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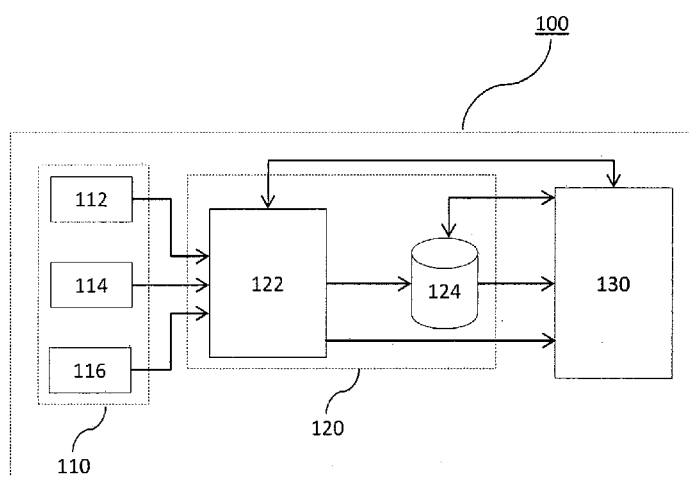


Fig. 1

(57) Abstract: A method and an apparatus for processing at least one set of source data from a source portion. The source portion can be associated with a reading material source having identification tags which can be included in the at least one set of source data. The method includes receiving at least one set of source data and processing the received set of source data in a manner so as to extract identification tags therefrom. The method further includes producing at least one of a set of code data and a set of graphic data based on the extracted identification tags. The method yet further includes processing at least one of the set of code data and the set of graphic data in a manner so as to produce at least one set of processed data.

A METHOD, SYSTEM AND APPARATUS FOR EFFICIENT DISPLAY AND BROWSING OF E-BOOKS**Field Of Invention**

The present disclosure generally relates to information storage, processing and display. More particularly, various embodiments of the disclosure relate to a system, a processing apparatus and a processing method suitable for digitally rendering and displaying reading materials.

Background

Various advances in technology have given rise to advancement in information storage and display techniques. For example, reading materials in general, such as books or magazines, can be rendered into electronic form from their physical form due to various advances in digital processing techniques.

An electronic form of, for example, a book is generally known as an electronic book (e-book). A reading device such as an e-book reader is usually required to store and display the e-book.

As can be appreciated, by rendering reading materials from physical form into electronic form, storage constraint in association with storing the reading materials can be mitigated. Therefore, as a collection or a library of reading materials can be stored and displayed as e-books in an e-book reader, the reading materials can be efficiently stored and displayed.

Examples of conventional information storage and display techniques associated with storage and display of e-books in an e-book reader include selection of an e-book out of a collection of e-books via an attribute of the e-book, such as its title or author. Conventionally, at least one or more attributes of each e-book in the collection of e-books are listed as a listed display via the e-book reader. Based on the listed display, a selection can be made.

Further examples include the display of an e-book having a front plane which is replicated from the front cover of its corresponding reading material in physical form. In this regard, selection of an e-book can be a front plane based selection.

Yet further examples include a slanted and fanning arrangement in which the front plane of each e-book from a collection of e-books is displayed.

Unfortunately conventional information and storage techniques fail to facilitate display and selection of an e-book from a collection of e-books in an e-book reader, in a suitably efficient manner.

Moreover, conventional information and storage techniques do not facilitate browsing of e-books in an e-book reader in a manner which is user friendly, thus detracting reading experience using an e-book reader.

It is therefore desirable to provide a solution to address at least one of the foregoing problems of conventional information storage and display techniques.

Summary of the Invention

In accordance with a first aspect of the disclosure, a method for processing at least one set of source data from a source portion is provided. The source portion can be associated with a reading material source having identification tags. The identification tags can be included in the at least one set of source data. The at least one set of source data can be processed in a manner suitable for displaying a set of display e-books at an output device.

The method includes receiving at least one set of source data and processing the received set of source data in a manner so as to extract identification tags therefrom. The method further includes producing at least one of a set of code data and a set of graphic data based on the extracted identification tags. The method yet further includes processing at least one of the set of code data and the set of graphic data in a manner so as to produce at least one set of processed data.

The at least one set of processed data can correspond to a constructed representation which is associable with a display spine associable with a display e-book within the set of display e-books at the output device.

In accordance with a second aspect of the disclosure, a processing apparatus which is operable with an output device suitable for displaying a set of display e-books and which is configurable to receive at least one set of source data from a source portion is provided. The source portion can be

associated with a reading material source having identification tags. The identification tags can be included in the at least one set of source data.

The processing apparatus includes a processing module which can be configured to receive and process the at least one set of source data in a manner so as to extract identification tags therefrom, thereby producing at least one of a set of code data and a set of graphic data.

The processing module can be further configured to process at least one of the set of code data and the set of graphic data in a manner so as to produce at least one set of processed data which is associable with a constructed graphic representation of a display spine of a display e-book within the set of display e-books.

The at least one set of processed data can be communicated to the output device as a corresponding least one set of output data. The at least one set of output data can be processed by the output device to produce display data associable with display of the display spine of a display e-book within the set of display e-book at the output device.

Brief Description of the Drawings

Embodiments of the disclosure are described hereinafter with reference to the following drawings, in which:

Fig. 1 shows a system which includes a a source portion, a processing apparatus and an output device, according to an embodiment of the disclosure;

Fig. 2a shows an example of a first input source of the source portion of Fig. 1, as an e-book source having a first set of e-books and a second set of e-books, according to an embodiment of the disclosure;

Fig. 2b shows, in further detail, an e-book from the first set and second set of e-books of Fig. 2a, according to an embodiment of the disclosure;

Fig. 2c shows an example of a second input source of the source portion of Fig. 1 as a converter source via which a book can be digitally translated from physical form to electronic form, according to an embodiment of the disclosure;

Fig. 2d shows, in further detail, the book of Fig. 2c which can be digitally translated from physical form to electronic form, according to an embodiment of the disclosure;

Fig. 3 shows, in further detail, the processing apparatus of Fig. 1 wherein the processing apparatus includes a processing module and a database module, according to an embodiment of the disclosure;

Fig. 4a shows, in further detail, the output device of Fig. 1 wherein the output device includes a display module having a library display portion, according to an embodiment of the disclosure;

Fig. 4b to Fig. 4d show, respectively, a first display configuration, second display configuration and a third display configuration for the library display portion of Fig. 4a, according to an embodiment of the disclosure; and

Fig. 5 shows a flow diagram for a processing method which can be implemented in association with the system of Fig. 1, according to an embodiment of the disclosure.

Detailed Description

Representative embodiments of the disclosure for addressing one or more of the foregoing problems associated with conventional information storage and display techniques are described hereinafter with reference to Fig. 1 to Fig. 5.

A system 100, which includes a source portion 110, a processing apparatus 120 and an output device 130, is shown in Fig. 1, in accordance with an embodiment of the disclosure. The source portion 110 is coupled to the processing apparatus 120 which is coupled to the output device 130. The output device 130 can optionally be referred to as a device.

The source portion 110 provides one or more sets of source data, each of which is receivable by the processing apparatus 120. The processing apparatus 120 processes a set of source data and produces a corresponding set of output data which is receivable by the output device 130. The set

of output data can be further processed and subsequently displayed as display data by the output device 130.

In one embodiment, as shown, the processing apparatus 120 is externally coupled to the output device 130. In another embodiment (not shown), at least a portion of the processing apparatus 120 is coupled within, and thus integrated with, the output device 130. In yet another embodiment (not shown), the processing apparatus 120 is coupled within, and thus integrated with, the output device 130.

The source portion 110 is preferably associable with at least one reading material source having identification tags and includes at least one input source which provides one or more sets of source data, each of which is receivable by the processing apparatus 120. Preferably, the identification tags are included in the one or more sets of source data.

For example, as shown, the source portion 110 includes a first input source 112, a second input source 114 and a third input source 116.

The first input source 112, which will be described in greater detail with respect to Fig. 2a and Fig. 2b, is, for example, an electronic book (e-book) source. Examples of the first input source 112 include a World Wide Web source, a virtual e-book store and a kiosk. Further examples of the first input source 112 include another device such as a handheld device, a portable computer or a workstation. The second input source 114, which will be described in greater detail with respect to Fig. 2c and Fig. 2d, can be a converter source in which, for example, a book in physical form is digitally translated into electronic form. The third input source 116 can be a physical book source.

The processing apparatus 120, in one embodiment, includes a processing module 122. In another embodiment, the processing apparatus 120 further includes a database module 124 which is coupled to the processing module 122. The processing module 122 can be configured, as will be discussed in greater detail with respect to Fig. 3, to receive one or more sets of source data from the source portion 110. The processing module 122 can be further configured, as will also be discussed in greater detail with respect to Fig. 3, to process the received one or more sets of source data to produce a corresponding one or more sets of processed data. The processing module 122 can yet be

further configured to communicate control signals to the database module 124 to control the database module 124.

Preferably, each set of processed data is received by the database module 124 and stored therein. Each set of processed data received and stored in the database module 124 can be referred to as stored data. The database module 124 can be configured to categorize stored data in a manner, which will be discussed in greater detail with respect to Fig. 3, to produce categorized data. Either one or both of the stored data and the categorized data can be communicated as one or more sets of output data to the output device 130 from the processing apparatus 120 via the database module 124.

Alternatively, the one or more sets of processed data can be communicated as a corresponding one or more sets of output data to the output device 130 from the processing apparatus 120 via the processing module 122.

The output device 130, which will be discussed in further detail with respect to Fig. 4a to Fig. 4d, can be, for example, an e-book reader which is configured and operable to further process at least one set of output data from the processing apparatus 120. The output device 130 can produce display data based on the one or more sets of output data received from the processing apparatus 120.

The output device 130 can be further configured to communicate control signals. The control signals can be used to control the processing apparatus 120. More specifically, the output device 130 can be further configured to communicate control signals to one or both of the processing module 122 and the database module 124, thereby controlling at least one, or both, thereof.

The control signals can also be used for selection in association with the display data, as will be described hereinafter.

Depending on, for example, whether the output device 130 receives one set of output data or more than one set of output data, the display data can be a visual representation of either a book or a collection of books, respectively. More specifically, the display data can be a display of either a display e-book or a collection of display e-books. Thus each set of output data can correspond to a display e-book.

As will be illustrated in Fig. 4b to Fig. 4d, the display e-book or each display e-book within the collection of display e-books can include a display front cover and a display rear cover. The display e-book or each display e-book within the collection of display e-books can further include a display spine. Additionally, the display e-book or each display e-book within the collection of display e-books can include viewing content.

The display spine can be configured to include one or more characteristic indications, each of which indicates an attribute of the display e-book. Examples of an attribute of a display e-book include genre, author, language of publication, date of publication, country of publication, edition and publisher.

The characteristic indications can be derived from at least one set of output data from the processing apparatus 120. The one or more characteristic indications included in each display spine facilitate browsing and selection based on a corresponding one or more preferred attributes of a display e-book.

For example, the output device 130 is operable to communicate control signals indicating one or more preferred attributes of a display e-book, so as to make a selection from the collection of display e-books. Control signals can thus be communicated from the output device 130 to facilitate a selection based on the display spine of each display e-book from the collection of display e-books.

The output device 130 can yet be further configured to display viewing content of a display e-book thereupon its selection.

As mentioned earlier, conventional information storage and display techniques include associating at least one or more attributes of each e-book in a collection of e-books to a listed display, to facilitate selection of an e-book. However, a listed display may be rendered cumbersome and verbose as an increasing number of attributes of each e-book become associated to the listed display, thus detracting browsing experience and adversely affecting selection efficiency.

Therefore, by configuring the display spine of each display e-book to include one or more characteristic indications, a listed display via which attributes of an e-book are associated becomes unnecessary. Browsing experience and selection efficiency can thus be improved.

In addition, as mentioned earlier, selection of an e-book can conventionally be a front plane based selection. However, as there is a need to display the front plane of an e-book, more display space is required to display the collection of e-books on an e-book reader. Thus efficiency associated with usage of display space is adversely affected.

Therefore, by configuring the display spine of each e-book to include one or more characteristic indications, the display of the front plane becomes optional. Improvement in efficiency associated with display of the collection of display e-books at the output device 130 can thus be facilitated. Particularly, since each display spine suffices in facilitating browsing and selection, the display of one or both of the display front and display rear covers is optional.

Furthermore, as mentioned earlier, conventional information storage and display techniques include displaying the front plane of each e-book in the collection of e-books in a slanted and fanning arrangement, which will be further illustrated with reference to Fig. 2a. Similar to the foregoing in relation to conventional front plane based selection, efficiency associated with usage of display space is adversely affected.

Thus by configuring the display spine of each display e-book to include one or more characteristic indications, improvement in efficiency associated with display of the collection of display e-books at the output device 130 can be facilitated, as previously discussed in relation to conventional front plane based selection.

Referring to Fig. 2a and Fig. 2b, the first input source 112 is a reading material source such as an e-book source.

As shown in Fig. 2a, the first input source 112 can be a virtual e-book store which is accessible, using a webpage browser 200 via World Wide Web, as a website 210. The website 210 includes one or more selection categories, each of which includes one or more e-books available for selection. For example, the website 210 includes a first selection category 212 and a second selection category 214.

A first set of e-books 216 and a second set of e-books 218, each set of which is displayed in a slanted and fanning arrangement 217, are included in the first and second selection categories 212/214 respectively.

As shown in Fig. 2b, each e-book 219 within the first and second set of e-books 216/218 can have a front plane 219a and a rear plane 219b opposing the front plane 219a, and can include e-book data unique to itself. The e-book data can include e-identification data 219c. The e-book data can further include e-cover data 219d. Each of the e-identification data 219c and the e-cover data 219d can be associated with the aforementioned identification tags of the reading material source.

Examples of the e-identification data 219c include a Cataloguing in Publication (CIP) data and an International Standard Book Number (ISBN). Other examples of include author or title of the e-book. Thus the e-identification data 219c can be associated with the aforementioned one or more attributes of an e-book.

The e-cover data 219d can, for example, be a cover art included in either one or both of the front and rear plane 219a/219b of the e-book 219. The cover art can be a graphic art design for the purposes of enhancing the aesthetic value of the e-book 219.

The e-book data of the e-book 219 can be graphically rendered on one or both of the front and rear planes 219a/219b of the e-book 219. For example, one or both of the e-identification data 219c and the e-cover data 219c can be graphically rendered on the front plane 219a of the e-book 219.

Various programming languages such as Hyper Text Markup Language (HTML) can be used for coding to produce a HTML code such that the e-identification data 219c and the e-cover data 219d are graphically rendered on the front plane 219a of the e-book 219. For example, the HTML code can include one or more HTML tags, otherwise known as Meta tags, descriptive of the identification tags associated with the e-identification data 219c.

The HTML code can also include programming codes representative of the e-cover data 219d. The HTML code can further include sub-functions representative of the e-cover data 219d. The HTML code can yet further include embedded graphic files, in standard file formats such as Joint

Photographic Experts Group (JPEG) format or Graphics Interchange Format (GIF), representative of the e-cover data 219d.

The e-book data of the e-book 219 can be communicated as one or more sets of source data from the source portion 110 to the processing apparatus 120.

Referring to Fig. 2c and Fig. 2d, an example of the second input source 114 as a converter source is illustrated.

As shown in Fig. 2c, the second input source 114 can be a scanner 300 which digitally translates a book 310 in physical form to electronic form.

As shown in Fig. 2d, the book 310 can have a front book cover 310a and a rear book cover 310b opposing the front book cover 310a, and can include book data unique to itself. The book data can include book identification data 310c and book cover data 310d. In this regard, the foregoing discussion in relation to the e-book data of the e-book 219 of Fig. 2b applies analogously.

For example, the book 310 is scanned such that a digital output which is representative of its front book cover 310a is produced by the scanner 300. The digital output can, for example, be a portable document file (PDF) which includes the book identification and book cover data 310c/310d.

The digital output can be further processed in a manner to produce a processed digital output which includes an identification tag associated with the book 310, such as the ISBN. The digital output can be processed using, for example, optical character recognition (OCR) based techniques.

In one embodiment, the digital output is processed at the source portion 110. The processed digital output is preferably communicated as a set of source data from the source portion 110 to the processing apparatus 120. Alternatively, the processed digital output is communicated as more than one set of source data from the source portion 110 to the processing apparatus 120.

More specifically, the processing module 122 receives one or more sets of source data from the source portion 110. Thus the processing module 122 processes the digital output.

The third input source 116 is a physical book source which is analogous to the book 310 described with reference to Fig. 2c and Fig. 2d. In this respect, the foregoing discussion in relation to the book data of the book 310 applies analogously.

Referring to Fig. 3, the processing apparatus 120 of the system 100 illustrated in Fig. 1, is shown in greater detail. As mentioned earlier, the processing apparatus 120 receives one or more sets of source data from the source portion 110. More specifically, one or more sets of source data can be received by the processing module 122.

In one embodiment, the processing module 122 includes a code processor 412 which is coupled to the source portion 110 and a first graphics processor 414 which coupled to the code processor 412. More specifically, the code processor 412 couples the source portion 110 and the first graphics processor 414.

In another embodiment, the processing module 122 includes a second graphics processor 416 which coupled to the first graphics processor 414 and which is coupled to the source portion 110. More specifically, the second graphics processor 416 couples the source portion 110 and the first graphics processor 414.

In yet another embodiment, the processing module 122 includes a code processor 412, a second graphics processor 416, both of which are coupled to the source portion 110, and a first graphics processor 414. The code processor 412 is further coupled to the first graphics processor 414. The second graphics processor 416 is further coupled to at least one of the code processor 412 and the first graphics processor 414.

In yet a further embodiment, the processing module 122 further includes an image capture portion 418 which is coupled to the second graphics processor 416 and which is coupled to the source portion 110. More specifically, the image capture portion 418 couples the source portion 110 and the second graphics processor 416.

Examples of the code processor 412 include microcontrollers such as Motorola based microcontrollers and NEC based microcontrollers. Other examples of the code processor 412

include Digital Signal Processing (DSP) integrated circuits (ICs) such as Texas Instruments based DSP ICs and NEC based DSP ICs.

Examples of the first and second graphics processors 414/416 include graphic processors such as AMD Radeon based graphic processors and NVIDIA GeForce based graphic processors.

Examples of the image capture portion 418 include digital image capturing devices such as web cameras. Examples of web cameras include "Live! Cam series" and "Live! Cam series for notebooks," both of which are available from Creative technology Ltd.

In one embodiment, the code processor 412 receives at least a set of source data from one or both of the first and second input portions 112/114. The code processor 412 processes a received set of source data to produce a corresponding set of code data. The first graphics processor 414 receives and processes one or more sets of code data to produce a corresponding one or more sets of processed data.

In one example, the code processor 412 receives the HTML code from the first input portion 112 as a first set of source data, and processes the first set of source data in a manner so as to extract Meta-tags relevant the e-identification data 219c, such as the title, of the e-book 219. The extracted Meta-tags can subsequently be communicated as a first set of code data to the first graphics processor 414. The first graphics processor 414 processes the first set of code data to produce a first set of processed data.

In another example, the code processor 412 receives the processed digital output from the second input portion 116 as a second set of source data, and processes the second set of source data in a manner analogous to the earlier described extraction of Meta-tags, so as to extract identification data 310c, such as the ISBN, of the book 310. The extracted Meta-tags can subsequently be communicated as a second set of code data to the first graphics processor 414. The first graphics processor 414 processes the second set of code data to produce a second set of processed data.

In another embodiment, at least a set of source data from one or both of the first and second input portions 112/114 is received by the second graphics processor 416. The second graphics processor 416 processes a received set of source data to produce a corresponding set of graphic data which

can be communicated to either one or both of the code processor 412 and the first graphics processor 414 for further processing. The code processor 412 processes one or more sets of graphic data to produce a corresponding one or more sets of code data. The first graphics processor 414 processes one or more sets of graphic data to produce a corresponding one or more sets of processed data.

In one example, the second graphics processor 416 receives the first set of source data, and processes it in a manner so as to extract embedded graphic files, such as JPEG or GIF formatted graphic files, relevant to the e-cover data 219d of the e-book 219. The extracted embedded graphic files can subsequently be communicated as a corresponding set of graphic data to either one or both of the code processor 412 and the first graphics processor 414 for further processing to produce a corresponding set of code data and processed data respectively.

In another example, the second graphics processor 416 receives and processes the second set of source data. The second set of source data can be processed by, for example, using OCR processing techniques or data mining techniques. In addition, the second set of source data can be further processed by, for example, association or assignment of meta-tags to portions thereto, after processing by the aforementioned OCR processing or data mining. The second graphics processor 416 processes the second set of source data to produce a corresponding set of graphic data which can be communicated to the code processor 412 for further processing so as to extract one or more of the identification tags associated with the identification data 310c of the book 310.

In yet another embodiment, source data from the third input portion 116 can be received by the image capture portion 418 as a third set of source data. The image capture portion 418 processes the third set of source data to produce a corresponding set of image data which can be received by the second graphics processor 416. The second graphics processor 416 processes a set of image data to produce a corresponding set of graphic data which can be received by either one or both of the code processor 412 and the first graphics processor 414 for further processing to produce a corresponding set of code data and processed data respectively. As mentioned earlier, the third input portion 116 is a physical book source which is analogous to the book 310 of Fig. 2d.

For example, the image capture portion 418 captures an image of the front cover 310a of the book 310. The image of the front cover 310a of the book 310 can be captured and communicated from

the image capture portion 418 to the second graphics processor 416 as a set of image data which can be associated with graphic file formats such as JPEG or GIF. The set of image data can be processed in the second graphics processor 416 to produce a corresponding set of graphic data, in a manner analogous to the second set of source data. In this regard, the foregoing discussion in relation to the second input portion 116 and the second graphics processor 416 analogously applies.

Thus, the first graphics processor 414, in one embodiment, receives and processes one or more sets of code data to produce a corresponding one or more sets of processed data. In another embodiment, the first graphics processor 414 receives and processes one or more sets of graphic data to produce a corresponding one or more sets of processed data. In yet another embodiment, the first graphics processor 414 receives and processes one or more sets of code data and one or more sets of graphic data to produce a corresponding one or more sets of processed data.

Additionally, the first graphics processor 414 can be configured to communicate control signals to the database module 124 to control the database module 124 in a manner which will be described in further detail later.

A set of processed data can, in one embodiment, be a constructed representation which is associated with the displayed spine at the output device 130.

More specifically, one or both of a set of code data and a set of graphic data can be processed at the first graphics processor 414, in a manner so as to provide a constructed representation such that, when the corresponding set of processed data is communicated as a set of corresponding output data to the output device 130 and eventually displayed as display data thereat, the aforementioned one or more characteristic indications are graphically represented on the display spine.

In one example, one or both of a set of code data and a set of graphic data can be processed in a manner such that the identification tags associated with the e-identification data 219c corresponding to, for example, the author and title, are replicated in the constructed representation. Thus, at the output device 130, the replicated author and title are graphically represented as characteristic indications on the display spine.

In another example, each e-identification data 219c included in one or both of a set of code data and a set of graphic data can be processed such that at least a color code is assignable to each of the identification tags associated with the e-identification data 219c. For example, a set of code data includes identification tags associated with the e-identification data 219c which include the author and title. Thus the set of code data can be processed in a manner such that a corresponding color code is assigned to each of the author and the title. Therefore, at the output device 130, the color code for each of the identification tags associated with the e-identification data 219c can be graphically represented as characteristic indications on the display spine.

A set of processed data can, in another embodiment, be a constructed representation associated with the display spine, in conjunction with one or both of the display front cover and display rear cover, at the output device 130.

More specifically, one or both of a set of code data and a set of graphic data can be processed at the first graphics processor 414, in a manner so as to provide a corresponding set of processed data associated with a constructed representation in which one or both of the e-book data and book data can be graphically replicated on one or both of the display front and rear covers in addition to the aforementioned one or more characteristic indications being graphically represented on the display spine.

Even more specifically, one or both of a set of code data and a set of graphic data can be processed at the first graphics processor 414, in a manner so as to provide a corresponding set of processed data associated with a constructed representation in which one or both of the display front and rear covers cohere with the display spine. Thus when the corresponding set of processed data is communicated as a corresponding set of output data to the output device 130 and displayed as display data thereat, one or both of the display front and rear covers are graphically represented cohesively with the display spine.

By providing a constructed representation in which one or both of the display front and rear covers are graphically represented cohesively with the display spine, a faithful reproduction, at the output device 130, of one or both of the book 310 of Fig. 2c/Fig. 2d and physical book source of the third input source 116 can be provided. A realistic browsing experience can thus be provided, if desired.

The database module 124 can be configured to receive one or more sets of processed data from the processing module 122. More specifically, the database module 124 is coupled to the first graphics processor 414 via which one or more sets processed data can be communicated. Even more specifically, the database module 124 is configured to store at least one set of processed data to produce a corresponding at least one set of stored data. The database module 124 can be further configured to store and process one or more sets of processed data to produce a corresponding one or more sets of categorized data.

In one embodiment, the database module 124 can be configured to receive and store the one or more sets of processed data in a sequential manner to produce a corresponding one or more sets of stored data. For example, database module 124 receives and stores the one or more sets of processed data in a conventional First-In-First-Out (FIFO) manner.

In another embodiment, the database module 124 can be configured to receive and store the one or more sets of processed data in a cataloguing manner to produce a corresponding one or more sets of categorized data.

In one example, two or more sets of processed data which include identical characteristic indications can be categorized as a category group to produce a set of categorized data. In a more specific example, two or more sets of processed data which include identical characteristic indications graphically represented by identical color codes can be categorized as a category group to produce a set of categorized data.

In yet another embodiment, the database module 124 can be configured to receive and store one or more sets of processed data in a customized manner to produce a corresponding one or more sets of categorized data. As mentioned earlier, either one or both of the processing module 122 and the output device 130 can be configured to communicate control signals to the database module 124. The control signals can be used to customize the manner in which the one or more sets of processed data are stored in the database module 124. Storage of the one or more sets of processed data can be customized by cataloguing two or more sets of processed data in a category group based, for example, on matching of preferred characteristic indications to produce a set of categorized data. Matching of preferred characteristic indications can include matching number of identical preferred characteristic indications.

In an exemplary scenario, a first set of processed data, a second set of processed data and a third set of processed data are received by the database module 124. The first set of processed data includes three characteristic indications such as the author, the language of publication and the date of publication. The second set of processed data includes three characteristic indications such as the author, the language of publication and the country of publication. The third set of processed data includes three indications such as the ISBN, the genre and the author.

In one example, control signals are, in the above exemplary scenario, communicated to the database module 124, indicating that the author and the language of publication are preferred characteristic indications. The author of each of the first, second and third sets of processed data matches the author indicated by the control signals. The language of publication of each of the first and second sets of processed data matches the language of publication indicated by the control signals. Thus, as the first and second sets of processed data include both preferred characteristic indications indicated by the control signals, and the third set of processed data includes only one, the first and second sets of processed data are catalogued as a category group to produce a set of categorized data, with the exception of the third set of processed data.

In another example, control signals are, in the above exemplary scenario, communicated to the database module 124, indicating that the preferred characteristic indication can be one of author and the language of publication. Thus, all three of the first, second and third sets of processed data can be catalogued as a category group to produce a set of categorized data.

As mentioned earlier, one or more sets of processed data from the processing module 122 is preferably received and processed by the database module 124 to produce a corresponding one or more sets of output data based on, either one or both of, a corresponding one or more sets of stored data and a corresponding one or more sets of categorized data. One or more sets of output data can be communicated to the output device 130.

Alternatively, one or more sets of processed data from the processing module 122 can be communicated as a corresponding one or more sets of output data to the output device 130.

Thus, one or more sets of output data can be communicated from the processing apparatus 120, via either one or both of the processing module 122 and the database module 124, to the output device 130.

Referring to Fig. 4a to Fig. 4d, the output device 130 of the system 100 illustrated in Fig. 1, is shown in greater detail. As mentioned earlier, the output device 130 receives one or more sets of output data from the processing apparatus 120. The output device 130 can produce display data based on the one or more sets of output data received from the processing apparatus 120.

Referring to Fig. 4a, the output device 130 includes a display module 510 via which the display data can be displayed. The display module 510 can, for example be a liquid crystal display (LCD) screen or a touch screen having a screen dimension. The screen dimension can be associated with the aforementioned display space. In one embodiment, the display module 510 includes a library display portion 520. In another embodiment, the display module 510 further includes a graphic user interface (GUI) 530. In yet another embodiment, the display module 510 further includes a preview display portion 540.

The library display portion 520 can preferably be configured to display the display data in one or more display configurations.

In an exemplary event, a collection of display e-books is displayed as display data at the library display portion 520. The collection of display e-books includes a first display e-book, a second display e-book, a third display e-book, a fourth display e-book, a fifth display e-book and a sixth display e-book.

In one embodiment as shown in Fig. 4b, the library display portion 520 can be configured to display the display data in a first display configuration 550a in which the display spine of each display e-book is displayed. As shown, with reference to the above exemplary event, the first to sixth display e-books have corresponding first to sixth display spines 520a/520b/520c/520d/520e/520f which are displayed at the library display portion 520.

In another embodiment as shown in Fig. 4c, the library display portion 520 can be configured to display the display data in a second display configuration 550b in which a combination of the display

spine and at least one of the display front and rear covers of each display e-book is displayed. As shown, with reference to the above exemplary event, the first to sixth display e-books have corresponding first to sixth display spines 520a/520b/520c/520d/520e/520f which are displayed at the library display portion 520. In addition, the first and sixth display e-books have, respectively, a corresponding display rear cover 520g and a corresponding display front cover 520h, which are displayed at the library display portion 520.

In yet another embodiment, as shown in Fig. 4d, the library display portion 520 can be configured to display the display data in a third display configuration 550c based on a combination of the first and second display configurations 550a/550b.

By configuring the library display portion 520 to display the display data in any of the first to third display configuration 550a/550b/550c, browsing experience and selection efficiency can be improved. Additionally, efficiency associated with usage of display space can be improved.

For example, based on the first display configuration 550a, display of a collection of display e-books in the aforementioned slanted and fanning arrangement 217 in Fig. 2a is not unnecessary. As less display space is required to display a collection of display e-books using the first display configuration 550a compared to the slanted and fanning arrangement 217 in Fig. 2a, efficiency associated with usage of display space can be improved.

Moreover, referring to, for example the second display configuration 550b, a realistic browsing experience can optionally be provided in addition to improved browsing experience, selection efficiency and usage of display space.

The GUI 530 can, in one embodiment, be operated to communicate control signals which can be used to configure the library display portion 520 to display the display data in one or more display configurations.

The GUI 530 can, in another embodiment, be operated to communicate control signals to control the processing apparatus 120. More specifically, the GUI 530 can be operated to communicate control signals to one or both of the processing module 122 and the database module 124, thereby controlling at least one, or both, thereof.

The GUI 530 can, in yet another embodiment, be operated to communicate control signals to control the processing apparatus 120 and configure the library display portion 520.

In addition, upon selection of a display e-book, viewing content associated with the selected display e-book can be displayed.

In one embodiment, the preview display portion 540 is be used to display at least a portion of the viewing content of a display e-book upon selection thereof. In another embodiment, upon selection of a display e-book, at least a portion of the viewing content of the display e-book is displayed via the display module 510.

In accordance with another embodiment of the disclosure, a processing method 600, as shown in Fig. 5, can be implemented in association with the system 100.

In one embodiment, the processing method 600 includes receiving at least one set of source data 610, processing the received set of source data 620 and producing at least one of a set of code data and a set of graphic data 630. In another embodiment, the processing method 600 further includes at least one of storing and processing at least one set of processed data 640. In yet a further embodiment, the processing method further includes displaying at least one set of output data 650.

With regard to receiving at least one set of source data 610, one or more sets of source data can be communicated from the source portion 110 to the processing apparatus 120. More specifically, one or more sets of source data can be communicated from the source portion 110 to at least one of the code processor 412, the second graphics processor 416 and the image capture module 418.

With regard to processing the received set of source data 620, one or more sets of source data can be processed to produce either one or both of a corresponding one or more sets of code data and a corresponding one or more sets of graphic data.

In one embodiment, the code processor 412 processes one or more sets of source data to produce a corresponding one or more sets of code data. In another embodiment, the code processor 412, in combination with the second graphics processor 416, processes one or more sets of source data to

produce a corresponding one or more sets of code data. In yet another embodiment, the code processor 412, in combination with the second graphics processor 416 and the image capture module 418, processes one or more sets of source data to produce a corresponding one or more sets of code data. In yet a further embodiment, the second graphics processor 416, either alone or in combination with the image capture module 418, processes one or more sets of source data to produce a corresponding one or more sets of graphic data.

With regard to producing at least one of a set of code data and a set of graphic data 630, either one or both of at least one set of code data and at least one set of graphic data can be processed to produce a corresponding at least one set of processed data.

In one embodiment, the first graphics processor 414 processes of at least one set of code data to produce a corresponding at least one set of processed data. In another embodiment, the first graphics processor 414 processes of at least one set of graphic data to produce a corresponding at least one set of processed data. In yet another embodiment, the first graphics processor 414 processes at least one set of code data and at least one set of graphic data to produce a corresponding at least one set of processed data.

With regard to at least one of storing and processing at least one set of processed data 640, the database module 124 can be configured to receive and process one or more sets of processed data from the processing module 122.

In one embodiment, the database module 124 receives and processes one or more sets of processed data to produce a corresponding one or more sets of stored data. In another embodiment, the database module 124 receives and processes one or more sets of processed data to produce a corresponding one or more sets of categorized data.

The processing method 600 can be, optionally, completed with displaying at least one set of output data 650 wherein one or more sets of output data can be received from the processing apparatus 120 and processed to produce display data which can be displayed at the display module 510 of the output device 130.

In the foregoing manner, various embodiments of the disclosure are described for addressing at least one of the foregoing disadvantages. Such embodiments are intended to be encompassed by the following claims, and are not to be limited to specific forms or arrangements of parts so described and it will be apparent to one skilled in the art in view of this disclosure that numerous changes and/or modification can be made, which are also intended to be encompassed by the following claims.

Claims

1. A method for processing at least one set of source data from a source portion associable with a reading material source having identification tags, the identification tags being included in the at least one set of source data, the at least one set of source data being processed in a manner suitable for displaying a set of display e-books at an output device, the method comprising:
 - receiving at least one set of source data;
 - processing the received set of source data in a manner so as to extract identification tags therefrom;
 - producing at least one of a set of code data and a set of graphic data, based on the extracted identification tags;
 - processing at least one of the set of code data and the set of graphic data in a manner so as to produce at least one set of processed data,
 - wherein the at least one set of processed data corresponds to a constructed representation which is associable with a display spine associable with a display e-book within the set of display e-books at the output device.
2. The method as in claim 1 further comprising providing a processing apparatus via which the at least one set of source data is receivable.
3. The method as in claim 2 wherein the processing apparatus comprises a processing module having at least one of a code processor, a first graphics processor and a second graphics processor.
4. The method as in claim 3 wherein the received set of source data is processed by the processing module via at least one of the code processor and the second graphics processor.
5. The method as in claim 4 wherein the set of code data and the set of graphic data are produced via the code processor and the second graphics processor respectively.
6. The method as in claim 5 wherein at least one of the set of code data and the set of graphic data are further processed via the first graphics processor to produce the at least one set of processed data.

7. The method as in claim 1 further comprising storing the at least one set of processed data to produce a corresponding at least one set of stored data.
8. The method as in claim 1 further comprising receiving and processing the at least one set of processed data in a manner so as to produce at least one set of categorized data.
9. The method as in claim 8 wherein a database module is provided for receiving and processing the at least one set of processed data.
10. The method as in claim 1 further comprising displaying at least one set of output data, the at least one set of output data corresponding to the least one set of processed data.
11. The method as in claim 1 wherein the at least one set of processed data further corresponds to a constructed representation which is associable with at least one of a display front cover and a display rear cover associable with a display e-book within the set of display e-books at the output device.
12. The method as in claim 11 wherein the at least one set of processed data corresponds to a constructed representation in which at least one of the display front cover and the display rear cover substantially cohere with the display spine.
13. A processing apparatus which is operable with an output device suitable for displaying a set of display e-books and which is configurable to receive at least one set of source data from a source portion associable with a reading material source having identification tags, the identification tags being included in the at least one set of source data, the processing apparatus comprising:
 - a processing module being configurable to receive and process the at least one set of source data in a manner so as to extract identification tags therefrom, thereby producing at least one of a set of code data and a set of graphic data,
 - wherein the processing module is further configurable to process at least one of the set of code data and the set of graphic data in a manner so as to produce at least one set of processed data which is associable with a constructed graphic representation of a display spine of a display e-book within the set of display e-books, the at least one set of processed data being communicable to the output device as a corresponding at least one set of output data, the at least one set of output

data being processable by the output device to produce display data associable with display of the display spine of a display e-book within the set of display e-book at the output device.

14. The processing apparatus as in claim 13 wherein the processing module comprises at least one of:

a code processor;

a first graphics processor which is coupled to the code processor; and

a second graphics processor which is coupled to at least one of the code processor and the first graphics processor, at least one of the code processor and the second graphics processor being configurable to receive and process the at least one set of source data in a manner so as to extract identification tags therefrom, thereby producing at least one of the set of code data and the set of graphic data,

wherein the first graphic processor is configurable to receive and process at least one of the set of code data and the set of graphic data in a manner so as to produce the at least one set of processed data.

15. The processing apparatus as in claim 14 wherein the first graphic processor is further configurable to receive and process at least one of the set of code data and the set of graphic data in a manner so as to produce at least one set of processed data which is further associable with a constructed graphic representation of at least one of a display front cover and a display rear cover of a display e-book within the set of display e-books.

16. The processing apparatus as in claim 15 wherein the first graphic processor is configurable to process at least one of the set of code data and the set of graphic data in a manner so as to produce at least one set of processed data associated with a constructed representation in which at least one of the display front cover and the display rear cover substantially cohere with the display spine.

17. The processing apparatus as in claim 14 wherein the set of code data and the set of graphic data are produced via the code processor and the second graphics processor respectively.

18. The processing apparatus as in claim 14 further comprising an image capture portion coupled to the second graphics processor and the source portion,

wherein the image capture portion is configurable to receive and process the at least one set of source data from the source portion to produce at least one set of image data,

wherein the at least one set of image data is communicable from the image capture portion to the second graphics processor for further processing to produce at least one set of graphic data, and

wherein the at least one set of graphic data is communicable from the second graphics processor to at least one of the code processor and the first graphics processor for further processing to respectively produce the set of code data and the set of graphic data.

19. The processing apparatus as in claim 13 further comprising a database module which is coupled to the processing module,

wherein the database module is configurable to receive and store the at least one set of processed data, and

wherein the database module is configurable to process stored processed data in a manner so as to produce at least one set of categorized data.

20. A device suitable for at least one of storing and displaying display data associable with a set of e-books, the device configurable for receiving at least one set source data from a source portion which is associable with a reading material source having identification tags, the identification tags being included in the at least one set of source data, the device comprising:

a processing apparatus which is configurable to receive at least one set of source data from the source portion, the processing apparatus having at least one of a code processor, a first graphic processor which is coupled to the code processor and a second graphics processor which is coupled to at least one of the code processor and the first graphics processor, at least one of the code processor and the second graphics processor being configurable to receive and process the at least one set of source data in a manner so as to extract identification tags therefrom, thereby producing at least one of a set of code data and a set of graphic data,

wherein the first graphic processor is configured to receive and process at least one of the set of code data and the set of graphic data, in a manner so as to produce at least one set of processed data which is associable with a constructed graphic representation of a display spine of a display e-book within the set of display e-books, the at least one set of processed data being communicable to the output device as a corresponding at least one set of output data, the at least one set of output data being processable by the output device to produce display data associable

with display of the display spine of a display e-book within the set of display e-book at the output device.

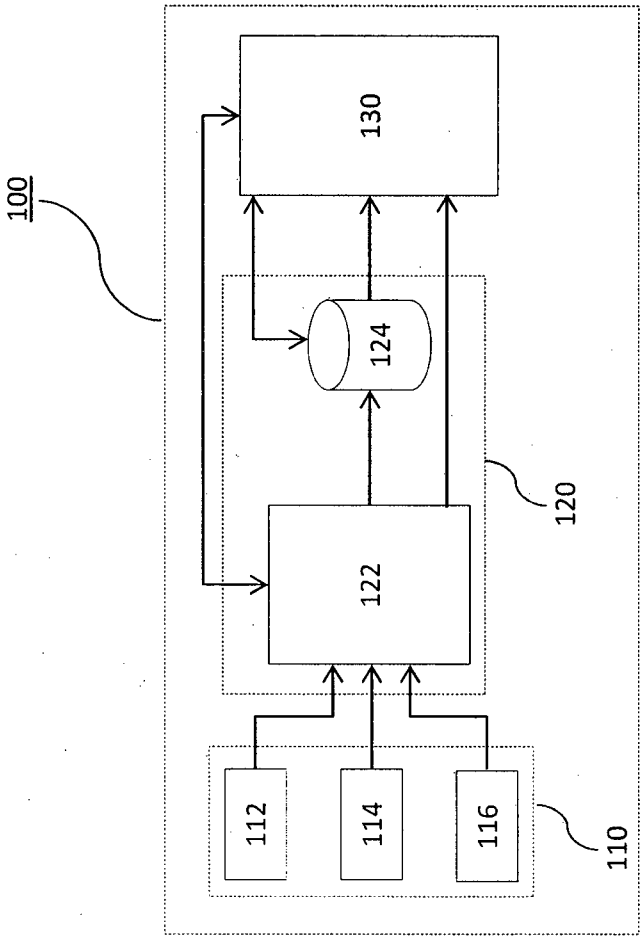


Fig. 1

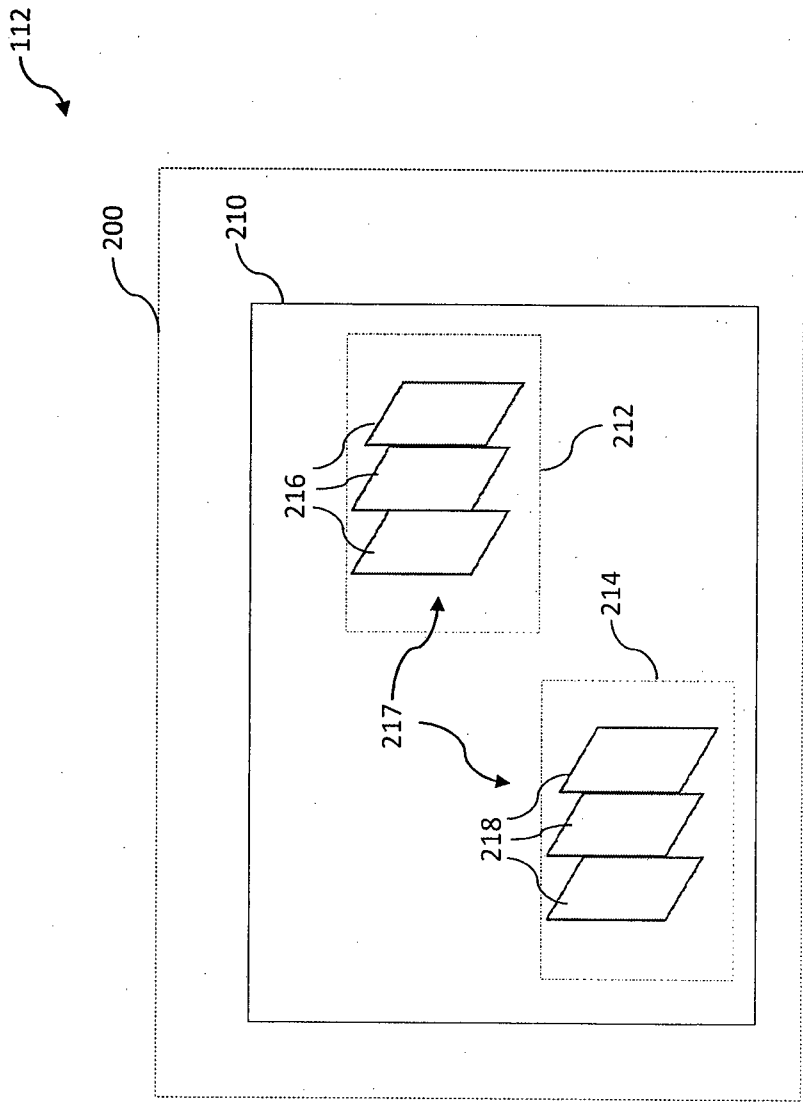


Fig. 2a

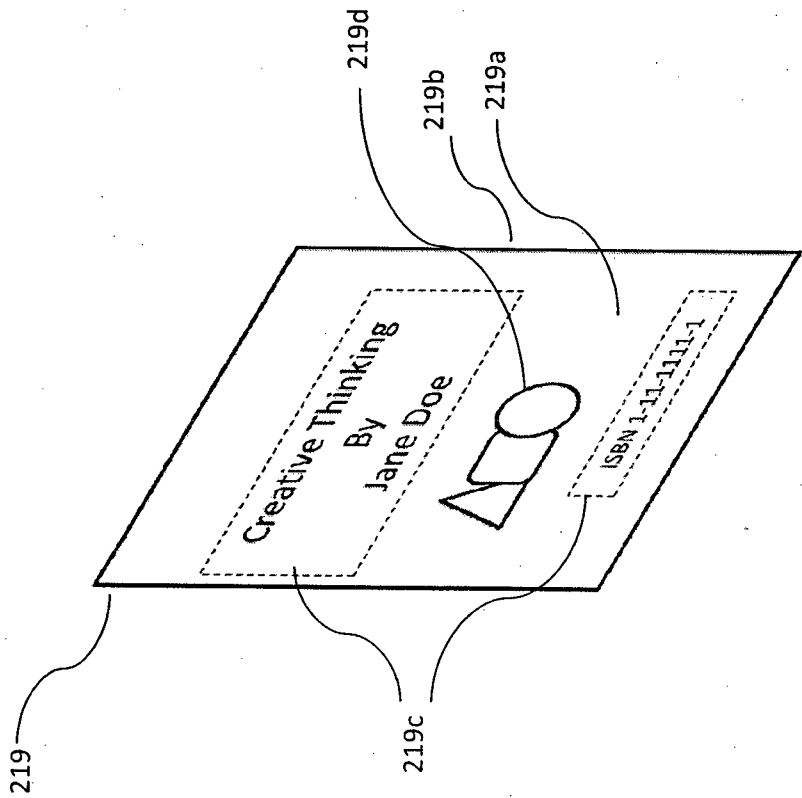


Fig. 2b

4/9

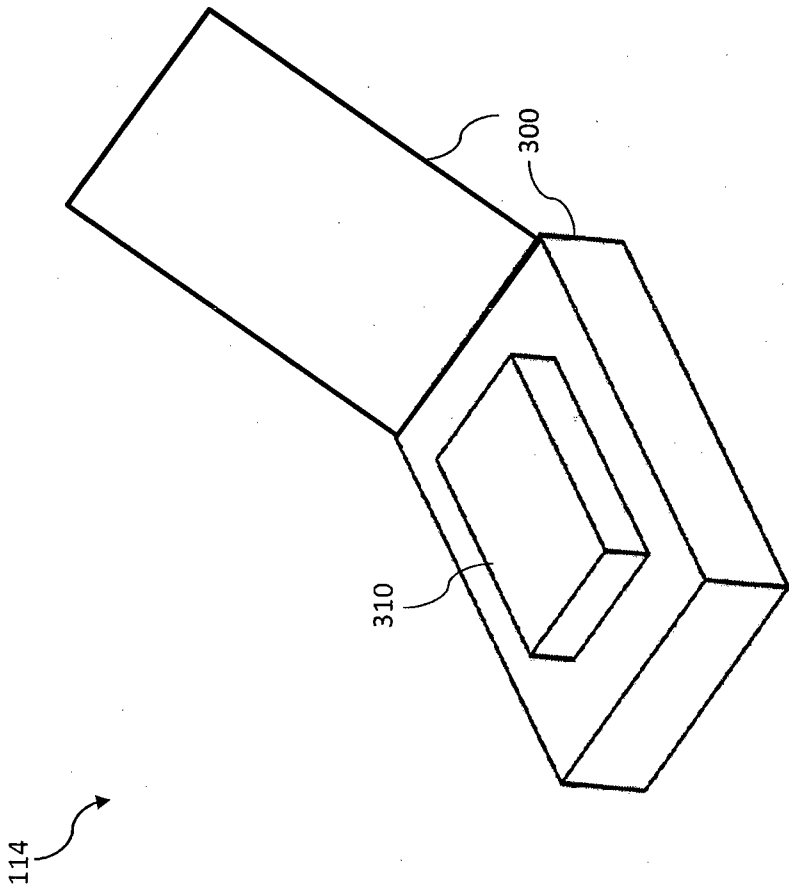


Fig. 2c

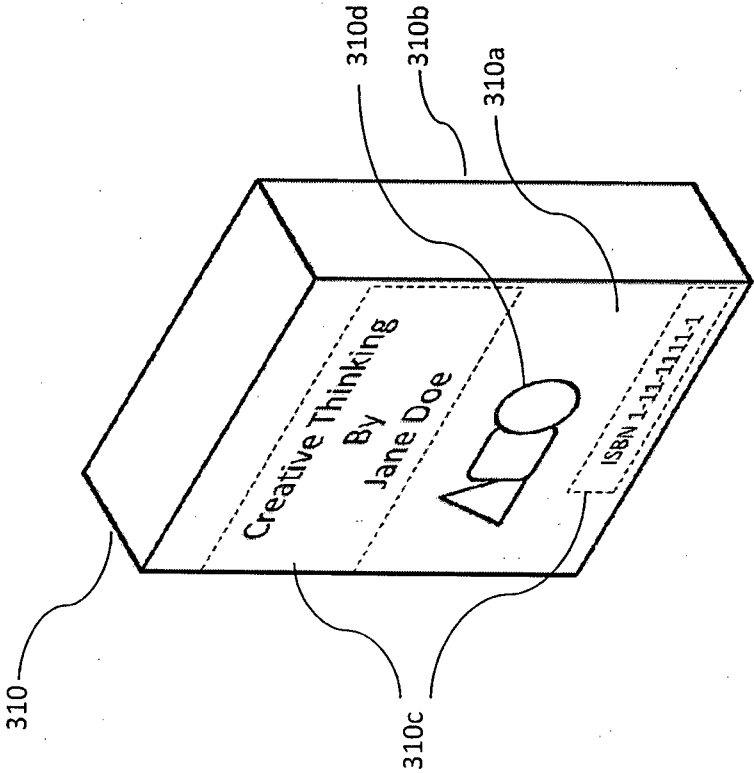


Fig. 2d

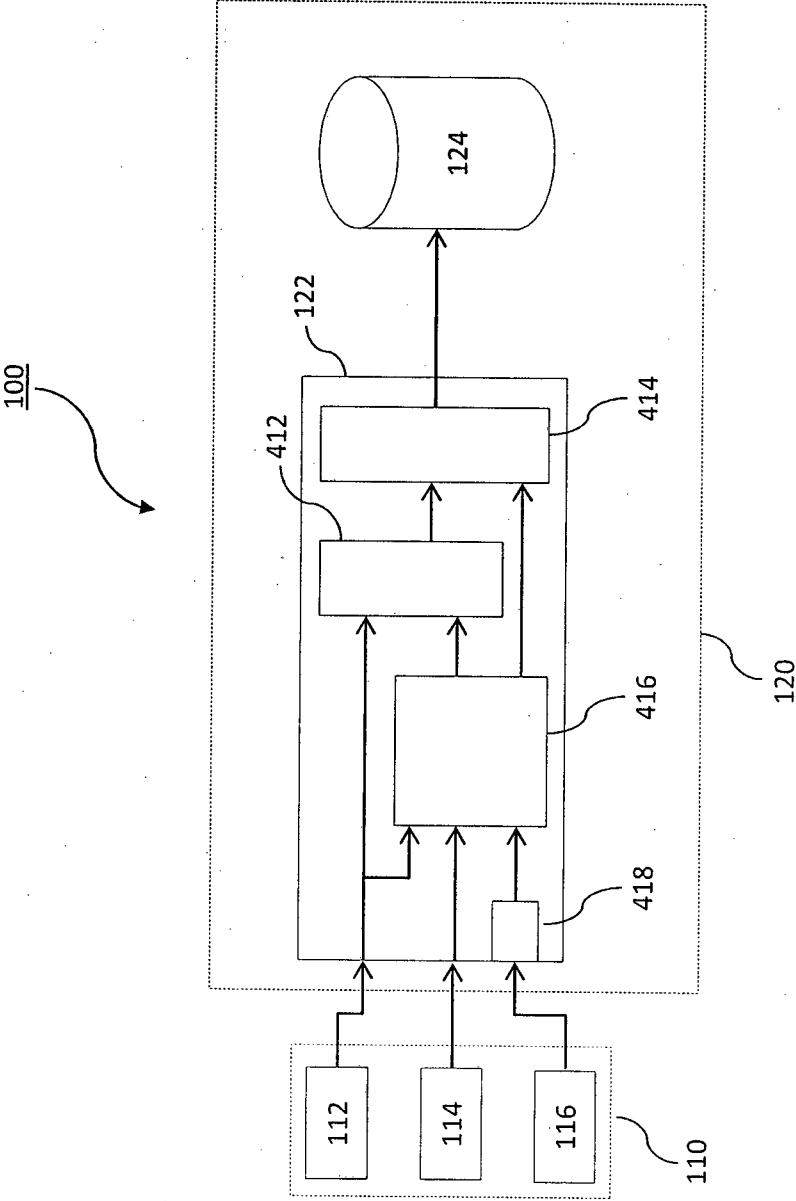


Fig. 3

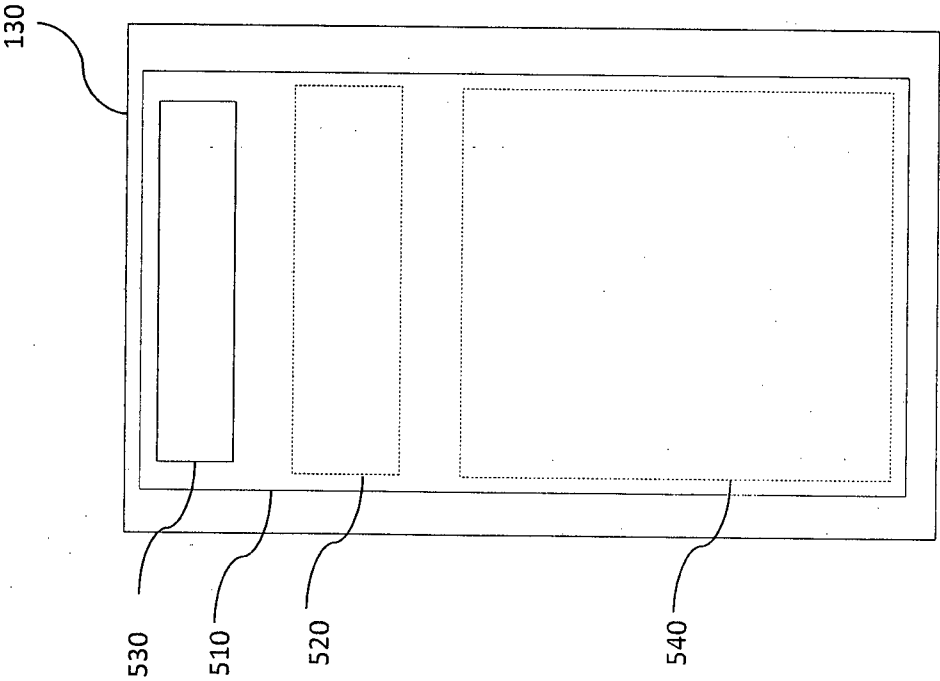
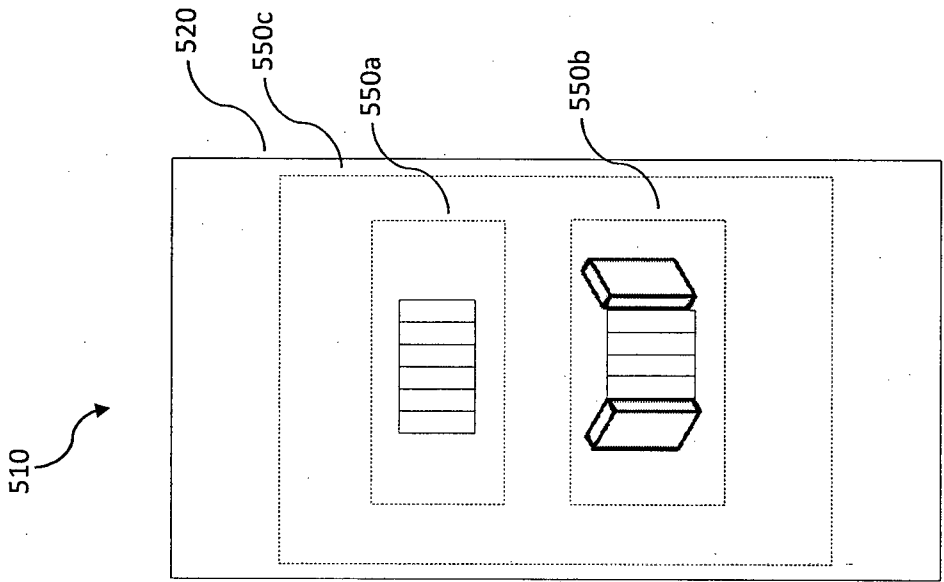
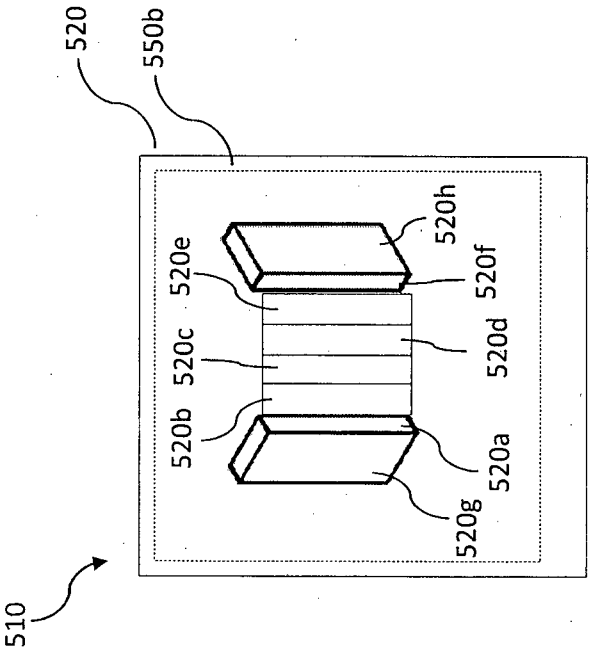
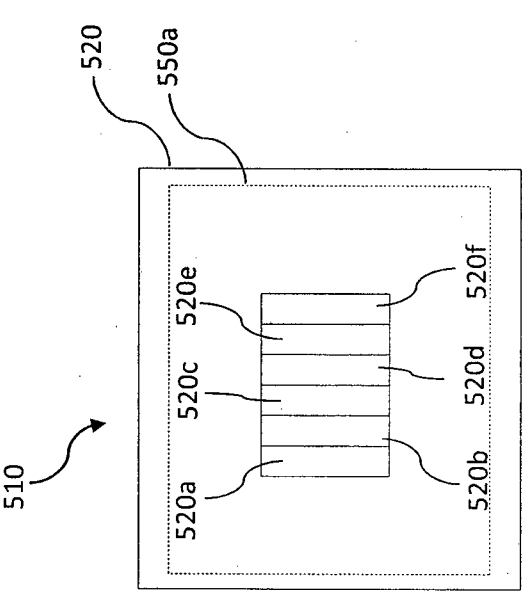


Fig. 4a



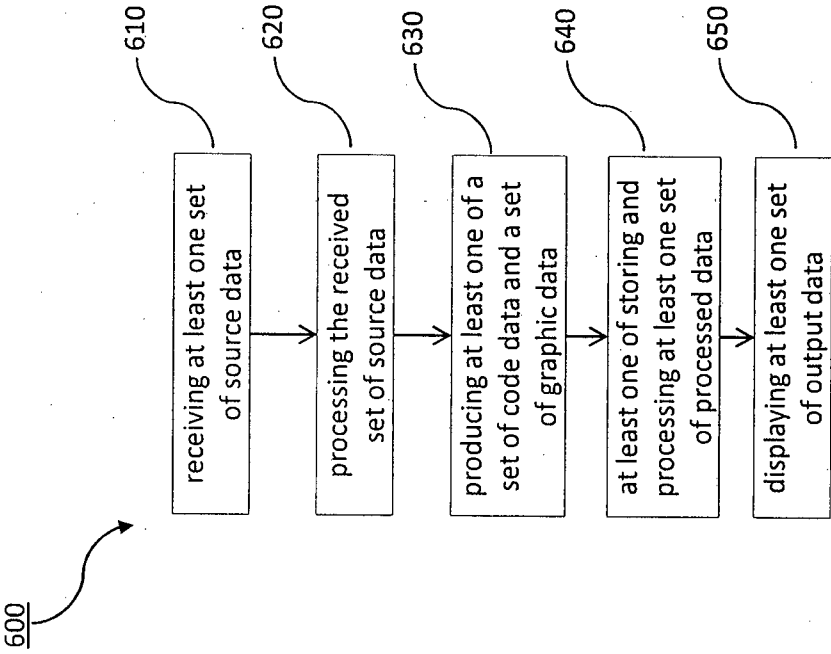


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SG2011/000344

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.

G06F 17/30 (2006.01)

G06T 1/00 (2006.01)

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)

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)

Internet (Google, Google Scholar), USPTO, WPI, EPODOC using keywords and terms such as: ebook, electronic book, electronic document, metadata meta tag, extract, retrieve, parse, browse, render display, virtual, bookshelf, library

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BLONG et al., "The Virtual Shelf", UC Berkeley School of Information, Master of Information Management and Systems Final Report, 7 May 2009 See whole document, in particular: Abstract; Figure 9; Page 2, Paras 3 – 4; Page 26, Para 1; Page 26, Para 4 – Page 27, Para 1; Page 28, Para 2	1 – 20
X	DUSHAY, "Visualizing Bibliographic Metadata – A virtual (Book) Spine Viewer", D-Lib Magazine, Vol 10, No 10, October 2004 See whole document, in particular: Abstract; Section 5, The National Science Digital Library Context; Section 6, Virtual Spine Viewer – Alpha Prototype	1 - 6, 10, 13 – 14, 17, 20



Further documents are listed in the continuation of Box C



See patent family annex

* Special categories of cited documents:			
"A"	document defining the general state of the art which is not considered to be of particular relevance	"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
"E"	earlier application or patent but published on or after the international filing date	"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
"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)	"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
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"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
21 November 2011Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/SG2011/000344

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	RAUBER et al., "Visualizing Electronic Document Repositories: Drawing Books and Papers in a Digital Library", In Proceedings of the 5. IFIP 2.6 Working Conference on Visual Database Systems, 10 – 12 May 2000 See whole document, in particular: Abstract; Figure 2; Section 2, The Information: Library Metadata; Section 3, The Visualization: Metaphors; Section 4, libViewer Architecture	1 - 6, 10, 13 – 14, 17, 20
A	US 7778994 B2 (RAMAN et al.) 17 August 2010 See whole document	
A	US 7287214 B1 (JENKINS et al.) 23 October 2007 See whole document	
A	US 7240291 B2 (CARD et al.) 3 July 2007 See whole document	
A	US 6112201 A (WICAL) 29 August 2000 See whole document	
A	US 5907845 A (COX et al.) 25 May 1999 See whole document	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SG2011/000344

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member			
US	7778994	US	2008114729	WO	2008063445
US	7287214	US	2008065609		
US	7240291	EP	1217508	EP	1816553
		US	2003052900	US	6924822
		US	7015910	US	2002083101
		US	2002113823	US	7139982
		US	2006033762	US	7248269
		US	7493572	US	2005005245
US	6112201	US	6240410		
US	5907845	EP	0821315		
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.					
END OF ANNEX					