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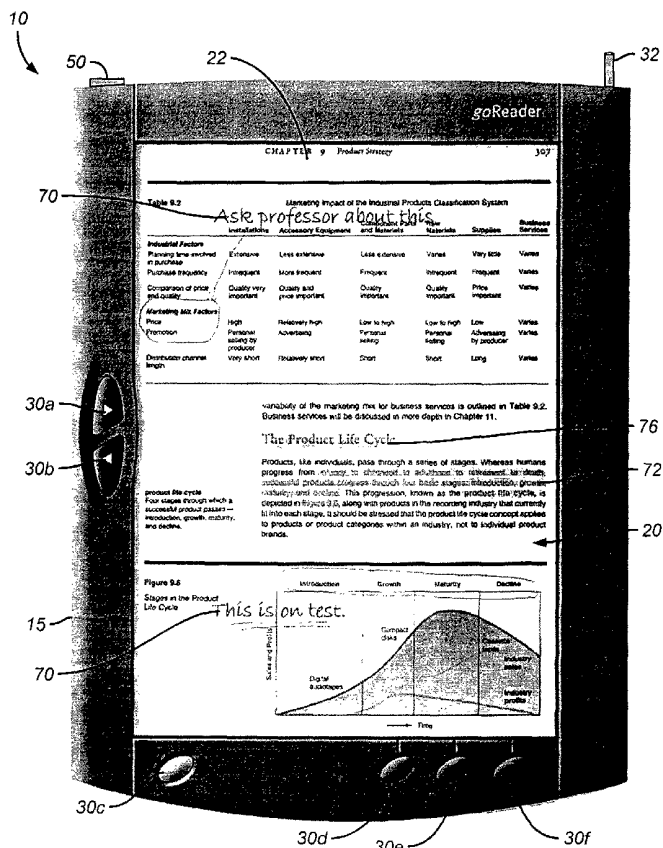
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(54) Title: METHOD, APPARATUS, AND SYSTEM FOR MANIPULATION OF ELECTRONIC CONTENT

(57) Abstract: The present invention comprises a method, apparatus and system for manipulation of electronic content. The device may be used for accessing and manipulating electronic content, the content comprising text, graphics, video, and audio and combinations thereof, the device comprising a case (15); a display (20); a touchscreen (22); short term memory (42) and a large memory storage device (40); an encryption key (46) associated with and stored in the large memory storage device (40); a communications port (50); a processing unit (44); and access and manipulation software (200) that allows processing unit (44) to receive encrypted content from the communications port (50), store the encrypted content in the large memory storage device (40), and later retrieve and decrypt the encrypted content using the encryption key (46) for display of the decrypted content on the display (20). The access and manipulation software (200) also allows creation and manipulation of retrievable persistent annotations that are configurably associated with content displayed on the display (20) as well as retrievable persistent annotations that are not configurably associated with content displayed on the display (20).

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**METHOD, APPARATUS, AND SYSTEM FOR
MANIPULATION OF ELECTRONIC CONTENT**

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This nonprovisional U.S. national application, filed under 35 U.S.C. § 111(a), claims, under 37 C.F.R. § 1.78(a)(3), the benefit of the filing date of provisional U.S. national application no. 60/206,671, attorney docket no. D6502-00003, filed on 05/24/2000 under 35 U.S.C. § 111(b), the entirety of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention relates to the display, sale, and distribution of electronic content and related services and systems and, in particular, to methods, systems, and apparatuses for distribution of electronic book content such as textbooks.

Description of the Related Art

[0003] Information is currently widely distributed by means of printed media such as books and magazines. This information includes text and graphics images as well as audio and video data, all of which is referred to generally herein as "content." With the advent of computers and data networks such as the Internet, content is provided more and more often in electronic (digital) form. [0004] One disadvantage of conventional print media is the cost of production. Another disadvantage is the weight and bulkiness of physical media such as books or magazines. Further, these physical media must be distributed, transported, and stored, all of which can be costly. In addition, the content in these physical media is fixed and static and therefore not easily subject to computer operations such as searching and cutting and pasting. Further, a publisher can more easily update content that is in electronic form as opposed to having to reprint new editions.

[0005] Computers, whether desktop or laptop, which are used to browse and access digital content are not as portable or easy to use as conventional media such as books and magazines.

Moreover, content in digital form can be easier to copy, thus heightening concerns regarding unauthorized duplication and use of content.

[0006] Numerous proposed electronic book readers lack precision of display appropriate for viewing content, including lacking color, lacking sharp displays of text and graphics, and lacking contrast. By way of example, a Liquid Crystal Display (LCD) consists of pixels whose rectangular shape can limit the ability to render fonts. Additionally, color is often of great importance to the textbook community, for example, because textbooks, e.g., science books, often rely on complex, multicolored visuals. Some prior art has attempted to address the sharp display of text and graphics, e.g. Microsoft® ClearType™ font technologies.

[0007] Prior art includes specialized software executing in personal computers such as laptop computers for viewing content. Included in such software are Internet browsers, such as Microsoft® Internet Explorer™ and Netscape® Communicator™, and specialized software, such as Adobe® Acrobat® and Acrobat Reader® applications for viewing and/or manipulating specialized portable data format (PDF) files. While these applications allow viewing content, their displays of content are not formatted specifically for larger textbook content, resulting in a loss of maintaining viewability of the full page and a loss of readability.

[0008] In particular, Adobe® Acrobat™ allows a user to annotate content and export the annotations, but offers no ability to separate annotations or to assign values to annotations or manipulate annotations by value. Further, none of these applications provide an ability to track a user's content access, viewing, and manipulation histories.

[0009] In addition to general purpose computers such as laptops, numerous electronic book readers and systems have been proposed. United States Patent 5,956,034 issued to Sachs et al. discloses a portable electronic book having a memory that stores a unique code number associated only with the electronic book. This code is used to encrypt and decrypt content transmitted to the electronic book. In this scheme, two encryption keys are used, a public and

a private key, where the private key is stored in ROM, NVRAM, or any other semiconductor memory. Sachs '034 discloses the ability to highlight or underline portions of the content as well as allow text font size to be enlarged or reduced by the user.

[0010] However, the electronic book prior art, including Sachs '034, does not teach or suggest allowing a user to add annotations in either "sticky" form, i.e., permanently associated with a word or group of words in the content being currently displayed, or overlay form, i.e., not permanently associated with a word or group of words in the content being displayed, and search for such annotations. Sachs '034 neither teaches nor discloses the ability to annotate content in both a "sticky" manner or an overlay manner; use of annotations comprising user manipulatable attributes; the ability to magnify a user selected region of the displayed content, e.g. other than text font size; or collaborative sharing of annotations between a plurality of users. Moreover, the prior art does not teach or suggest assigning manipulation values to annotations or allowing collaborative sharing of annotations.

[0011] Electronic file formats for eBooks tend to be proprietary, although many of the current eBook data are formatted in one of two ways, hypertext markup language (HTML) or its superset XML, or Adobe® portable document format (PDF). A new standard, Open eBook File format (OEB), is beginning to gain acceptance as a portable, standard format for content.

[0012] Additionally, in recognition that publishers and authors would like to get paid for their efforts, numerous distribution and copy protection schemes have been proposed. For example, Adobe® has proposed PDF Merchant™ along with Web Buy, a system that allegedly lets publishers sell PDF formatted eBooks over the Internet while addressing protecting copyright and distribution concerns. PDF Merchant™ uses encryption to control delivery and retrieval of PDF documents. In the PDF Merchant™ method, an external key is required, obtained from a publisher upon payment of an appropriate fee. A problem with this approach is that the key will

work with any device in which those data are stored, i.e., the key is not unique to the reader device but, rather, to the content.

[0013] Sachs '034 and other proposed or actual electronic books also do not provide a display capable of rendering content in a manner that appears to the viewer in the same dimensions as identical printed content.

[0014] Further, the prior art does not teach or suggest using an electronic book to process annotation information and made the processed information available to a publisher or author that can show how the book is used by the users.

[0015] There is, therefore, a need for electronic books, i.e., portable processor-based content access machines which are easy to use and have many of the same features as conventional media, but which also have additional features not possible with static print-based content, and which also avoid the drawbacks of using conventional machines such as desktop or laptop computers to access digital content. There is also a need to provide a workable content distribution system that can generate profit and avoid unauthorized duplication and use of content.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] These and other features, aspects, and advantages of the present invention will become more fully apparent from the following description, appended claims, and accompanying drawings in which:

[0017] **Fig. 1** is a plan view of an exemplary embodiment of an electronic reader device according to the present invention;

[0018] **Fig. 2** is a partial perspective view of an exemplary embodiment of an electronic reader device according to the present invention;

[0019] **Fig. 3** is a schematic view of a system using electronic reader devices according to the present invention;

[0020] Fig. 4 is a representation of an exemplary content source web screen; and

[0021] Fig. 5 is a schematic representation of a process flow according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0022] The present invention provides an electronic content manipulation system and associated hardware and methods, which provides content to be sold and marketed to selected audiences who can then retrieve and selectively manipulate the retrieved content. One aspect of the invention is a portable, dedicated content access device, referred in provisional U.S. national application no. 60/206,671, attorney docket no. D6502-00003, filed on 05/24/2000, incorporated by reference herein, as a "goReader" electronic book reader, "eReader," or sometimes referred to in the provisional as a "UReader" device. Within this application, the term "eReader" is used to refer to electronic book readers as described more fully herein and is generally referred to by the numeral "10." eReader 10 permits a user to download content, to access the content, and to manipulate the content. As used herein, the term "content" comprises text, graphics, audio, video, and tactile representations of data, by way of example and not limitation including textbooks with or without imbedded or accessible multimedia as that term is understood by those of ordinary skill in the software arts. Some types of electronic content may be referred to herein as an electronic book or textbook, or eBook or eTextbook for short. To facilitate understanding of the present invention, the term "content" and the term "textbook" also comprise books, newspapers, magazines, technical manuals, course packs, class handouts, lecture notes, non-technical manuals, other publications found in printed form, and the like, or any combination thereof. As further used herein, the terms "accessing" and "manipulating" comprise retrieving and viewing (reading) the content, as well as annotating, associating, searching, navigating, and cutting-and-pasting the content, as described in further detail herein. In this regard, "manipulate" further comprises uploading, printing, and creating new content. A system is described as well which

provides secure distribution, routing, and control of content, to prevent unauthorized use of content and to complement a given marketing and distribution system.

[0023] The concept of electronic books dates back to 1945, when Vannevar Bush proposed a “memex” electronic reader, and later to around 1968 when Alan Kay proposed a “dynabook.” Within the last few years, new technologies have arisen to recreate content, by way of example and not limitation including CDROM, DVD, Internet books, and multimedia presentations. While there have been some notable exceptions, such as the elimination of the printed encyclopedia, the distribution, accessing, and manipulation of content has not changed.

[0024] Referring now to **Fig. 1**, a top plan view of an exemplary eReader 10, in an embodiment, the eReader 10 of the present invention is a user-friendly, portable device, with the capacity to store a large number of content such as digital versions of textbooks (“eTextbooks”). By way of example and not limitation, throughout this description an exemplary embodiment of the present invention will be described in terms of such eTextbooks and the eReader 10 of the present invention described as it may be used by college, university, high school, junior high school, middle school, elementary school, or other students, to store eTextbooks and related content such as course packs, study guides, and annotations created by the user or created by other students or by professionals. eTextbooks can be downloaded by the student, either for free or for a fee, into the eReader 10. Thus, in one presently envisioned embodiment, an eReader 10 with the capacity to hold every textbook a student needs eliminates the problem of heavy backpacks while enhancing the educational experience through the provision of features not possible with standard printed textbooks (such as copying-and-pasting to create notes or study guides, sharing and sale of annotations, searching annotations, and the like).

[0025] In a presently preferred embodiment, eReader 10 comprises power supply 12, case 15, display 20, touchscreen 22, one or more buttons 30, a stylus 32, a large memory storage device

40 (not shown in **Fig. 1**), short term memory 42 (not shown in **Fig. 1**), processing unit 44 (not shown in **Fig. 1**), and communications port 50.

[0026] Case 15 is made of an appropriate material such as polycarbonate/ABS or magnesium. Additionally, in a preferred embodiment the size of case 15 allows display 20 to maintain the integrity of the size of the printed material with no reduction or very little reduction in size.

[0027] In a presently preferred embodiment, display 20 is capable of displaying a complete single page of content as if viewing the printed form of the content. In a presently preferred embodiment, display 20 is an approximately 7" wide by approximately 9" tall dual backlit LCD screen having an approximately 12" diagonal and capable of full-color SVGA resolution that allows for multicolor highlighting, note taking, and magnification of images. In a currently envisioned embodiment, display 20 may be an XGA type, which has a higher resolution than SVGA and other display technologies may be used in addition to dual backlit LCD, the equivalents to which are familiar to those of ordinary skill in the computer display arts. In a further currently envisioned embodiment, display 20 may have an approximately 10" diagonal.

[0028] Additional controls, such as a brightness and contrast controls, may also be provided as will be apparent to those of ordinary skill in the computer display arts.

[0029] In a preferred embodiment, eReader 10 uses enhanced font technology to ensure crisp text and graphics, as will be understood by those of ordinary skill in the computer display arts. In a presently preferred embodiment, eReader 10 comprises a library of fonts that give an appearance closer to that of printed text when text is displayed. However, as opposed to prior art text font manipulation, to ensure that smaller or more detailed information can be viewed, all content may be selectively tagged by a user, including charts and graphs, allowing the user to magnify the selected display regions by means as will be understood by those of ordinary skill in the computer arts such as by using touchscreen 22 or a function key like button 30 or the like. Additionally, in a preferred embodiment, display 20 is sized to permit display of content in a format congruent

with the format of the content if it were printed, by way of example and not limitation including size, color, font, and the like, or combinations thereof.

[0030] In a currently envisioned embodiment, a graphic accelerator chip is also provided for aiding creation of display content.

[0031] In other currently envisioned embodiments, a user may increase font size for displayed content. However, in doing so, original pagination of the content may be lost, e.g. a five hundred page book could become a five hundred fifty page book. Although such user customization may change pagination, the index, table of contents, annotations, and the like will be modified to reflect the new pagination. Additionally, the user may opt to turn off the images in the content, which may make for faster page-to-page navigation.

[0032] Touchscreen 22 allows a user to use a stylus such as stylus 32 or a finger to maneuver among and/or annotate content and access the various other functions available through access and manipulation software 200 resident in eReader 10.

[0033] One or more buttons 30 may be present to facilitate one or more eReader 10 functions. By way of example and not limitation, buttons 30a and 30b may be used to regress or progress the display of content, i.e., retrieve the next or prior pages of content. Button 30c may be used as an on/off button. Buttons 30d, 30e, and 30f may be assigned one or more functions by applications executing within eReader 10. Additionally, buttons 30 may be positioned where ergonomically desirable such as in proximity to finger or thumb placement of a hand holding eReader 10.

[0034] Menus may also be present, either as icons, function keys, title bars, or the like, or any combination thereof. By way of example and not limitation, a menu item such as an icon may be selected by a user to magnify a region of content being currently displayed. Menus may be associated with and selectable by use of buttons 30, icons, or a combination thereof or any other method as will be familiar to those of ordinary skill in the computer arts.

[0035] In the preferred embodiment, large memory storage device 40 (not shown in **Fig. 1**) is a small footprint hard drive which has multiple gigabytes of data storage and is sufficiently engineered for portable use, including by way of example and not limitation physical shock tolerance. In a currently preferred embodiment, large memory storage device 40 is a 2.5" 6.4 GB hard drive such as TRAVELSTAR™ by IBM Corp. of Armonk, New York. In other presently envisioned embodiments, large memory storage device 40 may be removable devices such as JAZ® by IOMEGA Corp. of Roy, Utah or any other removable memory device such as memory sticks, flash memory, and the like, or any combination thereof.

[0036] As opposed to prior art methods of embedding or otherwise integrating an encryption key into memory such as ROM or NVRAM to associate the key with a single electronic book, eReader 10 allows encryption key 46 to be stored on a dedicated chip with a unique serial number or be resident in large memory store 40. In this manner, large memory store 40 may be a removable hard drive, allowing transference of encrypted data and the encryption key 46 required to decrypt that content while simultaneously providing protection and ensuring that the content will be usable only by a single user at a time. In an additional embodiment, eReader 10 may utilize a serial number that is associated with processing unit 44 or some other chip.

[0037] In the preferred embodiment, short term memory 42 (not shown in **Fig. 1**) comprises both RAM and ROM devices. In a presently preferred embodiment, eReader 10 comprises 32 MB of RAM and 1 MB of flash ROM. Additional short term memory 42 may be installed, either by replacing the originally installed short term memory 42 or adding to short term memory 42 such as by memory expansion slots as will be familiar to those of ordinary skill in the computer arts.

[0038] In the preferred embodiment, processing unit 44 (not shown in **Fig. 1**) is an Intel® StrongARM™ SA-1110 microprocessor running at 206Mhz. However, any microprocessor capable of withstanding portable device packaging and capable of executing eReader 10 software may be used. As will be understood by those of ordinary skill in the computer arts, as used

herein "processing unit 44" includes ancillary support electronics including firmware.

[0039] In the currently preferred embodiment, communications port 50 is a universal serial bus ("USB") port, as that term is understood by those of ordinary skill in the computer arts. As will be familiar to those of ordinary skill in the computer arts, communications port 50 may comprise two USB connectors, a slave and a host, wherein the slave may be used for transferring files to eReader 10 and the host may be used for interfacing and using USB devices such as mice, keyboards, modems, routers, audiovisual devices, and the like, or combinations thereof. In other presently contemplated embodiments, communications port 50 may comprise IEEE 1394 (Firewire™), PCMCIA, IrDA, custom I/O connectors, wireless connectors capable of using communication protocols such as 802.11b or BlueTooth™, and the like, or any combination thereof.

[0040] Referring now to **Fig. 2**, in an embodiment, power supply 12 is a battery 12 sized to provide at least two hours of runtime between charges. In a presently preferred embodiment, battery 12 is a rechargeable lithium ion battery capable of providing at least four hours of use between charges and is replaceable within case 15. Additionally, eReader 10 may further provide for A/C power via an A/C power cord or its equivalent such as a power transform or converter for providing DC or rectified A/C power to eReader 10. In one embodiment, an A/C source can recharge battery 12 while battery 12 is installed in case 15. In a further embodiment, a secondary battery (not shown in the **Figures**) is included to allow persistence of data when battery 12 is being swapped or otherwise replaced.

[0041] Referring now to **Fig. 3**, in an embodiment, content distribution system 100 of the present invention combines the use of an open standard for book publication (the Open E-Book (OEB) standard or format), Internet distribution, and a special-purpose, dedicated eReader 10 computer device. This system decreases the cost of college text books, enhances the learning process, ensures copyright protection, and shortens the publisher-to-student supply chain. The new,

industry-wide OEB standard is a specialized subset of XML, and replaces the plethora of book formats, so that a single device that displays OEB can display any book. The content and product distribution web site will provide a content-rich environment to offer a “one-stop” shopping experience of complementary products and services offered through the vendor’s distribution network or as links to partner companies. Support for other formats is currently contemplated such as for Adobe® PDF and the Microsoft® MSReader format.

[0042] eReader 10 further comprises access and manipulation software 200 (not shown in the **figures**) executable by processing unit 44. In a preferred embodiment, accessing and manipulation software 200 is capable of accepting input from touchscreen 22, buttons 30, and communications port 50 and outputting formatted content to the display 20. As described below for a preferred embodiment, access and manipulation software 200 allows processing unit 44 to receive encrypted content from content provider 110 via communications port 50 and store the encrypted content in large memory storage device 40. Upon request by a user, access and manipulation software 200 allows a user to retrieve the encrypted content stored in large memory storage device 40, decrypt the encrypted content retrieved using encryption key 46, and display the decrypted content on the display 20. As opposed to the prior art, access and manipulation software 200 allows a user to create persistent annotations from input received from an input device such as touchscreen 22 or communications port 50 that are configurably associated with content displayed on the display 20 (i.e., “sticky” annotations) and/or create persistent annotations from input received from touchscreen 22 or communications port 50 that are not configurably associated with content displayed on the display 20 (i.e., overlay). The overlay annotations may be uploaded to a server such as content provider 110 or another eReader 10 for collaborative sharing of annotations or for backup of data. Further, all annotations, having one or more attributes, may be selectively extracted such as by attribute or group of attributes and gathered in a separately manipulated manner such as to a separate file. In this manner, a user

may create a separate “book” or study guide or outline. By way of example and not limitation, a user may elect to have all study guide annotations appear highlighted in yellow, all interesting but non-critical annotations appear highlighted in green, and all critical annotations appear highlighted in pink. To create a study guide, the user can then selectively extract only those annotations whose highlight attribute is pink or yellow. Similarly, a user may elect to selectively extract only those annotations whose highlight attribute is green to create a set of shared, collaborative annotations.

[0043] eReader 10 may further comprise additional functional features, by way of example and not limitation including a built-in calculator, calendar, and electronic notepad, mail, spreadsheet, word processing, a Motion Pictures Expert Group Level 3 (MPEG 3 or mp3) player, and video functions. In additionally contemplated embodiments, eReader 10 may also be able to utilize handwriting recognition software as an input for annotations.

[0044] **In the operation of an exemplary embodiment**, referring generally to **Fig. 1** and **Fig. 3**, eReader 10 accessing and manipulating will be described in the context of students and eTextbooks. It is understood that this example is not a limitation on eReader 10 and that eReader 10 may be used for a wide variety of content other than eTextbooks. In a preferred embodiment, eReader 10 is capable of downloading or uploading content via communications port 50, by way of example and not limitation a high speed USB connection to a modem or local area network or to the Internet. Additionally, eReader 10 allows annotations to be entered via touchscreen 22 using handwriting, such as annotation 70, including using handwriting recognition features, such as by a finger or stylus 32 or via a keyboard operatively attached to communications port 50. Annotations such as annotations 72 and 76 may be configured by a user as to attributes including color and width and may be exchanged and/or shared with other users. Additionally, referring to **Fig. 2**, annotations may have different color attributes, such as annotations 72 and 76, including background color, font color, font type, font size, persistence, indexability, brightness,

contrast, volume, magnification/size, and resolution.

[0045] A key function of access and manipulation software 200 will allow students to highlight, then copy and paste material, e.g. to create a user created study guide for that which they need to study. Annotations and portions of content may therefore be copied and pasted into such study guides. For example, a math student may want to “copy” all of the equations in a certain chapter to simplify problem solving. With this functionality he will be able to produce a document that he can print or load into any Windows® or Apple® Macintosh® software package. By way of example and not limitation, law students may want to “copy” groupings of decisions to help create an opinion and could do so by assigning values to annotation attributes, such as color. Users can then sort, search, selectively export, and the like using these attributes. By way of additional example and not limitation, a user can cut and paste by selecting annotations having highlight attributes of a certain color. Attributes for selected annotations may further be retained after a cut and paste, e.g. content can retain the colored highlights associated with that content.

[0046] In the currently preferred embodiment, this copy and paste feature may only allow a limited amount of pages to be done at a time. By way of example and not limitation, each content publisher may have the ability to determine how many pages (e.g., ten) of homemade study guide may be created at a time. This limitation is in place to effectively stop the reproduction of entire books. Additionally, a publisher could also limit the ability to copy graphics so that only text can be cut and pasted. Moreover, in the currently preferred embodiment all such content which is copied and pasted is first converted to a bitmap format before permitting uploading of this data to further hinder unauthorized duplication of the contents of a given content. In the currently preferred embodiment, annotation files are separate files with respect to the book files, making the annotation files smaller in size and quicker to upload/download.

[0047] Additionally, annotations and the like such as study guides may be printed such as by a printer (not shown in the **Figures**) attached to communications port 50 or via a wireless connection. To facilitate annotations and navigation between annotations, eReader 10 may also support linking functions such as hyperlinks between annotations and content, and/or to definitions and study guides as well as bookmarks functions. For bookmarks, in a preferred embodiment bookmarks comprise user manipulatable attributes, by way of example and not limitation comprising names. If no bookmark name is provided by the user, a default name attribute may be provided, in the preferred embodiment being the page number. An index of all bookmarks may further be provided, allowing a user to navigate content using the bookmark index.

[0048] eReader 10 may contain multiple content at one time in large memory storage device 40, and multiple content may open at a time for display. In the currently preferred embodiment, upon a power up condition, eReader 10 recalls the last page of content that was being viewed when eReader 10 was last powered down.

[0049] Referring now to **Fig. 4**, in an embodiment, content is offered for sale at a specified web site such as central server 110. Central server 110 may be a web site, a plurality of web sites, one or more local servers, another computer, or any combination thereof. Students may access central server 110 such as by web page 300, select content such as by check box 310, and download the selected content such as eTextbooks from central server 110. Additionally, central server 110 may be used to store students' content, complete with any notes and annotations, in personal libraries for future retrieval, such as with a backup function. As opposed to the prior art, access and manipulation software 200 allows customization of a personal library view.

[0050] In a currently envisioned embodiment, users may be provided with selective access via a second device such as a personal computer to their personal library. Such access may be configurably limited in duration as well as in the number of such allowed accesses. In this way,

a user can view the user's library of content from a non-dedicated device, for example, if the user's eReader 10 breaks right before a test and the user needs to view their books.

[0051] In a presently preferred embodiment, eReader 10 offers an advanced search function, which allows students to search their personal library of eTextbooks for key words, chapters, annotation attributes, and bookmarks, to ensure quick access for an integrated learning process.

eReader 10 users may view the contents of their personal libraries, including book cover thumbnails as well as the title and author information. However, as opposed to the prior art, access and manipulation software allows a user to modify the information displayed including display text associated with an element of the personal library. In a currently preferred embodiment, a user may assign attributes such as an instructor or course identifier and then use these to search.

[0052] Additionally, eReader 10 may also provide for a table of contents and/or index for one or more content stored in large memory device 40.

[0053] eReader 10 seeks to replicate aspects of the experience of using a physical book. Users may configurably manipulate content attributes such as color (both font and background color) and size of display in addition to having the ability to directly annotate the content. In some configurations, printed content may appear on display 20 without any repagination of the printed content with respect to the content's printed form.

[0054] Students may also share notes and text annotations with other users of the reader device, thereby creating a "virtual community." As currently envisioned, such sharing will be via central server 110, although peer-to-peer sharing may be allowed such as by direct connections between two or more eReaders 10 using data communications port 50.

[0055] In an embodiment, various content are offered for sale to be downloaded into eReader 10. The content may be provided, for example, by conventional publishers of traditional print textbooks, who convert their books into suitable electronic format, such as the OEB format.

Other learning related content may be offered, such as study guides prepared by the author or publisher of the textbook, or by students, teachers or tutors, and annotations prepared by students may also be offered for sale or be made freely available. In addition, other types of content can be offered, such as trade books (fiction and non-fiction), magazines, and newspapers. Advertising revenues may also be obtained by placing ads on central server 110.

[0056] Referring now to **Fig. 5**, a process flow diagram illustrating the electronic content distribution system 100 of the present invention, each eReader 10 may be configured so that it can only accept predetermined content such as from a designated source like a central server 110. Central server 110 may sell content or offer free content, such as eTextbooks and associated study guides, for a certain price, and transmit sold content as an encrypted file to eReader 10, using that eReader's 10 encryption key 46. Each eReader 10 also may be configured to have its ability to upload limited in a predetermined manner. It is understood by those of ordinary skill in the data processing arts that a single central server 110 may exist through which all content is retrieved and/or stored, or numerous central sites 110 may exist, each of which allows for some or all content to be retrieved and/or stored.

[0057] The encryption is preferably based upon a unique number associated with eReader 10 such as encryption key 46. By way of example and not limitation, when a customer creates an account, central server 110 assigns a created customer account and maintains database 112 which contains tracking information for that customer including that customer's encryption key 46 to be associated with the customer's account. When the customer purchases content, e.g. an eTextbook, central server 110 interrogates the requesting device, e.g. eReader 10, to ensure that the customer is allowed to download content into that specific requesting device.

[0058] In order to protect the content, content delivered to each requesting device is encrypted using that device's encryption key 46 and stored in large memory storage device 40 in encrypted form. eReader 10 dynamically decrypts only a portion of stored content upon access by a user

for display or manipulation, e.g. by storing the decrypted portion temporarily in short term memory 42 in some unencrypted format such as the Open E-Book (OEB) or XML standard or format. In part, content stored in encrypted form helps ensure that removal of large memory storage device 40 does not give someone else access to unencrypted content. In a further envisioned embodiment, the decrypted data may remain in an uncompressed form while the unencrypted data remains compressed, saving memory.

[0059] Further, by tracking each book's owner relative to their device, users may be prevented from selling or otherwise distributing their content, limiting or eliminating a used book market.

[0060] After purchase of a reader device, the user can establish an account with one or more content providers or with central server 110 (acting as a distributor) and begin to download content. In an embodiment, some items may be "loaned" (e.g., trade books), while others are only sold. In this regard, loaning may be accomplished by establishing expiration codes in the content such that the content is unavailable after the expiration code is triggered. In a currently preferred embodiment, content may be configurably restricted such that only a certain type of content, e.g. non-textbooks, may be loaned from one device to another. In addition to content, annotations may also be loaned.

[0061] The ability of each reader to download and upload is carefully controlled such as by encryption. In the preferred embodiment, the system may be configured to permit the electronic copy of the content to exist in only a single location at a given time, e.g. on a given reader device or in a personal library at a central server 110. Because a reader device itself is physical, the ability to loan a book is controlled by the device and website.

[0062] In one embodiment, customers will purchase eReader 10 and content through a designated content distribution web site 110, e.g. the vendor's web site or their university. Content distribution web site 110 may additionally function as a marketing engine, an e-commerce site, and an electronic library. Content distribution web site 110 may allow instant

purchase and download of e-books such as through use of a credit card. Content distribution web site 110 may additionally have intelligent consumer preference technology to remember past purchases, give instant status updates, and make recommendations based on previous visits.

[0063] Users may be encouraged to back-up their content and annotations frequently, driving visits to central server 110, thereby allowing the creation of a portal community by allowing the sharing of textbook annotations and-notebooks. For instance, if a student misses a day of class, their classmate may post notes for them to download and use. Another example is that a student who does not highlight their book frequently may now download a heavily annotated book from anywhere in the country to assist in their learning.

[0064] Central server 110 may also offer an “electronic library.” In one currently envisioned embodiment, all of a user’s past purchased content may be stored at central server 110 for future use by that user at no cost to that user. Further, users may be permitted to upload and download content as often as they like but limited to a predetermined eReader 10. Additionally, the electronic library may be configured to allow users to exchange notes with each other, especially annotations.

[0065] In one embodiment, at least a portion of the electronic library comprises a “personal library” at central server 110 which may be represented on eReader 10 by displaying a book cover image on display 10 along with both configurable and non-configurable attributes such as book title, author, title, ISBN, course, instructor, and the like. As opposed to prior art, eReader 10 can also access and display user configurable data, by way of example and not limitation including associations of the content, e.g. course name, course number, course subject, and the like for an eTextbook. In further opposition to the prior art, users can selectively manipulate display and other functions involving content stored in a user’s personal library such as by searching for content by using one or more associations or sorting by associations, e.g., show all content related to “chemistry” or all content related to “course 101” or show all content sorted

by course name.

[0066] Central server 110 may also provide other content, by way of example and not limitation including e-magazines and e-newspapers as well as video and audio data. These items may be sold on a subscription basis, on a per use basis, a one-time fee, or provided for free.

[0067] As noted above, the eReader 10 may be configured, as in the preferred embodiment, to include additional applications. These applications may include a calculator, calendar, and a "blank" notebook for note-taking such as with overlay annotations. By way of example and not limitation, in the currently preferred embodiment, calendar may allow the student to track exams, quizzes and other events by writing them on a monthly calendar presented on the screen.

[0068] Other applications that may be included as currently envisioned include a music player such as an MP3 audio player, a video player for embedded or standalone multimedia files, and the like.

[0069] Some of the advantages of the content distribution system of the present invention are discussed below. For example, elimination of a used book market represents increased sales opportunities for publishers. Publishers have been searching for methods to entice students to buy new books such as shrink wrapped CD-ROMs, but have not made very much progress. The fact that there is no eReader 10 used book market is of great value to the publishers.

[0070] Access and manipulation software 200 further embodies a method of gathering data regarding accessed content stored in eReader 10. In a preferred embodiment, access and manipulation software 200 captures a predetermined, configurable set of user actions undertaken with the content. These actions may be kept in a file, a database, or any other method as will be familiar to those of ordinary skill in the computer arts.

[0071] These user actions can include frequency of accessing on a page-by-page basis of the content, time spent accessing and/or displaying content on a page-by-page or other basis, annotations made, annotations reviewed, and the like, or any combination thereof. By way of

example and not limitation, user actions record may also comprise recording the frequency of each access to the content; recording the usage of web hyperlinks, including the sites actually linked; recording what hyperlinks were added; or any combination thereof.

[0072] Access and manipulation software 200 may further maintain these data in a database or other file for uploading to a predetermined other site such as central server 110. In this manner, publishers, editors, authors, professors, and others can gain insight into the use and characteristics of their content, possibly using these data to modify their content.

[0073] Colleges and universities may also reap benefits from the business model of the present invention. There are currently adversarial relationships between universities and their college bookstores. Even if the bookstore is outsourced, which occurs more than 50% of the time, the student associates poor service, sold-out books, and outrageous prices with the school, not the outsourcing vendor. The larger-than-bookstore margins possible with the present system allow eReader 10 eTextbooks to be sold to students at discounted prices while creating more revenue for the university.

[0074] Additionally, a new channel will exist for a school and professors to distribute information. Universities can save money and time by using eReader 10 to distribute all manner of content, by way of example and not limitation including handbooks, directories, and/or student newspapers.

[0075] A traditional hurdle to implementing a new technology at a university is the acceptance of the professors. Because the administration does not have complete control over the professors, they can refuse to implement new things. Knowing this, eReader 10 creates a new revenue stream for professors who use an eReader 10 distribution platform. By way of example and not limitation, professors have extensive intellectual capital invested in their class notes. In the past, many professors have chosen not to publish textbooks because of the extensive editing time associated with the process. Many professors also have note packs that they distribute, at very

low margins, through the bookstores or copy shops. Students traditionally photocopy these packs. Using eReader 10, professors can easily create eTextbooks and/or note packs, creating new revenue streams at higher margins.

[0076] Students gain as well because the present invention permits students to carry all their textbooks, study guides, and supplementary information and devices, such as calculators, calendar, and dictionaries, in a single lightweight device. eReader 10 also increases the student's ability to access and annotate content. Further, the students can purchase new textbooks at a lower cost, and receive updated material or corrections more easily and frequently, than with a physical textbook. Thus, it enhances learning while paying for itself through reduced textbook costs.

[0077] eReader 10 may also be viewed by some consumers as more environment-friendly than traditional physical books, thereby further enhancing the demand for the product. Unlike a laptop computer, the reader of the present invention has a full-page display, enhanced font technology, and touchscreen highlighting and annotating, and is easier to use and more affordable than many general-purpose laptops. It also has superior portability and ergonomics for content viewing with respect to laptops.

[0078] The content distribution system of the present invention allows for differentiation based upon demographics, and allows marketing to be tailored to this segment more effectively than brand age/gender campaigns. Prices may be reduced based on in-product advertising or tuition bundling. The content distribution system of the present invention permits at least three revenue streams: the appliance and accessories, student specific marketing data, and the industry standard electronic textbooks and other content.

[0079] The present invention can be embodied in the form of computer-implemented processes and apparatuses for practicing those processes. Various aspects of the present invention can also be embodied in the form of computer program code embodied in tangible media, such as floppy

diskettes, CD-ROMs, hard drives, or any other computer-readable storage medium, wherein, when the computer program code is loaded into and executed by a computer, the computer becomes an apparatus for practicing the invention. The present invention can also be embodied in the form of computer program code, for example, whether stored in a storage medium, loaded into and/or executed by a computer, or transmitted as a propagated computer data or other signal over some transmission or propagation medium, such as over electrical wiring or cabling, through fiber optics, or via electromagnetic radiation, or otherwise embodied in a carrier wave, wherein, when the computer program code is loaded into and executed by a computer, the computer becomes an apparatus for practicing the invention. When implemented on a general-purpose microprocessor, the computer program code segments configure the microprocessor to create specific logic circuits to carry out the desired process.

[0080] It will be understood that various changes in the details, materials, and arrangements of the parts which have been described and illustrated above in order to explain the nature of this invention may be made by those skilled in the art without departing from the principle and scope of the invention as recited in the following claims.

CLAIMS

What is claimed is:

1. A device for accessing and manipulating electronic content, the content comprising text, graphics, video, and audio and combinations thereof, the device comprising:
 - a. a case (15);
 - b. a display (20) disposed within the case (15) and at least partially exposed through a predetermined side of the case (15);
 - c. an input device;
 - d. a short term memory (42) disposed within the case (15);
 - e. a large memory storage device (40) disposed within the case (15);
 - f. an addressable encryption key (46);
 - g. a communications port (50) disposed within the case; and
 - h. a processing unit (44) disposed within the case (15) and operatively in communication with the large memory storage device (40), the short term memory device (42), the communications port (50), the encryption key (46), the input device, and the display (20), the processing unit (44) responsive to access and manipulation software (200) for accepting input from the input device and outputting formatted content to the display (20);
 - i. wherein the processing unit (44) is programmed responsive to access and manipulation software (200) to accept user manipulation directives to create selectively extractable persistent annotations from input received from the input device, the annotations comprising user manipulatable attributes, whereby the user can selectively manipulate the annotations using the user manipulatable attributes.
2. The device of claim 1 wherein the user manipulation of selectively extractable persistent annotations comprises creating, storing, retrieving, modifying, and deleting the annotations and one or more attributes of the annotations.

3. The device of claim 1 wherein the input device further comprises:
 - a. a touchscreen (22) disposed proximate the display (20); and
 - b. the communications port (50).

4. The device of claim 1 wherein at least a portion of the communications port (50) is accessible through the case (15).

5. The device of claim 1 wherein the user manipulatable attributes comprise background color, font color, font type, font size, association with a user selected content, permanent association with a user selected displayed portion of content, persistence, indexability, brightness, contrast, volume, magnification/size, and resolution.

6. The device of claim 1 wherein the processing unit (44), responsive to the access and manipulation software (200), is further programmed to:
 - a. receive encrypted content from the communications port (50);
 - b. store the encrypted content in the large memory storage device (40);
 - c. retrieve the encrypted content stored in the large memory storage device (40);
 - d. decrypt the encrypted content retrieved using the encryption key (46); and
 - e. display the decrypted content on the display (20).

7. The device of claim 6 wherein in its decrypted form the content further comprises a native format comprising OEB/XML formats, PDF formats, multimedia formats including audio, and combinations thereof.

8. The device of claim 1 further comprising a power source wherein the power source is selected from the set of power sources consisting of a battery (12) disposed at least partially within the case (15), a battery (12) disposed outside the case (15), a rechargeable battery (12) disposed at least partially within the case (15), a rechargeable battery (12) disposed outside the case (15), a lithium ion battery (12) disposed at least partially within the case (15), an external power supply powered by alternating current, or a combination thereof.

9. The device of claim 8 further comprising a second battery disposed within the case (15) for providing power when battery (12) is being replaced.

10. The device of claim 1 further comprising a stylus (32) disposed at least partially within the case (15).

11. The device of claim 1 wherein the case (15) further comprises at least one contoured side wherein the contoured side is ergonomically configured for a human arm or a human hand or both.

12. The device of claim 11 further comprising a battery (12) removably disposed within the case (15) on the contoured side.

13. The device of claim 11 further comprising at least one button (30) disposed within the case (15) and accessible to a user of the device wherein the at least one button (30) is disposed on the contoured side proximate natural placement of a human hand holding the device.

14. The device of claim 13 wherein the at least one button (30) is a plurality of buttons (30) comprising at least one button programmatically designated to cause content to be successively regressed or progressed for display.

15. The device of claim 1 wherein the communications port (50) is a USB port for supporting USB devices, the USB devices comprising modems, routers, bridges, gateways, hubs, network interface cards for wired networks, network interface cards for wireless networks, keyboards, pointing devices, speakers, MP3 players, microphones, scanners, printers, disk drives, CD-ROM drives, CD-Recordable (CD-R) drives, CD-Rewritable (CD-RW) drives, DVD-ROM (Read-only DVD) drives, rewritable DVD (DVD-RAM) drives, DVD players, digital photographic cameras, digital motion picture cameras, and the like, or a combination thereof.

16. The device of claim 1 wherein the display (20) is sufficiently sized to provide display of a single page of content in a format congruent with the format of that content if printed.

17. The device of claim 1 wherein the display (20) further:

- a. renders content in color, black and white, shades of grey, or combinations thereof;
and
- b. crisply renders text using enhanced font technology.

18. The device of claim 1 wherein the processing unit (44), responsive to access and manipulation software (200), is programmed to selectively magnify a user selected region of content displayed on the display (20).

19. The device of claim 1 further comprising a screen cover attachable to the case (15) wherein the screen cover at least partially covers the display (20) in a first position and at least partially uncovers the display (20) in a second position.

20. The device of claim 1 wherein the large memory storage device (40) is selected from the set of large memory storage devices consisting of internal hard drives, removable hard drives, flash memory storage devices, solid state memory storage devices, and memory sticks.

21. The device of claim 1 wherein the short term memory device (42) comprises RAM, NVRAM, flash RAM, and ROM.

22. The device of claim 1 wherein the content is selected from the group of content consisting of textbooks, periodicals, student newspapers, handbooks, directories, class specific materials, syllabi, course packs, advertisements, and combinations thereof.

23. The device of claim 1 wherein the processing unit (44), responsive to the access and manipulation software (200), is further programmed to create at least one table of contents for the content, at least one index for the content, at least one hyperlink relating a first portion of the content to a second portion of the content, and at least one hyperlink relating an annotation to a predetermined portion of the content.

24. The device of claim 23 wherein the processing unit (44), responsive to the access and manipulation software (200), is programmed to use a predetermined set of the annotation attributes to create the at least one table of contents for the content, the at least one index for the content, the at least one hyperlink relating a first portion of the content to a second portion of the

content, and the at least one hyperlink relating an annotation to a predetermined portion of the content.

25. The device of claim 1 wherein the processing unit (44) is further programmed to provide calculator functions, calendar functions, e-mail reader/writer functions, organizer functions, spreadsheet functions, multimedia functions, and notepad functions.

26. A system for accessing and manipulating electronic content, the content comprising text, graphics, video, and audio and combinations thereof, comprising:

- a. an electronic reader device comprising a case (15) comprising an outer shell 16, a display (20) disposed within the outer shell (16) and at least partially exposed through a predetermined side of the outer shell (16), an input device, a large memory storage device (40) disposed within the outer shell (16), an encryption key (46) disposed within the large memory device (40), a communications port (50) disposed within the outer shell (16), at least a portion of the communications port (50) being accessible through the outer shell (16), and a microprocessor disposed within the outer shell (16) and operatively in communication with the large memory storage device (40), the communications port (50), the encryption key (46), the input device, and the display (20);
- b. a source of content (110), the source (110) capable of encrypting the content using the encryption key (46); and
- c. content encrypted using the encryption key (46), the content being retrieved from the source of content and stored in the large memory storage device (40);
- d. wherein the microprocessor, under control of access and manipulation software (200), accepts input from the input device and the communications port (50),

outputs formatted content to the display (20), and manipulates annotations, the annotations comprising user modifiable attributes usable by the access and manipulation software (200) to create, store, retrieve, modify, and delete the annotations.

27. A system for accessing and manipulating electronic content, the content comprising text, graphics, video, and audio and combinations thereof, comprising:

- a. an electronic reader device comprising a case (15) comprising a display (20), an input device, a large memory storage device (40), an encryption key (46) disposed within the large memory device (40), a communications port (50) at least a portion of which is accessible through a outer shell (16), and a microprocessor operatively in communication with the large memory storage device (40), the communications port (50), the encryption key (46), the input device, and the display (20);
- b. a source of content (110), the source (110) capable of encrypting the content using the encryption key (46); and
- c. content encrypted using the encryption key (46), the content being retrieved from the source of content (110) and stored in the large memory storage device (40); and
- d. wherein the microprocessor, under control of access and manipulation software (200):
 - i. accepts input from the input device and the communications port (50);
 - ii. concurrently outputs formatted, separately identifiable content to the display (20) from a plurality of user selected, different content; and
 - iii. accesses and manipulates annotations, the annotations comprising user

modifiable attributes usable by the access and manipulation software (200) to create, store, retrieve, modify, and delete the annotations.

28. A device for accessing and manipulating electronic content comprising text, graphics, video, and audio and combinations thereof, the device comprising:

- a. a case (15);
- b. power means;
- c. means disposed within the case (15) for displaying content (20), the means at least partially exposed through a predetermined side of the case (15);
- d. input means;
- e. memory means;
- f. an interrogatable encryption key (46) stored in the memory means;
- g. communications means disposed within the case, at least a portion of the communications means being accessible through the case (15);
- h. a processing unit (44) disposed within the case (15) and operatively in communication with the memory means, the communications means, the encryption key (46), the input means, and the display means; and
- i. access and manipulation software (200) for programming the processing unit (44) to accept input from the input means and the communications means, output formatted content to the display means, and manipulate annotations, the annotations comprising user modifiable attributes usable by the access and manipulation software (200) to create, store, retrieve, modify, and delete the annotations.

29. A method for accessing and manipulating electronic content comprising text, graphics, video, and audio and combinations thereof, for a reader device (10) comprising a case (15) comprising an outer shell (16), a display (20) disposed within the outer shell (16) and at least partially exposed through a predetermined side of the outer shell (16), a touchscreen (22) disposed proximate the display (20) and at least partially exposed through a predetermined side of the outer shell (16), a battery (12) disposed within the outer shell (16), at least one button (30) disposed within the outer shell (16) and accessible to a user of the device, a stylus (32) removably disposed within the outer shell (16), a large memory storage device (40) disposed within the outer shell (16) and comprising an encryption key (46), a short term memory (42) disposed within the outer shell (16), a communications port (50) disposed within the outer shell (16) wherein at least a portion of the communications port (50) is accessible through the outer shell (16), a processing unit (44) disposed within the outer shell (16) and operatively in communication with the large memory storage device (40), the short term memory device (42), the communications port (50), the touchscreen 22, and the display (20); and access and manipulation software (200) executable by the processing unit (44) capable of accepting input from the touchscreen (22) and the communications port (50) and outputting formatted content to the display (20); the method comprising:

- a. selectively retrieving encrypted content stored in the large memory storage device (40);
- b. decrypting the selectively retrieved content using the encryption key (46);
- c. displaying the decrypted content on the display (20);
- d. accepting persistent annotations to be associated with the content displayed on the display, the annotations comprising user modifiable attributes usable by the access and manipulation software (200) to create, store, retrieve, modify, and delete the annotations, the annotations further comprising:

- i. sticky annotations permanently associated with a word or group of words in the content being currently displayed; and
 - ii. overlay annotations not permanently associated with a word or group of words in the content being displayed; and
- e. displaying persistent annotations associated with the content when a portion of the content with which the persistent annotations are associated is displayed, the display being consistent with the user manipulatable attributes of the annotation.
30. The method of claim 29, further comprising:
- f. accepting input from the user; and
 - g. changing at least one annotation attribute using the input.
31. The method of claim 29 further comprising:
- f. establishing a connection to a data communications network;
 - g. establishing a link via the data communications network to a content provider (110);
 - h. providing the content provider (110) with the encryption key (46);
 - i. notifying the content provider (110) of at least one content to be retrieved;
 - j. encrypting the content to be provided at the content provider (110) using the encryption key (46) before transmitting the content from the content provider (110) to the reader device (10); and
 - k. storing the encrypted content in the large memory storage device (40).

32. The method of claim 29 further comprising accepting input to associate a bookmark with a portion of content selected by the user, the bookmark comprising user manipulatable attributes.

33. The method of claim 29 further comprising:

- f. allowing the user to create user defined search categories;
- g. allowing the user to associate portions of content, entire content, and annotations with one or more of the predefined and/or the user defined search categories;
- h. accepting user input signifying an item for searching;
- i. accepting user input signifying a method to be used for searching;
- j. accepting user input designating at least one of the user defined or the predefined search category in which to search for the item;
- k. searching for the item in the user designated search categories.

34. The method of claim 33 wherein the searching method is selected from the set of searching methods consisting of keyword searches, phrase searches, related topic searches, and combinations thereof.

35. A method of annotation of electronic content comprising text, graphics, video, and audio and combinations thereof, the content displayable by an electronic display device (10) comprising an input device, the method comprising:

- a. accepting input from the input device to create at least one annotation, the annotations comprising:
 - i. sticky annotations permanently associated with a word or group of words in content being currently displayed; and

- ii. overlay annotations not permanently associated with a word or group of words in the content being displayed; and
- b. setting attributes for the annotation from a predetermined set of attributes, the attributes comprising persistence attributes for the annotation and association attributes for the annotation;
- c. displaying a desired portion of the content;
- d. selecting at least a portion of the displayed content;
- e. setting at least one persistence attribute for the annotation to associate the annotation with the selected portion of the content for annotations to be associated with the selected portion of the content; and
- f. storing the annotation.

36. The method of claim 35 further comprising allowing a user to create a hyperlink associated with content and with a separate file, webpage, or content page.

37. The method of claim 35 wherein the stored annotations may be selectively uploaded to a remote device.

38. The method of claim 35, further comprising allowing a user having authoring privileges to manipulate predetermined portions of content, thereby creating a new revision of the content.

39. The method of claim 35, further comprising allowing the user to collaboratively share uploaded annotations with other users.

40. A method of annotating electronic content comprising text, graphics, video, and audio and combinations thereof present in an electronic content reader device (10), comprising:

- a. displaying a desired portion of the content;
- b. selecting a desired portion of the displayed portion of the content;
- c. associating the selected portion with an annotation identifier;
- d. setting at least one attribute of the annotation identifier;
- e. copying the selected portion of the content; and
- f. converting the copied selected content into a bitmap format before permitting uploading of the selected content.

41. The method of claim 40 wherein the converted selected content is copied to a file.

42. The method of claim 40 wherein the converted selected content may be selectively uploaded to a remote device.

43. The method of claim 40 may be further manipulated to create a tailored study guide.

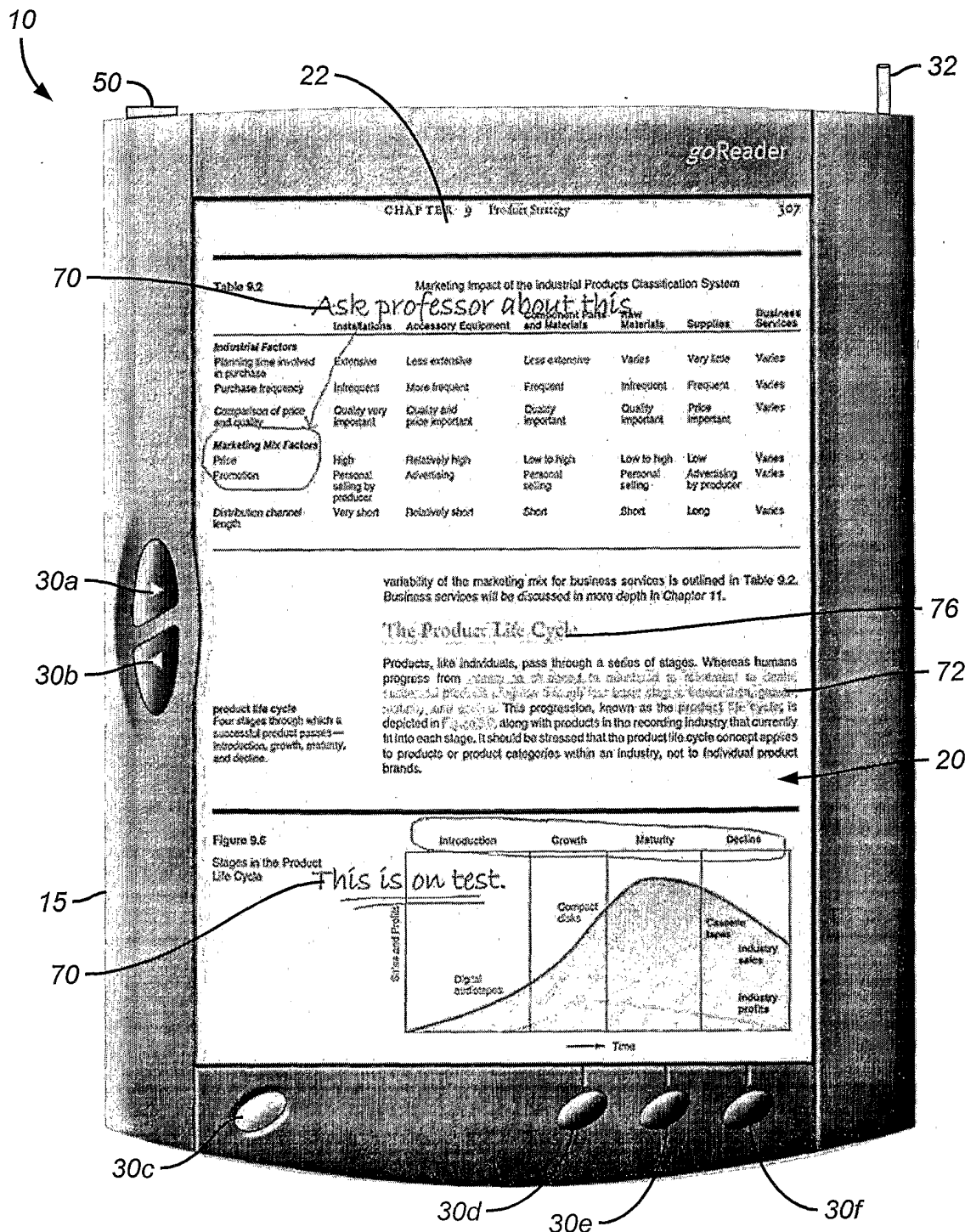


FIG. 1

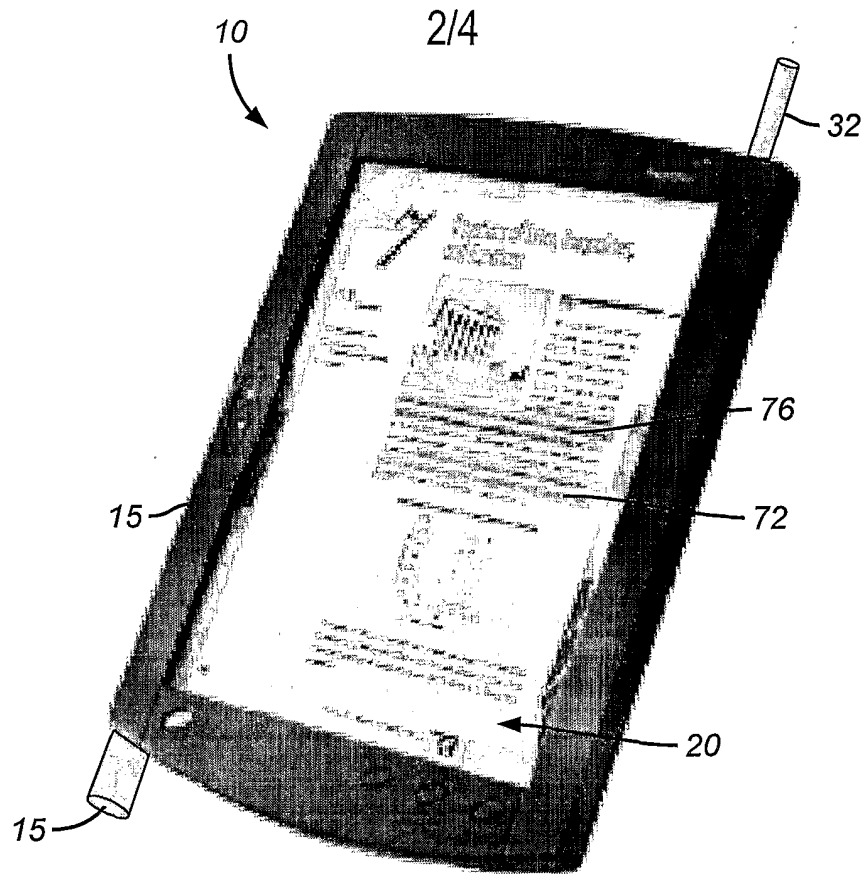


FIG. 2

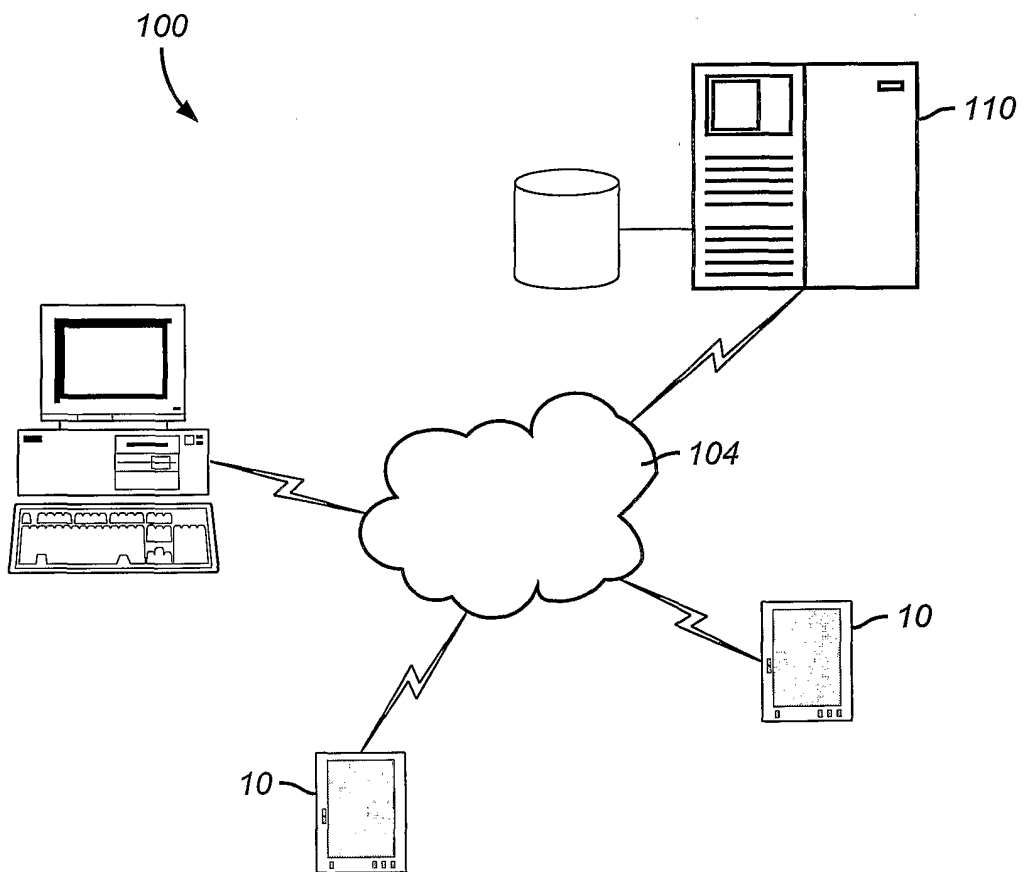


FIG. 3

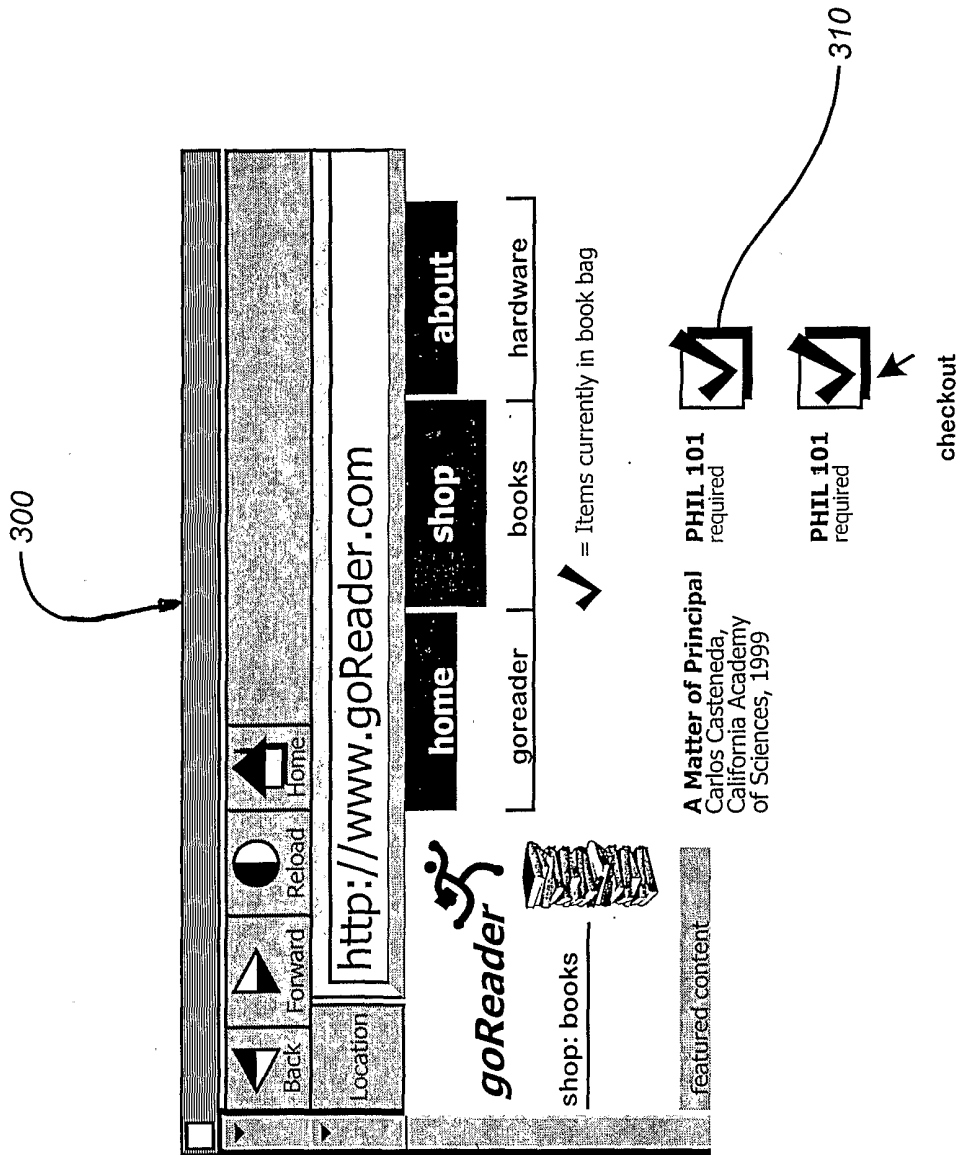


FIG. 4

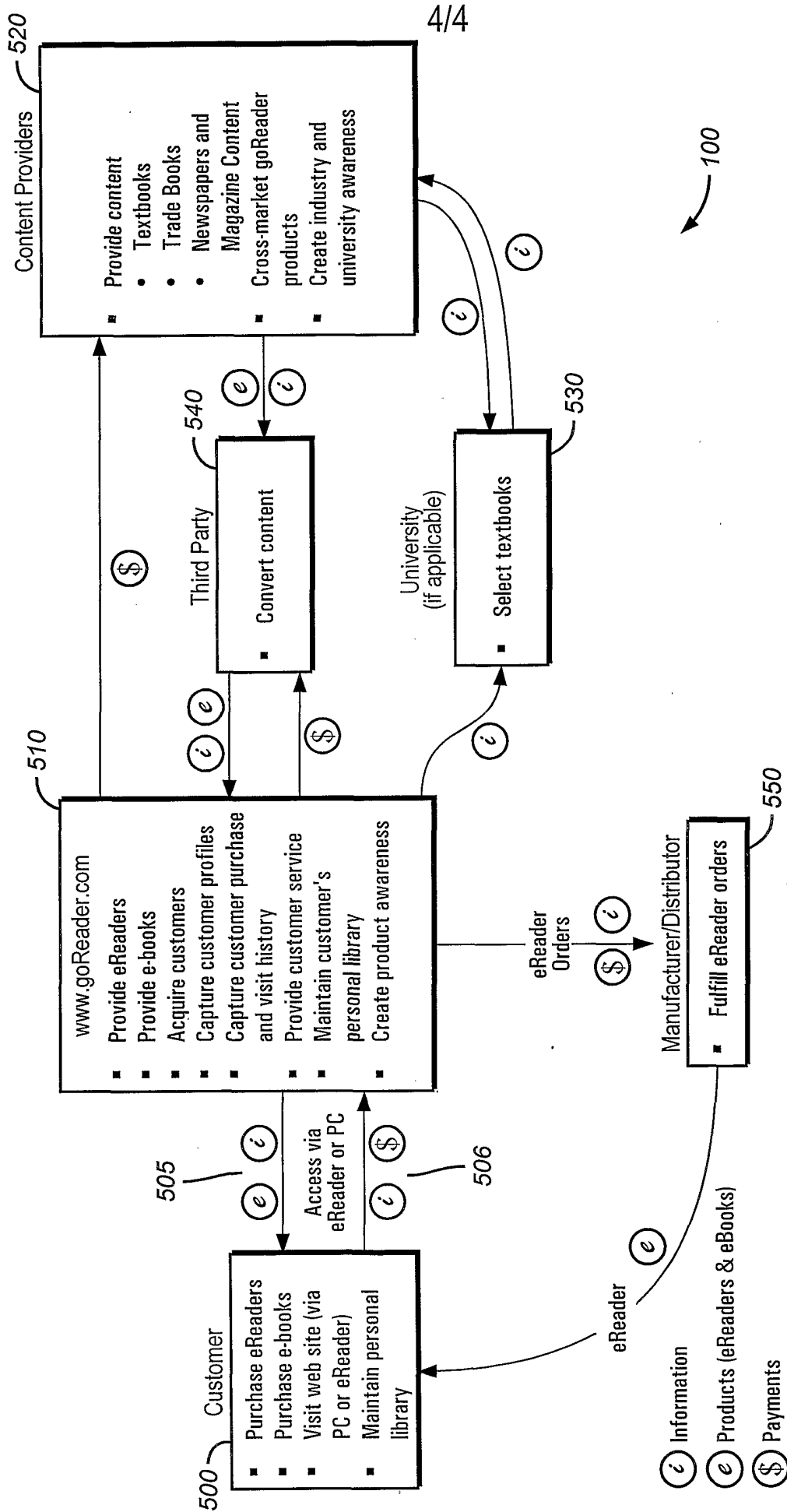


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/17134

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : G06F 17/21 US CL : 707/501, 512, 526 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 707/501, 512, 526 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WEST Database search terms: electronic book, ebook, annotation, PDA		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,761,681 A (HUFFMAN et al) 02 June 1998, all.	1-43
A	US 5,761,485 A (MUNYAN) 02 June 1998, all.	1-43
A, P	US 6,195,667 B1 (DUGA et al) 27 February 2001, all.	1-43
A	US 5,663,748 A (HUFFMAN et al) 02 September 1997, all.	1-43
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 19 JULY 2001	Date of mailing of the international search report 22 AUG 2001	
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer STEPHEN HO <i>James R. Matthews</i> Telephone No. (703) 305-3900	