

[0069] In accordance with one preferred aspect of the present invention, the map items may dynamically shift on a navigation map depending upon the current subject matter represented by the map items. Thus, a map may exhibit dynamic re-mapping of map items onto different regions in response to programming changes or other criteria. For example, a map item representing the station HBO may appear on the "Movies" region 122 during the broadcast of a movie and automatically shift to the "Sports" region 120 if a sporting event is broadcast after the movie. In addition, different map items may dynamically appear or disappear in response to the characteristics or availability of programming.

[0070] As described above, a user can navigate map 108 using navigation bar 104, a remote control device, and/or other user interface devices (e.g., a mouse, a keyboard, a trackball, a joystick, a touch pad, etc.). In accordance with one aspect of the present invention, map 108 can be navigated and traversed in an intuitive and easy manner. The user may engage navigation bar 104 for purposes of zooming and panning. In addition, the user can direct the displayed cursor to a specific region of map 108 and select that region (e.g., by clicking the mouse button) to center map 108 about that region or to magnify map 108 about that region. For example, the user can select the Sports island 120 to automatically zoom and reposition or re-center map 108 to focus on that region. Such zooming and repositioning may also be controlled by external events that do not require the user to initiate a zoom or re-center command. For example, the interface display system may receive a request to display the region labeled "Movies." In response, the map 108 may be adjusted to focus on that region. As another example, a user may select a banner advertisement displayed in connection with an application external to the interface display system (such as a web browser). In response to the selection of the advertisement, map 108 can be displayed with an appropriate region (associated with the advertisement) as the central focal point. Embodiments that implement continuous zooming and/or continuous panning may have intuitive navigation capabilities that allow the user to easily pan, zoom, or scroll over map 108 using an interface device, e.g., by clicking and dragging the cursor to reposition map 108.

[0071] As described above, many televisions and set-top converters are controlled by remote control devices having limited navigation capabilities (many of these devices merely include four directional control buttons). Traversing through an interactive interface can be difficult with such remote control devices, particularly when the interface display does not contain control points arranged in a grid pattern. In other words, it can be difficult for the user to ascertain which control point will be selected in response to any given directional button.

[0072] The navigation interface display system of the present invention may be suitably configured to generate guidance indicators on the navigation map. The guidance indicators provide visual guidance to the user, thus simplifying navigation of the map with a user device having limited navigation capabilities. FIG. 3 depicts exemplary guidance indicators rendered in the form of directional arrows. In this example, a map item 316 is the currently selected symbol or the symbol associated with the current position of the user's navigation device. Map item 316 is located in response to user interaction and map item 316

may be highlighted to reflect that it is the current position. As shown in the map 328 of FIG. 3, a number of asymmetrically arranged map items surround map item 316. Map item 302 is associated with an arrow pointing up, map item 318 is associated with an arrow pointing down, map item 320 is associated with an arrow pointing right, and map item 322 is associated with an arrow pointing left. These arrows rendered on the display element provide immediate visual feedback to the user by indicating map items, other than the selected map item, to which the user can move. The navigation indicators are dynamic in nature; they automatically respond to movement of the cursor position by identifying the appropriate neighboring map items.

[0073] The correspondence between map items and directional indicators may be determined in a dynamic manner using any number of algorithms designed to find the "closest neighbors." Such an embodiment would allow automatic adaptation to the addition or subtraction of map items. In an alternate embodiment, the map may be initially designed with such guidance indicators coded along with the map items. This technique may be suitable for use with navigation maps where the number and location of map items are fixed.

[0074] It should be appreciated that the number of navigation indicators need not be limited to four and that the present invention may be flexibly configured to accommodate any number of discrete navigation directions. In addition, the navigation indicators need not be rendered as directional arrows. Alternate embodiments may employ any suitable pointing icon such as those rendered for use with a mouse cursor, colored markers, distinguishable icons, or the like. Indeed, some benefits may be derived by merely highlighting or indicating the neighboring map items without specifically identifying the direction of travel required to reach them. Although the guidance indicators are utilized in the context of the navigation interface display system described herein, the technique may be implemented in any number of alternative navigation display systems. For example, the concept of guidance indicators may be employed in the context of video games, interactive DVDs, and other applications that rely on a remote control device having a discrete number of directional controls.

[0075] In a practical embodiment, the navigation of the displayed map is responsive to directional control signals, magnification control signals, centering control signals, and other navigational control signals that may be initiated by the user. Such control signals may be directly processed by the respective presentation device or they may be suitably transmitted to a server for central processing and manipulation of the displayed map. The processing of such control signals may be better understood in connection with the description of the hardware and software architecture of the navigation interface display system (see the description associated with FIGS. 4-12).

[0076] Hierarchical Map Characteristics

[0077] The navigation map is preferably designed to display its features in a hierarchical manner. Briefly, the navigation map exhibits a hierarchical categorization scheme associated with the grouping of the map items and a hierarchical visibility scheme associated with the display of active map items. Both of these hierarchical schemes will be described in detail with reference to FIGS. 1-3.