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Audet

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(54) **METHOD OF DISTINGUISHING DOCUMENTS**

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CPC combination set(s) only.
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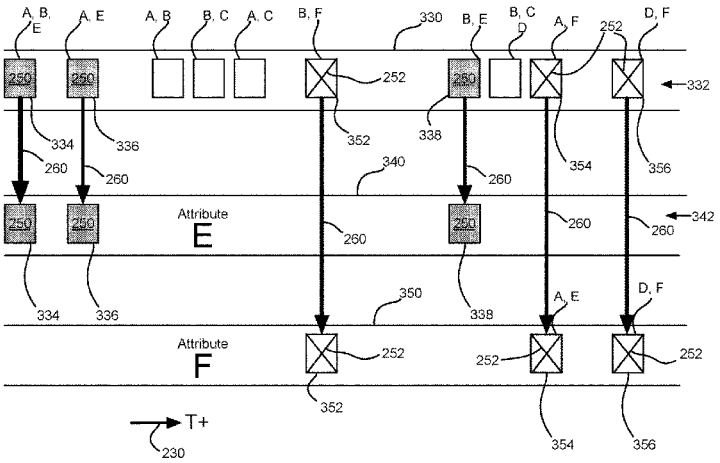
(57) **ABSTRACT**

The document relates to a method for visually indicating on a display those documents that have been displayed a plurality of times on a plurality of axes of documents based on a matching value of an attribute, the method comprising providing a first group of documents at least some of which associated with one or more attributes; displaying documents of the first group of documents along a first axis; receiving an input representing a selected attribute of one of the first group of documents that is associated with one or more attributes; displaying to a second axis documents of the first group of documents that has a value matching the value of the user-selected attribute; and displaying a visual distinctive feature for each displayed document in the first group of documents that is displayed along the second axis, whereby a user is able to visualize which documents displayed along the first axis are also displayed on the second axis for having a value matching the value of the selected attribute. A system and a graphical user interface providing same are also provided.

20 Claims, 15 Drawing Sheets



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2011/0012927 A1 1/2011 Lin
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2013/0227470 A1 8/2013 Thorsander
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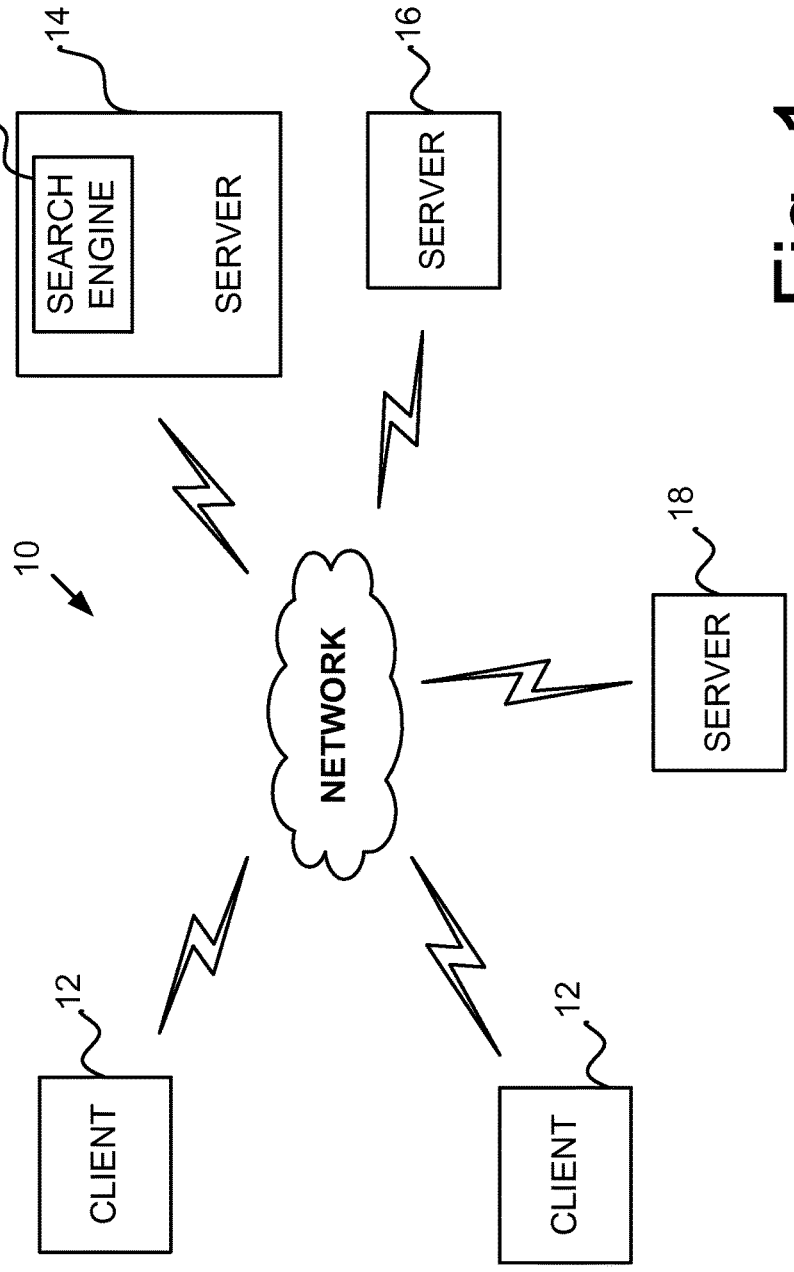
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SEARCH ENGINE
SERVER
16
SERVER
10
NETWORK
18
SERVER
12
CLIENT
12
CLIENT

Fig. 1

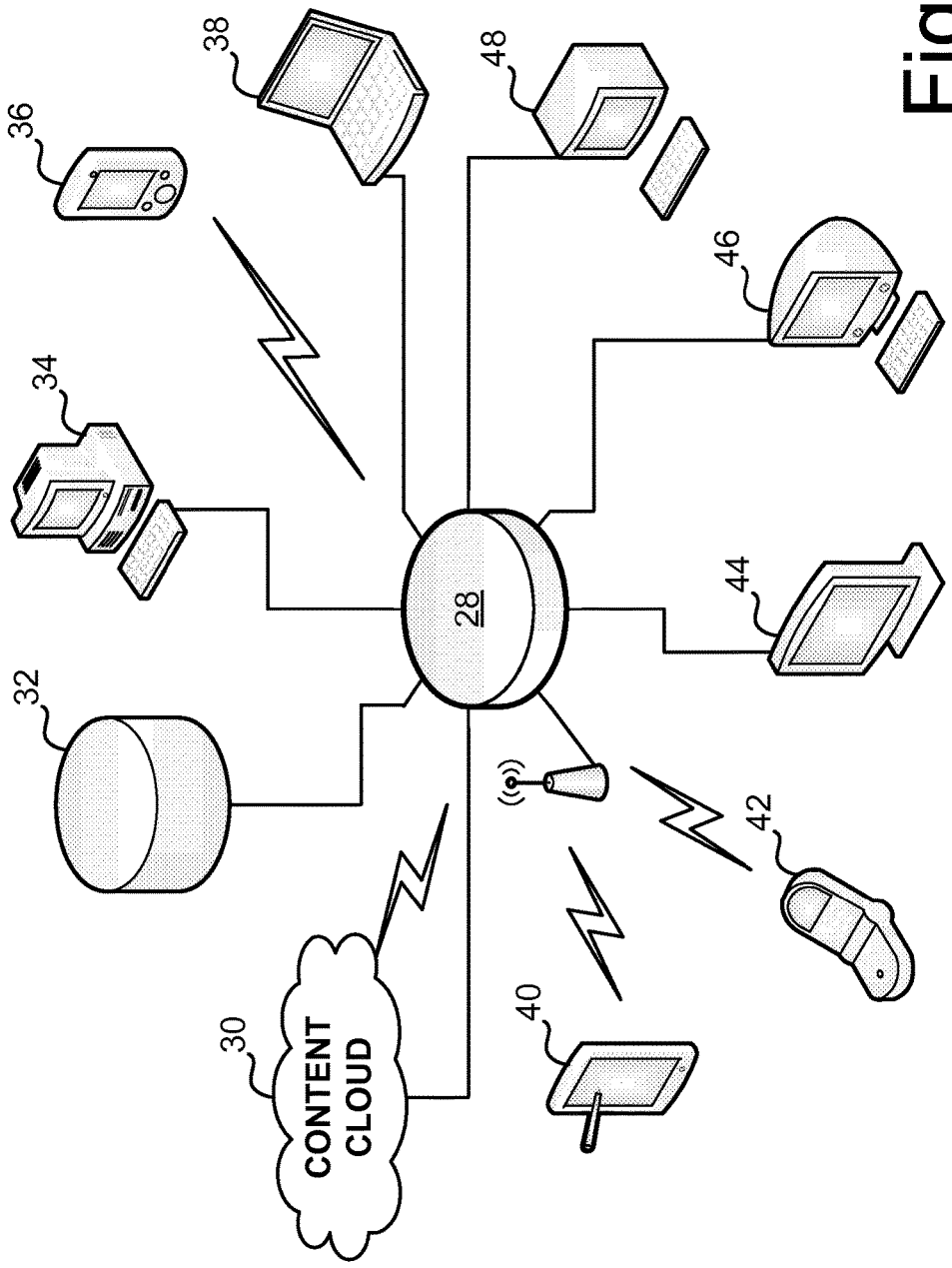
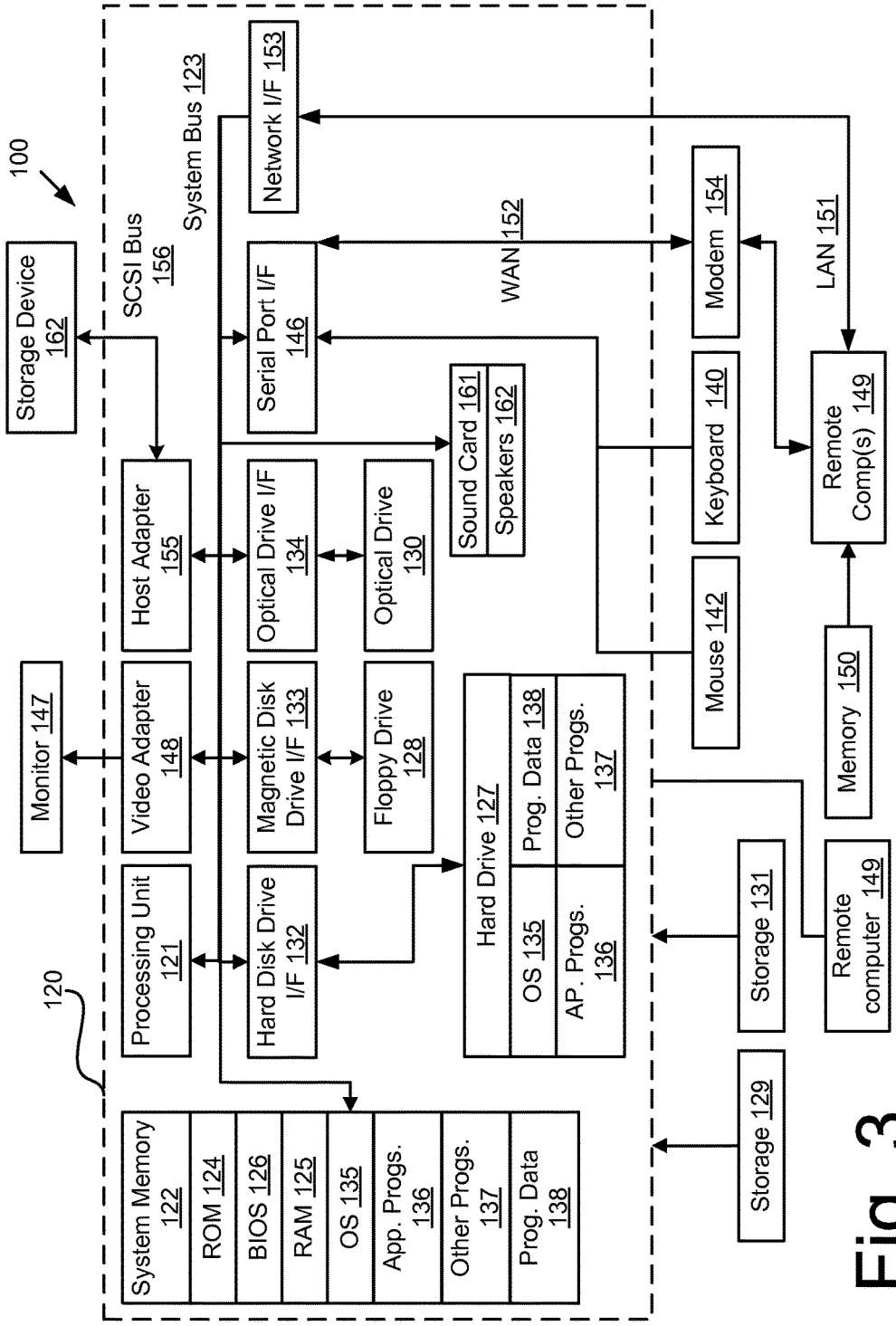


Fig. 2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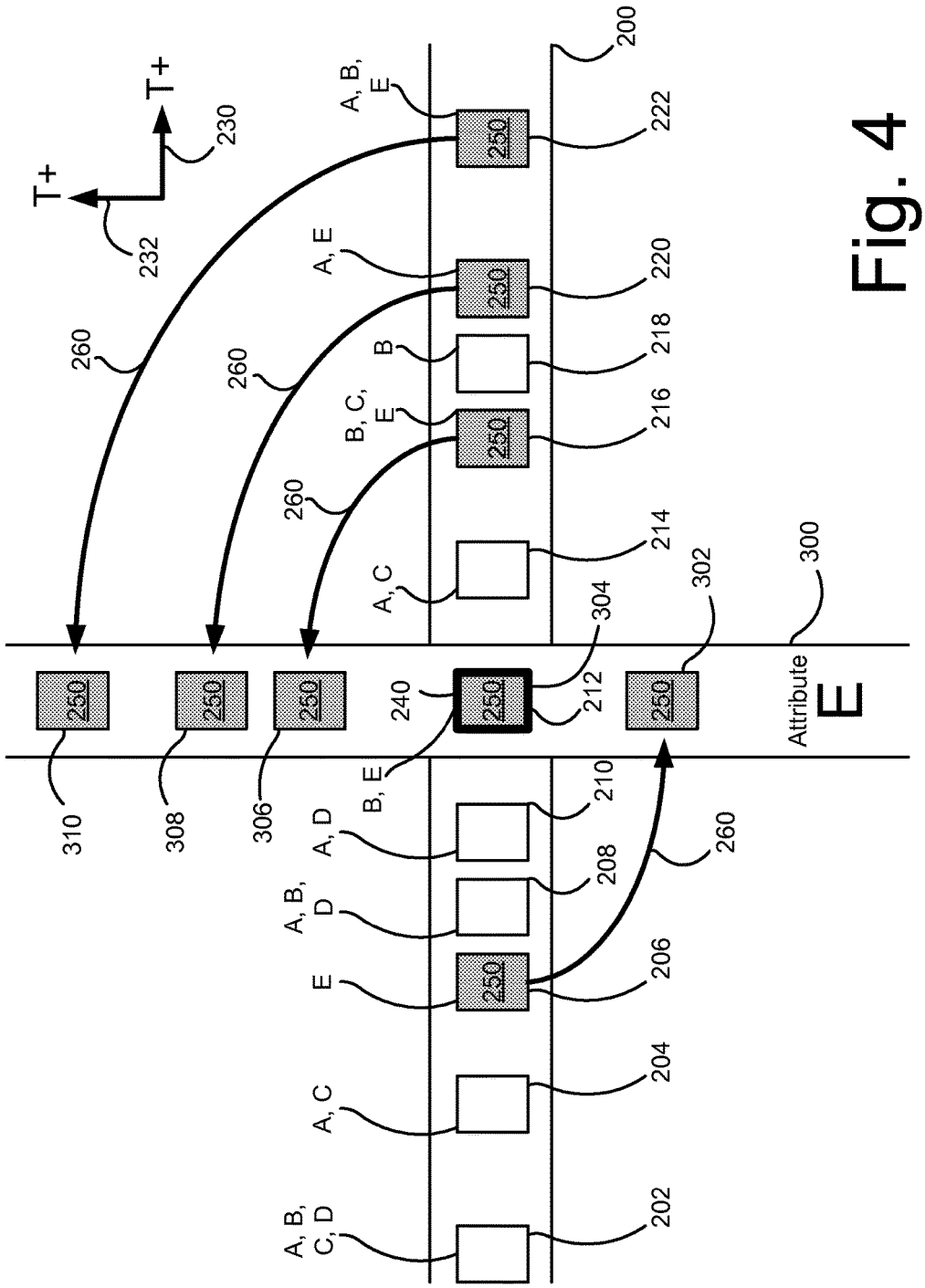
System Memory 122
ROM 124
BIOS 126
RAM 125
OS 135
App. Progs. 136
Other Progs. 137
Prog. Data 138
Processing Unit 121
System Bus 123
SCSI Bus 156
Storage Device 162
Storage 129
Storage 131
Monitor 147
Video Adapter 148
Host Adapter 155
Hard Disk Drive I/F 132
Magnetic Disk Drive I/F 133
Optical Drive I/F 134
Floppy Drive 128
Optical Drive 130
Hard Drive 127
OS 135
AP. Progs. 136
Prog. Data 138
Other Progs. 137
Network I/F 153
Serial Port I/F 146
Sound Card 161
Speakers 162
WAN 152
LAN 151
Modem 154
Keyboard 140
Mouse 142
Memory 150
Remote Comp(s) 149
Remote computer 149

Fig. 3


T+
T+
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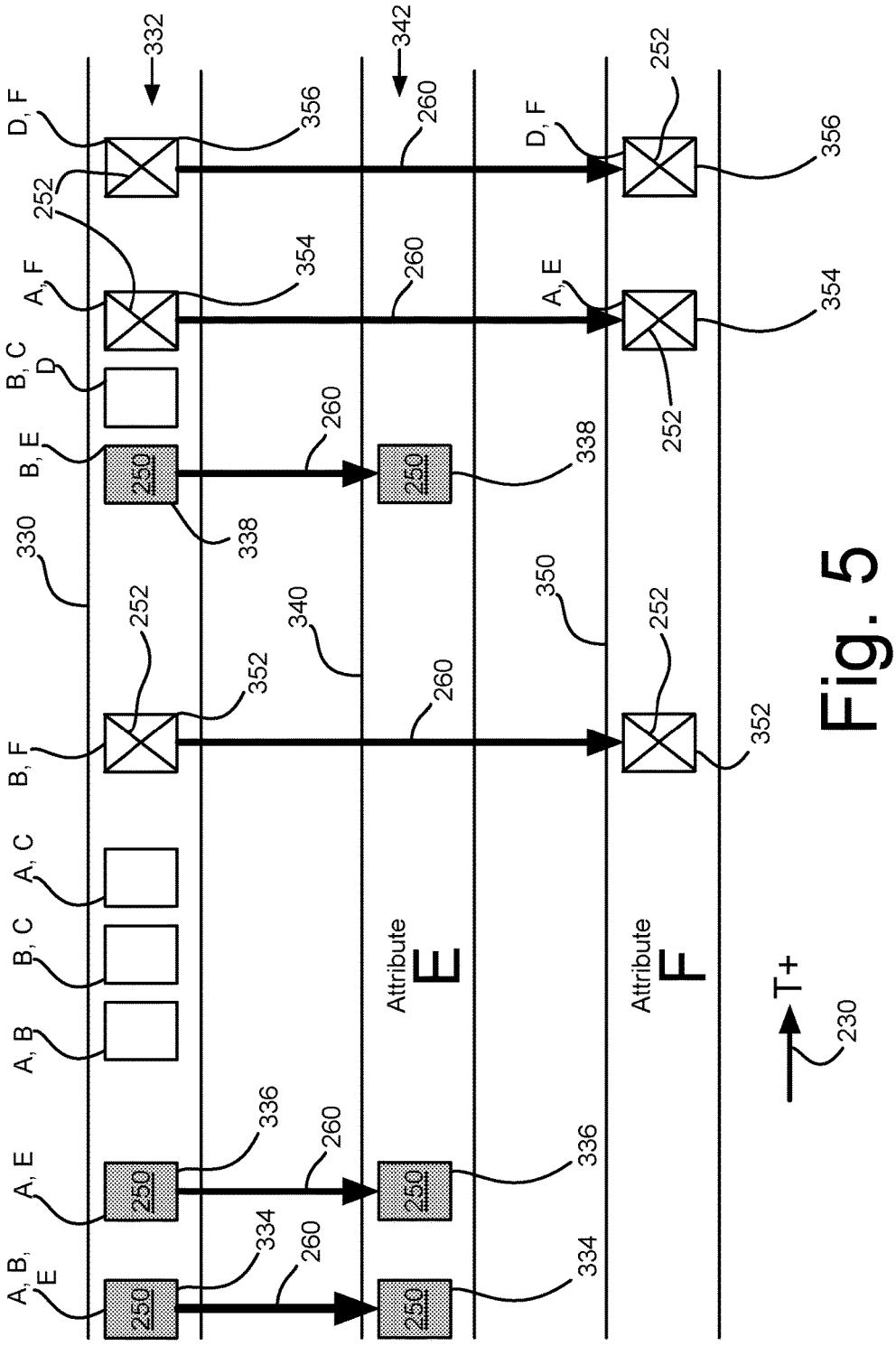
232
200
A, B, E
222
250
A, E
220
260
218
B
B, C, E
216
214
A, C
300
302
304
Attribute E
240
212
B, E
210
A, D
208
A, B, D
206
E
204
A, C
202
A, B, C, D
310
308
306

Fig. 4


332
342
D, F
356
260
D, F
252
356
252
A, F
354
260
A, E
354
B, C
D
B, E
250
260
250
338
338
252
330
252
340
350
252
352
260
B, F
352
A, C
B, C
A, B
Attribute
E
Attribute
F
T+
230
A, E
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250
336
A, B, E
250
334
260
250
334

Fig. 5

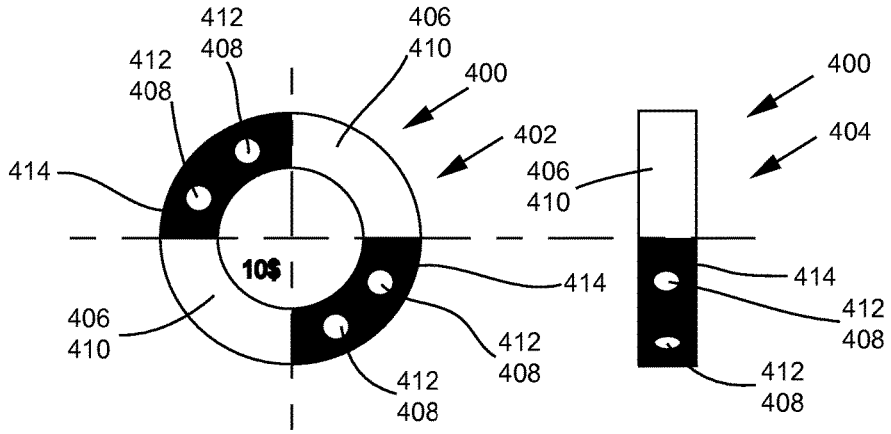


Fig. 6

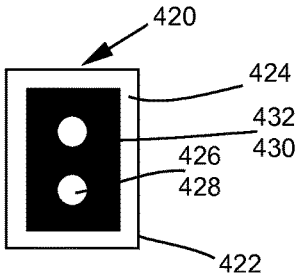


Fig. 7

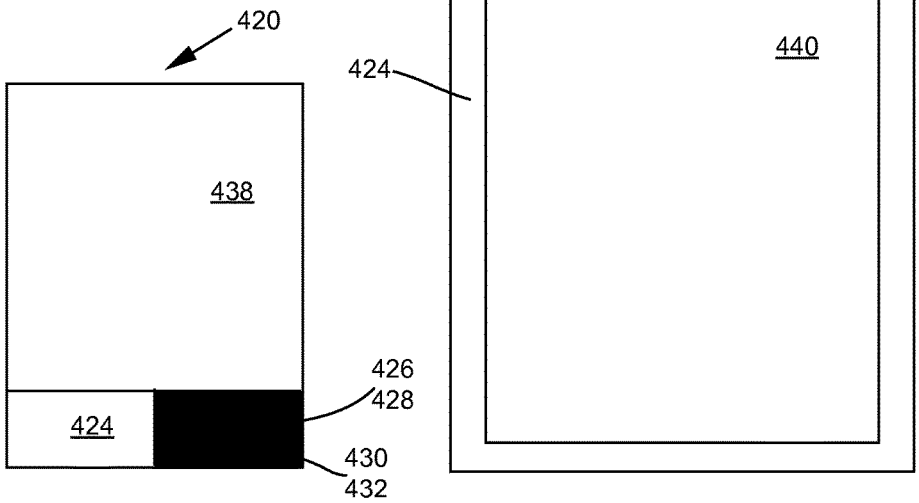


Fig. 9

Fig. 8

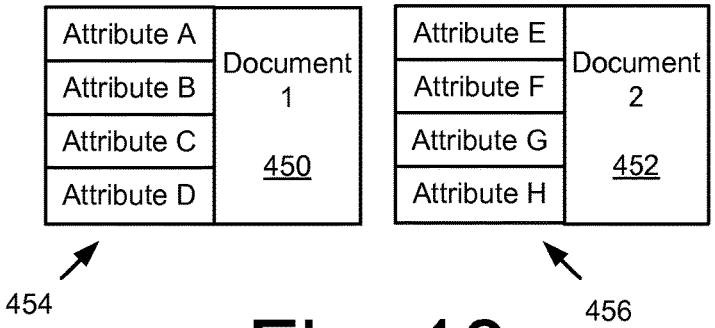


Fig. 10

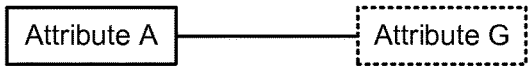


Fig. 11

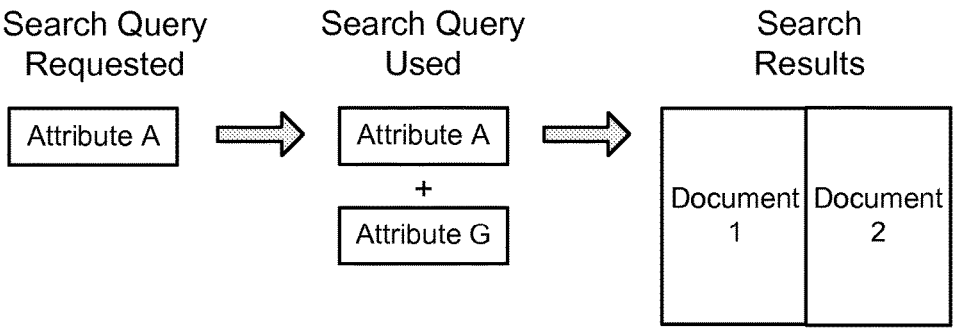


Fig. 12

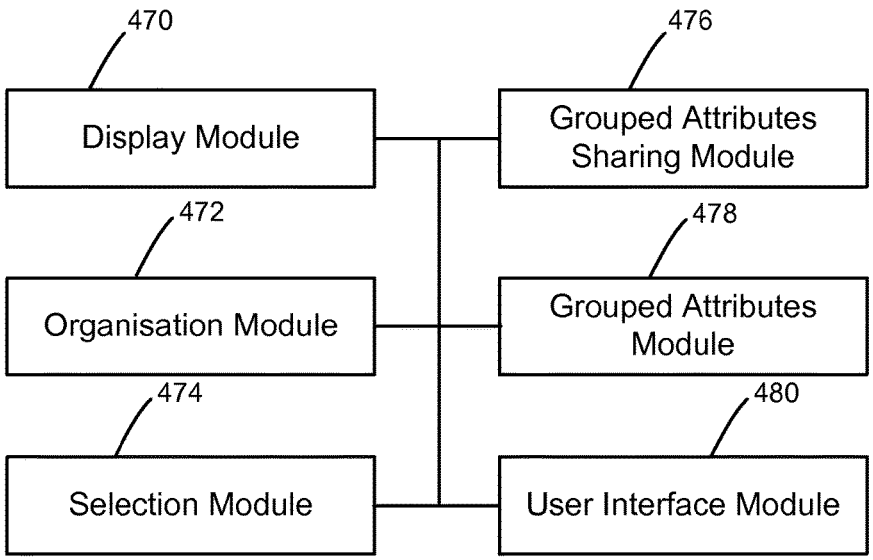

470
Display Module
472
Organisation Module
474
Selection Module
476
Grouped Attributes Sharing Module
478
Grouped Attributes Module
480
User Interface Module

Fig. 13

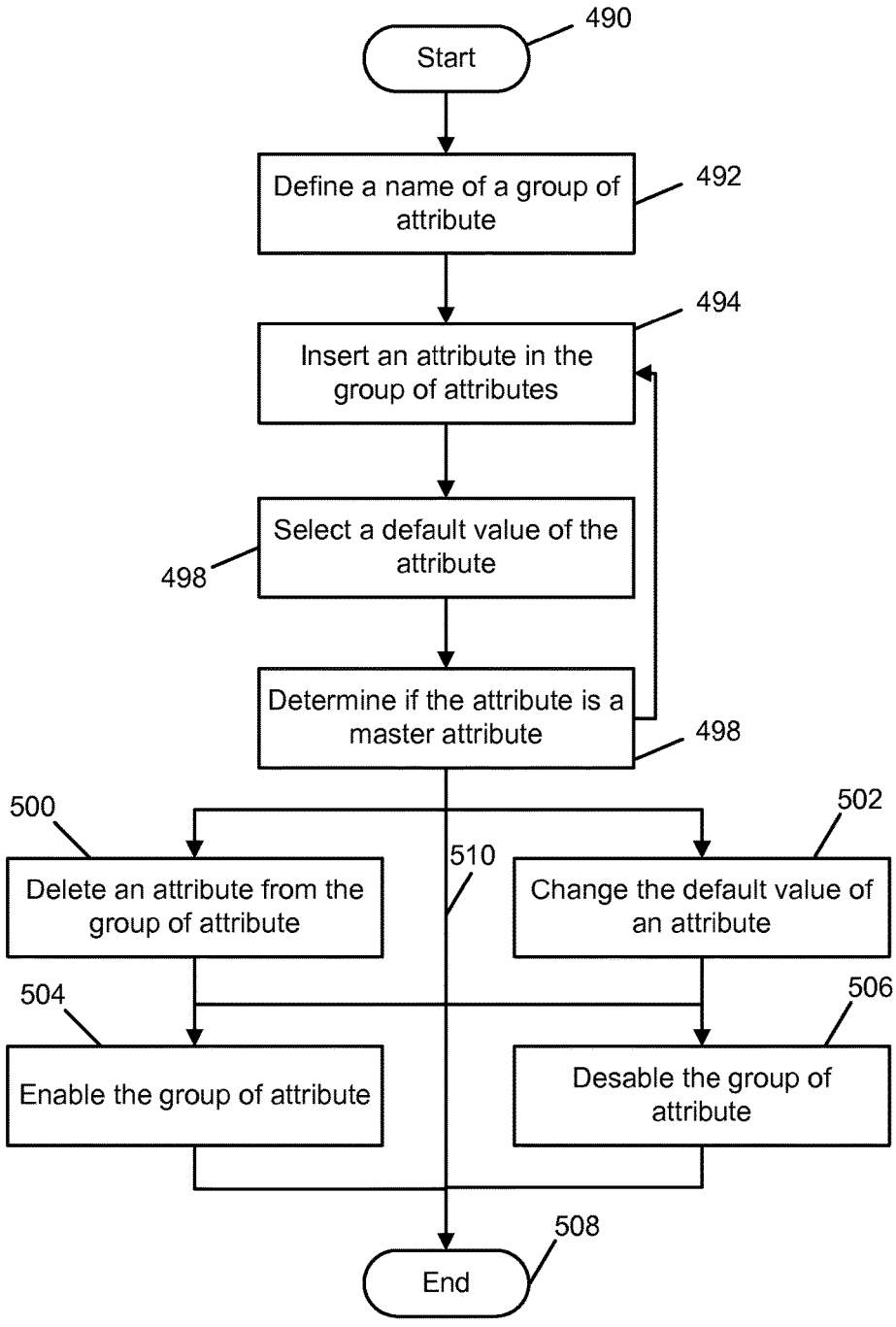

490
Start
Define a name of a group of attribute
492
Insert an attribute in the group of attributes
494
Select a default value of the attribute
498
Determine if the attribute is a master attribute
498
500
Delete an attribute from the group of attribute
510
502
Change the default value of an attribute
504
Enable the group of attribute
506
Desable the group of attribute
508
End

Fig. 14

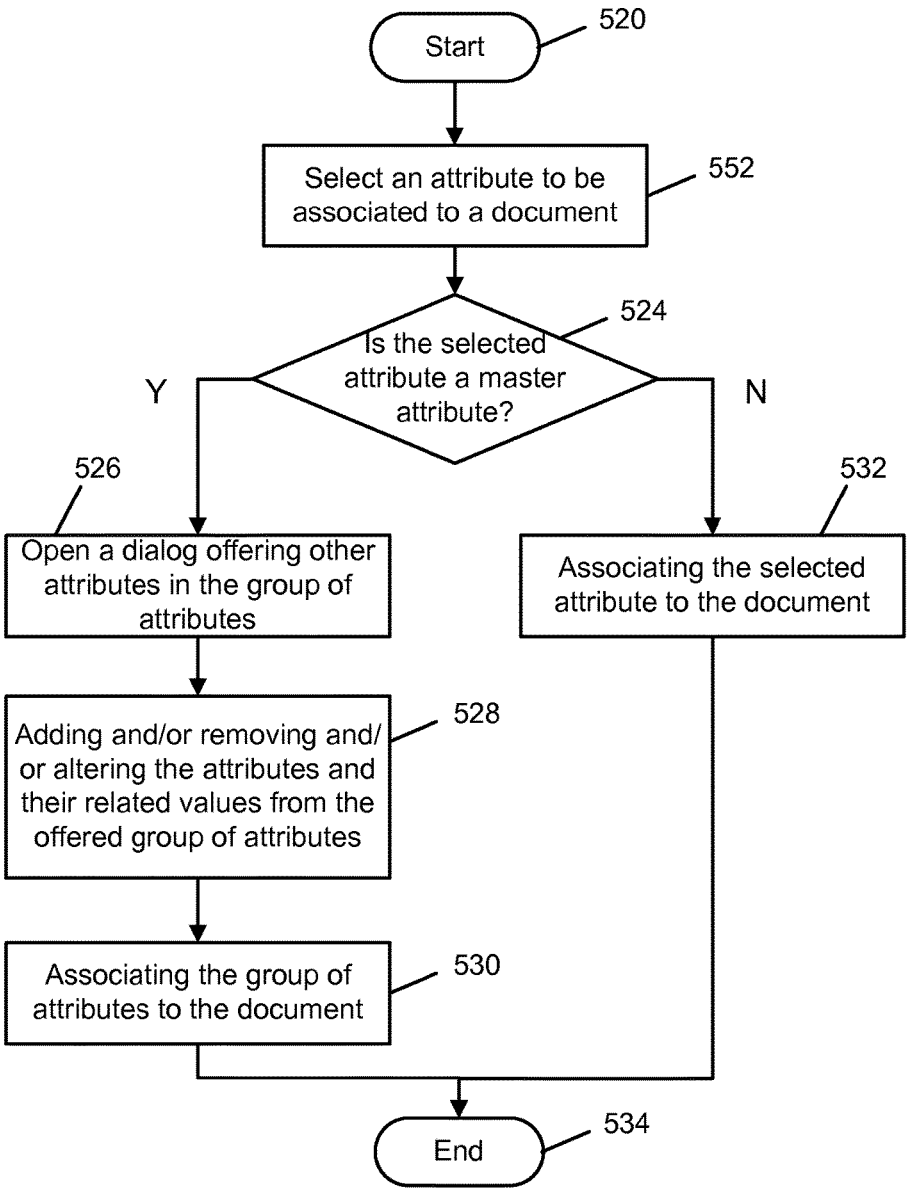

Start
520
Select an attribute to be associated to a document
552
Is the selected attribute a master attribute?
524
Y
N
526
532
Open a dialog offering other attributes in the group of attributes
Associating the selected attribute to the document
Adding and/or removing and/or altering the attributes and their related values from the offered group of attributes
528
Associating the group of attributes to the document
530
End
534

Fig. 15

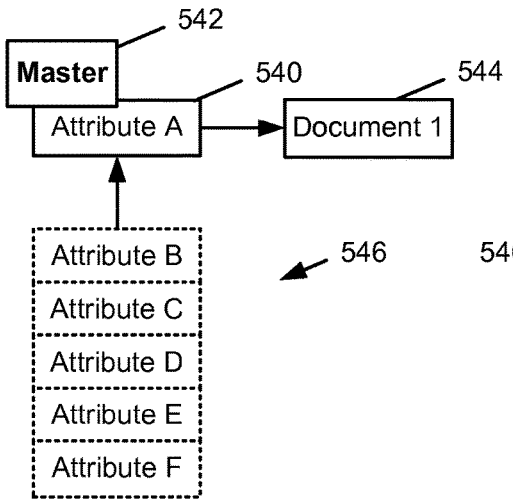


Fig. 16

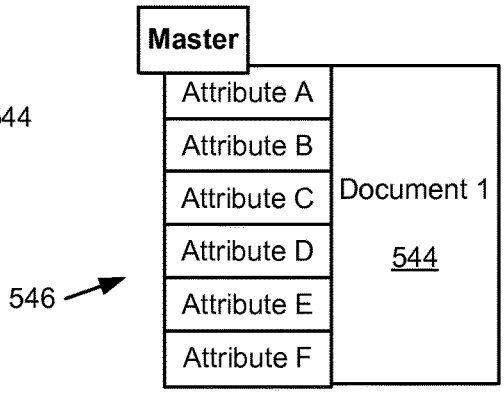


Fig. 17

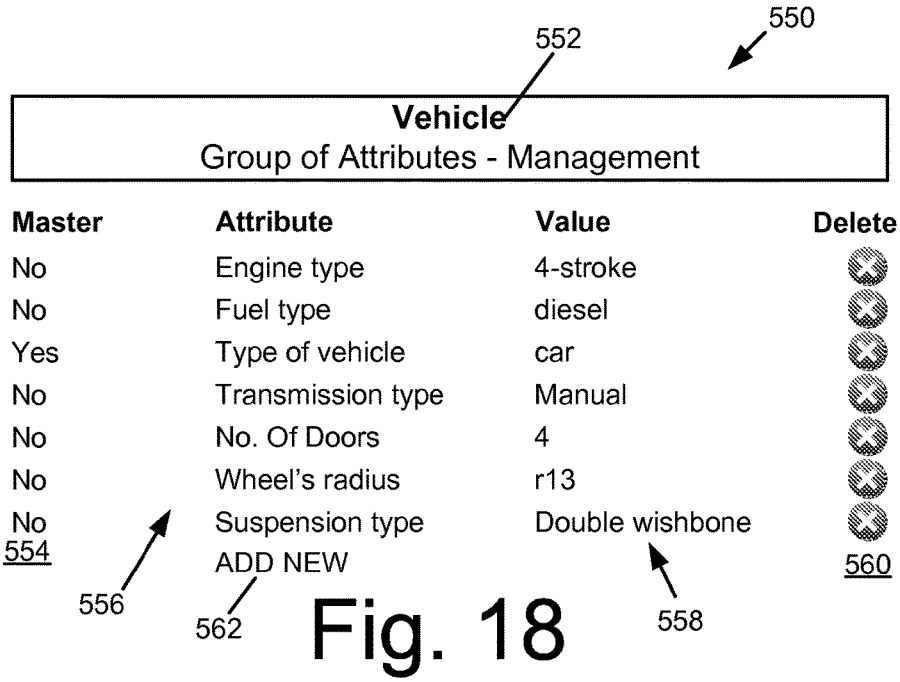


Fig. 18

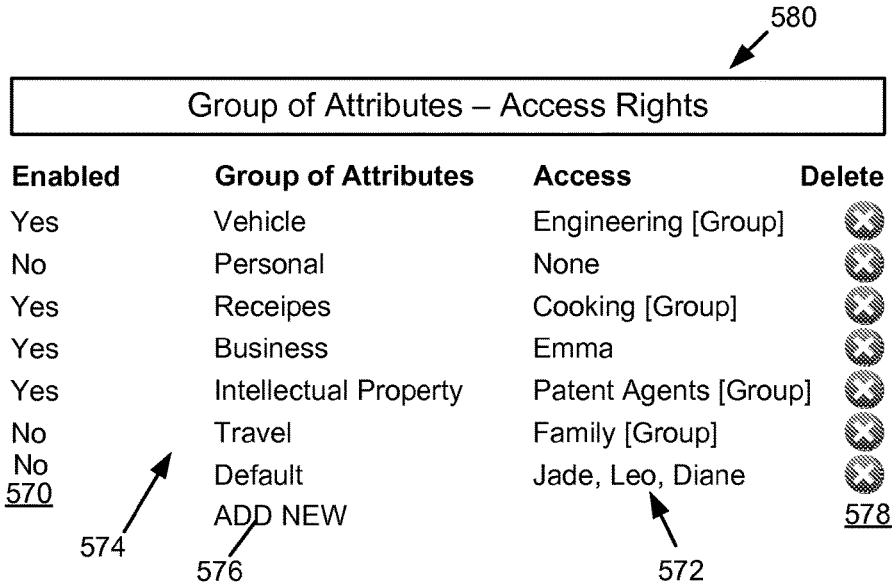

580
Group of Attributes – Access Rights
Enabled
Group of Attributes
Access
Delete
Yes
Vehicle
Engineering [Group]
No
Personal
None
Yes
Receipes
Cooking [Group]
Yes
Business
Emma
Yes
Intellectual Property
Patent Agents [Group]
No
Travel
Family [Group]
No
570
Default
Jade, Leo, Diane
ADD NEW
578
574
576
572

Fig. 19

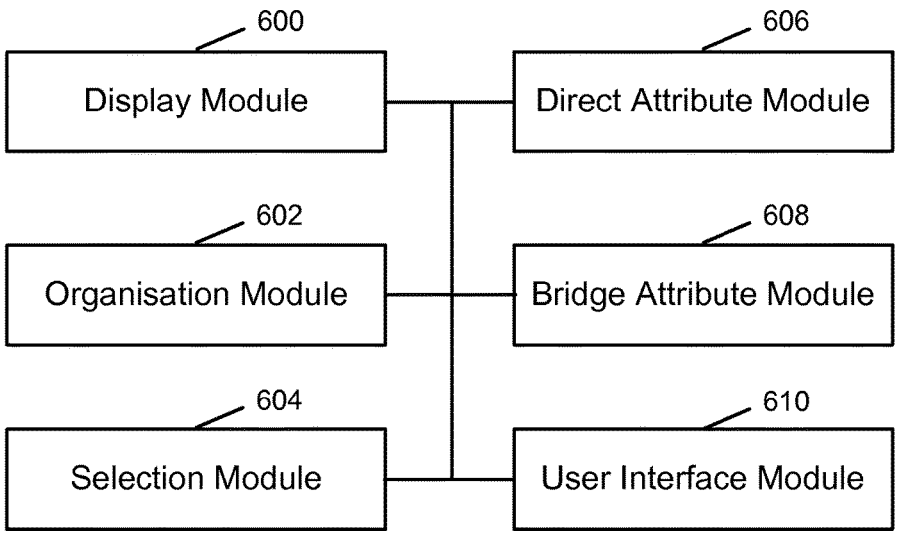

600
Display Module
606
Direct Attribute Module
602
Organisation Module
608
Bridge Attribute Module
604
Selection Module
610
User Interface Module

Fig. 20

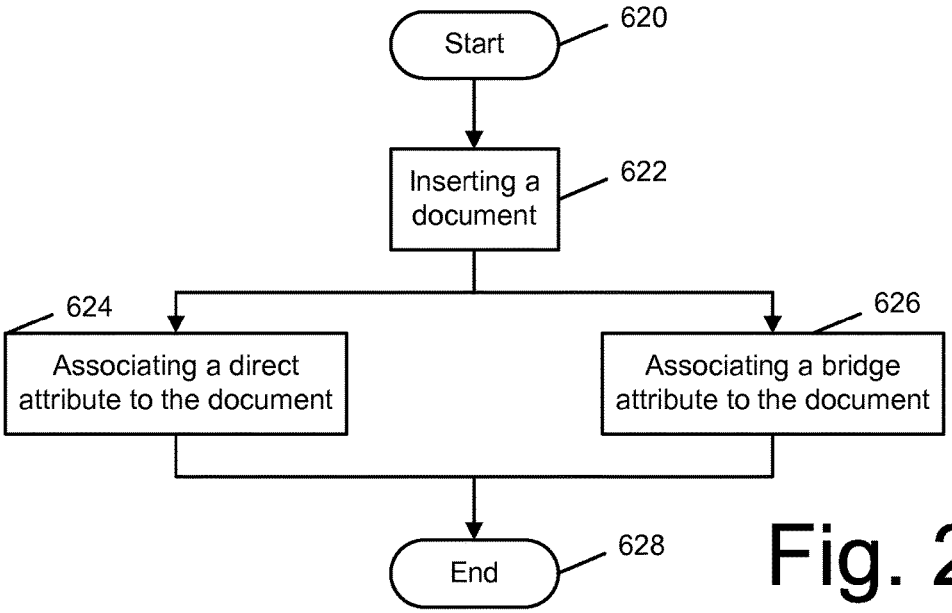

Start
620
Inserting a document
622
624
Associating a direct attribute to the document
626
Associating a bridge attribute to the document
End
628

Fig. 21

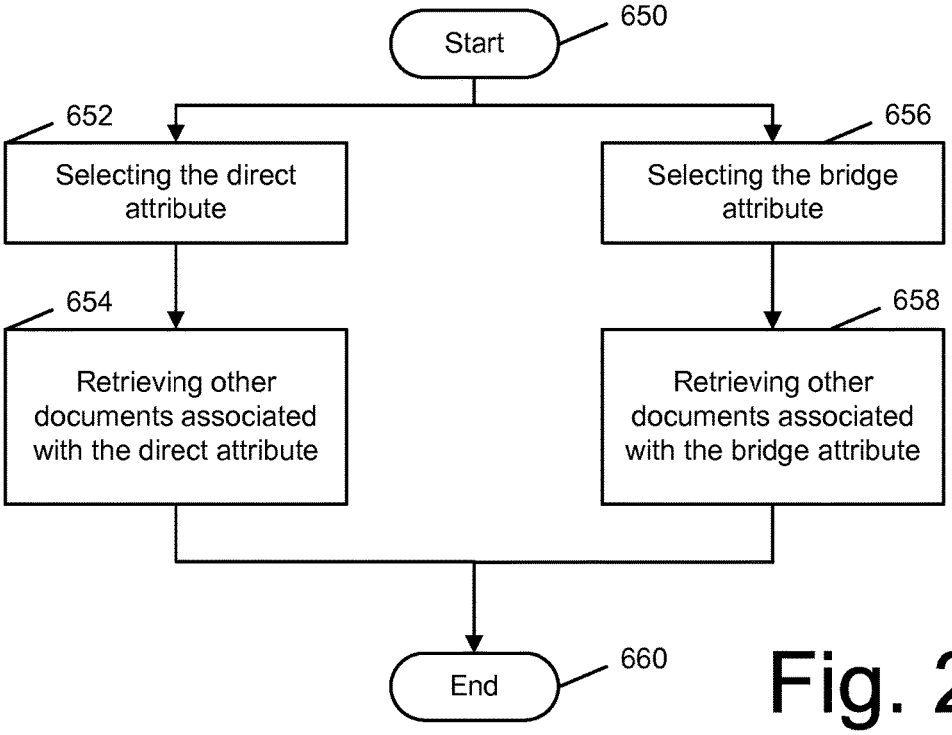

Start
650
652
Selecting the direct attribute
656
Selecting the bridge attribute
654
Retrieving other documents associated with the direct attribute
658
Retrieving other documents associated with the bridge attribute
End
660

Fig. 22

Attribute A	Attribute E	Attribute I	Attribute M
Attribute B	Attribute F	Attribute J	Attribute N
Attribute C	Attribute G	Attribute K	Attribute O
Attribute D	Attribute H	Attribute L	Attribute P

Fig. 23

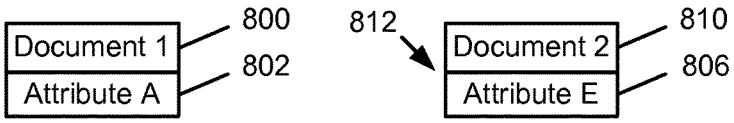


Fig. 24

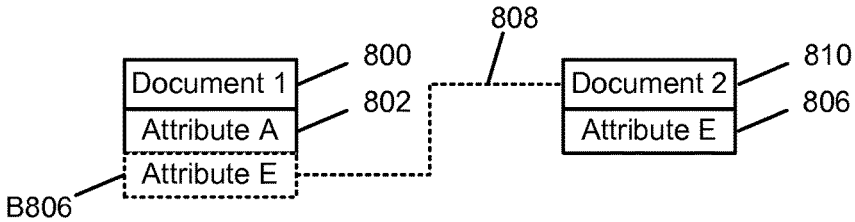


Fig. 25

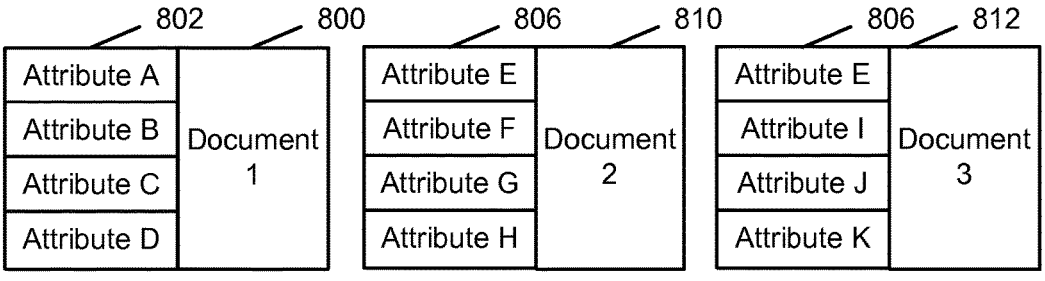


Fig. 26

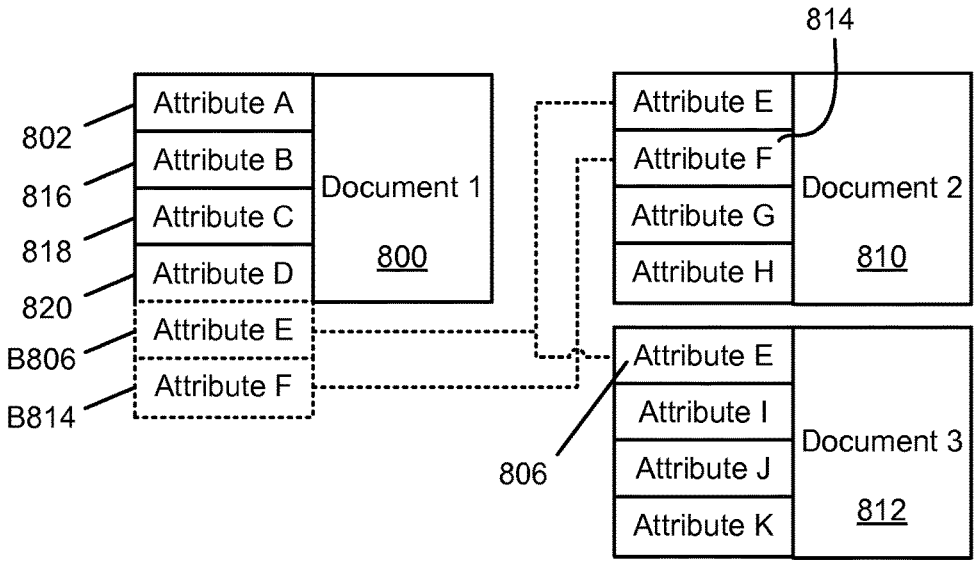
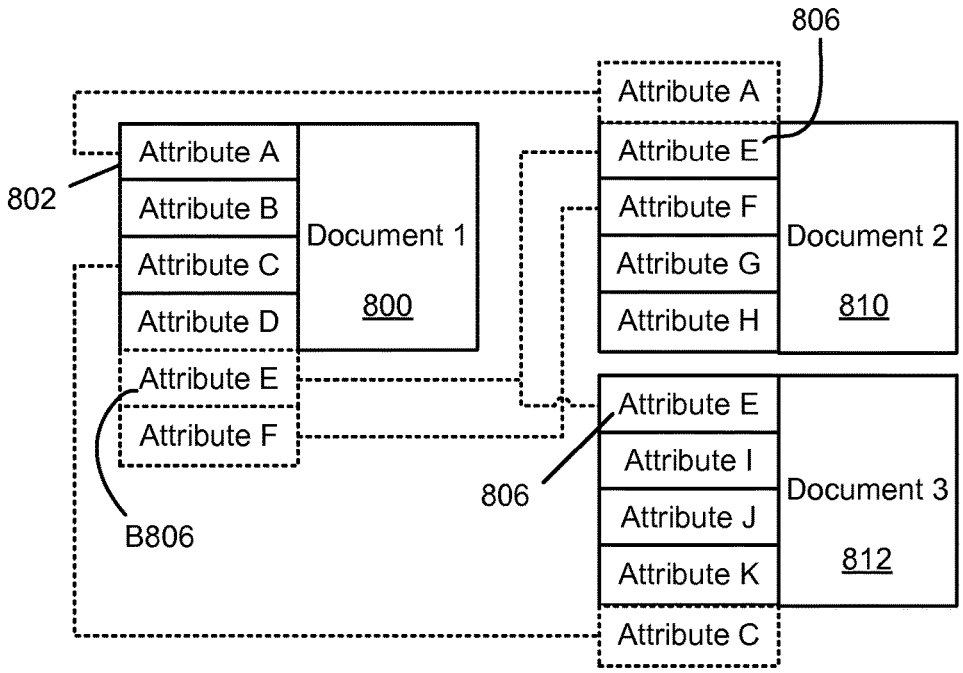

814
802
816
818
820
B806
B814
806
Attribute A
Attribute B
Attribute C
Attribute D
Attribute E
Attribute F
Document 1
800
Attribute E
Attribute F
Attribute G
Attribute H
Document 2
810
Attribute E
Attribute I
Attribute J
Attribute K
Document 3
812

Fig. 27


806
802
B806
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Attribute A
Attribute B
Attribute C
Attribute D
Attribute E
Attribute F
Document 1
800
Attribute A
Attribute E
Attribute F
Attribute G
Attribute H
Document 2
810
Attribute E
Attribute I
Attribute J
Attribute K
Document 3
812
Attribute C

Fig. 28

METHOD OF DISTINGUISHING DOCUMENTS

CROSS-REFERENCE TO RELATED APPLICATIONS

The present invention relates to and claims priority from and is a continuation application of U.S. patent application Ser. No. 13/408,340, entitled METHOD OF MANAGING ATTRIBUTES AND SYSTEM OF MANAGING SAME, filed on Feb. 29, 2012 which claims priority and is a continuation of U.S. patent application Ser. No. 12/400,773, filed Mar. 9, 2009, entitled DOCUMENTS DISCRIMINATION SYSTEM AND METHOD THEREOF, which claims priority from U.S. provisional patent application Ser. 61/034,625, filed Mar. 7, 2008, entitled INTERFACE, U.S. provisional patent application Ser. 61/096,655, filed Sep. 12, 2008, entitled INFORMATION MANAGEMENT TOOL, all these documents are incorporated herein by reference. The present invention also relates to United States Patent Application Publication No.: US 2007/0214169 A1, published Sep. 13, 2007, entitled MULTI-DIMENSIONAL LOCATING SYSTEM AND METHOD and relates to United States Patent Application Publication No.: US 2007/0271508 A1, published Nov. 22, 2007, entitled MULTI-DIMENSIONAL LOCATING SYSTEM AND METHOD. All these documents are incorporated herein by reference in their entireties.

FIELD OF THE INVENTION

This invention relates generally to a computer system and more specifically to a user interface providing methods that facilitate information management and organization. More precisely, the present invention relates to management of a plurality of documents along axes thereof.

BACKGROUND OF THE INVENTION

United States Patent Application Publication No.: US 2007/0214169 A1, published on Sep. 13, 2007 teaches a Multi-dimensional locating system and method (title). United States Patent Application Publication No.: US 2007/0271508 A1, published on Nov. 22, 2007 teaches a Multi-dimensional locating system and method (title). Both patent applications teach ways of managing and displaying documents on arrays of documents. What is taught in these documents have deficiencies.

For instance, one of the deficiencies becomes apparent when a first array of documents presents a group of documents having various attributes (or tags, categories . . .) associated therewith. When selecting an attribute, either by selecting the attribute, or a document to select an attribute associated therewith, a second array of documents is enabled and displayed. The second array of documents, being either displayed non-parallel or parallel with the first array of documents, groups documents from the first array of documents having the selected attribute in common. Some documents from the first array of documents associated with the selected attribute will therefore appear a second time on the second array of documents. Displaying many times the same documents on different arrays of documents might be confusing for a user.

Another deficiency becomes apparent when a user wants to infer the attribute(s), value or the status of a document just by seeing a document. A document can be associated with a color associated therewith, however, the information transmitted by a color is not enough to properly translate more complex status or value of a document.

The meaning of a color or a pattern associated with a document is arbitrary. It might be desirable to use a color and a pattern that are already known in a complete non-analogous field and use the color and the pattern with documents to reduce the effort required to understand the meaning inferred by colors and patterns associated with documents.

Another deficiency becomes apparent when attributes, or tags, are used to categorize documents according to subjects, topics, categories or other means for linking to documents additional related information or documents. Attributes are associated with documents to categorize the documents and create a link among documents sharing the same attribute. This could be called a first-degree relationship. Thus, attributes are used to retrieve documents associated therewith. So, by selecting an attribute it is possible to retrieve the documents having the selected attribute associated therewith.

In certain circumstances it could be useful to draw a link between two documents, inter alia, that don't share a common attribute. It is therefore desirable to have a way to connect one document to another document despite they are not sharing any common attributes.

Another deficiency becomes apparent when multiple attributes are associated with documents. It can easily become time consuming to individually associate a plurality of attributes with documents.

One other deficiency becomes apparent when multiple attributes having substantially similar meaning are used. A query based on a specific attribute is unlikely to retrieve documents associated with another attribute despite the other attribute has a substantially similar meaning.

The prior art computer systems or computer interfaces have not provided solutions to deal with the aforementioned deficiencies and each of these deficiencies in the prior art yield a demand for an improved information managing system and method using an intuitive and natural way to visually present information as well as improved ways to manage associations between the documents.

SUMMARY OF THE INVENTION

The following presents a simplified summary of the disclosure in order to provide a basic understanding to the reader. This summary is not an exhaustive or limiting overview of the disclosure. The summary is not provided to identify key and, or critical elements of the invention, delineate the scope of the invention, or limit the scope of the invention in any way. Its sole purpose is to present some of the objects and aspects disclosed in a simplified form, as an introduction to the more detailed description that is presented later.

The word "document" is used throughout the present specification to facilitate its readability. It is nonetheless not intended to restrict or limit the scope of the present specification to documents. The present specification is mainly directed to computer systems and provides improvements that are useable for managing documents, electronic documents, menu items, application windows and other user-selectable elements displayed on a user graphical interface. The applicant therefore reserves the rights to define claimed subject matters to, inter alia, the above identified elements that could be represented on a user-graphical interface.

The present specification refers to "arrays of documents" although arrays of documents can have various forms. In an embodiment the array of documents can have a substantially

linear shape disposing documents along a timeline. In another possible embodiment the array can be a curved line along which documents are displayed. Alternatively, the array can dispose documents on a matrix having a plurality of columns and rows.

Methods of managing information and graphical user interfaces are carried on by computer-readable instructions that are enabled on a computer. Nowadays computers are used everywhere; they come in various shapes and devices. Computers are so popular, inter alia, because they transform into a variety of dedicated purpose computers depending on the instructions they use. De facto, a general purpose computer is of little help until it has dedicated useful instructions defining its functioning. Once it uses dedicated instructions defining its functions, the dedicated purpose computer is adapted to manage data, to transform graphical rendering of information, to exchange data, in other words the computer using dedicated instructions is material in the transformation of data, the management of the process of transformation and the graphical representation of the process of transformation and the result of the process of transformation for a user to appreciate and, possibly, act upon.

It is therefore one object of the present specification to improve at least one of the aforementioned deficiencies.

One object of the present specification provides an improved method for managing information on a computer system.

Another object of the present specification provides an improved user graphical user interface for managing information.

One other object of the present specification provides an improved computer system adapted to manage information.

An object of the present specification provides an improved graphical representation of documents that appears on more than one array of documents.

Another object of the present specification provides an improved graphical document representation capable of providing additional meaning associated therewith.

One other object of the present specification provides a method for drawing links between documents that don't commonly share an attribute.

It is one aspect of the specification to provide a discriminative visual feature to documents from a first array of documents that will also be displayed on the second array of documents when displaying the second array of documents.

An aspect of the present specification provides a discriminative visual feature for identifying which documents from a first array of documents will be copied on a second array of documents so that it becomes apparent for a user that the same document is displayed simultaneously more than one time to prevent confusion.

An aspect of the present specification provides a discriminative visual feature adapted to identify documents displayed on a first array of documents that will also be displayed on a second array of documents. The discriminative visual feature being enabled either 1) before the second array of documents is displayed, 2) at the same time the second array of documents is displayed or 3) after the second array of documents is displayed.

One aspect of the present specification provides a discriminative visual feature that is, individually or in combination, a document color, a document texture, a document frame, a document animation or a transition animation applied to the documents present on both the first array of document and the second array of documents.

Another aspect of the present specification provides an animation adapted to illustrate copying of documents into document copies to be displayed on other arrays of documents. The copying being preferably shown simultaneously when the additional arrays of documents are displayed.

It is one object of the present specification provides a plurality of pattern codes adapted to be associated with documents. Each of the pattern code has a meaning associated therewith allowing a viewer to infer the meaning associated with the pattern that is combined with a document.

An additional object of the specification provides a method to associate attributes with color codes and/or pattern codes adapted to be applied to documents.

One additional object of the present invention provides color codes and/or pattern codes that are adapted to be associated with attributes, an association of a specific arrangement of color codes and/or pattern codes being associated to more than a single attribute.

One aspect of the present specification provides a graphical pattern code providing attribute-related meaning to a document to which it is associated so that a viewer can infers the attribute associated therewith without reading the attributes when seeing the document.

Another aspect of the present specification provides color codes and pattern codes that are analogous to colors and patterns distinguishing values of poker chips (or token).

An aspect of the present specification provides document quantification associated with a color code and/or a pattern code that is analogous to poker chips values.

Another aspect of the present specification provides a set of color codes and/or a set of pattern codes associated with incremental values; each of the color codes and each of the pattern codes being adapted to be associated, individually or collectively, with documents to graphically illustrate the value of each document.

One aspect of the present specification provides an icon size, a thumbnail size and a document size representing one document over various strength of zoom; each of the icon size, the thumbnail size and the document size being adapted to illustrate a color code and/or a pattern code adapted to its respective size.

Another aspect of the present specification provides a color code and/or a pattern code associated with an attribute, the color code and/or the pattern code being adapted to be graphically associated with documents associated with the attribute in a way that an observer can infer which attribute is associated with a document without reading.

One other aspect of the present specification provides a color code and/or a pattern code adapted to use, inter alia, a main color, a secondary color, a main shape and a secondary shape in association with attributes that can be associated with documents.

An additional aspect of the specification provides a value associated with color codes and/or pattern codes applied to documents. Variations in colors or in patterns meaning variation in value.

One object of the invention is to group at least two attributes/values, used to categorize documents together, when the at least two attributes/values are considered to be analogous, to use the group of attributes/values in a search despite the at least two attributes/values are not selected by a user to perform the search.

An aspect of the present specification provides the ability to group a plurality of attributes/values having analogous meaning and to use one attribute/value from the group of attributes/values to generate a search that will also automatically consider the other attributes/values from the group of attributes/values in the search.

One aspect of the specification provides a method to associate a plurality of attributes/values together such that a single-attribute/value based search performed by a user also provides search results also having the remaining attributes/values of the plurality of attributes/values.

Another aspect of the specification provides a visual distinctive feature adapted to be associated with attributes/values that are in a group of associated attributes/values so that they are discriminated in a list of attributes/values.

One other aspect of the present invention provides sharing of group of attributes among users.

One object of the specification provides a group of attributes/values adapted to be offered to a user when a document in inserted in a database; the attributes/values can be deleted, modified and other attributes/values can be added to the document when the group of attributes/values is offered.

Another object of the specification is to reduce the time required to properly associate attributes/values to documents by providing a group of attributes/values instead of selecting each relevant attributes/value independently.

One other object of the specification provides at least one master attribute/value a group of attributes/values; the group of attributes/values being offered to the user when one of the at least one master attribute/value is selected to be associated with the a document.

An aspect of the specification provides a dialogue on a user graphical interface adapted to display a group of attributes/values potentially relevant to a document when the document is categorized.

Another aspect of the specification provides a mechanism in a computer system adapted to propose to a user groups of potentially relevant attributes/values to be associated with documents; the selected group of potentially relevant attributes/values proposed to a user being based on the selection of a master attribute.

One another aspect of the specification provides a plurality of master attributes in a same group of attributes/values, a selection of each of the master attributes enabling the display of a dialogue containing the group of attributes/values.

Another aspect of the specification provides access and/or sharing rights of each group of attributes.

One object of the specification provides a means for associating documents having no common attributes.

An aspect of the present specification provides attributes and bridge attributes (indirect attribute) associable with a document.

Another aspect of the specification provides an interface capable of displaying a document associated with attributes (direct attributes) and/or associated with bridge attributes (indirect attributes). The direct attributes categorizing the document, and the bridge attributes, not categorizing the document but categorizing another document, provide a bridge to the other document(s) from the document.

An aspect of the present specification provides a graphical association between a bridge attribute and a document.

One other aspect of the present specification provides a bridge between a document and a related document not sharing the same attributes.

Another aspect of the present specification provides instructions to a computer system to associate an attribute and a bridge attribute to a document.

Another aspect of the present specification provides instructions to a computer system to access a first document from a second document by selecting a bridge attribute associated with the first document and not categorizing the second document, the bridge attribute being an attribute categorizing the first document.

One other aspect of the present specification provides a non-transitory computer-readable storage medium for tangibly storing computer-readable code thereon suitable for execution by a computing apparatus, the computer-readable code, when executed, being adapted to implement a method for visually indicating on a display those documents that have been displayed a plurality of times on a plurality of axes of documents based on a matching value of an attribute, the method comprising, providing a first group of documents at least some of which associated with one or more attributes; displaying documents of the first group of documents along a first axis; receiving an input representing a selected attribute of one of the first group of documents that is associated with one or more attributes; displaying to a second axis documents of the first group of documents that has a value matching the value of the user-selected attribute; and displaying a visual distinctive feature for each displayed document in the first group of documents that is displayed along the second axis; whereby a user is able to visualize which documents displayed along the first axis are also displayed on the second axis for having a value matching the value of the selected attribute

One aspect of the present specification provides a method for visually indicating on a display those documents that have been displayed on one axis of documents and on another axis of documents based on a matching value of an attribute, the method comprising: displaying a first group of documents in a first display area of a display such that the group of documents defines at least a portion of a first axis of documents; receiving an input representing an attribute associated with at least one of the document of the first group; and displaying to a second display area of the display documents of the first group of documents that have a value matching the value of the selected attribute, said displaying to a second display area resulting in the displayed documents defining a second axis of documents; wherein the method further comprises: displaying a visual distinctive feature with the displayed documents that are displayed on the second axis, and not displaying the visual distinctive feature with displayed documents on the first axis that are not displayed on the second axis; whereby a user is able to visualize which displayed documents along the first axis have been displayed on the second axis for having a value matching the value of the selected attribute.

Another aspect of the present invention provides an apparatus for implementing a user interface adapted to visually indicating on a display those documents that have been displayed on an axis of documents and to another axis of documents based on a matching value of a selected attribute, the apparatus comprising a memory module adapted to store thereon a plurality of documents; and a processing unit in communication with the memory module, the processing unit being operative for executing computer readable program code stored on a non-transient computer readable medium for implementing a method comprising displaying documents of the plurality of documents on a first axis of documents; receiving an input representing a selected attribute of at least one of the plurality of documents; displaying, to a second axis of documents, documents of the plurality of documents that have a value matching the value of the user-selected attribute; and displaying a visual distinctive feature associated with displayed documents on the first axis that are displayed on the second axis, and not displaying the visual distinctive feature with displayed documents on the first axis that are not displayed to the second

axis; and whereby a user is able to visualize which documents along the first axis have been displayed on the second axis for having a value matching the value of the user-selected attribute.

These and other advantages and features of the present invention will become apparent from the following description and the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a block diagram of an exemplary computer network;

FIG. **2** illustrates a block diagram of an exemplary computer network;

FIG. **3** illustrates a block diagram of an exemplary computer system;

FIG. **4** illustrates a schematic exemplary embodiment of non-parallel arrays of documents with emphasis added on repeating documents thereon;

FIG. **5** illustrates a schematic exemplary embodiment of substantially parallel arrays of documents with emphasis added on repeating documents thereon;

FIG. **6** illustrates an exemplary poker token;

FIG. **7** illustrates an exemplary icon representing a document with color-coding thereon;

FIG. **8** illustrates an exemplary thumbnail representing a document with color-coding thereon;

FIG. **9** illustrates an exemplary document with color-coding thereon;

FIG. **10** illustrates an exemplary block diagram of documents with attributes associated therewith;

FIG. **11** illustrates an exemplary of associated attributes;

FIG. **12** illustrates an exemplary query using associated attributes, despite a single attribute has been selected, to build the query and provide results;

FIG. **13** illustrates an exemplary block diagram of a module-based system adapted to manage and use grouped attributes;

FIG. **14** illustrates an exemplary flow chart of steps performed during the creation of a group of attributes;

FIG. **15** illustrates an exemplary flow chart of steps performed during the association of attributes from a group of attributes with a document(s);

FIG. **16** illustrates an exemplary block diagram of a master attribute adapted to associate its related group of attributes with a document;

FIG. **17** illustrates an exemplary block diagram of a plurality of attributes from a group of attributes associated with a document;

FIG. **18** illustrates an exemplary dialogue adapted to allow the management of a group of attributes;

FIG. **19** illustrates an exemplary dialogue adapted to allow the management of access rights related to groups of attributes;

FIG. **20** illustrates an exemplary block diagram of a module-based system adapted to manage and use bridge attributes;

FIG. **21** illustrates an exemplary flow chart of steps performed to associate direct and bridge attributes to document(s);

FIG. **22** illustrates an exemplary flow chart of steps performed to retrieve documents based, at least in part, on direct and bridge attributes to document(s);

FIG. **23** illustrates a list of attributes;

FIG. **24** illustrates two documents with one respective attribute associated therewith;

FIG. **25** illustrates two documents of FIG. **23** with bridge attribute E associated with document (1);

FIG. **26** illustrates a plurality of documents with respective attributes associated therewith;

FIG. **27** illustrates the plurality of documents of FIG. **25** with bridge attributes E and F associated with document (1); and

FIG. **28** illustrates the plurality of documents of FIG. **26** with additional bridge attributes associated with documents (1), (2) and (3).

DESCRIPTION OF EMBODIMENT(S) OF THE INVENTION

The present invention is now described with reference to the figures. In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the present invention by way of embodiment(s). It may be evident, however, that the present invention may be practiced without these specific details. In other instances, well-known structures and devices are shown in block diagram form in order to facilitate describing the present invention.

The features provided in this specification mainly, but might not exclusively, relate to principles of computer software and machine-readable code/instructions adapted to instruct a computer, many computers or other machines adapted to use the instructions to provide material effects on a display, or other means enabling human-computer interactions to manage documents, menus, user-selectable elements and other computer files. These code/instructions are preferably stored on a machine-readable medium to be read and acted upon to with a computer or a machine having the appropriate code/instructions reading capability.

Exemplary Network

FIG. **1** illustrates an exemplary network **10** in which a system and a method, consistent with the present invention, may be implemented. The network **10** may include multiple client devices **12** connected to multiple servers **14**, **16**, **18** via a network **20**. The network **20** may include a local area network (LAN), a wide area network (WAN), a phone network, such as the Public Switched Phone Network (PSTN), an intranet, the Internet, Wi-Fi, WiMAX or a combination of networks. Two client devices **12** and three servers **14**, **16**, **18** have been illustrated as connected to network **20** for simplicity. In practice, there may be more or less client devices and servers **14**, **16**, **18**. Also, in some instances, a client **12** device may perform the functions of a server **14**, **16**, **18** and a server **14**, **16**, **18** may perform the functions of a client **12** device.

The client devices **12** may include devices, such as mainframes, minicomputers, personal computers, laptops, personal digital assistants, phones, or the like, capable of connecting to the network **20**. The client devices **12** may transmit data over the network **20** or receive data from the network **20** via a wired, wireless, or optical connection.

The servers **14**, **16**, **18** may include one or more types of computer system, such as a mainframe, minicomputer, or personal computer, capable of connecting to the network **20** to enable servers **14**, **16**, **18** to communicate with the client devices **12**. In alternative implementations, the servers **14**, **16**, **18** may include mechanisms for directly connecting to one or more client devices **12**. The servers **14**, **16**, **18** may transmit data over the network **20** or receive data from the network **20** via a wired, wireless, or optical connection.

In an implementation consistent with the present invention illustratively embodied herein, the server **14** may

include a search engine **22** usable by the client devices **12**. The servers **14**, **16**, **18** may store documents, such as web pages, accessible by the client devices **12**.

With reference to FIG. **2**, a network **20** includes the content cloud **30**, a content database **32**, content devices **34-38**, and other devices **40-48**. The network mediator **28** enables network devices **32-48** to communicate with each other without pre-configuring each device. The content cloud **30** represent a content source such as the Internet, where content exists at various locations across the globe that could be reached through a wired connection and/or with a wireless connection. The content includes multimedia content such as audio and video. The mediator **28** allows the content cloud to provide content to devices **34-48**. The content database **32** is a storage device that maintains content. The content database **32** may be a stand-alone device on an external communication network. The mediator **28** communicates with the content database **32** to access and retrieve content. The content devices **34-48** include intelligent devices, such as, for example, personal computers, laptops, cell phones and personal digital assistants. The content devices **34-48** are capable or storing content data. The devices **34-48** are intelligent devices that receive content from other content devices **30-48**. However, the devices **30-48** can also operate as servers to distribute content to other client devices.

Exemplary Client Architecture

The following discussion provides a brief, general description of an exemplary computer apparatus in which at least some aspects of the present invention may be implemented. The present invention will be described in the general context of computer-executable instructions, such as program modules, being executed by a computerized device. However, the methods of the present invention may be affected by other apparatus. Program modules may include routines, programs, objects, components, data structures, applets, WEB 2.0 type of evolved networked centered applications, etc. that perform a task(s) or implement particular abstract data types. Moreover, those skilled in the art will appreciate that at least some aspects of the present invention may be practiced with other configurations, including hand-held devices, multiprocessor system, microprocessor-based or programmable consumer electronics, network computers, minicomputers, set top boxes, mainframe computers, gaming console and the like. At least some aspects of the present invention may also be practiced in distributed computing environments where tasks are performed by remote processing devices linked through a communications network as exemplified in FIG. **2**. In a distributed computing environment, program modules may be located in local and/or remote memory storage devices.

With reference to FIG. **3**, an exemplary apparatus **100** for implementing at least some aspects of the present invention includes a general purpose computing device in the form of a computer **120** or in the form of a computerized portable apparatus. The computer **120** may include a processing unit **121**, a system memory **122**, and a system bus **123** that couples various system components, including the system memory **122**, to the processing unit **121**. The system bus **123** may be any of several types of bus structures including a memory bus or memory controller, a peripheral bus, and a local bus using any of a variety of bus architectures. The system memory may include read only memory (ROM) **124** and/or random access memory (RAM) **125**. A basic input/output system **126** (BIOS), containing basic routines that help to transfer data between elements within the computer **120**, such as during start-up, may be stored in ROM **124**. The computer **120** may also include a hard disk drive **127** for reading from and writing to a hard disk, (not shown), a magnetic disk drive **128** for reading from or writing to a (e.g., removable) magnetic disk **129**, and an optical disk drive **130** for reading from or writing to a removable (magneto) optical disk **131** such as a compact disk or other (magneto) optical media. The hard disk drive **127**, magnetic disk drive **128**, and (magneto) optical disk drive **130** may be coupled with the system bus **123** by a hard disk drive interface **132**, a magnetic disk drive interface **133**, and a (magneto) optical drive interface **134**, respectively. The drives and their associated storage media provide nonvolatile (or persistent) storage of machine-readable instructions, data structures, program modules and other data for the computer **120**. Although the exemplary environment described herein employs a hard disk, a removable magnetic disk **129** and a removable optical disk **131**, these skilled in the art will appreciate that other types of storage media, such as magnetic cassettes, flash memory cards, digital video disks, Bernoulli cartridges, random access memories (RAMs), read only memories (ROM), remote cloud storage and the like, may be used instead of, or in addition to, the storage devices introduced above.

A number of program modules may be stored on the hard disk **127**, magnetic disk **129**, (magneto) optical disk **131**, ROM **124** or RAM **125**, such as an operating system **135** (for example, Windows® NT® 4.0, sold by Microsoft® Corporation of Redmond, Wash.), one or more application programs **136**, other program modules **137** (such as "Alice", which is a research system developed by the User Interface Group at Carnegie Mellon University available at www.Alice.org, OpenGL from Silicon Graphics Inc. of Mountain View Calif., or Direct 3D from Microsoft Corp. of Bellevue Wash.), and/or program data **138** for example.

A user may enter commands and data into the computer **120** through input devices, such as a keyboard **140**, a camera **141** and pointing device **142** for example. Other input devices (not shown) such as a microphone, joystick, game pad, satellite dish, scanner, a touch sensitive screen, accelerometers adapted to sense movements of the user or movements of a device, or the like may also be included. These and other input devices are often connected to the processing unit **121** through a serial port interface **146** coupled to the system bus. However, input devices may be connected by other interfaces, such as a parallel port, a game port, blue tooth connection or a universal serial bus (USB). For example, since the bandwidth of the camera **141** may be too great for the serial port, the video camera **141** may be coupled with the system bus **123** via a video capture card (not shown). The video monitor **147** or other type of display device may also be connected to the system bus **123** via an interface, such as a video adapter **148** for example. The video adapter **148** may include a graphics accelerator. One or more speaker **162** may be connected to the system bus **123** via a sound card **161** (e.g., a wave table synthesizer such as product number AWE64 Gold Card from Creative® Labs of Milpitas, Calif.). In addition to the monitor **147** and speaker(s) **162**, the computer **120** may include other peripheral output devices (not shown), such as a printer, a hi-definition television and a scanner for example. As an alternative or an addition to the video monitor **147**, a stereo video output device, such as a head mounted display or LCD shutter glasses for example, could be used.

The computer **120** may operate in a networked environment which defines logical connections to one or more remote computers, such as a remote computer **149**. The remote computer **149** may be another computer, a server, a

router, a network PC, a peer device or other common network node, and may include many or all of the elements described above relative to the computer **120**. The logical connections depicted in FIG. **3** include a local area network (LAN) **151** and a wide area network (WAN) **152**, an intranet and the Internet.

When used in a LAN, the computer **120** may be connected to the LAN **151** through a network interface adapter (or "NIC") **153**. When used in a WAN, such as the Internet, the computer **120** may include a modem **154** or other means for establishing communications over the wide area network **152** (e.g. Wi-Fi, WinMax). The modem **154**, which may be internal or external, may be connected to the system bus **123** via the serial port interface **146** or another type of port interface. In a networked environment, at least some of the program modules depicted relative to the computer **120** may be stored in the remote memory storage device. The network connections shown are exemplary and other means of establishing a communications link between the computers may be used.

Visual Document Attribute Discrimination

Referring to FIG. **4**, is illustrated a first array of documents **200** comprising a group of documents **202**, **204**, **206**, **208**, **210**, **212**, **214**, **216**, **218**, **220**, **222** disposed along a chronological order **230** on a graphical user interface adapted to manage documents.

Each document is associated with related attributes or tags, or keywords. In the present embodiment, each attribute is illustratively represented with a capital letter A, B, C, D or E. An attribute is selected, most likely by a user, from all the attributes associated with at least one of the documents present on the first array of documents **200**. For instance, attribute E is selected. Documents **206**, **212**, **216**, **220**, **222** are illustratively associated with the selected attribute (i.e. attribute E). The document from which attribute E is selected acts as intersecting document. Alternatively, another document could be used as intersecting document although it makes sense to use the document from which the attribute has been selected.

Thus, attribute E is selected and document **212** is the intersecting document intervening between both arrays of documents **200**, **300**. The intersecting document **212** is located at the intersection of both arrays of documents **200**, **300** to graphically put emphasis on the relationship between both arrays of documents **200**, **300**. A bold frame **240** or other visually discriminating element, optionally, illustrates that the selected attribute has been selected from this particular document **212**.

The second array of documents **300** is created, simultaneously or consecutively with the display of the first array of documents **200**, showing the documents from the first array of documents **200** that have the selected attribute E associated therewith. In other words, documents **206**, **212**, **216**, **220** and **222** are search results obtained with the query "attribute E" disposed on the second document array **300** along the chronological order **232**. As it can be appreciated, documents **206**, **212**, **216**, **220** and **222** are copied on both arrays of documents **200**, **300** where document **206** is copied and shown as document **302**, document **212** is copied as document **304** (the same document used as intersecting document **212** therefore used a single time by both arrays of documents **200**, **300**), document **216** is document **306**, document **220** is document **308** and document **222** is document **310**.

Since documents **206**, **216**, **220**, **222** are copied on both arrays of documents **200**, **300** it could be confusing for a user to see the same documents **206**, **216**, **220** and **222** displayed at two different places, e.g. displayed on both array of documents **200** and array of documents **300**. Or, it could be useful to a user to see where is copied a document of interest.

In order to identify and discriminate the documents on the first document array **200** that will be found on the second array of documents **300**, a discrimination visual feature **250** is applied to the documents **206**, **212**, **216**, **220**, **222** and similarly applied to the documents **302**, **304**, **306**, **308**, **310** displayed on the second array of documents **300**. In the present situation the illustrative discriminative visual feature darkens **250** the relevant documents as shown on FIG. **4**. The discriminative visual feature **250** assists an observer, or a user of the system, to infer which documents from the first array of documents **200** will also appear on the second array of documents **300** and where it will appear so that a quick relation can be established between the duplicated documents **206**, **216**, **220** and **222**. Document **212** is a special case and is darken **250** for a reason of consistency despite it is not duplicated for obvious reasons.

It might be desirable that the discriminating visual feature **250** be applied (or enabled) to the documents having the attribute E associated therewith on the first array of documents **200**, then, display the second array of documents **300** with the duplicated documents **206**, **216**, **220** and **222**. Then, enable the discriminating visual feature to be displayed with documents **302**, **304**, **306**, **308**, **310** on the second array of documents **300**.

The discriminating visual feature **250** can appear for a limited lapse of time at the moment the second array of documents **300** is displayed so that an observer, or a user, could see which documents from the first array of documents **200** will also appear on the second array of documents **300**. The discriminating visual feature **250** will disappear after a pre-selected delay is expired. Conversely, discriminating visual features **250**, such as a document color, a document frame and a document texture applied to the documents to be duplicated, can remain associated with the subject documents as long as the second array of documents **300** is displayed. Conversely, the discriminating visual features **250** can remain visible for a predetermined amount of time and then disappear.

The discriminating visual feature **250** could be a color applied to the documents, a border around the documents, animations, an alteration of a portion of the documents, an animation showing a movement **260** of each documents having the E attribute from the first array of documents **200** to their respective position on the second array of documents **300**. The display of the discriminating visual feature **250** can be made with an animation **260** literally moving, or copying, documents **206**, **216**, **220**, **222** from the first array of documents **200** to their respective locations on the second array of documents **300**.

Any visual means capable of discriminating the documents from a user point of view so that the user can see which documents from the first array of documents **200** will be, or is, duplicated on the second array of documents **300** is encompassed by the present specification. Also, more than two arrays of documents can be involved into the use of the discriminating visual features.

Referring now to FIG. **5** where are provided three parallel arrays of documents **330**, **340**, **350**. The first array of documents **330** displays a group of documents **332** having a respective selection of attributes A, B, C, D, E and F associated therewith. Attribute E, in relation with all attributes associated with the first array of documents **330** or in relation with a particular document from the first array of documents **330** or from a list of attributes is selected and

leads to the creation of array of documents **340** displaying only documents having the attribute E. The discriminating visual feature **250** is applied so that an observer, or a user, would see which documents from the first array of documents **330** are associated with the attribute E and are to be duplicated on the second array of documents **340** when the attribute E is selected and the second array of documents **340**, displaying only the documents **334**, **336**, **338** associated with the attribute E, is created and displayed. As explained above, but this time in respect to substantially parallel arrays of documents, this application of discriminating visual feature **250** helps preventing any confusion occurring with the duplication of a number of documents. The second array of documents **340**, thus, displays a group of documents **342** having the attribute E in common.

The same principle is applied to the third array of documents **350** that displays a group of documents **352**, **354**, **356** having the attribute F in common. A logic similar to the logic described in respect with attribute E applies here where a discriminating visual feature **252** put a X on the documents having the attribute F that will be duplicated on the third array of documents **350** grouping the documents having the attribute F in common. Similarly discriminating visual feature **252** marks the documents having the attribute F that are displayed on the third array of documents **350** grouping the documents having the attribute F in common.

Here again, the application of the discriminating visual feature **352** can be made with an animation **260** clearly moving, or copying, documents **352**, **354**, **356** from the first array of documents **330** to their respective locations on the third array of documents **352**.

The illustrative embodiments presented herein are presenting three arrays of documents **330**, **340**, **350**. However, the present specification does not intend to limit the number of arrays displayed consecutively or simultaneously.

Document Color Coding

As mentioned above, discriminative visual features **250**, **252** are useful to distinguish documents from other documents that do not share some specific attribute, or tag, or key word.

Documents can be reduced and magnified in size according to the number of documents desired to be seen at one time on a display. When the document is too small to appreciate its details it is convenient to use colors, shapes and patterns associated to different meanings, attributes and/or tags so that a viewer can infer the associated meaning without having to magnify the document. More than one attribute can be represented by an arrangement of shape and colors. Various colors, shapes and patterns could be used and the scope of the present application does not intend to limit their possible variations.

It is desirable be inspired by color and pattern coding associated with something already well known in a non-analogous field to represent one attribute of a combination of attributes. One possible option is to see what is done in the field of poker where colors and patterns are used to distinguish the chips used in the game as opposed to real money. The colors and patterns are intended to be easily recognizable a chip's value when the chip is seen from its face and from its side without reading the actual writing on it.

Typically colors found in home sets of poker chips include red, white, blue and sometimes black; however, more recently a wide assortment of colors has become readily available.

$2.50 chips are almost exclusively used for blackjack tables, since a "natural" (a 21 on the first two cards dealt to a player) typically pays 3:2 and most wagers are in increments of $5. However, the Tropicana Casino in Atlantic City, N.J. has used pink chips in $7.50-$15 and $10-$20 poker games. Low-denomination yellow chips can vary in value: $20 by statute in Atlantic City and Illinois (which also uses "mustard yellow" $0.50 chips); $5 at most Southern California poker rooms; $2 at Foxwoods' poker room in Ledyard, Conn. and at Casino del Sol in Tucson, Ariz.; and $0.50 at Potawatomi Casino in Milwaukee, Wis. Blue chips are occasionally used for $10, most notably by statute in Atlantic City. In Las Vegas and California, most casinos use blue or white for $1 chips, though many Vegas tables now use $1 metal tokens in lieu of chips. Many casinos have coinless slot machines, and this practice reduces costs by limiting $1 chips to the craps tables, where such chips are necessary.

Chips are commonly available in $1000 denominations, depending on the wagering limits of the casino in question. Such chips are often yellow or orange and of a large size. Las Vegas, Atlantic City, and other areas, which permit high wagers typically, have chips available in $5,000, $10,000, $25,000, and higher denominations; the colors for these vary widely.

European casinos use a similar scheme, though certain venues (such as Aviation Club de France) use pink for € 2 and blue for € 10. European casinos also use plaques rather than chips for high denominations (usually in the € 1000 and higher range).

In many places, gaming boards regulate the color and size of casino chips for consistency. All states require that casino chips have a unique combination of edge (e.g. side) spots for identification, the name and location of the casino and the chip's value, if any, impressed, printed, or molded onto the obverse and reverse of the token. Notably, Nevada has no regulations on color; this is why Nevada casinos may use white, blue, or gray as $1, though $5 and higher are almost always consistently colored.

Referring to FIG. **6**, the color and shape used on poker chips **400** are distinguishable when the chip is seen from its face **402** and from its side **404**.

A possible standard, for example, could use the following color-coding scheme illustrated in Table 1.

TABLE 1

Poker chips 400 colors 406, 408 and shape 412 values

Denomination	Main color 406	Secondary color 408 and secondary shape 412
$0.50	Dark yellow	None
$1	White	None
$2.50	Pink	Round black
$5	Red	Square yellow
$10	Blue	Round white
$20	Bright yellow	Square black
$25	Green	Round yellow
$100	Black	Square white
$500	Purple	Rectangle white
$1000	Fire orange	Lozenge black
$5000	Gray	Triangle red

The denomination is the actual value of the chip **400**. The main color **406** is used on a portion of the circumference of the chip **400** so that is can be consistently appreciated when seen from the face **402** and from the edge/side **404**. FIG. **6** is depicting a possible main color **406** and main shape **410** but other shapes/patterns are considered within the scope of the present specification. The secondary color **408** appears in a secondary shape **412** consistently visible from the face view **402** and from the side view **404** in a contrasting color

portion **414** (in the present example it is black). In the present example the secondary shape is a circle but it could be any other recognizable shape, e.g. square, triangle, oval, hexagon, diamond, spade, heart, skull, flag, clubs or a letter/number.

The application of a color and pattern code on documents could be defined as follow in Table 2 for illustrative purpose.

TABLE 2

Documents color codes and meaning

Main color 424	Importance	Secondary color 426	Delay	Secondary shape 430	Document type
Green	Low	Green	Prospective	Square	Email
Orange	Medium	Orange	In time	Circle	Text
Red	High	Red	Urgent	Rectangle	Webpage
				Heart	Picture
				Lozenge	Not assigned yet
				Triangle	Not assigned yet

Referring to FIG. **7** is shown an icon **422** representing a document **420**. The icon **422** is a small representation of a document **420** used when the document would be shown too small for perceiving the details of the actual document **420**. For this reason the color and pattern coding take illustratively all the area on the icon **422**. The main color **424** is illustratively disposed on the periphery of the icon **422** while the secondary color **426** is displayed in cooperation with the secondary shape **430**. Again, the secondary color **426** and secondary shape **430** are disposed in a contrasting portion **432**.

Still on FIG. **7**, for example, if the main color **424** is illustratively orange, the secondary color **426** is illustratively orange and the secondary shape **430** is illustratively round. According to Table 2, the attributes associated with the main color **424**, the secondary color **426** and the secondary shape **430** of document **420** infer that it is a "text document" that is of "medium importance" and dealt with "in time". This way, with a simple look over documents, it is possible to retrieve the "urgent documents" **420** by finding the documents having a secondary color **426** that is "red".

FIG. **8** illustrates the same document in a thumbnail size **438** where it is possible to see the text document in much smaller size than the actual real life document size **440**. The colors **424**, **426** and the shape **430** are illustratively identified on the bottom of the thumbnail document **438** to limit the interference with the visible portion of the document **420**.

FIG. **9** illustrates the actual document **420** in a real life size **440**, or magnified size, so that it is possible to read the text of the document. In this case the colors **424**, **426** and the shape **430** are applied on the circumference of the document **420** not to hide the document **420** itself.

Shapes and colors can be shared among users. The actual layout of the main color **420**, the secondary color **426** and the secondary shape **430** on the document **420** are for illustrative purpose and could be changed while keeping the same spirit and without departing from the present specification.

Associated Attributes

As identified above, attributes, tags or key words are used to categorize and discriminate documents. The use of several attributes is desirable to properly classify documents with as many different attributes as necessary. This is probably workable without too much difficulty if there is a single user classifying its own documents with its own set of attributes, although it might not. When documents are exchanged among a plurality of users it becomes more difficult to keep a clear list of attributes since a user has to consider the attributes created by other users.

One possible issue arises when doing a search among documents. For instance, two (or more) attributes from different users (or perhaps a single user) can substantially share the same meaning. If only one attribute is selected to build the search query only the documents associated with this particular attribute will be presented as results. In other words all relevant documents associated to like attributes in meaning (but literally different attributes) will not be retrieved despite they could be relevant.

A way to fix this would be to change attributes on documents provided or shared by others. One can imagine that this process would be painful and time consuming. Realistically it would not be possible to do such an up-date to documents. Even if this was possible it would risk to created such a mess with shared documents that would then appear to have different attributes for each user.

An embodiment of the present specification provides associated attributes. An associated attribute is, like it says, associated with another attribute so that when an attribute is selected the associated attribute is considered as well.

Two documents (1), (2), **450**, **452** are illustrated on FIG. **10** with respective associated attributes **454**, **456**. For example, if attribute A is selected to retrieved documents associated therewith, only document 1 would be retrieved as a result. There is no similar attribute with document 2 that is shared by another user because the document (2) **452** is categorized with the other user's attributes. The search would fail to provide all relevant results if attribute A of our user is equivalent in sense to attribute G of the other user's attribute. Therefore, the present embodiment provides a way to associate attribute A with attribute G as illustrated in FIG. **11**.

FIG. **12** shows what happens with an attribute based search query if attribute A is associated with attribute G: both document 1 and document 2 are retrieved and presented in the results.

In the latter illustrative example, the logical operator used between attribute A and attribute G is logical operator (AND). Other logical operators could be used between associated attributes. One example could be to associate attribute A with attribute G with the logical operator (NOT) to exclude documents having both attribute A and G from the search results by keeping only documents associated with attribute A in combination with other attributes but attribute G.

To achieve this a correspondence table (not shown) could be used where a user indicates which attribute is associated with which other attribute(s). The attributes could be attributes of a single user or be attributes shared by other users. The attributes shared by other users could be shared by sharing the actual attribute(s) or by sharing documents having the attribute(s) associated therewith. In the latter situation the attribute(s) might not be usable by the user if the other user has granted no such access right.

Associated attributes can evolve over time. At first, two attributes can be associated together and later a third attribute can be associated thereto. The evolution of each "package" of associated attribute can be illustrated over a timeline showing when each additional attribute has been added to the "package" and when attributes have been removed from the "package" of attributes. It is desirable to keep track of the

time of entry and the time of extraction of each attribute in a "package" of attributes to properly define a query targeting a specific time period.

Grouped Attributes

It can rapidly become time consuming to individually associate many attributes with a document (or a plurality of documents at the same time). In order to facilitate the process of associating attributes to documents it is provided herein to group attributes that are likely to be used together when associating attributes to document(s). In turn, many different groups of attributes can be created and retrieved when desired.

FIG. **13** illustrates a block diagram of a system capable of providing such mechanism. A display module **470** is provided to display documents and attributes; an organization module **472** adapted to organize documents with related attributes; a selection module **474** is adapted to select attributes and documents by a user; a group sharing module **476** adapted to share groups of attributes among users; a grouped attributes module **478** adapted to manage groups of attributes and a user interface module **480** adapted to provide user interaction based, at least in part, on a graphical display of user-selectable elements adapted to offer choices to a user in order to establish a dialogue with the user.

Turning now to FIG. **14** illustrating an exemplary flow chart of a possible sequence of actions leading to the use of groups of attributes. The sequence starts **490** with defining a name of a subject group of attributes **492** (to be created) and inserting an attribute **494** in the group of attributes with a predetermined selected default value associated with the attribute **496** (an alternative would provide an attribute with no value although the present embodiment uses a more refined attribute/value system thus requiring to select a default value to the attribute). It is determined if the attribute is a "master attribute" or not a master attribute **498**. A master attribute is an attribute that, when selected in the course of associating attributes with document(s), will call the other attributes of the group of attributes to the dialogue presented to the user. The user can decide which attribute(s) from the group of attributes, and desired value associated therewith, when applicable, will be associated with the document(s). Each attribute in a group of attributes can be designed as a "master attribute". This way, the selection of any of the "master attributes" of a group of attributes will call the other attributes from the group of attributes in the dialogue allowing association of attributes with document(s). Steps **494**, **496** and **498** are repeated for each attribute in the group of attributes. Several choices are offered to the user managing the group of attributes. Still in FIG. **14**, undesired attributes can simply be removed (or deleted) **500** from the group of attributes, other attributes that are not already part of the group of attributes can alternatively be added as previously discussed. The default value of each attribute can be changed **502**. Finally, the group of attributes can either be enabled **504** or disabled **506** depending of the pertinence of the group before the illustrative process ends **508**.

Turning now to FIG. **18** illustrating an exemplary process for associating attribute(s) to document(s). The process begins **520** with the selection of an attribute **522** intended to be associated with the document(s). If the selected attribute is a "master attribute" a dialog opens **526** to offer the other attributes from the group of attributes that includes the selected "master attribute". It is possible to modify the attributes forming the group of attributes by adding, removing or altering the attributes/values of the group of attributes **528**. The attributes are associated to the document(s) **530** when the adjustment(s), if needed, on the proposed group of attributes are done. Alternatively, if the selected attribute **522** is not a master attribute **524** then, the selected attribute can be associated with the document(s) **532** without offering a group of attributes before the process ends **534**.

Other attributes forming another group of attributes are added in the dialog when another master attribute is selected. Redundant attributes will be automatically removed from the dialog. Many attributes, master attribute(s) or not, can be added in the dialog to properly categorize the subject document(s).

Turning to FIG. **16** illustrating a master attribute **540** accompanied by a master attribute identifier **542** adapted to be associated with document (1) **544**. When the master attribute **540** is selected it calls the other attributes **546** from the group of attributes the master attribute **540** relates to. FIG. **17** illustrates the association of all attributes from the group of attributes with document (1).

An exemplary group attributes management dialog **550** is illustrated in FIG. **18**. The dialog **550** displays the name **552** of the group of attributes. Each attribute in the group is disposed on a row. Each row presents editable choices related to each attribute. In the present situation, column **554** identifies if the attribute is a master attribute, column **556** identifies the name of the attribute, column **558** identifies the value of the attribute and column **560** offers the choice of deleting the attribute from the group of attributes. Other attributes can be added **562** if desired.

Access rights can be managed with another dialog as embodied in FIG. **19**. Each group of attributes is illustrated on a row. Similarly with the dialog of FIG. **18**, each column offers editable information. Namely, to enable or disable **570** the group of attributes, to which user or group of user **572** the group of attribute is accessible to and, inter alia, as understood, the name of each group of attributes **574**. It is also possible to add **576** or delete **578** a group of attributes from the group of attribute access right management dialog **580**.

Grouped attributes can evolve over time. At first, two attributes can be grouped together and later a third attribute can be added in the group. The evolution of each group of attributes can be illustrated over a timeline showing when each additional attribute has been added to the group of attribute and when attributes have been removed from the group of attributes. It is desirable to keep track of the time of entry and the time of extraction of each attribute in a group of attributes to have the possibility to retroactively modify attributes that have been associated with a document based on the use of the group of attributes.

Bridge Attributes

It is sometimes desirable to associate attributes to a document that do not categorize the document. This non-categorizing attribute is called a bridge attribute (or indirect attribute). It bridges the document to which it is associated [without further categorizing it] with other documents categorized by this bridge attribute [the bridge attribute is a direct attribute to them]. The bridge attribute, as opposed to a direct attribute, is associated with a document, or documents, because it builds a bridge, a link, leading to other relevant related documents. The same attribute thus can be a direct attribute for some documents and a bridge attribute for other documents. It is desirable that each direct attribute has its corresponding bridge attribute but it is not mandatory.

FIG. **20** illustrates a block diagram of a system capable of providing such mechanism. A display module **600** is provided to display documents and attributes; an organization module **602** adapted to organize documents with related attributes; a selection module **604** is adapted to select

attributes and documents by a user; a direct attribute module **606** adapted to manage direct attributes; a bridge attributes module **608** adapted to manage bridge attributes and a user interface module **610** adapted to provide user interaction based, at least in part, on a graphical display of user-selectable elements adapted to offer choices to a user in order to establish a dialogue with the user.

Turning now to FIG. **21** illustrating an exemplary flow chart of a possible sequence of actions leading to the use of direct and bridge attributes. The sequence starts **620** with the insertion of a new document **622**, or the insertion of many documents or the modification of attributes already associated with document(s) already entered in the system and the sequence ends **628**. In contrast, in FIG. **22**, an illustrative sequence of actions related to the use of direct and bridge attributes is shown. The sequence starts **650** by having the choice of either selecting one or more direct attributes **652** or selecting one or more bridge attributes **656**. If a direct attribute has been selected **652** a query is launched to retrieve other documents directly associated with the direct attribute **654**. In contrast, if a bridge attribute has been selected **656** a query is launched to retrieve other documents associated with the selected bridge attribute **658** before the process ends **660**. The selection of either direct or bridge attributes is not exclusive and a mix of direct and bridge attributes can be made to build a query to retrieve relevant documents.

FIG. **23** illustrates a plurality of attributes that can be either directly associated with documents or bridge documents to other documents by being associated with documents as bridge attributes. FIG. **24** illustrates two documents, document (1) and document (2), associated with respective direct attributes A and E. FIG. **25** illustrates the same two documents of FIG. **24** with bridge attribute E [in dotted line] being associated with document (1). In so doing, bridge attribute E associated with document (1) builds a link, or a bridge to use the same wording, with document (2) because document (2) is directly associated with attribute E; the bridge being illustrated with the dotted line **670**.

Lets use an example that patent people will understand to illustrate the current embodiment in relation with FIGS. **24**, **25** and **26**. Document (1) **800** is a USPTO form PTO/SB/07 used to file prior art related to a patent application with the USPTO in an Information Disclosure Statement (IDS). Document (1) **800** can be associated with attributes that could be 1) "document sent to USPTO" [because this document is sent by the applicant to the United States Patent and Trademark Office], 2) "PTO/SB/07" [the USPTO form identification], 3) "IDS" [that is the purpose of the document] and/or 4) "attorney's file number xxx" [that indicates to which matter number this document relates to]. These attributes work fine with document (1) **800** but it would be useful to have direct access to the actual patent document [illustratively document (2) **810**] cited in document (1) **800** (USPTO form PTO/SB/07). Document (1) **800** (USPTO form PTO/SB/07) is not a patent document and therefore is not associated with the attribute E **806** "patent document". A bridge attribute E B**806** "patent document" is therefore associated with document (1) **800** (USPTO form PTO/SB/07) despite the bridge attribute E B**806** "patent document" is not categorizing document (1) **800** (USPTO form PTO/SB/07) [because document (1) **800** is not a patent document]. The bridge attribute E B**806** "patent document" would lead to documents associated directly with attribute E **806**, in the present situation the actual patent document (2) **810** cited in document (1) **800** (USPTO form PTO/SB/07) [here we assume there is only one patent publication to be cited in the IDS]. And, in turn, patent document (2) is directly associated with the [direct] attribute E **806** "patent document" that is actually correctly categorizing the patent document (2) **810**. As one has understood from the figures, direct attributes are illustrated in solid lines and bridge attributes are illustrated in dotted lines.

Now referring more precisely to FIGS. **26**, **27** and **28**, document (1) **800** (USPTO form PTO/SB/07) is directly associated with attribute A **802** that is the "document sent to USPTO" attribute. The bridge attribute E B**806** "patent document" is also associated with document (1) **800**. The actual patent documents cited in the "IDS" of document (1) **800** are document (2) **810** and document (3) **812**, both associated with attribute E **806**.

Still referring to the exemplary embodiment of FIGS. **26**, **27** and **28**, the selection of attribute A **802** is adapted to launch a search to gather all documents having the attribute A **802** in common. Similarly, as mentioned above, it is desirable to allow an association with related documents not directly categorized by attribute A **802** but meaningful to document (1) **800** with a bridge attribute. The bridge attribute E **806** is a direct attribute associated with document (2) **810** and is a bridge attribute to document (1) **800**. Thus, attribute E is an attribute to document (2) **810** and document (3) **812** and is a bridge attribute to document (1) **800**.

FIG. **27** illustrates the graphical association between direct attributes A, B, C, D, E, F, G, H, I, J, K and their respective documents (1), (2), (3) **800**, **810**, **812** using boxes of solid lines. The bridge attribute E B**806** is also graphically associated, illustratively using a dotted lined box to distinguish the bridge attribute E B**806** from direct attributes illustrated in solid lines, with document (1) **800**. The selection of direct attribute A from document (1) leads, when the attribute is selected in the context of a query, to other documents having the attribute A associated thereto. The selection of bridge attribute E B**806** on document (1) **800** leads to document (2) **810** and document (3) **812**, which neither share a direct common attribute with document (1) **800**. The bridge attribute E B**806** bridges document (1) with document (2) and (3) because they are relevant to document (1). In addition, other documents also associated with attribute E **806** will be provided if the bridge attribute E B**806** was selected in the context of the building of a query.

FIG. **28** illustrates the documents of FIG. **27** with additional bridge attributes associated therebetween. One can appreciate that document (2) is associated with direct attribute E, F, G, H and bridge attribute A. Bridge attribute A draw a connection with document (1) despite document (2) has no common direct attribute with document (1). Similarly, one can also appreciate that document (3) is associated with direct attribute E, I, J, K and bridge attribute C. Bridge attribute C draw a connection with document (1) despite document (3) has no common direct attribute with document (1). As it is shown, bridge attributes can be used in both directions.

A computer-readable medium including computer-executable instructions for performing a method of discriminating documents, the method comprising: displaying a first array of documents; receiving instructions from the selection of an attribute associated with at least one document; displaying a second array of documents grouping documents having the selected attribute; and displaying documents associated with the selected attribute with a graphical discriminating feature.

The computer-readable medium of claim **1**, wherein the graphical discriminating feature is displayed on the first array of documents.

The computer-readable medium of claim **1**, wherein the graphical discriminating feature is displayed on the second array of documents.

The computer-readable medium of claim **1**, wherein the graphical discriminating feature is associated with a transition between the first array of documents and the second array of documents.

The computer-readable medium of claim **1**, wherein the graphical discriminating feature is a displacement of documents having the selected attribute from the first array of documents to their respective positions on the second array of documents.

The computer-readable medium of claim **1**, wherein the graphical discriminating feature is applied on the documents having the selected attribute on the first array of documents and the second array of documents.

The computer-readable medium of claim **1**, wherein the graphical discriminating feature is selected from a group consisting of a document color, a document frame, a document texture, a document animation.

The computer-readable medium of claim **1**, wherein the graphical discriminating feature is progressively applied to the documents.

The computer-readable medium of claim **1**, wherein the display of the second array of documents triggers the removal of the first array of documents.

In a computing device, a method of discriminating documents, the method comprising: displaying a first array of documents; receiving instructions about the selection of an attribute associated with at least one document; displaying a second array of documents grouping documents having the selected attribute; and displaying documents associated with the selected attribute with a graphical discriminating feature.

A system for discriminating documents comprising: a display module adapted to display arrays of documents; a selection module adapted to manage a signal provided by a selection of an attribute; and a discriminating feature module adapted to apply discriminating features to documents having the selected attribute.

A graphical user interface adapted to graphically discriminate documents from a first array of documents that are also displayed on a second array of documents to show which documents from the first array of documents are on the second array of documents.

A computer-readable medium including computer-executable instructions implementing a method of discriminating documents, the method comprising: associating a first graphical discriminator with a first attribute; associating a second graphical discriminator with a second attribute; and displaying the first graphical discriminator and the second graphical discriminator with a document having the first attribute and the second attribute associated therewith. The computer-readable medium of claim **13**, wherein the graphical discriminator is selected from a group consisting of a color and a shape.

The computer-readable medium of claim **13**, wherein the attribute is a value.

In a computing device, a method for graphically associate a plurality of attributes with documents, the method comprising: providing a group of graphical discriminators associated with attributes and analogous to poker chips design; displaying graphical discriminators, associated with attributes associated with a document, with the document.

A computer-readable medium including computer-executable instructions providing a method of grouping documents, the method comprising: associating a plurality of attributes therewith; providing a document; selecting at least one attribute from the plurality of attributes; providing at least a some of the remaining attributes from the plurality of attributes; and associating at least one attribute from the plurality of attributes with the document.

The computer-readable medium of claim **17**, wherein at least one attribute from the plurality of attributes comprises the attribute and a value associated therewith.

The computer-readable medium of claim **17**, wherein the plurality of attributes is adapted to be associated with a workspace.

The computer-readable medium of claim **19**, wherein the plurality of attributes is a cluster of attributes, further comprising providing a plurality of clusters of attributes adapted to respectively be associated with workspaces.

The computer-readable medium of claim **19**, wherein at least one attribute from the plurality of attributes is a master attribute adapted to call the other attributes from the plurality of attributes.

The computer-readable medium of claim **19**, wherein the plurality of attributes is adapted to be shared with a plurality of users.

In a computing device, a method for graphically associating a plurality of attributes with documents, the method comprising: associating a plurality of attributes therewith; providing a document; selecting at least one attribute from the plurality of attributes; providing at least a some of the remaining attributes from the plurality of attributes; and associating at least one attribute from the plurality of attributes with the document.

A system for grouping documents to be associated with a document, the system comprising: a display module adapted to display documents; a grouped attributes module adapted to group attributes; and a selection module adapted to receive instructions from a selection of an attribute.

A computer-readable medium having computer-readable code stored thereon providing a method of associating attributes with a document, the method comprising: directly associating a first attribute with a first document; directly associating a second attribute with a second document; and indirectly associating the second attribute with the first document, the second attribute being a bridge attribute to the first document.

The computer-readable medium of claim 25, wherein the bridge attribute does not categorize the first document and draws a link between the first document and the second document.

A method of associating attributes with a document, the method comprising: directly associating a first attribute with a first document; directly associating a second attribute with a second document; and indirectly associating the second attribute with the first document, the second attribute being a bridge attribute to the first document.

The method of claim 27, wherein the bridge attribute does not categorize the first document and draws a link between the first document and the second document.

The description and the drawings that are presented above are meant to be illustrative of the present invention. They are not meant to be limiting of the scope of the present invention. Modifications to the embodiments described may be made without departing from the present invention, the scope of which is defined by the following claims:

What is claimed is:

1. A non-transitory computer-readable storage medium for tangibly storing computer-readable code thereon suitable for execution by a computing apparatus, the computer-readable code, when executed, being adapted to implement a method for visually indicating on a display those user-

selectable elements that have been displayed in a plurality of independent user-selectable elements based on a user-selected attribute, the method comprising:

(a) providing a group of user-selectable elements, at least some of which are associated with one or more attributes;

(b) displaying user-selectable elements of the group of user-selectable elements along a first axis displaying a single juxtaposition of user-selectable elements according to a first predetermined collation function along a generally rectilinear orientation, each user-selectable element being graphically represented, the user-selectable elements being spaced apart from each other according to the first predetermined collation function;

(c) with respect to a user-selected attribute of one of the group of user-selectable elements that is associated with one or more attributes,

(i) receiving user input representing the user-selected attribute;

(ii) displaying user-selectable elements of the group of user-selectable elements along a second axis, independent from the first axis, the second axis displaying a single juxtaposition of user-selectable elements according to a second predetermined collation function along a generally rectilinear orientation, each user-selectable element being graphically represented, the user-selectable elements being spaced apart from each other according to the second predetermined collation function;

(iii) identifying, on the second axis, each user-selectable element of the group of user-selectable elements that has the user-selected attribute; and

(iv) displaying a visual distinctive feature for each displayed user-selectable element along the second axis that has the user-selectable attribute,

whereby a user is able to visualize which user-selectable elements have the user-selected attribute along the second axis.

2. The non-transitory computer-readable storage medium tangibly storing computer-readable code thereon for implementing the method of claim **1**, wherein the first axis is displayed adjacent and parallel to the second axis.

3. The non-transitory computer-readable storage medium tangibly storing computer-readable code thereon for implementing the method of claim **1**, wherein the second axis is displayed at an angle in respect to the first axis and intersects or abuts the first axis at a displayed document on the first axis having the user-selected attribute.

4. The non-transitory computer-readable storage medium tangibly storing computer-readable code thereon for implementing the method of claim **1**, wherein at least one of the collation functions is a chronological order thereof.

5. The non-transitory computer-readable storage medium tangibly storing computer-readable code thereon for implementing the method of claim **1**, wherein the user-selectable elements simultaneously displayed in the first and second axes are adapted to be axially aligned on their respective axes to provide a graphical transversal alignment thereof.

6. The non-transitory computer-readable storage medium tangibly storing computer-readable code thereon for implementing the method of claim **1**, wherein, with respect to the user-selected attribute, the visual distinctive feature is adapted to be selectively displayed.

7. The non-transitory computer-readable storage medium tangibly storing computer-readable code thereon for implementing the method of claim **1**, wherein, with respect to the user-selected attribute, the visual distinctive feature is selected from a group consisting of a pattern, a border and a color.

8. The non-transitory computer-readable storage medium tangibly storing computer-readable code thereon for implementing the method of claim **1**, wherein, with respect to the user-selected attribute, the visual distinctive feature is progressively applied to the user-selectable elements.

9. The non-transitory computer-readable storage medium tangibly storing computer-readable code thereon for implementing the method of claim **1**, further comprising

(i) identifying on the first axis each user-selectable elements from the group of user-selectable elements that has the user-selected attribute; and

(ii) displaying the visual distinctive feature for each displayed user-selectable element along the first axis that has the user-selectable attribute;

whereby a user is able to visualize which user-selectable elements have the user-selected attribute along the first axis.

10. The non-transitory computer-readable storage medium tangibly storing computer-readable code thereon for implementing the method of claim **1**, wherein, with respect to the user-selected attribute, the visual distinctive feature is displayed in connection with user-selectable elements along the first axis that are displayed in connection with any user-selectable element along the first axis that is not displayed on the second axis.

11. The non-transitory computer-readable storage medium tangibly storing computer-readable code thereon for implementing the method of claim **1**, wherein the implemented method further comprises displaying an animation showing a movement of one or more of user-selectable elements that are displayed on the two axes.

12. The non-statutory computer-readable storage medium tangibly storing computer-readable code thereon for implementing the method of claim **1**, wherein the user-selected attribute comprises a value.

13. A method for visually indicating on a display those user-selectable elements that have been copied from one axis of user-selectable elements to another axis of user-selectable elements based on a user-selected attribute, the method comprising:

(a) providing a group of user-selectable elements, at least some of which are associated with one or more attributes;

(b) displaying user-selectable elements of the group of user-selectable elements along a first axis displaying a single juxtaposition of user-selectable elements according to a first predetermined collation function along a generally rectilinear orientation, each user-selectable element being graphically represented, the user-selectable elements being spaced apart from each other according to the first predetermined collation function;

(c) with respect to a user-selected attribute of one of the group of user-selectable elements that is associated with one or more attributes,

(i) receiving user input representing the user-selected attribute;

(ii) displaying user-selectable elements of the group of user-selectable elements along a second axis, independent from the first axis, the second axis displaying a single juxtaposition of user-selectable elements according to a second predetermined collation function along a generally rectilinear orientation, each user-selectable element being graphically represented, the user-selectable elements being spaced

apart from each other according to the second predetermined collation function;

(iii) identifying, on the second axis, each user-selectable element of the group of user-selectable elements that has the user-selected attribute; and

(iv) displaying a visual distinctive feature for each displayed user-selectable element along the second axis that has the user-selectable attribute,

whereby a user is able to visualize which user-selectable elements have the user-selected attribute along the second axis.

14. The method of claim **13**, wherein the first axis is displayed adjacent and parallel to the second axis.

15. The method of claim **13**, wherein the second axis is displayed at an angle in respect to the first axis and intersects or abuts the first axis at a displayed user-selectable element on the first axis having the user-selected attribute.

16. The method of claim **13**, wherein at least one of the collation functions is a chronological order thereof.

17. The method of claim **13**, wherein the user-selectable elements simultaneously displayed in the first and second axes are adapted to be axially aligned on their respective axes to provide a graphical transversal alignment thereof.

18. The method of claim **13**, wherein, with respect to the user-selected attribute, the visual distinctive feature is adapted to be selectively displayed.

19. The method of claim **13**, wherein, with respect to the user-selected attribute, the visual distinctive feature is selected from a group consisting of a pattern, a border and a color.

20. The method of claim **13**, wherein, with respect to the user-selected attribute, the visual distinctive feature is progressively applied to the user-selectable elements.

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