UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Facebook, Inc.
Petitioner

v.

Windy City Innovations, LLC
Patent Owner

U.S. Patent No. 8,458,245

TITLE: REAL TIME COMMUNICATIONS SYSTEM

DECLARATION OF TAL LAVIAN, PH.D.

Table of Contents

Page

Table of Contents
(continued)

Page

Table of Contents
(continued)

Page

I, Tal Lavian, Ph.D., declare as follows:

I. INTRODUCTION AND QUALIFICATIONS

A. Summary of My Opinions

1. U.S. Patent No. 8,458,245 purports to describe a computerized technique for facilitating communication between individuals using computers connected via the Internet. As I will explain below, the claims do not recite any feature that would have been regarded as novel or non-obvious to a person of ordinary skill in the art. By April 1996 (the earliest priority date of the ’245 patent), communication over computer networks was well-known, including whiteboarding and messaging. One of these references, U.S. Patent No. 6,608,636 to Robert D. Roseman, was filed more than four years before the earliest priority date for the ’245 patent. Roseman discloses a networked “virtual conferencing” system that discloses the supposedly inventive features of the ’245 patent.

2. The remaining features in the claims recite functionalities that were standard Internet features such as using Uniform Resource Locators (URLs) to locate and retrieve content from the Internet, and use of external viewer applications to display certain types of multimedia content such as sound and video. These features were built-in features of web browsers no later than 1994, including the Mosaic web browser discussed in Mary Ann Pike et al., *Using*

Mosaic (1994). As I will explain below, all of the claims would have been obvious based on the prior art.

B. Qualifications and Experience

3. I have more than 25 years of experience in the networking, telecommunications, Internet, and software fields. I received a Ph.D. in Computer Science from the University of California at Berkeley in 2006 and obtained a Master's of Science ("M.Sc.") degree in Electrical Engineering from Tel Aviv University, Israel, in 1996. In 1987, I obtained a Bachelor of Science ("B.Sc.") in Mathematics and Computer Science, also from Tel Aviv University.

4. I am currently employed by the University of California at Berkeley and was appointed as a lecturer and Industry Fellow in the Center of Entrepreneurship and Technology ("CET") as part of UC Berkeley College of Engineering. I have been with the University of California at Berkeley since 2000 where I served as Berkeley Industry Fellow, Lecturer, Visiting Scientist, Ph.D. Candidate, and Nortel's Scientist Liaison, where some positions and projects were done concurrently, others sequentially.

5. I have more than 25 years of experience as a scientist, educator and technologist, and much of my experience relates to computer networking technologies. For eleven years from 1996 to 2007, I worked for Bay Networks and

Nortel Networks. Bay Networks was in the business of making and selling computer network hardware and software. Nortel Networks acquired Bay Networks in 1998, and I continued to work at Nortel after the acquisition. Throughout my tenure at Bay and Nortel, I held positions including Principal Scientist, Principal Architect, Principal Engineer, Senior Software Engineer, and led the development and research involving a number of networking technologies. I led the efforts of Java technologies at Bay Networks and Nortel Networks. In addition, during 1999-2001, I served as the President of the Silicon Valley Java User Group with over 800 active members from many companies in the Silicon Valley.

6. Prior to that, from 1994 to 1995, I worked as a software engineer and team leader for Aptel Communications, designing and developing mobile wireless devices and network software products. From 1990 to 1993, I worked as a software engineer and team leader at Scitex Ltd., where I developed system and network communications tools (mostly in C and C++).

7. I have extensive experience in communications technologies including routing and switching architectures and protocols, including Multi-Protocol Label Switching Networks, Layer 2 and Layer 3 Virtual Private Networks, and Pseudowire technologies. Much of my work for Nortel Networks

(mentioned above) involved the research and development of these technologies. For example, I wrote software for Bay Networks and Nortel Networks switches and routers, developed network technologies for the Accelar 8600 family of switches and routers, the OPTera 3500 SONET switches, the OPTera 5000 DWDM family, and the Alteon L4-7 switching product family. I wrote software for Java based device management including software interface to the device management and network management for the Accelar routing switch family network management system.

8. I am named as a co-inventor on more than 80 issued patents and I co-authored more than 25 scientific publications, journal articles, and peer-reviewed papers. Furthermore, I am a Senior Member of the Institute of Electrical and Electronics Engineers ("IEEE").

9. I currently serve as a Principal Scientist at my company Telecomm Net Consulting Inc., where I develop network communication technologies and provide research and consulting in advanced technologies, mainly in computer networking and Internet technologies. In addition, I serve as a Co-Founder and Chief Technology Officer (CTO) of VisuMenu, Inc., where I design and develop architecture of visual IVR technologies for smartphones and wireless mobile devices in the area of network communications.

10. Additional details of my background are set forth in my curriculum vitae, attached as **Exhibit A** to this Declaration, which provides a more complete description of my educational background and work experience. I am being compensated for the time I have spent on this matter at the rate of $400 per hour. My compensation does not depend in any way upon the outcome of this proceeding. I hold no interest in the Petitioner (Facebook, Inc.) or the patent owner (Windy City Innovations, LLC).

C. Materials Considered

11. The analysis that I provide in this Declaration is based on my education and experience in the field of computer systems, as well as the documents I have considered including U.S. Patent No. 8,458,245 ("'245 patent") **[Ex. 1001]**, which states on its face that it issued from an application filed on August 24, 2006, which in turn claims priority to back to an earlier application filed on April 1, 1996. For purposes of this Declaration, I have assumed April 1996 as the relevant priority date.

12. I reviewed various documents dated prior to April 1996 describing the state of the art at the time of the alleged invention of the '245 patent. The prior art documents relied upon as actually disclosing the limitations of the claims are:

Exhibit No.	Title of Document
1003	U.S. Patent No. 6,608,636 to Robert D. Roseman
1004	EP 0621532 A1 to Eugene Rissanen, published on April 13, 1994
1005	Ronald J. Vetter, *Videoconferencing on the Internet*, Computer, IEEE Computer Society, Vol. 28, No. 1, at pp.77-79 (Jan. 1995)
1006	Excerpts from Mary Ann Pike et al., *Using Mosaic* (1994)
1007	U.S. Patent No. 5,226,176 to William D. Westaway et al.
1008	Excerpts from Tom Lichty, *The Official America Online for Macintosh Membership Kit & Tour Guide* (2d ed. 1994)

This Declaration also cites the following additional prior art documents for purposes of describing the relevant technology, including the relevant state of the art at the time of the alleged invention of the ’245 patent:

Exhibit No.	Title of Document
1009	Tim Berners-Lee et al., Request for Comments (RFC) 1738, Uniform Resource Locators (URL), Dec. 1994
1010	James Coates, *A Mailbox in Cyberspace Brings World to Your PC*, Chicago Tribune, Mar. 1995

II. PERSON OF ORDINARY SKILL IN THE ART

13. I understand that an assessment of claims of the ’245 patent should be undertaken from the perspective of a person of ordinary skill in the art as of the earliest claimed priority date, which I understand is April 1996.

14. In my opinion, a person of ordinary skill in the art as of April 1996 would possess at least a bachelor’s degree in electrical engineering or computer

science (or equivalent degree or experience) with practical experience or coursework in the design or development of systems for network-based communication between computer systems. This could have included, for example, experience implementing systems for communicating over Local Area Networks (LANs) and Wide Area Networks (WANs), such as the Internet.

15. Although my qualifications and experience exceed those of the hypothetical person having ordinary skill in the art defined above, my analysis and opinions regarding the ’245 patent have been based on the perspective of a person of ordinary skill in the art as of April 1996.

III. CLAIM CONSTRUCTION

16. I have been informed by counsel that invalidity analysis is a two-step process. In the first step, the scope and meaning of a claim is determined by construing the terms of that claim. In the second step, the claim as interpreted is compared to the prior art. Thus, before I address the application of the prior art to the claims of the ’245 patent in **Part IV** below, I provide constructions for certain terms in those claims.

17. I have been informed by counsel that a claim in an unexpired patent subject to *inter partes* review must be given its “broadest reasonable construction in light of the specification of the patent in which it appears,” which is different

from the manner in which the scope of a claim is determined in litigation. I apply the "broadest reasonable construction" standard in my analysis below.

A. "token"

18. Each independent claim recites a database that serves as a "repository of tokens" for other programs to access. The written description describes a "token" as a piece of information associated with a user identity:

> With regard to the arbitrating of the controller computer **3** is directed by the controller computer program **2** to <u>use "identity tokens", which are pieces of information associated with user identity</u>. The pieces of information are stored in memory **11** in a control computer database, along with personal information about the user, such as the user's age.

('245, 8:6-11 (underlining added).) The specification goes on to describe several exemplary purposes for tokens, including "to control the ability of a user to gain access to other tokens in a token hierarchy arbitration process" ('245, 8:19-20), "to control a user's group priority and moderation privileges, as well as controlling who joins the group, who leaves the group, and the visibility of members in the group" ('245, 8:27-28), and "to permit a user's control of identity, and in priority contests between 2 users, for example, a challenge as to whether a first user can see a second user." ('245, 9:33-35).

19. Based on the definitional language in the written description, I have construed "**token**" as a "**piece of information associated with user identity**."

B. "pointer"

20. The term "pointer" appears in independent claims 7, 19, 37, 38, and 41, and in claim 1 as part of the larger term "pointer-triggered message." "Pointers" are well-known in computer science and exist at all levels of computer system design – from the lower microprocessor levels to the higher levels where application programs execute. To persons of ordinary skill in the art having read the patent, the term "pointer" would be understood as simply a piece of information that "points to," or references, other information.

21. The written description provides only the following mention of pointers, which identifies a Uniform Resource Locator as an example of a pointer:

> The present invention comprehends communicating all electrically communicable multimedia information as Message **8**, by such means as pointers, for example, URLs. URLs can point to pre-stored audio and video communications, which the Controller Computer **3** can fetch and communicate to the Participator Computers **5**.

('245, Ex. 1001, 5:36-41.) Based on this description, the term "pointer" should be construed as a "**piece of information that points to or references other information**."

C. “pointer-triggered” message terms

22. The term “pointer-triggered” is recited in independent claim 1 (“**pointer-triggered private message**”) and in claims 37 and 38 (“**pointer-triggered message**”). As explained previously, the written description identifies a URL as an example of a pointer. I could not locate the term “pointer-triggered,” or even the term “trigger,” in the written description.

23. In my opinion, the term “pointer-triggered” refers to a message whose content is referenced – and thus may be obtained – by a pointer such as a URL. As noted in the passage quoted above, “URLs can point to pre-stored audio and video communications, which the Controller Computer **3** can fetch and communicate to the Participator Computers **5**.” (’245, 5:38-41.) The written description identifies several examples of how this might occur. First, the specification describes an embodiment in which a received message contains a URL, to which the software on the participator computer can respond by invoking an external data viewer, but “only on demand of the operator of the participator software”:

> If a URL is detected at Block **116**, Block **118** invokes an external data type viewer only on demand of the operator of the participator software, and otherwise Block **120** stores the reference for future use by the operator of the participator software, or treats the reference as an externally handled multimedia type (at the user’s option).

('245, 7:50-55.) The patent describes another example in which a multimedia message containing a URL is sent, and the participator software attempts to present the message in a readable way:

> The controller computer **5** now passes the URL to the channel members. This participator software **4** performs two actions in response to the graphical multimedia display request. The first is to put the name of the URL onto the transcript of the group's channel, so that it can be read by group members. The second response is to have the participator software show the data associated with the graphical multimedia message in a human interpretable way (at FIG. 25). To do this, the participator software **6** either uses built in rules to decide how the graphical multimedia data is to be presented, or locates another program suitable to present the data. In this case, the software **6** is utilizing Netscape Navigator™, a program for displaying graphical multimedia documents specified by a URL (at FIG. 26). Inside the Navigator window, the graphical multimedia content, the home page of AIS, is shown.

('245, 10:55-11:3.)

24. As noted above, the patent expressly describes an embodiment in which an external viewer to view content referenced by a URL is invoked "only on demand of the operator of the participator software" ('245, 7:51-52), so in my opinion, the term "**pointer-triggered**" under its broadest reasonable construction should not be construed to require that the content be obtained automatically

(without any user action). It should also encompass, under its broadest reasonable construction, the user activating the pointer (for example by clicking the URL) to obtain the content to which it refers. In my opinion, the broadest reasonable construction of "**pointer-triggered message**" is a "**message that allows its recipient to obtain content via a pointer**." A "**pointer-triggered private message**" thus should be interpreted as a "**private message that allows its recipient to obtain content via a pointer**."

IV. APPLICATION OF THE PRIOR ART TO THE CLAIMS

25. I have reviewed and analyzed the prior art references and materials listed in **Part I.C** above. In my opinion, each and every limitation of claims 1-5, 7, 9-14, 19, and 22-25 is disclosed by the following references: (1) U.S. Patent No. 6,608,636 to Robert D. Roseman ("Roseman") **[Ex. 1003]**; (2) EP 0621532 A1 to Eugene Rissanen, published on April 13, 1994 ("Rissanen") **[Ex. 1004]**; (3) Ronald J. Vetter, *Videoconferencing on the Internet*, IEEE Computer, Vol. 28, No. 1, at pp. 77-79 (Jan. 1995) ("Vetter") **[Ex. 1005]**; (4) Mary Ann Pike et al., *Using Mosaic* (1994) ("Pike") **[Ex. 1006]**; and (5) U.S. Patent No. 5,226,176 to William D. Westaway et al. ("Westaway") **[Ex. 1007]**. Claims 6, 8, 15, 17, and 18 are disclosed by these listed above in further view of Tom Lichty, *The Official*

America Online for Macintosh Membership Kit & Tour Guide (2d ed. 1994) ("Lichty") **[Ex. 1008]**.

26. I observe that the claims of the ’245 patent reveal significant redundancy and duplication – other independent and dependent claims recite substantially the same and in many cases identical language as claims 1-25. I am aware that the Petitioner may use my analysis of representative claims 1-15, 17-19, and 22-25 to show the unpatentability of other claims that recite substantially the same limitations. My focus on claims 1-15, 17-19, and 22-25 does not suggest that my opinions do not apply to other claims; to the contrary, to the extent other claims recite the same language or impose the same limitations, my analysis applies.

27. I am informed that Roseman qualifies as prior art because it issued from an application filed on May 13, 1992, which is several years before the earliest application to which the ’245 patent can claim priority (April 1, 1996). I am also informed that Vetter, Rissanen, Pike, Westaway and Lichty qualify as prior art because they were all published more than one year before April 1, 1996.

28. Before explaining how the prior art applies to the claims, I will briefly summarize each piece of art and provide an overview of how I have applied it.

A. Brief Description and Summary of the Prior Art

1. Roseman [Ex. 1003]

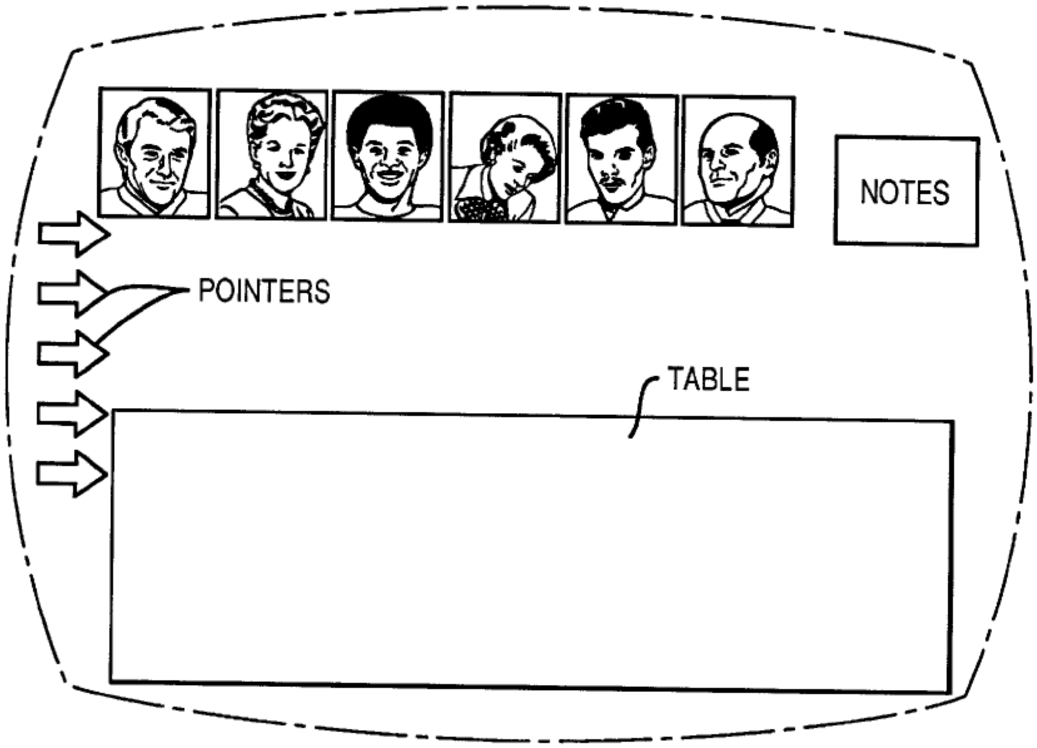
29. Roseman, entitled "Server Based Virtual Conferencing," discloses a system for creating a virtual conference room that allows participants to collaborate in real time over a computer network. My Declaration cites Roseman for the majority of the limitations in the challenged claims, and relies on the other references (Vetter, Rissanen and Pike) only for a few limitations to the extent not disclosed in Roseman.

30. The virtual conferencing system in Roseman "allows multiple persons, at different locations, to hold a conference, by providing many of the conveniences which the participants would have if present together in the same physical room." (Roseman, 1:19-23.) Roseman describes "a virtual conferencing system which allows multiple persons to view, and also manipulate, a common video display, which is simultaneously displayed at their different locations." (Roseman, 1:28-31.) Each conference participant has his or her own "local computer." (Roseman, 1:34-35, 2:64-65.) The local computers "have associated video cameras, speaker-type telephones, and pointing devices (such as 'mouses'). When a conference is established, the local computers become connected to a host

computer, via commercially available Local Area Networks (LANs) and Wide Area Networks (WANs)." (Roseman, 1:36-41; *see also id*. 3:14-19.)

31. A user in Roseman creates a virtual conference room by clicking an appropriate icon, identifying the participants of the conference room and providing other information such as the rules that govern the conference. (Roseman, 3:22-56.) Once the parameters of the conference are established, the host computer "creates the conference room. The host does this by creating a common image, such as that shown in FIG. 9. The common image includes a picture of each invitee, a 'table,' and the room decor." (Roseman, 7:30-34.) An example of the Roseman virtual conference room is shown in Figure 9 below:

FIG. 9



(Roseman, Fig. 9.)

32. Roseman explains that when a meeting participant enters a virtual conference room with other participants, "the data connection is made. Audio and video connections are made if supported by the user, the room and the other users. A small picture of each user is displayed in the meeting room to indicate presence." (Roseman, 11:11-14.) Once inside the conference room, "[o]bjects (documents) can be shared in the conference room by placing them on the table. This might be done by dragging an icon . . . onto the table." (Roseman, 11:18-22.) Additionally, the user can click on the picture of another participant to engage in a

private voice conversation, or drag a textual note onto the picture of another participant to send a private text message. (Roseman, 9:16-31.) Other communication features are described in my discussion of the claims below.

33. Roseman also discloses a security and user authentication mechanism in which users must be invited and have an appropriate "**key**" to enter the conference room. (Roseman, *e.g.*, 9:34-55, 10:61-64 ("To open a door with a key, the user drops the key onto the door lock. If the key is valid and the user has the authority to use the key, the door opens and the user is admitted to the room.").) "The meeting room 'knows' about each key and its invitation level. Persons with improper keys are not admitted to the room." (Roseman, 9:49-51.) These conference room "keys," as I will explain below, correspond to the "tokens" recited in the independent claims.

34. Roseman also discloses a database that stores the keys for the conference room. In particular, Roseman explains that "[t]he meeting room 'knows' about each key and its invitation level." (Roseman, 9:49-50.) The "meeting room," in turn, is stored on the host computer. (Roseman, 9:61-63 ("Meeting Facilitator (or Requestor) creates [sic] meeting room <u>on a host computer</u> which is accessible to all Invitees.") (underlining added), 12:16-18 ("The

conference room itself is actually a combination of stored data and computer programs.”).) More details about Roseman are set forth below.

2. Rissanen [Ex. 1004]

35. Various claims recite “**a database which serves as a repository of tokens for other programs to access**.” As I noted above, the “keys” in Roseman disclose the claimed “tokens,” and those keys are stored on the central host computer. But Roseman does not use the word “database” to describe the storage of keys by the host. In the event it is argued that Roseman fails to disclose a “database” that stores tokens, as recited by the claims, this requirement would have been trivially obvious over Rissanen.

36. Rissanen, entitled “Password Verification System,” discloses a technique for user authentication using passwords stored in a database. My Declaration relies on Rissanen as an alternative basis to teach “**a database which serves as a repository of tokens for other programs to access**,” in the event it is argued that Roseman alone does not disclose the database limitation. Rissanen discloses storing user passwords in a database, and subsequently using those stored passwords to verify user identity when users subsequently attempt to log-on. (Rissanen, Ex. 1004, at 1:21-28 (“Some business computer systems are arranged to initially record and store passwords assigned to users. In response to a prompt by

the system for the user's password, the user enters the password onto a keyboard and the system compares the keyboard entered password with the stored passwords and enables the user to access the system when the entered password matches the previously stored password.") (underlining added).) Rissanen also discloses that user login and password information may be stored in a database. (Rissanen, at 2:22-29 ("In accordance with an embodiment of the preferred invention, a computer controlled database is linked to a telecommunication network with which users are provided password controlled access. Users are initially entered into a password database stored in the computer system by assigning each user an account code and a password, such as consisting of a number of numerical digits.") (underlining added).) Although Rissanen also describes a technique for using spoken voice passwords, I have cited it for basic teachings relating to database storage of user authentication information of any form.

37. As I will explain in detail below, the user and password information in the database in Rissanen is analogous to the conference room "keys" in Roseman. It would have been obvious to a person of ordinary skill in the art to combine Roseman and Rissanen to produce the virtual conferencing system of Roseman in which the conference room keys are stored in a database serving as a repository of tokens (keys) for other programs to access, as taught in Rissanen.

3. Vetter [Ex. 1005]

38. Certain claims require that information be transmitted via the "**Internet network**." Roseman discloses using "commercially available" Wide Area Networks (WANs) to communicate between the host and meeting participants' computers, but Roseman does not specifically disclose that those WANs include the Internet. (Roseman, Ex. 1003, 1:37-41, 3:14-19.)

39. Vetter, entitled "Videoconferencing on the Internet," discloses software tools for enabling videoconferencing over the Internet. I have cited Vetter to show that using the Internet to send information to meeting participant computers in Roseman would have been obvious to a person of ordinary skill in the art. Vetter discloses that "[v]ideoconferences are becoming increasingly frequent on the Internet," and that "[r]eadily available software tools enable real-time audio and video channels as well as shared whiteboards that allow groups to collaborate on distributed group work more easily than ever . . ." (Vetter, at p. 77.)

40. As I will explain below, the requirement of communication the "Internet" does not provide any non-obvious distinction over Roseman. Vetter confirms adding transmission over the Internet to Roseman would have been obvious to a person of ordinary skill in the art, and a person of ordinary skill in the art would have had ample motivations to combine Roseman with Vetter.

4. Pike [Ex. 1006]

41. Pike, entitled *Using Mosaic*, is a book describing NCSA Mosaic, one of the early browsers for accessing the World Wide Web. (Pike, Ex. 1006, at 1-2.) I have cited Pike to demonstrate that two of the features recited in the claims involved nothing more than well-known Internet and web browser features.

42. First, certain claims recite that the information communicated between computers can include a "**pointer**" or a "**pointer-triggered**" message. As explained throughout this Declaration, Roseman discloses a pointer in the form of a clickable icon that, when clicked by a meeting participant, presents a document, message or other content to the user. (Roseman, Ex. 1003, *e.g.*, 14:53-57 & 14:59-62 (icon representing document placed on table), 9:28-31 (icon representing private message).) Roseman does not disclose the detailed mechanics of how the pointer works and does not mention URLs. In the event it is argued that the "pointer" and "pointer-triggered" limitations require something functionally equivalent to an Internet URL, these limitations would have been obvious to a person of ordinary skill in the art in view Pike **[Ex. 1006]**.

43. URLs are used today to identify hundreds of millions of resources located on the Internet, and were clearly not an invention of the '245 patent. Pike, which was published in 1994, provides an introductory section describing basic

Internet concepts such as URLs. (Pike, Ex. 1006, at 38-39.) Pike explains that "[a] *URL* is a complete description of an item, including the location of the item that you want to retrieve." (*Id.* at 38 (italics in original).) "The location of the item can range from a file on your local disk to a file on an Internet site halfway around the world." (*Id.*) Pike further explains that a URL can identify any resource on the Internet, and "is not limited to describing the location of WWW [World Wide Web] files." (*Id.*) Pike goes onto describe how URLs can be used to retrieve documents from other computers over the Internet. (*Id.* at 38-39.)

44. Second, the claims recite an "**agent with an ability to present the communication**." This technology was available for use with the Mosaic web browser no later than 1994, as confirmed by Pike.

45. Pike explains that when a user encounters content on the Internet that cannot be displayed on his or her computer, external software viewers can be downloaded and installed to allow the computer to present the content. (Pike, at pp. 55-56 ("While Mosaic for Windows displays normal Web documents, you may want to obtain additional software to allow Mosaic to handle things such as pictures, sounds, and animations (movies). This additional software is available through anonymous FTP at **ftp.ncsa.uiuc.edu** in the directory /Web/Windows/Mosaic/viewers.") (boldface in original).) Pike lists several

examples of this "additional software," including viewers for handling PostScript documents, GIF and JPEG graphic images, MPEG movies, and audio files. (*Id.* at p. 56.) Once an external viewer has been installed, it is invoked automatically to view the files:

> After you have a viewer installed and Mosaic knows where to find it and what type of files it displays, you can load files of that type and Mosaic automatically starts the viewer to display them.

(*Id.* at p. 96 (under "Viewing Multimedia Files").)

46. As I will demonstrate below, it would have been obvious to a person of ordinary skill in the art to adapt known URL techniques, and known external viewer software, to the conferencing system of Roseman.

5. Westaway [Ex. 1007]

47. Each independent claim recites "**internally determin[**ing]" whether a communication can be presented, and if not, "**obtaining an agent**" for presenting the communication. Westaway refers to computers as "agents" and describes a method for obtaining software over a network "[i]n the event an agent requires certain software for execution, and the software is not available on the agent's local hard disk drive or internal memory." (Westaway, 1:24-27.) I have cited Westaway to show that it would have been obvious for the local computer in

Roseman to determine that it is missing software necessary to present a communication, and to then obtain that software.

6. Lichty [Ex. 1008]

48. Lichty, entitled *The Official America Online for Macintosh Membership Kit & Tour Guide*, is a 1994 book describing the online service provider America Online. Lichty describes "chat room" features, analogous to the virtual conference rooms of Roseman, that allowed users to send real-time messages to each other over a computer network. (Lichty, *e.g.*, pp. 252-278.) I cite Lichty in connection with features recited in certain dependent claims of the '245 patent. In particular, certain dependent claims recite a step of determining that a message "is not censored." ('245, *e.g.* claims 6 & 8.) Other claims recite the ability of a computer system to form a "chat channel" with other users (*e.g.*, claim 15), and keeping track of a "user age" corresponding to user identities (*e.g.*, claim 17). Each of these limitations is disclosed in Lichty.

49. Lichty describes a "chat room" functionality that allows individual users to "censor" other users in the chat room. For example, a user in a chat room can decide to "ignore" other users and thus no longer receive communications from them. (Lichty, pp. 269, 510 (definition of "Ignore"); *see also id.* at p. 264-65.) Lichty also discloses that America Online kept track of the birthdate (and thus

the age) of its users, and could display that information within a chat room. (*Id.* at p. 73, Fig. 3-14; *id.* at p. 268-69.) As I explain below, it would have been obvious to a person of ordinary skill in the art in April 1996 to add these features to the system of Roseman.

D. Comparison of the Prior Art to the Claims

1. Independent Claim 1

a. "A computer apparatus distributing a communication over an Internet network" (Claim 1, Preamble)

50. Roseman discloses "[**a**] **computer apparatus for distributing a communication**."[1] In particular, Roseman discloses a virtual conferencing system for individuals (e.g. conference participants) to share content:

> The parties send the information which they want displayed, such as drawings, to the host computer. The host computer generates a common video screen, which it distributes to the parties: they see the drawings at their own local computers. Each party can move a pointer on the display, and point to features on the drawings. The telephones and video cameras allow the parties to see and speak with each other

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[1] I am informed by counsel that a claim preamble does not always impose a limitation on the claim. It is unnecessary for me to determine whether the preamble is limiting because the prior art nevertheless discloses it.

(Roseman, 1:42-49.) Further details on how Roseman discloses distribution of communications over a network is set forth in the discussion of later claim limitations. Roseman discloses a "**computer apparatus**" for performing these collaborative functions that includes at least a networked server computer, which Roseman calls the "host computer" or "host." (Roseman, 1:39, 3:14-19, 1:50-52.) I will provide more details about the host computer in the next claim limitation which calls for a "controller computer system."

51. The preamble concludes by reciting distributing a communication "**over an Internet network**." Roseman discloses the ability to distribute communications over "commercially-available" Wide Area Networks (WANs). (Roseman, 3:14-19, 1:37-41.) A person of ordinary skill in the art would have understood that the Internet is an example of a Wide Area Network (WAN), but Roseman does not expressly mention the "Internet."

52. Nevertheless, adapting the virtual conferencing system of Roseman to communicate over the Internet would have been obvious. For example, Vetter discloses that, well before April 1996, the Internet was being used to facilitate precisely the same types of computer-based conferencing functions described in Roseman, such as video and audio conferencing and document sharing (via shared whiteboards):

> Videoconferences are becoming increasingly frequent on the Internet and generating much research interest. Readily available software tools enable real-time audio and video channels as well as shared whiteboards that allow groups to collaborate on distributed group work more quickly and easily than ever (see sidebar on available tools).
>
> The Internet infrastructure is beginning to support videoconferencing applications in several ways. First, the emerging multicast backbone (or MBone) can efficiently send traffic from a single source over the network to multiple recipients. At the same time, many workstations attached to the Internet are being equipped with video capture and sound cards to send and receive video and audio data streams. The price/performance of these hardware devices has finally reached a level that makes wide-scale deployment possible, which is perhaps the most important factor in the recent growth of videoconferencing applications.

(Vetter, Ex. 1005, at p. 77 (underlining added).)

53. Vetter describes a number of conferencing tools for performing real-time collaboration over the Internet. (*Id.* at p. 78 (under "Available Conferencing Tools").) One example is "CU-SeeMe," which Vetter describes as "a software platform that supports audio and video conferencing over the Internet." (*Id.*) Vetter explains that CU-SeeMe "is becoming very popular" (*id.* at p. 77), and discloses a server program known as the CU-SeeMe "reflector" that facilitates

multiparty conferencing. (*Id.* at p. 78.) Vetter therefore discloses sending information to participator computers via the Internet network.

54. ***Rationale and Motivation to Combine***: It would have been obvious to a person of ordinary skill in the art to combine Roseman with Vetter, with no change in their respective functions, predictably resulting in the virtual conferencing system of Roseman in which the host (server) computer and participant computers distribute communications over an Internet network. Vetter provides an express motivation for this combination by confirming that "[v]ideoconferences are becoming <u>increasingly frequent</u> on the Internet" (*id.* at p. 77), and that the "CU-SeeMe videoconferencing tool is also becoming <u>very popular</u>." (*Id.* (underlining added to both).) Moreover, a person of ordinary skill in the art would have recognized the Internet as one of the largest networks for connecting remote computers (if not the largest), making it the obvious Wide Area Network (WAN) for use with Roseman to distribute communications.

55. Vetter also discloses that the increasing popularity of videoconferencing was fueled by the fact that, as of January 1995, "[t]he price/performance" of hardware devices had finally reached a level in which widespread deployment was possible. (*Id.*) A person of ordinary skill in the art would have understood that the ratio of price-to-performance would have

continued to improve, making videoconferencing even more attractive in April 1996 than it was in January 1995 when Vetter was published.

56. Nothing in Vetter would discourage or teach away from this combination. Vetter has an extended discussion of some of the challenges he encountered in using Internet videoconferencing in a classroom context, but none of those issues would have discouraged my proposed combination. Vetter describes issues such as maintaining software and hardware configurations, coordinating when individuals at a site should speak, audio feedback caused by participants leaving their microphones open, delays in whiteboard performance, and network performance of video streams. (*Id.* at p. 78-79.) None of these issues would have discouraged my proposed combination. Most of the problems identified by Vetter are directly attributable to using Internet videoconferencing in a very unique classroom context. Vetter even acknowledges that "these tools may not have been designed for such an environment, but my goal is to point out important issues in distance-learning video/audio applications." (*Id.* at p. 78 (top of page).) Vetter nevertheless ends on a decidedly positive note by confirming that "video and audio conferencing are an increasingly important way of carrying out collaborative group work." (*Id.* at p. 79 (right column).)

57. A person of ordinary skill in the art would have understood that the videoconferencing system of Roseman involves a simpler conferencing setup with a smaller number of participants, which could avoid or at least reduce the severity of all of the issues encountered by Vetter. A person of ordinary skill in the art would also have understood that network performance in a real-time conferencing application depends on a multiplicity of different factors including the speed of the connections, the number of participants, the amount and type of information being sent, and many other factors. A person of ordinary skill in the art would have understood that performance concerns present themselves in any conferencing system (including to this day), and as such, the network performance issues identified by Vetter would not have discouraged a skilled artisan from using the Internet to support the conferencing functions disclosed in Roseman. In my opinion, therefore, Roseman and Vetter disclose and render obvious the preamble.

b. "a controller computer system adapted to communicate responsive to a respective authenticated user identity corresponding respectively to each of a plurality of participator computers" (Claim 1[a])

58. As noted, Roseman discloses "**a controller computer system**" in the form of a central "host" or "host computer" that communicates with meeting participant computers ("participator computers") over the network:

> These individual [participant] systems are located at different

> geographic locations, and, when a virtual conference is to be held, become connected to a central, host, computer (or multiplicity of host computers) via the proper combination of Local Area Networks (LANs) and Wide Area Networks (WANs).

(Roseman, 3:14-19 (underlining added), 1:50-52 ("The host controls many of the events occurring during the conference, as well as those occurring both during initiation of the conference and after termination of the proceedings.").)

59. Roseman also discloses "**a plurality of participator computers**," as recited in the claim. The participator computers in Roseman take the form of the meeting participants' computers, which Roseman calls "local computers." (Roseman, 1:34-37 ("Two (or more) parties each operate their own local computers. The computers have associated video cameras, speaker-type telephones, and pointing devices (such as 'mouses')."); *id*., 2:64-65 ("Every office is equipped with the following equipment: a computer (termed a 'local computer' herein) . . . .").) The participants' local computers can run conventional operating systems and environments such as Microsoft Windows. (Roseman, 12:1-9.)

60. The host computer in Roseman is "**adapted to communicate responsive to a respective authenticated user identity corresponding respectively to each of a plurality of participator computers**," as recited in the claim. Roseman discloses that there can be multiple participants to a conference.

(*See* Roseman, Fig. 9 (showing conference having six participants).) Roseman explains that in creating a new virtual conference room, the creator can cause the host to send invitations to each participant. Each invitation contains a "key" that each invited participant, using his or her respective local computer (Roseman, 1:34-35, 2:64-65), can present to the host computer to authenticate the participant:

> Before an invitation list is compiled, the level of invitations must be specified by the invitor. Three levels of invitations are considered.
>
> 1. <u>an invitation is for the Invitee only</u>.
> 2. an invitation is for the Invitee, but can be passed to a delegate, who will attend in place of the Invitee.
> 3. an invitation is an open invitation to anyone wishing to attend.
>
> <u>Invitations contain "keys" which conform to the above invitation level</u>. <u>Level 1 keys may not be passed to any other person and may not be copied</u>. Level 2 keys may be passed to exactly one other person and may not be copied. If the key is returned to the original invitee than it may be passed again. Level 3 keys may be freely distributed and copied. The meeting is considered to be public.
>
> <u>The meeting room "knows" about each key and its invitation level</u>. <u>Persons with improper keys are not admitted to the room</u>. A person without a key may be admitted to the room only by someone already in the room or by the person responsible for the room.
>
> Invitations and keys are distributed electronically. The key is an electronic object attached to the invitation.

(Roseman, 9:34-55 (underlining added).) Roseman confirms that this validation and authorization process results in an "**authenticated user identity**." For example, as noted above, the host computer can assign a "Level 1" key to a user, which is "for the Invitee only" and "may not be passed to any other person and may not be copied." (Roseman, 9:37, 9:43-44).

61. A meeting participant to be authenticated uses its "key" to enter the conference. The host computer is "**adapted to communicate** <u>**responsive to**</u>" that authenticated user identity. In particular, if the key is valid and the participant user has authority to use it, he or she may enter the conference room.

> To open a door with a key, the user drops the key onto the door lock. <u>If the key is valid and the user has the authority to use the key, the door opens and the user is admitted to the room</u>. The other users in the room are alerted to a new presence and receive any relevant information.

(Roseman, 10:61-65 (underlining added).) This results in the host computer communicating with the participator computer:

> When a user enters a room with other occupants, the data connection is made. Audio and video connections are made if supported by the user, the room and the other users. A small picture of each user is displayed in the meeting room to indicate presence. If video links are enabled than the picture may be replaced with a video signal from the user, typically showing the user. The majority of the display shows

the room's table, walls, etc.

(Roseman, 11:10-17; *see also id.*, 1:43-46 ("The host computer generates a common video screen, which it distributes to the parties: they see the drawings at their own local computers.").) The "display" that "shows the room's table, walls, etc" and the "small picture[s]" or "video signal[s]" of other users in the conference room are communicated to the participant computer responsive to the participant being authenticated and allowed to enter the conference room. Further details on the types of communications that may take place after entering a conference room are discussed, in detail, in the next claim limitation.

c. "each said participator computer communicatively connected to said Internet network, each said participator computer programmed to enable the communication, the communication including at least one of a pre-stored sound, video, graphic, and multimedia" (Claim 1[b])

62. Roseman discloses that each meeting participant computer ("**each said participator computer**") is communicatively connected to the network through at least LANs and WANs. (Roseman, 1:37-41 ("When a conference is established, the local computers become connected to a host computer, via commercially available Local Area Networks (LANs) and Wide Area Networks (WANs)."), 3:14-19.) As noted previously, it would have been obvious that the participant computers could be connected "**to said Internet network**."

63. Roseman further discloses that each meeting participant computer is "**programmed to enable the communication, the communication including at least one of a pre-stored sound, video, graphic, and multimedia**." Roseman discloses multiple embodiments in which each participant computer enables such communication. A straightforward example is shown in the ability of each participant to a "drag-and-drop" a pre-stored document on the "table" of the virtual conference room, which causes the file to become accessible to other meeting participants. This feature is illustrated in Figure 10 and Figure 11 of Roseman:

FIG. 10

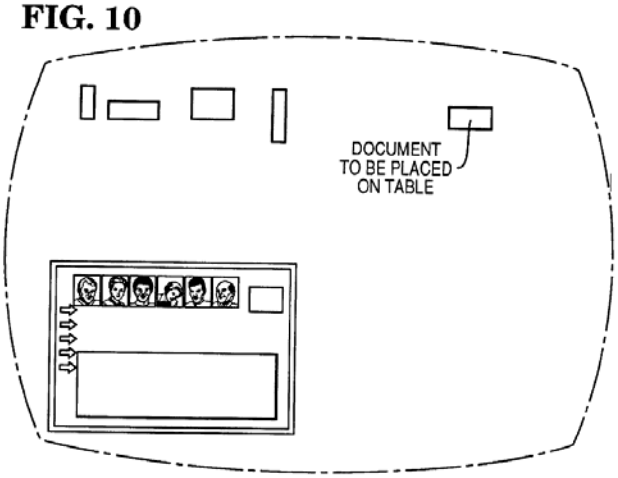
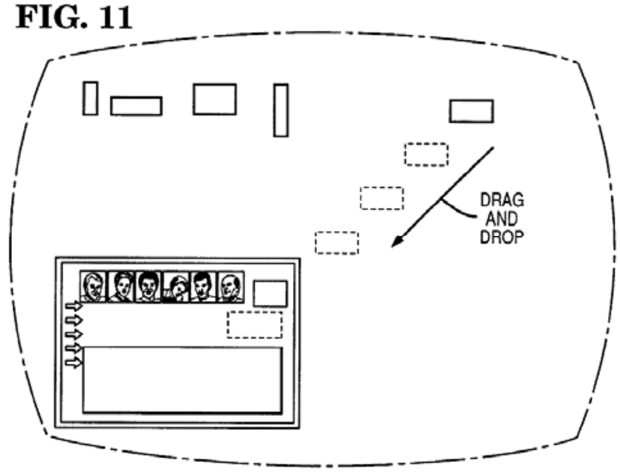


FIG. 11



(Roseman, Figs. 10 & 11.) As further explained in Roseman:

> Each invitee can transmit a file (of any suitable kind: data, text, or graphic) to the host, and the host will place the file onto the table, where all participants can see it. To place a document on the table, an Invitee performs a "drag-and-drop." That is, the invitee shrinks the window of the conference room to the size shown in FIG. 10. The

> private work area outside the window displays the icons representing the invitee's programs and data files. The Invitee drags an icon onto the table, as shown in FIG. 11, and double-clicks (or actuates) the icon. The icon blooms into an image dictated by the type of file which the icon represents (graphic, text, etc.)

(Roseman, 8:1-13.)

64. This feature shows an example of communicating of "**at least one of a pre-stored sound, video, graphic, and multimedia**," as recited in the claim. The passage from Roseman quoted above confirms that documents placed on the table can be "of any suitable kind: <u>data, text, or graphic</u>" (Roseman, 8:2 (underlining added)), which discloses communicating at least graphic and multimedia. Moreover, a document or file placed on the table is "**pre-stored**" because as shown in Figure 10, it was already stored as a file on the participant's local computer. (*See* Roseman, 8:7-9 ("The private work area outside the window [in Fig. 10] displays the icons representing the invitee's programs and data files.").)

d. "the controller computer system including a controller computer and a database which serves as a repository of tokens for other programs to access, thereby affording information to each of the participator computers which are otherwise independent of each other; wherein" (Claim 1[c])

65. Because of the length of this claim limitation, I will address its limitations piece-by-piece to ensure that I cover all requirements that the language may impose. To begin with, as noted above, Roseman discloses a "**controller computer system including a controller computer**" in the form of "a central, host, computer (or multiplicity of host computers)" (Roseman, 3:16-17).

66. Roseman further discloses that the controller computer system includes "**a database which serves as a repository of tokens for other programs to access**." The tokens in Roseman take the form of "**keys**," which as I discussed above, are stored and distributed by the host computer to invited conference participants. (Roseman, 9:34-55.) Roseman states that "the key is, essentially, a block of data, or a code." (Roseman, 6:60-61; *see also id.*, 9:54-55 ("The key is an electronic object attached to the invitation.").) The "**keys**" in Roseman are associated with a user identity and control whether a user has permission to enter a conference room, as discussed previously. (Roseman, 10:61-64 ("To open a door with a key, the user drops the key onto the door lock. <u>If the key is valid and the</u>

user has the authority to use the key, the door opens and the user is admitted to the room.") (underlining added).) The "keys" therefore qualify as "**tokens**."

67. Roseman also discloses that the host computer has a "**database which serves as a repository**" of keys (tokens), because the host computer stores the keys for a particular conference room. In particular, Roseman discloses that a "meeting room" is stored on the host computer. (Roseman, 9:61-63 ("Meeting Facilitator (or Requestor) creates [sic] meeting room on a host computer which is accessible to all Invitees."), 7:30-31 ("[T]he host creates the conference room."), 12:16-18 ("The conference room itself is actually a combination of stored data and computer programs.").) As noted above, Roseman explains that "[t]he meeting room 'knows' about each key and its invitation level. Persons with improper keys are not admitted to the room." (Roseman, 9:49-51 (underlining added).)

68. A copy of each key is therefore stored on the host computer – otherwise the meeting room could not "'know[]' about each key and its invitation level" (*id.*), or verify whether the invitee's user's key was valid in response to a request for access. (Roseman, 10:61-64.) Thus, Roseman discloses a host computer with a "database which serves as a repository of tokens" because the host computer stores the keys issued to invitees that control access to the room.

69. As noted previously, although Roseman discloses the claimed database and repository of tokens, it does not expressly use the word "**database**" or describe the storage methodology in detail. In my opinion, this does not provide any distinction between Roseman and the claim. A person of ordinary skill in the art would have understood the claimed "database" under its broadest reasonable construction to simply refer to a stored collection of tokens. The '245 patent does not provide any detail about the claimed "database" except stating that the tokens "are stored in memory **11** in a control computer database, along with personal information about the user, such as the user's age." ('245, 8:9-11.) The patent does not specify technical details regarding storage of tokens in a database and does require that the database be any particular type, such as relational.

70. In any event, even if one were to argue that Roseman does not sufficiently disclose the claimed "**database which serves as a repository of tokens**," the addition of a database to Roseman would have been trivially obvious to a person of ordinary skill in the art. Database technologies predated the '245 patent by decades, and it was known to use databases to store user identity and authentication information ("tokens"). For example, Rissanen, entitled "Password Verification System," discloses a technique for user authentication in which user

identity information and passwords, which are analogous to and serve the same purpose as the "keys" in Roseman, are stored in a database:

> Some business computer systems are arranged to initially record and store passwords assigned to users. In response to a prompt by the system for the user's password, the user enters the password onto a keyboard and the system compares the keyboard entered password with the stored passwords and enables the user to access the system when the entered password matches the previously stored password.

(Rissanen, Ex. 1004, at 1:21-28 (underlining added).) Rissanen discloses that this password information, as well as the user's account code (login information), are stored in a database. (Rissanen, at 2:26-29 ("Users are initially entered into a password database stored in the computer system by assigning each user an account code and a password, such as consisting of a number of numerical digits."), Fig. 2 (showing password file **101** with passwords for each user).)

71. ***Rationale and Motivation to Combine***: It would have been obvious to a person of ordinary skill in the art to combine Roseman with Rissanen, with no change in their respective functions, predictably resulting in the virtual conference system of Roseman in which the conference room "keys" are stored in a database which serves as a repository of keys for other programs to access. A skilled artisan would have understood that the user identity and password information in Rissanen is analogous to the "keys" in Roseman, and would have been motivated to make

this combination. In fact, a person of ordinary skill in the art reading Roseman would have found it plainly apparent that the host computer would store and maintain a copy of the keys issued to invitees in a "**database**" to verify the stored key against a key provided by a user seeking access. A person of ordinary skill in the art would have understood that the key verification step in Roseman might not function properly if the host computer could not store and retrieve previously-issued key information to determine validity when a user presents a key seeking access to a conference room. (Roseman, 9:49-50 ("The meeting room 'knows' about each key and its invitation level."), 10:61-64 ("To open a door with a key, the user drops the key onto the door lock. If the key is valid and the user has the authority to use the key, the door opens and the user is admitted to the room.").) Storing the keys in a database is one of a finite number of predictable, well-known solutions to the problem of verifying whether a previously-issued key matches or otherwise corresponds to a key later presented by a user seeking access to a conference room.

72. In short, a person of ordinary skill in the art would have found nothing inventive or non-obvious about the idea of storing "keys" in a "**database**." As noted previously, Rissanen goes on to describe a more advanced technique for storing and recognizing spoken (voice) passwords, but these additional details

would not have discouraged my proposed combination. I have relied upon Rissanen for its basic disclosures relating to the ability to store the "tokens" of Roseman in a database, and as such, it does not matter if the tokens are text, audio, or some other media. A person of ordinary skill in the art would have found the basic teachings relating to the storage of user information and passwords in a database applicable to any system that requires user authentication as a prerequisite to access, such as Roseman.

73. Roseman also discloses that the database serves as a repository of tokens "**for other programs to access**." Roseman discloses that the keys on the host computer may be accessed by "other programs," e.g., the various meeting or conference rooms maintained on the host computer. As noted above, Roseman discloses that each conference room "is actually <u>a combination of stored data and computer programs</u>." (Roseman, 12:16-18 (underlining added).) Moreover, in order to access a conference room, the host computer presents a virtual "hallway" containing "doors," each door representing a different conference/meeting room. (Roseman, 9:63-65 ("The meeting room door is accessible from a hallway which has doors to other meeting rooms."), 10:28-29 ("Meeting rooms are child rooms of the hallway.").) Each meeting room therefore contains a number of computer programs, and each meeting room itself can be thought of as a program. These

programs access the repository of keys when a user presents a key to obtain access to a conference room.

74. As explained in Roseman: "When a person wants to go to a room, he first enters the hallway. The user's display shows an image of a hallway with various doors to rooms." (Roseman, 10:30-32.) If a user locates the door for the appropriate conference, it can drop the key to attempt to gain access: "To open a door with a key, the user drops the key onto the door lock. If the key is valid and the user has the authority to use the key, the door opens and the user is admitted to the room." (Roseman, 10:61-64.) The repository of tokens is therefore accessed by the conference rooms and the programs within them, *e.g.* to verify if the user-provided token is valid. Moreover, the repository is also indirectly accessed by programs on participant computers as they must present their key to the host computer, which in turn validates that key against previously-issued keys in the repository to determine whether or not to allow access. Roseman in view of Rissanen therefore discloses multiple embodiments of a repository of tokens "**for other programs to access**," as recited in the claim.

75. This claim limitation concludes by reciting, "**thereby affording information to each of the participator computers which are otherwise independent of each other**." As noted above, Roseman explains that, if the key

(token) is valid and the participant is authorized to use it, "the door opens and the user is admitted to the room. The other users in the room are alerted to a new presence and receive any relevant information." (Roseman, 10:63-65.) The conference room participants are then afforded information, as previously noted:

> When a user enters a room with other occupants, the data connection is made. Audio and video connections are made if supported by the user, the room and the other users. A small picture of each user is displayed in the meeting room to indicate presence. If video links are enabled than [sic] the picture may be replaced with a video signal from the user, typically showing the user. The majority of the display shows the room's table, walls, etc.

(Roseman, 11:11-17.) Roseman discloses multiple ways of communicating ("affording") information to each meeting participant ("**each of the participator computers**"), such as placing documents on the table of the virtual conference room to share content with the other participants, as discussed in great detail above. (Roseman, 8:1-4, 11:18-22.)

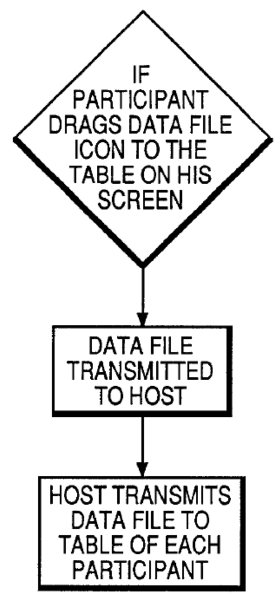
76. Finally, Roseman discloses that the participator computers "**are otherwise independent of each other**." As noted above, each meeting participant in Roseman has a participator computer, which Roseman calls a "local computer." (Roseman, 1:34-37 ("Two (or more) parties each operate their own local computers. The computers have associated video cameras, speaker-type

telephones, and pointing devices (such as 'mouses').”); *id.*, 2:64-65 (“Every office is equipped with the following equipment: a computer (termed a 'local computer' herein) . . . .”).) The participants' local computers can run conventional operating systems and environments such as Microsoft Windows. (Roseman, 12:1-8.) Each local computer in Roseman is “otherwise independent of each other” because the computers are located at different geographic locations and only become part of a virtual conference when connected to the host computer. (Roseman, 3:14-19 (“These individual systems are located at different geographic locations, and, when a virtual conference is to be held, become connected to a central, host, computer (or multiplicity of host computers) . . .”).) Roseman confirms, in fact, that the local computers can be separated by considerable distances, *e.g.* in different states or in several cities within a state. (Roseman, 4:47-53, Fig. 4, Fig. 5 (showing company facilities in several cities in Ohio).) In the event it is argued that Roseman's local computers are not “otherwise independent of each other” because they are connected through a network belonging to an enterprise or company, it would have been trivially obvious, as discussed above, to adapt Roseman to the Internet such that the Internet is the only network shared by the individual local computers.

e. "one said authenticated user identity is used to communicate a pointer-triggered private message from a first of said participator computers to said controller computer and from said controller computer to a second of said participator computers that invokes said pointer-triggered private message to fetch and receive the communication from a computer other than said first or said second said participator computers in real time over the Internet network" (Claim 1[d])

77. Although this limitation is lengthy, the way in which it maps to the disclosures of Roseman is straightforward. As I explained in detail above, a first meeting participant in Roseman who had a valid key and entered the virtual conference room ("**one said authenticated user identity**") can place a document on the table. As shown in Figure 16A shown at the right, this results in the document first being transmitted from the local computer to the host computer, which in turn makes the file available to a second participant's local computer. (Roseman, 8:1-4 ("Each Invitee can transmit a file (of any suitable kind: data, text, or graphic) to the host, and the host will place the file onto the table, where all participants can see it.") (underlining added).) This discloses a message being communicated "**from a first of said participator computers to said controller computer and from said controller computer to a**

FIG. 16A

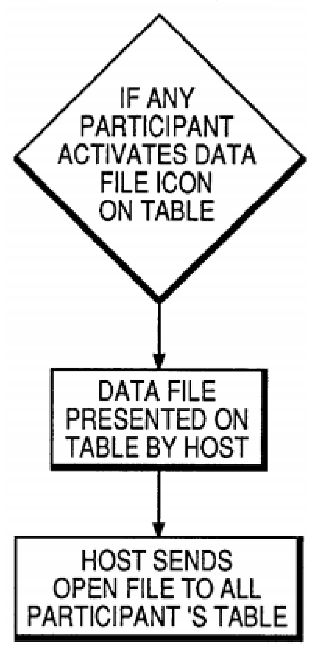


second of said participator computers," as recited in the claim. As I will explain in detail below, the host computer makes the document available by sending a pointer (in the form of a clickable icon) to each meeting participant computer that can be used to obtain the document.

78. The claim limitation further specifies that the communicated message be "**a pointer-triggered private message**." As I explained above, the term "pointer-triggered private message" is a "private message that allows its recipient to obtain content via a pointer." I will first address the "**pointer-triggered**" limitation, and then, the "**private**" requirement.

79. Roseman discloses a "pointer-triggered" message. As noted previously, if a user places a document onto the table of the virtual conference room, the host sends an icon to the table of each conference participant. (Roseman, 14:53-57.) This is a "pointer-triggered message" because the icon contains information that points to and is used to present the underlying document. Clicking on the icon by the recipient participant causes the host computer to present the file to the participant. (Roseman, 14:59-62 ("IF ANY PARTICIPANT ACTIVATES ICON ON TABLE," "DATA FILE

FIG. 16B



PRESENTED ON TABLE BY HOST," "HOST SENDS OPEN FILE TO ALL PARTICIPANTS TABLES") (capital letters in original); *id.* Fig. 16B (at right).) The icon therefore points to the file to be presented to the participant, and when invoked, the file content appears on the tables of each conference room participant.

80. In my opinion, the disclosures of Roseman alone disclose the claimed "pointer-triggered message." But in the event it is later argued or determined that "pointer" requires an Internet URL or something functionally similar, or argues that the implementation of the file icon in Roseman is insufficiently described, then Roseman would render the "pointer-triggered message" limitation obvious in view of the teachings of Pike **[Ex. 1006.]**

81. Pike provides an introductory section describing several basic and familiar Internet concepts, such as hypertext links and URLs. (Pike, Ex. 1006, at 36-39.) Pike explains that "[a] *URL* is a complete description of an item, including the location of the item that you want to retrieve." (*Id.* at 38 (italics in original).) "The location of the item can range from a file on your local disk to a file on an Internet site halfway around the world." (*Id.*) Pike explains that a URL can identify any resource on the Internet, and "is not limited to describing the location of WWW [World Wide Web] files." (*Id.*) Pike further explains that a URL can be used to locate and fetch a document from another computer, and includes "a

UNIX-style path for the file that you want to retrieve." (*Id.* at 39.) Pike therefore discloses a "pointer-triggered message" in the form of a message containing a URL that causes a computer to fetch and retrieve a document from another computer.

82. It would have been obvious to a person of ordinary skill in the art to combine Roseman and Vetter with Pike, with no change in their respective functions. This would have predictably resulted in the virtual conferencing system of Roseman in which the clickable icons used to access content (such as a document placed on the table) included a URL that identified the location of the document on the host computer. As explained previously, Vetter expressly discloses the ability to use the Internet to enable videoconferencing features similar to Roseman. A person of ordinary skill in the art would have understood that, once a system is communicating over the Internet, the URL is a preferred means to identify resources on the Internet. It would have required no leap of inventiveness for a person of ordinary skill in the art to use the ubiquitous Internet URL to identify content stored on the host computer of Roseman which, upon activation, would fetch the requested content and transmit it to second meeting participant computer over the Internet. One of ordinary skill in the art would have recognized that use of the URL method, as taught by Pike, would be particularly advantageous in the context of the Internet and known bandwidth restrictions that existed at the

time of the alleged invention. (*See* Pike, Ex. 1006, at p. 43 (top of page).) This is because the file content need not be communicated from the host computer to the participant (thus consuming network bandwidth) unless the participant requests to view the content by invoking the URL.

83. Moreover, it was well-known to send messages containing Internet URLs. Pike describes a technique for allowing a user to send URLs for interesting Internet resources in email messages to other people. (Pike, at p. 121.) This capability was well-known because, in part, it was one of the original design goals of the URL. As explained in Request for Comments 1738 by Tim Berners-Lee (December 1994), the famous standard that defined the syntax of URLs, "there are many occasions when URLs are included in other kinds of text; examples include electronic mail, USENET news messages, or printed on paper." (RFC 1738, Ex. 1009, at p. 22.) RFC 1738 describes techniques for embedding URLs into textual messages so they can be easily used. (*Id.*) By March 1995, URLs were being regularly distributed by businesses, government agencies, academic institutions, and individuals. (Ex. 1010.)

84. By April 1996, therefore, a person of ordinary skill in the art would have found nothing non-obvious about adapting the document-on-the-table feature of Roseman to send a message containing an Internet URL to meeting participants.

Roseman specifically discloses that a document placed on the table can include "text" (8:2) and thus, a person of ordinary skill in the art would have understood that the document could contain an Internet URL. In my opinion, therefore, the "pointer-triggered" limitation provides no meaningful distinction over Roseman.

85. As noted, the claim also requires that the message be a "**<u>private</u>** pointer-triggered message." Roseman also discloses this. When a meeting participant places a document on the table, that document is not made available to the general public; it is provided only to participants. As I explained above, meeting participants must be invited and have a valid "key" to join the virtual conference. A person of ordinary skill in the art would have regarded this as sufficiently "**private**" to meet the claim limitation. The claim does not require that a "private" message be limited ***only*** to the first and second participator computers.

86. But even if "**private**" were understood to require that the "pointer-triggered message" be limited only to the first and second participator computers, such a requirement would be obvious. A person of ordinary skill in the art would have understood that a virtual conference room in Roseman could have only two participants (a requester and one invitee) in which case a document placed on the table of the conference by one participant would be shared with the other participant. Moreover, Roseman expressly discloses one-on-one private messages.

"The participants can privately whisper or pass notes to each other, without the knowledge of the others." (Roseman, 2:49-50.)

87. More specifically, Roseman discloses a note-passing feature in which a first participant can send a private note to a second participant. The first participant drags the note into the virtual conference room and onto the picture of the recipient participant. (Roseman, 9:26-28.) A small square icon representing the note appears on the other participant's screen. (Roseman, Fig. 12.) "When the other party sees the note on his picture, as in FIG. 12, he can drag it to a private viewing area, double-click it, and read it. No other people are aware of the passed note." (Roseman, 9:28-31 (underlining added).) The square icon similarly serves as a pointer because it points to, or references, the underlying note content, and presents the content on demand. This second embodiment independently discloses a "private pointer-triggered message," as recited in the claim.

88. It would have been obvious to a person of ordinary skill in the art that the communication technique described above, in which a document is placed on the table, could have been enhanced to allow private communication between only two participants (instead of all participants). Because Roseman already teaches the ability to send private one-on-one messages, it would be trivially obvious to add that capability to the conference room table to allow the first participant to place a

document on the conference room table for private viewing only for a second participant. It would alternatively be trivial to adapt the ability to share multimedia documents (from the conference table feature) to the private note-passing feature. A person of ordinary skill in the art would have seen these possibilities as obvious combinations of two closely-related messaging features described in Roseman.

89. Finally, the claim requires that the second participator computer "**invokes said pointer-triggered private message to fetch and receive the communication from a computer other than said first or said second said participator computers in real time over the Internet network**." This limitation was largely covered by my discussion of the "pointer-triggered message" limitation above. As noted above, the icon in Roseman, when invoked by the second participant computer, causes the second computer to fetch and receive the underlying content. Pike confirms that the pointer could be a URL, which could be used to download the document content from the host computer over the Internet in real-time when the URL is invoked. In fact, this limitation is little more than a recitation of basic Internet URL functionality. (Pike, at p. 43 ("When you view a document on the WWW, you are actually retrieving it from somewhere on the Internet. When you do this, you are making demands on the Internet host that is providing the information, and also on the network itself.").)

90. This limitation is therefore disclosed and rendered obvious by the prior art as discussed above.

f. "such that the second of said participator computers internally determines whether or not the second of the participator computers can present the communication, if it is determined that the second of the participator computers can not present the communication then obtaining an agent with an ability to present the communication, and otherwise presenting the communication independent of the first of the independent participator computers and the computer" (Claim 1[e])

91. Each aspect of this final limitation is disclosed by the prior art. To begin with, Roseman in view of Pike and Westaway discloses that "**the second of said participator computers internally determines whether or not the second of the participator computers can present the communication**," as recited in the claim. As explained in Roseman, when a participant "clicks" on the icon of the document placed on the conference room table, the file is obtained and displayed as an icon image:

> The Invitee drags an icon onto the table, as shown in FIG. 11, and double-clicks (or actuates) the icon. The icon blooms into an image dictated by the type of file which the icon represents (graphic, text, etc.)

(Roseman, 8:1-13.) The second conference participant (not just the Invitee) can double-click the icon to cause the host to present view the file content. (Roseman,

14:59-62 ("IF ANY PARTICIPANT ACTIVATES ICON ON TABLE," "DATA FILE PRESENTED ON TABLE BY HOST," "HOST SENDS OPEN FILE TO ALL PARTICIPANTS TABLES") (capital letters in original); *id.* Fig. 16B.) The passage quoted above also confirms that the file can be of various "type[s]," e.g., "graphic, text, etc." (Roseman, 8:12-13), and thus Roseman discloses the ability to handle and present different types of data.

92. But Roseman does not appear to disclose the scenario in which the second participant computer ***internally determines that it <u>cannot</u> present the communication***. However, this would have been obvious in view of <u>Pike</u> and <u>Westaway</u>.

93. With respect to Pike, it explains that there may be occasions when a user receives information over the Internet but his or her computer lacks the software needed to view it:

> While Mosaic for Windows displays normal Web documents, you may want to obtain additional software to allow Mosaic to handle things such as pictures, sounds, and animations (movies). This additional software is available through anonymous FTP at **ftp.ncsa.uiuc.edu** in the directory /Web/Windows/Mosaic/viewers.

(Pike, at pp. 55-56 (boldface in original); *see also id.* at p. 55 ("Besides the standard software necessary to run Mosaic for Windows, there is some additional software which you may need to either set up Mosaic or allow Mosaic to handle certain documents.").) Pike lists several examples of this "additional software," including viewers for handling PostScript documents, GIF and JPEG graphic images, MPEG movies, and audio files. (*Id.* at p. 56.) Pike further explains:

> You can run Mosaic without installing any additional viewers or configuring Mosaic to use them. But you may want to install these so you can view images, watch movies, and listen to sounds that you download through Mosaic.

(*Id.* at p. 61 (under "Installing Viewers").)

94. Pike further explains that once an external viewer has been installed, it is invoked automatically to view the files for which the viewer was designed:

> After you have a viewer installed and Mosaic knows where to find it and what type of files it displays, you can load files of that type and Mosaic automatically starts the viewer to display them.

(*Id.* at p. 96 (under "Viewing Multimedia Files").)

95. Pike therefore discloses the "determining" and "obtaining" steps. Pike explains that "Mosaic can display text and inline graphics directly, but to display other types of files, you <u>must</u> have viewers for those files installed on your machine." (Pike, at p. 96 (emphasis added).) If Mosaic encounters one of these "other types of files," it checks to see if an appropriate viewer application is installed. If so, "you can load files of that type and Mosaic automatically starts the

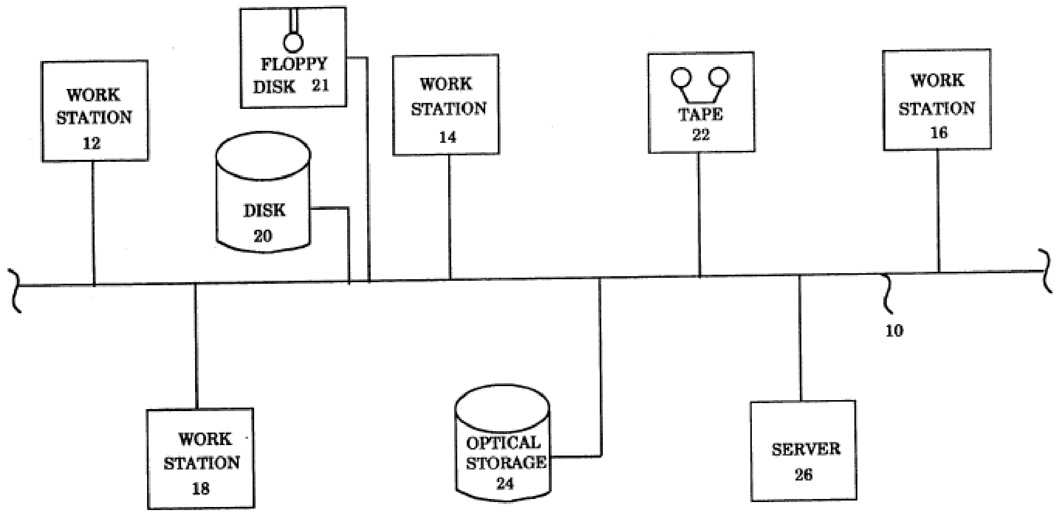
viewer to display them." (*Id*.) This functionality confirms that a computer with Mosaic must have the ability to "internally determin[e]" that it cannot itself display the file because if it cannot read the file using Mosaic, and it cannot locate an appropriate viewer application, it cannot present the communication. As explained above, Pike makes clear that one response to this problem is for the user to the download and install an appropriate viewer application for use by the computer along with Mosaic. (*Id.* at pp. 55-6.)

96. The claims under their broadest reasonable construction do not appear to require that the step of "**obtaining an agent with an ability to present the communication**" be performed automatically without any user involvement. But even if this was deemed to be a requirement of the claim, such a feature would be obvious in further view of Westaway

97. Westaway discloses multiple "participator computers," which it calls "data processing devices," "agents," or "workstations." (Westaway, Abstract ("data processing devices ('agents')"), 1:15, 1:19, 2:18, 3:52, 4:3-5 ("[T]he workstation may comprise any data processing resource, computer or specialized data processing device.").) Westaway explains that there are instances where "an agent requires certain software for execution, and the software is not available on the agent's local hard disk drive or internal memory." (Westaway, 1:25-27.)

"Therefore, if a running process attempts to access missing software, the operating system typically returns a 'file not found' message, . . ." (Westaway, 1:64-66; *see also* 1:47-51 ("Typically, in most software operating environments, a user obtains a message similar to 'file not found' or 'command not found', when an attempt occurs to access programs which have not yet been loaded onto the system's software resources.").) Westaway thus discloses that an agent ("the second of said participator computers") can "**internally determine**[]" whether or not software required for a certain task is present in its local memory. (1:26-27.)

98. Westaway further explains that the agent can be connected to a network. (Westaway, Abstract ("Apparatus and methods are disclosed having application for use in data processing systems which include <u>a plurality of data processing devices ('agents') coupled to a communication network</u> . . .") (underlining added), 1:18-20, 2:17-20.) Additionally, "[s]ystem software resources, such as for example, disk drives, tape drives, or optical storage devices such as CD ROMs, may be coupled to the network." (1:20-24; *see also id.* 4:43-44 ("software location[:] location on either the media or <u>the network</u>") (underlining added).) Figure 1 shows network connecting workstations to software resources:



99. As Westaway makes clear, the "[s]ystem software resources" stored on "for example, disk drives, tape drives, or optical storage devices such as CD ROMs" on the network "provide system software to be accessed and executed by agents coupled to the network." (1:18-24 (underlining added).) Thus, "[i]n the event an agent requires certain software for execution, and the software is not available on the agent's local hard disk drive or internal memory, then it accessed from one of the system software resources such as a disk drive, tape drive or the like." (Westaway, 1:24-29 (underlining added).) The computer, in other words, will retrieve the missing software from software resources on the network. Specifically, the computer can issue a "'file system request' for the missing file," and "a return code is sent to the workstation such that the desired data/program is provided and execution of the program may continue." (5:21-26.) Westaway

therefore discloses automatically "**obtaining**" the requisite software if it is determined that the computer cannot execute a certain process. (*See also* 1:10-16 ("The present invention relates to apparatus and methods for providing data and programs to a data processing device, and more particularly, to methods and apparatus for automatically loading missing system software without terminating current processing operations being executed by the data processing device in a data processing system."); 1:56-58 ("Today, there exists many 'indexes' which allow the user to find and load missing software, and tool/utilities which will load the missing programs for the user.").) Although Westaway does not expressly disclose that the software determined to be missing and then obtained can include software for "present[ing] [] communication," this would have been trivially obvious in view of <u>Pike</u> **[Ex. 1006.]** because, as explained previously, Pike expressly contemplates that additional software may be required to present certain types of communications.

100. Thus, Roseman, Westaway, and Pike disclose and render obvious the requirement that, "**if it is determined that the second of the participator computers can not present the communication then obtaining an agent with an ability to present the communication**."

101. ***Rationale and Motivation to Combine***: I have already explained the reasons to combine Roseman and Pike in connection with previous limitations, but further motivations to combine apply to Pike's teachings regarding external viewer software. It would have been obvious to adapt the teachings of Pike and Westaway to the virtual conferencing system of Roseman, predictably resulting in the videoconferencing system of Roseman in which the system first determines whether or not it can present a particular communication. If it cannot, appropriate presentation software is obtained and used to present the content that the existing software on the local computer in Roseman cannot handle.

102. Persons of ordinary skill in the art would have appreciated that in any computing system, it was routine that a user could receive a document from someone else but be unable to open or access it because the user lacked the correct software (or perhaps even the correct version of the software). Anyone who attempted to read a Microsoft Word document using WordPerfect (or vice versa), without a document format converter, would have been aware of this problem. This problem was exacerbated by wide area computer networks such as the Internet, which made it easier to exchange different types of documents from a rapidly expanding number of Internet users.

103. These considerations would have been particularly applicable to Roseman. As noted, the system of Roseman allows a meeting participant to "drag-and-drop" an icon of a document onto the table of the virtual conference room. Roseman places no limits on what that document could be; it could be any file stored on the participant's local computer. (Roseman, 8:1-13, Fig. 10.) Accordingly, a person of ordinary skill in the art would have understood that a meeting participant could place a document on the table that other participants could not view using currently-installed software applications, making the teachings of Pike and Westaway particularly useful. The motivation to combine is further enhanced by the fact that Pike specifically explains that a user may want to obtain external viewer software to handle types of files not supported by the user's already-installed software (Pike, at p. 61), and Westaway notes that lacking the appropriate software can "prematurely terminate[] whatever process, programs, or command is being executed." (Westaway, 1:52-53.) It would have been abundantly obvious to one of ordinary skill in the art that the performance and execution of the virtual conference of Roseman could be improved using the viewer software applications described in Pike, to be obtained using the software retrieval techniques taught by Westaway.

104. Claim 1 ends with the requirement of "**otherwise presenting the communication independent of the first of the independent participator computers and the computer**." As explained previously, this limitation is obvious over the prior art. It would have been obvious, as noted above, that the communication could be presented by the second participant computers' existing software, or through the obtained viewer software ("agent with an ability to present the communication"). In either case, because the file had been downloaded onto the second participant's computer, and the presentation software is running on that second computer, the presentation of the communication is "**independent of**" the first participant's computer or the host computer in Roseman.

2. Claims 2-5 (Web, Sound, Video Communications)

105. Dependent claims 2-5 all recite closely-related subject matter and thus will be treated together. These claims recite:

2. The apparatus of claim **1**, wherein the computer system includes a world wide web communication.
3. The apparatus of claim **1**, wherein the computer system includes data representing sound communications.
4. The apparatus of claim **1**, wherein the computer system includes data representing video communications.
5. The apparatus of claim **1**, wherein the computer system includes data representing sound and video communications.

As shown above, claims 2-5 recite that the content communicated among users must include web, sound, video and/or audio communications.

106. In my opinion, these claims do not add anything of significance that is not disclosed by the prior art that I applied to claim 1. With respect to claim 2, as I explained previously, it is plainly apparent that a "pointer-triggered" message could contain a URL to a website ("**a world wide web communication**"). As for claims 3-5, Pike discloses that users could communicate sound and video (and any combination of sound and video) over the Internet. (Pike, at p. 61 ("But you may want to install these [viewer programs] so you can view images, watch movies, and listen to sounds that you download through Mosaic.").)

3. Claims 6 ("Message is not Censored")

107. Claim 6 recites, "[t]**he apparatus system of claim 1, wherein the computer system further determines that the message is not censored**."

Roseman discloses several techniques for censorship of content. For example, the conference room could be set up to require that certain "procedural issues" be followed before individuals were allowed to speak, that users be limited to a particular amount of time, and discloses a host-controlled content moderator to prevent one participant from "filibustering" and not allowing others to speak. (Roseman, *e.g.*, 11:40-46, 12:29-45.) These censorship features, however, appear to apply to the voice communication capabilities of Roseman and not to other features such as placing documents on the table or passing private notes, upon which I have relied in my discussion of independent claim 1.

108. Nevertheless, this feature would have been obvious to a person of ordinary skill in the art in view of Lichty **[Ex. 1008]**. Lichty describes "chat room" services provided by America Online that are closely analogous to the virtual conference room features of Roseman. (Lichty, *e.g.*, pp. 252-278.) Like Roseman, a "chat room" provides a forum for multiple participants to communicate in real-time with each other over a computer network. (*Id.*)

109. Lichty provides a method for screening out ("censoring") certain messages from being received by a chat room participant. For example, a participant can prevent AOL from having messages from another recipient appear on the recipient's screen. (Lichty, pp. 269 ("If you wish to exclude a member's comments (or those of all members in the conversation in which you're not interested), select the member's name in the People in this Room window and click the Ignore button. From then on, that member's text will not appear on your screen.").) Conversely, if a participant finds another participant's communications to be particularly relevant, the participant can have that participant's comments highlighted. (*Id.*) These features disclose the limitation, "**wherein the computer**

system further determines that the message is not censored," because these features require the computer system to determine whether or not a message is censored (*e.g.*, may be delivered to a participant).

110. ***Rationale and Motivation to Combine***: It would have been obvious to a person of ordinary skill in the art adapt Roseman to provide the features of Lichty described above, predictably resulting in the virtual conference system of Roseman in which the host determines whether a message is censored and, based on that determination, decides whether to deliver the message. These features would allow meeting participants in Roseman, for example, to block private "note-passing" and any other type of communication from identified individuals.

111. As stated above, Lichty and Roseman are analogous references in the same field of providing real-time communication to groups of computer users connected to a network. In fact, the analogous nature of these references is confirmed by the fact that they use "censorship" features to address the same challenges with real-time communications. Lichty acknowledges that "[w]hen rooms become full and everyone is talking, it can be difficult to follow what's going on." (Lichty, at p. 269.) Lichty explains that this feature "is most useful when the chat of another member becomes disruptive in the chat room." (*Id.* at

510 (definition of “Ignore”).) Lichty calls this feature as “a real boon when chats get busy” (Lichty, p. 269), thus providing a further express motivation to combine.

112. Roseman identifies a similar problem by instructing conference organizers to consider, at the time of meeting room creation, “[i]s the meeting a brainstorming free-for-all, where numerous people can speak at once?” (Roseman, 3:55-56.) Roseman acknowledges that, like Lichty, one participant may attempt to disrupt or dominate a conference by talking excessively, and thus, may need have his or her communications blocked. (Roseman, 12:29-45.) Roseman also notes that a meeting participant’s interest in another participant’s communications may vary. (Roseman, 11:46-47 (“An ‘Interest Meter’ might show the interest level of the listeners to a speaker.”).) A person of ordinary skill in the art, therefore, would have recognized that the two references address the same types of problems, and thus, the solution provided by Lichty would also be applicable to Roseman.

113. As noted previously, Roseman already discloses censorship techniques for voice communications. A person of ordinary skill in the art would have found the features of Lichty to be a natural addition to the other virtual conferencing features of Roseman. A person of ordinary skill in the art, therefore, would have been amply motivated to combine.

4. Independent Claim 7 (Similar to Claim 1)

114. Independent claim 7 recites an apparatus that recites substantially similar limitations as claim 1, so I will describe it only briefly and refer back to my analysis of claim 1 as appropriate.

115. The preamble of claim 7 recites "[**a**]**n apparatus to communicate via an Internet network**." (Claim 7, Preamble.) Roseman describes such an apparatus as discussed above. The apparatus includes, as noted, at least a "host computer."

116. Claim 7 continues by reciting "**a computer system communicatively connected to each of a plurality of participator computers responsive to communication of a respective login name and a password corresponding to a respective user identity**" (Claim 7[a]), which is disclosed by Roseman and Rissanen for substantially the same reasons as the "authenticated user identity" limitation in claim 1. (*See* my analysis in **Part IV.D.1(b)**.) Although there are some differences in the language used to express this limitation as compared to claim 1, they are immaterial. The "**computer system**" in claim 7 corresponds in Roseman to the host computer system, and the "participator computers" to meeting participant local computers. (Roseman, 1:34-41, 2:64-3:19.)

117. Roseman and Rissanen disclose the ability of a computer to communicate a "**login name and a password corresponding to a respective user identity**." Roseman discloses a technique for distributing and using "keys" to access the conference room, as noted previously. (Roseman, 9:32-53, 10:61-65.) Roseman also discloses that in order to access the key, a user may be required to provide a "pass-code" to retrieve the key from a virtual vault. (Roseman, 6:64-7:3, Fig. 8.) To the extent it is not clear if the "key" feature in Roseman discloses a "login name and a password," as claimed, this is a trivially obvious detail that is disclosed by Rissanen. (Rissanen, 1:37-39 ("Typically, the computer system prompts the user to enter the user's account code and then prompts the user to enter the assigned password . . ."), 1:33-34 (explaining that the "account code" stores the user's "login identification").)

118. It would have been obvious to combine Roseman and Rissanen for the reasons stated above. Moreover, Rissanen is just one example of a system in which a login name and password are used to provide user authentication; such systems were common long before the '245 patent. It would have been obvious to adapt such a technique to Roseman to enhance the existing "key" system of Roseman. As noted, Roseman already discloses entering a "pass-code" to gain

access to the "key," so adding a login name and password to Roseman would have been seen as a natural and obvious extension of its existing features.

119. Claim 7 continues by reciting "**a first of the participator computers running software communicating a private message to the computer system, the private message comprising a pointer**." (Claim 7[b].) As I explained above, the meeting participant computers in Roseman run software that allows the participant to communicate a private message to the host computer – for example, by dragging-and-dropping a document on the table of the conference room or by passing a private note to another user. (*See* Roseman, 8:1-6, 11:18-27.) Both of these messages comprise a pointer in the form of an icon that, when activated, displays the underlying message content. As I explained above, the combination of Roseman and Pike fully disclose and render obvious the claimed "private message comprising a pointer," as recited in this limitation.

120. Claim 7 continues by reciting "**the computer system, including a database which serves as a repository of tokens for other programs to access, thereby affording information to each of the participator computers which are otherwise independent of each other**" (Claim 7[c]), which is substantially the same as the language I addressed in claim 1 above. (*See* **Part IV.D.1(d)** above.)

121. Claim 7 continues by reciting "**the first participator computer of the computer system is running software communicating the private message to a second of the participator computers**," and then, "**the second of the participator computers is running software receiving a communication via the pointer provided within the private message from the first of the participator computers**." (Claim 7[d].) As I explained for claim 1, both participant computers in Roseman execute software to present the virtual conference room, which includes the ability for the first participant computer to send a private message (*e.g.* document placed on the table or private note) to the second participant computer via the host computer. (Roseman, 8:1-5, 9:26-31, 11:18-27.)

122. Claim 7 continues by reciting, "**the communication being sent in real time and via the Internet network**." (Claim 7[e].) Conference participants in Roseman communicate in real time. (Roseman, 2:38-46 ("In the invention, the participants share a common virtual conference table. Each participant can (1) place a document onto the table electronically . . . All other participants see the [sic] the preceding three events <u>as they occur</u>.") (underlining added).) As noted in my analysis of claim 1, moreover, when a user activates an Internet URL, the content to which the URL refers is fetched in real-time. (See above, **Part**

IV.D.1(e); Pike, at p. 43 ("When you view a document on the WWW, you are actually retrieving it from somewhere on the Internet.").)

123. Claim 7 continues by reciting, "**the communication including pre-stored data representing at least one of video, a graphic, sound, and multimedia**" (Claim 7[f]), which I covered in detail above. Roseman discloses that a document placed on the table ("**the communication**") can be "of any suitable kind: data, text, or graphic" (Roseman, 8:2), which discloses at least graphic and multimedia content. Moreover, the document or file placed on the table is "**pre-stored**" because, as I explained above, the document was already stored as a file on the participant's local computer. (*See* Roseman, 8:7-9; Fig. 10.)

124. Claim 7 continues by reciting, "**such that the second of the participator computers determines internally whether or not the second of the participator computers can present the communication**," "**if it is determined that the second of the participator computers can not present the communication then obtaining an agent with an ability to present the communication, and otherwise presenting the communication independent of the first of the independent participator computers**." (Claim 7[g].) These limitations are substantially identical to the one I addressed in claim 1. (*See* my analysis of claim 1 above in **Part IV.D.1(f)**.)

5. Claim 8 (Similar to Claim 6)

125. Claim 8 is substantially the same as claim 6, the only material difference being that the former depends from claim 7 and the latter from claim 1. My analysis of claim 6 applies with full force here.

6. Claim 9

126. Dependent claim 9 recites "[t]**he apparatus of claim 7, wherein the computer system includes the pointer as a pointer that causes the communication to be produced on demand**." This claim adds nothing significant to my analysis of claim 7 above. As noted, clicking a URL in a message ("**the pointer**") causes the communication to be produced on demand, *e.g.* by fetching from the Internet the content to which the URL points.

7. Claim 10-12 (Similar to Claims 3-5)

127. Claims 10-12 are substantially the same as claims 3-5, the only material difference being that the former group of claims depends from claim 7 and the latter from claim 1. My analysis of claims 3-5 applies here.

8. Claim 13 (Text/ASCII)

128. Claim 13 recites that the computer system "**includes messaging data representing at least one of text communications and ASCII communications**." Roseman discloses that the messages can be "of any suitable kind: <u>data, text, or graphic</u>" (Roseman, 8:2), and thus discloses this limitation. It

would also have been plainly obvious to a person of ordinary skill in the art that messages exchanged in Roseman, Vetter and Pike could have included text.

9. Claim 14 (Member-Associated Image Communications)

129. Claim 14 recites "[**t**]**he apparatus of claim 7, wherein the computer system includes data representing a member-associated image communications**." Roseman discloses that the virtual conference room, which is communicated to each of the participants, includes a picture of each member. (Roseman, 7:30-39 ("Once these preliminary matters are established, the host creates the conference room. The host does this by creating a common image, such as that shown in FIG. 9. The common image includes a picture of each invitee, a 'table,' and the room décor. . . The pictures of the invitees can be the actual images seen by the each invitee's close-up camera, or can be a photograph taken from the host's memory. In some situations, the photograph may be more convenient."); Fig. 9 (showing pictures of six meeting participants).)

10. Claim 15 (Chat Channel)

130. Claim 15 recites "[**t**]**he apparatus of claim 7, wherein the computer system provides a chat channel via the Internet network between at least two of the plurality of independent computers**." Roseman describes several examples of real-time communications that meet the "chat channel" limitation.

For example, "[t]he participants can privately whisper or pass notes to each other, without the knowledge of the others." (Roseman, 2:49-50.) In particular, Roseman discloses a note-passing feature in which a first participant can send a private note to a second participant. (Roseman, 9:26-31.) The exchange of private notes between two users clearly qualifies as a "chat channel" because users can exchange textual messages between each other in real-time. Another example of a "chat channel" would include Roseman's real-time voice communication capabilities. For example, "[a]ny participant can whisper to another, without being-heard by others. For example, one party can click onto the picture of another. . . . At this time, the host makes an audio connection between the two whispering parties, and between nobody else. The parties can communicate, until they terminate whisper mode." (Roseman, 9:16-26.)

131. As explained previously, moreover, Roseman discloses the ability to communicate messages to participants by placing a document on the table, which causes it to appear in real-time to other participants. (Roseman, 8:1-5; see also id., 2:46-47 (noting that participants see documents being placed on the table "as they occur.").) Any one of these functionalities independently satisfies the "**chat channel**" limitation of claim 15 because each involves real-time text or multimedia communication between two or more meeting participants. Although Roseman

does not disclose a chat channel "**via the Internet**," this would have been obvious over Vetter and Pike as previously explained in detail above.

132. Moreover, even if Roseman did not disclose the claimed "chat channel," such a channel is disclosed by Lichty. (Lichty, at p. 270 (Fig., 12-13).) As I explained in my discussion of claim 6, a person of ordinary skill in the art would have found Roseman and Lichty to be entirely combinable.

11. Claim 17 ("User Age")

133. Claim 17 depends from claim 8 and recites, "**wherein the computer system includes a user age corresponding to each of the user identities**." Roseman does not appear to explicitly disclose this feature, but it is disclosed by Lichty. Lichty discloses that the America Online system recorded certain "Member Profile" information about its users, including their birthdates. (Lichty, p. 73, Fig. 3-14 (showing "Birthdate: 05/18/44" for user "MajorTom").) This profile information is also available for participants of a "chat room" by simply clicking on the participant's name and pressing "Get Info." (*Id.* at p. 268-69.)

134. A person of ordinary skill in the art would have found it obvious to adapt the system of Roseman to record the user age. A person of ordinary skill in the art would have understood that the age or birthdate of a person is one of the fundamental pieces of information that can be recorded in a personal information

database, and thus, would have found this limitation obvious even without an additional reference such as Lichty. A person of ordinary skill in the art would also have recognized that recording the age of conference participants in Roseman would help the conference organizer confirm that participants met minimum age limits, or to ensure that the content presented is age-appropriate.

12. Claim 18 (Text/ASCII)

135. Claim 18 is substantially similar to claim 13 except that it depends from a different independent claim. As explained in my discussion of claim 13, above Roseman discloses that the messages can be "of any suitable kind: data, text, or graphic" (Roseman, 8:2 (underlining added)), and thus discloses this limitation. It would also have been plainly obvious to a person of ordinary skill in the art that messages exchanged in Roseman, Vetter and Pike could have included text.

13. Independent Claim 19 (Similar to Claim 7)

136. Independent claim 19 recites an apparatus that recites substantially similar limitations as claim 7. I have provided a side-by-side comparison below which shows that all of the limitations of claim 19 are recited using substantially similar language as claim 7. I have underlined language that is identical between the claim elements.

Claim 7	**Claim 19**
7. An apparatus to communicate via an Internet network, the apparatus including:	19. An apparatus to receive a communication via an Internet network, the apparatus including:
[a] a computer system communicatively connected to each of a plurality of participator computers responsive to communication of a respective login name and password corresponding to a respective user identity;	[a] a computer system, and a plurality of participator computers, each of the participator computers communicatively connected to the computer system responsive to each of the plurality of participator computers being associated with a respective login name and password;
[b] a first of the participator computers running software communicating a private message to the computer system, the private message comprising a pointer, [f] the communication including pre-stored data representing at least one of a video, a graphic, sound, and multimedia,	[b] a first of the plurality of participator computers being programmed to communicate such that a private message is sent to the computer system, [c] the private message including a pointer pointing to a communication that includes pre-stored data representing at least one of a video, graphic, sound, and multimedia;
[c] the computer system, including a database which serves as a repository of tokens for other programs to access, thereby affording information to each of the participator computers which are otherwise independent of each other; wherein	[d] the computer system, including a computer and a database which serves as a repository of tokens for other programs to access, thereby affording information to each of the participator computers which are otherwise independent of each other; wherein
[d] the first participator computer of the computer system is running software communicating the private message to a	[e] the computer system communicates the private message to a second of the plurality of participator computers; and

Claim 7	Claim 19
second of the participator computers, and the second of the participator computers is running software receiving a communication via the pointer provided within the private message from the first of the participator computers,	the second participator computer is programmed to receive the communication provided within the private message, which originates from the first participator computer,
[e] the communication being sent in real time and via the Internet network,	[f] the communication being sent in real time and via the Internet network,
[g] such that the second participator computer internally determines whether or not the second participator computer can present the pre-stored data, if it is determined that the second participator computer can not present the pre-stored data then obtaining an agent with an ability to present the pre-stored data, and otherwise presenting the pre-stored data independent of the first participator computer.	[g] and the second participator computer internally determines whether or not the second participator computer can present the pre-stored data, if it is determined that the second participator computer can not present the pre-stored data then obtaining an agent with an ability to present the pre-stored data, and otherwise presenting the pre-stored data independent of the first participator computer.

137. As shown above, the differences between claims 7 and 19 consist largely of immaterial variations in language. Therefore, as I explained in connection with each element of claim 7 above, including with reference to similar corresponding elements in claim 1, claim 19 is obvious over Roseman in view of Rissanen, Vetter, Pike, and Westaway. (See above, **Part IV.D.1** and **Part IV.D.4**.)

It would have been obvious to a person of ordinary skill in the art to combine these references for the reasons stated above. (*Id.*)

138. For clarity, I will now address each element of claim 19 with reference to my previous discussion above.

139. The preamble of claim 19 recites **"[a]n apparatus to receive a communication via an Internet network."** This is not meaningfully different from the preamble of claim 7, which recites **"[a]n apparatus to communicate via an Internet network."** As I discussed above, Roseman discloses a virtual conferencing system including a host computer that receives and facilitates communications among participator computers. (See above, **Part IV.D.1(a)** at ¶ 50 and **Part IV.D.4** at ¶¶ 114-115.) As I also discussed above, Roseman in view of Vetter further discloses and renders obvious that the communications are transmitted via an Internet network. (See above, **Part IV.D.1(a)** at ¶¶ 51-57 and **Part IV.D.4** at ¶¶ 114-115.) Pike also discloses and renders obvious an apparatus to receive a communication via an Internet network, as I discussed previously. (See **Part IV.D.1(e)** at ¶¶ 81-84; **Part IV.D.4** at ¶¶114-115; Pike, at pg. 43 ("When you view a document on the WWW, you are actually retrieving it from somewhere on the Internet.").)

140. The next element of claim 19 recites "**a computer system, and a plurality of participator computers, each of the participator computers communicatively connected to the computer system responsive to each of the plurality of participator computers being associated with a respective login name and password**." This is not meaningfully different from claim 7[a] and is disclosed and obvious for the same reasons I previously explained. (See above, **Part IV.D.1(b)** and **Part IV.D.4** at ¶¶ 116-118.) The '245 patent describes that a user enters a login and password, and if the login information is valid the user can proceed to participate in chat channels. ('245, 9:16-22, 11:14-21, Figs. 7-9, 28, 29.) Similarly, as I discussed previously, Roseman describes that if a participant's computer is associated with a valid key, a data connection is made with that computer and audio and video connections may also be made. (See above, **Part IV.D.1(b)**; **Part IV.D.4** at ¶¶ 116-118; Roseman, 11:10-17.) Furthermore, as I explained, Roseman and Rissanen disclose and render obvious that each participator computer is connected for communication based on a login name and password received from that computer. (See above, **Part IV.D.4** at ¶¶ 117-118.)

141. The next two elements of claim 19 recite "**a first of the plurality of participator computers being programmed to communicate such that a private message is sent to the computer system**" and "**the private message**

including a pointer pointing to a communication that includes pre-stored data representing at least one of a video, graphic, sound, and multimedia." These elements correspond to the elements of claim elements 7[b] and 7[f] that I previously discussed, and are disclosed and obvious for the same reasons I previously explained. (See above, **Part IV.D.1(c)**, **Part IV.D.1(e)**, and **Part IV.D.4** at ¶¶ 119, 123.)

142. I note that the phrase **"running software"** in claims 7[b] and 7[d] is not meaningfully different from the phrase **"programmed"** in claims 19[b] and 19[e]. As discussed above, Roseman discloses that the meeting participant computers run software (i.e., are "programmed") to allow the participant to communicate a private message to the host computer – for example, by dragging-and-dropping a document on the table of the conference room or by passing a private note to another user. (See above, **Part IV.D.1(c)** at ¶ 63 and **Part IV.D.4** at ¶ 119; Roseman, 8:1-6, 11:18-27.)

143. In addition, the recitation of **"the private message including a pointer pointing to a communication that includes pre-stored data representing at least one of a that includes pre-stored data representing at least one of a video, graphic, sound, and multimedia"** corresponds with the limitations in claim 7[b], which provides that **"the private message compris[es] a**

pointer," and claim 7[f], which provides that **"the communication includ[es] pre-stored data representing at least one of a video, a graphic, sound, and multimedia."** As I explained above, Roseman describes the sending of private messages between only two users, such as in a conference with only two participants or by using a private note-passing feature. (See above **Part IV.D.1(e)** at ¶¶ 85-88 and **Part IV.D.4** at ¶¶ 119; Roseman, 2:49-50, 9:26-31.) A participant in a private conference can "drag-and-drop" a pre-stored file on the "table" of a virtual conference room, which causes the file to become accessible to the other meeting participant. (See above **Part IV.D.1(e)** at ¶¶ 79-80 and **Part IV.D.4** at ¶ 119; Roseman, Figs. 10 & 11.) As I explained, the file is represented by a pointer in the form of a clickable icon that, when clicked by a meeting participant, presents the pre-stored content associated with the pointer. (**Part IV.D.1(e)** at ¶¶ 79-80; **Part IV.D.4** at ¶ 119; Roseman, Ex. 1003, *e.g.*, 14:53-57 & 14:59-62 (icon representing document placed on table), 9:28-31 (icon representing private message).) The pre-stored content can be "of any suitable kind: data, text, or graphic" (Roseman, 8:2 (underlining added)), which discloses communicating at least graphic and multimedia, as I discussed above. (See above **Part IV.D.1(c)** at ¶¶ 63-64 and **Part IV.D.4** at ¶ 123.)

144. As I also explained previously, the combination of Roseman, Vetter, and Pike also discloses and renders obvious a private message that includes a URL (a pointer) that can be used to communicate any pre-stored content on the Internet, including sound, graphics, and video. (See above **Part IV.D.1(e)** including ¶¶ 79-90 and **Part IV.D.4** at ¶ 122-123; Pike, at p. 61 ("But you may want to install these [viewer programs] so you can view images, watch movies, and listen to sounds that you download through Mosaic.").) Roseman, Vetter, and Pike therefore disclose and render obvious claim 19[c] for the same reasons discussed above.

145. Element 19[d] is not substantially different from element 7[c]. Element 19[d] further recites a "computer" that is disclosed by the Roseman host computer, as I discussed previously. (See above, **Part IV.D.1(d)** at ¶ 65 and **Part IV.D.4** at ¶ 120.)

146. Element 19[e] is not substantially different from element 7[d]. As I explained previously, the prior art discloses and renders obvious the Roseman host computer system receiving a private message from a participator computer and communicating it to a second participator computer. (See above, **Part IV.D.1(e)** and **Part IV.D.4** at ¶ 121.)

147. Finally, element 19[f] is identical to element 7[e], and there is no substantial difference between element 19[g] and element 7[g].

14. Claim 22 (Similar to Claim 9)

148. Claim 22 is substantially similar to claim 9 except that it depends from a different independent claim.

Claim 9	Claim 22
9. The apparatus of claim 7, wherein the computer system includes the pointer as a pointer that causes the communication to be produced on demand.	22. The apparatus of claim 19, wherein the pointer produces the communication on demand.

149. My analysis of claim 9, presented previously above, applies with full force here. (See above **Part IV.D.1(e)** at ¶¶ 78-90; **Part IV.D.4** at ¶ 119; **Part IV.D.6**.)

15. Claim 23 (Similar to Claim 10)

150. Claim 23 is substantially similar to claim 10 except that it depends from a different independent claim.

Claim 10	Claim 23
10. The apparatus of claim 7, wherein the computer system includes data representing video communications.	23. The apparatus of claim 19, wherein the communication includes the pre-stored data representing video.

151. Claim 10 depends upon independent claim 7, which in turn provides that the "communication includ[es] ***pre-stored*** data representing at least one of video, a graphic, sound, and multimedia." (*See* claim 7[f] (emphasis added).) My

analysis of claim 7 and claim 10, presented previously, addresses the limitation in claim 22 requiring the data to be "pre-stored." As discussed above, the combination of Roseman and Pike discloses and renders obvious that conference participants could communicate pointers (in the form of a clickable icon and/or URL) pointing to pre-stored video located on the Internet. (See above **Part IV.D.1(c)** at ¶¶ 63-64; **Part IV.D.1(e)** at ¶¶ 79-90; **Part IV.D.2**; **Part IV.D.4** at ¶ 123; **Part IV.D.7**; Pike, at p. 61 ("But you may want to install these [viewer programs] so you can view images, watch movies, and listen to sounds that you download through Mosaic.").)

16. Claim 24 (Similar to Claim 11)

152. Claim 24 is substantially similar to claim 11 except that it depends from a different independent claim.

Claim 11	**Claim 24**
11. The apparatus of claim 7, wherein the computer system includes data representing sound communications.	24. The apparatus of claim 19, wherein the communication includes the pre-stored data representing the sound.

153. Claim 11 depends upon independent claim 7, which in turn provides that the "communication includ[es] ***pre-stored*** data representing at least one of video, a graphic, sound, and multimedia" (emphasis added). (*See* claim 7[f].) My analysis of claims 7 and 11, presented previously, addresses the limitation in claim

24 requiring the data to be "pre-stored." As I discussed above, the combination of Roseman and Pike discloses and renders obvious that conference participants could communicate pointers (in the form of a clickable icon and/or URL) pointing to pre-stored sound located on the Internet. (See above **Part IV.D.1(c)** at ¶¶ 63-64; **Part IV.D.1(e)** at ¶¶ 79-90; **Part IV.D.2**; **Part IV.D.4** at ¶ 123; **Part IV.D.7**; Pike, at p. 61 ("But you may want to install these [viewer programs] so you can view images, watch movies, and listen to sounds that you download through Mosaic.").)

17. Claim 25 (Similar to Claim 12)

154. Claim 25 is substantially similar to claim 12 except that it depends from a different independent claim.

Claim 12	**Claim 25**
12. The apparatus of claim 7, wherein the computer system includes data representing sound and video communications.	25. The apparatus of claim 19, wherein the communication includes the pre-stored data representing the sound and the video.

155. Claim 12 depends upon claim 7, which in turn provides that the "communication includ[es] ***pre-stored*** data representing at least one of video, a graphic, sound, and multimedia" (emphasis added). (*See* claim 7[f].) My analysis of claims 7 and 12, presented previously, addresses the limitation in claim 25 requiring the data to be "pre-stored." As discussed above, the combination of Roseman and Pike discloses and renders obvious that conference participants can

communicate pointers (in the form of a clickable icon and/or URL) pointing to pre-stored sound and video located on the Internet. (See above **Part IV.D.1(c)** at ¶¶ 63-64; **Part IV.D.1(e)** at ¶¶ 79-90; **Part IV.D.2**; **Part IV.D.4** at ¶ 123; **Part IV.D.7**; Pike, at p. 61 ("But you may want to install these [viewer programs] so you can view images, watch movies, and listen to sounds that you download through Mosaic.").)

V. CONCLUSION

156. In signing this Declaration, I recognize that the Declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in this proceeding. If required, I will appear for cross-examination at the appropriate time. I reserve the right to offer opinions relevant to the invalidity of the '245 patent claims at issue and/or offer testimony in support of this Declaration.

157. 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 18 U.S.C. § 1001.

Dated: January 16, 2017

Respectfully submitted,

Tal Lavian
Jan 16, 2017

Tal Lavian, Ph.D.
Sunnyvale, California

EXHIBIT A

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Research and Consulting:Telecommunications,Network Communications, and Mobile Wireless Technologies

Scientist, educator, and technologist with over 25years of experience; co-author on over 25 scientific publications, journal articles, and peer-reviewed papers; named inventor on over 100 issued and filed patents; industry fellow and lecturer at UC Berkeley Engineering–Center for Entrepreneurship and Technology (CET)

EDUCATION

- **Ph.D.**, Computer Science specializing in networking and communications, UC Berkeley
- **M.Sc.**, Electrical Engineering, Tel Aviv University
- **B.Sc.**, Mathematics and Computer Science, Tel Aviv University

EXPERTISE

Network communications, telecommunications, Internet protocols, and mobile wireless:

- **Communication networks:** Internet protocols; TCP/IP suite; TCP; UDP; IP; VoIP; Ethernet; network protocols; network software applications; data link, network, and transport layers (L2, L3, L4)
- **Internet software:** Internet software applications; distributed computing; cloud computing; Web applications; FTP; HTTP; Java; client server; file transfer; multicast; streaming media
- **Routing/switching:** LAN; WAN; VPN; routing protocols; RIP; BGP; MPLS; OSPF; IS-IS; DNS; QoS; switching; packet switching; network infrastructure; network communication architectures
- **Mobile wireless:** wireless LAN; 802.11; cellular systems; mobile devices; smartphone technologies

ACCOMPLISHMENTS

- Selected as principal investigator for three US Department of Defense (DARPA) projects
- Directed research project on networking computation for the US Air Force Research Lab (AFRL)
- Led and developed the first network resourcescheduling service for grid computing
- Administered wireless research project for an undisclosed US federal agency
- Managed and engineered the first demonstrated transatlantic dynamic allocation of 10Gbs Lambdas as a grid service
- Spearheaded the development of the first demonstrated wire-speed active network on commercial hardware
- Invented over 100 patents; over 50 prosecuted *pro se* in front of the USPTO
- Created and chaired Nortel Networks' EDN Patent Committee

PROFESSIONAL EXPERIENCE

University of California, Berkeley, Berkeley, California 2000-Present
Berkeley Industry Fellow, Lecturer, Visiting Scientist, Ph.D. Candidate, Nortel's Scientist Liaison
Some positions and projects were concurrent, others sequential

- Serves as an industry fellow and lecturer at the Center for Entrepreneurship and Technology (CET).
- Studied network services, telecommunication systems and software, communications infrastructure, and data centers
- Developed long-term technology for the enterprise market, integrating communication and computing technologies
- Conducted research projects in data centers (RAD Labs), telecommunication infrastructure (SAHARA), and wireless systems (ICEBERG)
- Acted as scientific liaison between Nortel Research Lab and UC Berkeley, providing tangible value in advanced technologies
- Earned a Ph.D. in Computer Science with a specialization in communications and networking

TelecommNet Consulting, Inc.(Innovations-IP) Sunnyvale, California 2006-Present
Principal Scientist

- Consults in the areas of network communications, telecommunications, Internet protocols, and smartphone mobile wireless devices
- Provides architecture and system consultation for projects relating to computer networks, mobile wireless devices, and Internet web technologies
- Acts as an expert witness in network communications patent infringement lawsuits

VisuMenu, Inc., Sunnyvale, California 2010-Present
Co- Founder and Chief Technology Officer (CTO)

- Designs and develops architecture and system of visual IVR technologies for smartphones and wireless mobile devices in the area of network communications
- Designs crawler/spider system for IVR / PBX using Asterisk, SIP, and VoIP
- Deploys the system as cloud networking and cloud computing utilizing Amazon Web Services

Ixia, Santa Clara, California 2008 - 2008
Communications Consultant

- Researched and developed advanced network communications testing technologies:
  • IxNetwork/IxN2X — tested IP routing and switching devices and broadband access equipment. Provided traffic generation and emulation for the full range of protocols: routing, MPLS, layer 2/3 VPNs, carrier Ethernet, broadband access, and data center bridging
  • IxLoad — quickly and accurately modeled high-volume video, data, and voice subscribers and servers to test real-world performance of multiservice delivery and security platforms
  • IxCatapult — emulated a broad range of wireless access and core protocols to test wireless components and systems that, when combined with IxLoad, provides an end-to-end solution for testing wireless service quality
  • IxVeriWave — employed a client-centric model to test Wi-Fi and wireless LAN networks by generating repeatable large-scale, real-world test scenarios that are virtually impossible to create by any other means

• Test automation — provided simple, comprehensive lab automation to help test engineering teams create, organize, catalog, and schedule execution of tests

Nortel Networks, Santa Clara, California 1996 - 2007

Originally employed by Bay Networks, which was acquired by Nortel Networks

Principal Scientist, Principal Architect, Principal Engineer, Senior Software Engineer

- Held scientific and research roles at Nortel Labs, Bay Architecture Labs, and in the office of the CTO

Principal Investigator for US Department of Defense (DARPA) Projects

- Conceived, proposed, and completed three research projects: active networks, DWDM-RAM, and a networking computation project for Air Force Research Lab (AFRL)
- Led a wireless research project for an undisclosed US federal agency

Academic and Industrial Researcher

- Analyzed new technologies to reduce risks associated with R&D investment
- Spearheaded research collaboration with leading universities and professors at UC Berkeley, Northwestern University, University of Amsterdam, and University of Technology, Sydney
- Evaluated competitive products relative to Nortel's products and technology
- Proactively identified prospective business ideas, which led to new networking products
- Predicted technological trends through researching the technological horizon and academic sphere
- Designed software for switches, routers, and network communications devices
- Developed systems and architectures for switches, routers, and network management
- Researched and developed the following projects:
  - Data-Center Communications: network and server orchestration 2006-2007
  - DRAC: SOA-facilitated L1/L2/L3 network dynamic controller 2003-2007
  - Omega: classified wireless project for undisclosed US Federal Agency 2006-2006
  - Open platform: project for the US Air Force Research Laboratory (AFRL) 2005-2005
  - Network resource orchestration for Web services workflows 2004-2005
  - Proxy study between Web/grids services and network services 2004-2004
  - Streaming content replication: real-time A/V media multicast at edge 2003-2004
  - DWDM-RAM: US DARPA-funded program on agile optical transport 2003-2004
  - Packet capturing and forwarding service on IP and Ethernet traffic 2002-2003
  - CO2: content-aware agile networking 2001-2003
  - Active networks: US DARPA-funded research program 1999-2002
  - ORE: programmable network service platform 1998-2002
  - JVM platform: Java on network devices 1998-2001
  - Web-based device management: network device management 1996-1997

Technology Innovator and Patent Leader

- Created and chaired Nortel Networks' EDN Patent Committee
- Facilitated continuous stream of innovative ideas and their conversion into intellectual property rights
- Developed intellectual property assets through invention and analysis of existing technology portfolios

Aptel Communications, Netanya, Israel 1994-1995

Software Engineer, Team Leader

Start-up company focused on mobile wireless CDMA spread spectrum PCN/PCS

- Developed a mobile wireless device using an unlicensed band [Direct Sequence Spread Spectrum (DSSS)]
- Designed and managed a personal communication network (PCN) and personal communication system (PCS), which are the precursors of short text messages (SMS)
- Designed and developed network communications software products (mainly in C/C++)
- Brought a two-way paging product from concept to development

Scitex Ltd.,Herzeliya, Israel 1990-1993

Software Engineer, Team Leader

Software and hardware company acquired by Hewlett Packard (HP)

- Developed system and network communications (mainly in C/C++)
- Invented Parallel SIMD Architecture
- Participated in the Technology Innovation group

Shalev, Ramat-HaSharon, Israel 1987-1990

Start-up company

Software Engineer

- Developed real-time software and algorithms (mainly in C/C++ and Pascal)

PROFESSIONAL ASSOCIATIONS

- IEEE senior member
- IEEE CNSV co-chair, Intellectual Property SIG (2013)
- President Next Step Toastmasters (an advanced TM club in the Silicon Valley) (2013-2014)
- Technical co-chair, IEEE Hot Interconnects 2005 at Stanford University
- Member, IEEE Communications Society (COMMSOC)
- Member, IEEE Computer Society
- Member, IEEE Systems, Man, and Cybernetics Society
- Member, IEEE-USA Intellectual Property Committee
- Member, ACM, ACM Special Interest Group on Data Communication (SIGCOM)
- Member, ACM Special Interest Group on Hypertext, Hypermedia, and Web (SIGWEB)
- Member, IEEE Consultants' Network (CNSV)
- Global Member, Internet Society (ISOC)
- President Java Users Group – Silicon Valley Mountain View, CA,1999-2000
- Toastmasters International

ADVISORY BOARDS

- Quixey –search engine for wireless mobile apps
- Mytopia – mobile social games
- iLeverage – Israeli Innovations

PROFESSIONAL AWARDS

- Top Talent Award – Nortel
- Top Inventors Award – Nortel EDN
- Certified IEEE-WCET - Wireless Communications Engineering Technologies
- Toastmasters International - Competent Communicator (twice)
- Toastmasters International - Advanced Communicator Bronze

Patents and Publications

(Not an exhaustive list)

Patents Issued

US 9,184,989	Grid proxy architecture for network resources	Link
US 9,083,728	Systems and methods to support sharing and exchanging in a network	Link
US 9,021,130	Photonic line sharing for high-speed routers	Link
US 9,001,819	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,949,846	Time-value curves to provide dynamic QoS for time sensitive file transfers	Link
US 8,929,517	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,903,073	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,898,274	Grid proxy architecture for network resources	Link
US 8,880,120	Device and method for providing enhanced telephony	Link
US 8,879,703	System method and device for providing tailored services when call is on-hold	Link
US 8,879,698	Device and method for providing enhanced telephony	Link
US 8,867,708	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,787,536	Systems and methods for communicating with an interactive voice response system	Link
US 8,782,230	Method and apparatus for using a command design pattern to access and configure network elements	Link
US 8,762,963	Translation of programming code	Link
US 8,762,962	Methods and apparatus for automatic translation of a computer program language code	Link
US 8,745,573	Platform-independent application development framework	Link
US 8,731,148	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,688,796	Rating system for determining whether to accept or reject objection raised by user in social network	Link
US 8,619,793	Dynamic assignment of traffic classes to a priority queue in a packet forwarding device	Link
US 8,572,303	Portable universal communication device	Link
US 8,553,859	Device and method for providing enhanced telephony	Link

US 8,548,131	Systems and methods for communicating with an interactive voice response system	Link
US 8,537,989	Device and method for providing enhanced telephony	Link
US 8,341,257	Grid proxy architecture for network resources	Link
US 8,161,139	Method and apparatus for intelligent management of a network element	Link
US 8,146,090	Time-value curves to provide dynamic QoS for time sensitive file transfer	Link
US 8,078,708	Grid proxy architecture for network resources	Link
US 7,944,827	Content-aware dynamic network resource allocation	Link
US 7,860,999	Distributed computation in network devices	Link
US 7,734,748	Method and apparatus for intelligent management of a network element	Link
US 7,710,871	Dynamic assignment of traffic classes to a priority queue in a packet forwarding device	Link
US 7,580,349	Content-aware dynamic network resource allocation	Link
US 7,433,941	Method and apparatus for accessing network information on a network device	Link
US 7,359,993	Method and apparatus for interfacing external resources with a network element	Link
US 7,313,608	Method and apparatus for using documents written in a markup language to access and configure network elements	Link
US 7,260,621	Object-oriented network management interface	Link
US 7,237,012	Method and apparatus for classifying Java remote method invocation transport traffic	Link
US 7,127,526	Method and apparatus for dynamically loading and managing software services on a network device	Link
US 7,047,536	Method and apparatus for classifying remote procedure call transport traffic	Link
US 7,039,724	Programmable command-line interface API for managing operation of a network device	Link
US 6,976,054	Method and system for accessing low-level resources in a network device	Link
US 6,970,943	Routing architecture including a compute plane configured for high-speed processing of packets to provide application layer support	Link
US 6,950,932	Security association mediator for Java-enabled devices	Link
US 6,850,989	Method and apparatus for automatically configuring a network switch	Link

US 6,845,397	Interface method and system for accessing inner layers of a network protocol	Link
US 6,842,781	Download and processing of a network management application on a network device	Link
US 6,772,205	Executing applications on a target network device using a proxy network device	Link
US 6,564,325	Method of and apparatus for providing multi-level security access to system	Link
US 6,175,868	Method and apparatus for automatically configuring a network switch	Link
US 6,170,015	Network apparatus with Java co-processor	Link
US 8,687,777	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,681,951	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,625,756	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,594,280	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,548,135	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,406,388	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,345,835	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,223,931	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,160,215	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,155,280	Systems and methods for visual presentation and selection of IVR menu	Link
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EP 1,905,211	Technique for authenticating network users	Link
EP 1,142,213	Dynamic assignment of traffic classes to a priority queue in a packet forwarding device	Link
EP 1,671,460	Method and apparatus for scheduling resources on a switched underlay network	Link
CA 2,358,525	Dynamic assignment of traffic classes to a priority queue in a packet forwarding device	Link

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(Not an exhaustive list)

US 20150058490	Grid Proxy Architecture for Network Resources	Link
US 20150010136	Systems and Methods for Visual Presentation and Selection of IVR Menu	Link
US 20140379784	Method and Apparatus for Using a Command Design Pattern to Access and Configure Network Elements	Link
US 20140105025	Dynamic Assignment of Traffic Classes to a Priority Queue in a Packet Forwarding Device	Link
US 20140105012	Dynamic Assignment of Traffic Classes to a Priority Queue in a Packet Forwarding Device	Link
US 20140012991	Grid Proxy Architecture for Network Resources	Link
US 20130080898	Systems and Methods for Electronic Communications	Link
US 20130022191	Systems and Methods for Visual Presentation and Selection of IVR Menu	Link
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US 20090313613	Methods and Apparatus for Automatic Translation of a Computer Program Language Code	Link
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US 20060123481	Method and apparatus for network immunization	Link
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- Web Services and OGSA
- WINER Workflow Integrated Network Resource Orchestration.
- Technology & Society
- Abundant Bandwidth and how it affects us?
- Active Content Networking(ACN)
- DWDM-RAM:Enabling Grid Services with Dynamic Optical Networks
- Application-engaged Dynamic Orchestration of Optical Network Resources
- A Platform for Data Intensive Services Enabled by Next Generation Dynamic Optical Networks
- Optical Networks
- Grid Optical Network Service Architecture for Data Intensive Applications
- Optical Networking & DWDM
- OptiCal Inc.
- OptiCal & LUMOS Networks
- Optical Networking Services
- Business Models for Dynamically Provisioned Optical Networks
- Business Model Concepts for Dynamically Provisioned Optical Networks
- Optical Networks Infrastructure
- Research Challenges in agile optical networks
- Services and Applications' infrastructure for agile optical networks
- Impact on Society
- TeraGrid Communication and Computation
- Unified Device Management via Java-enabled Network Devices
- Active Network Node in Silicon-Based L3 Gigabit Routing Switch
- Active Nets Technology Transfer through High-Performance Network Devices
- Programmable Network Node: Applications
- Open Innovation via Java-enabled Network Devices
- Practical Considerations for Deploying a Java Active Networking Platform
- Open Java-Based Intelligent Agent Architecture for Adaptive Networking Devices

- Java SNMP Oplet
- Open Distributed Networking Intelligence: A New Java Paradigm
- Open Programmability
- Active Networking On A Programmable Networking Platform
- Open Networking through Programmability
- Open Programmable Architecture for Java-enabled Network Devices
- Integrating Active Networking and Commercial-Grade Routing Platforms
- Programmable Network Devices
- To be smart or not to be?