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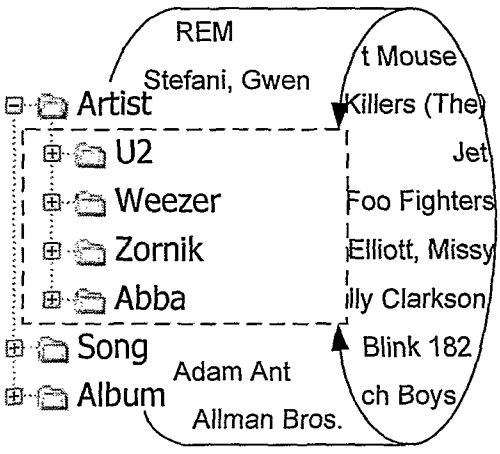
(54) Title: CAROUSEL CONTROL FOR METADATA NAVIGATION AND ASSIGNMENT



(57) Abstract: A property tree user interface permits user assignment of values to metadata properties and user navigation of data, within a system that includes a data storage subsystem in which data items are organized and queried by way of properties. The property tree includes nodes that expose properties of data items. A user may interact with the property tree in order to effect an assignment of a property, in which case the value associated with the property in the data storage subsystem is modified. The property tree may also display nodes that represent folders within a hierarchical file system, nodes that represent properties with inherent hierarchy, and nodes that represent user-defined hierarchical properties, and the property tree may display such nodes in a carousel control.

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CAROUSEL CONTROL FOR METADATA NAVIGATION AND ASSIGNMENT

BACKGROUND

[0001] Today most computer users interact with the machine by way of a graphical user interface which, by exploiting the computer's visual display and intuitive input devices such as the mouse, mediates access to the operating system, application programs, and stored data. The standard approach to the design of the user interface has relied on a simple visual metaphor in which data files are contained in folders organized within a hierarchically-structured file system tree. The user interface provides controls that permit the user to navigate through the file system tree in order to locate and act upon data. Although such systems are easier to use than the command-line shell interfaces that preceded them, they generally have not provided a greater degree of abstraction from the underlying physical storage of data than was available in earlier systems.

[0002] The real-world familiarity of the file/folder model of storage contributed to its acceptance and popularity among computer users, but such user interfaces were also successful because users typically stored a relatively small number of data files on their machines. The ease with which computer systems can now be used, coupled with the availability of massive amounts of inexpensive disk storage, have to some degree made the standard data storage interface a victim of its own success. Computers are now being used to store large quantities of personal data in a variety of different formats for use with many different applications. It is not uncommon for a user to have hundreds or thousands of text documents, photographs, audio files, and other data records stored across multiple hard disks, shared networks and other storage media. Given such a development, drawbacks to the conventional folder tree storage model have become evident to computer users.

[0003] For the present-day user, the conventional storage model is undesirably and inflexibly one-dimensional. Items of data exist in one location and relate to other files in one way, by their relative position within the hierarchical folder tree, which ignores the many logical relationships files may have to one another. In previous versions of Microsoft® Windows®, files are associated with a limited number of properties over which the user has limited control, and those properties are accessible through a control that is difficult to locate and use. In other systems file metadata may be limited to the file name and the user's informal

knowledge of the file's type. Such limitations have made it difficult for users to organize their data in new ways based on the content and use of the data. As a result, the growth in the amount of data stored by users has made searching for data less efficient and more cumbersome.

[0004] Particular applications have offered domain-specific solutions to the problem of user data management. Two examples involve applications for storing and organizing digital photograph files. The Digital Image Library in Microsoft® Digital Image Suite 9.0 includes a "Keyword Painter" control that enables the user to easily organize and subsequently locate images stored in disparate locations throughout the file system. The user clicks on identifying keywords of the user's own choosing and then clicks on thumbnail images of pictures to which the selected keywords are to be assigned. The user can now filter the view of the library of pictures by particular keywords. Adobe Photoshop Album 2.0 permits the user to associate content-descriptive tags with pictures by drag-drop actions on thumbnail images. The user can then quickly search the collection of pictures by subject matter using one or more tags.

[0005] Another example is the Grand Central e-mail interface, a project of Microsoft Research. Hierarchical properties are used to categorize e-mail messages. An arbitrary number of categories can be assigned by way of the user interface. The categories facilitate searching for messages and the organization of messages into conversational threads.

[0006] Disclosed features of the Microsoft® Windows® Code-Named "Longhorn" platform point to a more comprehensive solution. A storage subsystem, WinFS, relies on an extensible scheme of metadata properties to enable the user to search for, organize and share data. The basic unit of data container is the item, which is associated with multiple properties set to specific values. Items are organized by properties most relevant to the user at a particular time. Powerful querying capabilities over the store of items are provided. Users can thus find data more quickly and can organize and operate upon data more efficiently.

[0007] Prior to the present invention, however, there has been no general mechanism for metadata assignment and metadata-based navigation comparable in ease and generality of use to such conventional storage system interfaces as the file system Explorer tree of previous versions of Microsoft® Windows®, which permit the user to navigate to a folder and to modify its contents in intuitive ways such as by dragging and dropping with the mouse.

SUMMARY

[0008] The following represents a simplified summary of some embodiments of the invention in order to provide a basic understanding of the invention. This summary is not an extensive overview of the invention. It is not intended to identify key or critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some embodiments of the invention in simplified form as a prelude to the more detailed description that is presented below.

[0009] Features may be practiced in the context of a computer system having a graphical user interface, or another kind of user interface, and a data storage subsystem in which data items are organized and queried by way of metadata properties. In accordance with one embodiment, a computer-implemented method of assigning values to properties is provided. The method includes displaying a property tree having nodes that expose properties of a set of data items, where the property tree utilizes a carousel control for displaying subnodes parented by a node in the tree.

[0010] In some aspects of the aforementioned embodiments, the property tree also provides nodes that represent folders within a hierarchical file system, in addition to nodes that represent metadata properties. In other aspects of these embodiments, the property tree has nodes that represent properties with inherent hierarchy, and nodes that represent user-defined hierarchical properties.

[0011] According to an aspect of the invention, software instructions control a carousel control within a menu displayed on a computer display device. The carousel control displays a list of elements in a display area that can display a certain number of elements at a time. An input handler associated with the carousel control handles user input for scrolling the list elements displayed in the display area, based on each element's order within the list, such that a user can traverse the list. For example, the carousel control may store the list elements in a circular list, ordered by some criteria, and a user can circle through the list as desired within the display area.

[0012] The invention may be implemented by way of software, hardware, or a combination thereof. The invention may be implemented, for example, within an operating system shell or within a running application program. It is contemplated that the invention may be embodied in one or more computer-readable media.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] Features of the invention will become apparent from the following detailed description when taken in conjunction with the drawings, in which:

[0014] FIGURE 1 is a schematic diagram showing an exemplary computer operating environment within which the present invention may be incorporated.

[0015] FIGS. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19 are screenshots of a user interface for viewing and organizing stored music data, within which an embodiment of the present invention is incorporated.

[0016] FIGS. 20, 21, and 22 illustrate carousel controls according to various features described herein.

DETAILED DESCRIPTION

[0017] The present invention includes a tree-shaped set of user interface controls that exposes properties of data items, which will henceforth be referred to as the "ProperTree." The ProperTree provides two principal functions. First, the ProperTree enables the user to navigate across the virtual namespace of the user's data. Navigation is discussed further below. Second, the ProperTree permits the user to quickly and easily assign values to data item properties by adding or removing metadata with respect to property nodes exposed by the ProperTree. The user can add metadata to, and remove metadata from, many nodes at the same time. Because the ProperTree mimics the traditional folder tree control in certain respects, it enables users familiar with the conventional approach to storing, organizing and retrieving their data to work comfortably in a system with a radically different approach to storage that relies upon an extensible scheme of metadata properties and querying.

[0018] In one embodiment, the ProperTree control is displayed by default in a window within a pane to the left of a pane displaying a list view of items. When the user selects an item, the user can click on a property node exposed by the ProperTree to expand the node in place; the node can be collapsed if it is already expanded. A small widget, such as one displaying '+' or '-', may be used to indicate whether a node is collapsed or expanded. The expansion of a node shows the property values set for the currently selected item, as well as additional values that can be applied. In an embodiment, a most-frequently-used subset of values across a set of items is shown; the user can expand the list of values for the expanded property fully

by, for example, clicking on a button. Having expanded a property node in the ProperTree, the user can change the property values; the changes are immediately applied to the item or items that have been selected by the user. The system may assign initial values to properties based on most-frequently used values.

[0019] Properties are displayed in the ProperTree in a manner that is appropriate to their type. Certain properties have only one value with respect to an item. A photograph, for example, might be either "Black/White" or "Color," with users being permitted to change this property. The user interface for changing the value may, in such a case, comprise a clickable radio button adjacent to each possible value. Other properties may be capable of having multiple values with respect to an item. For example, a document may have multiple authors. In this case the user interface may comprise a checkbox adjacent to each possible value, with the user being permitted to check one or more boxes as desired. Richer properties are also supported appropriately. For example, a rich calendar control is shown for dates; for ratings, a five-star control may be shown.

[0020] Properties that cannot be changed by the user, such as the date on which a document is written, do not have value selection controls in the tree, and the nodes for such properties can only be used for navigation. The system is extensible with respect to adding new controls appropriate to particular data types.

[0021] For any given property or property value in the ProperTree, the user can navigate to a view of storage that is pivoted to that property or value. Thus, navigation does not simply involve taking the user to a single location, unlike navigation using a conventional folder tree. Rather, navigation by way of the ProperTree causes all relevant data to be rearranged into a new structure through which the user can browse. For example, the user can use the ProperTree to query storage for all documents having a particular "Author" value. The list view then changes to show documents meeting that criterion. Alternatively, the user can use the ProperTree to display all document authors. This causes a stacked view of authors within which the user can then browse.

[0022] Turning now to the drawings, FIGS. 2 through 19 are screenshots of an exemplary user interface 201 for viewing and organizing stored music data, incorporated an embodiment of the present invention. On the right is a list view 205, and on the left is a ProperTree property tree 203. In an embodiment, similar interfaces are provided for documents, messages, video files, and contacts, with the ProperTree in each case being specifically

adapted for the kind of data item that is presented. Such content-oriented interfaces may be provided with an operating system product as a component of the shell. Additionally, in an embodiment of the invention, the ProperTree is a control made available through the Common File Dialog in Microsoft® Windows® for application developers to reuse in their own applications. As noted above, the ProperTree 203 is displayed on the left side of the window 201 by default.

[0023] The ProperTree 203 includes a header 207, which in the depicted case is titled "Music Links". Below the header 207 are the nodes of the ProperTree 203. The nodes labeled Rating 217, Artist 221, and Genre 223, represent single properties. Certain other nodes exposed by the tree 203, All Songs 209, Online Store 211, and Recently Played 215, are constructs that represent a query that searches for particular items in the list view 205 that satisfy conditions of the query. The nodes iPod 213 and Playlists 219, which represent static lists, are similar. If the user selects All Songs 209, for example, all the songs in the list view 205 are displayed. If the user selects Recently Played 215, however, only songs that have recently been played are shown.

[0024] Turning to FIG. 3, the effect of an initial user interaction with the ProperTree 203 is shown. "Expand" widgets 327, 329, 331, 333, 335 are displayed next to the expandable property nodes 213, 217, 219, 221, 223, respectively, when the user hovers in the area of the ProperTree with the mouse, as indicated by the arrow cursor 325. The property nodes 213, 217, 219, 221, 223 can be expanded by the user by clicking on the displayed '+' in the widgets 327, 329, 331, 333, 335.

[0025] Turning to FIG. 4, there is shown the state of the ProperTree 203 after the user hovers with the mouse over the text label of one of the property nodes, in this case Artists 221, as indicated by the hand-shaped cursor 437. If the user double-clicks on the text label of the property node, the list view 205 will be updated so that it is organized by the particular property that is selected, and the node will expand. In FIG. 5, there is shown the state of the ProperTree 203 when the user hovers with the mouse over the '+' of the expand widget 333 associated with the Artists node 221, as indicated by the mouse arrow cursor 539.

[0026] Turning to FIG. 6, there is shown the state of the ProperTree 203 after the Artists node 221 is expanded. The "Artists" text label is rendered in boldface, and the expand widget is replaced by a "collapse" widget 641. A list of five Artists values 643, 645, 647, 649, 651 is

displayed, representing the most frequently used and most recently used values, below which is an overflow arrow button 653.

[0027] FIG. 7 shows the effect of the user clicking on the overflow arrow 653, as indicated by the mouse arrow cursor 755. A pop-up menu 757 is displayed, showing all the values for the Artists property as a flat list. Alternatively, as shown in FIG. 8, the complete list of values can be displayed in a pop-up menu 859 as a list of several subnodes 861, 863, 865, 867, 869, each subnode representing a range within the full list that can be expanded further by the user by clicking on one of the rightward-pointing arrow buttons 871, 873, 875, 877, 879. An alternative rendering of the range pop-up menu 881 is also shown.

[0028] Returning briefly to FIG. 6, it may be noted that a property value name 649 that is too long to display in full is truncated with an ellipsis or similar symbol. In FIG. 9, the effect of hovering over such a truncated value is shown, as indicated by the mouse hand-shaped cursor 983. A pop-up element 985 displays the full name of the value.

[0029] Turning to FIG. 10, there is shown the effect of selecting an item in the list view 205. Checkboxes 1087, 1089, 1091, 1093, 1095 are immediately displayed next to each value in the expanded property node 221. The checkboxes serve as controls by means of which metadata can be assigned to the selected item. In this case, the user has selected the song item "Encounter" 1097. The checkbox 1089 is checked, indicating that the existing Artist value for that item is "50 Cent." The user can check a different box to change the value by assigning a different artist name to the song item. Similarly, checkboxes can be used in a list view of photographs to assign keywords to a selected photograph item. FIG. 11 shows the effect of the user clicking on the overflow arrow button 653 when an item in the list view 205 has been selected, as indicated by the mouse arrow cursor 1101. The pop-up menu 1103 is displayed, each value in the complete list now having a checkbox in front of it.

[0030] In general, a property node in the ProperTree 203 may have a context menu that is specific to that node. An example is shown in FIG. 12, where the context menu 1205 for the node Artists 221 is displayed. The top element in the menu 1205 is "Show All Music By Artist" 1207. The effect of selecting this task is identical to the navigation effect of clicking on the "Artists" label, as described above. "Add new Artist" 1209 provides an entry point for the user to add additional values to the list of values for this property node. "Rename" 1211 can be used to rename the property. In this case "Rename" is grayed out because Artists is a property that end users cannot rename. A user can devise new properties which can be made

renameable. The "Move Up" 1213 and "Move Down" 1215 menu elements can be used to organize the order of property nodes in the ProperTree 203.

[0031] FIG. 13 shows the state of the ProperTree 203 after the user has selected "Add new Artist" 1209 in the context menu 1205 shown in FIG. 12. A type-in box 1317 is displayed, permitting the user to enter a new value for the Artists property. Once a new Artists value is entered, it can be assigned to a selected song item.

[0032] FIG. 14 illustrates the fact that the ProperTree 203 is not restricted to containing assignable property nodes, but may contain several kinds of navigable sets, pages or collections. Here the Playlists node 219 has been expanded. Playlists in the music data item context are one example of user-defined lists that function as data item containers, similar to traditional file system folders. As with traditional folders, the Playlists 219 may have an arbitrary number of nested components in a hierarchical structure, unlike property nodes that comprise only values. Here a most-frequently-used subset 1419, 1421, 1423 of the sublists of Playlists is displayed, below which is an overflow arrow button 1425. FIG. 15 displays the state of the ProperTree 203 after

[0033] the user clicks the overflow button 1425 of FIG. 14. The full list hierarchy of Playlists 219 is displayed, comprising sublists 1421, 1527, 1529, 1531, 1533, 1423.

[0034] Turning to FIG. 16, there is shown the state of the ProperTree 203 after the user selects the label 1637 of the "Recently played" node 215, as indicated by the mouse arrow cursor 1635. As noted above, this node is not a single property, but represents a query. The user can pivot the list view by selecting the glyph 1639 to the left of the node label 1637, as explained above. As shown in FIG. 16, selecting the node label 1637 displays a context menu 1641. Selecting the top element 1643 of the context menu 1641, "Show 'Recently Played'", has the same navigation effect as selecting the glyph 1639. Below this are two specific node tasks 1645, 1647 (not further specified here). The remainder of the context menu 1641 is similar to the context menu 1205 for the property node Artists 221 in FIG. 12. The user can select Delete 1649 to delete an item, Rename 1651 to rename it, and Move Up 1653 and Move Down 1655 to reorder it in the ProperTree 203.

[0035] Turning to FIG. 17, there is shown the state of the ProperTree 203 after the user clicks on the Music Links header 207, as indicated by the mouse arrow cursor 1759. A command menu 176 is displayed, permitting the user to perform certain tasks applicable to the entire

tree control 203. By selecting the task "Add Current Page to Music Links" 1763, the user can define new nodes to add to the tree 203. By selecting "Sort Music Links by" 1765, the user can sort the nodes in a desired order. The user can hide the entire tree 203 from view by selecting "Hide Pane" 1767. By selecting the entry point 1769 at the bottom of the menu, "Add/Remove MusicLinks", the user causes a dialog to be brought up, allowing the user to select among different properties to add or remove properties to or from the ProperTree 203.

[0036] Similarly to the conventional folder tree control, the ProperTree 203 supports drag-and-drop semantics, but the behavior is different. An item in the list view 205 can be dragged and dropped onto a node in the ProperTree 203, but the item does not disappear from the list view; the behavior is more like tagging information to a file. A drag/drop action is shown in FIG. 18. The user clicks on an item in the list view, here the item 1871 corresponding to the song "Encounter," and drags it to the Artists node 221 in the ProperTree 203, as indicated by the mouse arrow cursor 1873 and the blurred selected item image 1875. In this case, Artists 221 is not itself an assignable property. Turning to FIG. 19, if the user hovers over the Artists node 221 for a sufficient length of time, the node 221 expands, permitting the user to drop the dragged item 1871 onto the name of a displayed artist. In this case the user is dropping the item 1871 onto the Artists value "Kruder & Dorfmeister" 649, and the checkbox 1093 associated with that value is highlighted. This is thus another mechanism by which a user can assign metadata to items.

[0037] In one embodiment of the invention, the ProperTree is integrated with a conventional folder tree control. In this embodiment, the tree has nodes that represent properties and expand to reveal values, as well as nodes that represent folders located in the hierarchical file system. In this embodiment, the advantages of both the hierarchical model and the metadata model of storage are present. The tree may additionally include nodes representing other constructs, such as a link to a web page.

[0038] In an embodiment, the ProperTree supports "hierarchical properties," properties that inherently have hierarchy. For example, a date property may be represented in the tree as the hierarchy:

Year
    Month
        Day

[0039] In addition, in an embodiment, the ProperTree supports free-form hierarchical properties that are set by the user.

[0040] For example:

Animal
    Dog
        Poodle
    Cat
Mineral
    Gold
Plant
    Palm Tree

[0041] With reference to FIG. 20, the property tree may use a carousel control 2001 to display subnodes under any parent node within the property tree. Carousel control 2001 may be used, e.g., to display subnodes when a limited amount of vertical display screen real estate (space) is available, or to limit a single node or nodes from using all the available vertical display screen space for the display of that node's respective subnodes. The carousel control is useful, e.g., to scroll large sets of subnodes in a limited amount of space in which the entire set of subnodes cannot all be displayed simultaneously.

[0042] Carousel control 2001 includes a circular list 2003 of all elements 2011a and 2011b within the carousel control 2001, and a corresponding display area 2005. The circular list 2003 may be organized according to some predefined criteria or metadata, for example, alphabetical, chronological, etc. Display area 2005 displays one or more elements of the carousel control 2001. In this example, the carousel control is used to display subnodes under an "Artist" node 2007 of a property tree 2009. The elements 2011a and 2011b of carousel control 2001 include the subnodes of the Artist node 2007, namely, Abba, Adam Ant, Allman Bros., Beach Boys, Blink 182, Kelly Clarkson, Missy Elliott, Foo Fighters, Jet, The Killers, Modest Mouse, REM, Gwen Stefani, U2, Weezer, and Zornik. The nodes Artist, Song, and Album are not elements of carousel control 2001. In this example, display area 2005 displays four elements 2011a at a time, although other numbers of elements may alternatively be displayed as desired or as dictated by screen space. In FIG. 20, the nodes Artist, Jet, The Killers, Modest Mouse, REM, Song, and Album are visible to the user, while the remaining elements 2011b of carousel control 2001 are not presently displayed.

[0043] While the carousel control has input focus, a user can scroll the elements in the carousel control to circularly shift the elements visible in display area 2005. For example, pressing the up arrow when the carousel control is positioned as shown in FIG. 20 may result in rotating the carousel control up, such that the elements The Killers, Modest Mouse, REM, and Gwen Stefani are displayed in the display area 2005. Similarly, pressing the down arrow when the carousel control is positioned as shown in FIG. 20 may result in rotating the carousel control down, such that the elements Foo Fighters, Jet, The Killers, and Modest Mouse are displayed in the display area 2005. Those of skill in the art will appreciate that other navigation/scroll techniques and inputs may be used to control the rotation of the carousel control 2001.

[0044] When the user has scrolled to the beginning or end of the elements as presently arranged (e.g., alphabetical, chronological, etc.), upon further scrolling in the same direction the carousel control continues traversing the circular list. Thus, when scrolling in alphabetical order, upon reaching the last item in the carousel control (here, Zornik), the carousel control displays the first item in the list (here, Abba) upon further scrolling by the user in the same direction. The reverse is also true, such that when scrolling in reverse alphabetical order, upon reaching the first item in the carousel control (here, Abba), the carousel control displays the last item in the list (here, Zornik) upon further scrolling by the user in the same direction.

[0045] A user may also "jump" to a specific item in the list by typing one or more characters on an attached keyboard or other data entry device. For example, by typing the letter 'U,' the carousel control may automatically rotate or shift the carousel control such that the first item matching the input is displayed at the top of the display area 2005. The results of such input are shown in FIG. 21

[0046] Similarly, if a user inputs the letter 'B,' the carousel control may jump to display the element Beach Boys at the top of the display area 2005. However, if the user inputs B-L (case sensitivity is optional, and not necessary) in quick succession (within some predetermined amount of time, and/or without a delay exceeding some predetermined amount of time between the inputs), the carousel control may jump to display the element Blink 182 at the top of the display area 2005. The carousel control may include an input handler routine for scrolling and jumping to particular elements based on user input.

[0047] While the example of FIGS. 20 and 21 illustrates an alphabetical carousel control, any organization of elements in the circular list corresponding to a carousel control may be used, including for example, chronological, numerical, color, genre, category, a metadata value, user specified order, etc. The presently displayed elements 2011a of a carousel control 2001 may provide the same behavior as other nodes in the property tree 2009. That is, nodes may be dragged and dropped, expanded, collapsed, etc., while displayed in display area 2005. Those of skill in the art will appreciate that various modifications may be made to the carousel control, e.g., the carousel control may utilize a list instead of a circular list, such that a user cannot scroll continuously through the ends of the list. That is, when a user reaches the end of the list, the scrolling stops, and does not begin anew at the beginning of the list. Likewise, when a user scrolls to the beginning of the list, scrolling does not continue from the end.

[0048] Those of skill in the art will appreciate that various modifications may be made to the carousel control to provide additional functionality to a user. For example, the carousel control may be used with hierarchical properties, such that one carousel control becomes nested within another. In such a nested embodiment, the nested carousel control reflects (i.e., is based on) the selected parent element 2011a from the parent carousel control, and keyboard shortcuts are usable within whichever carousel control presently has input focus.

[0049] Carousel controls may be provided with any number of display appearances. For example, FIG. 22 illustrates a carousel control 2201 according to another illustrative appearance. Carousel control 2201 includes top marker 2203 indicating the upper boundary of the display area 2005, bottom marker 2205 indicating the lower boundary of the display area 2005, revolution marker 2207 indicating the virtual boundary between the end and the head of the circular list as the carousel control revolves through the entire list, and scroll controls 2209, 2211 for scrolling up and down, respectively. A carousel control, e.g., carousel control 2201, may expose navigation and control capabilities to the user. A user may be able to resize the carousel control 2201 by hovering a cursor 2213 over a boundary line, e.g., lower boundary 2205, and selecting and dragging the lower boundary line 2205 such that the display area 2005 is a desired height. In addition, a user may automatically expand the display area to a maximum height, e.g., by double clicking the down scroll control 2211. Similarly, double clicking the up scroll control 2209 may result in the collapsing of the display area, similar to the user selection of an expand/collapse widget 2215.

[0050] FIG. 1 is a highly simplified schematic diagram showing an example of a suitable operating environment 100 in which any or all of the features described herein may be implemented. The features of such environments are well-known to those having skill in the art and need not be described at length here. The operating environment 100 is only one example of a suitable operating environment and is not intended to suggest any limitation as to the scope of use or functionality of the invention. Suitable computing environments for use with the invention include any computing device or computing system that supports interaction between user and machine.

[0051] With reference to FIG. 1, an exemplary system for implementing the invention includes a computing device, such as device 101. Device 101 typically includes at least one processing unit 103 and main memory unit 105, and at least one level of cache memory 107 connected to or situated within the processing unit 103 and serving as a buffer for the main memory 105. Device 101 has additional storage, including at least one magnetic hard disk 109 that serves as nonvolatile secondary storage and which is additionally used along with the main memory 105 in providing virtual memory. Device 101 may also have other storage 111, such as optical disks, removable magnetic disks, magnetic tape, and other removable and nonremovable computer-readable media capable of nonvolatile storage of program modules and data and accessible by device 101. Any such storage media may be part of device 101. To facilitate user-machine interaction, device 101 has input devices 113, such as a keyboard 115 and a mouse 117 or other pointing device, and output devices 119, including a monitor or other display device 121. Device 101 also typically includes one or more communication connections 123 that allow the device to communicate data with other devices.

[0052] Programs, comprising sets of instructions and associated data for the device 101, are stored in the memory 105, from which they can be retrieved and executed by the processing unit 103. Among the programs and program modules stored in the memory 105 are those that comprise or are associated with an operating system 125 as well as application programs 127. The device 101 has one or more systems of logical data storage, such as a file system or alternative systems using database-related techniques, associated with the operating system 125. Such systems of logical data storage serve as interfaces that map logically-organized data to data physically located on secondary storage media, such as data stored in clusters or sectors on the hard disk 109.

[0053] Computing device 101 includes forms of computer-readable media. Computer-readable media include any available media that can be accessed by the computing device 101. Computer-readable media may comprise storage media and communication media. Storage media include volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information such as computer-readable instructions, object code, data structures, program modules, or other data. Communication media include any information delivery media and typically embody data in a modulated data signal such as a carrier wave or other transport mechanism.

[0054] All references cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be incorporated by reference and were set forth in its entirety herein.

[0055] The use of the terms "a," "an" and "the" and similar referents in the context of describing the invention, especially in the context of the following claims, is to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms "comprising," "having," "including," and "containing" are to be construed as open-ended terms (meaning "including, but not limited to,") unless otherwise noted. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. The use of any and all examples or exemplary language herein (e.g., "such as") is intended merely to better illuminate the invention and does not pose a limitation on the scope of the invention unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the invention.

[0056] Preferred embodiments of this invention are described herein, including the best mode known to the inventors for carrying out the invention. Variations on those preferred embodiments may become apparent to those having ordinary skill in the art upon reading the foregoing description. The inventors expect skilled artisans to employ such variations as appropriate, and the inventors intend for the invention to be practiced otherwise than as specifically described herein. Accordingly, this invention includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible

variations thereof is encompassed by the invention unless otherwise indicated herein or otherwise clearly contradicted by context.

WHAT IS CLAIMED IS:

1. In a computer system having a graphical user interface and a data storage subsystem in which data items are organized and queried by way of metadata properties, a computer-implemented method of assigning values to properties, comprising:

displaying a property tree, the property tree having a plurality of nodes exposing properties of a set of data items, said property tree including a carousel control for displaying a plurality of subnodes parented by one of the plurality of nodes; and

in response to user input indicative of an assignment of at least one property exposed by the property tree, modifying the value associated with the at least one property in the data storage subsystem.

2. The method of claim 1, wherein the carousel control comprises a circular list of elements, each element corresponding to one of the plurality of subnodes.

3. The method of claim 1, further comprising sorting the circular list according to predefined criteria.

4. The method of claim 3, wherein the predefined criteria comprises alphabetical order.

5. The method of claim 3, wherein the predefined criteria comprises numerical order.

6. The method of claim 1, wherein the carousel control comprises a display area for displaying a subset of the plurality of subnodes.

7. The method of claim 2, further comprising exposing a second carousel control corresponding to subnodes of a first one of the plurality of subnodes of the one of the plurality of nodes.

8. A computer readable medium storing computer executable instructions for performing the method of claim 1.

9. A computer readable medium storing computer executable instructions that, when executed, provide a carousel control within a menu displayed on a computer display device, said carousel control comprising:

a list of elements;

a display area in which a predetermined number of sequential list elements are displayed at a time; and

an input handler for scrolling the predetermined number of list elements displayed in the display area, based on each element's order within the list.

10. The computer readable medium of claim 9, wherein the list of elements comprises elements ordered according to predetermined criteria.

11. The computer readable medium of claim 10, wherein the predetermined criteria comprises alphabetical order.

12. The computer readable medium of claim 10, wherein the predetermined criteria comprises chronological order.

13. The computer readable medium of claim 9, wherein the input handler further causes the carousel control to display a particular element matching user input, said element being displayed in a predetermined position within the display area.

14. The computer readable medium of claim 9, wherein the list comprises a circular list.

15. The computer readable medium of claim 9, wherein the list of elements comprises musical artists.

16. The computer readable medium of claim 9, wherein the input handler further receives user input defining a size of the display area.

17. The computer readable medium of claim 16, wherein, upon receiving first predetermined input, the input handler causes the display area to resize to a maximum size.

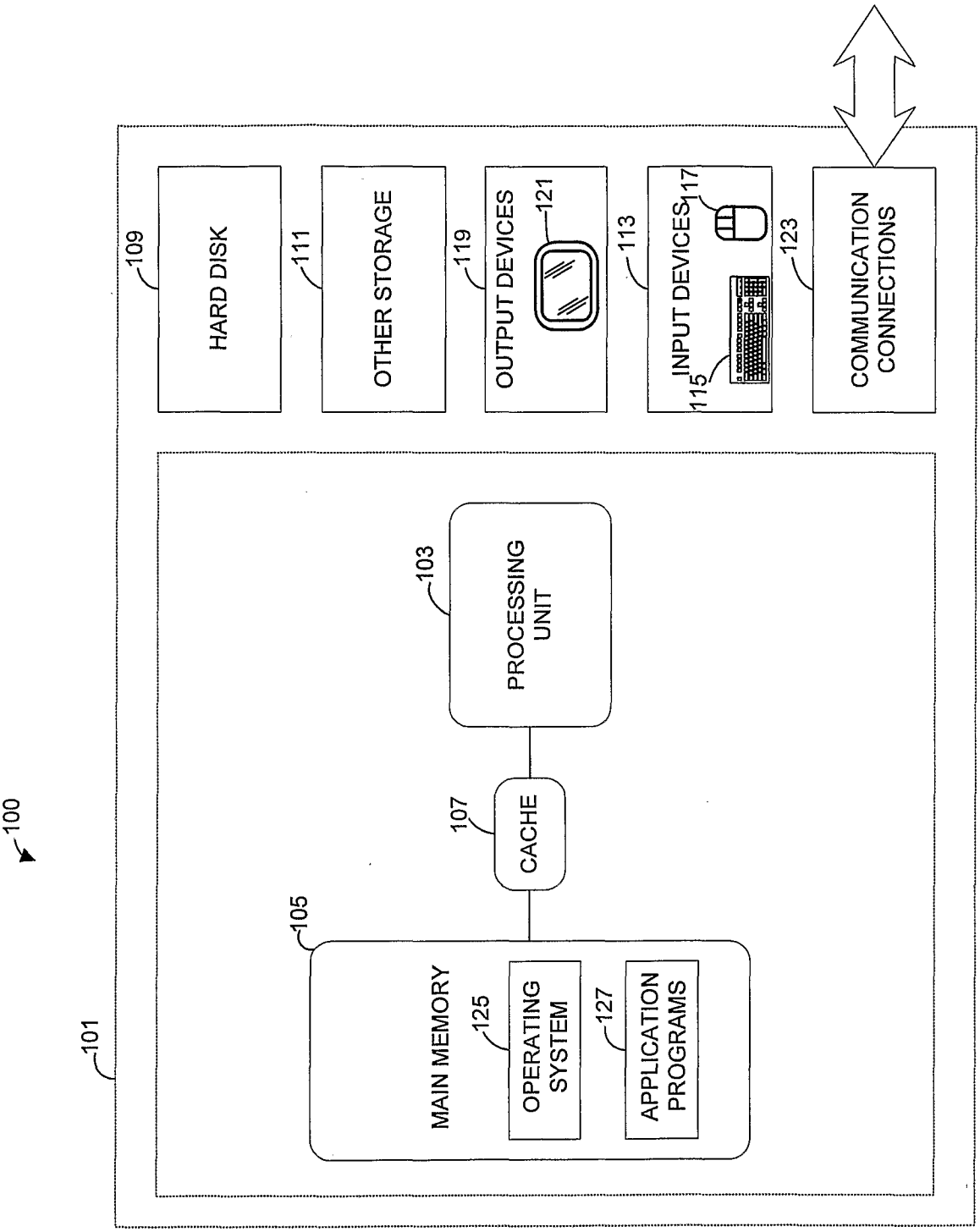
100
101
109
HARD DISK
111
OTHER STORAGE
119
OUTPUT DEVICES
121
113
INPUT DEVICES
117
115
123
COMMUNICATION CONNECTIONS
103
PROCESSING UNIT
107
CACHE
105
MAIN MEMORY
125
OPERATING SYSTEM
127
APPLICATION PROGRAMS

FIG. 1

Song Title
Time
Album
Genre
Rating
Count
Music Links
207
Scooter 3:06 Music For the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
All Songs 209
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Online Store 211
Hollywood 1:21 Great Expectations Soun... Electronic 2
iPod 213
If I were you 2:32 Great Expectations Soun... Electronic 3
Recently played 215
Mad World 6:56 A Bugged out Mix Electronic 23
Rating 217
Silk Road 3:06 A Bugged out Mix Electronic 7
Playlists 219
Dust 6:34 A Bugged out Mix Electronic 10
Artists 221
Encounter 8:23 Time for A Dance Pop 8
Genre 223
Forest 1:21 Come Away with Me Pop 50
203
Hippies I h... 2:32 Come Away with Me Rock 10
Spread YW... 6:56 Come Away with Me Rock 23
205
Down to Up... 3:06 Come Away with Me Rock 50
Top 1:21 Come Away with Me Rock 10
Rough Jump 1:21 Come Away with Me Rock 23
Run Around 2:32 Come Away with Me Rock 50
View
Tweet 6:56 Great Expectations Soun... Soundtrack 3
Just You 3:06 Great Expectations Soun... Soundtrack 53
201

FIG. 2

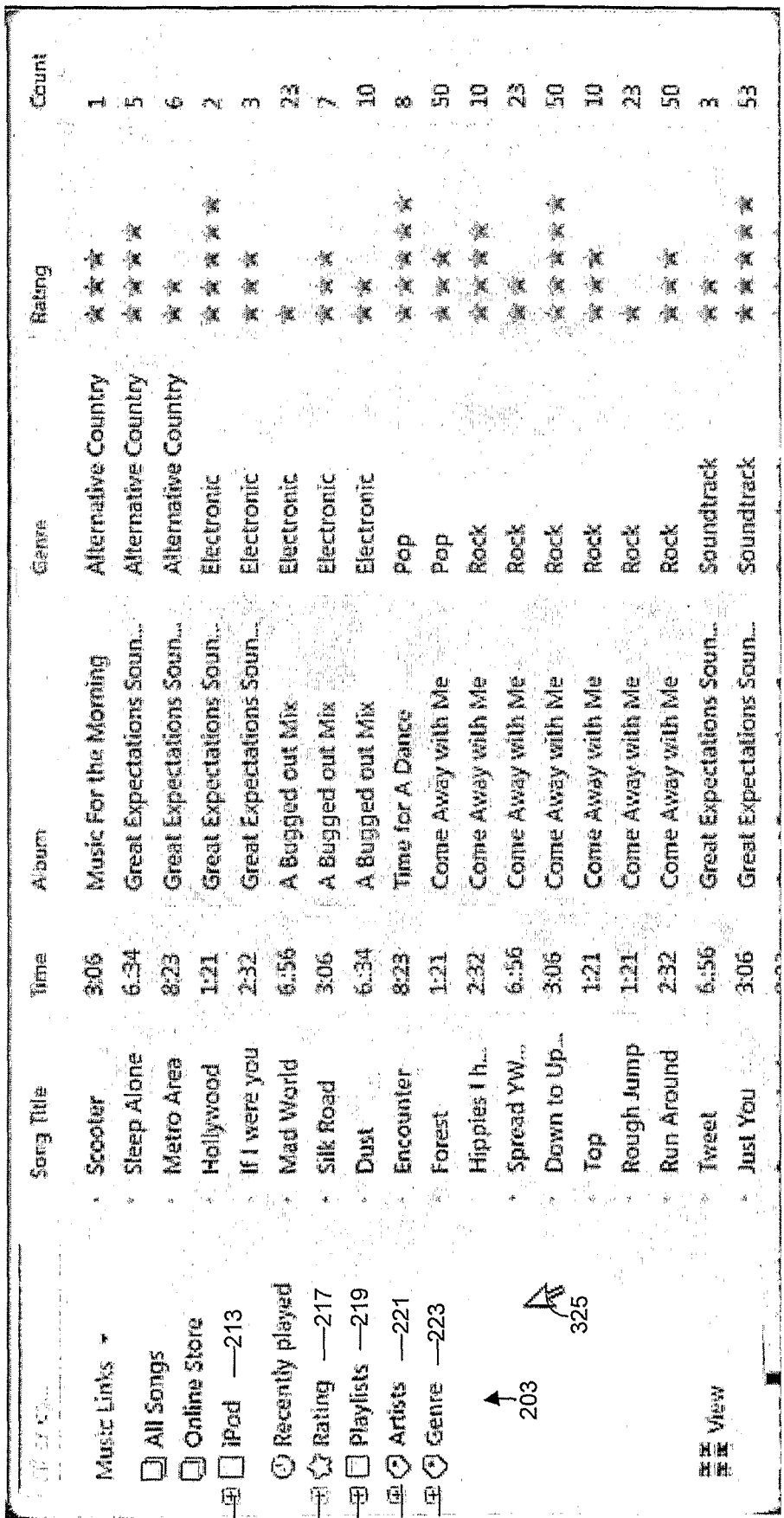
Music Links
All Songs
Online Store
iPod
Recently played
Rating
Playlists
Artists
Genre
Views
Song Title
Time
Album
Genre
Rating
Count
Scooter 3:06 Music For the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Hollywood 1:21 Great Expectations Soun... Electronic 2
If I were you 2:32 Great Expectations Soun... Electronic 3
Mad World 6:56 A Bugged out Mix Electronic 23
Silk Road 3:06 A Bugged out Mix Electronic 7
Dust 6:34 A Bugged out Mix Electronic 10
Encounter 8:23 Time for A Dance Pop 8
Forest 1:21 Come Away with Me Pop 50
Hippies I h... 2:32 Come Away with Me Rock 10
Spread YW... 6:56 Come Away with Me Rock 23
Down to Up... 3:06 Come Away with Me Rock 50
Top 1:21 Come Away with Me Rock 10
Rough Jump 1:21 Come Away with Me Rock 23
Run Around 2:32 Come Away with Me Rock 50
Tweet 6:56 Great Expectations Soun... Soundtrack 3
Just You 3:06 Great Expectations Soun... Soundtrack 53
203
325
327
329
331
333
335
213
217
219
221
223

FIG. 3

Music Links
All Songs
Online Store
iPod
Recently played
Rating
Playlists
Genre
Album
Song Title
Time
Rating
Count
Scooter 3:05 Music For the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Hollywood 1:21 Great Expectations Soun... Electronic 2
If I were you 2:32 Great Expectations Soun... Electronic 3
Mad World 6:56 A Bugged out Mix Electronic 23
Silk Road 3:06 A Bugged out Mix Electronic 7
Dust 6:34 A Bugged out Mix Electronic 10
Encounter 8:23 Time for A Dance Pop 8
Forest 1:21 Come Away with Me Pop 50
Hippies I h... 2:32 Come Away with Me Rock 10
Spread YW... 6:56 Come Away with Me Rock 23
Down to Up... 3:05 Come Away with Me Rock 50
Top 1:21 Come Away with Me Rock 10
Rough Jump 1:21 Come Away with Me Rock 23
Run Around 2:32 Come Away with Me Rock 50
Tweet 6:56 Great Expectations Soun... Soundtrack 3
Just You 3:06 Great Expectations Soun... Soundtrack 53
View
203
205
221
437

FIG. 4

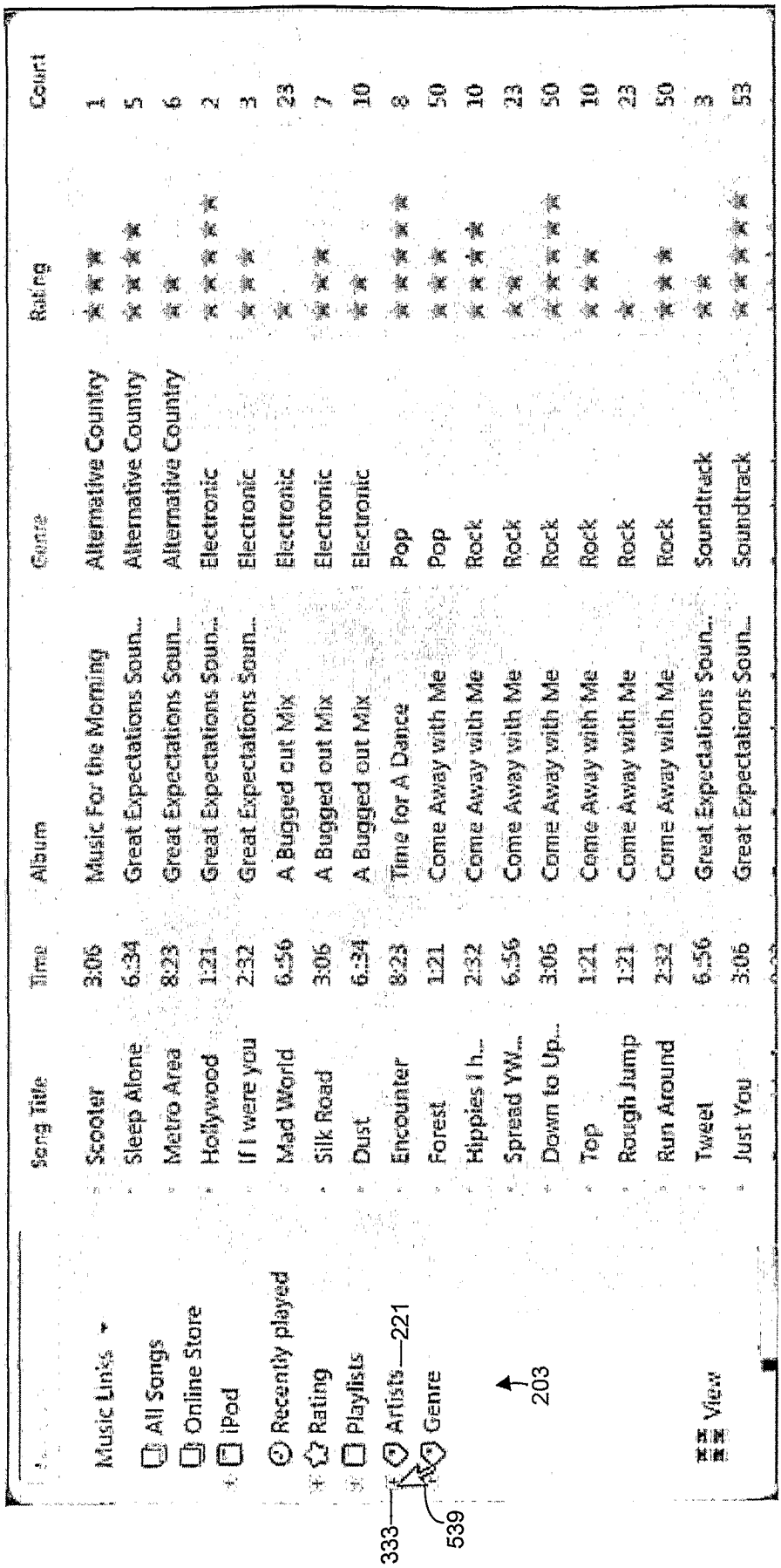
Music Links
All Songs
Online Store
iPod
Recently played
Rating
Playlists
Artists
Genre
333
539
221
203
Song Title
Time
Album
Genre
Rating
Count
Scooter 3:06 Music For the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Hollywood 1:21 Great Expectations Soun... Electronic 2
If I were you 2:32 Great Expectations Soun... Electronic 3
Mad World 6:56 A Bugged out Mix Electronic 23
Silk Road 3:06 A Bugged out Mix Electronic 7
Dust 6:34 A Bugged out Mix Electronic 10
Encounter 8:23 Time for A Dance Pop 8
Forest 1:21 Come Away with Me Pop 50
Hippies i h... 2:32 Come Away with Me Rock 10
Spread YW... 6:56 Come Away with Me Rock 23
Down to Up... 3:06 Come Away with Me Rock 50
Top 1:21 Come Away with Me Rock 10
Rough Jump 1:21 Come Away with Me Rock 23
Run Around 2:32 Come Away with Me Rock 50
Tweet 6:56 Great Expectations Soun... Soundtrack 3
Just You 3:06 Great Expectations Soun... Soundtrack 53
View

FIG. 5

Song Title
Time
Album
Genre
Rating
Count
Music Links
Scooter 3:06 Music For the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
All Songs
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Online Store
Hollywood 1:21 Great Expectations Soun... Electronic 2
iPod
If I were you 2:32 Great Expectations Soun... Electronic 3
Recently played
Mad World 6:56 A Bugged out Mix Electronic 23
Rating
Silk Road 3:06 A Bugged out Mix Electronic 7
Playlists
Dust 6:34 A Bugged out Mix Electronic 10
Artists—221
Encounter 8:23 Time for A Dance Pop 8
641
Madonna —643
Forest 1:21 Come Away with Me Pop 50
50 Cent—645
Hippies Ih... 2:32 Come Away with Me Rock 10
Chocolate—647
649
Spread YW... 6:56 Come Away with Me Rock 23
Kruder & Dorfmei...
Down to Up... 3:06 Come Away with Me Rock 50
Eminem —651
Top 1:21 Come Away with Me Rock 10
—653
Rough Jump 1:21 Come Away with Me Rock 23
Genre
Run Around 2:32 Come Away with Me Rock 50
View
203
Tweet 6:56 Great Expectations Soun... Soundtrack 3
Just You 3:06 Great Expectations Soun... Soundtrack 53

FIG. 6

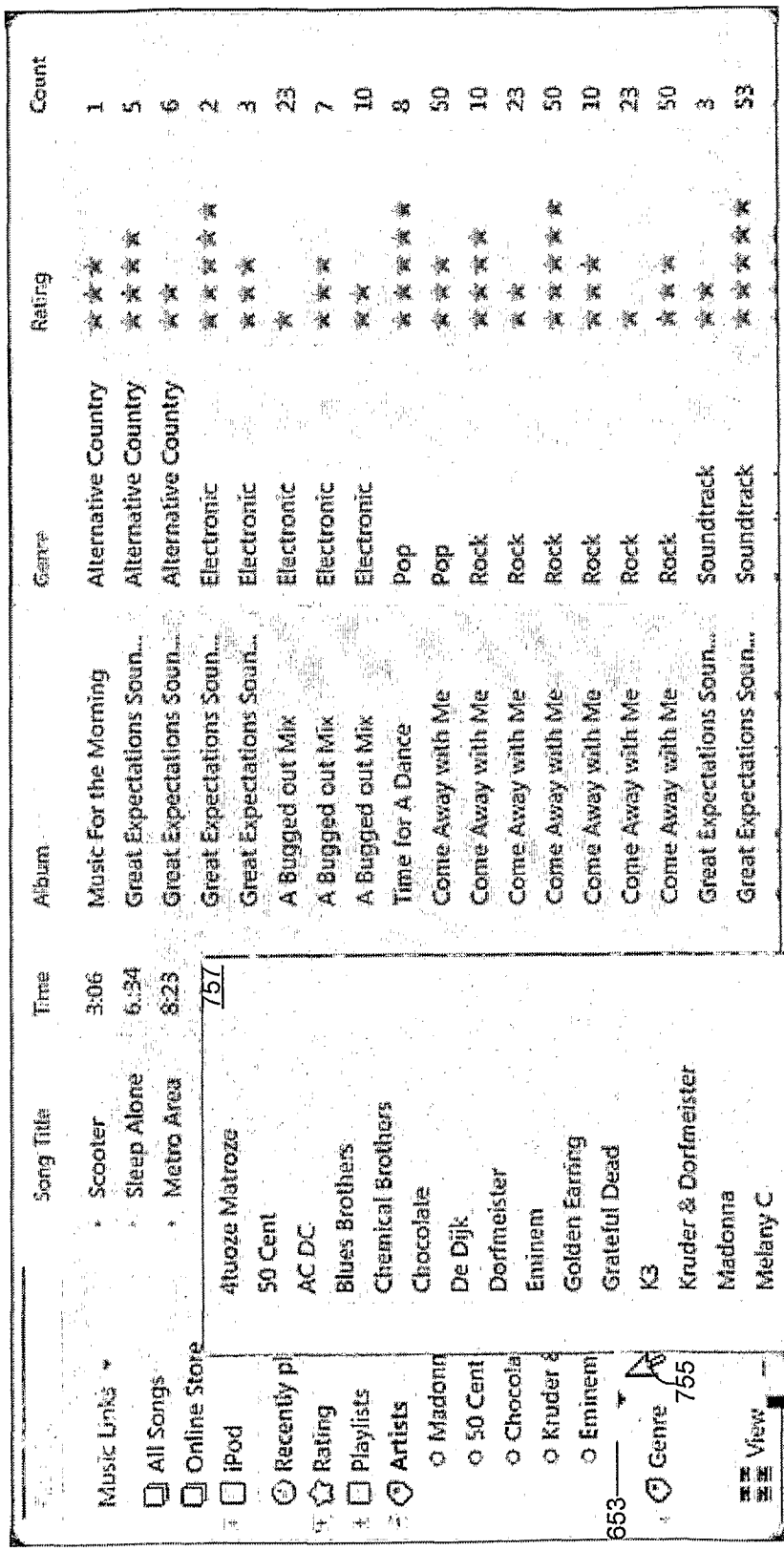
Song Title
Time
Album
Genre
Rating
Count
Scooter 3:06 Music For the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Great Expectations Soun... Electronic 2
Great Expectations Soun... Electronic 3
A Bugged out Mix Electronic 23
A Bugged out Mix Electronic 7
A Bugged out Mix Electronic 10
Time for A Dance Pop 8
Come Away with Me Pop 50
Come Away with Me Rock 10
Come Away with Me Rock 23
Come Away with Me Rock 50
Come Away with Me Rock 10
Come Away with Me Rock 23
Come Away with Me Rock 50
Great Expectations Soun... Soundtrack 3
Great Expectations Soun... Soundtrack 53
Music Links
All Songs
Online Store
iPod
Recently pl
Rating
Playlists
Artists
Madonn
50 Cent
Chocola
Kruder &
Eminem
Genre
View
757
755
653
4tuoze Matroze
50 Cent
AC DC
Blues Brothers
Chemical Brothers
Chocolate
De Dijk
Dorfmeister
Eminem
Golden Earring
Grateful Dead
K3
Kruder & Dorfmeister
Madonna
Melany C
Moby
Night Vision
OxyGen
Paul Oakenfold
Peter Ford
Prince
Sheryl Crowe
The Righteous Brothers
ZZ Top

FIG. 7

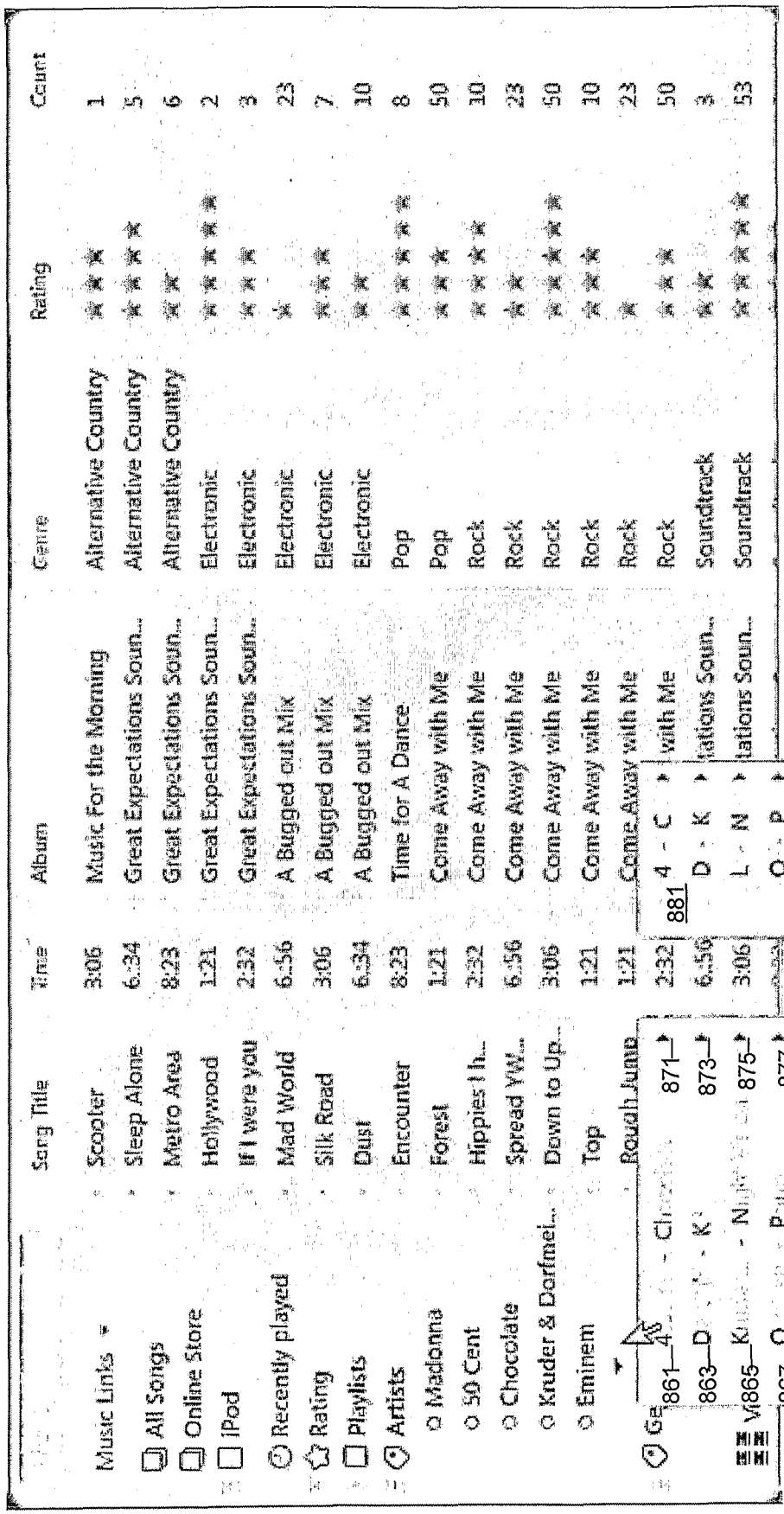
Music Links
All Songs
Online Store
iPod
Recently played
Rating
Playlists
Artists
Madonna
50 Cent
Chocolate
Kruder & Dorfmei...
Eminem
Song Title
Time
Album
Genre
Rating
Count
Scooter 3:06 Music For the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Hollywood 1:21 Great Expectations Soun... Electronic 2
If I were you 2:32 Great Expectations Soun... Electronic 3
Mad World 6:56 A Bugged out Mix Electronic 23
Silk Road 3:06 A Bugged out Mix Electronic 7
Dust 6:34 A Bugged out Mix Electronic 10
Encounter 8:23 Time for A Dance Pop 8
Forest 1:21 Come Away with Me Pop 50
Hippies ! h... 2:32 Come Away with Me Rock 10
Spread YW... 6:56 Come Away with Me Rock 23
Down to Up... 3:06 Come Away with Me Rock 50
Top 1:21 Come Away with Me Rock 10
Rough Jump 1:21 Come Away with Me Rock 23
2:32 with Me Rock 50
6:56 lations Soun... Soundtrack 3
3:06 lations Soun... Soundtrack 53
881
4 - C
D - K
L - N
O - P
S - Z
861
863
865
867
869
871
873
875
877
879
859

FIG. 8

Music Links
All Songs
Online Store
iPod
Recently played
Rating
Playlists
Artists
Madonna
50 Cent
Chocolate
Eminem
Genre
View
Song Title
Time
Album
Genre
Rating
Count
Scooter 3:06 Music for the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Hollywood 1:21 Great Expectations Soun... Electronic 2
If I were you 2:32 Great Expectations Soun... Electronic 3
Mad World 6:56 A Bugged out Mix Electronic 23
Silk Road 3:06 A Bugged out Mix Electronic 7
Dust 6:34 A Bugged out Mix Electronic 10
Encounter 8:23 Time for A Dance Pop 8
Forest 1:21 Come Away with Me Pop 50
Hippies I h... 2:32 Come Away with Me Rock 10
Spread YW... 6:56 Come Away with Me Rock 23
Down to Up... 3:06 Come Away with Me Rock 50
Top 1:21 Come Away with Me Rock 10
Rough Jump 1:21 Come Away with Me Rock 23
Run Around 2:32 Come Away with Me Rock 50
Tweet 6:56 Great Expectations Soun... Soundtrack 3
Just You 3:06 Great Expectations Soun... Soundtrack 53
985
983

FIG. 9

Song Title
Time
Album
Genre
Rating
Count
Music Links
All Songs
Online Store
iPod
Recently played
Rating
Playlists
Artists—221
Madonna
50 Cent
Chocolate
Kruder & Dorfm...
Eminem
Genre
View
205
1097
1087
1089
1091
1093
1095
Scooter 3:05 Music For the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Hollywood 1:21 Great Expectations Soun... Electronic 2
If I were you 2:32 Great Expectations Soun... Electronic 3
Mad World 6:56 A Bugged out Mix Electronic 23
Silk Road 3:06 A Bugged out Mix Electronic 7
Dust 6:34 A Bugged out Mix Electronic 10
Forest 1:21 Come Away with Me Pop 50
Hippies I h... 2:32 Come Away with Me Rock 10
Spread YW... 6:56 Come Away with Me Rock 23
Down to Up... 3:06 Come Away with Me Rock 50
Top 1:21 Come Away with Me Rock 10
Rough Jump 1:21 Come Away with Me Rock 23
Run Around 2:32 Come Away with Me Rock 50
Tweet 6:56 Great Expectations Soun... Soundtrack 3
Just You 3:06 Great Expectations Soun... Soundtrack 53

FIG. 10

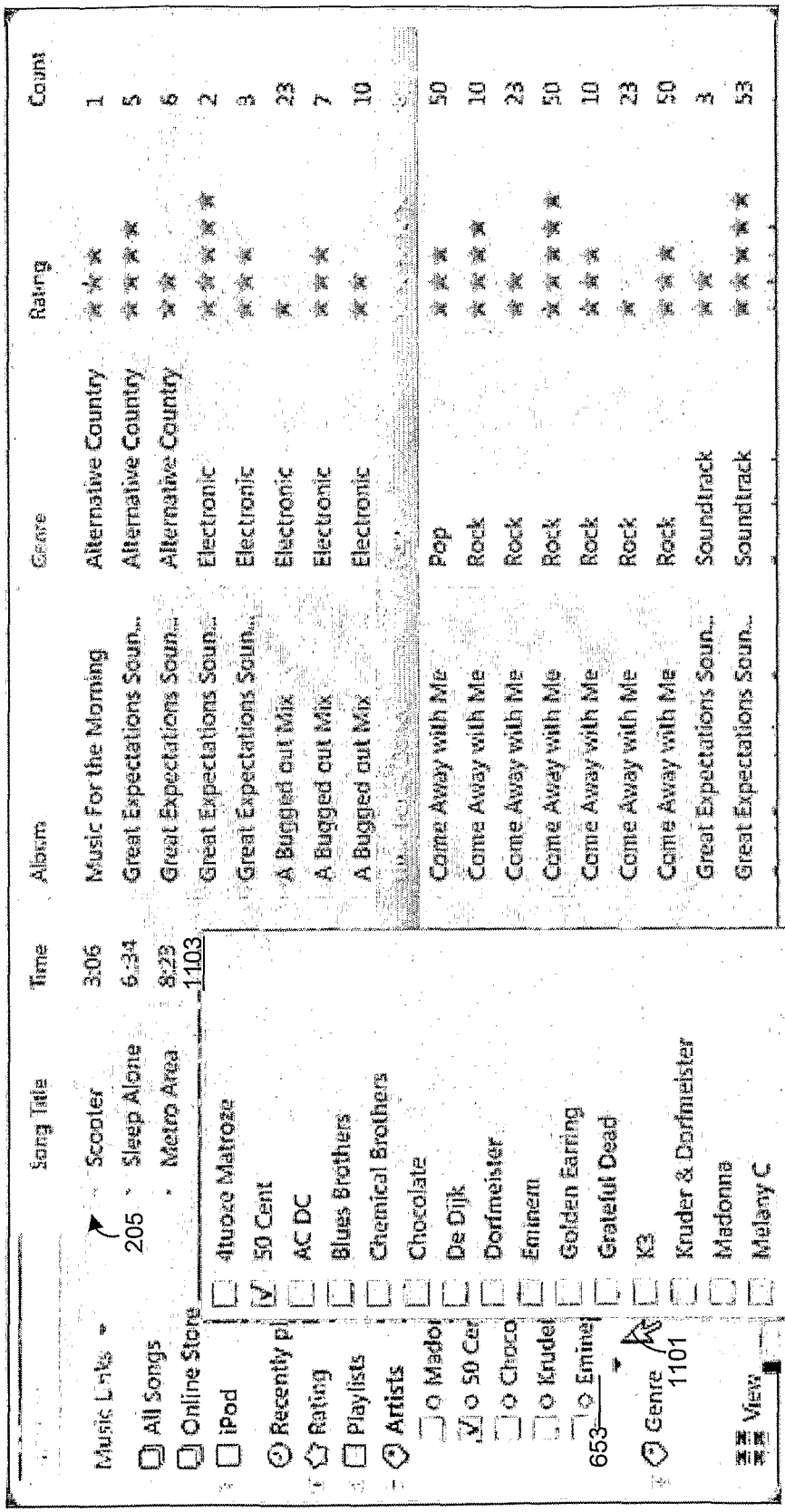
Song Title
Time
Album
Genre
Rating
Count
Music Links
Scooter
3:06
Music For the Morning
Alternative Country
1
205
Sleep Alone
6:34
Great Expectations Soun...
Alternative Country
5
All Songs
Metro Area
8:23
Great Expectations Soun...
Alternative Country
6
Online Store
1103
Great Expectations Soun...
Electronic
2
iPod
Great Expectations Soun...
Electronic
3
Recently pl
A Bugged out Mix
Electronic
23
Rating
A Bugged out Mix
Electronic
7
Playlists
A Bugged out Mix
Electronic
10
Artists
Come Away with Me
Pop
50
Genre
1101
Come Away with Me
Rock
10
Come Away with Me
Rock
23
Come Away with Me
Rock
50
Come Away with Me
Rock
10
Come Away with Me
Rock
23
Come Away with Me
Rock
50
Great Expectations Soun...
Soundtrack
3
Great Expectations Soun...
Soundtrack
53
653
View
4tunoze Matroze
50 Cent
AC DC
Blues Brothers
Chemical Brothers
Chocolate
De Dijk
Dorfmeister
Eminem
Golden Earring
Grateful Dead
K3
Kruder & Dorfmeister
Madonna
Melany C
Moby
Night Vision
OxyGen
Paul Oakenfold
Peter Ford
Prince
Sheryl Crowe
The Righteous Brothers
ZZ Top

FIG. 11

Song Title
Time
Album
Genre
Rating
Count
Music Links
All Songs
Online Store
iPod
Recently played
Rating
Playlists
Artists
Genre
Scooter 3:06 Music For the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Hollywood 1:21 Great Expectations Soun... Electronic 2
If I were you 2:32 Great Expectations Soun... Electronic 3
Mad World 6:56 A Bugged out Mix Electronic 23
Silk Road 3:05 A Bugged out Mix Electronic 7
Dust 6:34 A Bugged out Mix Electronic 10
Time for A Dance Pop 8
Come Away with Me Pop 50
Come Away with Me Rock 10
Come Away with Me Rock 23
Come Away with Me Rock 50
Come Away with Me Rock 10
Come Away with Me Rock 23
Come Away with Me Rock 50
Tweet 6:56 Great Expectations Soun... Soundtrack 3
Just You 3:06 Great Expectations Soun... Soundtrack 53
Madonna
50 Cent
Chocolate
Krudor &
Eminem
Show All Music by Artist
Add new Artist
Move Up
Move Down
Add / Remove Music Links
221
1205
1207
1209
1211
1213
1215
203
View

FIG. 12

Music Links
All Songs
Online Store
iPod
Recently played
Rating
Playlists
Artists
Madonna
50 Cent
Chocolate
Kruder & Dorfmeis...
Eminem
Genre
View
1317
203
Song Title
Time
Album
Genre
Rating
Count
Scooter 3:06 Music For the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Hollywood 1:21 Great Expectations Soun... Electronic 2
If I were you 2:32 Great Expectations Soun... Electronic 3
Mad World 6:56 A Bugged out Mix Electronic 23
Silk Road 3:06 A Bugged out Mix Electronic 7
Dust 6:34 A Bugged out Mix Electronic 10
Encounter 8:23 Time for A Dance Pop 8
Forest 1:21 Come Away with Me Pop 50
Hippies I h... 2:32 Come Away with Me Rock 10
Spread YW... 6:56 Come Away with Me Rock 23
Down to Up... 3:06 Come Away with Me Rock 50
Top 1:21 Come Away with Me Rock 10
Rough Jump 1:21 Come Away with Me Rock 23
Run Around 2:32 Come Away with Me Rock 50
Tweet 6:56 Great Expectations Soun... Soundtrack 3
Just You 3:06 Great Expectations Soun... Soundtrack 53

FIG. 13

Music Links
All Songs
Online Store
iPod
Recently played
Rating
Playlists
Halloween Party
Coast to Coast
Xmas
Artists
Genre
View
203
219
1419
1421
1423
1425
Song Title
Time
Album
Genre
Rating
Count
Scooter 3:06 Music For the Morning Alternative Country 1
Sheep Alone 6:34 Great Expectations Soun... Alternative Country 5
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Hollywood 1:21 Great Expectations Soun... Electronic 2
If I were you 2:32 Great Expectations Soun... Electronic 3
Mad World 6:56 A Bugged out Mix Electronic 23
Silk Road 3:06 A Bugged out Mix Electronic 7
Dust 6:34 A Bugged out Mix Electronic 10
Encounter 8:23 Time for A Dance Pop 8
Forest 1:21 Come Away with Me Pop 50
Hippies I h... 2:32 Come Away with Me Rock 10
Spread YW... 6:56 Come Away with Me Rock 23
Down to Up... 3:06 Come Away with Me Rock 50
Top 1:21 Come Away with Me Rock 10
Rough Jump 1:21 Come Away with Me Rock 23
Run Around 2:32 Come Away with Me Rock 50
Tweet 6:56 Great Expectations Soun... Soundtrack 3
Just You 3:06 Great Expectations Soun... Soundtrack 53

FIG. 14

Music Links
All Songs
Online Store
iPod
Recently played
Rating
Playlists—219
1419
Halloween Party
1421
Coast to Coast trip
Cruising—1527
Specials—1529
1531
Mountain High
Beach Songs
1533
Xmas 2003
1423
203
View
Song Title
Time
Album
Genre
Rating
Count
Scooter 3:06 Music For the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Hollywood 1:21 Great Expectations Soun... Electronic 2
If I were you 2:32 Great Expectations Soun... Electronic 3
Mad World 6:56 A Bugged out Mix Electronic 23
Silk Road 3:06 A Bugged out Mix Electronic 7
Dust 6:34 A Bugged out Mix Electronic 10
Encounter 8:23 Time for A Dance Pop 8
Forest 1:21 Come Away with Me Pop 50
Hippies I h... 2:32 Come Away with Me Rock 10
Spread YW... 6:56 Come Away with Me Rock 23
Down to Up... 3:06 Come Away with Me Rock 50
Top 1:21 Come Away with Me Rock 10
Rough Jump 1:21 Come Away with Me Rock 23
Run Around 2:32 Come Away with Me Rock 50
Tweet 6:56 Great Expectations Soun... Soundtrack 3
Just You 3:06 Great Expectations Soun... Soundtrack 53

FIG. 15

Song Title
Time
Album
Genre
Rating
Count
Music Links
Scooter 3:06 Music For the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
All Songs
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Online Store
Hollywood 1:21 Great Expectations Soun... Electronic 2
iPod 1637
If I were you 2:32 Great Expectations Soun... Electronic 3
1639
Recently played 215
A Bugged out Mix Electronic 23
Rating
Show 'Recently played' 1643
A Bugged out Mix Electronic 7
Playlists 1635
Specific node task 1 1645
A Bugged out Mix Electronic 10
Artists
Specific node task 2 1647
Time for A Dance Pop 8
Genre
Delete 1649
Come Away with Me Pop 50
1641
Rename 1651
Come Away with Me Rock 10
203
Move Up 1653
Come Away with Me Rock 23
Move Down 1655
Come Away with Me Rock 50
Add / Remove Music Links
Come Away with Me Rock 10
Come Away with Me Rock 23
Run Around 2:32
Come Away with Me Rock 50
Tweet 6:56
Great Expectations Soun... Soundtrack 3
View
Just You 3:06
Great Expectations Soun... Soundtrack 53

FIG. 16

Song Title
Time
Album
Genre
Rating
Count
Music Links
Add Current Page to Music Links
Sort Music Links by
Hide Pane
Add / Remove Music Links
Rating
Playlists
Artists
Genre
View
Scooter 3:06 Music For the Morning Alternative Country 1
6:34 Great Expectations Soun... Alternative Country 5
8:23 Great Expectations Soun... Alternative Country 6
1:21 Great Expectations Soun... Electronic 2
2:32 Great Expectations Soun... Electronic 3
6:56 A Bugged out Mix Electronic 23
Silk Road 3:06 A Bugged out Mix Electronic 7
Dust 6:34 A Bugged out Mix Electronic 10
Encounter 8:23 Time for A Dance Pop 8
Forest 1:21 Come Away with Me Pop 50
Hippies I h... 2:32 Come Away with Me Rock 10
Spread YW... 6:56 Come Away with Me Rock 23
Down to Up... 3:06 Come Away with Me Rock 50
Top 1:21 Come Away with Me Rock 10
Rough Jump 1:21 Come Away with Me Rock 23
Run Around 2:32 Come Away with Me Rock 50
Tweet 6:56 Great Expectations Soun... Soundtrack 3
Just You 3:06 Great Expectations Soun... Soundtrack 53
207
1759
1763
1765
1767
1769
203
205

FIG. 17

Song Title
Time
Album
Genre
Rating
Count
Music Links
All Songs
Online Store
iPod
Recently played
Rating
Playlists
Artists
Genre
View
Scooter 3:06 Music For the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Hollywood 1:21 Great Expectations Soun... Electronic 2
If I were you 2:32 Great Expectations Soun... Electronic 3
Mad World 6:56 A Bugged out Mix Electronic 23
Silk Road 3:06 A Bugged out Mix Electronic 7
Fast 6:34 A Bugged out Mix Electronic 10
Forest 1:21 Come Away with Me Pop 50
Hippies I h... 2:32 Come Away with Me Rock 10
Spread YW... 6:56 Come Away with Me Rock 23
Down to Up... 3:06 Come Away with Me Rock 50
Top 1:21 Come Away with Me Rock 10
Rough Jump 1:21 Come Away with Me Rock 23
Run Around 2:32 Come Away with Me Rock 50
Tweet 6:56 Great Expectations Soun... Soundtrack 3
Just You 3:06 Great Expectations Soun... Soundtrack 53
1871
1875
1873
221
205
203

FIG. 18

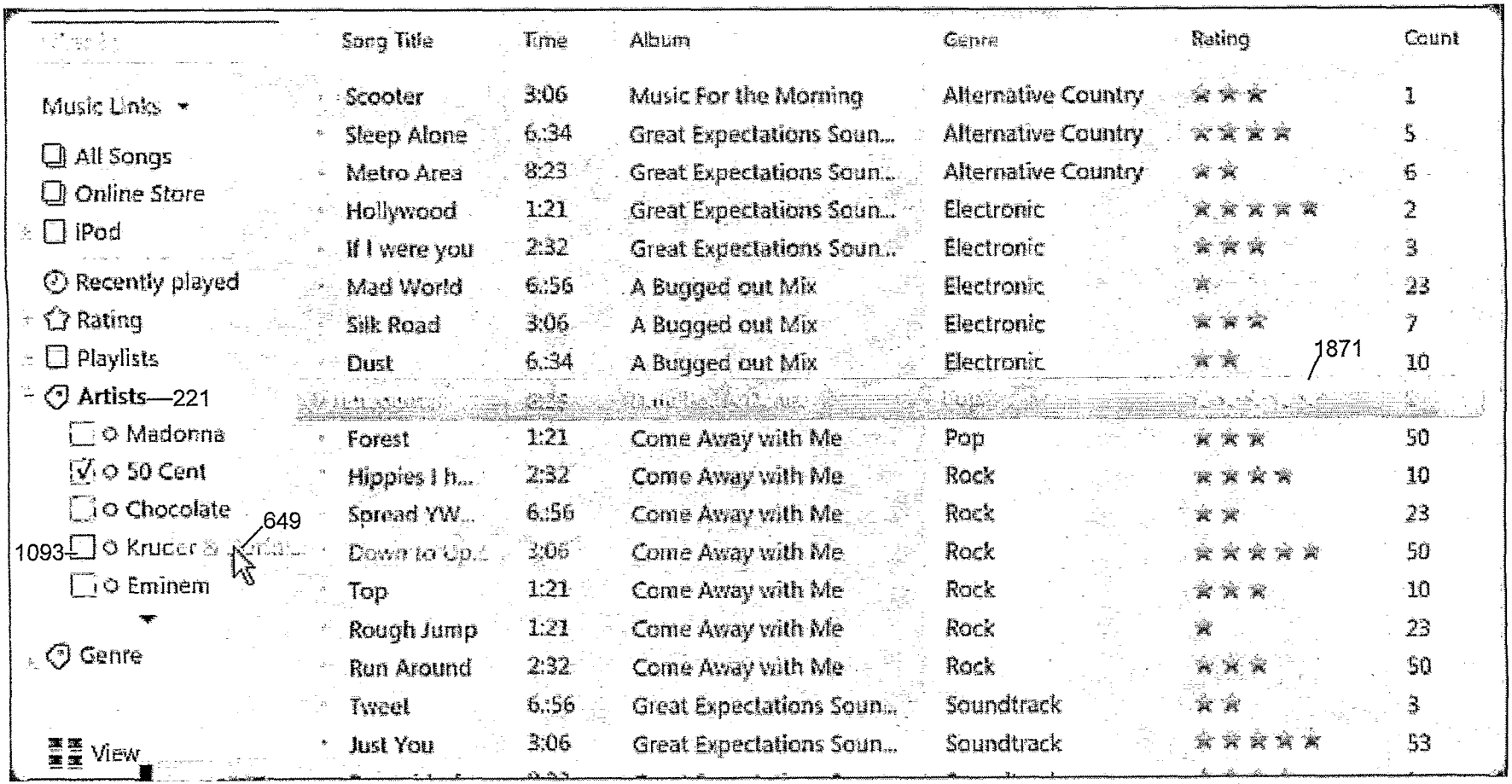
Music Links
All Songs
Online Store
iPod
Recently played
Rating
Playlists
Artists—221
Madonna
50 Cent
Chocolate
Kruder & Dorfmeister
Eminem
Genre
View
649
1093
1871
Song Title
Time
Album
Genre
Rating
Count
Scooter 3:06 Music For the Morning Alternative Country 1
Sleep Alone 6:34 Great Expectations Soun... Alternative Country 5
Metro Area 8:23 Great Expectations Soun... Alternative Country 6
Hollywood 1:21 Great Expectations Soun... Electronic 2
If I were you 2:32 Great Expectations Soun... Electronic 3
Mad World 6:56 A Bugged out Mix Electronic 23
Silk Road 3:06 A Bugged out Mix Electronic 7
Dust 6:34 A Bugged out Mix Electronic 10
Forest 1:21 Come Away with Me Pop 50
Hippies I h... 2:32 Come Away with Me Rock 10
Spread YW... 6:56 Come Away with Me Rock 23
Down to Up... 3:06 Come Away with Me Rock 50
Top 1:21 Come Away with Me Rock 10
Rough Jump 1:21 Come Away with Me Rock 23
Run Around 2:32 Come Away with Me Rock 50
Tweet 6:56 Great Expectations Soun... Soundtrack 3
Just You 3:06 Great Expectations Soun... Soundtrack 53

FIG. 19

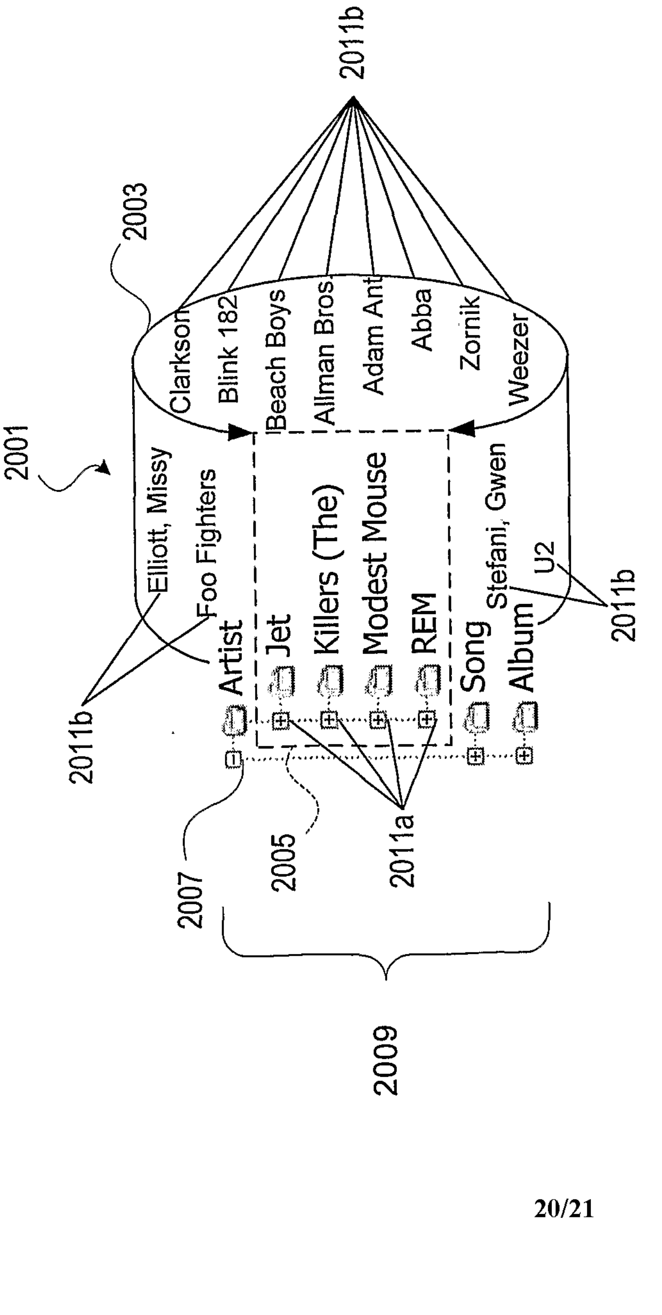
2001
2003
2011b
Clarkson
Blink 182
Beach Boys
Allman Bros
Adam Ant
Abba
Zornik
Weezer
Elliott, Missy
Foo Fighters
Artist
Jet
Killers (The)
Modest Mouse
REM
Song
Album
Stefani, Gwen
U2
2011b
2011b
2007
2005
2011a
2009

FIG. 20

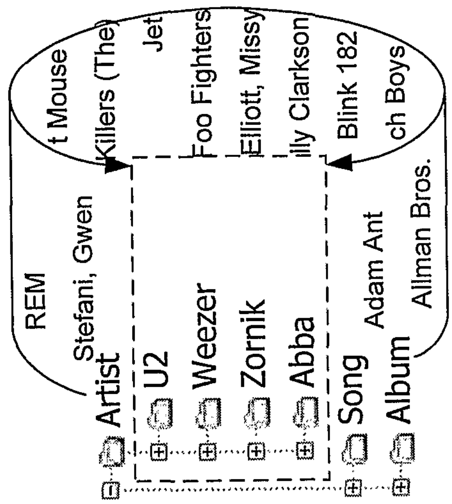
REM
Stefani, Gwen
t Mouse
Killers (The)
Jet
Foo Fighters
Elliott, Missy
lly Clarkson
Blink 182
ch Boys
Allman Bros.
Adam Ant
Artist
U2
Weezer
Zornik
Abba
Song
Album

FIG. 21

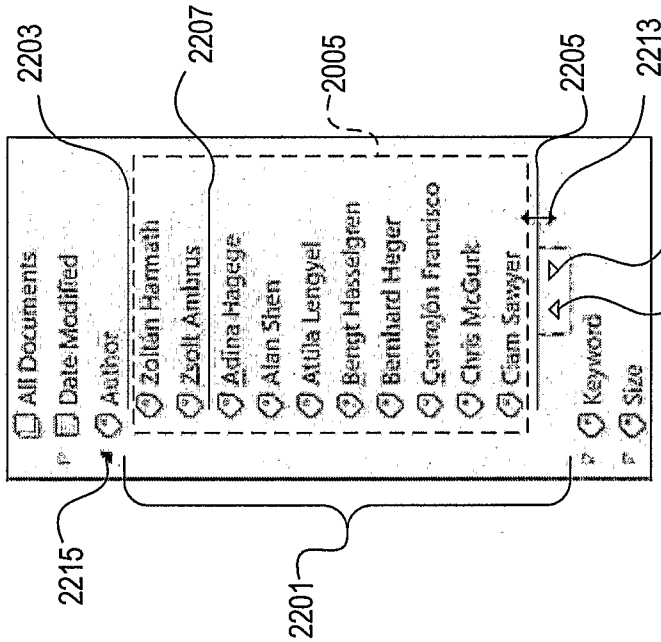
All Documents
Date Modified
Author
Zoltán Hamath
Zsolt Amlrus
Adina Hagege
Alan Shen
Attila Lengyel
Bengt Hasselgren
Bernhard Heger
Castrejón Francisco
Chris McGurk
Clam Sawyer
Keyword
Size
2203
2207
2005
2205
2213
2211
2209
2215
2201

FIG. 22