

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AMERICAN AIRLINES, INC. AND SOUTHWEST AIRLINES CO.,

Petitioners

v.

INTELLECTUAL VENTURES I LLC,

Patent Owner.

IPR2025-00987
U.S. Patent No. 8,407,722

DECLARATION OF DR. CHUCK EASTTOM Ph.D., D.Sc.

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I. INTRODUCTION

1. My name is William C. Easttom II (Chuck Easttom), I have 30 years of experience in the computer science industry including extensive experience with computer science including parallel and distributed programming as well as multi-threaded programming. I have authored 44 computer science books, including textbooks used at over 60 universities around the world. I also have authored over 80 research papers and am an inventor with 27 computer science patents.

2. I hold a Doctor of Science (D.Sc.) degree in Cyber Security from Capitol Technology University (Dissertation Topic: “A Comparative Study of Lattice Based Algorithms for Post Quantum Computing”). I also hold a Doctor of Philosophy (Ph.D.) in Technology focused on nanotechnology (Dissertation Topic: “The Effects of Complexity on Carbon Nanotube Failures”) from Capitol Technology University. I also have a Doctor of Philosophy (Ph.D.) in Computer Science from the University of Portsmouth (Dissertation Topic: topic “A Systematic Framework for Network Forensics Using Graph Theory”). I also hold four master’s degrees (one in Applied Computer Science, one in Education, one in Defense and Strategic Studies, and one in Systems Engineering).

3. I am currently an Adjunct Lecturer for Georgetown teaching graduate courses in requirements engineering, cybersecurity, artificial intelligence, and cryptography. I am also an adjunct for Vanderbilt University teaching graduate computer science

courses, specifically quantum computing, secure software engineering, and digital forensics. I also developed a graduate course in digital forensics for the University of Dallas and taught that course from 2019 to 2022.

4. I am a Senior member and Distinguished Speaker for the Association of Computing Machinery (ACM) and a Senior Member and Distinguished Visitor of the Institute for Electrical and Electronics Engineering (IEEE). The IEEE is the world's largest and most preeminent engineering organization. Among other activities, the IEEE creates industry standards for a wide range of engineering disciplines, including software development standards. I am also a Distinguished Visitor of the IEEE. I have been involved in IEEE standards creation for several years.

5. I have frequently worked with multi-threaded and parallel processing programming. I have also consulted with and taught embedded systems to the U.S. Navy.

6. My full CV is included as Exhibit 1004.

7. I have been asked to review the U.S. Patent 8,407,722, and prior art cited in this declaration, and to form my own independent scientific opinions.

8. I am being compensated at my usual rate of \$550 per hour. My compensation is not dependent in any way upon my conclusions or the outcome of this matter.

II. LEGAL STANDARDS

9. In forming my analysis and conclusions expressed in this Declaration, I have applied the legal principles described in the following paragraphs, which were provided to me by counsel for the Petitioners.

A. Validity

10. I understand that each claim of a patent is presumed to be valid. Dependent claims shall also be presumed valid even if they depend upon an invalid claim.

11. 35 U.S. Code § 282 states, “[a] patent shall be presumed valid. Each claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim. The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.”

B. Obviousness

12. I understand that a patent claim is invalid if the differences between the subject matter and the prior art are such that the subject matter as a whole would have been obvious to a person of skill in the art, or POSITA, at the time of the alleged invention. I further understand that an obviousness analysis involves a review of the scope and content of the asserted prior art; the differences between the prior art and the claims at issue; the level of ordinary skill in the pertinent art; and objective indicia of non-

obviousness (i.e., secondary considerations), such as long-felt but unsolved needs, failure of others, industry praise, commercial success, and skepticism of others in the field.

13. In determining obviousness based on a combination of prior art references, I also understand that evidence of a reason to combine the teachings is required to make the combination. Any evidence that one or more of the references would have taught away from the claimed invention at the time of the invention must also be considered.

14. I have been informed that the following rationales, among others, may support a conclusion of obviousness:

- i. the combination of familiar elements according to known methods to yield predictable results;
- ii. the simple substitution of one known element for another to obtain predictable results;
- iii. the use of known techniques to improve similar methods or apparatuses in the same way;
- iv. the application of a known technique to a known method or apparatus ready for improvement to yield predictable results;
- v. the choice of a particular solution from a finite number of identified, predictable solutions with a reasonable expectation of success;

- vi. the use of known work in one field of endeavor in either the same field or a different one based on design incentives or other market forces, if the variations are predictable to one of ordinary skill in the art; and
- vii. the following of some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

15. I also understand that secondary considerations such as long-felt but unsolved needs, failure of others, praise, skepticism, and commercial success are relevant to determining obviousness.

16. I understand that there must be evidence showing an articulated reasoning with rational underpinnings to support a motivation to combine teachings and to support the legal conclusion of obviousness. However, I understand that proposed modifications which would render the prior art unsatisfactory for its intended purposes or change the principal operation of the reference do not render a claim obvious.

17. Moreover, if prior art indicates that the invention would not have worked for its intended purpose, or otherwise teaches away from the invention, then a claim would not be obvious. A reference teaches away when a POSITA, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken in the claim.

C. Motivation to Combine

18. It is my understanding that a motivation to combine must meet certain requirements. It is not sufficient for an expert to simply state there is a motivation to combine. Instead, there must be a clearly articulated reason to combine. In order to satisfy these requirements, the articulated motivation to combine should include the following:

- i. the prior art included each element claimed, although not necessarily in a single prior art reference, with the only difference between the claimed invention and the prior art being the lack of actual combination of the elements in a single prior art reference;
- ii. one of ordinary skill in the art could have combined the elements as claimed by known methods, and that in combination, each element merely performs the same function as it does separately; and
- iii. one of ordinary skill in the art would have recognized that the results of the combination were predictable.

D. Claim Construction

19. I understand that, for purposes of my analysis in this inter partes review proceeding, the terms appearing in the patent claims should be interpreted according to their “ordinary and customary meaning.” In determining the ordinary and customary meaning, I understand that the words of a claim are first given their plain

meaning that those words would have had to a person of ordinary skill in the art at the time of the alleged invention. I also understand that the structure of the claims, the specification and file history may be used to better construe a claim. Moreover, I understand that even treatises and dictionaries may be used, albeit under limited circumstances, to determine the meaning attributed by a person of ordinary skill in the art to a claim term.

III. ANALYSIS

20. This section contains my analysis of U.S. Patent 8,407,722 ('722 patent) and its validity or invalidity in light of cited prior art.

A. U.S. Patent 8,407,722

21. The '722 patent was granted March 16, 2013, filed March 30, 2006, and claims priority to December 18, 2000. The '722 patent describes itself as being generally directed to transferring information through digital networks, specifically information for updating content at client devices.

1. Level of Ordinary Skill in the Art for '722 patent

22. In determining the level of one of ordinary skill in the art, I considered the '722 patent itself, the state of the art at the time of the invention (which I assume for the purposes of this declaration is no earlier than December 18, 2000), and the prior art referenced in the '722 patent itself.

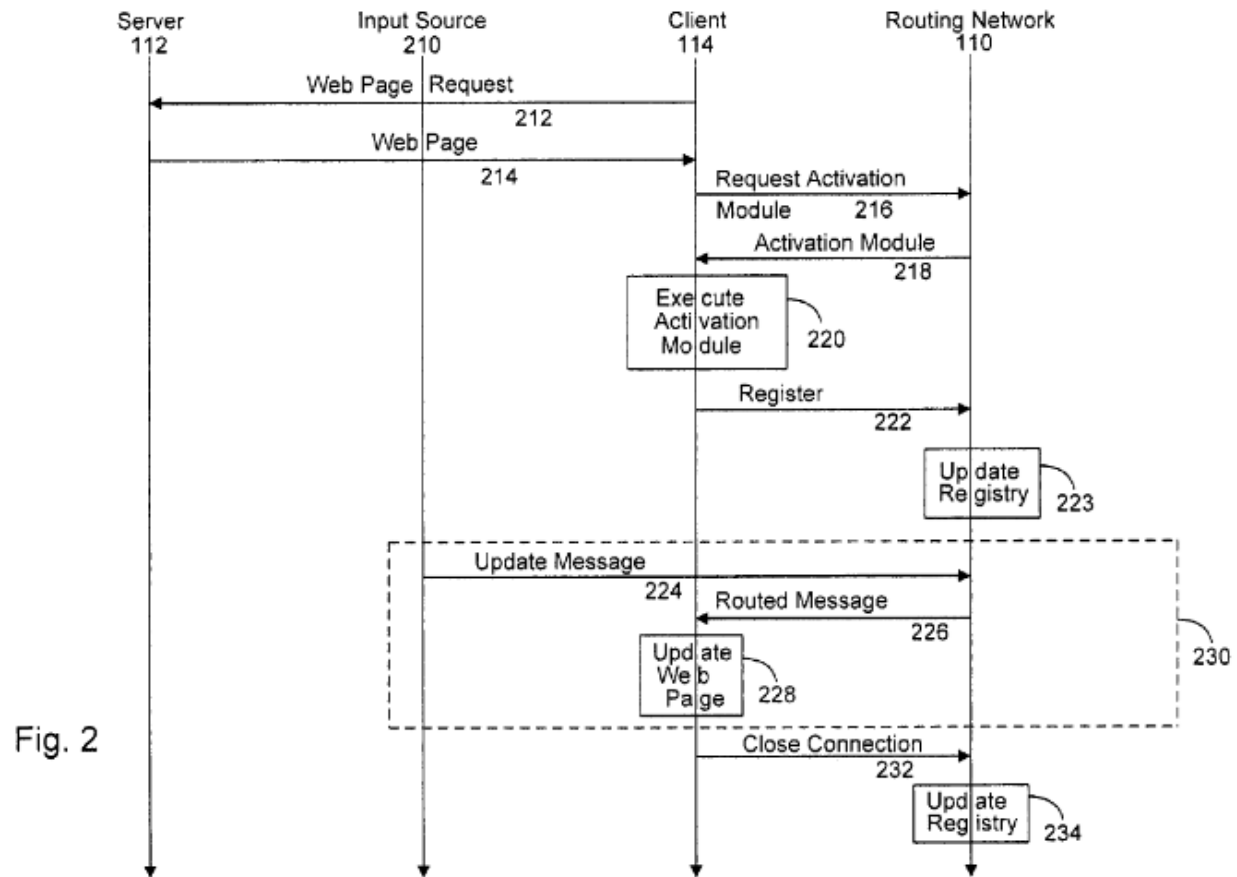
23. A person of ordinary skill in the art as of the '722 patent's earliest priority claim would have a bachelor's degree in an academic area emphasizing computer networking (i.e. computer science, computer information systems, computer engineering, etc.) and (2) at least two years of work experience with Internet routing with additional education substituting for less experience and vice versa. For example, someone with a relevant master's degree and 1 year of experience could qualify as one of ordinary skill in the art. Similarly, someone with no degree but five years of relevant experience might qualify as one of ordinary skill in the art.

2. Overview of '722 patent

24. The '722 patent utilizes 'live objects' to achieve its goals. The following is one excerpt from the '722 describing the live objects "The above need is met by a dynamic content routing network that routes messages containing data for updating properties of live objects to clients displaying web pages or other representations of data containing the live objects." Ex.1001, 3:9-12.

25. The '722 discloses a registry of the live objects: "Each gateway in the routing network maintains the mappings between the live: objects and the nodes that have registered for the live objects" Ex.1001, 3:23-25.

26. Figure 2 is an interaction diagram illustrating interactions among a server, information provider, dynamic content provider, client, and routing network to update a property of a live object on a web page:



27. The '722 states that "Each live object is identified by an object identifier, or object ID." Ex.1001, 5:30-31. The '722 patent further describes live objects as "Live objects have associated "properties" which include any modifiable data related to the object or referenced with respect to the object." Ex.1001, 7:22-24.

28. Claim 14 is a representative claim illustrating the functionality of the '722 patent:

[14.0] A method comprising:

[14.1] providing, using a processing device of an input source, a data representation to a client device, different from the input source, coupled to a routing network, wherein the data representation includes at least one live object recognizable by the client device, and

[14.2] causing the client device to respond to the live object of the data representation by determining an object identifier (ID) of the live object and to register for updates of the live object with the routing network, such that registering the client device with the routing network provides client connection information to a node in the routing network; and

[14.3] sending, using the processing device of the input source, an update message to the routing network, wherein the update message identifies the live object and contains update data that updates a property of the live object,

[14.4] wherein a gateway device at the routing network is configured to identify a category of the update message based on the input source, to determine a node type to which the identified category maps,

[14.5] and to route the update message to the node, having the node type, at the routing network,

[14.6] wherein the node is configured to identify the client device as a registered device and to route the update message to the client device, and

[14.7] wherein the client device processes the update message upon receipt to update the property of the live object at the client device.

3. Overview of Prosecution History of ‘722 Patent

29. During prosecution the examiner rejected the claims of the application that issued as the ‘722 patent many times over several pieces of prior art. Those rejections may be found at (Ex.1002, 413-31 (non-final rejection), 496-517 (non-final rejection), 575-606 (final rejection), 646-81 (non-final rejection), 723-63 (final rejection), 802-41 (non-final rejection), 892-938 (final rejection)).

30. Applicant amended the then-pending independent claims of the ‘722 patent in response to the second final rejection as to recite: “identifying a category of the update message based on the input source” (or similar language). Ex.1002, 792-801. The examiner, however, did not deem this amendment sufficient to overcome the prior art. In the third final rejection, the examiner maintained the rejections and

found the claims obvious under § 103 over U.S. 6,091,724 (“Chandra”), U.S. 6,510,323 (“Stocker”), and U.S. 6,324,578 (“Trenbeath”). Ex.1002, 892-938.

31. Applicants filed an appeal of the examiner’s last final rejection. Ex.1002, 997-1030. In the appeal, applicants alleged the limitation “identifying a category of the update message based on the input source” (or similar language) distinguished the claims over the prior art. Ex.1002, 1001-20.

32. After review of these appeal arguments focused on the limitation “identifying a category of the update message based on the input source” (or similar language), the examiner allowed the claims to issue as the ‘722 patent (after making typographical corrections to certain claims, e.g., spelling out “ID” as “identifier (ID)”). Ex.1002, 1038-59.

33. The examiner provided the following “Statement of Reasons for Allowance” referring back to the arguments applicants made in the appeal brief discussed above.

Examiner’s Statement of Reasons for Allowance

5. As Applicants pointed out in the Brief, the prior art of record (Chandra in view of Stocker and Trenbeath) does not disclose and/or fairly suggest at least claimed limitations recited in such manners in independent claim 1 and similarly recited in such manners in other independent claims 33, 39, 45, 51, and 57.

These claimed limitations are not present in the prior art of record and would not have been obvious, thus all pending claims 26, 28-31, 33-62, and 67-68 are allowed.

34. The '722 Patent was also the subject of an *ex parte* reexamination proceeding filed on September 16, 2024 and assigned Control No. 90/019,662. *See* Ex.1017, 1. In the reexamination, U.S. Patent No. 6,999,991 (Ikeda), U.S. Patent No. 6,480,883 (Tsutsumitake), and European Patent Application Publication No. EP1043671 (Bird) were used to challenge claims 1, 6, 7, 14-17, 20-23, 26-29, and 32-35 of the '722 Patent. Ex.1017, 5. No Office Actions were issued. The Notice of Intent to Issue Ex Parte Reexamination Certificate concluded that Ikeda did not disclose “determining a node having a node type to which the update message is to be routed based on a mapping of categories of update messages to node types, the mapping controlling the amount of update traffic through nodes of a routing network.” Ex.1017, 6. Based on this determination, the Examiner concluded the challenged claims remained valid. Ex. 1017, 7. The Examiner did not discuss Tsutsumitake or Bird in any detail. *See* Ex. 1017, 5-9.

4. Claim Construction

35. I understand that claim terms reciting function without sufficient structure for performing that function are interpreted under a specific statutory framework¹. The framework requires an analysis of the corresponding structure described in the

¹ I have been informed that this legal standard is met when claim terms, viewed from the perspective of a POSITA: (A) lack meaning as the name for structure; and (B) are not defined in terms of structure by the remaining portions of the claim.

specification as performing the claimed function. I find that certain terms of the ‘722 Patent’s claims (identified below) should be interpreted using this framework. No express construction of the other challenged claims is necessary in this proceeding because the prior art renders these claims obvious under any reasonable construction.

36. From a perspective of a POSITA, “module” is a nonce word that substitutes for “means.” Here, claims 17-19, 23-25, 29-31, 35-37 recite an “activation module” for performing certain functions without identifying the structure that performs those functions. As shown below, the ‘722 Patent’s specification identifies the structural components corresponding to the recited functions in these claims.

Claims	Function	Structure in ‘722 Specification
17, 23, 29, 35	“executing instructions by the client for registering the live object with the routing network”	“activation module 124[: (1)] parses 610 the web page 118 received from the server 112 and identifies the objectIDs of the live objects,” (2) “opens 612 a connection between the client 114 and the routing network 110,” and (3) “uses the connection ... to register 614 the object IDs by communicating to the routing network 116 [] the identified object IDs [(e.g., as a vector, list, or array)]” and equivalents thereof. Ex.1001, 14:33-15:1, Fig. 6; <i>see also</i> 11:1-8.
18, 24, 30, 36	“determining a node type that handles registration and causing the client device to register with the node corresponding to the node type”	activation module 124: (1) determines a node type in the routing network that handles registration, (2) makes a connection to that node, and (3) “registers the appropriate object IDs with the appropriate node[]” and equivalents thereof. Ex.1001, 21:43-52.

19, 25, 31, 37	“determining a message category of the data representation and causing the client device to register with a node having a node type corresponding to the message category”	activation module 124: (1) “determines which categories of messages it needs and to which nodes types it should connect,” (2) “makes a connection to one node of each relevant type,” and (3) “registers the appropriate object IDs with the appropriate nodes” and equivalents thereof. Ex.1001, 21:43-52.
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B. Lawson (Ex.1005)

37. U.S. Patent 5,721,825 (“Lawson”) was issued/published on February 24, 1998, and was filed on October 3, 1996 as Application No. 725,393. Lawson is directed towards event notification in a computer network. Ex.1005, Abstract. Lawson accomplishes this by utilizing a server network and event packets. One embodiment of an event packet is shown below. Ex.1005, 12:5-10.

Event Producer	Server	Type of Event	Time of Event	Size of Event Data	Event Data
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38. Lawson further describes this embodiment in the following excerpt “in the above event packet, the event producer field is an identifier that identifies the process, device, user, etc., which generated the event. The server field identifies the server location where the event was produced. The type of event field is an identifier describing the type of event which occurred. This identifier preferably identifies an

event in the global event registry and/or local event registry so that appropriate servers or event consumers can be identified to receive the event.” Ex.1005, 12:11-20.

39. Lawson “utilizes a local event registry to identify local event consumers that should be notified when an event occurs” and “a which identifies other servers which need notification when an event occurs.” Ex.1005, Abstract. Lawson discloses that “[t]hese other servers will then, in turn, notify their local event consumers of the event” and that “multiple levels of filtering” is used “to allow event consumers to remove notification of events having little or no interest.” Ex.1005, Abstract.

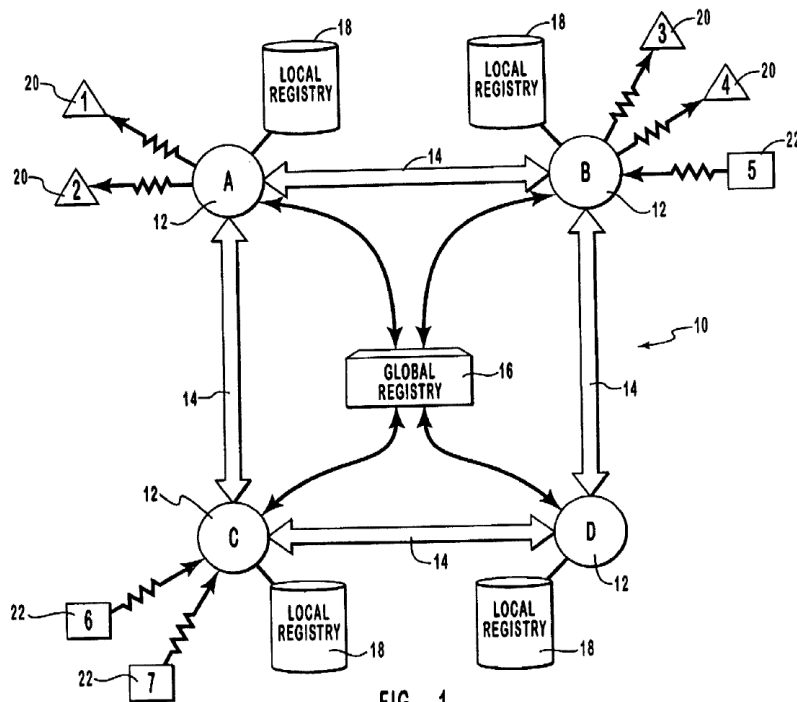
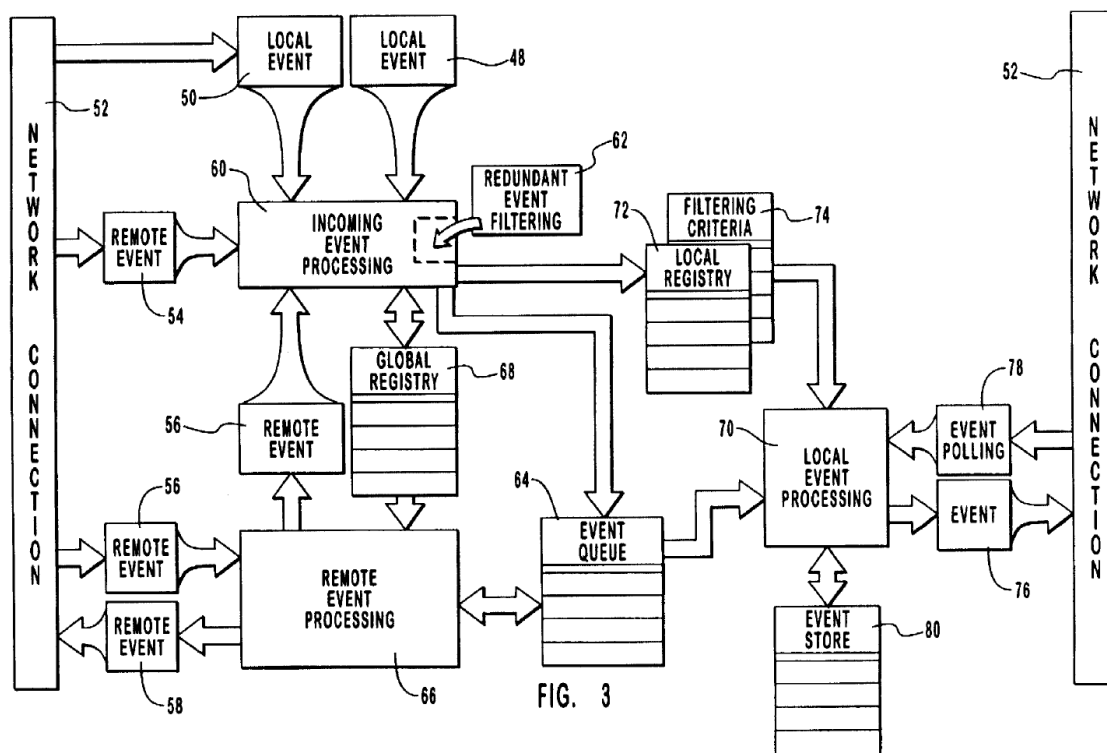


FIG. 1

40. Lawson utilizes a gateway, and describes its purpose as follows “The purpose and function of gateway 32 is to translate message traffic in network 24 to a format that is understood by network 26 and to translate message traffic in network 26 to a format that is understood by network 24. In other words, gateway 32 allows messages from network 24 to flow into network 26 and vice versa so that all servers may communicate.” Ex.1005, 9:23-30.

41. In Lawson, the remote event processing block directs events to the proper destination. The remote event processing block 66 is shown in figure 3 and the process in the remote event processing block is shown in figure 5.



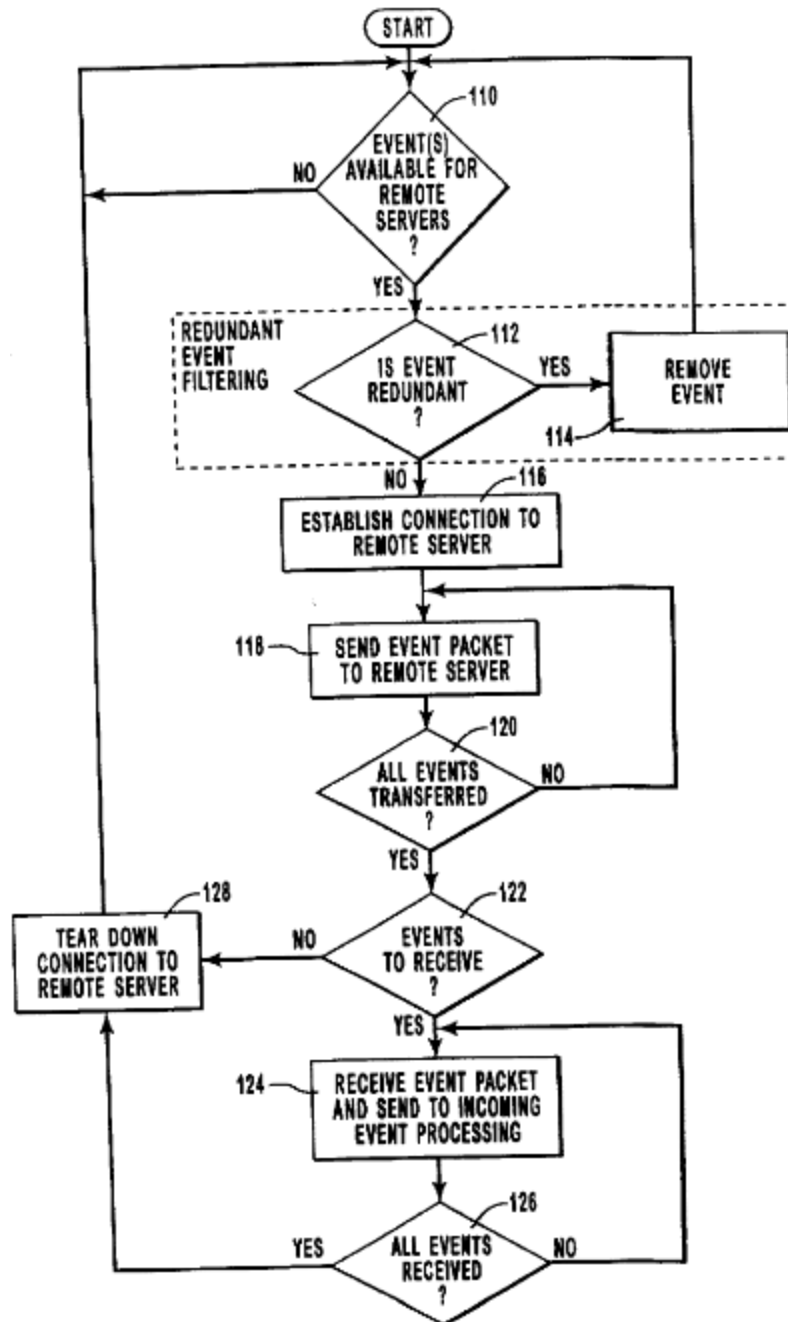


FIG. 5

C. Tsutsumitake (Ex.1006)

42. U.S. Patent 6,480,883 (“Tsutsumitake”) was issued/published on November 12, 2002, and was filed on June 29, 1999 as Application No. 09/342,732.

Tsutsumitake is directed towards a real time information transmission system that “can immediately transmit information updated on a server to a client” in a web-enabled environment.” Ex.1006, Abstract, 1:6-32. One object of Tsutsumitake is to reduce the time interval of information update on the server side. Figure 1 of Tsutsumitake illustrates the general architecture:

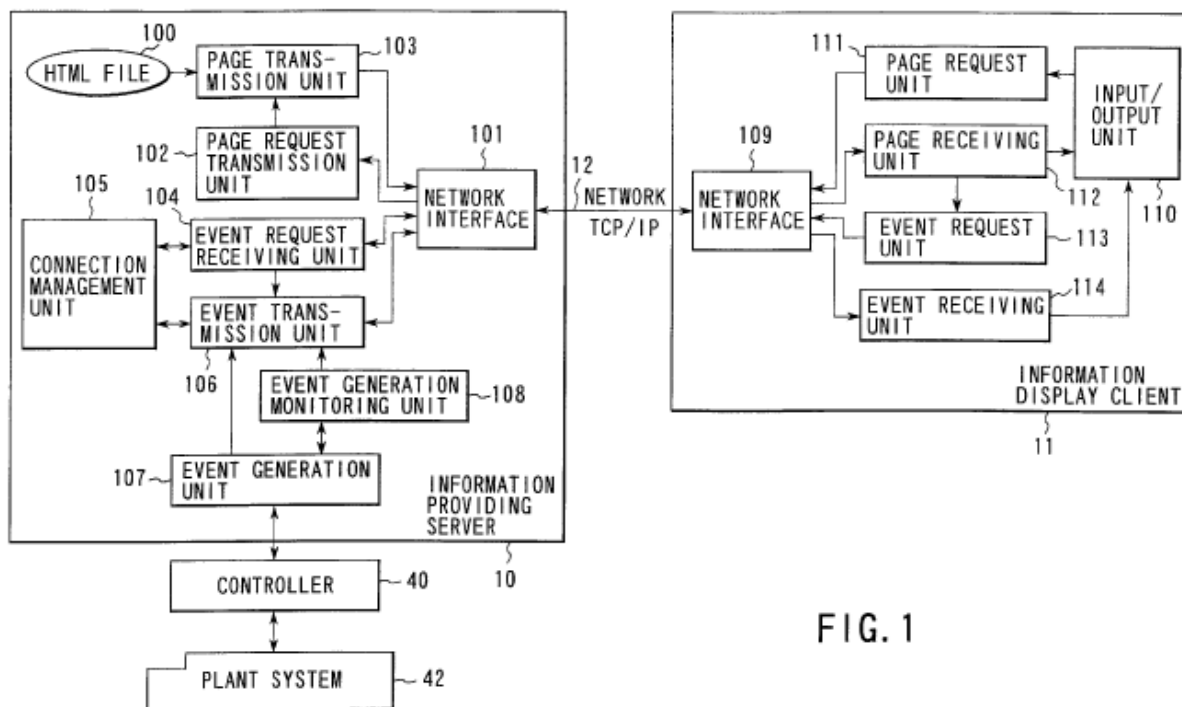
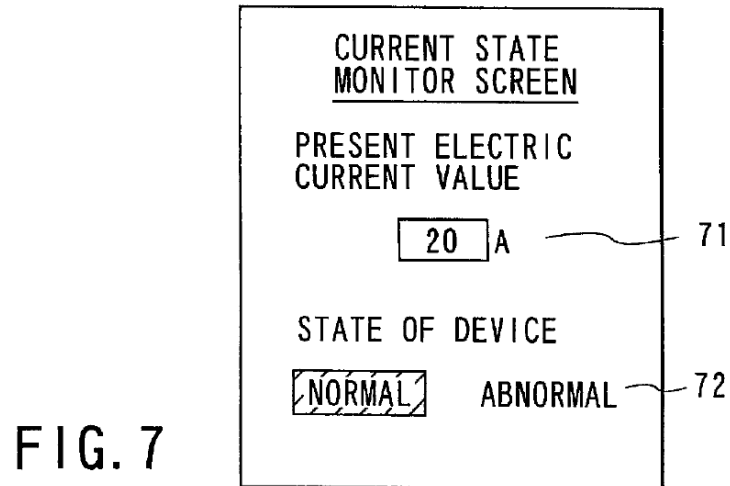


FIG. 1

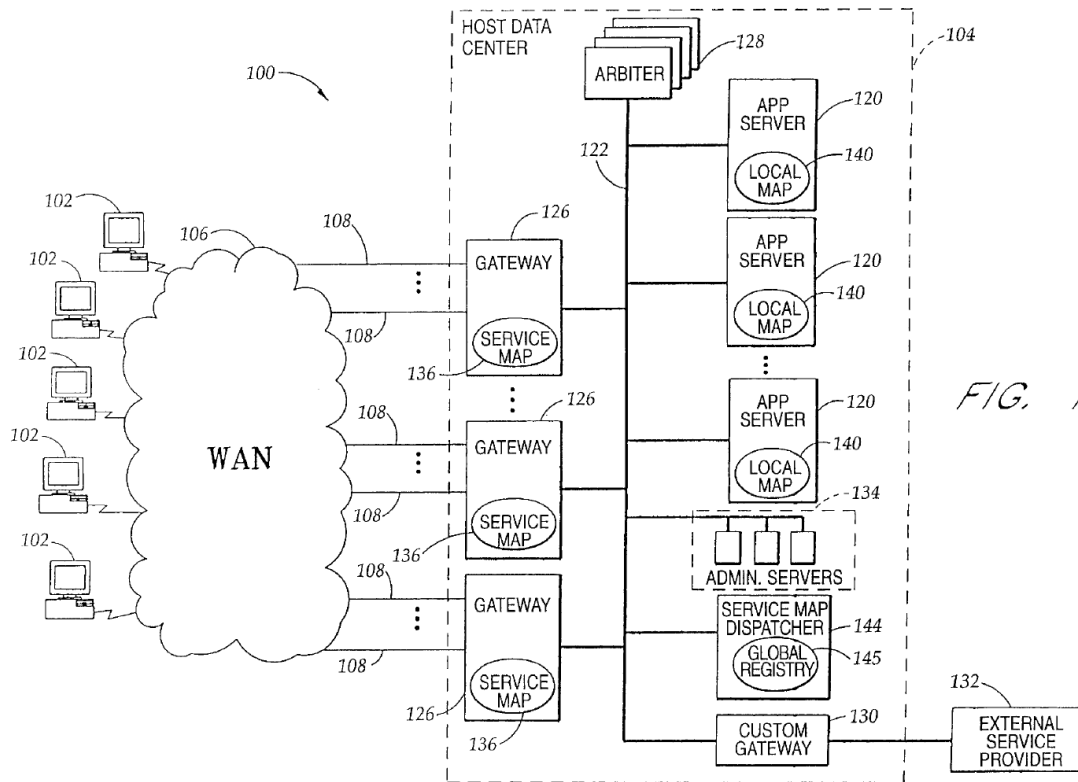
43. Tsutsumitake describes that a web “client analyzes [a web]page” and “[i]f an event request is included in the analyzed page ... [a] connection ID [is used by] the server [to] send[] an event to the client each time the event has occurred.” The “client processes the event and reflects the processed result on a screen of a display” to, e.g., update in real-time data being monitored. Ex.1006, Abstract, 13:31-65.

44. An example updating event is shown in FIG. 7 of Tsutsumitake as an updating current value and a device state presented in a webpage. Ex.1006, 13:46-57.



D. Choquier (Ex.1007)

45. U.S. Patent No. 5,951,694 ("Choquier") was issued/published on September 14, 1999, and was filed on February 3, 1997 as Application No. 08/794,350. Choquier discloses "a client-server architecture for an on-line services network" using "groups of application servers." Ex.1007, 1:45-48. See FIG. 1:



46. The application servers are part of a host data center 104 and “arranged into service groups, with each service group corresponding to a particular service.” Ex.1007, 2:1-4. These services can include online services like bulletin board system (BBS), chat, mail, news, multimedia viewing, and interactive games services. Ex.1007, 6:8-22. Service groups can include one server or multiple servers, and it is possible for a server to be assigned to multiple service groups. Ex.1007, 2:14-18, 6:24-31, 9:40-49, 11:44-47. See. Fig. 3:

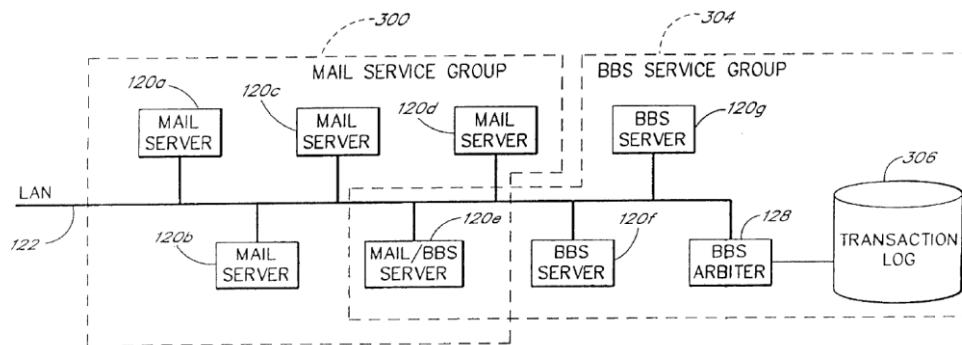


FIG. 3

47. Service groups can also be assigned based on topics with “each...service group handling a specific topic or set of topics,” such as different topics in Choquier’s BBS service. Ex.1007, 10:17-20.

48. As shown in FIG. 1, the architecture includes gateways 126 that facilitate communication between client devices 102 and the application servers 120. The gateways, using a service map, route communications to servers of the proper service type to handle services for clients. The service map includes IDs for every application server and the application/service types each server is configured to support, as well as server load information for use in server load balancing. Ex.1007, 2:58-3:3, 10:32-40.

49. The gateways function in Choquier can also be seen in figure 5B, shown here:

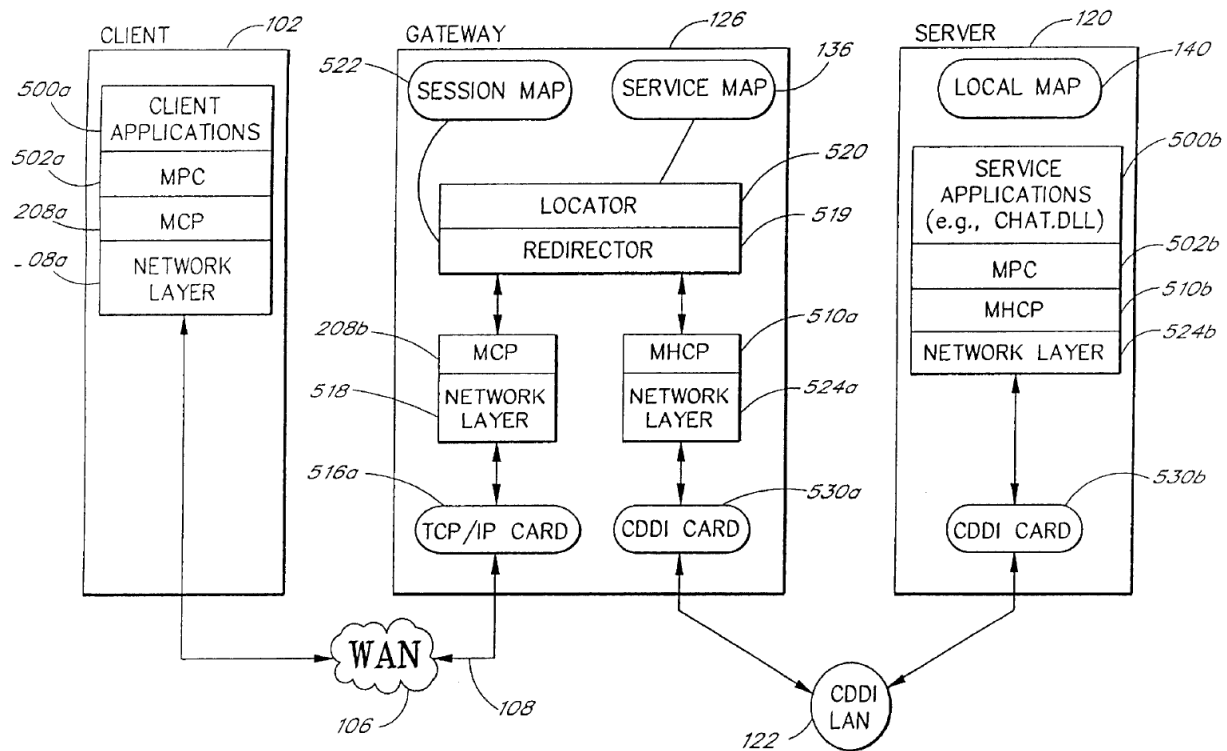
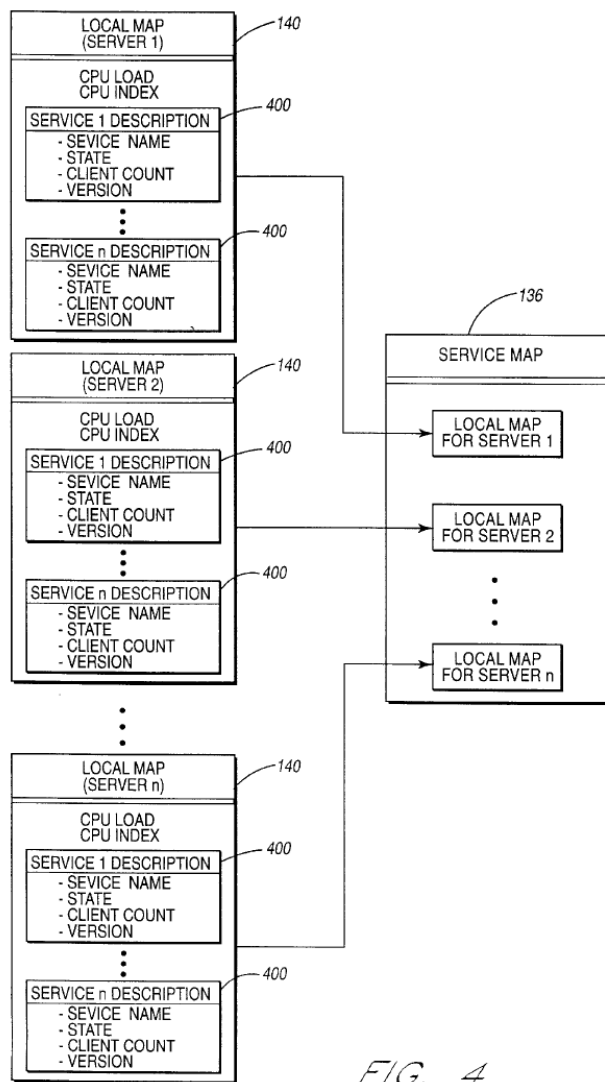


FIG. 5B

50. As also shown in FIG. 1, one or more custom gateways 130 “links the host data center 104 to one or more external service providers 132.” Ex.1007, 6:37-47. Arbiters 128 are also included that are used to replicate “update transactions” for services that update or change over time. Ex.1007, 9:50-65, 10:4-12

51. Arbiters use the service maps to “determine the status of servers 120 that are currently assigned to respective service groups.” 10:67-11:3. A service map dispatcher 144 maintains a global registry 145 that includes, for each service group, “the IDs of the servers 120 of the service group” and the identity of the Arbiters, and the service map dispatcher creates service maps from local maps stored at each

server and broadcasts service maps to the gateways 126 and Arbiters 128. Ex.1007, 10:62-11:11, 11:66-12:18. See FIG. 4.



52. The global registry 145 “could be maintained by some entity other than the service map dispatcher.” Ex.1007, 12:16-18.

53. Services that include “update transactions” and utilize Arbiters can include services like the BBS service and interactive games services that involve periodic

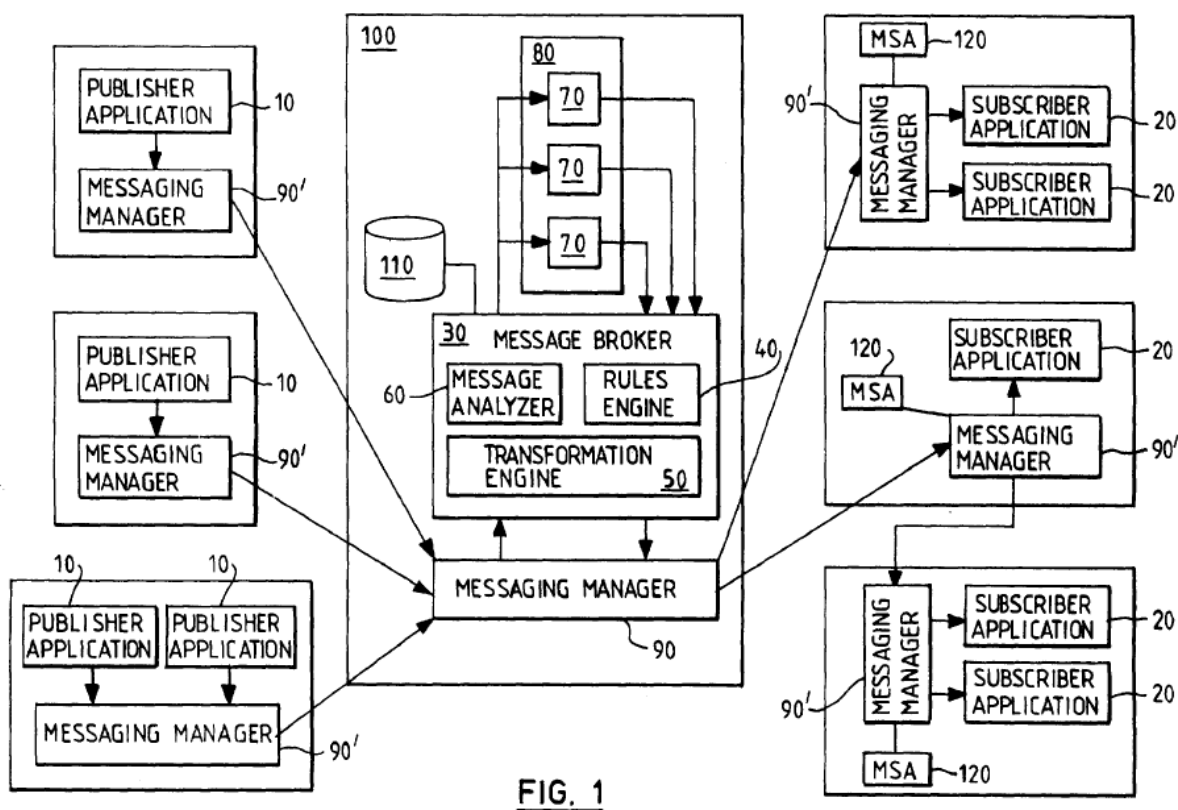
updates to be sent to clients. Ex.1007, 9:50-65, 21:22-23:19. The update transactions can “originate from a variety of sources,” such as “an external data provider connected to the host data center 104 by the Internet.” Ex.1007, 9:57-65. For example, in the BBS service, the update source can be a data provider that posts a message to the bulletin board, and an update is routed to clients via the application servers so they can view the updated bulletin board. Ex.1007, 9:50-65. When a message is received that requires an update to a service’s content, the message is sent to an Arbiter. Ex.1007, 21:33-39. The Arbiters record update transactions in logs that store aspects of the update such as the originator of the update, a transaction ID, a data set affected by the update, etc., and the Arbiters dispatch the updates to each server in the server group. Ex.1007, 21:39-45, 22:34-45. The servers process the updates so that clients can view the updated data. Ex.1007, 9:50-65, 21:51-53. The Arbiters can also monitor the global registry 145 to keep track of servers in the Arbiter’s service group. Ex.1007, 21:47-50. Arbiter functionality can be performed using service-specific microcomputers, or can be “implemented elsewhere...in the host data center 104,” such as “by a server 120 of a service group,” and “two or more service groups” can be assigned to an Arbiter. Ex.1007, 23:9-19.

E. Bird (Ex.1008)

54. European Patent Application Publication No. EP1043671 ("Bird") was published on October 11, 2000, and was filed on March 17, 2000 as Application No.

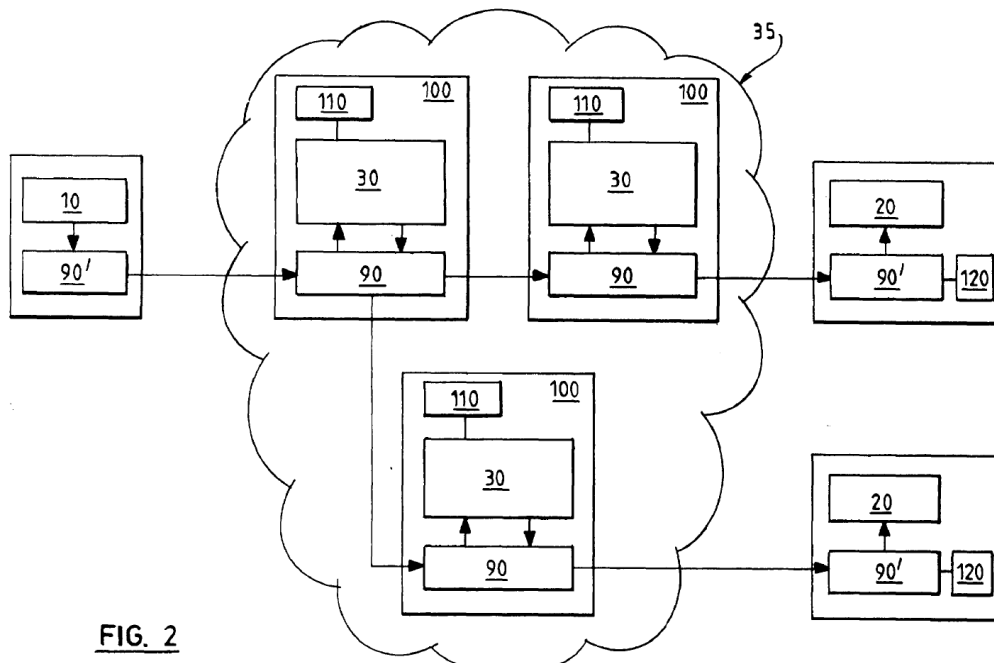
00302178.9. Bird discloses a message broker and a method of processing message content within a publish/subscribe message distribution service. "Figure 1 is a schematic representation of a computer network implementing a first embodiment of the invention, including publisher application programs sending messages to a broker and subscriber application programs receiving messages from the broker."

Ex.1008, [0028]. Figure 1 of Bird is shown here:



55. Subscriber clients in Bird subscribe to messages from specific publishers ("company name," "specific publisher organisation") and, when messages were published by publishers, a broker at a server 100 uses a message analyzer and rules

engine to “investigate...the message header for...identification of the sender” to determine the publisher identity and route the messages to subscribers. Ex.1008, [0003], [0044]-[0045], [0060]. The system could also be distributed across multiple servers 100. Ex.1008, [0037]. See FIG. 2:



F. Herz (Ex.1009)

56. U.S. Patent No. 5,754,939 (“Herz”) was issued/published on May 19, 1998, and was filed on October 31, 1995 as Application No. 551,197. Herz is directed to user profiles. Specifically, Herz identifies the problem it seeks to solve as “It is a problem in the field of electronic media to enable a user to access information of relevance and interest to the user without requiring the user to expend an excessive amount of time and energy searching for the information.” Ex.1009, 1:45-48. Herz

server in figure 1) and 15 of Herz:

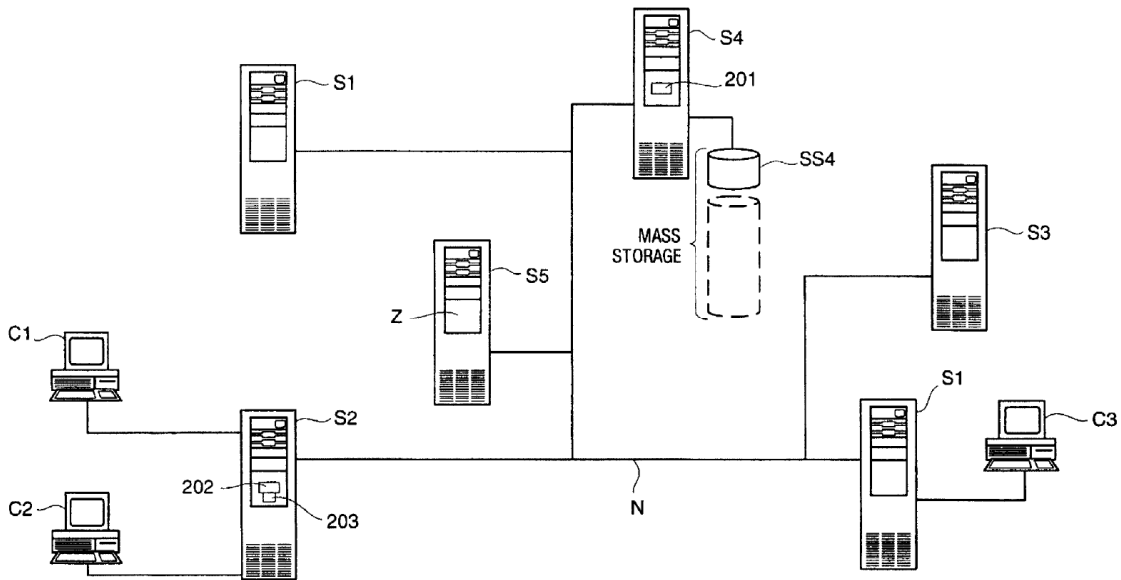
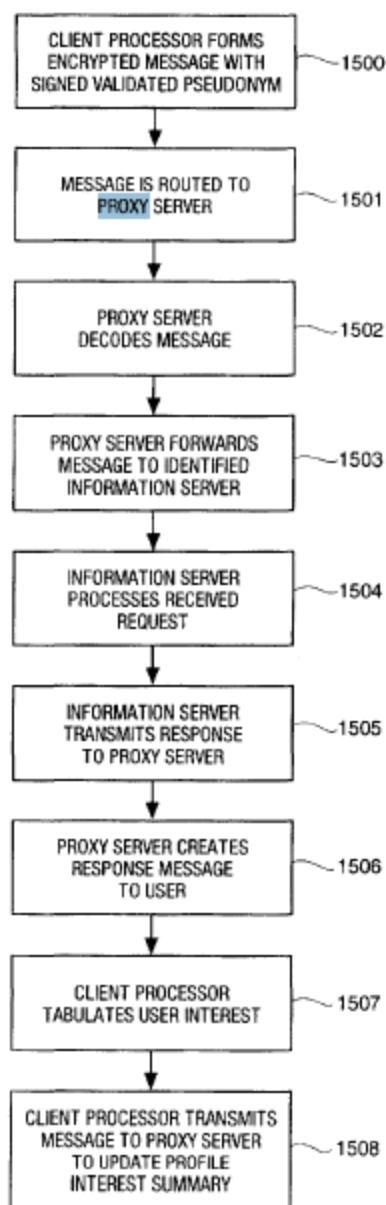


FIG. 2

FIG. 15



57. Herz describes its solution to problems in prior art as "The above-described problems are solved and a technical advance achieved in the field by the system for customized electronic identification of desirable objects in an electronic media environment, which system enables a user to access target objects of relevance and interest to the user without requiring the user to expend an excessive amount of time

and energy. Profiles of the target objects are stored on electronic media and are accessible via a data communication network. In many applications, the target objects are 45 informational in nature, and so may themselves be stored on electronic media and be accessible via a data communication network." Ex.1009, 4:36-47.

58. Herz's proxy server sits between clients and servers, bidirectionally transfers communications between the client and servers, and stores user-specific information in a secure and private manner, such as a user's "target profile interest summary" that "describes the user's interest level in various types of target objects." Ex.1009, 5:5-13, 32:7-49.

G. General Knowledge

59. There are general terms that would be well known by a POSITA which are used in both the '722 patent and in Lawson, Kostas, and Tsutsumitake. Those terms are briefly described here.

1. Node

60. A POSITA would understand a node to be any computing device connected to a network. Cornell University describes a node as "A **node** is a standalone physical computer unit with a network connection that typically runs its own copy of the operating system. Thus, a workstation in your office or your laptop computer is a

node. Supercomputer clusters are composed of nodes connected by a communications network.”²

61. 2002 lecture notes from Northwestern University describe a node as “Nodes are computers, switches, routers, servers and other devices.”³

62. The University of Oklahoma defines a node as “A computer that is attached to a network; also called a host.”⁴

63. These definitions are all consistent with the Microsoft 2002 Computer Dictionary definition “In networking, a device, such as a client computer, a server, or a shared printer, that is connected to the network and is capable of communicating with other network devices.”⁵

2. Routing

64. A POSITA would understand routing to be the moving of a packet from one node to another in a network or between networks. The Microsoft 2002 Computer Dictionary definition is “The process of forwarding packets between networks from source to destination.”⁶ Another similar definition comes from a textbook used at the

² <https://cvw.cac.cornell.edu/parallel/hpc/nodes> (Ex.1025)

³ <http://users.ece.northwestern.edu/~rberry/ECE333/Lectures/lec1.pdf> (Ex.1026).

⁴ <https://www.ou.edu/research/electron/internet/zen-glos.htm> (Ex.1027).

⁵ Microsoft Press. (2002). *Microsoft computer dictionary*. Microsoft Press (Ex.1028).

⁶ Microsoft Press. (2002). *Microsoft computer dictionary*. Microsoft Press (Ex.1028).

University of Southern Florida “Routing is the act of moving information across an internetwork from a source to a destination.”⁷

65. Juniper Networks defines routing as “Routing is the transmission of packets from a source to a destination address.”⁸ Cloudflare defines routing as “Network routing is the process of selecting a path across one or more networks.”⁹

3. Proxy

66. A proxy is a term that would be familiar to a POSITA. One definition is “proxy an item that represents something else. See also PROXY SERVER. proxy server a computer that saves information acquired from elsewhere on the INTERNET and makes it available to other computers in its immediate area. For example, if several users connect to the same WEB SITE through a proxy server, each page of information will be downloaded from that site only once and then provided to all the users. A disadvantage of proxy servers is that they make it impossible to count HITS accurately.”¹⁰

⁷ http://magrawal.myweb.usf.edu/dcom/Ch9_Routing-Basics.pdf (Ex.1029).

⁸ <https://www.juniper.net/documentation/us/en/software/junos/routing-overview/routing-overview.pdf> (Ex.1030).

⁹ <https://www.cloudflare.com/learning/network-layer/what-is-routing/> (Ex.1031).

¹⁰ Downing, Douglas; Covington, Michael A.; Mauldin, Melody. Dictionary of Computer and Internet Terms (Barron's Business Guides) (p. 384). Barron's Educational Series - A. Kindle Edition (Ex.1032).

67. New York University uses the following definition “In the context of computer networking, a proxy (or proxy server) acts as an intermediary between a client requesting data and the server providing that data.”¹¹

4. Messages

68. The ‘722 patent refers to update messages. A POSITA would understand a message is data sent across a network. This is disclosed several times in the ‘722, the following are just examples.

- i. "A network routes update messages containing updates to properties of live objects from input sources to clients having the objects." Ex.1001, Abstract.
- ii. "The above need is met by a dynamic content routing network that routes messages containing data for updating properties of live objects to clients displaying web pages or other representations of data containing the live objects." Ex.1001, 3:9-12.
- iii. "The implementations differ primarily in where the client registration information is stored. In the first implementation, client registration information is stored at the nodes, and the client proxy merely passes messages among the clients and nodes." Ex.1001, 3:51-55.

¹¹ <https://itp.nyu.edu/networks/explanations/proxies/> (Ex.1033).

69. Data sent across a network involves packets and routing.

H. Lawson, Tsutsumitake, and Choquier and, alternatively, Herz

1. Motivation to Combine Lawson and Tsutsumitake

70. There are multiple motivations for a POSITA to make such a combination and reasons to believe it would be successful. As described above in §III.B-D., Lawson, Tsutsumitake, and Choquier all disclose distributed computing systems that provide data updates from servers to clients (event notifications in Lawson, real-time event updates in Tsutsumitake, and update transactions in Choquier).

71. Lawson, for example, explicitly envisions being combined with other systems “The current system and method can be used with virtually any underlying event notification system. In one preferred embodiment, the present invention is designed to work in conjunction with current event notification systems to achieve the desired functionality” Ex.1005 4:27-32.

72. Tsutsumitake is a real-time information transmission system. Lawson is a system in method for global event notification in a distributed computer environment. Any event notification is a form of information transmission. Ensuring that events are transmitted in real-time would increase efficiency and reliability, and as disclosed in Tsutsumitake, such would be in accord with design trends at the time. Ex.1006, 2:46-58, 3:26-33. Therefore, a POSITA would be motivated to combine Tsutsumitake with Lawson to provide real-time transmissions to Lawson. Such a

combination would be combining elements using known techniques with predictable results and an expectation of success.

73. Lawson repeatedly describes itself as a “distributed computer system” Ex.1005, Abstract; 1:14-18; 4:24-27. Tsutsumitake describes information providing servers connected to the Internet. Ex.1006, 7:66-8-1. The Internet is the quintessential distributed computer system.

74. A POSITA would have also been motivated to combine Lawson with Choquier to expand Lawson’s individual identified servers (e.g., servers A-E) to include multiple servers and to be in server/service groups based on server type, including assigning server groups to categories of messages (see Ex.1007,10:17-20) categorized according to specific event producers (see Ex.1005, 12:3-11, 20:10-30). Doing so would provide Lawson’s system with “a high degree of scalability,” “dynamic[] balancing of processing load among...servers,” as well as redundancy in the event of server failure or overloading. Ex.1007, 1:52-62, 9:66-10:8, 25:5-35.

75. A POSITA would also recognize much overlap and many points of similarity between Lawson, Tsutsumitake, and Choquier that would facilitate combination. Tsutsumitake uses events (Ex.1006, 4:22-28); Lawson also uses events. Choquier similarly uses “update transactions.” Ex.1007, Ex.1007, 9:50-65, 21:33-53, 22:34-45. Tsutsumitake uses a proxy (Ex.1006, 8:7-9); Lawson also uses a proxy Ex.1005 4:54-5:2, 6:4-10). Choquier also uses a proxy. Ex.1007, 8:8-35. Tsutsumitake uses

identifiers (Ex.1006, 11: 45-55); Lawson also uses identifiers Ex.1005, 12:5-10, 16:47-48. Choquier also uses identifiers. Ex.1007, 18:24-19:60, FIGS. 11A-11B.

76. Choquier also explicitly specifies its system's adaptability for combination including its "ability to be scaled in capacity without having to change the existing system and application software" and that its Arbiter is "generic (i.e., service - independent)" and "new service applications can be written to make use of the services provided by the Arbiter." Ex.1007, 25:5-21. Lawson and Choquier also both disclose use of a "global registry" to track server mappings. Ex.1005, 4:45-48; Ex.1007, 10:62-11:11, 11:66-12:18. Choquier is also related to Tsutsumitake, as both deal with providing periodic data updates via servers.

77. Lawson is also explicitly designed to be integrated with other systems: Lawson states "The presently preferred embodiment of a system for global event notification and distribution comprises a general purpose computer. The present invention, however, can also be used with any special purpose computer or other hardware system and all should be included within its scope" Ex.1005, 7:17-21.

78. For at least the above reasons, modifying Lawson with Tsutsumitake and Choquier would have been straightforward, have had numerous benefits, and would not have required extensive experimentation or imposed undue burden. A POSITA would have a high expectation of success in the combination, because Lawson can be used with any event data, including transmitting events in real time over the

Internet as disclosed by Tsutsumitake, and because use of server groups or clusters as disclosed in Choquier was well-known and preferable for efficiency, scalability, and redundancy. For the same reasons, the combination would have yielded predictable results well within the skill of POSITA.

2. Motivation to combine Lawson with Herz

79. To the extent that Lawson, Tsutsumitake, and Choquier do not explicitly provide for a client proxy, a POSITA would have been motivated to combine Lawson, and the combination of Lawson, Tsutsumitake, and Choquier, with Herz to provide for a client proxy. First, as was pointed out in section III.H.1. Lawson explicitly envisions being combined with other systems “The current system and method can be used with virtually any underlying event notification system. In one preferred embodiment, the present invention is designed to work in conjunction with current event notification systems to achieve the desired functionality” Ex.1005, 4:27-32.

80. Lawson is concerned with routing events to consumers “in the above event packet, the event producer field is an identifier that identifies the process, device, user, etc., which generated the event. The server field identifies the server location where the event was produced. The type of event field is an identifier describing the type of event which occurred. This identifier preferably identifies an event in the

global event registry and/or local event registry so that appropriate servers or event consumers can be identified to receive the event” Ex.1005, 12:11-20.

81. Herz is directed to routing information to specific users "It is a problem in the field of electronic media to enable a user to access information of relevance and interest to the user without requiring the user to expend an excessive amount of time and energy searching for the information" Ex.1009, 1:45-48.

82. Herz discloses a proxy server that bidirectionally transfers communications between the client and servers, and stores user-specific information in a secure and private manner, such as a user’s “target profile interest summary.” Ex.1009, 5:5-13.

83. A POSITA would have known that use of proxies between clients and servers was well-known, and would have been motivated to use a proxy such as Herz’s proxy server to provide a common point of connection to clients in Lawson’s system as well as provide data privacy in storing client registration information, as disclosed in Herz.

84. Adding Lawson’s global event registry to Herz would improve Herz ability to rout information to specific users and in fact, assist in the goal of “... enable a user to access information of relevance and interest to the user without requiring the user to expend an excessive amount of time and energy searching for the information" (Herz 1:45-48).

85. Additionally, adding Herz's profiles of the target objects to Lawson's global event registry would improve Lawson. These are just two practical examples of how combining Herz and Lawson would have been the combining of elements as claimed by known methods, with predictable results.

86. A POSITA would also have a high expectation of success in the combination, because Lawson, Tsutsumitake, and Choquier all deal with client server communications over server networks. For the same reasons, the combination would have yielded predictable results well within the skill of POSITA.

3. Claim Analysis

87. In the following sub-sections, I provide a claim-by-claim analysis of Lawson disclosing the claim limitations of the '722 Patent as combined with Tsutsumitake and Choquier, and, alternatively, also with Herz. This would have been a combination of known elements with predictable results. Certain claim elements recite substantially overlapping subject matter, and therefore, for efficiency and ease of understanding, I group these claim elements together. I note that claims 14, 20, 26, and 32 include two additional steps not found in claims 1 and 7, but otherwise all independent claims 1, 7, 14, 20, 26, and 32 recite substantially similar elements.

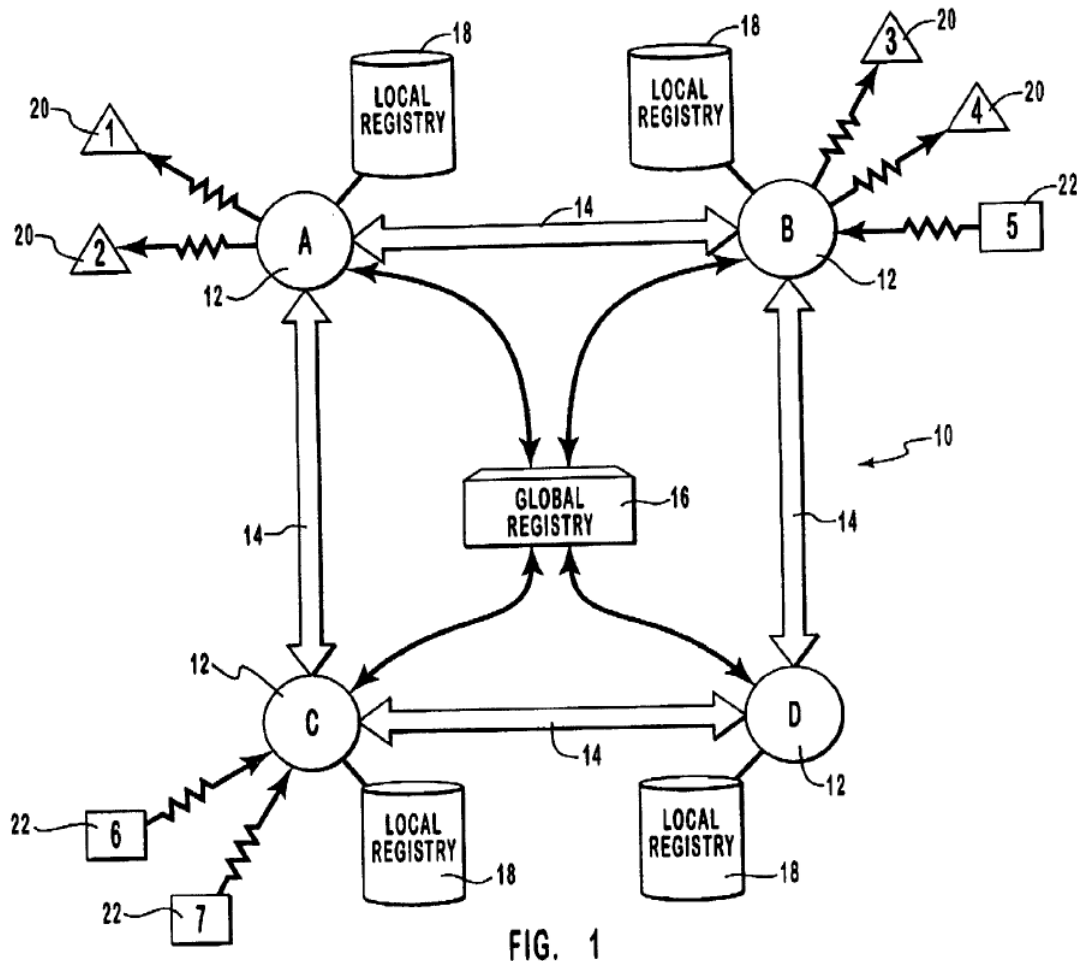
a. Claims [1.0], [7.0], [14.0], [20.0], [26.0], [32.0]: Preambles

Claim	Limitations
[1.0]	A method comprising:

[7.0]	A routing network comprising:
[14.0]	A method comprising:
[20.0]	An apparatus comprising:
[26.0]	An article of manufacture including a computer-readable storage medium having instructions stored thereon, execution of which by a computing device causes the computing device to perform operations comprising:
[32.0]	A non-transitory computer readable storage medium having instructions stored thereon, the instructions comprising:

88. Lawson discloses systems and methods, as recited in Claims 1 and 14. Lawson discloses” a system and method for globalizing event notifications in a distributed computing environment.” Ex.1005, Abstract, 4:25-27.

89. Lawson discloses a routing network, as recited in Claim 7. First Lawson describes a network “This invention relates to event notification and distribution between computer systems, more specifically to global event notification in a distributed computing environment, such as a computer network.” Ex.1005, 1:14-17. Figure 1 represents a network view of one embodiment of Lawson:



90. Lawson further describes this as a routing network “In this way, local events can be routed to any event consumer in the network without the need to register at each server” Ex.1005, 5:11-12.

91. Lawson describes a network “This invention relates to event notification and distribution between computer systems, more specifically to global event notification in a distributed computing environment, such as a computer network “ Ex.1005, 1:14-17.

92. “These corresponding event globalization processes, in ram, check their local event registries and provide the event to any event consumers identified therein. In this way, local events can be routed to any event consumer in the network without the need to register at each server” Ex.1005, 5:7-12.

93. Lawson also discloses an apparatus, as recited in Claim 20. The ‘722 patent describes the apparatus as having an input source, a client device different from the input source, and a routing network. As discussed below in reference to claim elements 14.1, 20.1, 26.1, and 32.1, Lawson discloses an input source and a client device that is separate from the input source.

94. Lawson also discloses an article of manufacture including a computer-readable storage medium having instructions stored thereon, execution of which by a computing device causes the computing device to perform operations, as recited in Claim 26. Lawson discloses “The preferred general purpose computer comprises traditional computer elements such as a display means for displaying information to a user, a CPU means or other processing means for processing program code means, program storage means for storing program code means executed by the CPU or other processing means, and input means for receiving input from a user” Ex.1005, 7:22-28.

95. Lawson also discloses a non-transitory computer readable storage medium, as recited in Claim 32. Lawson discloses: “The preferred general purpose computer

comprises traditional computer elements such as a display means for displaying information to a user, a CPU means or other processing means for processing program code means, program storage means for storing program code means executed by the CPU or other processing means, and input means for receiving input from a user.” Ex.1005, 7:22-28.

96. Tsutsumitake also discloses a method: "A description will now be given of a method of processing the event sent from the server 10 on the client (11) side and updating the screen image of the browser (page display screen image)." Ex.1006, 13:27-30.

97. Tsutsumitake is directed towards the world wide web which a POSITA would understand is a routing network.

98. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

b. [14.1], [20.1], [26.1], [32.1]: Input source provides data representation including live object

Claim	Limitations
[14.1]	providing, using a processing device of an input source, a data representation to a client device, different from the input source, coupled to a routing network, wherein the data representation includes at least one live object recognizable by the client device, and

[20.1]	an input source device configured to provide a data representation to a client device, different from the input source, coupled to a routing network, wherein the data representation includes at least one live object that is recognizable by the client device, and
[26.1]	providing, using a processing device of an input source, a data representation to a client device, different from the input source, coupled to a routing network, wherein the data representation includes at least one live object that is recognizable by the client device, and
[32.1]	instructions for providing a data representation to a client device coupled to a routing network, wherein the data representation includes at least one live object recognizable by the client device, and

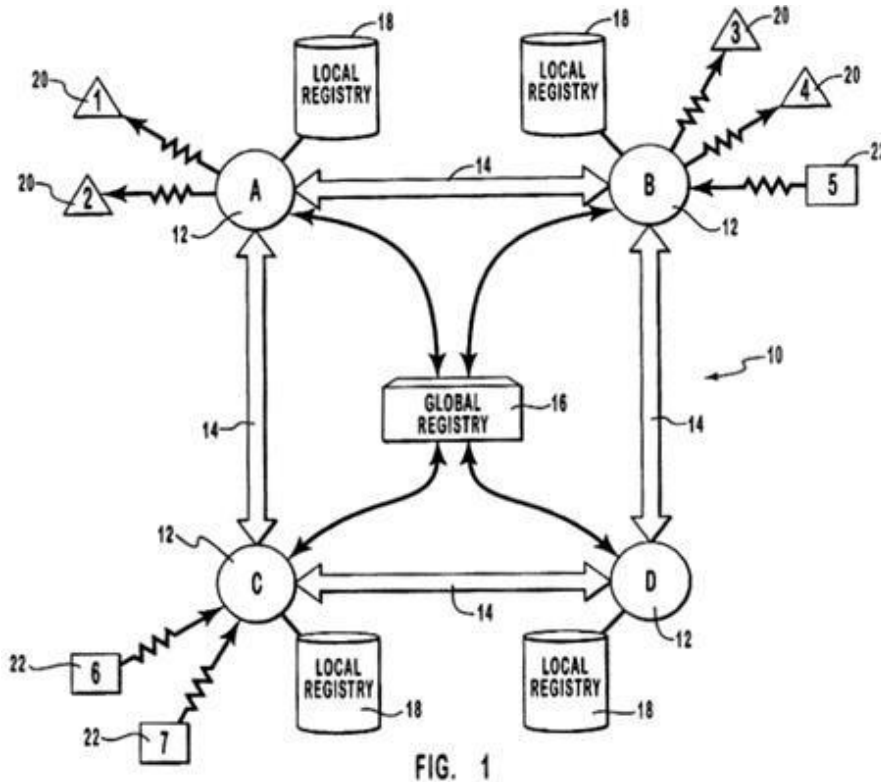
99. Lawson discloses these elements because Lawson discloses providing, using a processing device of an input source (event producer), a data representation (data/records) to a client device (event consumer), different from the input source, coupled to a routing network (network of servers implementing event globalization process), wherein the data representation includes at least one live object recognizable by the client device (records/data recognized by event consumers).

100. Lawson discloses input sources (event producers) and client devices (event consumers):

In Fig. 1, event consumers are illustrated by the triangular regions 20 and are numbered 1-4. Event producers are identified by rectangular regions 22 and are labeled 5-7. Event producer and event consumer are meant to be generic terms that are interpreted broadly. Event producer will be used to refer to a process, user, device, or other item that produces or generates an event. An event consumer should be broadly interpreted to refer to any process, user, device, or other item that desires notification of an event.

Ex.1005, 9:1-15; *see also* 1:51-60.

101. Event producers and consumers are different from each other and can be or include general or special purpose computers and software. Ex.1005, 7:17-39, Figs. 1-3; *see also* claims 38-39, 43-44.



102. As shown in FIG. 1, Lawson discloses a routing network in which the event producers 22 provide events to servers connected to client devices that register for the events via servers (servers A, B, C, D). Ex.1005, 4:54-65, 7:52-8:4.

103. Lawson discloses an “event packet” that corresponds to the ’722 Patent’s “live object recognizable by the client device” (i.e., event packet recognizable by Lawson’s event consumers) because Lawson’s event consumers use data/records in the event packet to update other data/records at the event consumers.

104. Lawson discloses examples in which “event consumer 4 [in Fig. 1] is a company phone directory” and “event consumer 1 [in Fig. 1] is a payroll database.” 23:64-65, 24:1. These event consumers dynamically update data/records they store based upon receipt and processing of an event packet (e.g., update phone number, update payroll database based on data/records in the event packet). 21:16-25, 24:64-24:6, Fig. 7 #178 (phone directory), 24:1-4, 25:16-21, Fig. 7 #186 (payroll database). Lawson illustrates these two examples via Fig. 7, which is “an example of how [Lawson’s system and method] works ... [where t]he network topology used for th[e] example is presented in Fig. 1” and the “event globalization process is described in Figs. 3-6.” 23:60-63, 24:17-18.

105. With respect to the “event packet,” Lawson discloses that “[f]or most events, packaging event data into an event packet has the benefit of adding data that may be

useful in processing the event.” Ex.1005,12:3-10. Lawson’s event packet is shown below:

Event Producer	Server	Type of Event	Time of Event	Size of Event Data	Event Data
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106. Lawson explains that “the event producer field is an identifier that identifies the process, device, user, etc., which generated the event,” “[t]he server field identifies the server location where the event was produced,” “[t]he type of event field is an identifier describing the type of event which occurred,” “[t]his [event type] identifier preferably identifies an event in the global event registry and/or local event registry so that appropriate servers or event consumers can be identified to receive the event,” and “[t]he event data is the data associated with the event.” Ex.1005, 12:12-26. The “event data” in Lawson can be any data or records, such as employee’s name, phone number, address, payroll data, program function call, computer program code, etc. Ex.1005, 6:4-15, 7:23-51, 21:15-26, 24:1-4.

107. Tsutsumitake also discloses providing data representations that include at least one live object to client devices in the form of HTML webpages with embedded event data. Tsutsumitake discloses “a real-time information transmission system for transmitting information in real time from a server to a client via a network.” Ex.1006, 3:39-41. As shown in Fig. 1, “A [web]page request receiving unit 102 [on server 10] receives a [web]page request sent from the client 11 via the network

interface 101, analyzes it, and informs a [web]page transmission unit 103 of a [web]page to be sent to the client 11.” The “page transmission unit 103 transmits an HTML file stored in the server 10 to the network 12 via the network interface 101 [to client 11]” and “[i]nformation to be transmitted is not limited to the HTML file (100) [webpage], and may be freely chosen one such as image or voice.” Ex.1006, 8:39-49; *see also* 3:39-56.

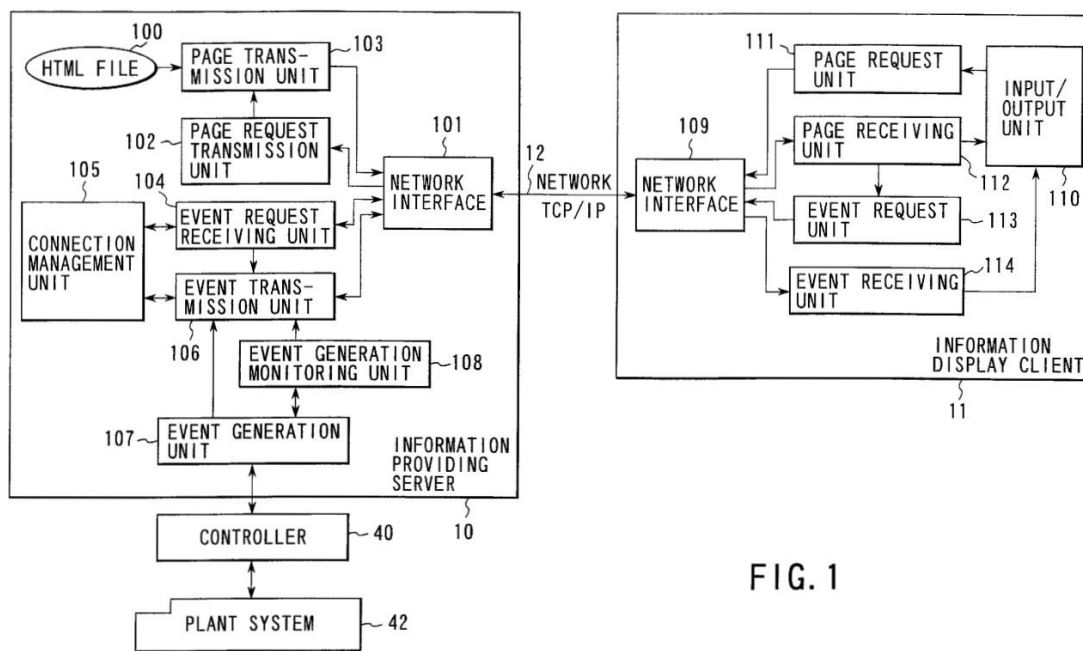


FIG. 1

b

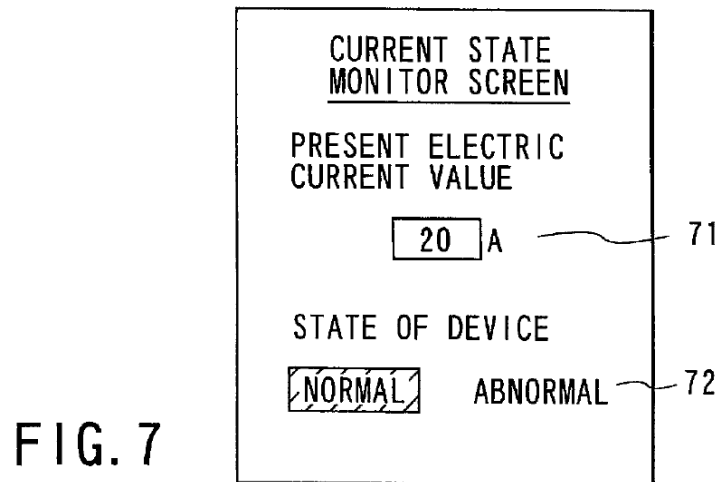
108. Fig. 2 of Tsutsumitake shows an example of the webpage data, including an embedded event, sent by server 10 to client 11.

```
< HTML >
< HEAD >
< TITLE > SAMPLE PAGE < /TITLE >
< /HEAD >
< BODY >
< H1 > SAMPLE PAGE < /H1 >
THIS PAGE INCLUDES EVENT REQUEST
< EMBED >
  < EVENT URL=http://abc.def/hij.evt >
< /EMBED >
< /BODY >
< /HTML >
```

FIG. 2

109. An “event request to the server is included in the [web]page. The event request is expressed by an attribute ‘URL’ in a tag ‘EVENT’ in a tag ‘EMBED’.” Ex.1006, 10:20-23. The client 11 recognizes the webpage as containing a “live object” because upon receiving the webpage, “the page receiving unit 112 [in client 11] informs an event request unit 113 of the URL of the event request.” Ex.1006, 9:61-68. *See also* 14:3-29, Fig. 8.

110. An example live object is shown below in FIG. 7 of Tsutsumitake.



111. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

c. [14.2], [20.2], [26.2], [32.2]: Causing client to respond by determining object ID and registering

Claim	Limitations
[14.2]	causing the client device to respond to the live object of the data representation by determining an object identifier (ID) of the live object and to register for updates of the live object with the routing network, such that registering the client device with the routing network provides client connection information to a node in the routing network; and
[20.2]	that causes the client device to determine an object identifier (ID) of the live object to register for updates of the live object with the routing network, such that registering the client device with the routing network provides client connection information to the routing network,

[26.2]	that causes the client device to respond to the live object by determining an object identifier (ID) of the live object to register for updates of the live object with the routing network, such that registering the client device with the routing network provides client connection information to the routing network; and
[32.2]	wherein the client device is configured to respond to the live object of the data representation by determining an object identifier (ID) of the live object to register for updates of the live object with the routing network, such that registering the client device with the routing network provides client connection information to the routing network; and

112. Lawson discloses causing the client device (event consumer) to respond to the live object of the data representation (records/data) by determining an object identifier (ID) (event type) of the live object and to register for updates of the live object (event consumer registers for events) with the routing network (network of servers implementing event globalization process), such that registering the client device with the routing network provides client connection information to a node in the routing network (updating a server's local event registry to identify event consumer).

113. In Lawson, the update message has an object identifier. Lawson has an event type field in its event packet, as shown here. Ex.1005, 12:5-10:

Event Producer	Server	Type of Event	Time of Event	Size of Event Data	Event Data
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114. This is further described elsewhere in Lawson, for example, “This entry will include the event identifier of the new event.” Ex.1005, 16:47-48. The event type identifier serves as the equivalent of the 722 patent’s object identifier.

115. Likewise, in Lawson event field in the event packet “identifies an event in the global event registry and/or local event registry so that appropriate servers or event consumers can be identified to receive the event.” Ex.1005, 12:15-20. “The type of event field is used to extract from the global event registry, either directly or indirectly, those servers that should receive notification of the event and is used to extract from the local event registry, either directly or indirectly, those local event consumers that should receive notification of the event.” Ex.1005, 12:28-34.

116. This, Lawson’s “event type” corresponds to the ’722 Patent’s “object identifier (ID) of the live object” because the ’722 Patent explains an “objectID [] is preferably a string. The string can encode any information ... [and can be] a simple textual and/or numeric identifier. Ex.1001, 8:34-37, 8:63-9:2, 14:14-22.

117. Lawson also discloses that event consumers register for events. “[w]hen an event consumer receives notification that a certain event happened on an event producer, the event consumer can take appropriate action” and that “event consumers which desire to receive notification of certain events ‘register’ with the event

producing system.” Ex. 1005, 1:61-63, 2:6-9. Lawson discloses that “[w]hen an event consumer needs to register for a new event...the event consumer can send a ‘register for event’ packet...to the event globalization process on the local server.” Created events are stored in the “global registry” and when “an event consumer registers for an event, the event globalization process will place an entry in the local event registry” at the servers “identifying the event and the event consumer wishing to receive notification of the event.” Ex.1005, 15:41-56.

118. For example, “the employee phone book database could register for notification of ‘a modified object’ type event.” Ex.1005, 21:20-21. As another example, “a payroll database [could] also register[] for the add user event so that information can be extracted to update the employee payroll database.” Ex.1005, 24:1-4.

119. Lawson’s “registry compris[es] a list of local event consumers and associated list of event types [] identify which local event consumers are registered for events of the type included in [the] event packet.” Ex.1005, 27:61-64 (claim 19). Ex.1005, 12:34-37, 21:15-26, 24:1-4.

120. Lawson as modified by Tsutsumitake further provides for causing a client device to respond to a live object to determine the ID and register for updates. Tsutsumitake discloses “[t]he page receiving unit 112 [on the client 11] analyzes the content of the [web]page sent from the server 10 (step A6) to determine whether an

event request is included in the page (step A7).” Ex.1006, 10:56-59. If “the event request is included, the page receiving unit 112 informs the event request unit 113 of the URL of the event and causes the event request unit 113 to send the event request to the server 10 (step A8).” Ex.1006, 10:64-67, Figs. 1, 3.

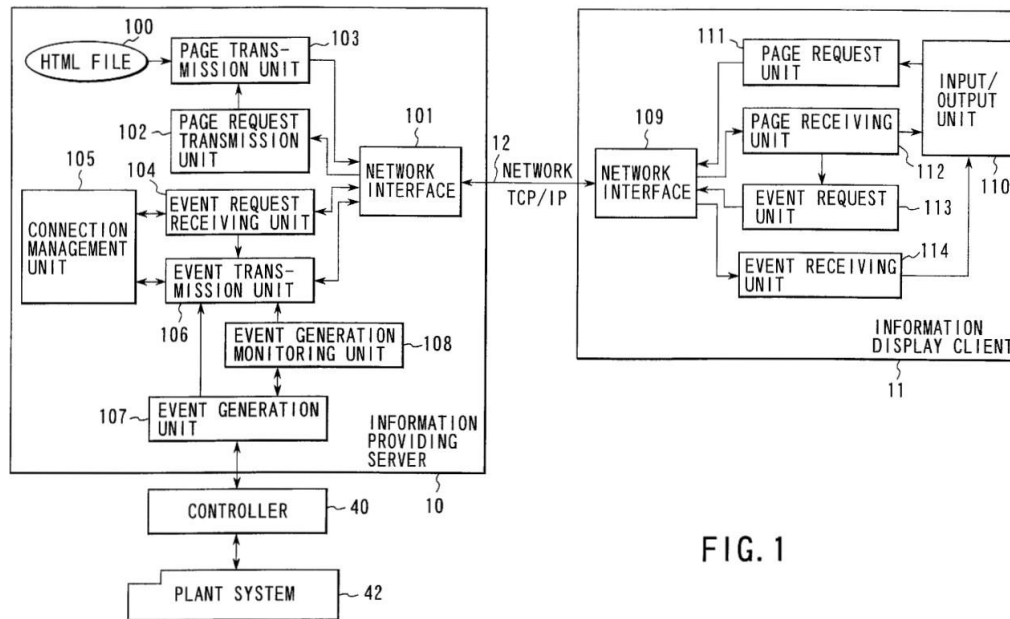


FIG. 1

121. This causes the client to register for updates because “[i]n this structure, the client [11], which received the requested [web]page information from the server, can automatically issue the event request to the server according to the event request information set in the [web]page information, and can activate the event notification,” and “[s]pecifically, by associating the [web]page information with the event, the [web]page information opened on the client side can be dynamically changed according to the event notification sent from the server.” Ex.1006, 4:22-29; see also 1:7-43, 7:63-8:23, 9:43-68, 13:32-14:3, Fig. 7.

122. At the server 10, “[i]f they are not registered, a pair of the...event ID...and...client ID...are registered in the connection management unit 105 (step B11).” Ex.1006, 11:45-55, Figs. 1, 4.

123. These steps in Tsutsumitake are shown in figure 4:

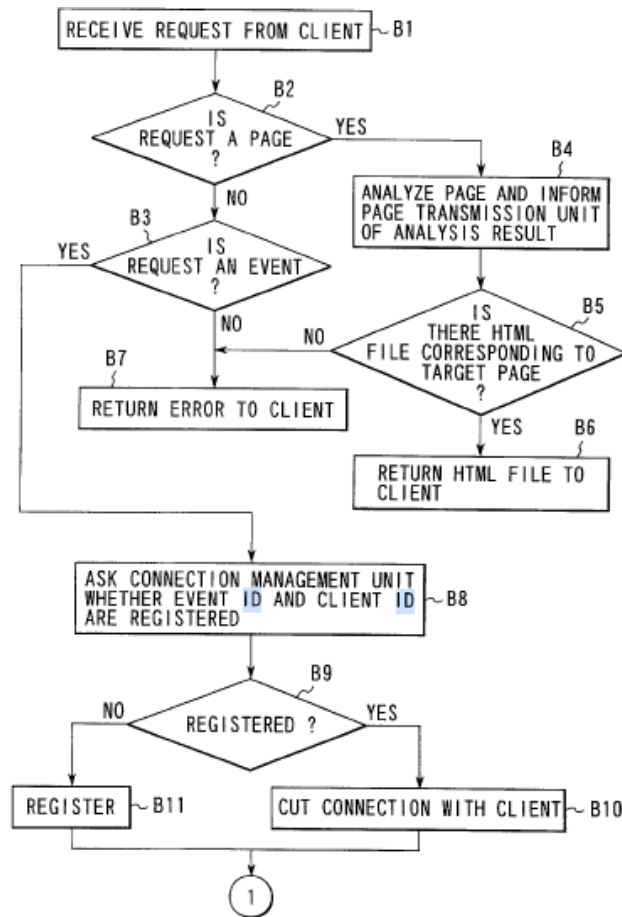
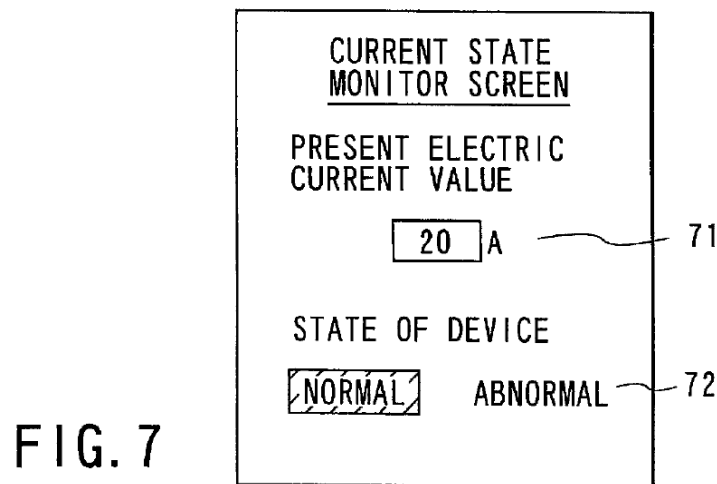


FIG. 4

124. An example updating live object is shown in FIG. 7 of Tsutsumitake as an updating current value and a device state. Ex.1006, 13:46-57.



125. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

d. [1.1], [7.1], [14.3], [20.3], [26.3], [32.3]: Receive/send update message from input source

Claim	Limitations
[1.1]	receiving, using a processing device, an update message from an input source, the update message identifying a live object and containing data for updating a property of the live object;
[7.1]	a gateway device configured to: receive an update message from an input source, the update message identifying a live object and containing data for updating a property of the live object,
[14.3]	sending, using the processing device of the input source, an update message to the routing network, wherein the update

	message identifies the live object and contains update data that updates a property of the live object,
[20.3]	wherein the input source device is configured to route an update message to the routing network, wherein the update message identifies the live object and contains update data for updating a property of the live object,
[26.3]	sending, using the processing device of the input source, an update message to the routing network, wherein the update message identifies the live object and contains update data for updating a property of the live object,
[32.3]	instructions for providing, using a processing device of an input source, different from the client device, an update message to the routing network, wherein the update message identifies the live object and contains update data for updating a property of the live object,

126. Lawson discloses sending by an input source, and receiving from an input source, using a processing device, an update message from an input source (receiving event from event producer), the update message identifying a live object and containing data for updating a property of the live object (the event having updated records/data for the event consumer). Lawson discloses sending, using the processing device of the input source (event producer), an update message (event) to the routing network (network of servers implementing event globalization process), wherein the update message identifies the live object (contains field “event

type”) and contains update data (updated event data) that updates a property of the live object (updates records/data at the event consumer/client).

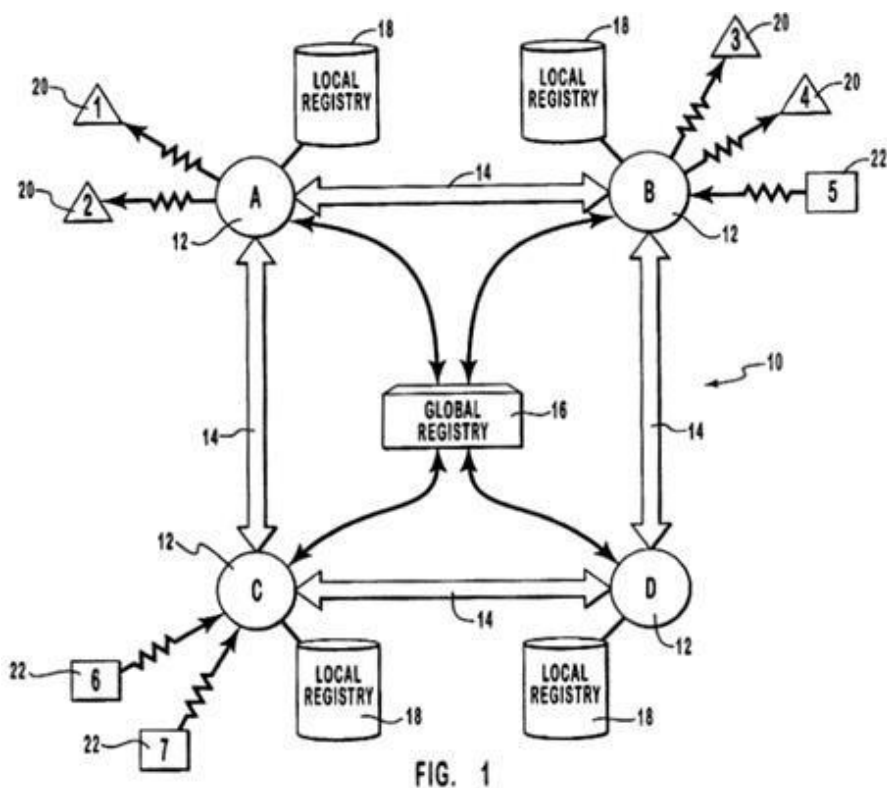
127. In particular, Lawson discloses an event packet. Ex.1005, 11:56-59, 12:3-6. Lawson describes event producers and consumers as follows “in Fig. 1, event consumers are illustrated by the triangular regions 20 and are numbered 1-4. Event producers are identified by rectangular regions 22 and are labeled 5-7. Event producer and event consumer are meant to be generic terms that are interpreted broadly. ***Event producer will be used to refer to a process, user, device, or other item that produces or generates an event. An event consumer should be broadly interpreted to refer to any process, user, device, or other item that desires notification of an event.*** As used throughout this application, event notification will refer to not only notification of an event but also distribution of information associated with that event. The details of how event information is distributed in conjunction with notification is described in greater detail below.” Ex.1005, 9:1-15 (emphasis added).

128. With respect to Claim 7, Lawson discloses a gateway device “Referring now to FIG.2 another network view of one embodiment of the present invention is presented. In FIG.2, two separate networks are shown generally as 24 and 26. Network 24 comprises servers 28, labeled A, B., and C. Network 26 comprises servers 30, labeled D and E. Networks 24 and 26 are interconnected by a gateway

32.” Ex.1005, 9:15-21. Lawson’s disclosure of a gateway device is further described below with respect to claim elements [1.2], [7.2], [14.4], [20.4], [26.4], and [32.4].

129. To the extent it is asserted the claimed “gateway” must be a device separate from the claimed “node,” Choquier would have rendered this obvious. Choquier discloses using an Arbiter microcomputer 128 and gateways 126, 130 that are separate devices from its servers 120, although Choquier specifies Arbiter functionality can be implemented in other devices, like the servers. Ex.1007, 23:9-19.

130. Lawson’s routing network and event packet are again shown below:



Event Producer	Server	Type of Event	Time of Event	Size of Event Data	Event Data
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131. A POSITA would recognize that the producer and consumer can be devices. Furthermore, a POSITA would understand that a process runs on a device. A POSITA would further understand that data or records in the *event packet* of Lawson corresponds to the *live object* of the '722. POSITA also would understand Lawson's *event packet* contains data for updating the *live object* of the '722 at the client.

132. In Lawson, event consumer clients receive notification of events. Ex.1005, 1:61-63, 2:6-8. Lawson further describes a client processing device receiving an event notification "A process running on each of the user computers would then receive the notification and in response run a virus scan program" Ex.1005, 6:13-15. A POSITA would readily understand that a computer is a processing device. Furthermore, Lawson's event determining what action to take is an update message. The event updates the status of the live object, in this case the status of the virus scanner is updated to running.

133. Lawson further discloses a processing device receiving an update message: "For the purposes of the present invention, all that is important is that all servers be able to access a list of servers that should receive an event that occurs" Ex.1005, 8:56-58. A POSITA would understand that a server is a processing device. Figure 4 of Lawson depicts the process:

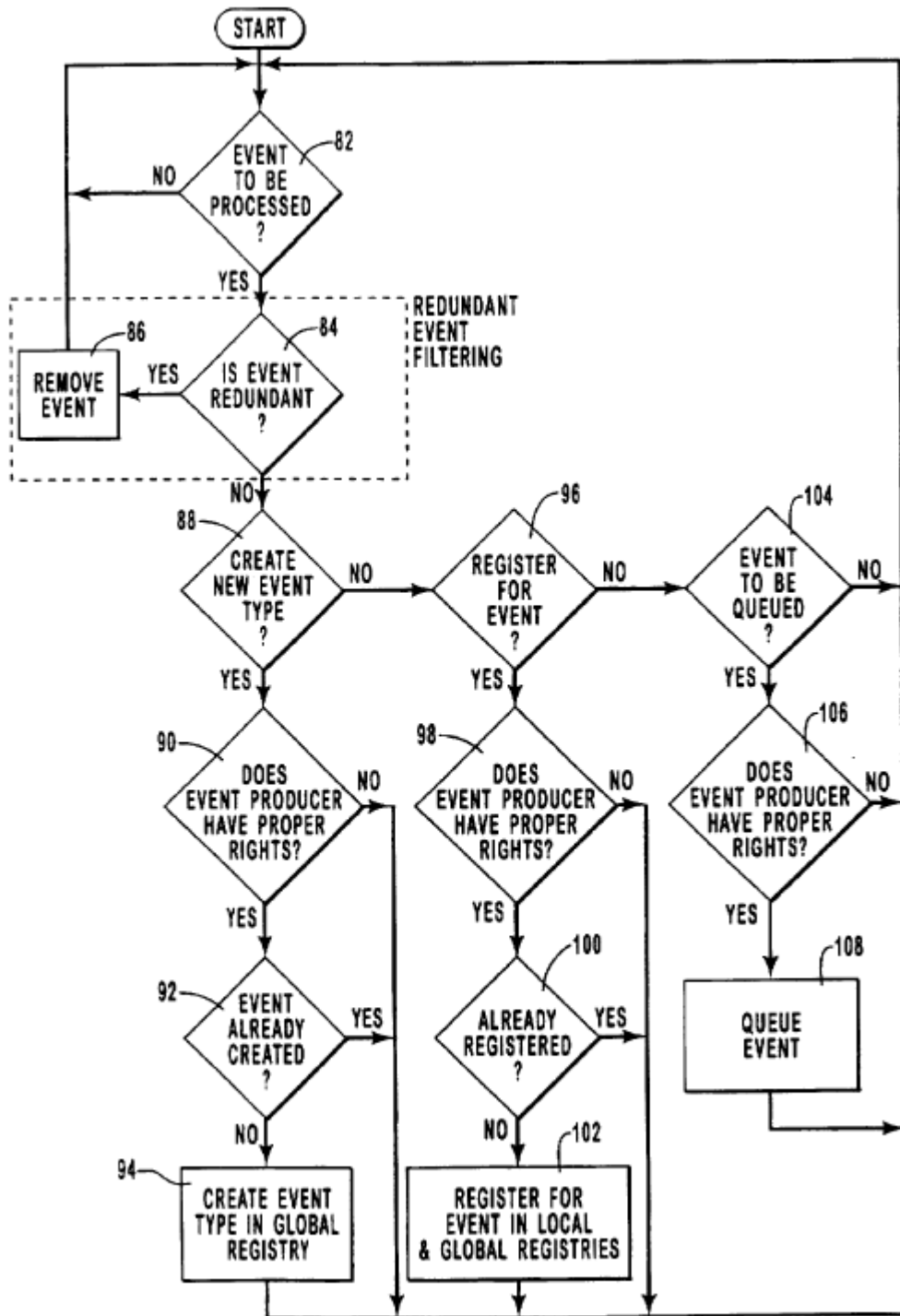


FIG. 4

134. Figure 4 depicts clients registering for events, processing devices processing an update from an input device, and the update message being used to update the

properties of a live object. Figure 5 depicts a flow diagram of the details of one embodiment of the remote event processing block of Figure 3 for sending events containing updated data via Lawson's network of servers implementing event globalization process so the events will reach the event consumers. The process for transferring the events to the event consumers is discussed further below in connection with Figure 6.

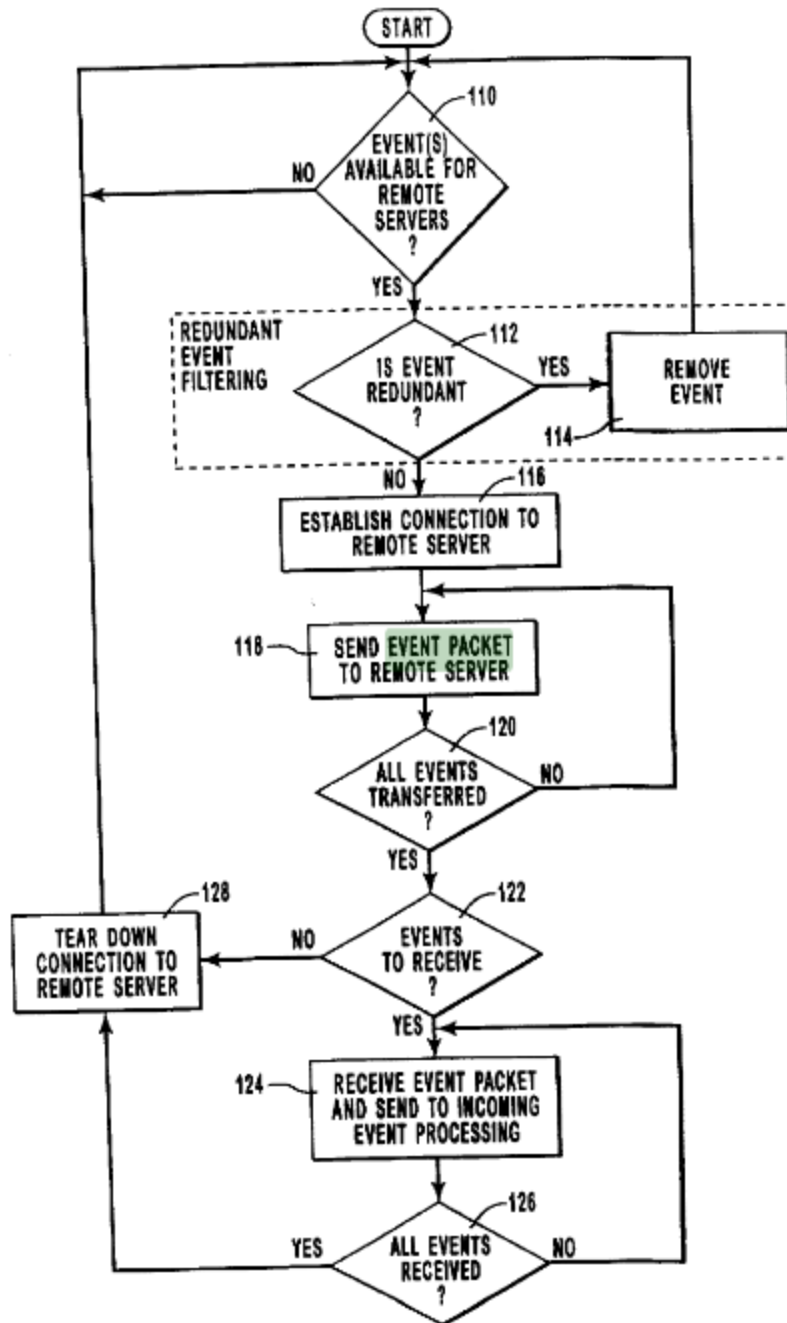
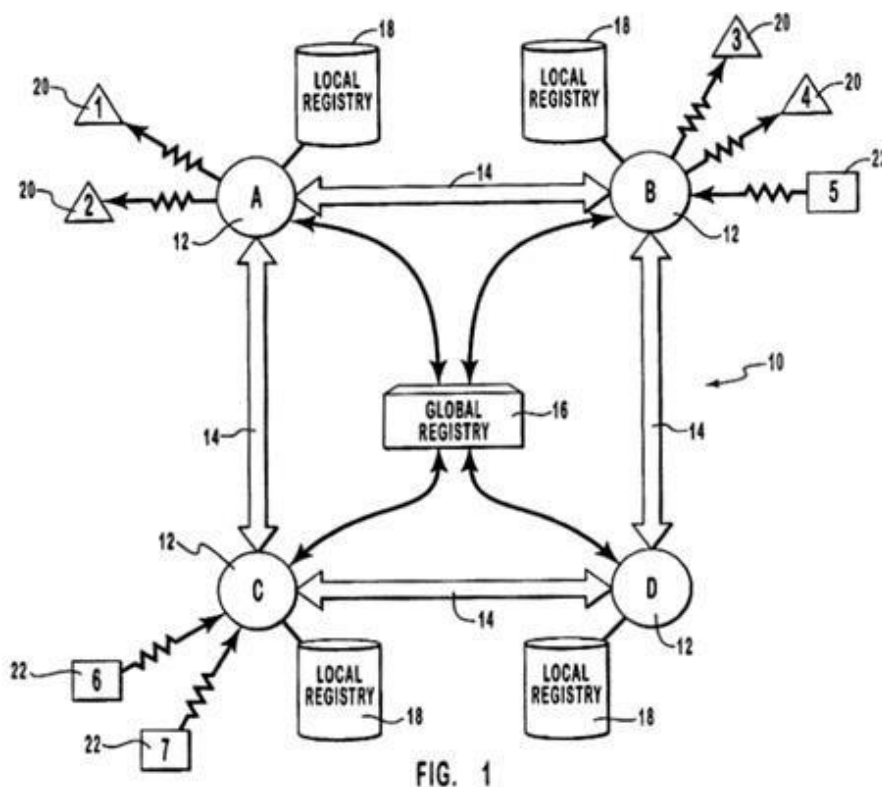


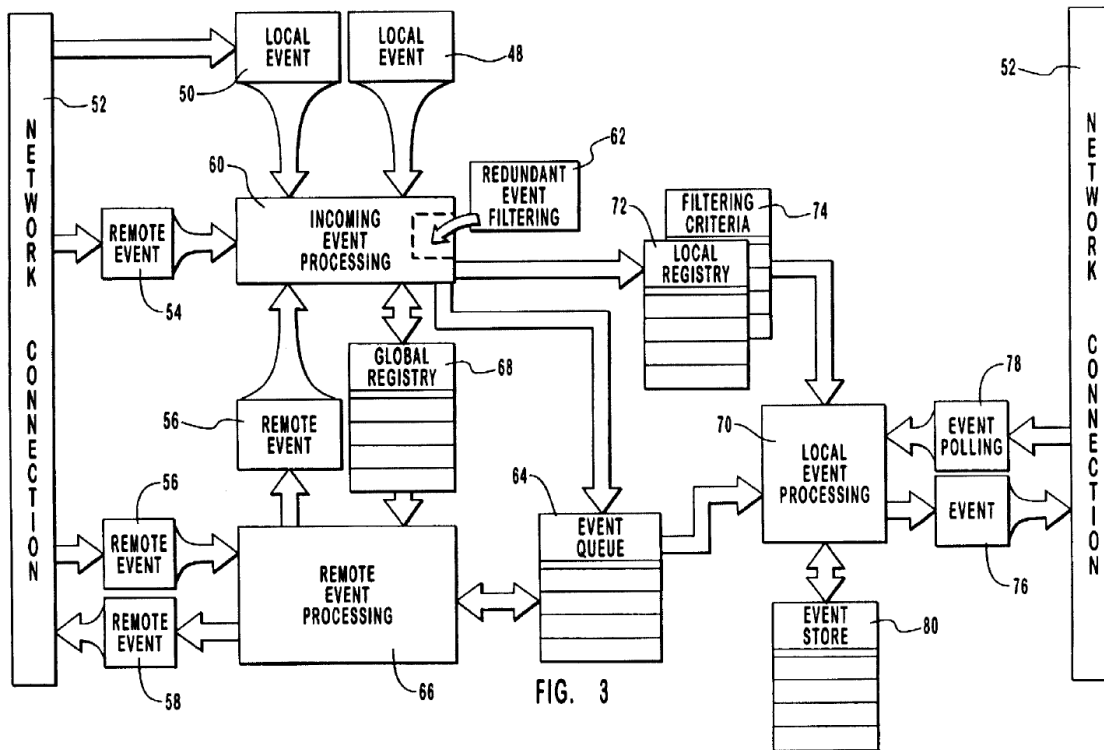
FIG. 5

135. In Lawson, event producers 22 “notif[y] event consumers of events.” Ex.1005, 2:4-5. Lawson provides an example in which “event producer 5 [at server B] added a new user to a database stored on the network” and “that event consumer

4 [at server B] is a company phone directory that has registered to receive an ‘add user’ [or ‘modified object’] event so that it can extract the phone number of the added user and place [or update] it in the company phone book. Further, assume that event consumer 1 [at server A] is a payroll database that has also registered for the add user event so that information can be extracted to update the employee payroll database.” Ex.1005, 21:16-26, 23:60-24:4. “After the user has been added to the database, step 156 indicates that an event packet is created [by event producer 5 at server B].” Ex.1005, 24:7-9.

136. Lawson’s servers include a “remote event processing block 66” that acts as a gateway. See FIGS. 1 and 3:





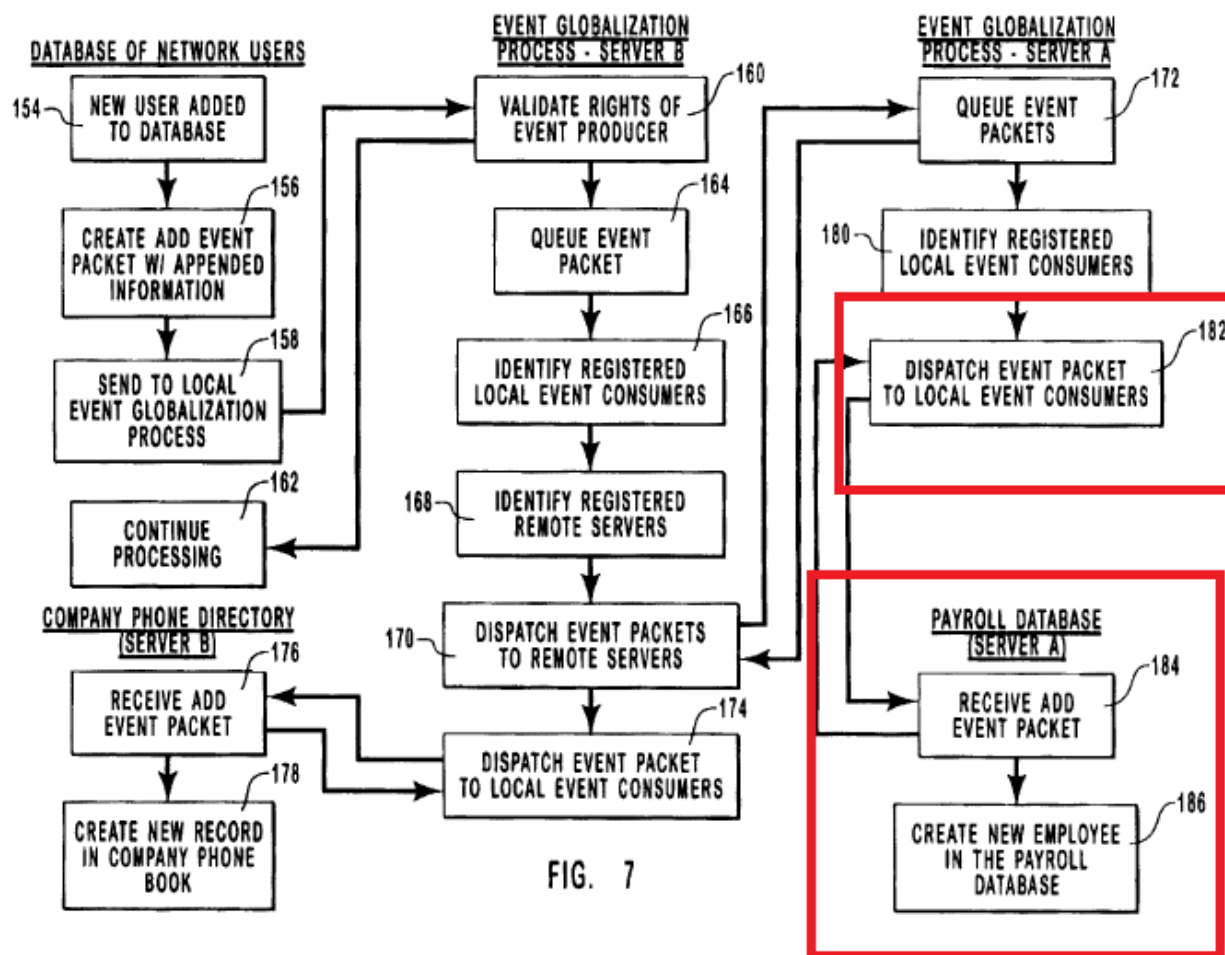
137. The server that receives the event/update from a consumer (e.g., if server C receives an event/update from event producer 6 or 7 shown in FIG. 1), places the incoming event/update into an event queue 64 for dispatch by the remote event processing block 66 to other servers that need the event, thus acting as a gateway between its event consumer (input source) (e.g., event consumer 6 or 7) and the other servers (nodes) (e.g., servers A, B, D) in Lawson's routing network. Ex.1005, 12:54-58.

138. Lawson's event packets include data identifying and for updating live objects. Among other things, an "event type" identifying the "appropriate servers or event

consumers [] to receive the event” and “event data” comprising any information, data, or records “associated with the event.” Ex.1005, 12:7-10, 12:17-20, 12:25-26.

139. Tsutsumitake similarly discloses “[i]f an event has occurred, the server 10 sends it to the client 11 with use of [a] connection ID. Subsequently, as shown in Fig. 6, each time an event has occurred, it is sent [to client 11] repeatedly with use of the [connection] ID.” Ex.1006, 13:1- 5; see also 12:10-15, Figs. 1, 5. The example of Fig. 7 discloses “the event indicat[es] the present value of current and...the state of the device being transmitted in real time.” Ex.1006, 13:59-66.

140. Yet another example of this claim limitation in Lawson is the payroll example. “returning now to step 172 for the event globalization process on Server A, after the events have been received from server B, server A proceeds to identify the registered local event consumers for this event. This is indicated in FIG. 7 by step 180. Again, the registered local event consumers are identified by checking the local event registry on server A. In this example, the only registered local event consumer on server A is event consumer 1. In step 182, the event globalization process of server A transfers the event packet to the local event consumer which, in this case, is the payroll database process. The payroll database process receives the information as indicated by step 184 and proceeds to create a new entry in the employee payroll database as indicated by step 186” Ex.1005, 25: 8-20. Figure 7 from Lawson with the parts identified in the preceding excerpt from Lawson, is shown here:



141. Another example where this is disclosed in Lawson is as follows:

“Furthermore, filtering can be performed –on any of the information available from a particular event. The available information for an event includes not only the information available in the event data itself, but also in the event packet, such as the event packet previously described.” Ex.1005, 20:25-30. This excerpt is in reference to the decision block 136 of figure 6. Figure 6 of Lawson is shown here, with that decision block highlighted:

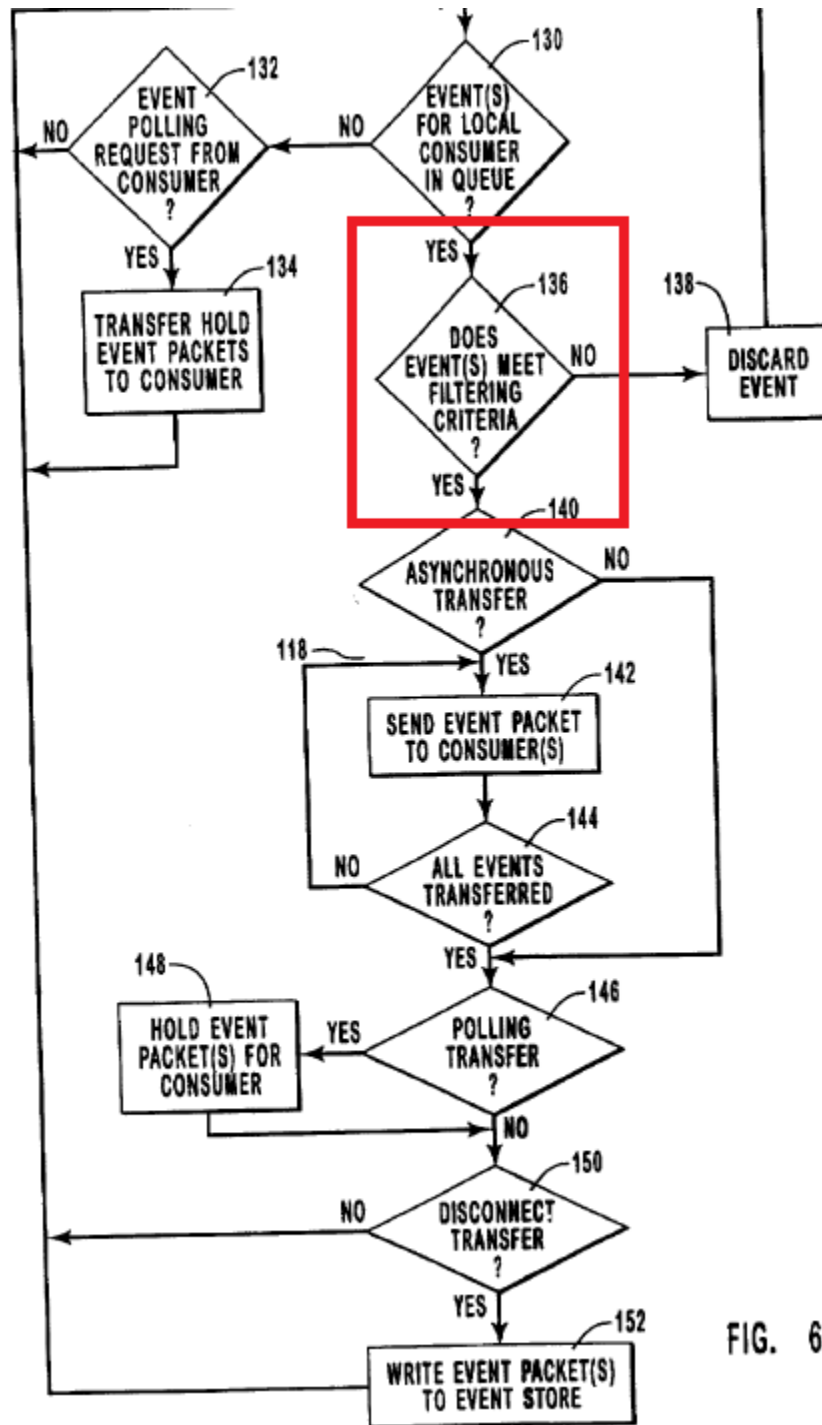


FIG. 6

142. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

e. [1.2], [7.2], [14.4], [20.4], [26.4], [32.4]: Gateway identifies a category of update message and determining node having node type

Claim	Limitations
[1.2]	identifying a category of the update message based on the input source; determining a node having a node type to which the update message is to be routed based on a mapping of categories of update messages to node types, the mapping controlling an amount of update message traffic through nodes of a routing network;
[7.2]	identify a category of the update message based on the input source; determine a node having a node type to which the update message is to be routed based on a mapping of a categories of update messages to node types, the mapping controlling an amount of update message traffic through nodes of a routing network; and
[14.4]	wherein a gateway device at the routing network is configured to identify a category of the update message based on the input source, to determine a node type to which the identified category maps,
[20.4]	wherein a gateway device at the network is configured to identify a category of the update message based on the input source, to determine a node type to which the identified category maps, and

[26.4]	wherein a gateway device at the routing network is configured to identify a category of the update message based on the input source, to determine a node type to which the identified category maps, and
[32.4]	wherein a gateway device at the routing network is configured to identify a category of the update message based on the input source, to determine a node type to which the identified category maps, and

143. Lawson discloses a gateway device (remote event processing block) and identifying the category of the update message based on the input source (identify servers to receive events by filtering, e.g., based on the event packet's data, such as based on the event producer or server field of the event packet). Lawson also discloses determining a node type to which the identified category maps, and to which the message is to be routed based on the mapping of categories of update messages to node types. Lawson also discloses that the mapping controls an amount of update message traffic through nodes of a routing network, as recited in Claims 1 and 7.

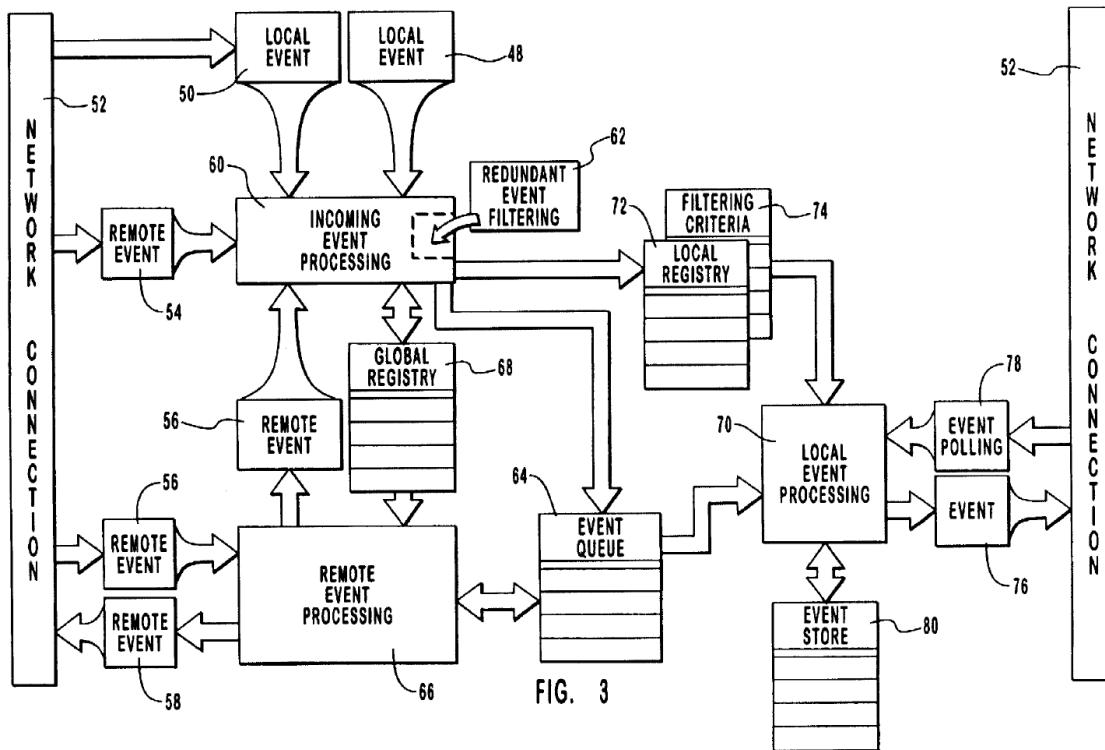
144. As shown above, Each independent claim recites identifying (by a gateway device) a category of the update message based on the input source and a mapping of a node type to the message category. As recited in the claims, this mapping is used to determine a node to route the update message to.

145. Lawson discloses categorizing messages based on input source. Lawson discloses event/object filtering on “any...pieces of information” so that event consumers registering for events can “prevent notifications of irrelevant events,” i.e., events they do not want to receive. Ex.1005, 5:26-30. Lawson’s filtering can be used so that “notification of events affecting a certain class of objects or category of objects is sent.” Ex.1005, 5:45-48. Filtering “can be performed on any of the information available from a particular event” to specify which events should be provided, and that filtering can be based on any data “in the event packet,” which includes data such as event type, *event producer*, server, etc.:

Event Producer	Server	Type of Event	Time of Event	Size of Event Data	Event Data
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20:10-13; *see also* 5:26-65, 16:63-17:6, 17:67-18:3, 22:9-11, Fig. 5.

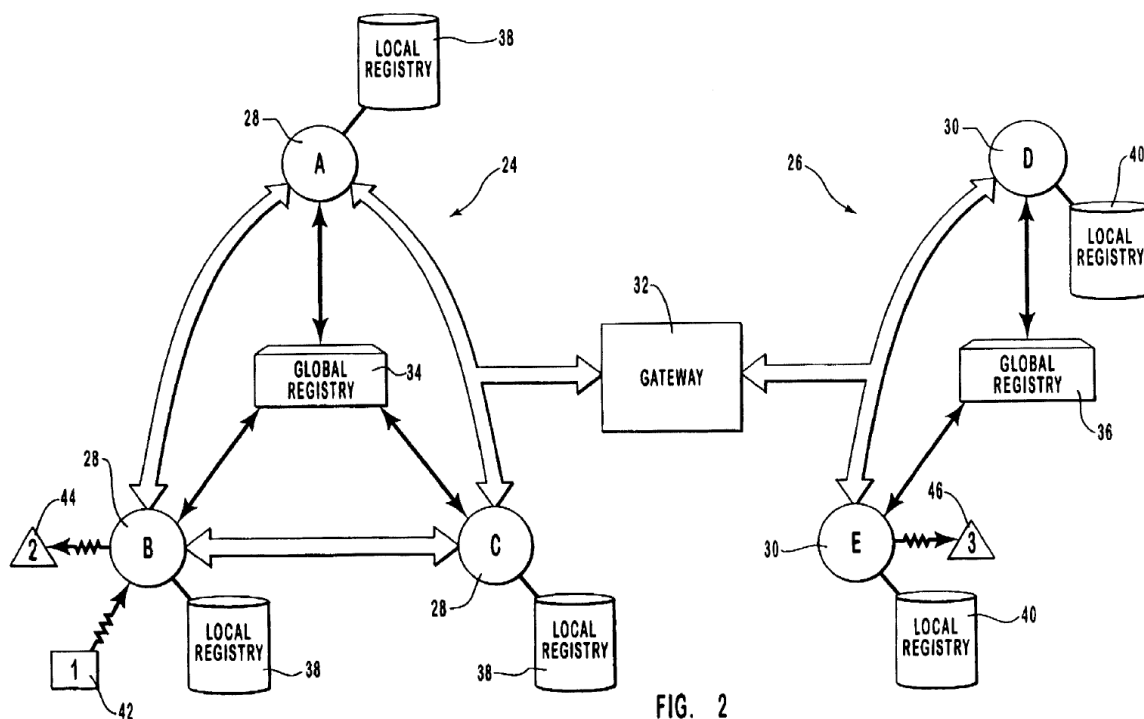
146. As described above, Lawson’s servers include a “remote event processing block 66” on servers that acts as a gateway. See FIG. 3:



147. The remote event processing block 66 “monitors event queue 64 and when events are placed therein...that need to be transferred to other servers in the network, remote event processing block 66 will establish a connection to those servers and transfer the events to the other server.” Ex.1005, 13:10-17.

148. In Lawson, to determine which servers (nodes) should receive events (updates), entries are placed in the “global event registry” so that “the global event registry is updated to contain an entry identifying the server where the event consumer is located and the desired event.” Ex.1005, 4:54-65, 7:52-8:4. An “event is only transferred to said another of said plurality of servers if said event meets designated filtering criteria,” (e.g., filtered for specific event producers). Ex.1005,

4:45-48, 30:25-30. Remote event processing block 66 “identifies the servers that should receive events queued in event queue 64 by checking global registry 68.” 13:12-24; see also 12:12-20, 12:29-34.



149. Lawson provides an example, referring to Fig. 2, in which “[w]hen server B recognized that event producer 42 had initiated an event, server B would check global event registry 34,” which “would identify that server E needed notification of the event,” and “[s]erver B would then send the event through gateway 32 to server E.” 10:23-28. In this example, server B acts as the gateway, as server B receives the initial event from event producer 42, and server B checks the mapping provided by the global event registry to determine which nodes (servers) need the event (update) based on the message category (filtering).

150. As such, Lawson determines the appropriate node to send the received event to “If the event producer (i.e., the local event consumer that is attempting to register for the event) has the appropriate rights, then the next step is to check and see if the event consumer has already registered for this event. This is performed by decision block 100. If the consumer is already registered for the designated event, execution returns to the start. If the event consumer has not already registered for the event, then entries are made into the local and global event registries in order to achieve registration for this event by the event consumer.” Ex.1005, 16: 35-44. The entire process is shown in figure 4:

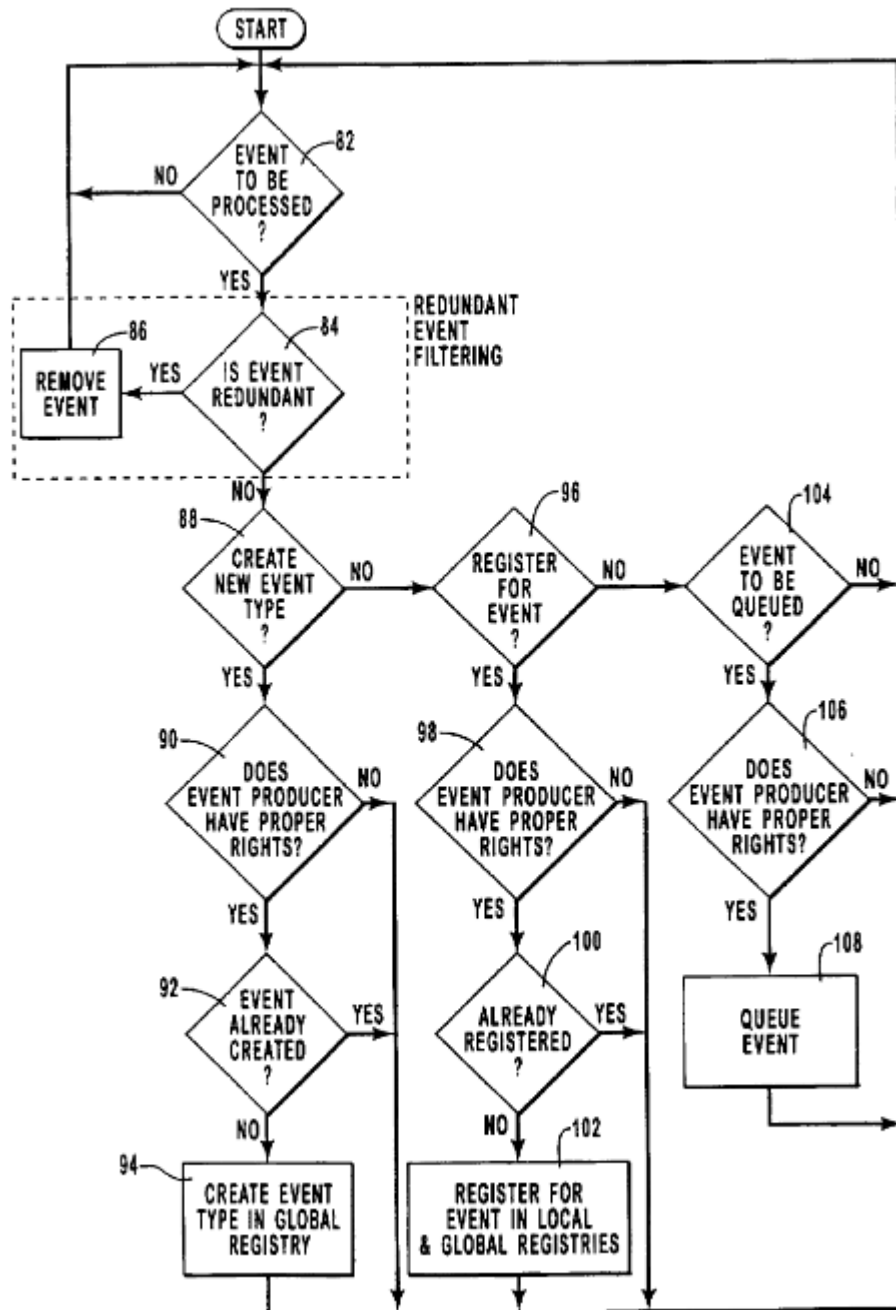


FIG. 4

151. The decision block determines if the consumer is the right node type: a node that has both registered for this event and has the appropriate permissions. If it is the right node type, then the update message is routed.

152. As already described, Lawson discloses a routing network. Lawson specifically describes this as a routing network “In this way, local events can be routed to any event consumer in the network without the need to register at each server” Ex.1005, 5:11-12.

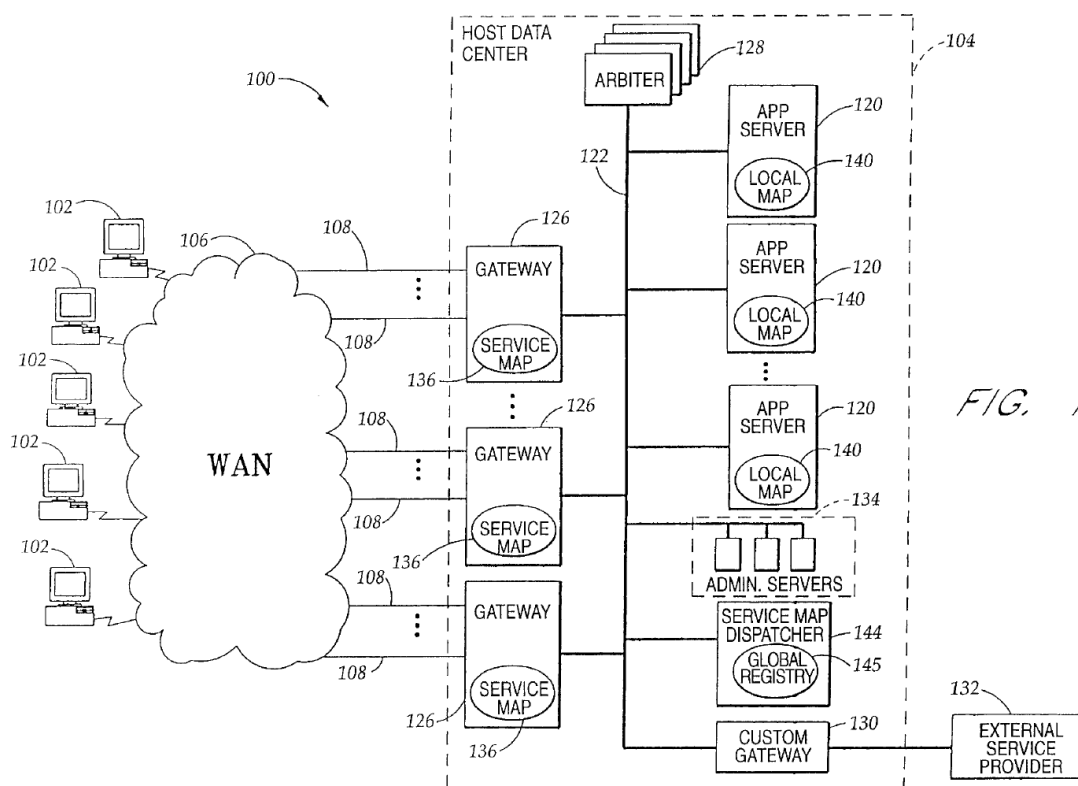
153. Lawson further discloses that this mapping provided by the global registry is for “controlling...message traffic” as recited in claims 1 and 7 of the ’722 Patent. Lawson’s example above regarding Fig. 2 specifies that the “event notification was transferred from server B to server E without broadcasting the event to servers A, C and D,” and “[t]hus, such a method can globalize an event to required locations while, simultaneously, *reducing message traffic* due to broadcast type events.” Ex.1005, 10:43-47 (emphasis added); *see also* 22:62-63.

154. The claimed mapping of message categories to node types is thus disclosed or suggested by Lawson. As described above, messages in Lawson’s routing network can be categorized based on input source using filtering by event producer. Further, each of the nodes in Lawson’s network can be considered different node types (types A, B, C, D, etc.) and the global registry is used to map message categories to node types.

155. To the extent it is asserted that Lawson does not explicitly disclose “node types” it would be obvious to include “node types” in Lawson either based on Choquier. As described above, Lawson discloses that servers in its network can

service application-specific events, such as “a payroll database” and “a company phone directory.” Ex.1005, 23:64-24:1.

156. As described above in §III.D., Choquier discloses assigning servers to server groups (node types) based on messages concerning “a specific topic or set of topics” using service maps. Ex.1007, 10:17-20, see also 2:1-4, 2:14-18, 6:8-31, 9:40-49, 11:44-47.



157. When an “update transaction” is received, such as from “an external data provider connected to the host data center 104 by the Internet,” an Arbitrator corresponding to a service type associated with the “update transaction” stores in a log information such as a transaction ID and an originator of the update, and then

disseminates the update to servers in the server group (servers of a particular server type) according to the service map. Ex.1007, 9:50-65, 21:33-53, 22:34-45. It would have been obvious based on the combination of Lawson and Choquier for Lawson's servers to be included in server groups to provide for server groups/clusters (e.g., providing servers groups at each of servers A, B, C, D in Lawson) assigned according to "topic" or set of "topics" (message category of "event producer" based on Lawson's filtering) as disclosed in Choquier, and for Lawson's servers to determine which server groups (node types) should receive an event update based on this server groups to event producer mapping.

158. As I described above, a POSITA would have been motivated to include server groups/clustering in Lawson's system, as it was well-known to do so to increase efficiency, redundancy, and scalability of Lawson's routing network.

159. Furthermore, a POSITA would understand that a node is simply a device connected to a network (Section III.G.1) and traffic on a network must be routed (Section III.G.2).

160. For at least these reasons, Lawson as combined with Tsutsumitake and or Choquier renders these elements obvious.

f. [1.3], [7.3], [14.5], [20.5], [26.5], [32.5]: Gateway routes the update message to the node having the node type

Claim	Limitations
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[1.3]	routing, using the processing device, the update message to the node having the determined node type;
[7.3]	route the update message; and the node configured to: receive the update message from the gateway device, wherein the node is configured to be mapped to the node type,
[14.5]	and to route the update message to the node, having the node type, at the routing network,
[20.5]	to route the update message to a node of the node type at the routing network,
[26.5]	to route the update message to a node of the node type at the routing network,
[32.5]	to route the update message to a node of the node type at the routing network,

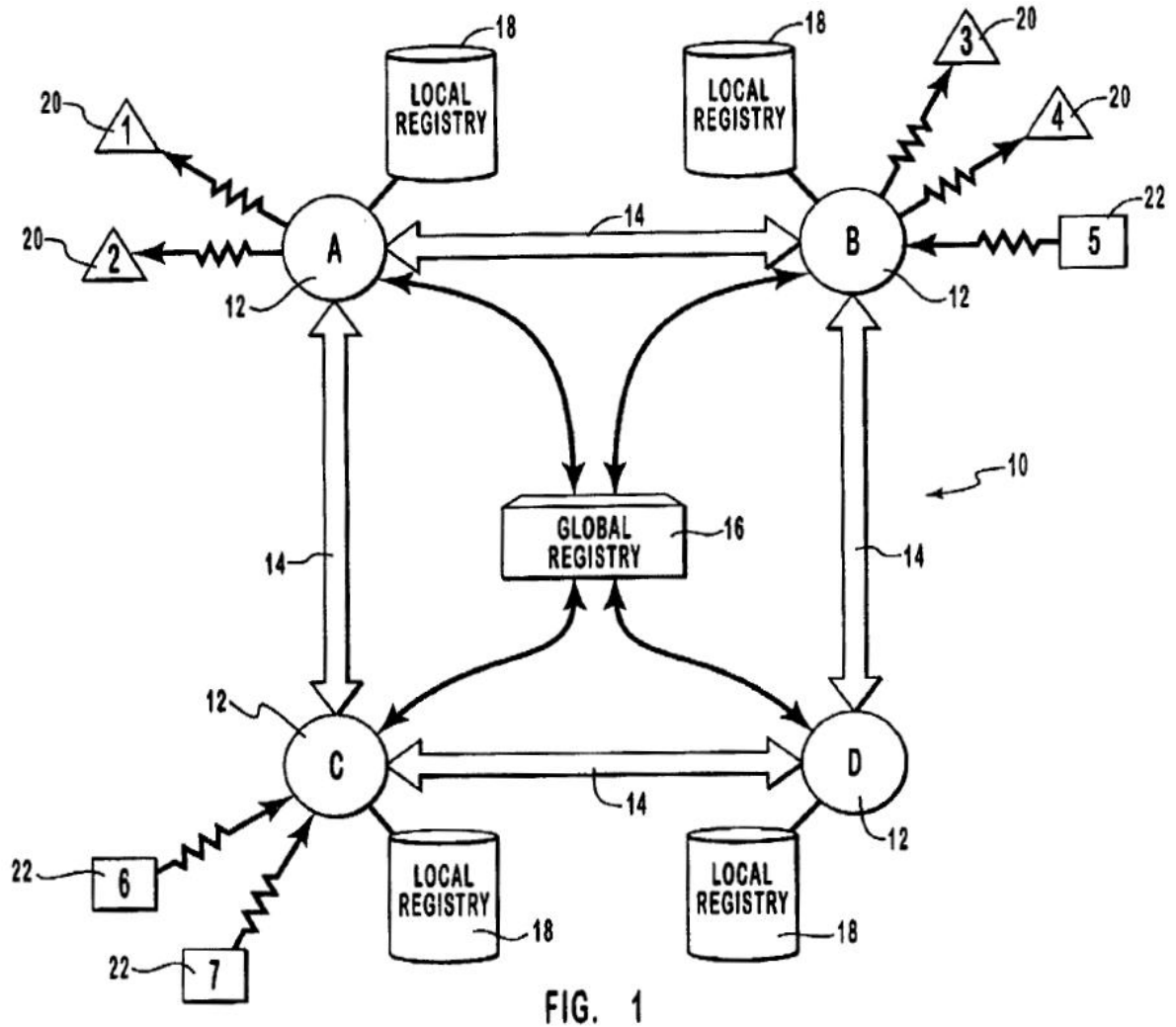
161. As was discussed above, the remote event processing block of Lawson determines if the node is the determined node type (i.e., both registered for the event and having appropriate permissions) and if so, routes the message to the node. The routing of the event to the determined node type is disclosed in multiple parts of Lawson.

162. As described above, Lawson's "remote event processing block 66 monitors event queue 64," based on the "global event registry to identify which servers should receive which events" determines "events...that need to be transferred to other servers in the network, and "establish[es] a connection to those servers and

transfer[es] the events to the other server. Ex.1005, 13:12-24; see also 12:12-20, 12:29-34.

163. As one example of routing using the processing device in Lawson is the following: “These corresponding event globalization processes, in ram, check their local event registries and provide the event to any event consumers identified therein. In this way, local events can be routed to any event consumer in the network without the need to register at each server.” Ex.1005, 5:7-12.

164. Another example of routing using the processing device in Lawson is the following: “Referring now to Fig1. A network view of one embodiment of the present invention is presented. In Fig. 1a computer network is generally shown as 10.” Ex.1005, 7:52-54. Figure 1 of Lawson is shown here:



165. Furthermore, a POSITA would understand that the decision block is executed on a processing device.

166. As also described above, Choquier discloses routing update messages to servers of particular server groups (server/node type) based on service maps that map servers to server groups. Ex.1007, 9:50-65, 21:33-53, 22:34-45.

167. A POSITA would understand that a node is simply a device connected to a network (Section III.G.1) and traffic on a network must be routed (Section III.G.2).

168. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

g. [1.4], [7.4], [14.6], [20.6], [26.6], [32.6]: Node determines/identifies client registered for updates and route update message to client

Claim	Limitations
[1.4]	causing the node, through the update message, to determine a client, different from the input source, that has registered for updates of the live object; causing the node to route the update message from the node to the client; and
[7.4]	determine a client, different from the input source, that has registered for updates of the live object, and route the update message from the node to the client,
[14.6]	wherein the node is configured to identify the client device as a registered device and to route the update message to the client device, and
[20.6]	wherein the node is configured to identify the client device as a registered device and route the update message containing the update data to the client device, and
[26.6]	wherein the node is configured to identify the client device as a registered device and to route the update message to the client device, and

[32.6]	wherein the node is configured to identify the client device as a registered device and to route the update message containing the update data to the client device, and
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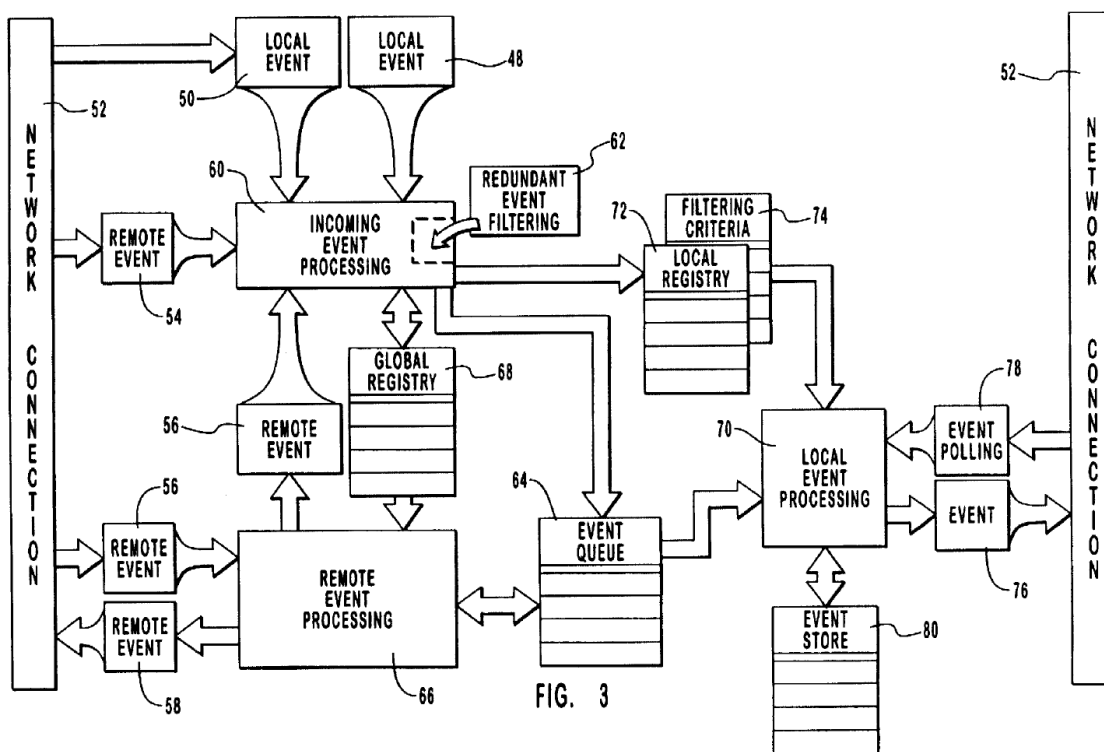
169. Lawson's event producers and event consumers are different from each other and can be or include general or special purpose computers and software. Lawson states "The presently preferred embodiment of a system for global event notification and distribution comprises a general purpose computer. The present invention, however, can also be used with any special purpose computer or other hardware system and all should be included within its scope." Ex.1005, 7:17-21. Similar disclosures can be found throughout Lawson (Figs. 1-3; claims 38-39, 43-44)

170. Furthermore, in Lawson event consumers must register for events (updates). This is disclosed throughout Lawson. As one example "Event consumers which desire to receive notification of certain events "register" with the event producing system." Ex.1005, 2:7-9. Another example is "In other words, an event producer notifies all event consumers that are registered for a particular event." Ex.1005, 2:32-33.

171. Yet another example is "Suppose part 1 of the database was changed. Further suppose that an event consumer who wished to be notified of changes in the database registered with Server A (Containing parts 1 and 3 of the database) and server B (containing parts 2 and 1 of the database). When Server A modifies part 1 of the

database, Server A will send notification of this event to the event consumer registered for the database modification event.” Ex.1005, 3:50-57. This excerpt from Lawson not only discusses registering for events, but the event is an update (i.e. modification of the database).

172. Lawson’s servers (nodes) include a “local event processing block 70” that monitors event queue 64 for events that should be transferred to a local event consumer” using a “local event registry.” Ex.1005, 13:43-48. See FIG. 3:



173. The local event registry “identif[ies] which local event consumers should receive which events” and “local event consumers that should receive events queued

in event queue 64 are identified by checking local event registry 72 and any associated filtering criteria.” Ex. 1005, 13: 13:45-52.

174. Once the server in Lawson identifies which event consumers need to receive the event, the event is routed to those identified event consumers. Ex.1005, 13:43-52, 13:65-67; see also Fig. 7 (showing at steps 174 and 182 events routed from a server to an event consumer), 24:60-64, 25:16-18.

175. In Lawson’s phone directory example, “the event notification process on server B dispatches the event packets [over the network] to registered local event consumers” and “the event packet is received by the company phone directory [event consumer 4 in Fig. 1].” Ex.1005, 24:60-66.

176. In Lawson’s payroll example, server B in Fig. 7 “dispatches the events to the event globalization process running on server A [where event consumer 1 is located as shown in Fig. 1].” Ex.1005, 24:44-47. Then, “[S]erver A proceeds to identify the registered local event consumers for this event...by checking the local event registry on server A,” and “server A transfers the event packet to the local event consumer which, in this case, is the payroll database process.” Ex.1005, 25:8-18.

177. Furthermore, Lawson as combined with Tsutsumitake also provides this element. Tsutsumitake also discloses clients registering for updates. One example of this is the following “The event request receiving unit 104 asks the connection management unit105 whether or not an identifier (event ID) of the event requested

by the event request and an identifier (client ID) of the client 11 at the request originating point have already been registered (steps B8, B9).” Ex.1006, 11:45-50.

Tsutsumitake also discloses “each time an event has occurred in the server the event notification has to be sent to the [registered] client[s].” Ex.1006, 4:36-38.

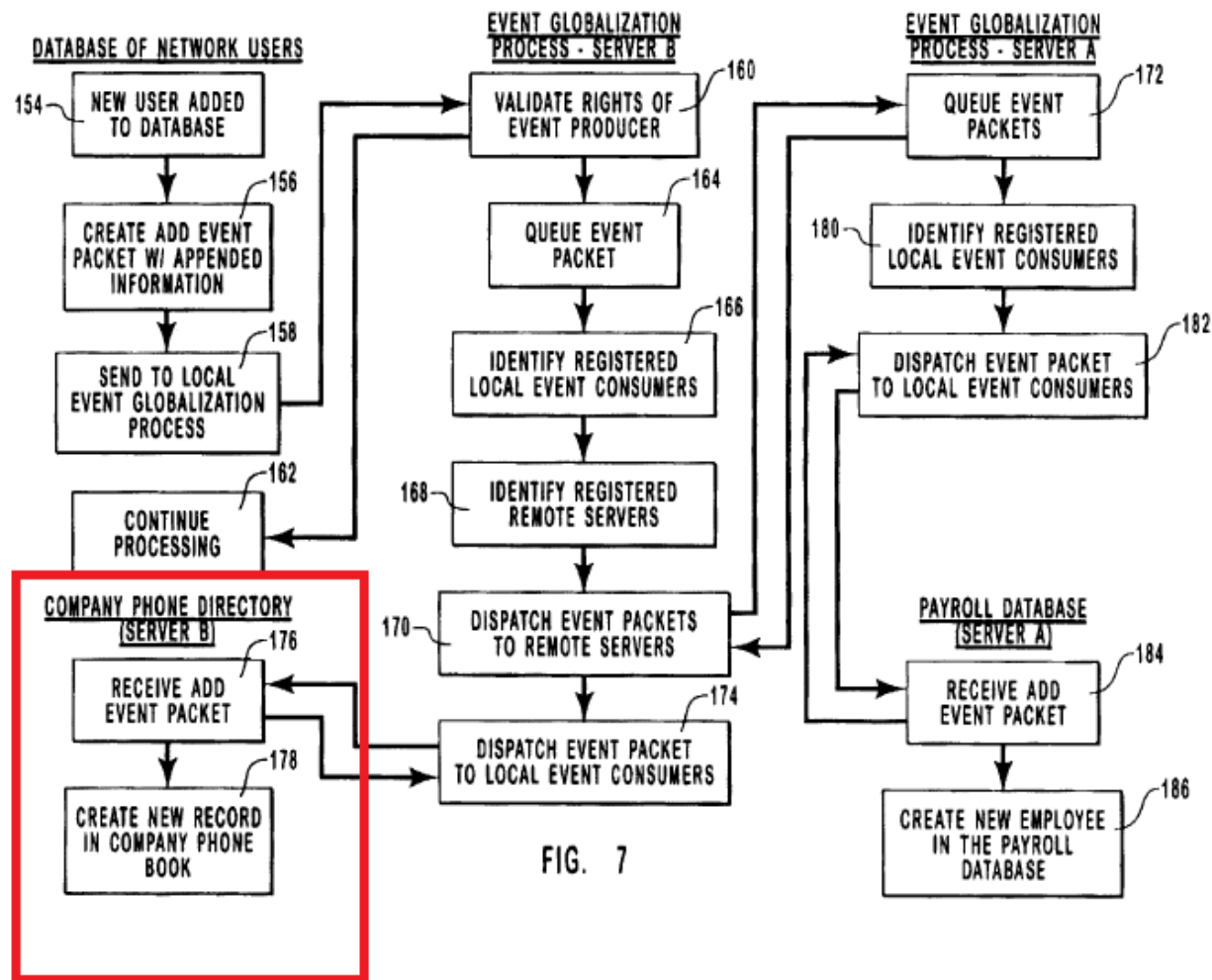
178. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

h. [1.5], [7.5], [14.7], [20.7], [26.7], [32.7]: Causing the client to process the update message and to update the property of the live object

Claim	Limitations
[1.5]	causing the client to process the update message and to update the property of the live object.
[7.5]	wherein the client is adapted to process the update message and to update the property of the live object.
[14.7]	wherein the client device processes the update message upon receipt to update the property of the live object at the client device.
[20.7]	wherein the client device is configured to process the update message upon receipt to update the property of the live object at the client device.
[26.7]	wherein the client device is configured to process the update message upon receipt to update the property of the live object at the client device.

[32.7]	wherein the client device is configured to process the update message upon receipt to update the property of the live object at the client device.
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179. Lawson discloses causing the client to process the update message and update the property of the live object. As one example is the following “As indicated by step 176, the event packet is received by the company phone directory and as indicated by the return arrow to step 175, processing could continue for the event notification process after transfer of the event packet.” Ex.1005, 24:64-25:1. This is in reference to figure 7, shown here:



180. In this example, server B is the client that received an event packet which causes Server B to create a new record in the company phone book.

181. In Lawson's phone directory example in which "event consumer 4 is a company phone directory," "[a]fter the event has been transferred, the company phone directory process creates a new record[/updates a record] in the company phone book as indicated by step 178." Ex.1005, 23:64-65, 24:64-66, 25:4-6; see also 21:16-19.

182. In Lawson's payroll example, "[t]he payroll database process receives the information...and proceeds to create a new entry[/update an entry] in the employee payroll database as indicated by step 186." Ex.1005, 25:16-21; see also 24:1-4.

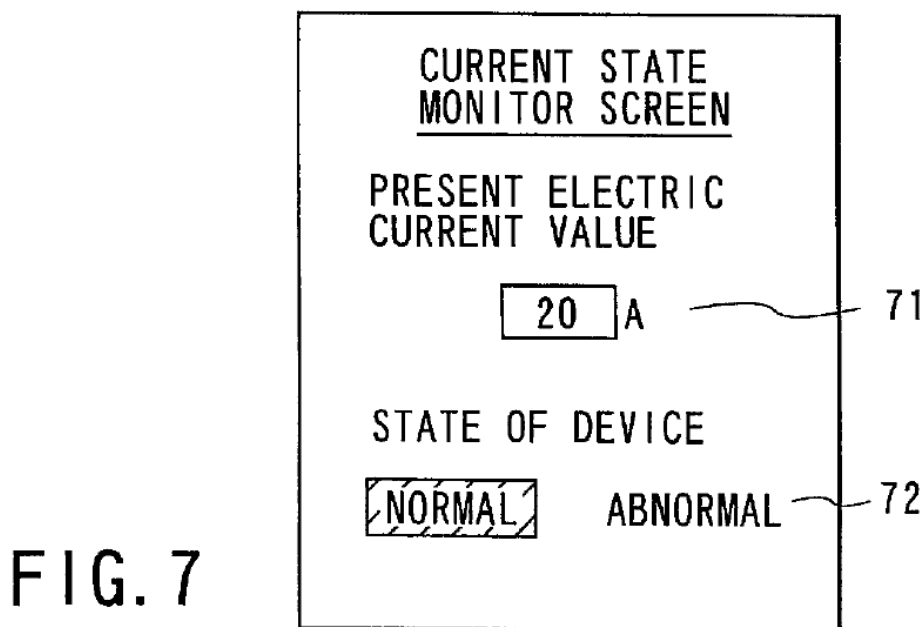
183. Lawson's updating of data/records as described above corresponds to the 722 Patent's "update the property of the live object at the client device" because the 722 Patent explains "live objects have associated 'properties' which include any modifiable data related to the object or referenced with respect to the object." Ex.1001, 7:22-24.

184. Lawson modified by Tsutsumitake also meets this element. Tsutsumitake discloses "generated events are transmitted in real time to the client 11" and "[t]he browser (client 11) processes a plurality of events (both the event indicating the present value of current and [] the state of the device being transmitted in real time) sent from the server 10 in response to one event request issued in accordance with the displayed page, and reflects on the screen the event processing results on the current value display section 71 or device state display section 72," as shown in Fig. 7. Ex. 1006, 13:59-66.

185. Tsutsumitake also discloses "In this structure, the client, which received the requested page information from the server, can automatically issue the even request to the server according to the event request information set in the page information, and can activate the event notification. Specifically, by associating the page

information with the event, the page information opened on the client side can be dynamically changed according to the event notification sent from the server”

Ex.1006, 4:22-28.



186. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

- i. **[2.0], [8.0]: Node extracts an object ID from the update message, to establish/determine a connection with the client, and to determine if the client has registered for updates of the live object based on the object ID.**

Claim	Limitations
[2.0]	The method of claim 1, further comprising: causing the node to extract an object identifier (ID) from the update message, to establish a connection with the client, and to

	determine if the client has registered for updates of the live object based on the object ID.
[8.0]	The routing network of claim 7, wherein the node is configured to extract an object identifier (ID) from the update message and to determine a connection to the client to route the data to the client.

187. As was described, Lawson discloses the method of claim 1 and the routing network of claim 7, and the combination provides for routing messages to clients over connections to clients based on the update message, and that update messages have IDs. In addition, Lawson as combined with Tsutsumitake disclose “determine if the client has registered for updates”/“a connection to the client” based on the “object ID.”

188. Lawson discloses that “entries...into the local and global event registries” identify “the event and the event consumer wishing to receive notification of the event” via the network. Ex.1005, 15:48-56, 16:35-44. Lawson also discloses an object identifier. Lawson has an event type field in its event packet, as shown here Ex.1005, 12:5-10:

Event Producer	Server	Type of Event	Time of Event	Size of Event Data	Event Data
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189. Lawson further states “In the above event packet, ... The type of event field is an identifier describing the type of event which occurred. This identifier preferably identifies an event in the global event registry and/or local event registry so that appropriate servers or event consumers can be identified to receive the event” Ex.1005, 12:15-20.

190. This is further described elsewhere in Lawson, for example, “This entry will include the event identifier of the new event.” Ex.1005, 16:47-48. The event type identifier serves as the equivalent of the 722 patent’s object identifier.

191. Furthermore, as previously discussed, Tsutsumitake also discloses clients registering for updates. One example of this is the following “The event request receiving unit 104 asks the connection management unit105 whether or not an identifier (event ID) of the event requested by the event request and an identifier (client ID) of the client 11 at the request originating point have already been registered (steps B8, B9).” Ex.1006, 11:45-50.

192. Tsutsumitake also discloses an object identifier: “The even request receiving unit 104 asks the connection management unit 105 whether or not an identifier (event ID) of the event requested by the event request and an identifier (client ID) of the client 11 at the request originating point have already been registered (steps B8, B9). If they are not registered, a pair of the identifier (event ID) off the event requested by the event request and the identifier (client ID) of the client 11 at the request

originating point are registered in the connection management unit 105 (step B11)”

Ex.1006, 11: 45-55. The aforementioned steps B8 and B9 are from figure 4 shown

here:

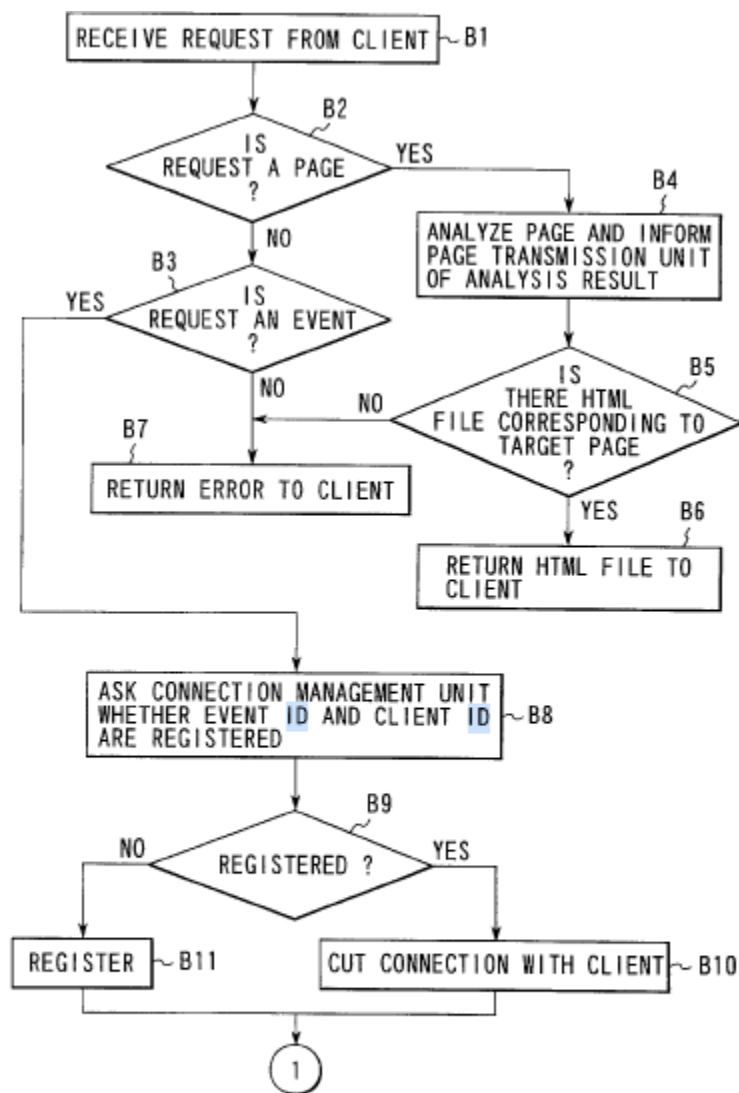


FIG. 4

193. This registration identifies the event and client to receive the event. Ex.1006,

11:56-60.

194. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

j. [3.0], [9.0]: Node determines at least one client proxy and routes to determine the connection

Claim	Limitations
[3.0]	The method of claim 2, further comprising: causing the node to determine at least one client proxy with which the client communicates; causing the node to route the update message to the client proxy; and causing the client proxy to route the update message to the client to determine the connection.
[9.0]	The routing network of claim 8, wherein the node is configured to determine the connection by determining at least one client proxy with which the client communicates and to route the update message to the client proxy.

195. As was discussed in reference to claims 2 and 8, Lawson in combination with Tsutsumitake and Choquier renders obvious the method of claim 2 and the routing network of claim 8.

196. Lawson discloses at least one client proxy. As one example, “Each server has running thereon a local event globalization process that registers for events desired by local event consumers. When an event consumer registers for an event, the event globalization process of the event consumer’s local server places an entry into the

local event registry for the local server. An entry is also placed into the global event registry for the local server where the event consumer is located. Thus, the global event registry is updated to contain an entry identifying the server where the event consumer is located, and the desired event and the local event registry of that server is updated to identify the event consumer and the desired event. When a local event globalization process receives notification of an event that has occurred locally, the local process looks in the local registry in order to identify local event consumers that need notification of the event.” Ex.1005, 4:54-5:2. In this example, the local event registry is a proxy.

197. Another example from Lawson is “For example, if a user wished to initiate automatic running of a virus scan program on multiple user computers in a network, the user would create a launch program even type and register the event type in the global registry. Each of the user computers would then register for the launch program even type using the procedure previously described.” Ex.1005, 6:4-10. In this example, the global registry is a proxy.

198. A POSITA would readily understand that registries in Lawson’s network of servers implementing the event globalization process are proxies. This corresponds to the ’722 Patent’s “client proxy,” which “merely passes messages among the clients and nodes” and/or “stores client registration information ... [to] determine which

client proxies have registered for the messages[] and [to] send the messages to the appropriate client proxies” to thereafter send to registered clients. Ex.1005, 3:60-4:2.

199. Tsutsumitake explicitly discloses a proxy server. Tsutsumitake states “though not shown, a relay server called ‘proxy server’ may be provided between the information providing server 10 and the information display client 11” and the “proxy server receives a request from the client, sends the request to the server as it is, and returns an result from the server directly to the client.” A “plurality of proxy servers” can also be included. Ex.1006, 8:7-14. It would have been obvious to include a proxy server in Lawson based on Tsutsumitake.

200. Lawson describes both global even registries (Ex.1005, 4:45-53) and local event registries (Ex.1005, 4:54-65). Lawson also discloses causing the node to determine at least one registry (proxy) to communicate with: “The following example illustrates how an embodiment of the present invention utilizes the global event registry and local event registries to globalize an event. Suppose event producer 42 initiated an event. Further assume, that event consumers 44 and 46 had registered for the event. When server B recognized event producer 42 had initiated an event, server B would check global event registry 34. Global event registry 34 would identify that server E needed notification of the event. Server B would then send the event through gateway 32 to Server E. Server B would then check its local event registry 46 had registered for the event. Server E would then transfer the vent

to event consumer 46 using an appropriate transfer method.” Ex.1005, 10:18-35. A POSITA would readily recognize that the system is causing the node (in this case Server B) to determine at least one proxy (global event registry).

201. Lawson discloses routing the update message. One example is the following “These corresponding event globalization processes, in ram, check their local event registries and provide the event to any event consumers identified therein. In this way, local events can be routed to any event consumer in the network without the need to register at each server.” Ex.1005, 5:7-12.

202. As was discussed, the system causes the node to route the update message to the client proxy. Ex.1005, 10:18-35.

203. As previously discussed, Tsutsumitake discloses a proxy server. As one example, “Though not shown, a relay server called “proxy server” may be provided between the information providing server 10 and the information display client 11” Ex.1006, 8:7-9.

204. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

205. To the extent the Lawson-Tsutsumitake-Choquier combination does not explicitly disclose a client proxy that routes messages and stores client information, it would have been obvious, and a POSITA would have been motivated as described above, to include one or more proxy servers as a client proxy, as disclosed in Herz,

in the system of the Lawson-Tsutsumitake-Choquier combination to transfer communications between servers and clients and handle client registration and connection information, as disclosed in Herz. Herz also discloses a proxy server, and one specifically to route messages: "Any server in the network N may be configured to act as a proxy server in addition to its other functions. Each proxy server provides service to a set of users, which set is termed the "user base" of that proxy server. A given proxy server provides three sorts of service to each user U in its user base." Ex.1009, 32:20-24. The proxy server of Herz is also shown in figure 2 (S2) and figure 15 from Herz:

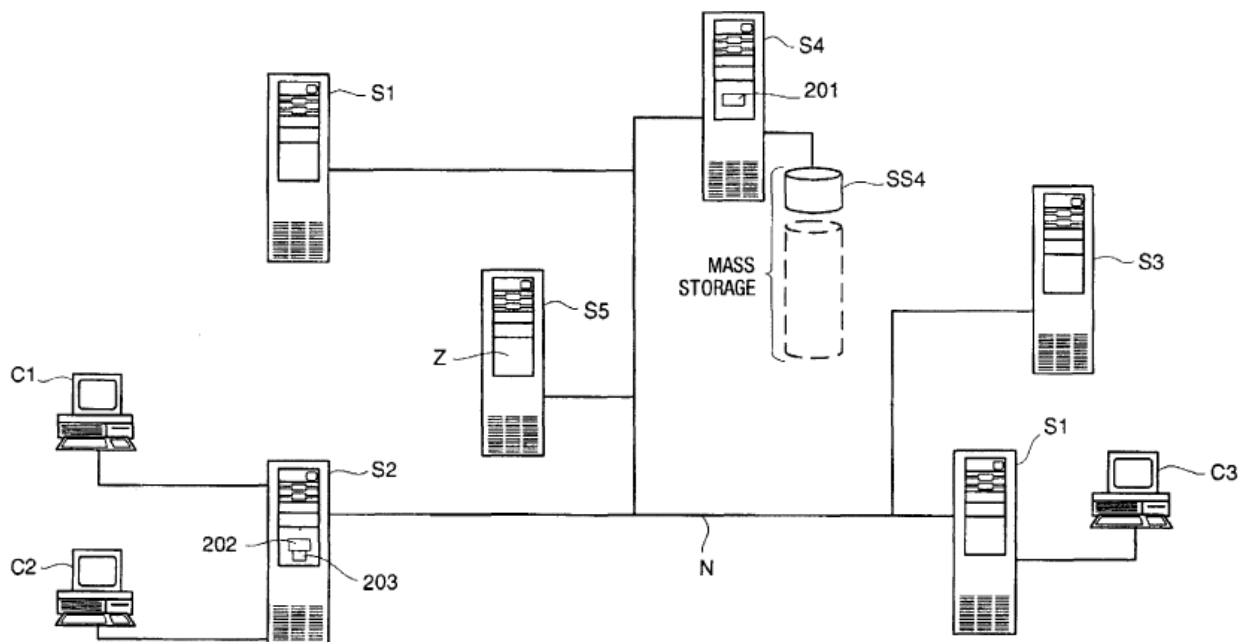
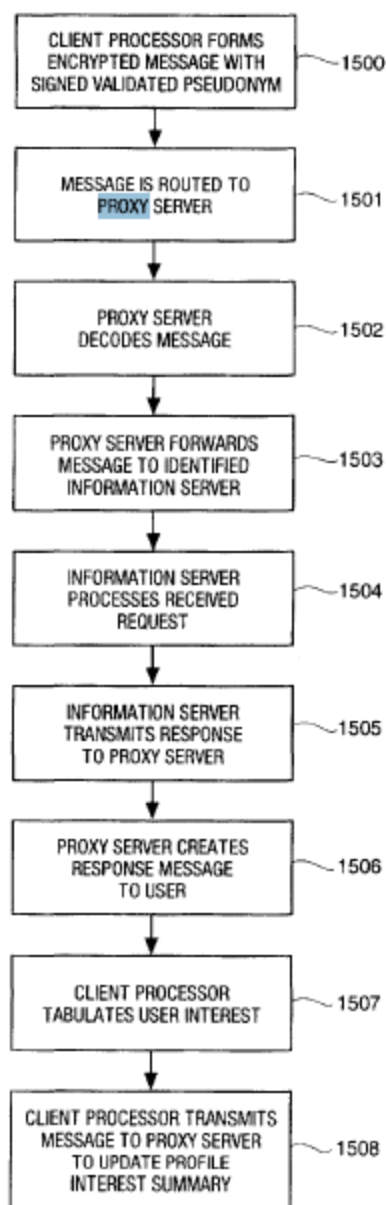


FIG. 2

FIG. 15



206. Herz also discloses routing the message from the node to the client "If the user is a subscriber to the news clipping service described below. request R may instruct proxy server S2 to forward to the user all target objects that the news clipping service has sent to proxy server S2 for the user's attention" Ex.1009, 38:44-47.

k. [4.0], [10.0]: Maintain client registration information concerning the client connection at the node

Claim	Limitations
[4.0]	The method of claim 3, further comprising causing the node to maintain client registration information concerning the client connection.
[10.0]	The routing network of claim 9, wherein client registration information concerning the client connection is configured to be maintained at the node.

207. As described above, the combination discloses the method of claim 3 and the routing network of claim 9.

208. Additionally, Lawson states “As described in greater detail below, when an event is transferred from one server to another, a connection must be established between the two servers. Once the transfer is complete, then the connection is terminated.” Ex.1005, 13:24-28. Establishing and terminating a connection is information concerning the client connection.

209. Tsutsumitake discloses maintaining the client registration information concerning the client connection. As one example, “Specifically the connection for the event notification is maintained, but if the connection is cut off due to some external cause, the client automatically reconnects to the network” Ex.1006, 6:59-63.

210. Maintaining client registration information concerning the client connection is also disclosed elsewhere in Tsutsumitake, “In order to transmit every occurring event in response to one event request, the connection between the server 10 and client 11 at the event request originating point is always maintained.” Ex.1006, 12:29-34.

211. Tsutsumitake further discloses “The connection management unit 105 manages, for example, on a table format, information indicating which event is requested by which client, namely, connection information” Ex.1006, 9:29-32.

212. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

I. [5.0], [11.0]: Maintain client registration information concerning the client connection at the client proxy

Claim	Limitations
[5.0]	The method of claim 3, further comprising causing the node to maintain client registration information concerning the client connection at the client proxy.
[11.0]	The routing network of claim 9, wherein client registration information concerning the client connection is configured to be maintained at the client proxy.

213. As described above, the combination discloses the method of claim 3 and the routing network of claim 9.

214. As also discussed in reference to claim 3, Lawson discloses at least one client proxy. As one example, “Each server has running thereon a local event globalization process that registers for events desired by local event consumers. When an event consumer registers for an event, the event globalization process of the event consumer’s local server places an entry into the local event registry for the local server. An entry is also placed into the global event registry for the local server where the event consumer is located. Thus, the global event registry is updated to contain an entry identifying the server where the event consumer is located, and the desired event and the local event registry of that server is updated to identify the event consumer and the desired event. When a local event globalization process receives notification of an event that has occurred locally, the local process looks in the local registry in order to identify local event consumers that need notification of the event.” Ex.1005, 4:54-5:2. In this example, the local event registry is a proxy.

215. Another example from Lawson is “For example, if a user wished to initiate automatic running of a virus scan program on multiple user computers in a network, the user would create a launch program even type and register the event type in the global registry. Each of the user computers would then register for the launch program even type using the procedure previously described.” Ex.1005, 6:4-10. In this example, the global registry is a proxy.

216. A POSITA would readily understand that registries in Lawson are proxies.

217. As was discussed in reference to claim 3, Tsutsumitake also discloses a proxy server. As one example, "Though not shown, a relay server called "proxy server" may be provided between the information providing server 10 and the information display client 11." Ex.1006, 8:7-9.

218. As was discussed in reference to claim 4, Lawson discloses information concerning the client connection.

219. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

220. To the extent the Lawson-Tsutsumitake-Choquier combination does not explicitly disclose a client proxy that routes messages and stores client information, it would have been obvious, and a POSITA would have been motivated as described above, to include one or more proxy servers as a client proxy, as disclosed in Herz, in the system of the Lawson-Tsutsumitake-Choquier combination to transfer communications between servers and clients and handle client registration and connection information, as disclosed in Herz. Herz also discloses a proxy server, and one specifically to route messages: "Any server in the network N may be configured to act as a proxy server in addition to its other functions. Each proxy server provides service to a set of users, which set is termed the "user base" of that proxy server. A given proxy server provides three sorts of service to each user U in its user base."

Ex.1009, 32:20-24. The proxy server of Herz is also shown in figure 2 (S2) and figure 15 from Herz:

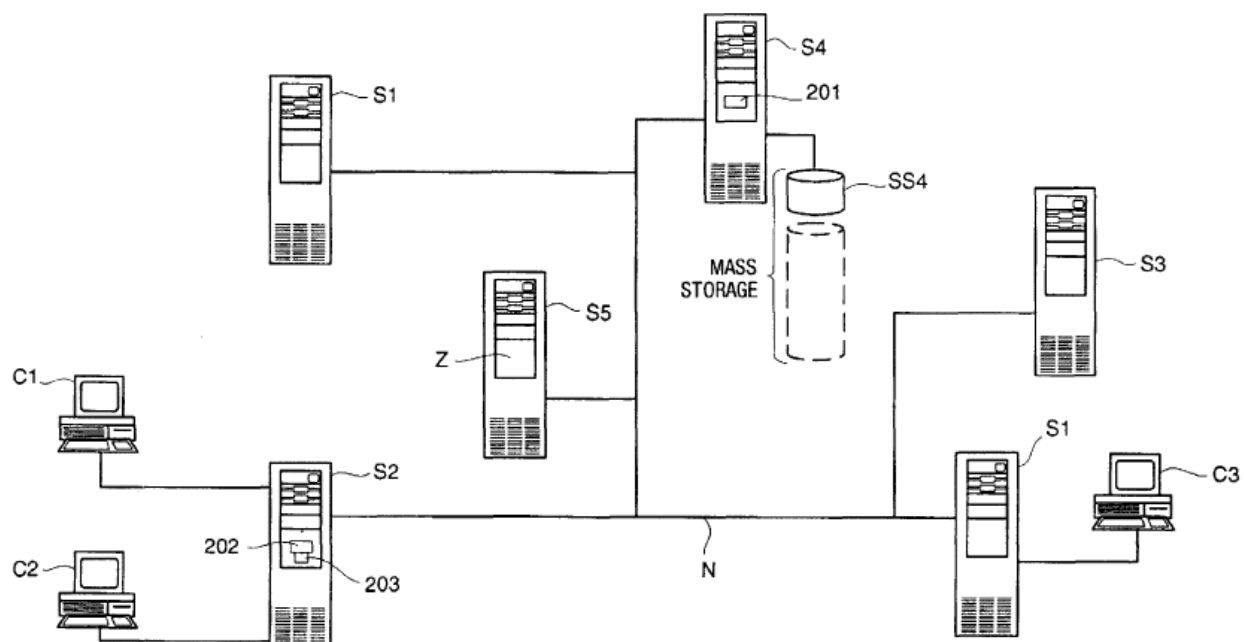
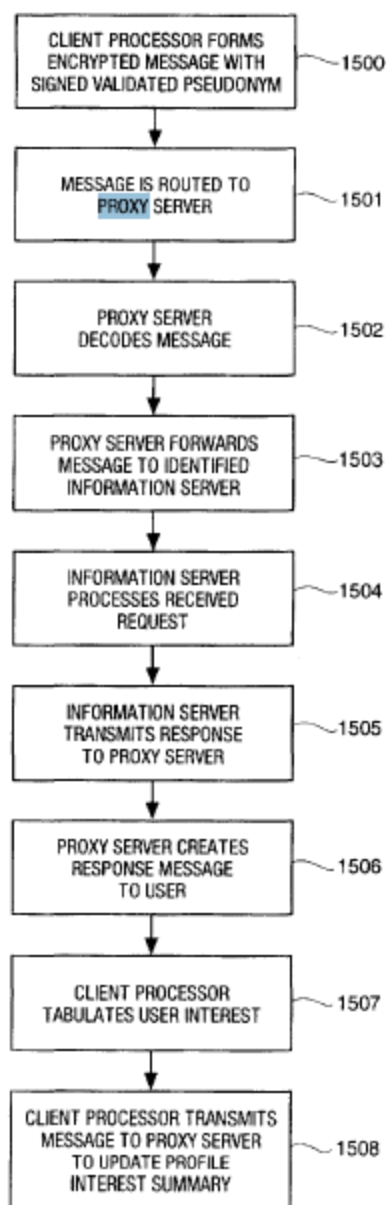


FIG. 2

FIG. 15



221. Herz also discloses client registration information and clients subscribing: "A subset of the user's long-term attributes are determined when the user first registers with the system." Ex.1009, 27:67-28:2. Herz also discloses subscribing "If the user is a subscriber to the news clipping service described below. request R may instruct

proxy server S2 to forward to the user all target objects that the news clipping service has sent to proxy server S2 for the user's attention." Ex.1009, 38:44-47.

m. [6.0]: Property of the live object has effect on visual representation of the live object...

Claim	Limitations
[6.0]	The method of claim 1, wherein the property of the live object has a direct effect on a visual representation of the live object in a data representation, has an effect on an internal aspect of the live object and has no effect on the visual representation of the live object in the data representation, or has a direct effect on one aspect of the visual representation of the live object in the data representation and has no effect on other aspect of the visual representation of the live object in the data representation.

222. Lawson's phone directory and payroll examples and Tsutsumitake's electric plant monitoring example disclose updates having a direct effect on a visual representation (e.g., user sees updated phone number, payroll data, current value 71, device state 72). *See* Section H.3.b-h.

223. Tsutsumitake discloses the property of the live object has a direct effect on a visual representation of the live object in a data representation. Throughout Tsutsumitake HTML pages are used. Ex.1006, 8:45-49, 10:16-20, 11:33-42, Fig. 2. Updating an HTML page would have a direct effect on the visual presentation of the HTML page. HTML consists of tags which describe how the web page will be

viewed in a web browser. Updating or changing those tags, changes the visual display. Tsutsumitake also discloses "The vent processing results can be reflected on the page screen image (event screen image) by using the Java (applet) of Sun Microsystems, JavaScript of Netscape Communications, or Dynamic HTML of Microsoft. Needless to say, the method is not limited to these Ex.1006, 13:66-14:3.

224. In Tsutsumitake, the update could also be to some internal aspect of the HTML page that does not affect the visual presentation. This could include the updating or embedding of JavaScript. Ex.1006, 10:30-33.

225. Tsutsumitake further discloses updating the visual display: "The event receiving unit 114 receives the event sent from the server 10 on the basis of the request to the server 10 from the event request unit 113. The received event is sent to the input/output unit 110, where necessary. For example, if the received event is an event indicating the update of the page in the server 10, the client 11 issues a page request to the server 10 and enables the updated page to be displayed on the display screen once again (i.e. the updated content being reflected on the display)" Ex.1006, 10:7-15.

226. Figure 3 of Tsutsumitake shows the update having a direct effect on a visual representation of the live object:

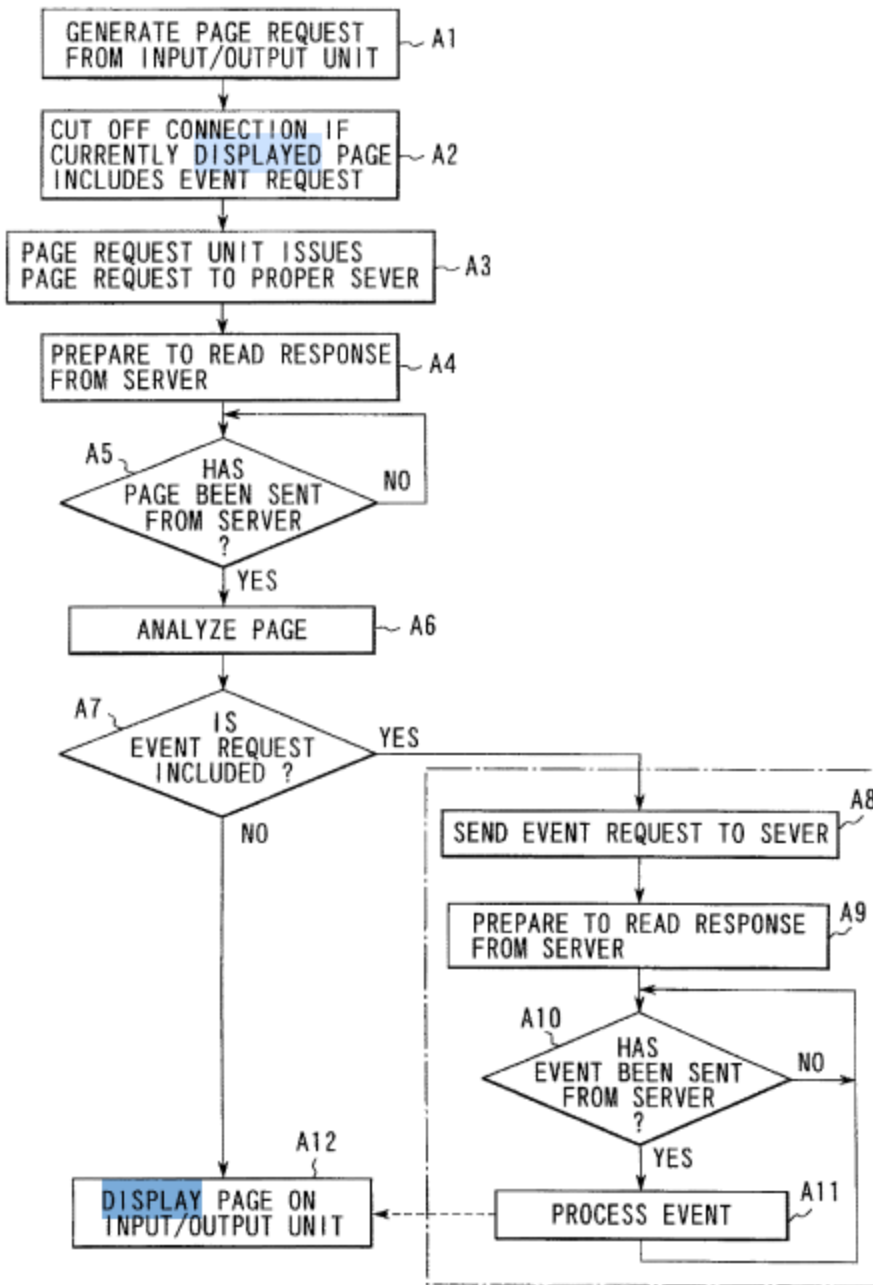


FIG. 3

227. The direct effect on a visual representation of the live object is also shown in figure 13 of Tsutsumitake:

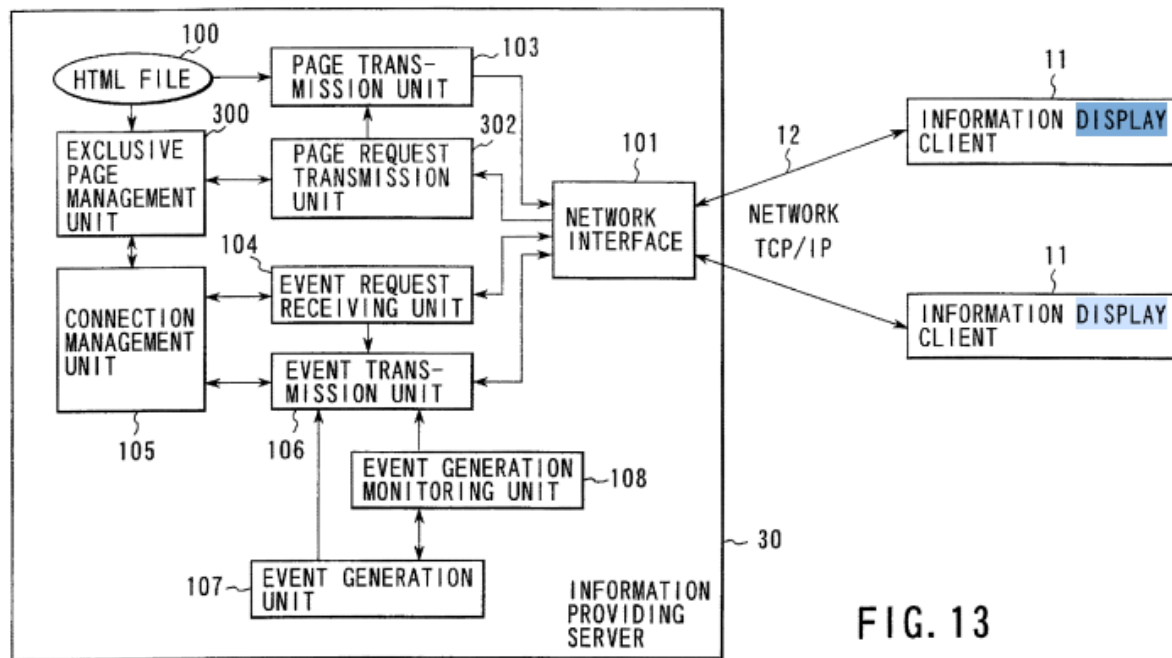


FIG. 13

228. Lawson discloses updates that have an effect on an internal aspect of the live object and has an effect on the visual representation of the live object in the data representation. Ex.1005, 3:50-57, 24:64-25:1, 25: 8-20.

229. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

- n. [12.0]: Gateway device routes update message to node adapted to receive messages of more than one message category and node determines client connection with client proxy and routes data to client proxy

Claim	Limitations
[12.0]	The routing network of claim 7, wherein:

	the gateway device is configured to route the update message to the node adapted to receive messages of more than one message category, and the node is configured to determine a connection with at least one client proxy with which the client communicates and to route the data to the client proxy.
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230. As was discussed in reference to claim 7, Lawson discloses the routing network of claim 7.

231. Lawson discloses receiving an update message identifying a live object and containing data for updating the proper of the live object, via the gateway device.

232. As one example, FIG. 2 also illustrates a single event producer 42 and two event consumers 44 and 46. The following example illustrates how an embodiment of the present invention utilizes the global event registry and local event registries to globalize an event. Suppose event producer 42 initiated an event. Further, assume that event consumers 44 and 46 had registered for the event. When server B recognized that event producer 42 had initiated an event, server B would check the global event registry 34. Global event registry 34 would identify that server E needed notification of the event. Server B would then send the event through gateway 32 to server E.” Ex.1005, 10:16-27. The aforementioned figure 2 from Lawson was shown in reference to claim 7.1.

233. A POSITA would understand that Lawson renders obvious this claim limitation.

234. The proxy was discussed in reference to claims 3, 5, 9, and 11. The proxy is the registry. The client communicates with the node to route data to the client proxy.

235. As was discussed in reference to claim 3, Tsutsumitake also discloses a proxy server. As one example, “Though not shown, a relay server called “proxy server” may be provided between the information providing server 10 and the information display client 11.” Ex.1006, 8:7-9.

236. Additionally, Choquier demonstrates that it was well-known for servers to be configured to process multiple application and message types because Choquier’s individual servers can be assigned to multiple service and message groups/types. Ex.1007, 2:14-18, 6:24-31, 9:40-49, 10:17-20, 11:44-47.

237. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

238. To the extent the Lawson-Tsutsumitake-Choquier combination does not explicitly disclose a client proxy that routes messages and stores client information, it would have been obvious, and a POSITA would have been motivated as described above, to include one or more proxy servers as a client proxy, as disclosed in Herz, in the system of the Lawson-Tsutsumitake-Choquier combination to transfer communications between servers and clients and handle client registration and

connection information, as disclosed in Herz. Herz also discloses a proxy server, and one specifically to route messages: "Any server in the network N may be configured to act as a proxy server in addition to its other functions. Each proxy server provides service to a set of users, which set is termed the "user base" of that proxy server. A given proxy server provides three sorts of service to each user U in its user base." Ex.1009, 32:20-24. The proxy server of Herz is also shown in figure 2 (S2) and figure 15 from Herz:

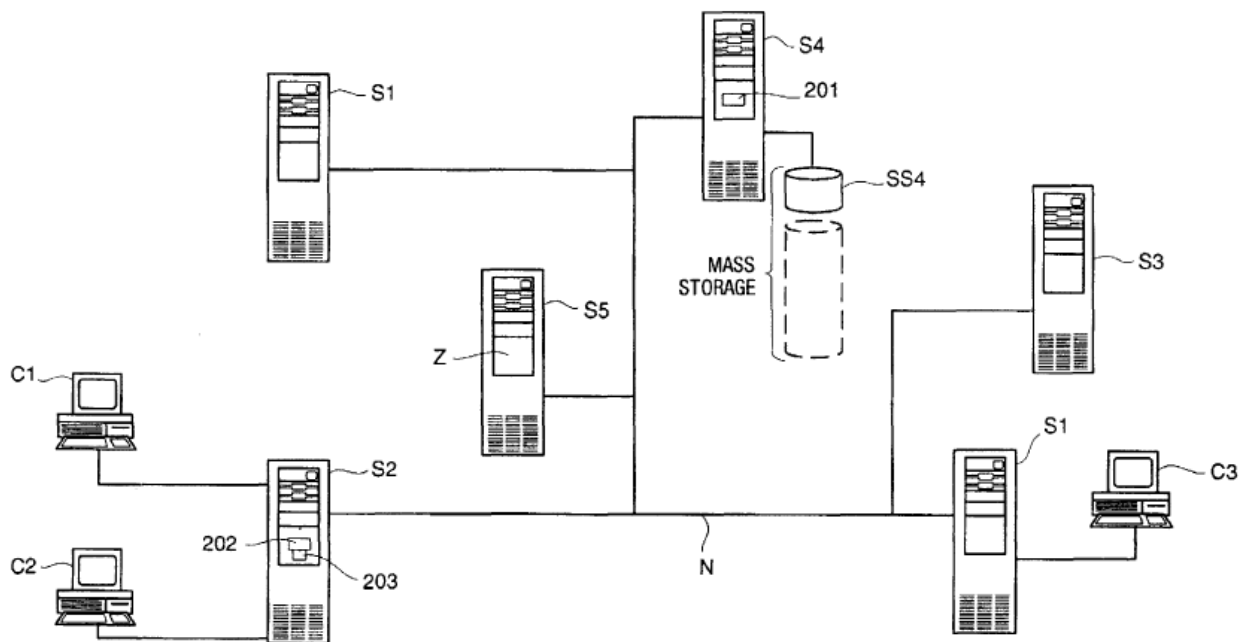
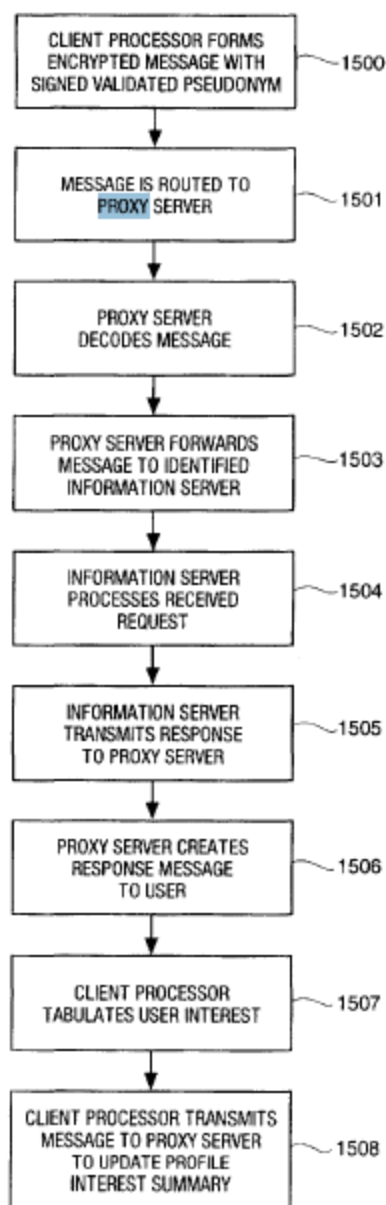


FIG. 2

FIG. 15



- o. [13.0] Node type is configured to identify the node that receives the update message from the gateway device.

Claim	Limitations
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[13.0]	The routing network of claim 7, wherein the node type is configured to identify the node that receives the update message from the gateway device.
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239. As was discussed in reference to claim 7, Lawson discloses the limitations of claim 7. As was discussed in reference to claim 7, Lawson discloses node types. As was discussed in reference to claim 7, Lawson discloses the gateway device.

240. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

p. [15.0], [21.0], [27.0], [33.0]: The method of claim 14, wherein providing the data representation to the client device includes providing the live object that causes the client device to register with a client proxy of the routing network.

Claim	Limitations
[15.0]	The method of claim 14, wherein providing the data representation to the client device includes providing the live object that causes the client device to register with a client proxy of the routing network.
[21.0]	The apparatus of claim 20, wherein the live object of the data representation is configured to cause the client device to register with a client proxy of the routing network.
[27.0]	The article of manufacture of claim 26, wherein the live object of the data representation causes the client device to register with a client proxy of the routing network.

[33.0]	The non-transitory computer readable storage medium of claim 32, wherein the live object of the data representation causes the client device to register with a client proxy of the routing network.
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241. The combination discloses the method of claim 14, the apparatus of claim 20, the article of manufacture of claim 27, and the non-transitory computer readable storage medium of claim 27 (see above). The combination also discloses providing the data representation (data/records) to the client device (event consumer) and to cause the client device to register with a client proxy of the routing network (network of servers implementing event globalization process).

242. As was discussed in reference to claim 3, Lawson discloses at least one client proxy. As one example, “Each server has running thereon a local event globalization process that registers for events desired by local event consumers. When an event consumer registers for an event, the event globalization process of the event consumer’s local server places an entry into the local event registry for the local server. An entry is also placed into the global event registry for the local server where the event consumer is located. Thus, the global event registry is updated to contain an entry identifying the server where the event consumer is located, and the desired event and the local event registry of that server is updated to identify the event consumer and the desired event. When a local event globalization process receives

notification of an event that has occurred locally, the local process looks in the local registry in order to identify local event consumers that need notification of the event.” Ex.1005, 4:54-5:2. In this example, the local event registry is a proxy.

243. Another example from Lawson is “For example, if a user wished to initiate automatic running of a virus scan program on multiple user computers in a network, the user would create a launch program even type and register the event type in the global registry. Each of the user computers would then register for the launch program even type using the procedure previously described.” Ex.1005, 6:4-10. In this example, the global registry is a proxy.

244. A POSITA would readily understand that registries in Lawson are proxies.

245. As was discussed in reference to claim 3, Tsutsumitake also discloses a proxy server. As one example, “Though not shown, a relay server called “proxy server” may be provided between the information providing server 10 and the information display client 11.” Ex.1006, 8:7-9.

246. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

247. To the extent the Lawson-Tsutsumitake-Choquier combination does not explicitly disclose a client proxy that routes messages and stores client information, it would have been obvious, and a POSITA would have been motivated as described above, to include one or more proxy servers as a client proxy, as disclosed in Herz,

in the system of the Lawson-Tsutsumitake-Choquier combination to transfer communications between servers and clients and handle client registration and connection information, as disclosed in Herz. Herz also discloses a proxy server, and one specifically to route messages: "Any server in the network N may be configured to act as a proxy server in addition to its other functions. Each proxy server provides service to a set of users, which set is termed the "user base" of that proxy server. A given proxy server provides three sorts of service to each user U in its user base." Ex.1009, 32:20-24. The proxy server of Herz is also shown in figure 2 (S2) and figure 15 from Herz:

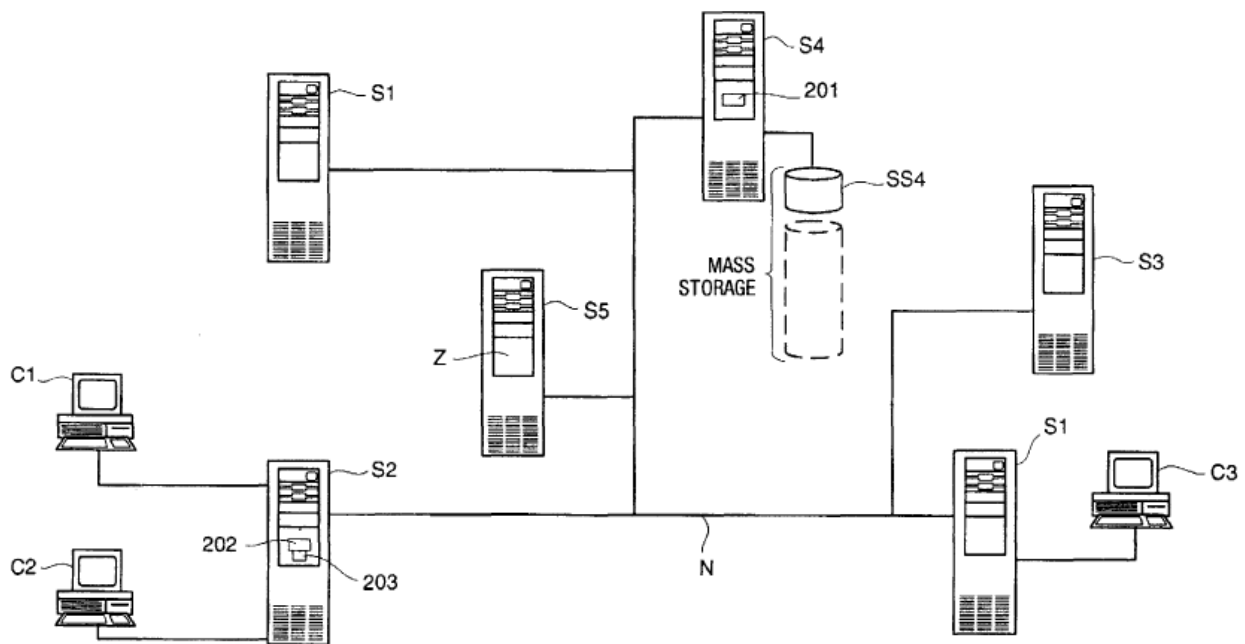
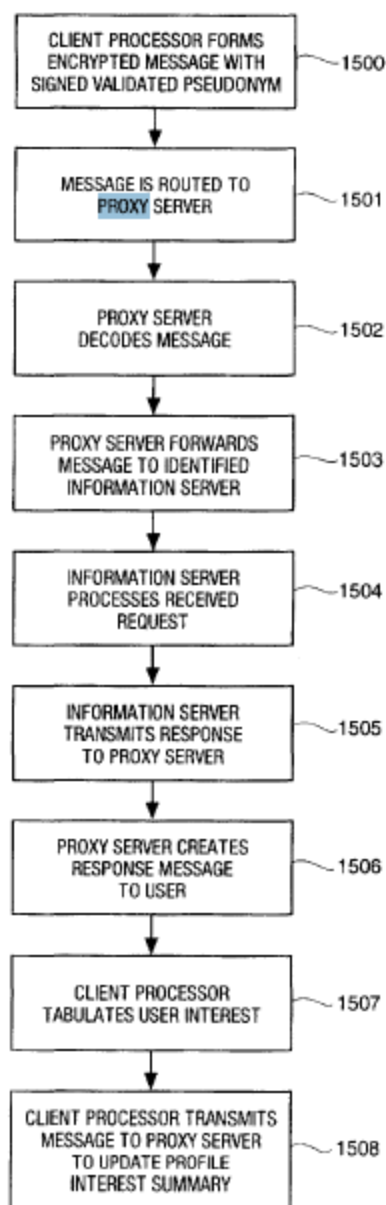


FIG. 2

FIG. 15



q. [16.0], [22.0], [28.0], [34.0]: The live object causes the client device to register with the node of the routing network

Claim	Limitations
[16.0]	The method of claim 14, wherein providing the data representation to the client device includes providing the live

	object that causes the client device to register with the node of the routing network.
[22.0]	The apparatus of claim 20, wherein the live object of the data representation is configured to cause the client device to register with the node of the routing network.
[28.0]	The article of manufacture of claim 26, wherein the live object of the data representation causes the client device to register with the node of the routing network.
[34.0]	The non-transitory computer readable storage medium of claim 32, wherein the live object of the data representation causes the client device to register with the node of the routing network.

248. The combination discloses the method of claim 14, the apparatus of claim 20, the article of manufacture of claim 27, and the non-transitory computer readable storage medium of claim 27 (see above). The combination also discloses providing the data representation (data/records) to the client device (event consumer) providing the live object that causes the client device to register with the node of the routing network (network of servers implementing event globalization process).

249. Lawson discloses client devices registering with the node of the routing network “The present invention presumes and underlying event notification system which: (1) allows local event consumers to register for notification of an event; and (2) sends notification of events that occurred to registered local event consumers”

Ex.1005, 4: 33-37.

250. Registering for events is further disclosed in the following excerpt from Lawson “When an event consumer needs to register for a new event or create a new event, the event consumer can send a “register for event” packet or a “create event packet” to the event globalization process on the local server” Ex.1005, 15:41-44.

251. Upon receiving an event, the client device will take appropriate action: “In addition, an associated process may have to be initiated which receives the custom event and takes the appropriate action. For example, if a user wished to initiate automatic running of a virus scan program on multiple user computers in a network, the user would create a launch program event type and register the event type in the global registry.” Ex.1005, 6:2-10.

252. Tsutsumitake also discloses this claim limitation. Tsutsumitake disclosing both object ID’s and registering for events was discussed in reference to claim 1 and 14: “The request receiving unit 104 asks the connection management unit 105 whether or not an identifier (event ID) of the event requested by the event request and an identifier (client ID) of the client 11 at the request originating point have already been registered (steps B8, B9).” Ex.1006, 11: 45-55.

253. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

r. [17.0], [23.0], [29.0], [35.0]: An activation module executed by the client device that registers the live object with the routing network

Claim	Limitations
[17.0]	The method of claim 14, wherein providing the data representation to the client device includes providing an activation module that is executed by the client device and that registers the live object with the routing network.
[23.0]	The apparatus of claim 20, wherein the received data representation includes an activation module that is configured to be executed by the client device and adapted to register the live object with the routing network.
[29.0]	The article of manufacture of claim 26, wherein the received data representation includes an activation module executed by the client device and adapted to register the live object with the routing network.
[35.0]	The non-transitory computer readable storage medium of claim 32, wherein the data representation includes an activation module that is executed by the client device and that is adapted to register the live object with the routing network.

254. The combination discloses the method of claim 14, the apparatus of claim 20, the article of manufacture of claim 27, and the non-transitory computer readable storage medium of claim 27 (see above). The combination also discloses providing the data representation (data/records) to the client device (event consumer) includes

providing an activation module that is executed by the client device and that registers the live object with the routing network (network of servers implementing event globalization process).

255. Lawson discloses “Each of the user computers would then register for the launch program event type using the procedure previously described. One user could then initiate or trigger the run program event. The global event notification process previously described would then notify each of the user computers that the event had occurred. A process running on each of the user computers would then receive the notification and in response run a virus scan program.” Ex.1005, 6:8-15.

256. Tsutsumitake discloses the data representation providing an activation module that is executed by the client device: “It is also possible to adopt a method wherein the event request is generated dynamically from a certain program incorporated in the page (e.g. “Applet” of Jave developed by Sun Microsystem, or “JavaScript” developed by Netscape).” Ex.1006, 10:30-33.

257. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

- s. **[18.0], [24.0], [30.0], [36.0]: The activation module is configured to determine a node type that handles registration and causes the client device to register with the node corresponding to the node type**

Claim	Limitations
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[18.0]	The method of claim 17, wherein providing the activation module includes providing the activation module that is configured to determine a node type that handles registration and that causes the client device to register with the node corresponding to the node type.
[24.0]	The apparatus of claim 23, wherein the activation module is configured to determine a node type for handling registration and to cause the client device to register with the node of the node type.
[30.0]	The article of manufacture of claim 29, wherein the activation module determines a node type that handles registration and causes the client device to register with the node of the node type.
[36.0]	The non-transitory computer readable storage medium of claim 35, wherein the activation module determines a node type for handling registration and causes the client device to register with the node of the node type.

258. The combination discloses the method of claim 17, the apparatus of claim 23, the article of manufacture of claim 29, and the non-transitory computer readable storage medium of claim 35 (see above). The combination also discloses providing the activation module includes providing the activation module that is configured to determine a node type that handles registration and that causes the client device to register with the node corresponding to the node type.

259. Lawson's and Tsutsumitake's disclosures correspond to the recited "activation module," which the '722 Patent explains is "functionality [on the client] for determining which node type handles which registration requests. Ex.1001, 19:61-63. One way the '722 Patent's "activation module" does so is by "determine[ing] which categories of messages it needs and to which nodes types it should connect [to get them]. The activation module 124 then makes a connection to one node of each relevant type and registers the appropriate object IDs with the appropriate node." Ex.1001, 21:47-52. Activation modules were discussed in reference to claim 17. Determining the node type was discussed in reference to claim 1. It would have been obvious to a POSITA to combine Lawson's teaching of determining a node type based on a message category with the activation module of Tsutsumitake to disclose the limitations of this claim.

260. It was commonplace to include JavaScript and/or Java applets in websites at the time of the '722 patent. In fact, JavaScript is still widely used today. Using such code as an activation module, and having that code determine the node type for registration would have allowed the determining of the node type to be integrated into a wide range of containers. This would have been an advantage that a POSITA would readily understand and seek to implement.

261. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

- t. **[19.0], [25.0], [31.0], [37.0]: The activation module is configured to determine a message category of the data representation and causes the client device to register with a node having a node type corresponding to the message category**

Claim	Limitations
[19.0]	The method of claim 17, wherein providing the activation module includes providing the activation module that is configured to determine a message category of the data representation and that causes the client device to register with a node having a node type corresponding to the message category.
[25.0]	The apparatus of claim 23, wherein the activation module determines a message category of the data representation and causes the client device to register with the node having a node type corresponding to the message category.
[31.0]	The article of manufacture of claim 29, wherein the activation module determines a message category of the data representation and causes the client device to register with the node having a node type corresponding to the message category.
[37.0]	The non-transitory computer readable storage medium of claim 35, wherein the activation module determines a message category of the data representation and causes the client device to register with the node having the node type corresponding to the message category.

262. The combination discloses the method of claim 17, the apparatus of claim 23, the article of manufacture of claim 29, and the non-transitory computer readable

storage medium of claim 35 (see above). The combination also discloses providing the activation module includes providing the activation module that is configured to determine a message category of the data representation and that causes the client device to register with a node having a node type corresponding to the message category.

263. As was discussed in reference to claim 17, Lawson discloses the method of claim 17. The activation module was discussed in reference to claims 17 and 18. Node types were discussed in reference to the independent claims.

264. Lawson discloses categories of messages: “Another type of filtering that may be supported by the present invention is a class based or category based filtering. A class based or category based filter identifies classes or categories of objects that are of interest to an event consumer.” Ex.1005, 12:11-14. A POSITA would understand that this is disclosing filtering based on categories of messages. Categories of messages are disclosed in other places in Lawson. Ex.1005, 5:39-48.

265. Tsutsumitake discloses message categories “On the other hand, if the event request is included, the page receiving unit 112 informs the event request unit 113 of the URL of the event and causes the event request unit 113 to send the event request to the server 10 (step A8) [for registration to receive events.” Ex.1006, 10:53-67.

266. Further, Choquier discloses that client devices are assigned to communicate with servers of certain server types based on the type of messages/applications being used by the servers. For example, Choquier uses gateways that “serve as intermediaries between the client microcomputers and the application servers,” and, even though “the user typically opens and closes multiple services,” the gateways “rout[e] service requests (from the client microcomputer) to the appropriate application servers” using the “service map.” Ex.1007, 2:32-61.

267. For at least these reasons, Lawson as combined with Tsutsumitake and Choquier renders these elements obvious.

I. Choquier, Bird, and Tsutsumitake and, alternatively, Herz

1. Motivation to combine Choquier with Bird and Tsutsumitake

268. As explained in Section III.C-E., Choquier, Bird, and Tsutsumitake all disclose distributed computing systems that provide data updates from servers to clients (update transactions in Choquier, subscription messages based on publisher type in Bird, real-time event updates in Tsutsumitake).

269. A POSITA would have been motivated to combine Choquier with Bird to use Choquier’s efficient server system for providing publish/subscribe services as taught by Bird, including providing end users the ability to subscribe to specific publisher content sources they wish to receive information from. A POSITA would have been further motivated to use message types according to specific publisher as taught in

Bird (see Ex.1008, [0060]) to map the message types to certain server groups according to service maps for improved scalability, resource allocation, and load balancing, as taught by Choquier. Ex.1007, 1:52-62, 9:66-10:8, 25:5-35. Choquier specifically specifies that multiple service groups for a service type can be formed, with each service group handling “a specific topic or set of topics.” Ex.1007, 10:17-20.

270. Choquier’s system was designed to be adaptable to provide various “communications-based and information-based on-line services to end users” providing high scalability “without degradation of on-line services” as “the number of end users increases.” Ex.1007,1:52-56, 6:8-10. In fact, various other patents filed after Choquier used its core server group architecture for expanded uses, such as a publisher-to-client multimedia publishing system as shown in FIG. 3 of U.S. Patent No. 6,230,173:

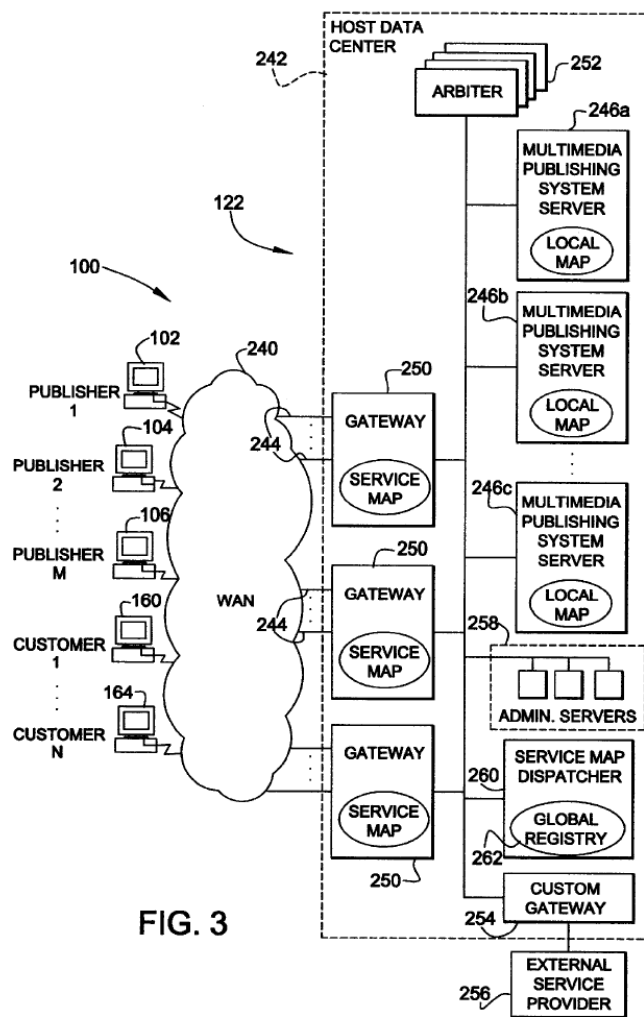


FIG. 3

Ex. 1018, see also Ex.1019 (USP 5,907,837), FIG.3, and Ex.1020 (USP 6,199,082), FIG.3.

271. A POSITA would have been further motivated to combine the Choquier-Bird combination with Tsutsumitake to provide for updating webpage content. As described in Tsutsumitake, browser-based, HTML webpage, applications had become widely popular by the late 1990s when Choquier, Bird, and Tsutsumitake were filed, and, although updating webpage content like news and weather were

available, they typically required the client to periodically issue a request for a refreshed webpage, rather than new content being pushed to the client device, due to issues such as firewalls between clients and servers. Ex.1006, 1:14-3:3. Tsutsumitake provided for allowing updates to be pushed using embedded webpage events. Ex.1006, 3:20-26, 3:3:56-4:6. A POSITA would have been motivated to publish real-time updates as provided by Tsutsumitake using established server systems such as that disclosed in Choquier and to provide for continuously updating webpage content for publish/subscribe applications like that disclosed by Bird.

272. Tsutsumitake discloses real-time information transmission from a server to a client. Real-time information would benefit Choquier, Bird, or Herz, thus motivating a POSITA to combine Tsutsumitake with one or more of Choquier, Bird, or Herz.

273. A POSITA would also have a high expectation of success in the combination, for example because publish/subscribe systems were well-known at the time (see, e.g., Ex.1008, [0002]-[0003]; Ex.1006, 1:60-2:30) and use of server groups or clusters as disclosed in Choquier was well-known and preferable for efficiency, scalability, and redundancy. Ex.1007, 1:52-65. For the same reasons, the combination would have yielded predictable results well within the skill of POSITA.

2. Motivation to combine Choquier with Herz

274. To the extent that Choquier, Bird, and Tsutsumitake do not explicitly provide for a client proxy, a POSITA would have been motivated to combine Choquier, and

the combination of Choquier, Bird, and Tsutsumitake, with Herz to provide for a client proxy. First, as was pointed out in section III.I.1., Choquier explicitly envisions being combined with other systems.

275. Herz discloses a proxy server that bidirectionally transfers communications between the client and servers, and stores user-specific information in a secure and private manner, such as a user's "target profile interest summary." Ex.1009, 5:5-13.

276. A POSITA would have known that use of proxies between clients and servers was well-known, and would have been motivated to use a proxy such as Herz's proxy server to provide a common point of connection to clients in Choquier's system as well as provide data privacy in storing client registration information, as disclosed in Herz.

277. A POSITA would also have a high expectation of success in the combination, because Choquier, Bird, and Tsutsumitake all deal with client server communications over server networks. For the same reasons, the combination would have yielded predictable results well within the skill of POSITA.

3. Claim Analysis

278. In the following sub-sections, I provide a claim-by-claim analysis of Choquier disclosing the claim limitations of the '722 patents as combined with Bird and/or Tsutsumitake, and, alternatively, Herz. Certain claim elements recite substantially overlapping subject matter, and therefore, for efficiency and ease of

understanding, I group these claim elements together. I note that claims 14, 20, 26, and 32 include two additional steps not found in claims 1 and 7, but otherwise all independent claims 1, 7, 14, 20, 26, and 32 recite substantially similar elements.

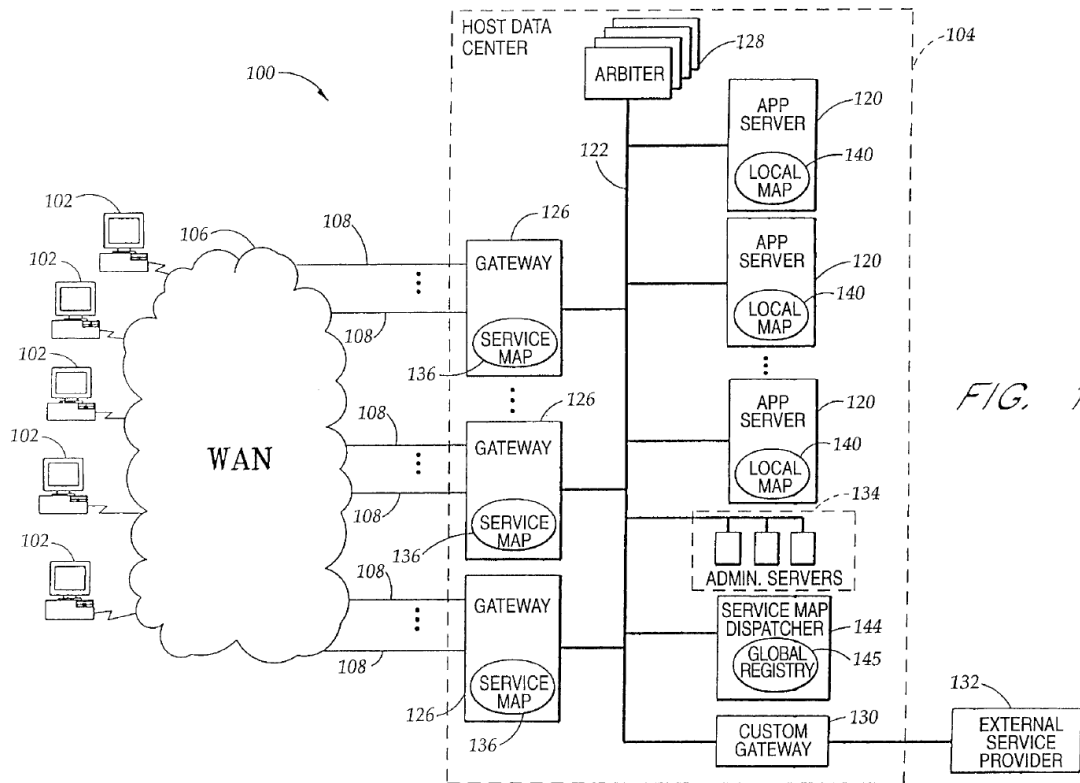
**a. Claims [1.0], [7.0], [14.0], [20.0], [26.0], [32.0]:
Preambles**

Claim	Limitations
[1.0]	A method comprising:
[7.0]	A routing network comprising:
[14.0]	A method comprising:
[20.0]	An apparatus comprising:
[26.0]	An article of manufacture including a computer-readable storage medium having instructions stored thereon, execution of which by a computing device causes the computing device to perform operations comprising:
[32.0]	A non-transitory computer readable storage medium having instructions stored thereon, the instructions comprising:

279. To the extent the preambles are limiting, Choquier provides “large-scale computer networks for providing information-related services and communications services to end users.” Ex.1007, 1:14-17.

280. Choquier discloses methods. Choquier describes processes for routing “update transactions” from via servers to client devices. Ex.1007, 9:50-65, 10:4-12, 10:67-11:3, 21:33-53, 22:34-45.

281. Choquier also discloses a routing network. A POSITA would understand that connecting a client in an intranet, with a server in an extranet, requires routing. Choquier discloses a routing network in figure 1:



282. A POSITA would understand figure 1 to be depicting a routing network. Choquier's systems include "microcomputers" and "computer-readable mediums." Ex.1007, 2:26-47, 6:32-47, 26:23-39, 27:19-28:13.

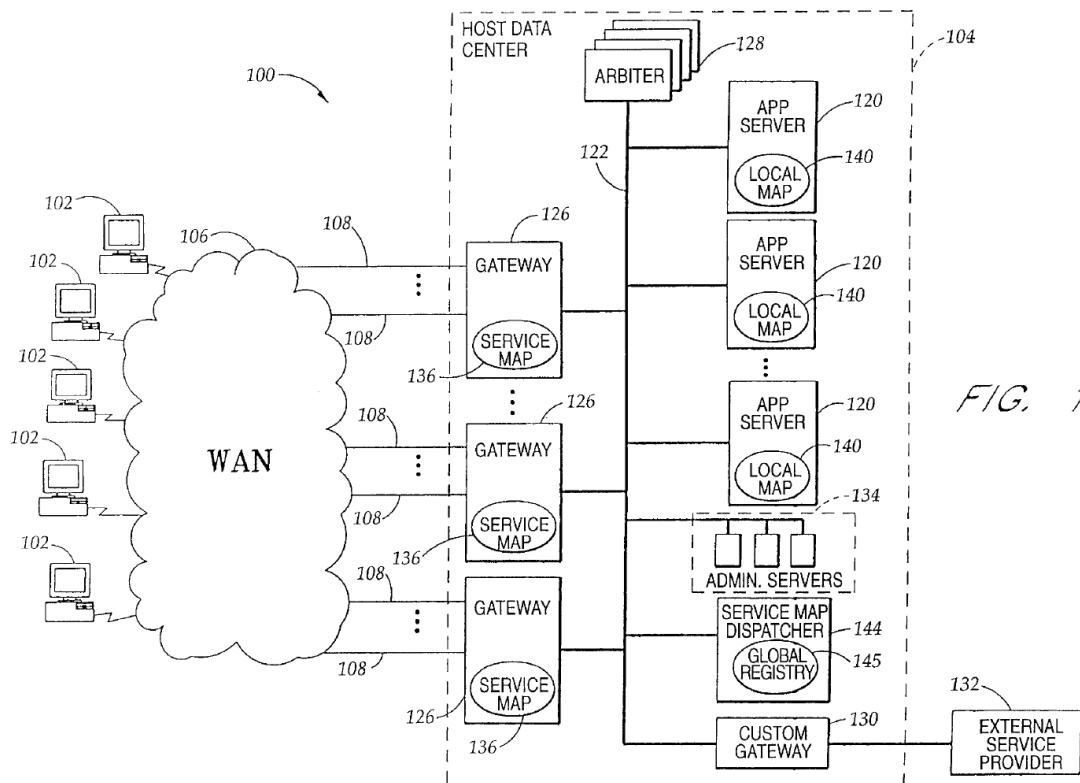
283. Tsutsumitake discloses "A description will now be given of a method of processing the event sent from the server 10 on the client (11) side and updating the screen image of the browser (page display screen image)." (Tsutsumitake 13:27-30).

284. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

b. [14.1], [20.1], [26.1], [32.1]: Input source provides data representation including live object

Claim	Limitations
[14.1]	providing, using a processing device of an input source, a data representation to a client device, different from the input source, coupled to a routing network, wherein the data representation includes at least one live object recognizable by the client device, and
[20.1]	an input source device configured to provide a data representation to a client device, different from the input source, coupled to a routing network, wherein the data representation includes at least one live object that is recognizable by the client device, and
[26.1]	providing, using a processing device of an input source, a data representation to a client device, different from the input source, coupled to a routing network, wherein the data representation includes at least one live object that is recognizable by the client device, and
[32.1]	instructions for providing a data representation to a client device coupled to a routing network, wherein the data representation includes at least one live object recognizable by the client device, and

285. As described above, Section III.D., Choquier discloses a routing network in which data received by a host data center 104 is routed to client devices 102 using application servers arranged into “service groups,” as shown in FIG. 1 below.



Ex.1007, 2:1-4. Data routed to the clients, coupled to the routing network, via the application servers can originate from “an external data provider connected to the host data center 104 by the Internet,” (an input source). Ex.1007, 9:57-65.

286. As described above in Section I.1., it would have been obvious to modify Choquier’s architecture to provide publish/subscribe system based on Bird and using an updating browser/webpage based on Tsutsumitake. Tsutsumitake, as I have also explained in this declaration, discloses providing a data representation that includes

a live object to a client device, where the client device is a different device from the input source (a server).

287. In Tsutsumitake, a “page transmission unit 103” at a server transmits an HTML file to client 11. Ex.1006, 8:39-49.

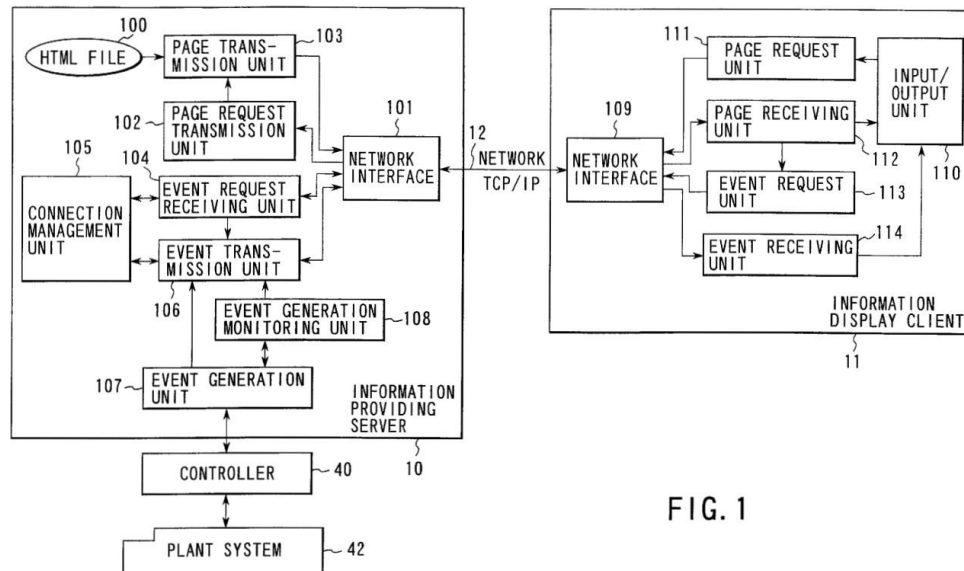


FIG. 1

288. Fig. 2 shows an example of the webpage, including an embedded event, sent by server 10 to client 11.

```
< HTML >
< HEAD >
< TITLE > SAMPLE PAGE < /TITLE >
< /HEAD >
< BODY >
< H1 > SAMPLE PAGE < /H1 >
THIS PAGE INCLUDES EVENT REQUEST
< EMBED >
  < EVENT URL=http://abc.def/hij.evt >
< /EMBED >
< /BODY >
< /HTML >
```

FIG. 2

289. The client recognizes the webpage as containing a “live object” (embedded URL) and “informs an event request unit 113” at the server “of the URL of the event request.” Ex.1006, 9:61-68, 10:20-23.

290. Choquier discloses servers (Ex.1007, 2:1-18); gateway microcomputers (Ex. 1007, 2:58-61); client microcomputers (Ex. 1007, 4:1-4), and Arbiter microcomputers (Ex. 1007, 6:32-35). All of which are processing devices. Tsutsumitake discloses servers (Ex.1006, 3:20-26); client computers (Ex.1006, 4:7-14) all of which are processing devices. Bird discloses subscriber computers and server computers (Ex.1008, 0006), which are processing devices.

291. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

c. [14.2], [20.2], [26.2], [32.2]: Causing client to respond by determining object ID and registering

Claim	Limitations
[14.2]	causing the client device to respond to the live object of the data representation by determining an object identifier (ID) of the live object and to register for updates of the live object with the routing network, such that registering the client device with the routing network provides client connection information to a node in the routing network; and
[20.2]	that causes the client device to determine an object identifier (ID) of the live object to register for updates of the live object with the routing network, such that registering the client device with the routing network provides client connection information to the routing network,
[26.2]	that causes the client device to respond to the live object by determining an object identifier (ID) of the live object to register for updates of the live object with the routing network, such that registering the client device with the routing network provides client connection information to the routing network; and
[32.2]	wherein the client device is configured to respond to the live object of the data representation by determining an object identifier (ID) of the live object to register for updates of the live object with the routing network, such that registering the client device with the routing network provides client connection information to the routing network; and

292. Choquier specifies that communication links are established via between clients and servers of Choquier's network to facilitate exchange of information such as "update transactions." Ex.1007, 8:8-12.

293. Bird specifies that client devices initiate requests to register for content updates. Ex.1008, [0039]. As I have explained in this declaration, Tsutsumitake discloses determining an object ID and registering for updates in response to receiving a data representation including a live object. Tsutsumitake discloses that the client "analyzes the content of the [web]page sent from the server," and, if "the event request is included" the client uses the URL (object ID) of the event and sends "the event request to the server." Ex.1006, 10:56-67, Figs. 1, 3.

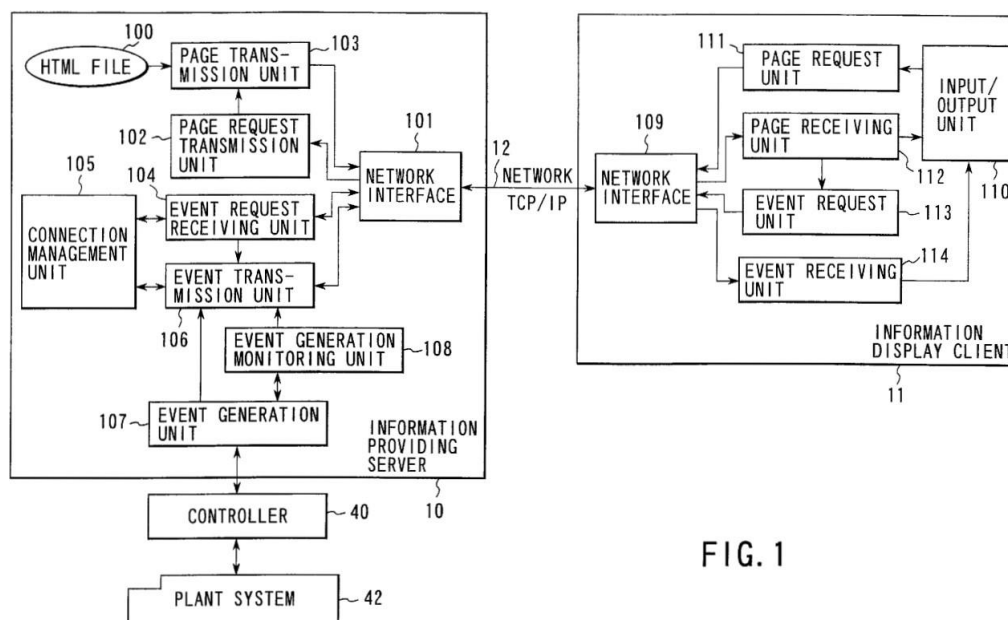
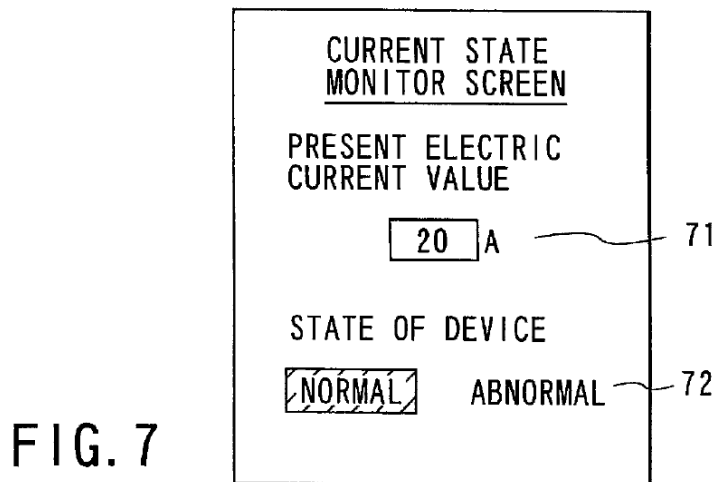


FIG. 1

294. This causes the client to register for updates because it "activate[s] the event notification," and can then "be dynamically changed according to the event

notification sent from the server.” Ex.1006, 4:22-29; see also 1:7-43, 7:63-8:23, 9:43-68, 13:32-14:3, Fig. 7.



295. Connection information is also provided as part of the registration request. At the server 10, “[t]he event request receiving unit 104 asks the connection management unit 105 whether or not an identifier (event ID) of the event requested by the event request and an identifier (client ID) of the client 11 at the request originating point have already been registered” and “[i]f they are not registered, a pair of the...event ID...and...client ID...are registered in the connection management unit 105.” Ex.1006, 11:45-55.

296. As I described in Section I.1., the combination would not be limited to Tsutsumitake’s example live object. Bird discloses updating stock prices. Ex.1008, [0039], [0044], [0065]. Choquier discloses various information-based updating content, like bulletin board messages, news, or stock quotes. Ex.1007, 6:8-22, 23:26-

33. As disclosed in Bird, publish/subscribe was “a known information distribution mechanism in which information providers (Publishers) send information electronically across a network to a community of information users (Subscribers) who have chosen the topics of information they wish to receive.” Ex.1008, [0002].

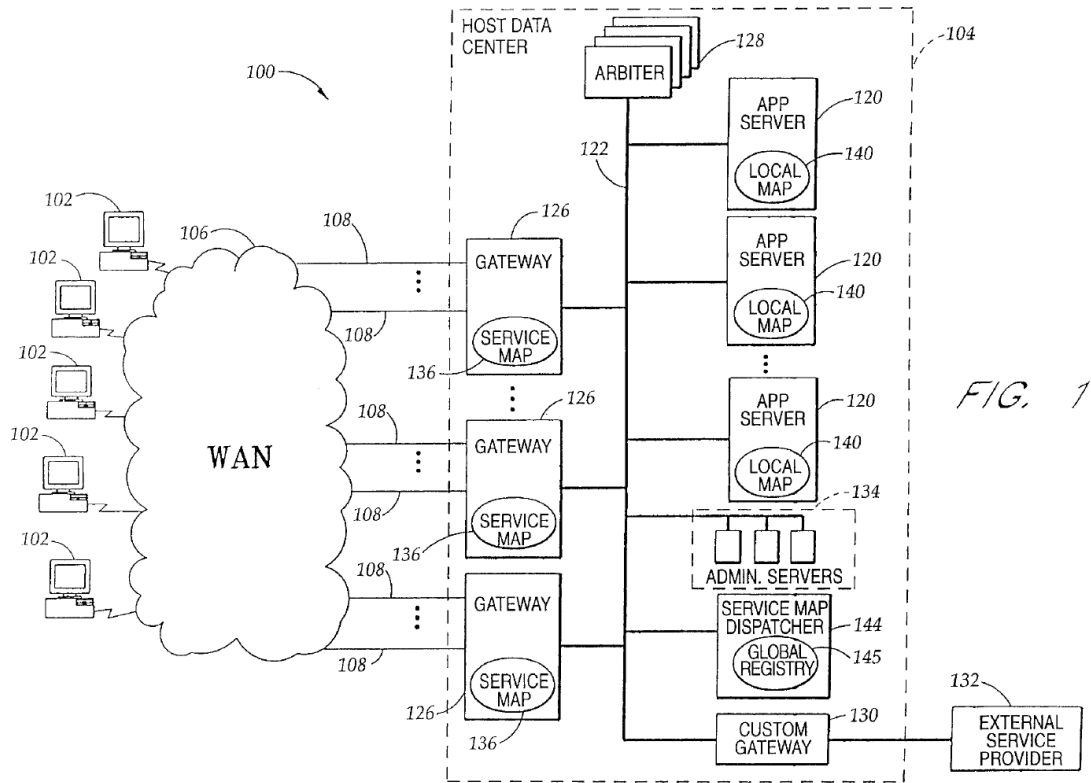
297. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

d. [1.1], [7.1], [14.3], [20.3], [26.3], [32.3]: Receive/send update message from input source

Claim	Limitations
[1.1]	receiving, using a processing device, an update message from an input source, the update message identifying a live object and containing data for updating a property of the live object;
[7.1]	a gateway device configured to: receive an update message from an input source, the update message identifying a live object and containing data for updating a property of the live object,
[14.3]	sending, using the processing device of the input source, an update message to the routing network, wherein the update message identifies the live object and contains update data that updates a property of the live object,
[20.3]	wherein the input source device is configured to route an update message to the routing network, wherein the update message identifies the live object and contains update data for updating a property of the live object,

[26.3]	sending, using the processing device of the input source, an update message to the routing network, wherein the update message identifies the live object and contains update data for updating a property of the live object,
[32.3]	instructions for providing, using a processing device of an input source, different from the client device, an update message to the routing network, wherein the update message identifies the live object and contains update data for updating a property of the live object,

298. Choquier discloses an input source, different from a client device, can send/route an update message to Choquier's network.



299. Choquier also discloses update messages. As explained in Choquier, data can be sent/routed from input sources such as “an external data provider connected to the host data center 104 by the Internet,” to provide update data (“update transactions”) for services that update or change over time. Ex.1007, 9:50-65, 10:4-12.

300. "To ensure consistency between such locally-stored data sets (so that all users of the service see the same data), an Arbiter service is used to replicate update transactions across all servers 120 of a service group. In the preferred embodiment, the Arbiter service runs on the Arbiter microcomputers 128, and one Arbiter microcomputer 128 is allocated to each service (i.e., to each service group) that uses the Arbiter service to replicate update transactions." (Ex.1007, 10: 4-12). A POSITA would understand that update transactions are update messages.

301. Choquier further discloses that the update messages can be received by a gateway device. Choquier discloses using a gateway 130 that “links the host data center 104 to one or more external service providers 132” and Arbiter microcomputers 128 for disseminating data to appropriate server groups using service maps 120. Ex.1007, 6:37-47, 23:9-19.

302. Bird also discloses various input sources (multiple publisher applications) sending published messages (with “message headers” and “content fields”) to a routing network (computer system(s) 100) for eventual routing of messages to

subscriber applications on client devices. Ex.1008, [0003], [0036]-[0039]. See.

FIGS. 1-2 of Bird:

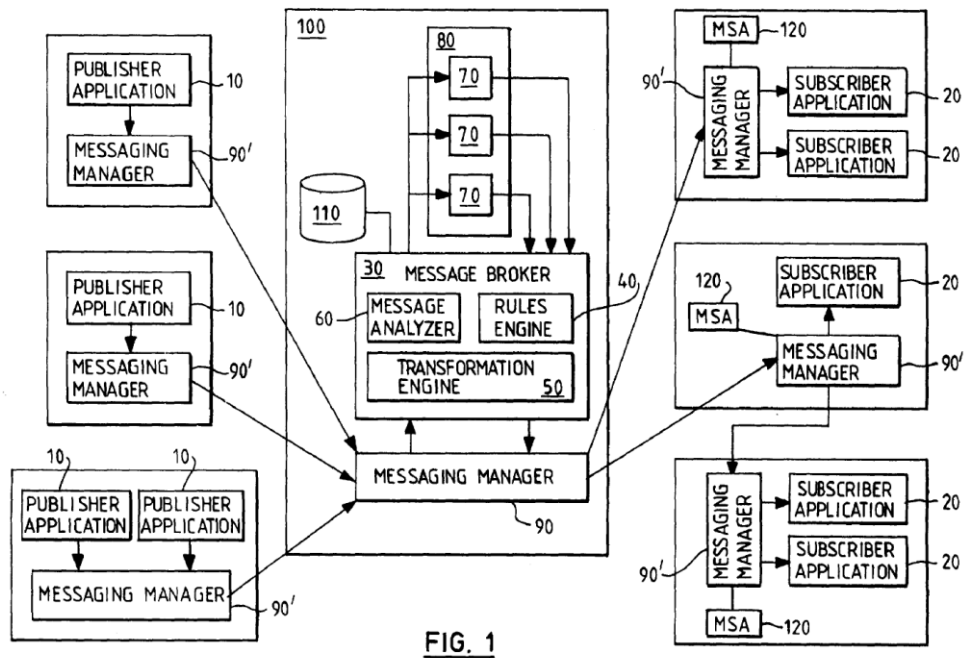


FIG. 1

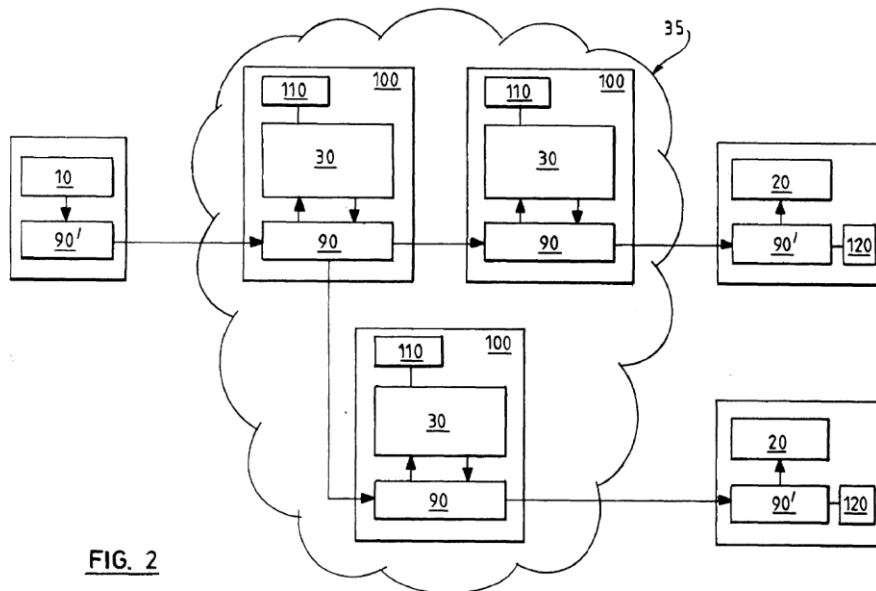


FIG. 2

303. Tsutsumitake discloses a live object: “[i]f an event has occurred, the server 10 sends it to the client 11 with use of [a] connection ID. Subsequently, as shown in Fig. 6, each time an event has occurred, it is sent [to client 11] repeatedly with use of the [connection] ID.” Ex.1006, 13:1- 5; see also 12:10-15, Figs. 1, 5. “[E]ach time an event has occurred in the server the event notification has to be sent to the [registered] client[s].” Ex.1006, 4:36-38; see also 12:23-28.

304. Choquier discloses servers (Ex.1007, 2:1-18); gateway microcomputers (Ex. 1007, 2:58-61); client microcomputers (Ex. 1007, 4:1-4), and Arbiter microcomputers (Ex. 1007, 6:32-35). All of which are processing devices. Tsutsumitake discloses servers (Ex.1006, 3:20-26); client computers (Ex.1006, 4:7-14) all of which are processing devices. Bird discloses subscriber computers and server computers (Ex.1008, 0006), which are processing devices.

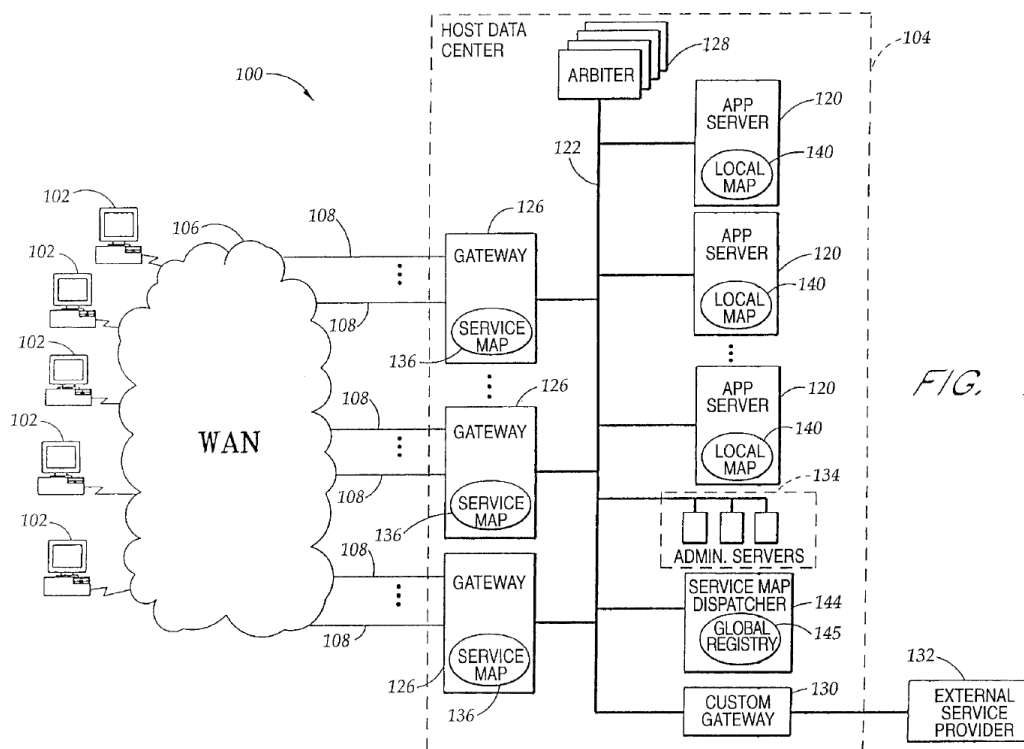
305. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

e. [1.2], [7.2], [14.4], [20.4], [26.4], [32.4]: Gateway identifies a category of update message and determining node having node type

Claim	Limitations
[1.2]	identifying a category of the update message based on the input source; determining a node having a node type to which the update message is to be routed based on a mapping of categories of

	update messages to node types, the mapping controlling an amount of update message traffic through nodes of a routing network;
[7.2]	identify a category of the update message based on the input source; determine a node having a node type to which the update message is to be routed based on a mapping of a categories of update messages to node types, the mapping controlling an amount of update message traffic through nodes of a routing network; and
[14.4]	wherein a gateway device at the routing network is configured to identify a category of the update message based on the input source, to determine a node type to which the identified category maps,
[20.4]	wherein a gateway device at the network is configured to identify a category of the update message based on the input source, to determine a node type to which the identified category maps, and
[26.4]	wherein a gateway device at the routing network is configured to identify a category of the update message based on the input source, to determine a node type to which the identified category maps, and
[32.4]	wherein a gateway device at the routing network is configured to identify a category of the update message based on the input source, to determine a node type to which the identified category maps, and

306. Choquier discloses assigning servers to server groups (node types) based on the type of services they are configured to provide using a service map. Ex.1007, 2:1-4, 2:14-18, 6:8-31, 9:40-49, 11:44-47. Service groups can include one server or multiple servers, and it is possible for a server to be assigned to multiple service groups. Ex.1007, 2:14-18, 6:24-31, 9:40-49, 11:44-47.



307. Choquier explicitly discloses mapping. As an example, when an “update transaction” is received, an Arbiter stores in a log information such as a transaction ID and an originator of the update, and then “dispatches the update transactions” to servers in the server group (servers of a particular server type) according to the service map to update at servers content to be provided to client devices, such as new messages for an online bulletin board application or an update to an interactive

game. Ex.1007, 9:50-65, 21:33-53, 22:34-45. Choquier also specifies that service groups can be assigned to handle a specific topic or set of topics. Ex.1007, 10:17-20. Each “Arbiter microcomputer 128 keeps track of the servers 120 within its respective service group by monitoring the global registry 145, which includes a mapping of servers to service groups.” Ex.1007, 21:22-30. A POSITA would understand that this mapping is determining the node to send the update message to based on a mapping of categories of update messages to node types.

308. Choquier further discloses service groups assist with controlling traffic on the network. First, a POSITA would have understood that sending communications to only certain server groups would reduce network traffic in Choquier’s system. Second, Choquier discloses load balancing using server loads recorded in the service maps and performance of dynamic server allocation to server groups to control overall network load and efficient use of network resources. Ex.1007, 23:26-35, 23:49-24:3.

309. Bird discloses that it was well-known for publish/subscribe systems to categorize messages according to input source topics, that is, messages from specific publishers (“company name” “specific publisher organisation”) and that headers of received messages can be analyzed to determine the identification of the sender for the message for use in subsequent routing of the message. Ex.1008, [0003], [0044]-[0045], [0060].

310. As described above in Section I.1., a POSITA would have been motivated to map Choquier's server groups, which Choquier discloses can be organized by type to handle a specific topic or a set of topics, to handle messages from specific publisher (message categories based on input source), as disclosed in Bird. Ex.1007, 1:52-67, 10:17-20, 25:5-21; Ex.1008, [0003], [0044]-[0045], [0060].

311. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

f. [1.3], [7.3], [14.5], [20.5], [26.5], [32.5]: Gateway routes the update message to the node having the node type

Claim	Limitations
[1.3]	routing, using the processing device, the update message to the node having the determined node type;
[7.3]	route the update message; and the node configured to: receive the update message from the gateway device, wherein the node is configured to be mapped to the node type,
[14.5]	and to route the update message to the node, having the node type, at the routing network,
[20.5]	to route the update message to a node of the node type at the routing network,
[26.5]	to route the update message to a node of the node type at the routing network,

[32.5]	to route the update message to a node of the node type at the routing network,
---------------	--

312. As described above, Choquier discloses routing update messages to servers (nodes) of particular server groups (server/node type) based on service maps that map servers to server groups, and server groups can be according to a topic or set of topics. Ex.1007, 9:50-65, 10:17-20, 21:33-53, 22:34-45.

313. When an “update transaction” is received, an Arbiter stores in a log information such as a transaction ID and an originator of the update, and then “dispatches the update transactions” to servers in the server group (servers of a particular server type) according to the service map to update at servers content to be provided to client devices, such as new messages for an online bulletin board application or an update to an interactive game. Ex.1007, 9:50-65, 21:33-53, 22:34-45. Choquier also specifies that service groups can be assigned to handle a specific topic or set of topics. Ex.1007, 10:17-20.

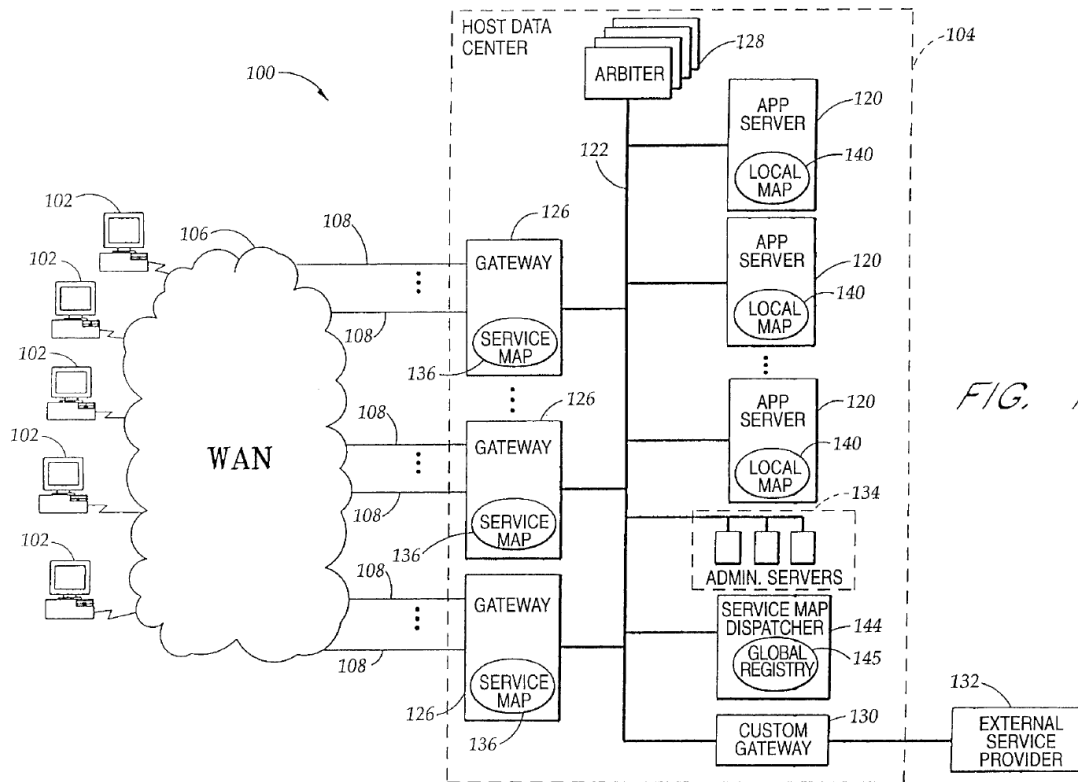
314. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

g. [1.4], [7.4], [14.6], [20.6], [26.6], [32.6]: Node determines/identifies client registered for updates and route update message to client

Claim	Limitations
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[1.4]	causing the node, through the update message, to determine a client, different from the input source, that has registered for updates of the live object; causing the node to route the update message from the node to the client; and
[7.4]	determine a client, different from the input source, that has registered for updates of the live object, and route the update message from the node to the client,
[14.6]	wherein the node is configured to identify the client device as a registered device and to route the update message to the client device, and
[20.6]	wherein the node is configured to identify the client device as a registered device and route the update message containing the update data to the client device, and
[26.6]	wherein the node is configured to identify the client device as a registered device and to route the update message to the client device, and
[32.6]	wherein the node is configured to identify the client device as a registered device and to route the update message containing the update data to the client device, and

315. Choquier discloses that servers communicate with client devices, through associated gateways 126, to route updates messages from the servers to clients.

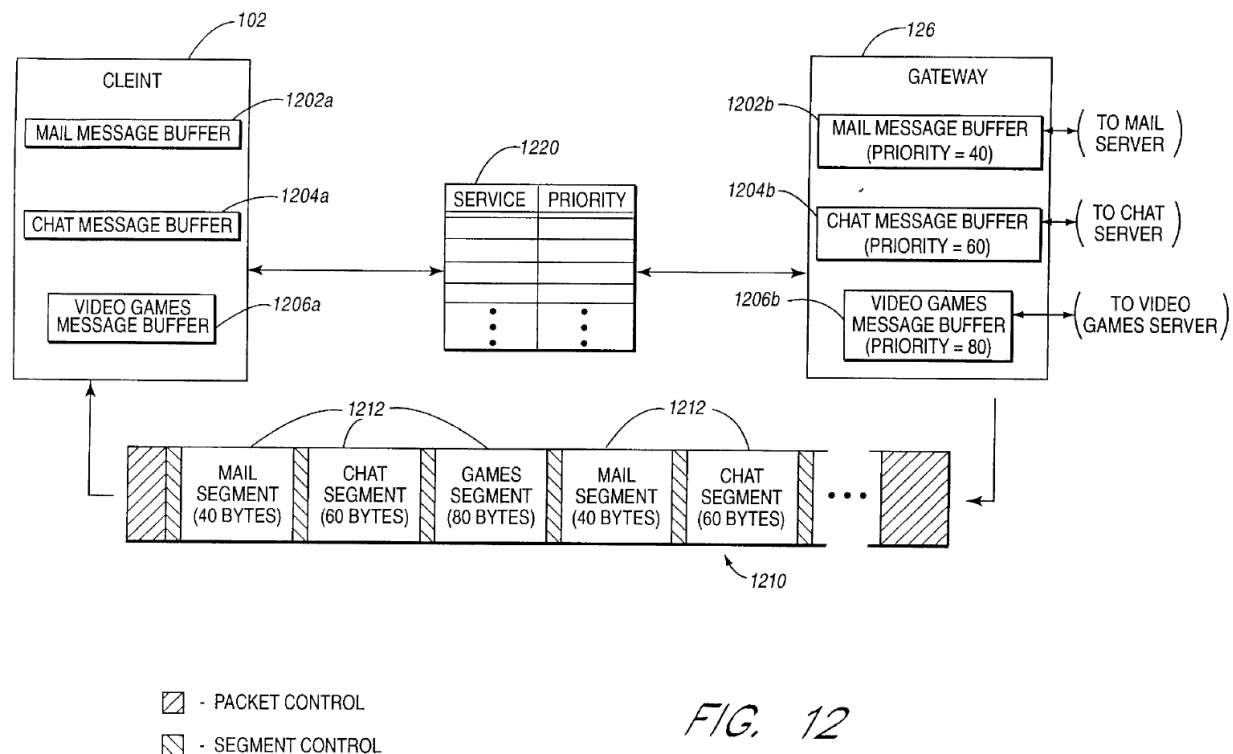


316. Choquier discloses "The Gateway microcomputers receive service requests which are transmitted over a WAN from client microcomputers operated by end users." Ex.1007, abstract. A POSITA would understand the client computers are different from the input source, e.g., "an external data provider connected to the host data center 104 by the Internet". Ex.1007, 9:57-65. Displaying data on these client computers would be updating a live object.

317. Choquier also discloses routing update messages from the node to the client. Choquier discloses that servers and clients communicate over service instance channels which can use TCP/IP. Ex.1007, 8:17-24. Messages are routed to the clients in packets. Ex.1007, 18:24-19:60, FIGS. 11A-11B. FIG. 12 illustrates messages

being sent to the client (which can be multiplexed if the client requested multiple types). Ex.1007, 20:16-31.

318.



319. “The Gateway microcomputer assigned to the logon session maintains the various client server message streams by routing service requests (from the client microcomputer) to the appropriate application servers, *and by returning application server responses to the client microcomputer*. Ex.1007, 2:40-45, (emphasis added).

320. Bird discloses routing messages. Bird’s servers use a message analyzer and rules engine to analyze message headers for the topic and/or sender (input source) identification, determine which clients are subscribed for the type, and to route

messages to the clients. Ex.1008, [0043]-[0044], [0052]. Bird also discloses "The message broker then forwards 280 the derived message to the subscriber or subscribers who specified this information requirement. This routing of the final derived message or messages to subscribers in accordance with subscriber's information requirements (under the control of the rules engine 40) is very similar to the routing performed by prior art message brokers." Ex.1008, [0062]. It would have been obvious to include such functionality when implementing a publish/subscribe service in Choquier's system so that servers can determine which subscribed clients need to receive messages.

321. Likewise, Tsutsumitake discloses "each time an event has occurred in the server the event notification has to be sent to the [registered] client[s]" and "generated events are transmitted in real time to the client 11." Ex.1006, 4:36-38, 13:56-57.

322. As described throughout this declaration, Tsutsumitake discloses clients registering for updates. One example of this is the following "The event request receiving unit 104 asks the connection management unit105 whether or not an identifier (event ID) of the event requested by the event request and an identifier (client ID) of the client 11 at the request originating point have already been registered (steps B8, B9)." Ex.1006, 11:45-50.

323. Bird also discloses registering for topics: "The message broker uses the topic identifier to check 210 records of subscriber requirements determining which *subscribers have registered a requirement to receive messages related to this* topic and determining what specific data requirements have been specified by those subscribers." Ex.1008, [0060], (emphasis added).

324. Choquier discloses update messages. The following excerpt is one example "The architecture further permits service applications to be updated without temporarily taking the services off-line." Ex.1007, 1:61-63. A POSITA would readily understand that updates are a core function of Choquier, and updates require some type of update message. Messages are discussed 92 times in Choquier, including the following "For example, all application servers within the BBS service group preferably store identical copies of all BBS messages. A service group may have as few as one application server." Ex.1007, 2:9-12. Choquier explicitly discloses at least the BBS service being updated via messages. As was discussed above, network traffic must be routed to the client to receive the updates, thus a POSITA would understand these update messages must be routed from node to the client.

325. As was discussed in section III.G.1 of this report, a node is simply a device that connects to a network. As such, Choquier, Bird, and Tsutsumitake all disclose nodes.

326. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

h. [1.5], [7.5], [14.7], [20.7], [26.7], [32.7]: Causing the client to process the update message and to update the property of the live object

Claim	Limitations
[1.5]	causing the client to process the update message and to update the property of the live object.
[7.5]	wherein the client is adapted to process the update message and to update the property of the live object.
[14.7]	wherein the client device processes the update message upon receipt to update the property of the live object at the client device.
[20.7]	wherein the client device is configured to process the update message upon receipt to update the property of the live object at the client device.
[26.7]	wherein the client device is configured to process the update message upon receipt to update the property of the live object at the client device.
[32.7]	wherein the client device is configured to process the update message upon receipt to update the property of the live object at the client device.

327. As described above, Choquier discloses that clients are sent packets providing updated content disseminated through its network to update content. Ex.1007, 9:50-58, 18:24-19:60, 20:16-31.

328. Additionally, Tsutsumitake discloses “[t]he browser (client 11) processes a plurality of events (both the event indicating the present value of current and [] the state of the device being transmitted in real time) sent from the server 10 in response to one event request issued in accordance with the displayed page, and reflects on the screen the event processing results,” as shown in Fig. 7. Ex. 1006, 13:59-66.

329. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

- i. **[2.0], [8.0]: Node extracts an object ID from the update message, to establish/determine a connection with the client, and to determine if the client has registered for updates of the live object based on the object ID.**

Claim	Limitations
[2.0]	The method of claim 1, further comprising: causing the node to extract an object identifier (ID) from the update message, to establish a connection with the client, and to determine if the client has registered for updates of the live object based on the object ID.
[8.0]	The routing network of claim 7, wherein the node is configured to extract an object identifier (ID) from the update message and

	to determine a connection to the client to route the data to the client.
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330. As explained in Section I.3.a-h., the combination provides for routing messages to clients over connections to clients based on the update message, and that update messages have IDs.

331. Also, Choquier identifies servers "Together, the CPU LOAD and CPU INDEX for a server 120 indicate the available processing power for the server and are thus useful for identifying the servers 120 that are most capable of handling new service sessions." Ex.1007, 11:36-38. Given that Choquier is sending messages to specific clients, it would be obvious to a POSITA that some identifier is necessary.

332. Bird discloses that its servers analyze message headers for the topic and/or sender (input source) identification, determines which clients are subscribed to received the message, and routes the message to the determined clients. Ex.1008, [0043]-[0044], [0052].

333. Tsutsumitake also discloses an object identifier. Tsutsumitake discloses associated event IDs with client IDs to determine which clients need event updates and "are registered in the connection management unit 105." Ex.1006, 11:45-55, Fig. 4. "The even request receiving unit 104 asks the connection management unit 105 whether or not an identifier (event ID) of the event requested by the event request and an identifier (client ID) of the client 11 at the request originating point have

already been registered (steps B8, B9). If they are not registered, a pair of the identifier (event ID) off the event requested by the event request and the identifier (client ID) of the client 11 at the request originating point are registered in the connection management unit 105 (step B11)” Ex.1006, 11: 45-55.

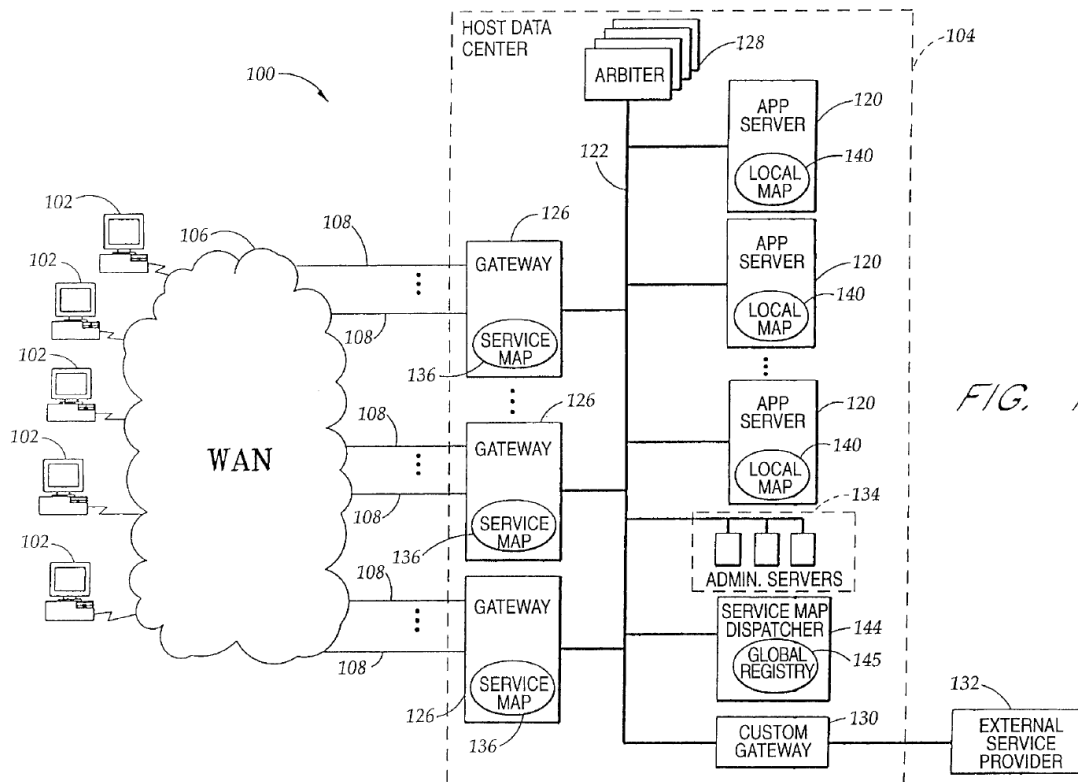
334. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

j. [3.0], [9.0]: Node determines at least one client proxy and routes to determine the connection

Claim	Limitations
[3.0]	The method of claim 2, further comprising: causing the node to determine at least one client proxy with which the client communicates; causing the node to route the update message to the client proxy; and causing the client proxy to route the update message to the client to determine the connection.
[9.0]	The routing network of claim 8, wherein the node is configured to determine the connection by determining at least one client proxy with which the client communicates and to route the update message to the client proxy.

335. As was discussed in section III.G.1 of this report, a node is simply a device that connects to a network. As such, Choquier, Bird, Tsutsumitake, Bird, and Herz all disclose nodes.

336. Choquier discloses gateways 126 that establish communication links with one or multiple clients to allow the client(s) to “communicate with multiple servers 120.” Ex.1007, 8:8-16. Messages are passed “between the gateway 126 and the server 120” and sent to the clients via the gateways 126. Ex.1007, 8:17-35.



337. This corresponds to the '722 Patent's “client proxy,” which “merely passes messages among the clients and nodes” and/or “stores client registration information ... [to] determine which client proxies have registered for the messages[] and [to] send the messages to the appropriate client proxies” to thereafter send to registered clients. Ex.1005, 3:60-4:2. As was discussed in section III.G.3, proxies are common

devices on networks. Choquier explicitly discloses gateways, it would have been obvious to a POSITA to also include a proxy in Choquier.

338. Choquier also discloses routing update messages. The following excerpt is one example "The architecture further permits service applications to be updated without temporarily taking the services off-line." Ex.1007, 1:61-63. A POSITA would readily understand that updates are a core function of Choquier, and updates require some type of update message. Messages are discussed 92 times in Choquier, including the following "For example, all application servers within the BBS service group preferably store identical copies of all BBS messages. A service group may have as few as one application server." Ex.1007, 2:9-12. Choquier explicitly discloses at least the BBS service being updated via messages.

339. Bird discloses routing messages: "The message broker then forwards 280 the derived message to the subscriber or subscribers who specified this information requirement. This routing of the final derived message or messages to subscribers in accordance with subscriber's information requirements (under the control of the rules engine 40) is very similar to the routing performed by prior art message brokers." Ex.1008, 0062.

340. Tsutsumitake also discloses a proxy server. As one example, "Though not shown, a relay server called "proxy server" may be provided between the information providing server 10 and the information display client 11. The proxy

server receives a request from the client, Sends the request to the Server as it is, and returns a result from the Server directly to the client. A plurality of Such proxy Servers may be provided between the information providing server 10 and information display client 1.” Ex.1006, 8:7-14.

341. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

342. To the extent the Choquier-Bird-Tsutsumitake combination does not explicitly disclose a client proxy that routes messages and stores client information, it would have been obvious, and a POSITA would have been motivated as described above, to include one or more proxy servers as a client proxy, as disclosed in Herz, in the system of the Choquier-Bird-Tsutsumitake combination to transfer communications between servers and clients and handle client registration and connection information, as disclosed in Herz. Herz also discloses a proxy server, and one specifically to route messages: "Any server in the network N may be configured to act as a proxy server in addition to its other functions. Each proxy server provides service to a set of users, which set is termed the "user base" of that proxy server. A given proxy server provides three sorts of service to each user U in its user base." Ex.1009, 32:20-24. The proxy server of Herz is also shown in figure 2 (S2) and figure 15 from Herz:

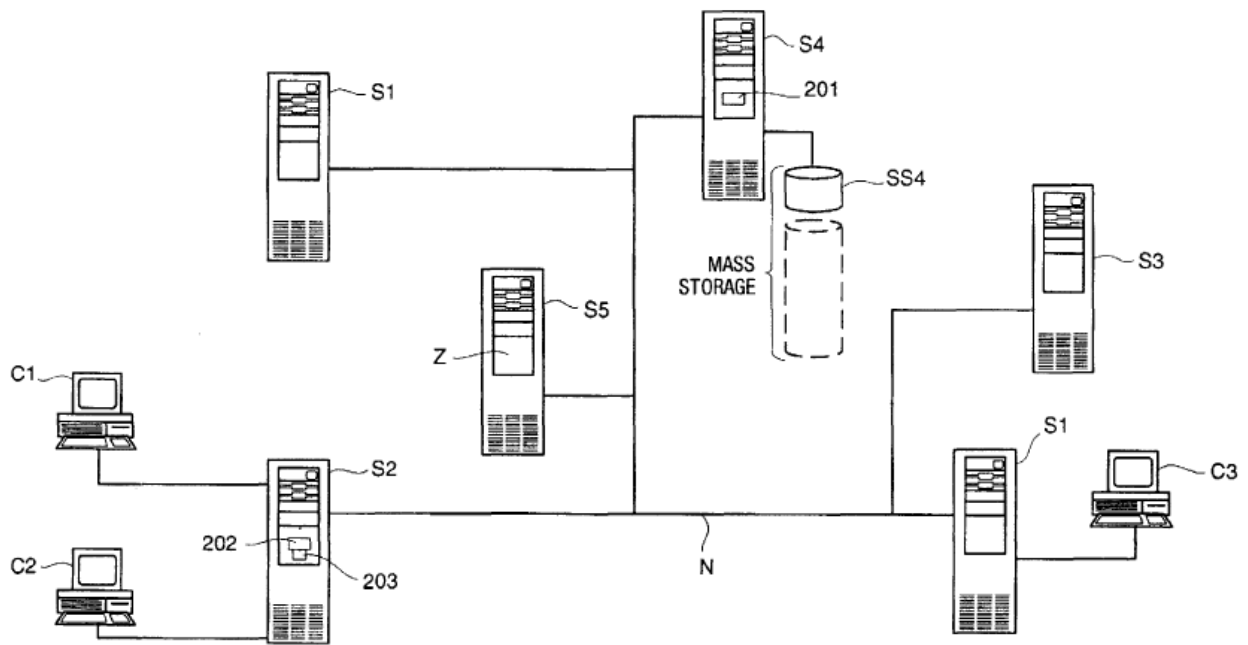
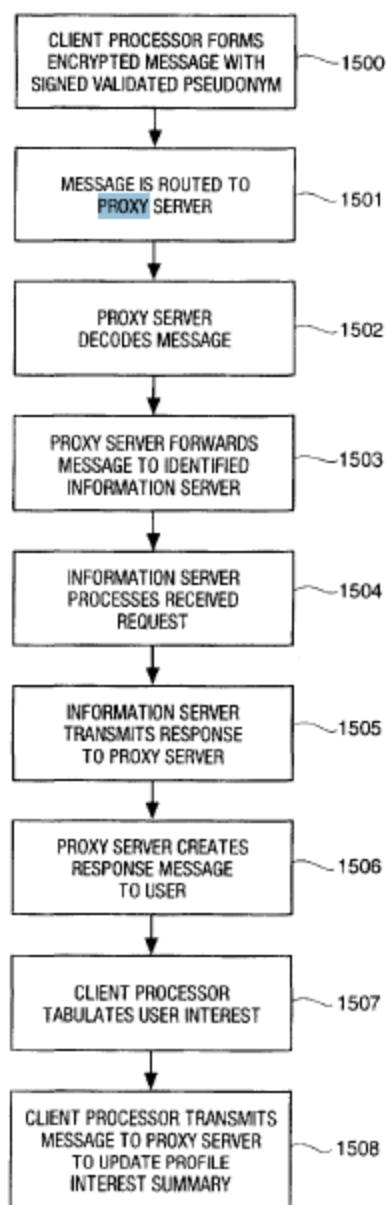


FIG. 2

FIG. 15



343. Herz also discloses routing the message from the node to the client "If the user is a subscriber to the news clipping service described below. request R may instruct proxy server S2 to forward to the user all target objects that the news clipping service has sent to proxy server S2 for the user's attention." Ex.1009, 38:44-47.

k. [4.0], [10.0]: Maintain client registration information concerning the client connection at the node

Claim	Limitations
[4.0]	The method of claim 3, further comprising causing the node to maintain client registration information concerning the client connection.
[10.0]	The routing network of claim 9, wherein client registration information concerning the client connection is configured to be maintained at the node.

344. As described above, the combination discloses the method of claim 3 and the routing network of claim 9.

345. As explained in Section I.3.a-h., Choquier establishes communication links with nodes and Choquier as modified would maintain information on client subscriptions/registrations. Ex.1007, 8:8-35.

346. Choquier discloses subscribers: "Advantageously, the processing capacity of the host data center 104 can easily be increased (to support increases in the number of subscribers, for example) by connecting additional Gateways 126 and application servers 120 to the LAN 122, adding additional LANs when necessary. Ex.1007, 5:45-49.

347. Choquier discloses "The Gateway microcomputers receive service requests which are transmitted over a WAN from client microcomputers operated by end users." Ex.1007, abstract.

348. Tsutsumitake discloses clients registering for updates. One example of this is the following "The event request receiving unit 104 asks the connection management unit105 whether or not an identifier (event ID) of the event requested by the event request and an identifier (client ID) of the client 11 at the request originating point have already been registered (steps B8, B9)." Ex.1006, 11:45-50.

349. Bird discloses registering for topics: "The message broker uses the topic identifier to check 210 records of subscriber requirements -determining which subscribers have registered a requirement to receive messages related to this topic and determining what specific data requirements have been specified by those subscribers." Ex.1008, [0060].

350. Tsutsumitake discloses maintaining the client registration information concerning the client connection. As one example, "Specifically the connection for the event notification is maintained, but if the connection is cut off due to some external cause, the client automatically reconnects to the network." Ex.1006, 6:59-63.

351. Maintaining client registration information concerning the client connection is also disclosed elsewhere in Tsutsumitake, "In order to transmit every occurring

event in response to one event request, the connection between the server 10 and client 11 at the event request originating point is always maintained.” Ex.1006, 12:29-34.

352. Tsutsumitake further discloses “The connection management unit 105 manages, for example, on a table format, information indicating which event is requested by which client, namely, connection information” Ex.1006, 9:29-32.

353. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

I. [5.0], [11.0]: Maintain client registration information concerning the client connection at the client proxy

Claim	Limitations
[5.0]	The method of claim 3, further comprising causing the node to maintain client registration information concerning the client connection at the client proxy.
[11.0]	The routing network of claim 9, wherein client registration information concerning the client connection is configured to be maintained at the client proxy.

354. As described above, the combination discloses the method of claim 3 and the routing network of claim 9.

355. As explained in Sections I.3.a-h, I.3.j., with respect to the independent claims and claims 3 and 9, Choquier's gateways 126 act as client proxies and maintain information on communication links with clients. Ex.1007, 8:17-35.

356. As was discussed in reference to claim 3, Tsutsumitake discloses a proxy. As one example, "Though not shown, a relay server called "proxy server" may be provided between the information providing server 10 and the information display client 11. The proxy server receives a request from the client, Sends the request to the Server as it is, and returns a result from the Server directly to the client. A plurality of Such proxy Servers may be provided between the information providing server 10 and information display client 1." Ex.1006, 8:7-14.

357. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

358. To the extent the Choquier-Bird-Tsutsumitake combination does not explicitly disclose a client proxy that routes messages and stores client information, it would have been obvious, and a POSITA would have been motivated as described above, to include one or more proxy servers as a client proxy, as disclosed in Herz, in the system of the Choquier-Bird-Tsutsumitake combination to transfer communications between servers and clients and handle client registration and connection information, as disclosed in Herz. Herz also discloses a proxy server, and one specifically to route messages: "Any server in the network N may be configured to

act as a proxy server in addition to its other functions. Each proxy server provides service to a set of users, which set is termed the "user base" of that proxy server. A given proxy server provides three sorts of service to each user U in its user base." Ex.1009, 32:20-24. The proxy server of Herz is also shown in figure 2 (S2) and figure 15 from Herz:

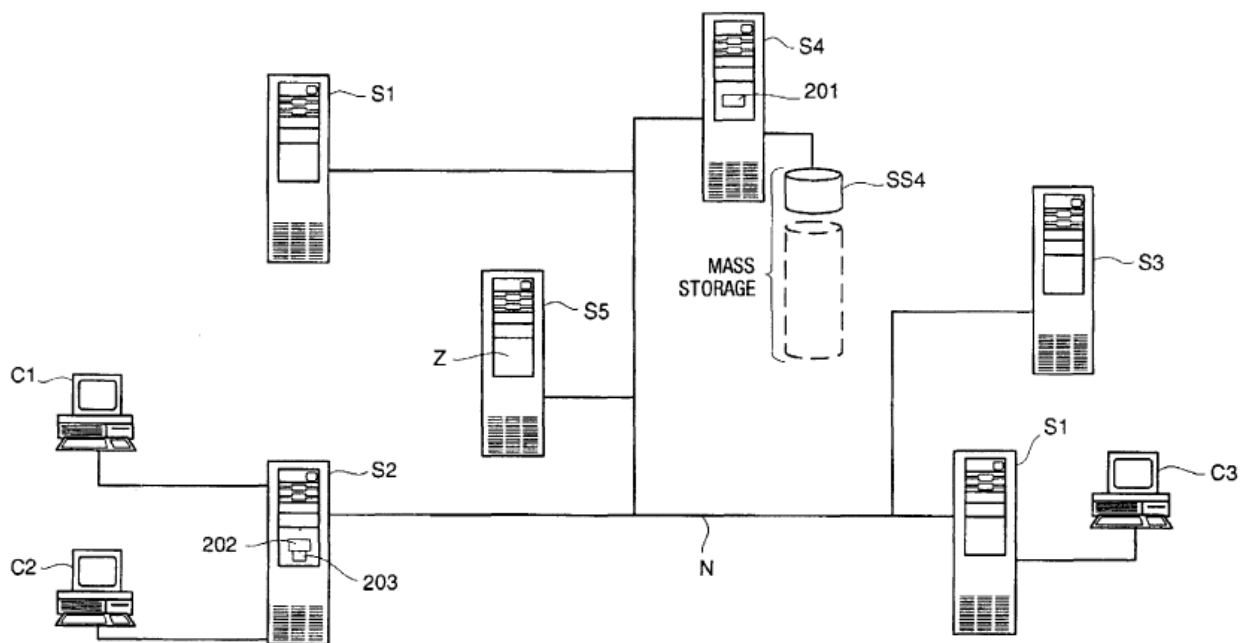
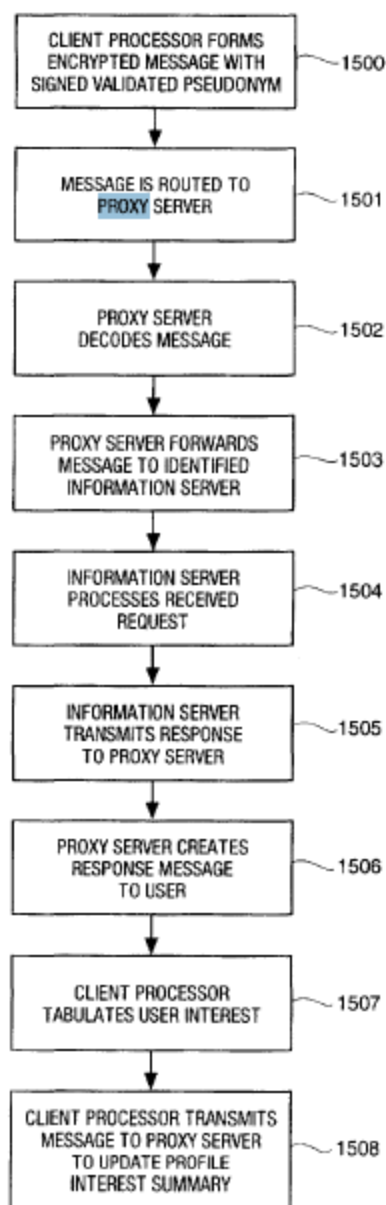


FIG. 2

FIG. 15



359. Herz also discloses client registration information and clients subscribing: "A subset of the user's long-term attributes are determined when the user first registers with the system." Ex.1009, 27:67-28:2. Herz also discloses subscribing "If the user is a subscriber to the news clipping service described below. request R may instruct

proxy server S2 to forward to the user all target objects that the news clipping service has sent to proxy server S2 for the user's attention" Ex.1009, 38:44-47.

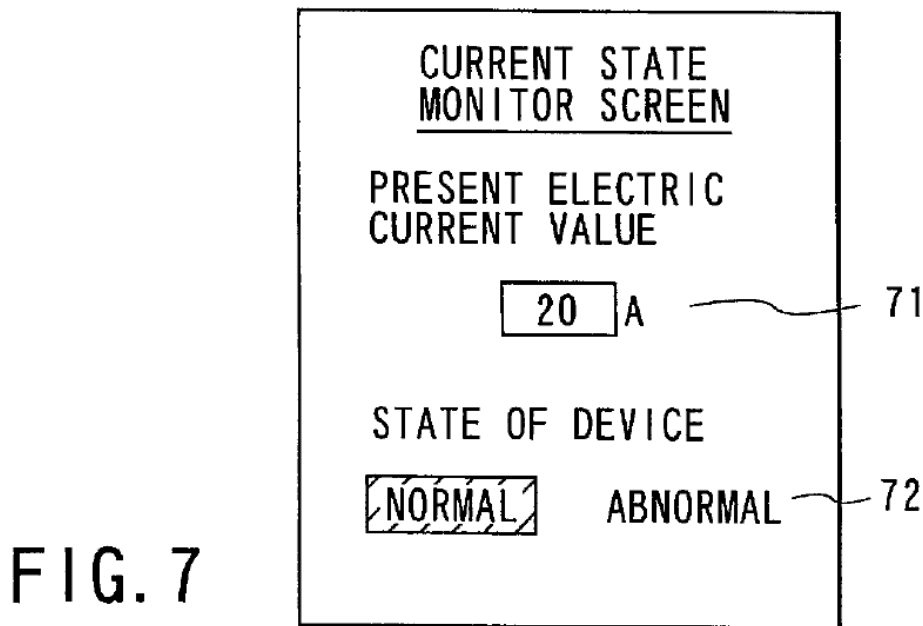
m. [6.0]: Property of the live object has effect on visual representation of the live object...

Claim	Limitations
[6.0]	The method of claim 1, wherein the property of the live object has a direct effect on a visual representation of the live object in a data representation, has an effect on an internal aspect of the live object and has no effect on the visual representation of the live object in the data representation, or has a direct effect on one aspect of the visual representation of the live object in the data representation and has no effect on other aspect of the visual representation of the live object in the data representation.

360. Choquier describes that its services cause visual updates to data, such as updates to news, chat messages, bulletin boards, stock quotes, etc. Ex.1007, 6:8-22.

361. Bird also discloses updating visual data, such as updating stock prices. Ex.1008, [0039], [0044], [0065].

362. Tsutsumitake discloses an example in which updating its live object causes a visual change in electric current value or device state. Ex.1006, FIG. 7.



363. Tsutsumitake also discloses events updating data that would have no direct effect on a visual representation (e.g., refresh “period,” “target,” “name” in Fig. 8’s HTML code). Ex.1006, 14:4-15.

```

< HTML >
< HEAD >
< TITLE > CURRENT MONITOR < /TITLE >
< /HEAD >
< BODY >
< H1 > CURRENT MONITOR SCREEN < /H1 >
< H2 > PRESENT CURRENT VALUE < /H2 >
  < HANDLER type=text name=currency > A
  < EMBED >
    < EVENT url=http://abc.def/current period=1 target=currency >
  < /EMBED >
< H2 > STATE OF DEVICE < /H2 >
  < HANDLER type=text value=normal name=valid >< HANDLER type=text value=abnormal name=invalid >
  < EMBED >
    < EVENT url=http://abc.cef/state target=valid,invalid >
  < /EMBED >
< /BODY >
< /HTML >

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FIG. 8

364. A POSITA would understand that Choquier as combined with Bird and Tsutsumitake renders obvious this claim limitation.

n. [12.0]: Gateway device routes update message to node adapted to receive messages of more than one message category and node determines client connection with client proxy and routes data to client proxy

Claim	Limitations
[12.0]	The routing network of claim 7, wherein: the gateway device is configured to route the update message to the node adapted to receive messages of more than one message category, and the node is configured to determine a connection with at least one client proxy with which the client communicates and to route the data to the client proxy.

365. As was discussed in reference to claim 7, the combination discloses the routing network of claim 7.

366. Claim 12 is obvious for at least the reasons described with respect to claims 3 and 9 in Section I.3.j. Choquier demonstrates that it was well-known for servers to be configured to process multiple application and message types because Choquier's individual servers can be assigned to multiple service and message groups/types. Ex.1007, 2:14-18, 6:24-31, 9:40-49, 10:17-20, 11:44-47.

367. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

368. To the extent the Choquier-Bird-Tsutsumitake combination does not explicitly disclose a client proxy that routes messages and stores client information, it would have been obvious, and a POSITA would have been motivated as described above, to include one or more proxy servers as a client proxy, as disclosed in Herz, in the system of the Choquier-Bird-Tsutsumitake combination to transfer communications between servers and clients and handle client registration and connection information, as disclosed in Herz. Herz also discloses a proxy server, and one specifically to route messages: "Any server in the network N may be configured to act as a proxy server in addition to its other functions. Each proxy server provides service to a set of users, which set is termed the "user base" of that proxy server. A given proxy server provides three sorts of service to each user U in its user base." Ex.1009, 32:20-24. The proxy server of Herz is also shown in figure 2 (S2) and figure 15 from Herz:

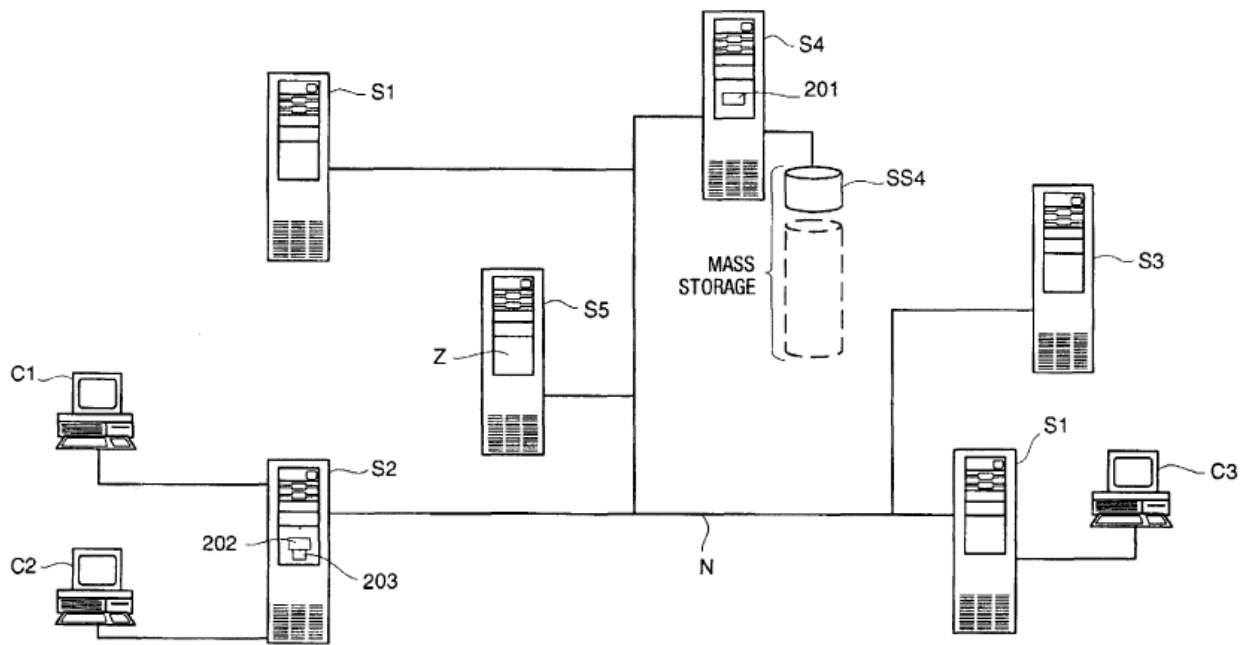
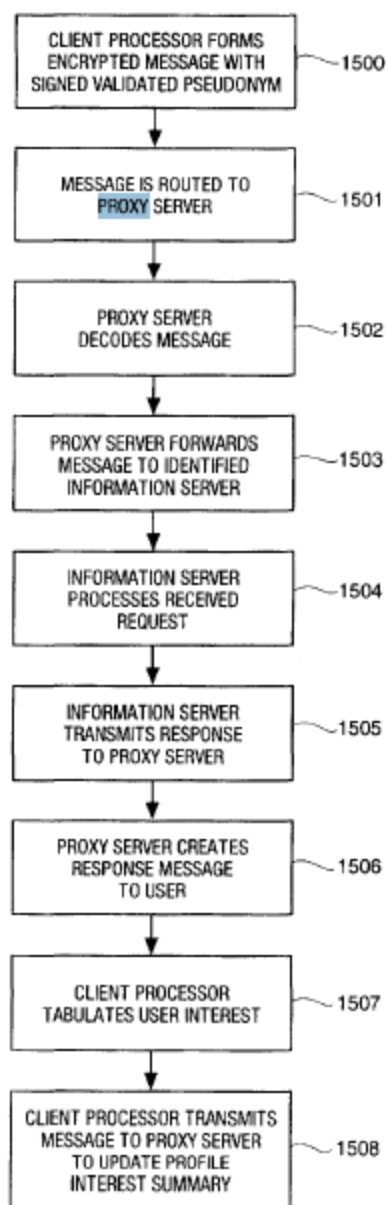


FIG. 2

FIG. 15



- o. [13.0] Node type is configured to identify the node that receives the update message from the gateway device.

Claim	Limitations
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[13.0]	The routing network of claim 7, wherein the node type is configured to identify the node that receives the update message from the gateway device.
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369. As was discussed in reference claim 7, the combination discloses the limitations of claim 7. As was discussed in reference to claim 7, the combination discloses node types. As was discussed in reference to claim 7, the combination discloses the gateway device.

370. Claim 13 is obvious for at least the reasons described with respect to the independent claims. As explained in Section I.3.a-h., the combination provides a gateway that routes messages to nodes based on node types.

371. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

p. [15.0], [21.0], [27.0], [33.0]: The method of claim 14, wherein providing the data representation to the client device includes providing the live object that causes the client device to register with a client proxy of the routing network.

Claim	Limitations
[15.0]	The method of claim 14, wherein providing the data representation to the client device includes providing the live object that causes the client device to register with a client proxy of the routing network.

[21.0]	The apparatus of claim 20, wherein the live object of the data representation is configured to cause the client device to register with a client proxy of the routing network.
[27.0]	The article of manufacture of claim 26, wherein the live object of the data representation causes the client device to register with a client proxy of the routing network.
[33.0]	The non-transitory computer readable storage medium of claim 32, wherein the live object of the data representation causes the client device to register with a client proxy of the routing network.

372. The combination discloses the method of claim 14, the apparatus of claim 20, the article of manufacture of claim 27, and the non-transitory computer readable storage medium of claim 27 (see above). The combination also discloses providing the data representation (data/records) to the client device (event consumer) and to cause the client device to register with a client proxy of the routing network (network of servers implementing event globalization process).

373. Choquier as modified by Tsutsumitake renders obvious that providing the data representation causes a client device to register for updates. See Section I.3.a-h. Additionally, the elements of claims 15, 21, 27, and 33 concerning a client proxy are obvious for similar reasons as claims 3 and 9. Choquier discloses using gateways 126 to establish client communications, acting as a proxy.

374. As was discussed in reference to claim 3, Tsutsumitake explicitly discloses a proxy. As one example, "Though not shown, a relay server called "proxy server" may be provided between the information providing server 10 and the information display client 11. The proxy server receives a request from the client, Sends the request to the Server as it is, and returns a result from the Server directly to the client. A plurality of such proxy servers may be provided between the information providing server 10 and information display client 1." Ex.1006, 8:7-14.

375. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

376. To the extent the Choquier-Bird-Tsutsumitake combination does not explicitly disclose a client proxy that routes messages and stores client information, it would have been obvious, and a POSITA would have been motivated as described above, to include one or more proxy servers as a client proxy, as disclosed in Herz, in the system of the Choquier-Bird-Tsutsumitake combination to transfer communications between servers and clients and handle client registration and connection information, as disclosed in Herz. Herz also discloses a proxy server, and one specifically to route messages: "Any server in the network N may be configured to act as a proxy server in addition to its other functions. Each proxy server provides service to a set of users, which set is termed the "user base" of that proxy server. A given proxy server provides three sorts of service to each user U in its user base."

Ex.1009, 32:20-24. The proxy server of Herz is also shown in figure 2 (S2) and figure 15 from Herz:

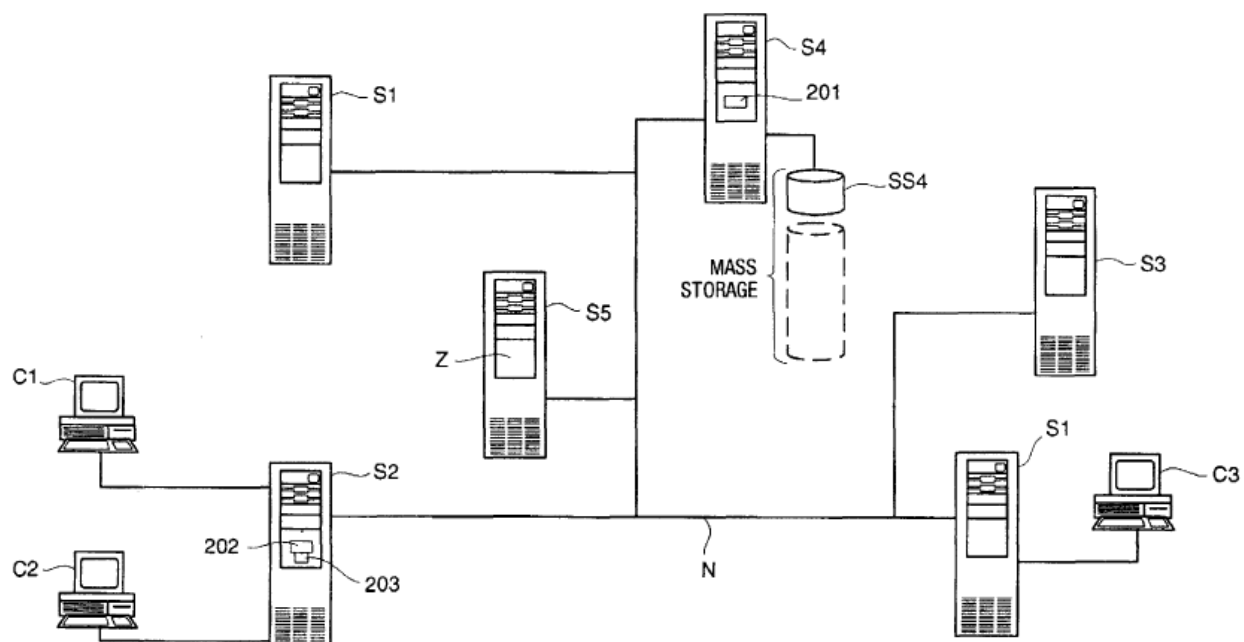
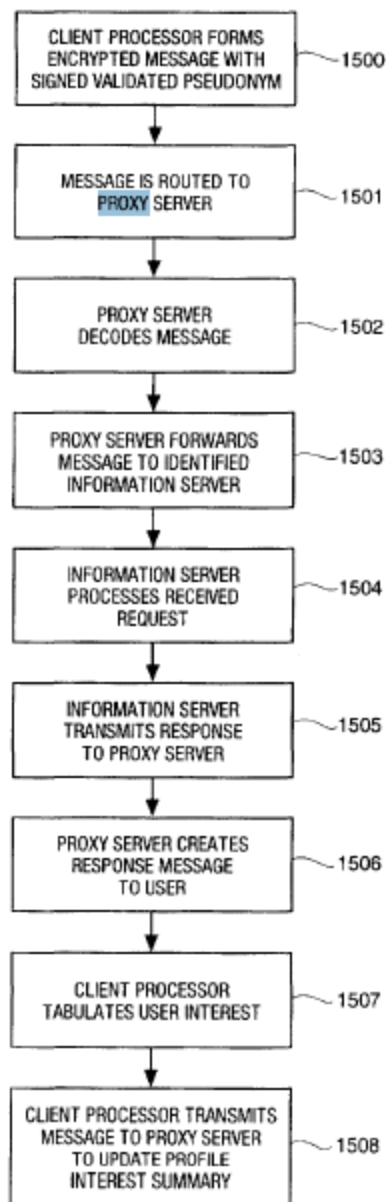


FIG. 2

FIG. 15



q. [16.0], [22.0], [28.0], [34.0]: The live object causes the client device to register with the node of the routing network

Claim	Limitations
[16.0]	The method of claim 14, wherein providing the data representation to the client device includes providing the live

	object that causes the client device to register with the node of the routing network.
[22.0]	The apparatus of claim 20, wherein the live object of the data representation is configured to cause the client device to register with the node of the routing network.
[28.0]	The article of manufacture of claim 26, wherein the live object of the data representation causes the client device to register with the node of the routing network.
[34.0]	The non-transitory computer readable storage medium of claim 32, wherein the live object of the data representation causes the client device to register with the node of the routing network.

377. The combination discloses the method of claim 14, the apparatus of claim 20, the article of manufacture of claim 27, and the non-transitory computer readable storage medium of claim 27 (see above). The combination also discloses providing the data representation (data/records) to the client device (event consumer) includes providing the live object that causes the client device to register with the node of the routing network (network of servers implementing event globalization process).

378. Choquier specifies that communication links are established via clients with servers of Choquier's network to facilitate exchange of information like updates to "update transactions" type services. Ex.1007, 8:8-12.

379. Bird specifies that client devices initiate requests to register for content updates. Ex.1008, [0039].

380. Tsutsumitake discloses that an HTML file that includes an embedded event (live object) is provided to the client and the client “can automatically issue the event request to the server according to the event request information set in the [web]page information, and can activate the event notification” to register for updates. Ex.1006, 4:22-29, 8:39-49, 11:45-55.

```
< HTML >
< HEAD >
< TITLE > SAMPLE PAGE < /TITLE >
< /HEAD >
< BODY >
< H1 > SAMPLE PAGE < /H1 >
THIS PAGE INCLUDES EVENT REQUEST
< EMBED >
  < EVENT URL=http://abc.def/hij.evt >
< /EMBED >
< /BODY >
< /HTML >
```

FIG. 2

381. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

r. [17.0], [23.0], [29.0], [35.0]: An activation module executed by the client device that registers the live object with the routing network

Claim	Limitations
[17.0]	The method of claim 14, wherein providing the data representation to the client device includes providing an

	activation module that is executed by the client device and that registers the live object with the routing network.
[23.0]	The apparatus of claim 20, wherein the received data representation includes an activation module that is configured to be executed by the client device and adapted to register the live object with the routing network.
[29.0]	The article of manufacture of claim 26, wherein the received data representation includes an activation module executed by the client device and adapted to register the live object with the routing network.
[35.0]	The non-transitory computer readable storage medium of claim 32, wherein the data representation includes an activation module that is executed by the client device and that is adapted to register the live object with the routing network.

382. The combination discloses the method of claim 14, the apparatus of claim 20, the article of manufacture of claim 27, and the non-transitory computer readable storage medium of claim 27 (see above). The combination also discloses providing the data representation (data/records) to the client device (event consumer) includes providing an activation module that is executed by the client device and that registers the live object with the routing network (network of servers implementing event globalization process).

383. Choquier specifies that communication links are established via clients with servers of Choquier's network to facilitate exchange of information like updates to "update transactions" type services. Ex.1007, 8:8-12.

384. Bird discloses a messaging manager connected between a subscriber application running on client devices and the server, and client devices register for messages with the server. Ex.1008, [0036]-[0039]. Bird discloses a subscriber application (Ex.1008, [0007]; [0017]; [0023]; [0039]; [0043]; [0047]; [0048]; [0051]; etc.) The function of this subscriber application is quite clear "***A user of a subscriber application initiates 130 a request to register the subscriber application with the broker***, the request including information entered by the user regarding the subjects for which the user wishes to receive messages." Ex.1008, [0039], (emphasis added)

385. Tsutsumitake discloses the data representation providing an activation module that is executed by the client device: "It is also possible to adopt a method wherein ***the event request is generated dynamically from a certain program incorporated in the page (e.g. "Applet" of Java developed by Sun Microsystem, or "JavaScript" developed by Netscape).***" Ex.1006, 10, 30-33, (emphasis added).

386. These disclosures correspond to the "activation module 124" of the '722 Patent, which "preferably contains JAVA® instructions ... [to] register[] object IDs from the web page 118 downloaded by the client 114 with the routing network 110"

by, for example, “pars[ing] 610 the web page 118 received from the server 112 and identif[ing] the object IDs of the live objects ... to register [] by communicating to the routing network 116.” Ex.1001, 11:1-14, 14:33-35, 14:55-59, Fig. 6.

387. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

s. [18.0], [24.0], [30.0], [36.0]: The activation module is configured to determine a node type that handles registration and causes the client device to register with the node corresponding to the node type

Claim	Limitations
[18.0]	The method of claim 17, wherein providing the activation module includes providing the activation module that is configured to determine a node type that handles registration and that causes the client device to register with the node corresponding to the node type.
[24.0]	The apparatus of claim 23, wherein the activation module is configured to determine a node type for handling registration and to cause the client device to register with the node of the node type.
[30.0]	The article of manufacture of claim 29, wherein the activation module determines a node type that handles registration and causes the client device to register with the node of the node type.
[36.0]	The non-transitory computer readable storage medium of claim 35, wherein the activation module determines a node type for

	handling registration and causes the client device to register with the node of the node type.
--	--

388. The combination discloses the method of claim 17, the apparatus of claim 23, the article of manufacture of claim 29, and the non-transitory computer readable storage medium of claim 35 (see above). The combination also discloses providing the activation module includes providing the activation module that is configured to determine a node type that handles registration and that causes the client device to register with the node corresponding to the node type.

389. See Sections I.3.e. regarding node types recited in the independent claims.

390. In Choquier, the gateways 126 establish communications between clients and servers and use the service maps to determine the server groups that are “currently handling the requested services.” Ex.1007, 10:32-41. Thus, the combination would allow for client devices to register for updates with nodes types (server groups) that

391. Tsutsumitake also discloses the claimed activation module. See also Section H.3.s. Tsutsumitake discloses the data representation providing an activation module that is executed by the client device: “It is also possible to adopt a method wherein *the event request is generated dynamically from a certain program incorporated in the page (e.g. “Applet” of Java developed by Sun Microsystem, or “JavaScript” developed by Netscape).*” Ex.1006, 10, 30-33 (emphasis added).

392. Choquier's and Tsutsumitake's disclosures correspond to the '722 Patent's recited "activation module that is configured to determine a node type that handles registration and that causes the client device to register with the node corresponding to the node type," which the '722 Patent explains is "functionality [on the client] for determining which node type handles which registration requests." Ex.1001, 19:61-63. One way the '722 Patent's "activation module" does so is by "determine[ing] which categories of messages it needs and to which nodes types it should connect [to get them]. The activation module 124 then makes a connection to one node of each relevant type and registers the appropriate object IDs with the appropriate node." Ex.1001, 21:47-52.

393. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

- t. **[19.0], [25.0], [31.0], [37.0]: The activation module is configured to determine a message category of the data representation and causes the client device to register with a node having a node type corresponding to the message category**

Claim	Limitations
[19.0]	The method of claim 17, wherein providing the activation module includes providing the activation module that is configured to determine a message category of the data representation and that causes the client device to register with a node having a node type corresponding to the message category.

[25.0]	The apparatus of claim 23, wherein the activation module determines a message category of the data representation and causes the client device to register with the node having a node type corresponding to the message category.
[31.0]	The article of manufacture of claim 29, wherein the activation module determines a message category of the data representation and causes the client device to register with the node having a node type corresponding to the message category.
[37.0]	The non-transitory computer readable storage medium of claim 35, wherein the activation module determines a message category of the data representation and causes the client device to register with the node having the node type corresponding to the message category.

394. The combination discloses the method of claim 17, the apparatus of claim 23, the article of manufacture of claim 29, and the non-transitory computer readable storage medium of claim 35 (see above). The combination also discloses providing the activation module includes providing the activation module that is configured to determine a message category of the data representation and that causes the client device to register with a node having a node type corresponding to the message category.

395. The combination discloses program or Java/JavaScript code at the event consumer/client to determine the producer or server an event came from and to

register for those events. See Section I.3.s. regarding claims 18, 24, 30, and 36. The '722 Patent explains that "[o]ne way [to assign messages into categories] is to assign all messages from a given input source 710 [(e.g., a publisher, server)] into a certain category." Ex.1001, 18:52-54; Ex.1002, 1014.

396. Bird discloses that it was well-known for publish/subscribe systems to categorize messages according to input source topics, that is, messages from specific publishers ("company name" "specific publisher organisation") and that clients could subscribe/register via a messaging manager to receive messages based on input source categories. Ex.1008, [0003], [0044]-[0045], [0060].

397. Choquier uses gateways that "serve as intermediaries between the client microcomputers and the application servers," and, even though "the user typically opens and closes multiple services," the gateways "rout[e] service requests (from the client microcomputer) to the appropriate application servers" using the "service map." Ex.1007, 2:32-61.

398. Moreover, Choquier specifies that server groups can be assigned to handle a specific topic or set of topics. Ex.1007, 10:17-20.

399. Thus, the combination provides for a client registering with a node having a node type (server group) corresponding to the message category (specific publisher).

400. For at least these reasons, Choquier as combined with Bird and Tsutsumitake renders these elements obvious.

IV. CONCLUSIONS

401. Based on the analysis provided in this declaration along with my education, training, and experience, it is my opinion that the claims of the '722 Patent described in this declaration are rendered obvious by the prior art cited as viewed by one of ordinary skill in the art.

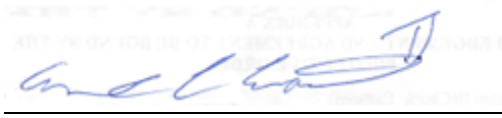
402. The claims referenced in this declaration would have been obvious in view of Lawson, Tsutsumitake, and Choquier. Such a combination would involve combining known elements with a predictable result.

403. Furthermore, the claims referenced in this declaration would have been obvious in view of Lawson, Tsutsumitake, Choquier, and Herz. Such a combination would involve combining known elements with a predictable result.

404. Furthermore, the claims referenced in this declaration would have been obvious in view of Choquier, Bird, and Tsutsumitake. Such a combination would involve combining known elements with a predictable result.

405. Furthermore, the claims referenced in this declaration would have been obvious in view of Choquier, Bird, Tsutsumitake, and Herz. Such a combination would involve combining known elements with a predictable result.

406. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and 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.



Dr. Chuck Easttom

08 May 2025

Date