interact with other objects. For instance, the routines in a transport object are used to retrieve data from the central computer through a network and a gateway. The program instructions and routines are used to obtain and update data for each piece of information in an object. See ¶¶ 78, 86, *above*.

142. The map and report objects also contain program instructions and routines. These instructions and routines are used to gather information from the various transport objects in order to generate and modify maps and reports for the user. See ¶¶ 90, 96, *above*.

143. These program instructions and routines are means by which the various objects in the railroad management system interact with each other.

144. Gibbs thus shows “*a gateway attached to and forming part of the container, the gateway controlling the interaction of the container with other containers, systems or processes*” as specified in claim 2. See ¶¶ 141-143, *above*.

3. Claim 3

145. The railroad management system described by Gibbs stores and displays historical data such as performance statistics. For instance, a train object keeps track of the physical train’s status and performance. A map or report object then uses this historical data as part of the determination of whether to display the

train, or other transport object, on an output list to the user. The historical information is also used to determine whether to trigger an alert or warning to the user. See ¶¶ 101-102, *above*.

146. Gibbs thus shows “[t]he apparatus of claim 1 or 2, wherein the plurality of registers includes at least one container history register for storing information regarding past interaction of the container with other containers, systems or processes, the container history register being modifiable” as specified in claim 3. See ¶ 145, *above*.

4. Claim 4

147. The railroad management system described by Gibbs stores and displays historical data such as performance statistics. For instance, a train object keeps track of the physical train’s status and performance. A map or report object then uses this historical data as part of the determination of whether to display the train, or other transport object, on an output list to the user. The historical information is also used to determine whether to trigger an alert or warning to the user. See ¶¶ 101-102, *above*.

148. The Gibbs railroad management system is also composed of a number of separate systems, including a computer aided dispatching system, a central computer, and various transportation workstations. These transportation workstations are connected to the central computer via a transportation workstation

network, and each workstation maintains its own operating system. See ¶¶ 70-72, *above*. These separate computer systems and networks must interact with each other in order for the railroad management system to function.

149. Gibbs thus shows “[t]he apparatus of claim 1 or 2, wherein the plurality of registers includes at least one system history register for storing information regarding past interaction of the container with different operating system and network processes” as specified in claim 4. See ¶¶ 147-148, *above*.

5. Claim 5

150. Gibbs describes a context menu object which serves as a user interface for the railroad management system. The context menu object allows a user to select and directly activate which information is displayed by map and report objects. See ¶ 88, *above*.

151. The user can also use this context menu object to set alarm and warning parameters, which will cause the railroad management system to alert the user whenever a selected object exceeds those parameters. See ¶¶ 106, *above*. The user can also select parameters such as the size of a map and which units to display on that map. See ¶¶ 90-95, *above*. The user can also use the context menu object to generate customized reports. See ¶¶ 96-99, *above*.

152. Gibbs thus shows “[t]he apparatus of claim 1 or 2, wherein the plurality of registers includes at least one predefined register, the predefined

register being a register associated with an editor for user selection and being appendable to any container” as specified in claim 5. See ¶¶ 150-151, above.

6. Claim 6

153. The user can create maps and reports to display information that the user selects. These reports are generated in response to a user request via the use of map and report objects. For instance, to generate a train consist report, the railroad management system prompts the user to select a train. In response to the user’s input, the system then generates the train consist report. In addition to train object information, this report will also include car object information. See ¶ 98, *above*.

154. The user can also generate customized reports for many other objects in the system, including a terminals and locomotives. See ¶ 100, *above*.

155. The railroad management system uses map and report objects to display warnings and alerts to the user. These warnings and alerts are based on “a system-defined or user-defined set of status and performance criteria,” which are monitored by the map and report objects. Ex. 1006 (Gibbs) at 22:18-19. See ¶¶ 103-105, *above*.

156. Gibbs thus shows “[t]he apparatus of claim 1 or 2, wherein the plurality of registers includes a user-created register, the user-created register

being generated by the user, and being appendable to any container” as specified in claim 6. See ¶¶ 153-155, above.

7. Claim 7

157. The railroad management system uses map and report objects to display warnings and alerts to the user. These warnings and alerts are based on “a system-defined or user-defined set of status and performance criteria,” which are monitored by the map and report objects. Ex. 1006 (Gibbs) at 22:18-19. See ¶¶ 103-105, *above*.

158. Gibbs thus shows “[t]he apparatus of claim 1 or 2, wherein the plurality of registers includes a system-defined register, the system-defined register being set, controlled and used by the system, and being appendable to any container” as specified in claim 7. See ¶ 157, *above*.

8. Claim 8

159. Gibbs describes map and report objects containing settings which determine which transport objects will be displayed on a map or shown in a report. For instance, the user enters parameters into the report object which determine which transport objects, representing physical equipment such as trains or facilities such as terminals, will be shown in a map or report. See ¶¶ 89, 92-95, 96, 98-99, *above*.

160. Each map and report object contains routines and program instructions which are used to interact with other objects, such as transport objects, in the system. *See* ¶¶ 90, 97, *above*.

161. The railroad management system also generates an output list, which contains any transport objects which meet selected criteria entered by the user into a report or map object. The transport objects added to the output list are displayed by the map or report. *See* ¶¶ 101-102, 106, *above*.

162. Gibbs thus shows “[t]he apparatus of claim 1 or 2, wherein the plurality of registers includes at least one acquire register for controlling whether the container adds a register from other containers or adds a container from other containers when interacting with them” as specified in claim 8. *See* ¶¶ 159-161, *above*.

9. Claim 9

163. The user can set up alerts and warnings which are automatically displayed to the user when specified conditions regarding particular objects are met. *See* ¶¶ 103-106, *above*. Gibbs describes monitoring the value of a data item in real time in order to properly trigger the audible or visual alert. *See* ¶ 106, *above*.

164. One data item that can be included in a map or report is the physical location of a train. *See* ¶¶ 90-94, *above*. Thus, the user can set a warning or alarm

to continuously monitor a train's physical location. If this location exceeds the parameters set by the user, the railroad management system will generate an audible or visual alarm. See ¶¶ 103-106, *above*.

165. Thus, the alerts will directly trigger action through the railroad management system's output device in response to a parameter such as an object's location exceeding a boundary set by the user.

166. The map object also actively displays the location of each type of train that is selected by the user for display. This location is updated whenever the train's location is updated. See ¶¶ 94-95, *above*.

167. Further, all objects in the system contain both data and routines and program instructions. The routines and program instructions are used by objects to interact with each other, including to enter and retrieve data to and from other objects. For instance, the map and report object use routines and program instructions contained within to retrieve information from transport objects and display that information appropriately to the user. See ¶¶ 86, 90, 97.

168. Gibbs thus shows “[t]he apparatus of claim 1 or 2, wherein the gateway includes means for acting upon another container, the means for acting upon another container using the plurality of registers to determine whether and how the container acts upon other containers” as specified in claim 9. See ¶¶ 163-167, *above*.

10. Claim 10

169. The railroad management system contains a context menu object, which allows the user to customize maps and reports for display. Depending on the options selected by the user in the context menu object, map and report objects will interact with the transport objects indicated by the user in order to display these customized maps and reports. *See* ¶¶ 87-88.

170. Further, all objects in the system contain both data and routines and program instructions. The routines and program instructions are used by objects to interact with each other, including to enter and retrieve data to and from other objects. *See* ¶¶ 86, 90, 97, *above*.

171. Gibbs thus shows “[t]he apparatus of claim 1 or 2, wherein the gateway includes means for allowing interaction, the means for allowing interaction using the plurality of registers to determine whether and how another container can act upon the container” as specified in claim 10. *See* ¶¶ 169-170, *above*.

11. Claim 11

172. A user can generate a map which only contains part of the railroad network. The user does this by restricting the geographic boundaries of the map, or zooming in. When the user is zoomed in, the map object responsible for

displaying the map accesses and display transport objects that are within the geographic boundaries. *See ¶ 93, above.*

173. The report objects in the Gibbs railroad management system record information based on the location of various transport objects. For instance, a train report object can generate a report which lists each car associated with a specific train. The report further lists the contents of each car. Finally, a graphical representation of the entire train, with each car and its contents, can be displayed to the user. *See ¶ 98, above.*

174. The cars and their contents are recorded into the consist report based on their location, which is attached to the train for which the report was requested. *See ¶ 98, above.*

175. Similarly, a user can generate a terminal status report which contains the number of trains that are in both the arrival and departure yards of a terminal. *See ¶ 99, above.* Thus, the transports objects for those trains are selected based on their physical locations, e.g., in either the arrival or departure yards.

176. Further, all objects in the system contain both data and routines and program instructions. The routines and program instructions are used by objects to interact with each other, including to enter and retrieve data to and from other objects. *See ¶¶ 86, 90, 97, above.*

177. Gibbs thus shows “[t]he apparatus of claim 1 or 2, wherein the gateway includes means for gathering information, the means for gathering information recording register information from other containers, systems or processes that interact with the container” as specified in claim 11. See ¶¶ 172-176, *above*.

12. Claim 12

178. The user can use both the map and report objects to generate maps and reports which both provide information on transport objects representing physical equipment and facilities. See ¶¶ 89-95, 96-100, *above*.

179. These maps and reports are selected via the context menu object and displayed to the user on a display device. See ¶¶ 87-88, 91, 96, *above*.

180. Both report and map objects contain routines and program instructions which enable the map and report objects to gather information from the transport objects. The routines and program instructions also enable the map and report objects to generate the appropriate report and display them to the user. See ¶¶ 90, 97, *above*.

181. Further, all objects in the system contain both data and routines and program instructions. The routines and program instructions are used by objects to interact with each other, including to enter and retrieve data to and from other objects. See ¶¶ 86, 90, 97, *above*.

182. Gibbs thus shows “[t]he apparatus of claim 1 or 2, wherein the gateway includes means for reporting information, the means for reporting information providing register information to other containers, systems or processes that interact with the container” as specified in claim 12. See ¶¶ 178-181, *above*.

13. Claim 13

183. The railroad management system uses user-defined or system-defined parameters, which can be considered rule sets, to determine when to display warnings and alerts to the user. See ¶¶ 101-106, *above*. This use of rule sets qualifies as an expert system.

184. Gibbs thus shows “[t]he apparatus of claim 1 or 2, wherein the gateway includes an expert system including rules defining the interaction of the container with other containers, systems or processes” as specified in claim 13. See ¶ 183, *above*.

14. Claim 14

185. Gibbs describes map objects which display both graphic images and textual information to the user. See ¶¶ 89-95, *above*. Further, report objects display graphic and textual information to the user. For instance, a train consist report can display a graphical representation of a particular train to the user. This

representation also contains text detailing the contents of the train cars. *See* ¶¶ 96-100, *above*.

186. Each transport object also contains both data elements containing text such as a train name or terminal name and routines and programming instructions which allow those objects to interact with the rest of the system. *See* ¶¶ 81-86, *above*. The train name and terminal name data consists of text, while the routines and program instructions describe a process.

187. Gibbs thus shows “[t]he apparatus of claim 1 or 2, wherein the information element is one from the group of text, graphic images, video, audio, a digital pattern, a process, a nested container, bit, natural number and a system” as specified in claim 14. *See* ¶¶ 185-186, *above*.

15. Claim 16

188. As described in ¶¶ 107-111, *above*, Gibbs shows “[a]n apparatus for transmitting, receiving and manipulating information on a computer system, the apparatus including a plurality of containers, each container being a logically defined data enclosure and comprising:” as specified in claim 16.

189. As described in ¶¶ 112-114, *above*, Gibbs shows “an information element having information” as specified in claim 16.

190. As described in ¶¶ 115-117, *above*, Gibbs shows “*a plurality of registers, the plurality of registers forming part of the container and including*” as specified in claim 16.

191. As described in ¶¶ 118-119, *above*, Gibbs shows “*a first register for storing a unique container identification value*” as specified in claim 16.

192. As described in ¶¶ 120-124, *above*, Gibbs shows “*a second register having a representation designating space and governing interactions of the container with other containers, systems or processes according to utility of information in the information element relative to an external-to-the-apparatus event space*” as specified in claim 16.

193. As described in ¶¶ 159-162, *above*, Gibbs thus shows “*at least one acquire register for controlling whether the container adds a register from other containers or adds a container from other containers when interacting with them*” as specified in claim 16.

194. As described in ¶¶ 141-144, *above*, Gibbs shows “*a gateway attached to and forming part of the container, the gateway controlling the interaction of the container with other containers, systems or processes*” as specified in claim 16.

C. CONCLUSION

195. For the reasons set forth above, it is my opinion that the subject matter recited in claims 2-14 and 16 of the '536 patent was not patentable as of the effective filing date of the '536 patent relative to Gibbs.

VI. APPENDIX A: Materials Considered by Henry Houh

Exhibit #	Reference Name
1001	U.S Patent No. 7,010,536
1002	File History of U.S Patent No. 7,010,536
1005	Evolutionary Intelligence Infringement Contentions re 7,010,536
1006	U.S. Patent No. 5,836,529 to Gibbs
1007	Return of Service for 6:12-cv-00783 (E.D. Tex.)