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(54) AUTOMATED ELECTRONIC RESERVES SYSTEM AND METHOD

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(51) Int. Cl.⁷ H04M 11/00

379/100.09, 100.12, 100.13; 358/400, 401, 403, 442

(56) References Cited

U.S. PATENT DOCUMENTS

* cited by examiner

Primary Examiner—Wing Chan

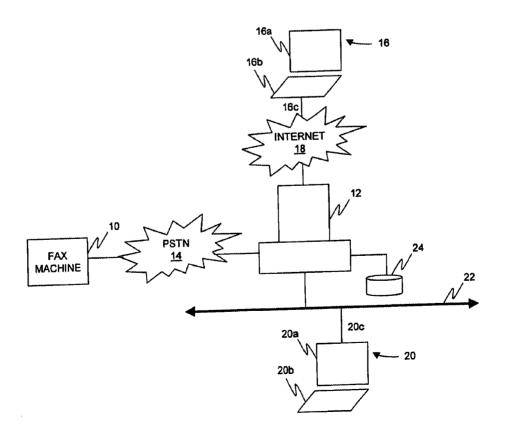
(74) Attorney, Agent, or Firm-Christie, Parker & Hale,

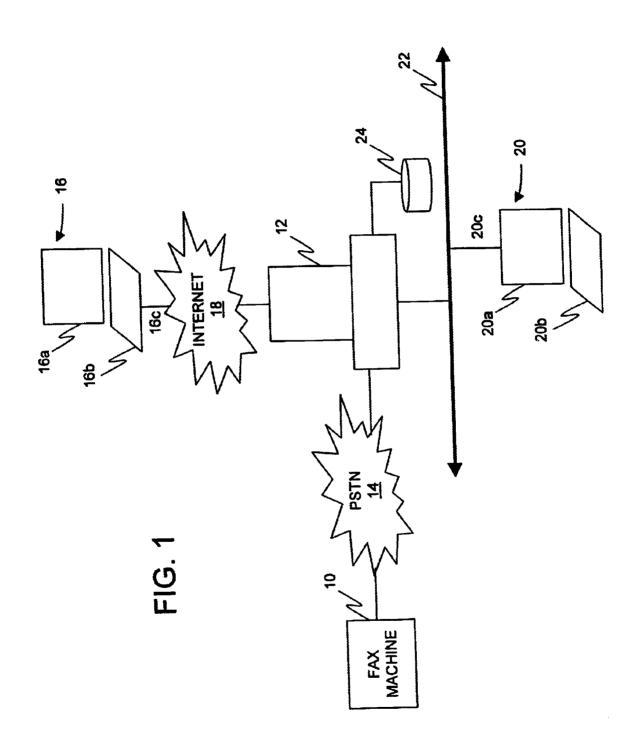
LLP

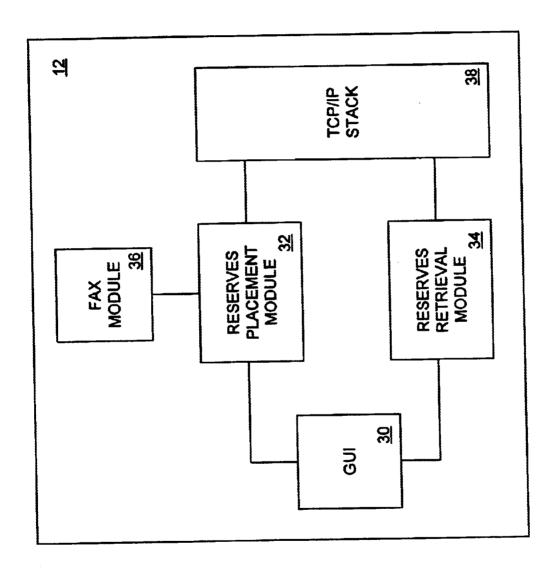
(57) ABSTRACT

A system and method automating the placement of paper documents in electronic reserves system. A document to be placed on reserve is faxed to a network server. The network server automatically receives the faxed document and converts it to a pre-determined file format, such as PDF. The converted document is placed in a staging directory including a list of faxed documents pending to be placed on electronic reserve. The network server provides a graphical user interface that the transmitting user accesses over the Internet to access the staging directory. The user selects the faxed document from the staging directory, and indicates that it be moved to a particular reserves area. The particular reserves area may be a course page for a course offered by an educational institution.

16 Claims, 13 Drawing Sheets







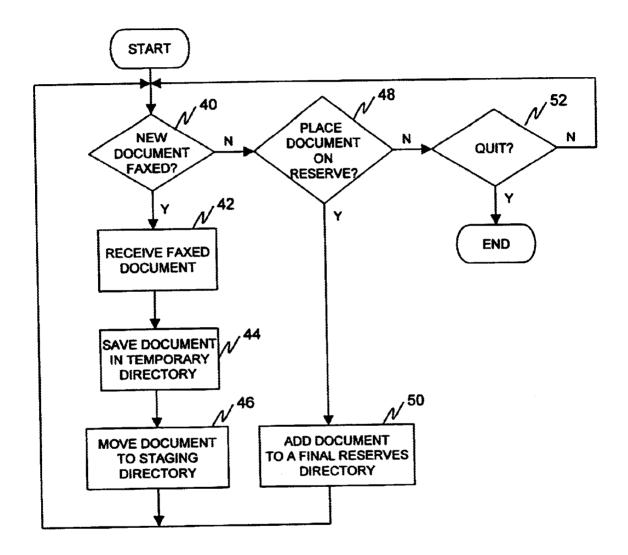


FIG. 3

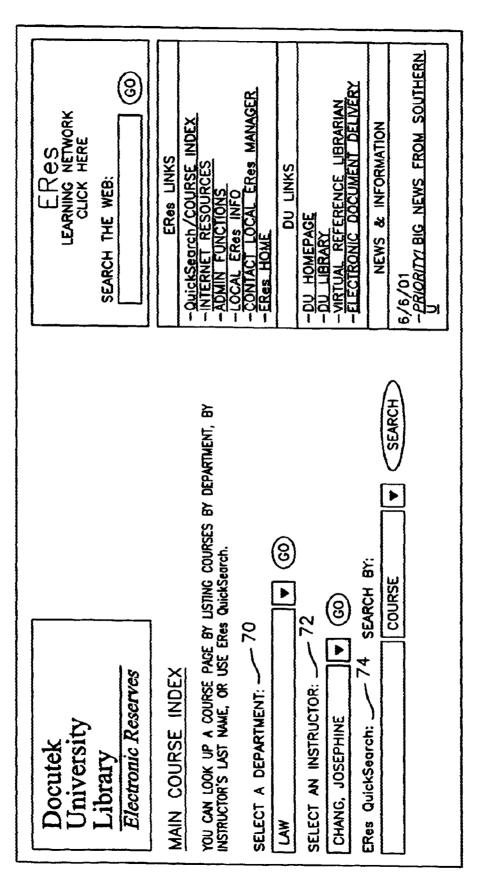


FIG.4A

Docutek University Library Electronic Reserves CLICK ON ANY OF THE LINKS ON A LINE TO DISPLAY THE CORRESPONDING COURSE PAGE: DISPLAY THE LIST OF LAW INTERNET RESOURCES SUGGESTED BY YOUR LIBRARIANS. ARABOOT INDERSTANDING ELECTION LAW COLSON WINTER LAW COURSE NUMBER COURSE NAME INSTRUCTOR TERM LAW COURSE NUMBER COURSE NAME INSTRUCTOR TERM LAW 1010 EU LAW COLSON COLSON GULNAC SPRING LAW 1234 CONSTITUTIONAL LAW GULNAC SPRING LAW 1234 CONSTITUTIONAL LAW GULNAC SPRING LAW 240 ANTITRUST GULNAC SPRING LAW 250 VOIES ROATS LAW GULNAC SPRING LAW 250 VOIES ROATS LAW WINTER
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FIG.4B

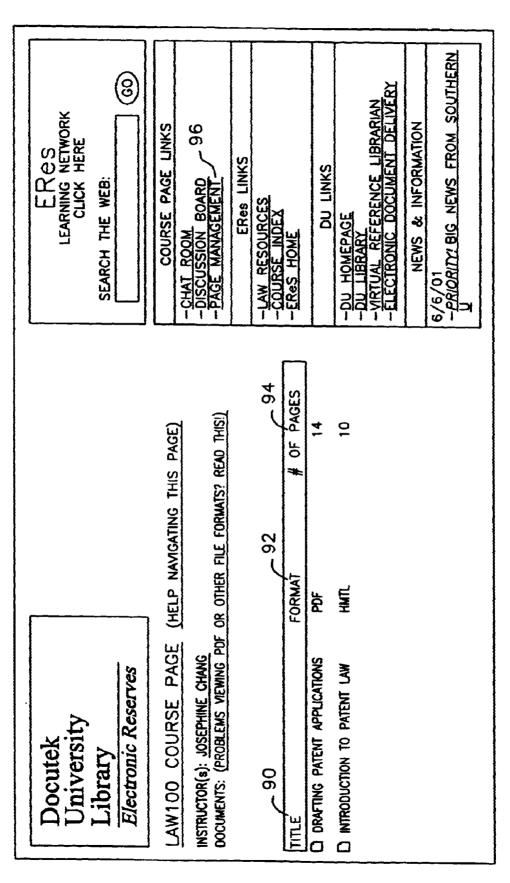


FIG.4C

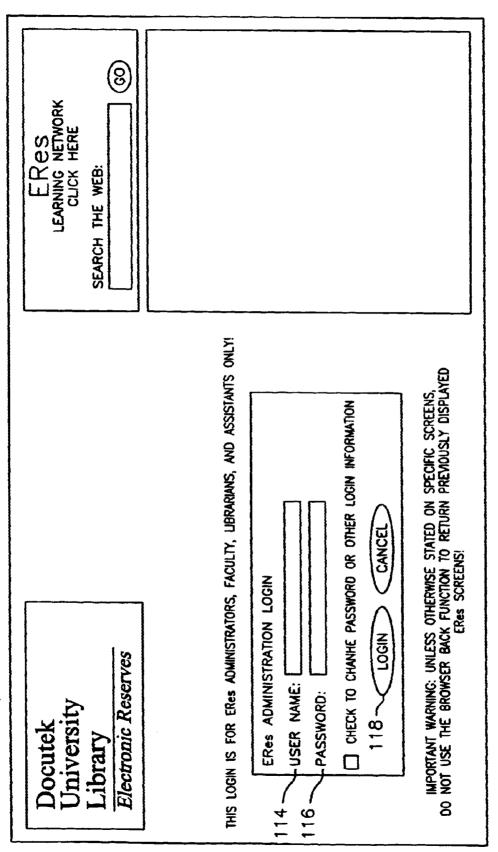


FIG. 4D

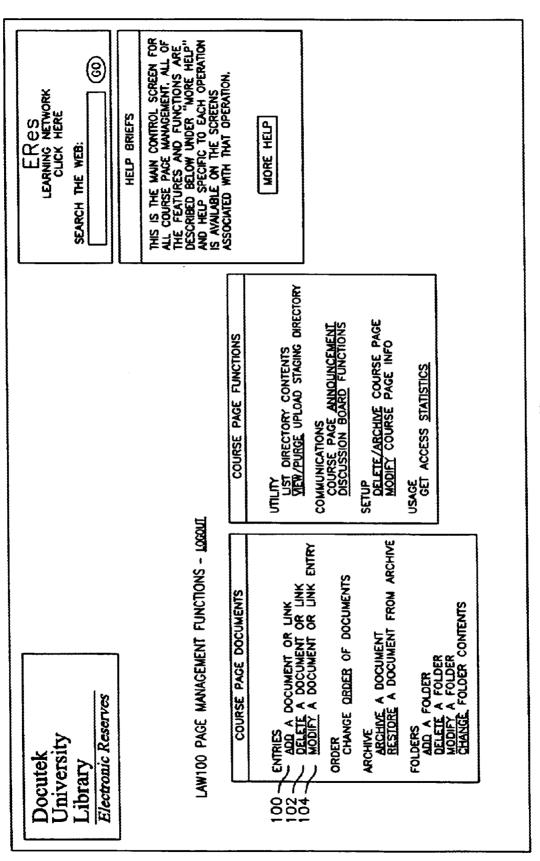


FIG. 4E

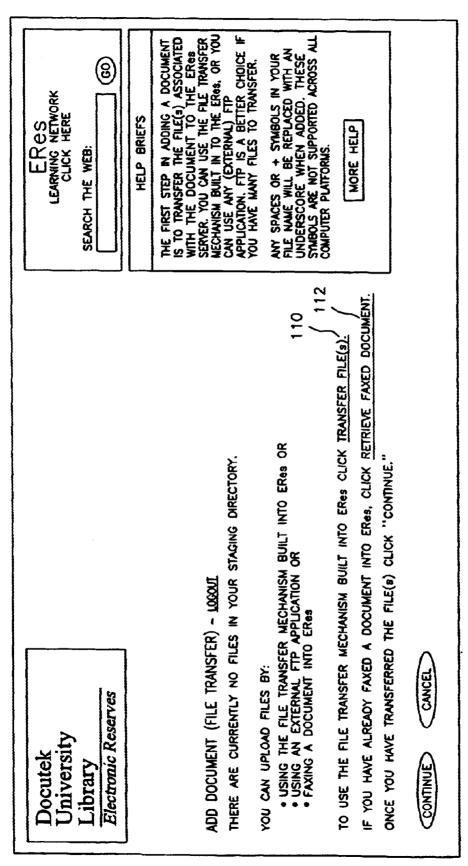


FIG. 4F

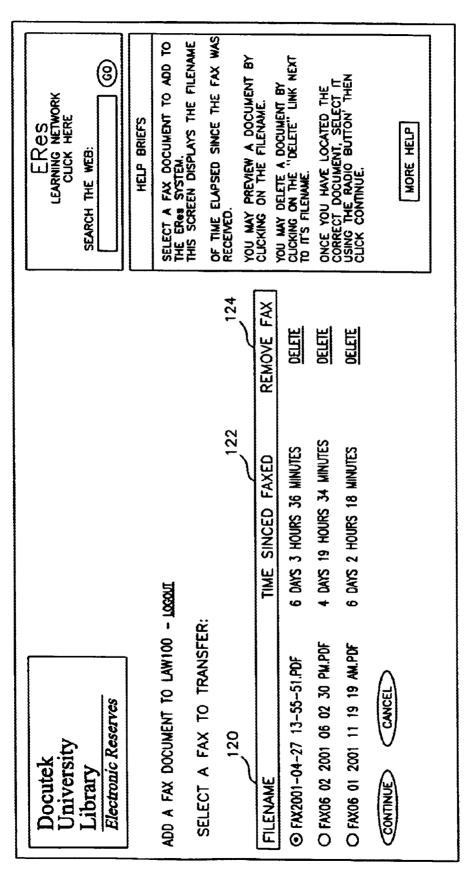


FIG. 4G

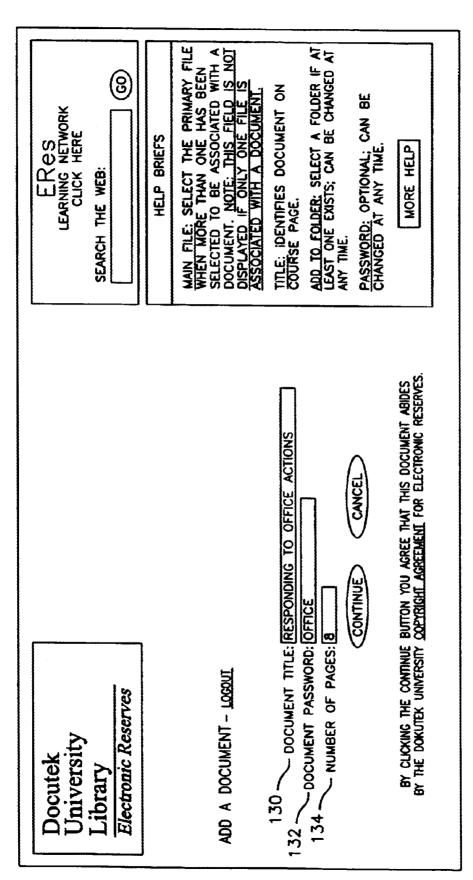


FIG. 4H

ERES LEARNING NETWORK CLICK HERE SEARCH THE WEB:	COURSE PAGE LINKSCHAT ROOMDISCUSSION BOARDPAGE MANAGEMENTLAW RESOURCES	-COURSE INDEX -ERES HOME DU LINKS -DU HOMEPAGE -DU LIBRARY -VIRTUAL REFERENCE LIBRARIAN -ELECTRONIC DOCUMENT DELIVERY NEWS & INFORMATION 6/6/01 -PRIORITY BIG NEWS FROM SOUTHERN
	ELP NAVIGATING THIS PAGE) OTHER FILE FORMATS? READ THIS!)	FORMAT # OF PAGES PDF 14 HMTL 10 PDF 8
Docutek University Library Electronic Reserves	LAW100 COURSE PAGE (HELP NAVIGATING THIS PAGE) PATENTS (SUMMER 01) INSTRUCTOR(s): JOSEPHINE CHANG DOCUMENTS: (PROBLEMS VIEWING POF OR OTHER FILE FORMATS? READ THIS	TITLE D DRAFTING PATENT APPLICATIONS INTRODUCTION TO PATENT LAW D RESPONDING TO OFFICE ACTIONS

FIG.4I

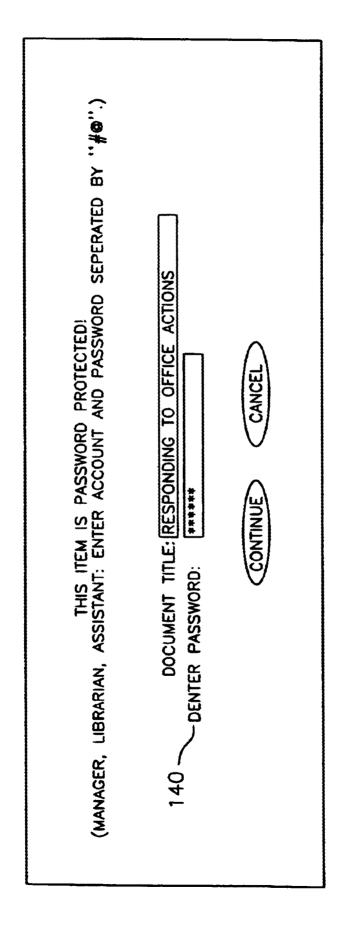


FIG.4J

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AUTOMATED ELECTRONIC RESERVES SYSTEM AND METHOD

FIELD OF THE INVENTION

This invention relates generally to electronic document management systems, and more particularly, to automating the placement of documents in an electronic reserves system.

BACKGROUND OF THE INVENTION

Course materials, for example, documents and other information resources that instructors make available to students, are traditionally kept in binders on a "reserve shelf" of a library. Typical reserve materials consist of copies of previous exams, articles from scientific and trade journals, homework solutions, excerpts from books, and the like. Generally, there is only one copy of a document placed on reserve. Furthermore, such document is traditionally available only for in-library use, on a short-term loan basis.

An emerging solution to the limitations presented in traditional reserve mechanisms involve placing reserve materials on electronic reserve. In fact, with the growth of the Internet, electronic document delivery and storage now extends far beyond course reserves to make all types of documents available electronically. A significant fraction of the documents added to electronic databases, however, exist in an ink-on-paper format. Those who administer such systems, for example, librarians, college faculty, and school teachers, are thus faced with the task of first converting these paper copies to electronic formats, and then transferring the computer file(s) to an Internet server used to house an electronic documents database.

The current two-step process for placing printed materials 35 reserve according to one embodiment of the invention; and on electronic reserve is unsatisfactory for many users in that the process may be time-consuming and potentially confusing to an average (non-technical) teacher, librarian, or administrator. Both the scanning and the file transfer steps require some, if not considerable, technical expertise. Even $_{40}$ someone skilled in the use of a scanner may sometimes struggle to create output files that are both of manageable size and of high display quality. Many times, post-scanning image processing may be necessary to either reduce the size of the output files and/or make them more legible. Such 45 post-scanning image processing is time consuming and also requires some technical knowledge.

Accordingly, there is a need for a system and method for automating the placement of documents into an electronic reserves system. Such a system and method should prefer- 50 ably cater to the needs of people with little or no technical expertise to facilitate the electronic placement of such documents.

SUMMARY OF THE INVENTION

The present invention is directed to a network server in an electronic reserves system. In one embodiment of the invention, the network server includes an input, a storage device, and a processor. The input allows the automatic receipt of a facsimile transmission of a document to be placed on electronic reserve. The processor is coupled to the input and the storage device, and includes logic for automatically formatting the received document into a predetermined file format, assigning a password to the formatted document, and saving the formatted document into the 65 serial arbitrated loops, and the like. storage device for later retrieval upon receipt of the assigned password.

In a further embodiment of the invention, the network server includes a processor with logic to include the received document into a list of documents pending to be placed on electronic reserve. The processor further provides a graphical user interface for allowing a user to view the list of documents pending to be placed on electronic reserve, select the received document from the list, assign a password to the selected document, select a particular reserves area, and move the selected document to the selected reserves area.

It should be appreciated, therefore, that the present invention helps simplify the placing of paper documents in electronic reserve. The users need no longer struggle with scanners, post-scanning devices, and manual file transfers which may be confusing and time-consuming for people with little or no technical expertise. Instead, a faxed document is automatically received by the network server, formatted, and placed on reserve. The graphical user interface further provides ease and convenience in placing a document on electronic reserve.

DESCRIPTION OF THE DRAWINGS

These and other features, aspects and advantages of the present invention will be more fully understood when considered with respect to the following detailed description, appended claims, and accompanying drawings where:

FIG. 1 is a schematic block diagram of an automated electronic reserves system according to one embodiment of the invention;

FIG. 2 is a more detailed block diagram of a network server in the electronic reserves system of FIG. 1 according to one embodiment of the invention;

FIG. 3 is a flow diagram of a process for receiving, processing, and retrieving faxed documents on electronic

FIGS. 4A-4J are a series of graphical user interface displays allowing a user to interact with the network server of FIG. 2.

DESCRIPTION OF THE INVENTION

FIG. 1 is a schematic block diagram of an automated electronic reserves system according to one embodiment of the invention. The system preferably includes a facsimile machine 10 connected to a network server 12 over a public switched telephone network (PSTN) 14. The network server 12 preferably resides in a high school, university, college, or another institution where printed materials are either kept on a reserve shelf or placed on electronic reserve.

The system preferably includes a personal computer (PC) 16 connected to the network server 12 via a wide area computer network, such as, for example, a public internet 18. The network server 12 and PC 16 and may be connected via cables or other transmission media, and may support various data communication protocols such as, for example, an Internet Protocol (IP), Asynchronous Transfer Mode (ATM), or the like.

The system may further include a local PC 20 connected to the network server 14 over a network signal bus 22 configured to support and operate as a local area network. The particular configuration of the local area network may be any one of a number of conventional network configurations, whether serial or parallel, such as tokenpassing architectures, RS-232-type serial daisy-chains,

The PCs 16, 20 are configured to include at least a display screen 16a, 20a, some form of I/O device 16b, 20b, such as

a keyboard, keypad, and the like, and a network connection 16c, 20c for bi-directional communication with the network server 12. In alternative embodiments, the PCs 16, 20 may be replaced or used in conjunction with other end devices such as, for example, mainframes, file servers, workstations, business computers, personal digital assistants, television/set-top-box units, or the like.

The network server 12 preferably includes a mass storage device 24, such as a hard disk drive, or drive array, which stores documents placed on electronic reserve as well as other information and/or documents used by the network server. The documents placed or to-be-placed on electronic reserve are preferably arranged in one or more directories, including a temporary directory, a staging directory, and one or more final reserves directories. The mass storage device 24 preferably maintains for each document placed on electronic reserve, a document title, a total number of pages contained in the document, a document file format, an associated password, and the like.

The mass storage device 24 further includes user databases storing user authentication information, such as, for example, usernames and passwords, for allowing access to particular parts of the system. Preferably, the user database indicates whether a user is an administrator, and provides administrative rights, such as creating course pages and placing documents on reserve, to such administrative users.

In general terms, an authorized administrative user of the system transmits a document to the network server 12 for being placed on electronic reserve, preferably through the facsimile machine 10. The document includes but is not limited to library documents, faculty and course materials, copies of previous exams, articles from scientific and trade journals, homework solutions, excerpts from books, and/or any other type of printed material.

Alternatively, the document is a file residing in a remote location in PC 16 or in a local area network in PC 20. The file may be uploaded to the network server 12 via the internet 18 or network signal bus 22, respectively. If the file resides in PC 16, the document is preferably transmitted using a TCP/IP based file transfer protocol (FTP). A third-party FTP application or an internal FTP code may be involved to transfer the file to the network server 12. Alternatively, PC 16 or 20 is equipped with a facsimile modem which allows a document to be faxed to the network server 18 using the PC.

The network server 12 receives a faxed document and stores it into the temporary directory. The document is then preferably converted to a pre-determined file format, such as, for example, a portable document format (PDF), and moved to the staging directory under a new file name. The user may access the faxed document in the staging directory via a graphical user interface (GUI) provided by the network server 12 for moving the document from the staging directory to a final reserves directory. The user may, prior to moving the document to the final reserves directory, use the user interface to view the document to verify that the transmission was successful. The final reserves directory may be a general directory or a directory associated with a particular course page.

Once the documents have been placed in a final reserves directory, an authorized user may access the documents using PC 16 or 20 through the internet 18 or local area network. Preferably, the user may select, view, and/or print a document placed on electronic reserve via the GUI provided by the network server 12.

FIG. 2 is a more detailed block diagram of the network server 12 according to one embodiment of the invention.

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The network server 12 preferably includes a processor including a GUI module 30, reserves placement module 32, reserves retrieval module 34, fax module 36, and TCP/IP stack 38. The GUI module 30 is coupled to the reserves placement and retrieval modules 32, 34, and provides various interactive screens for allowing a user of the PC 16 or 20 to interact with the network server 12 to place or retrieve documents on reserve and perform various administrative functions. One such administrative function includes the creation of course pages to which a reserved document may be added

The reserves placement module 32 preferably processes a received document for placing it in electronic reserve. Preferably, the reserves placement module 32 converts a faxed document into a pre-determined file format, such as for example, PDF, and stores it in the staging directory. The reserves placement module 32 may include commercially available third party software such as, for instance, Adobe® Acrobat® Distiller®, manufactured by Adobe Systems Incorporated, of San Jose, Calif., for formatting the faxed document. The reserves placement module 32 preferably further renames the faxed document for easy identification and access by the transmitting user. The reserves placement module also allows an authorized user to move faxed 25 documents from the staging directory into a final reserves directory.

The reserves retrieval module 34 allows a user to retrieve a document from a final reserves directory. The reserves retrieval module 34 receives a user-selection of a particular document placed on electronic reserve and determines if the user is authorized to access the selected document. If the user is authorized, the reserves retrieval module 34 retrieves the document from the mass storage device 22 for display on the display monitor 16a or 20a.

The reserves placement and retrieval modules 32, 34 are each coupled to the TCP/IP stack 32 for communicating over the Internet. The TCP/IP stack 32 processes packets received and transmitted between the PC 16 and network server 12 according to conventional methods. The TCP/IP stack preferably includes a built-in FTP code for allowing the uploading of a document to be placed on reserve using FTP.

The reserves placement module 32 is also coupled to the fax module 36. The fax module 36 preferably allows the receipt of fax documents transmitted by the facsimile machine 10, PC 16, or PC 20. The fax module may be implemented using a commercially available third-party software such as, for instance, WinFax PROTM, manufactured by Symantec Corporation of Cupertino, Calif.

It is understood, of course, that FIG. 2 illustrates a block diagram of the network server 12 without obfuscating inventive aspects of the present invention with additional elements and/or components which may be required by the network server. These additional elements and/or components, which are not shown in FIG. 2 are well known to those skilled in the art.

FIG. 3 is a flow diagram of a process of receiving, processing, and retrieving faxed documents on electronic reserve according to one embodiment of the invention. The process starts, and in step 40, the fax module 36 in the network server 12 determines whether a new document has been faxed. If it has, the fax module 36, in step 42, proceeds to receive the faxed document. In step 44, the network server 12 stores the received document in a temporary directory in the mass storage device 24. In step 46, the network server 12 invokes the reserves placement module 34 for converting the faxed document to a predetermined file format, renaming the

converted document, and saving the document in the staging directory of the mass storage device 24. Preferably, the document is renamed based on a date and time of receipt of the faxed document for allowing the transmitting user to easily identify the document.

In step 48, the network server 12 determines if a received document is to be placed on a final reserves directory. If it is, the network server 12, in step 50, places the document into the final reserves directory.

In step 52, the network server 12 determines whether the user has decided to log out or otherwise quit or cancel a particular task. If the answer is YES, the user is logged out or a particular task is canceled, and the process ends.

FIGS. 4A-4J are a series of graphical user interface displays allowing a user to interact with the network server 12. The graphical user interface displays are preferably web pages associated with a website hosted by the network server. The user preferably connects to the network server via the internet 18 using the PC 16 to access the website and the various web pages.

FIG. 4A illustrates a course index display allowing a user to search for a particular course. The user may search for the course by selecting a particular department **70** and/or instructor **72**, if known, or directly entering the name of the desired course **74**. If the user searches by a particular department or instructor, a list of courses offered by such ²⁵ department or instructor is preferably displayed.

FIG. 4B illustrates a display of various courses offered by a particular department. Preferably, the courses are organized based on a course number 80, course name 82, instructor name 84, and school term 86 offering the course. 30 A user may select a particular course for placing or viewing a document on electronic reserve for the course.

FIG. 4C is an illustration of a particular course page including a list of documents placed on reserve for the course. Preferably, the documents are identified by a title 90, 35 file format 92, and a total number of pages 94. An administrative user of the system, such as, for example, a faculty member or librarian, may select a course to place a document on reserve upon actuation of a page management link 96

FIG. 4D illustrates an administrative login screen display allowing the administrative user to access the system for placing documents on reserve for the selected course. In this regard, the administrative user enters his or her username 114 and password 116, and actuates a login radio button 118, causing the information to be transmitted to the network server 12 over the internet 18. The reserves placement module 32, or alternatively, a separate authentication module, determines if the transmitted information may be verified. If the information is verified, the user allows access to the system to perform document management functions.

FIG. 4E is an illustration of a screen providing access to the various document management functions according to one embodiment of the invention. The management functions may include adding, deleting, or modifying a document or link entry in the course page upon actuation of an add link 100, delete link 102, and modify link 104, respectively.

FIG. 4F illustrates a screen display upon actuation of the add link 100 for allowing the administrative user to place a 60 document on electronic reserve. The administrative user may upload the document to the network server 12 over the internet by actuating a transfer file link 110 on the displayed screen. If a particular document has previously been faxed, it is stored in the staging directory and the user may retrieve 65 the faxed document by selecting a retrieve faxed document link 112.

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FIG. 4G is an illustration of a screen display including a list of faxed documents in the staging directory. Preferably, each document in the staging directory adheres to a predetermined file format. Each document is further identified by a filename 120 indicating the date and time in which the document was received. The display further indicates the time that has elapsed 122 since the document was received. The document may be removed 124 from the staging directory or selected for transferring to a final reserves directory associated with the course page. The user may further preview the document prior to transferring it to the final reserves directory.

FIG. 4H is an illustration of a screen display upon a user selection of a document in the staging directory for transferring it into a final reserves directory associated with the selected course. The administrative user preferably provides a document title 130 by which the document is to be identified on the course page, and the number of pages 134 contained in the document. In addition, the administrative user provides a document password 132 that is to be used for accessing the document once it is placed on reserve.

FIG. 4I is an illustration of a screen display with an updated list of documents that have been placed on electronic reserve. Selection of one of the documents preferably causes the display of a display screen as illustrated in FIG. 4J for allowing the user to enter a password 140 to access the document. The password is transmitted to the reserves retrieval module 34 which preferably verifies that the appropriate password has been provided. If the password is verified, the reserves retrieval module 34 retrieves the document from the mass storage device 24 and displays it on the user's display 16a or 20a.

It should be appreciated, therefore, that the present invention helps simplify the placing of paper documents in electronic reserve. The users need no longer struggle with scanners, post-scanning devices, and manual file transfers which may be confusing and time-consuming for people with little or no technical expertise. Instead, a faxed document is automatically received by the network server, formatted, and placed on reserve. The graphical user interface further provides ease and convenience in placing a document on electronic reserve.

Although this invention has been described in certain specific embodiments, those skilled in the art will have no difficulty devising variations which in no way depart from the scope and spirit of the present invention. It is therefore to be understood that this invention may be practiced otherwise than is specifically described. Thus, the present embodiments of the invention should be considered in all respects as illustrative and not restrictive, the scope of the invention to be indicated by the appended claims and their equivalents rather than the foregoing description.

What is claimed is:

- 1. A network server in an electronic reserves system comprising:
 - an input for automatically receiving a facsimile transmission of a document to be placed on electronic reserve;
 - a storage device storing a plurality of electronic reserve documents; and
 - a processor coupled to the input and the storage device, the processor including logic for:
 - automatically formatting the received document into a pre-determined file format;
 - assigning a password to the formatted document; and saving the formatted document into the storage device for later retrieval upon receipt of the assigned password

- 2. The network server of claim 1, wherein the processor further includes logic for associating the formatted document with information on when the facsimile transmission was received
- 3. The network server of claim 1, wherein the processor 5 further includes logic for:
 - saving the formatted document into a particular directory of the storage device;
 - displaying the list of documents in the particular directory;
 - receiving a user selection of the formatted document from the list;
 - receiving a user selection of a particular reserves area; and moving the formatted document from the particular direc- 15 of: tory to the selected reserves area.
- 4. The network server of claim 3, wherein the particular reserves area is associated with a course offered by an educational institution, and the document is a material associated with the course.
- 5. The network server of claim 1 further including a network connection for receiving the document over a computer network.
- **6.** A network server in an electronic reserves system comprising:
 - an input for automatically receiving a facsimile transmission of a document to be placed on electronic reserve;
 - a storage device for storing a plurality of electronic reserve documents; and
 - a processor coupled to the input and the storage device, the processor including logic for including the received document into a list of documents pending to be placed on electronic reserve, the processor further providing a graphical user interface for allowing a user to:
 - view the list of documents pending to be placed on electronic reserve;
 - select the received document from the list;
 - assign a password to the selected document;
 - select a particular reserves area; and
 - move the selected document to the selected reserves area.
- 7. The network server of claim 6, wherein the processor further includes logic for:
 - associating the formatted document with information on $_{45}$ when the facsimile transmission was received; and
 - displaying the information in the list.
- 8. The network server of claim 6, wherein the particular reserves area is associated with a course offered by an educational institution.
- 9. The network server of claim 6 further including a network connection for receiving the document over a computer network.
- $1\hat{0}$. An automated electronic reserves method comprising the steps of:

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automatically receiving a facsimile transmission of a document to be placed on electronic reserve;

automatically formatting the received document into a pre-determined file format;

assigning a password to the formatted document;

saving the formatted document into the storage device; and

retrieving the formatted document upon receipt of the assigned password.

- 11. The method of claim 10 further comprising the step of associating the formatted document with information on when the facsimile transmission was received.
- 12. The method of claim 10 further comprising the steps of:
 - saving the formatted document into a particular directory of a storage device;
 - displaying the list of documents in the particular directory;
 - receiving a user selection of the formatted document from the list;

receiving a user selection of a particular reserves area; and moving the formatted document from the particular directory to the selected reserves area.

- 13. The method of claim 12, wherein the particular reserves area is associated with a course offered by an educational institution, and the document is a material associated with the course.
- 14. An automated electronic reserves method comprising the steps of:
 - automatically receiving a facsimile transmission of a document to be placed on electronic reserve;
 - including the received document into a list of documents pending to be placed on electronic reserve
 - providing a graphical user interface for allowing a user to: view the list of documents pending to be placed on electronic reserve;
 - select the received document from the list;
 - assign a password to the selected document;
 - select a particular reserves area; and
 - move the selected document to the selected reserves area.
- 15. The method of claim 14 further comprising the steps of:
 - associating the formatted document with information on when the facsimile transmission was received; and displaying the information in the list.
- 16. The method of claim 14, wherein the final particular reserves area is associated with a course offered by an educational institution, and the document is a material associated with the course.

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