

## METHOD AND APPARATUS FOR NAVIGATING AN IMAGE USING A TOUCHSCREEN

### BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention generally relates to navigating an image viewed on a display screen using a touchscreen.

[0003] 2. Background Information

[0004] A new era in TV viewing experience is emerging in which video complementary data services are available to the TV viewer using a second display screen on an auxiliary display device. One example of an auxiliary display device is a webpad, which is a relatively small remote wireless device.

[0005] FIG. 1 shows a conventional two-screen digital cable TV system 100. The system 100 includes an auxiliary display device 105 which communicates with a digital set-top box (STB) 110 (also referred to as a "local device") using a wireless connection. The wireless connection utilizes an external port 115 on the STB 110, such as a Universal serial bus (USB), Ethernet, or IEEE 1394 port equipped with an access point 120 that communicates with the auxiliary display device 105 over a wireless radio frequency (RF) link 125. The access point 120 in this scenario is a device designed for a specific interface (e.g., USB) and is used to support wireless connectivity. The auxiliary display device 105 may also be connected directly to a high-speed cable modem, digital subscriber (DSL) modem or any other high-speed Internet connection device to access the Internet 135. TV video programming 140 is accessible via STB 110. Typical wireless connection protocols that may be used by TV system 100 include, but are not limited to, HomeRF® and IEEE 802.11. A more traditional wired connection simply includes a cable or wire between the STB 110 and the auxiliary display device 105, again using a USB, Ethernet, or IEEE 1394 port. The STB 110 is also connected to a television 130.

[0006] The two-screen digital cable TV system 100 allows for many enhanced capabilities over a one-screen system. For example, a user can view Internet data on the screen of the auxiliary display device 105, while watching video uninterrupted on the television 130. In another example, STB applications that are normally viewed on the television screen, are viewed on the screen of the auxiliary display device 105, leaving the television 130 available for video program viewing.

[0007] In a CATV system, an electronic program guide (EPG) is a specific example of an application that can be interacted with through an application running on a second screen device, such as auxiliary display device 105. An EPG is used by a viewer to determine what programs are available for viewing on a television, at what time the programs will be broadcast, and on which channels. More sophisticated EPGs display supplemental information used by the viewer to determine whether the program is suitable for young children, what actors are in the program, how long the program is, and what the program is about. Normally in an EPG, an individual windowed portion is allocated for each program displayed. Viewers of CATV programs use a GUI to navigate an EPG and select program windows in the EPG that are of particular interest.

[0008] U.S. Pat. No. 6,130,726 (Darbee et al.) discloses a remote control display unit which selects programming shown on a television and displays images on a visual display. The remote control display unit disclosed in U.S. Pat. No. 6,130,726 includes an EZ NAV key used to navigate an EPG by moving up, down, left and right. U.S. Pat. No. 6,130,726 does not disclose using navigational control areas on a touchscreen to navigate an image.

[0009] Furthermore, many operating systems use scrollbars displayed on the X and/or Y axis margins of a display screen to allow an image on the screen to be navigated. Scrollbars take up a significant portion of the display that could be used to display a larger and less distracting view of the image.

[0010] Thus, it is desirable to navigate an image (e.g., EPG, game) displayed on a display of an auxiliary display device without using space consuming scrollbars or physical control devices such as a joystick, mouse, keys, or the like.

### SUMMARY OF THE INVENTION

[0011] The present invention is a method and apparatus for navigating an image viewed on a display screen. The image is controlled by a processor that receives navigational commands selected on a touchscreen of an auxiliary display device. The touchscreen is partitioned into a plurality of navigational control areas. Each navigational control area is associated with a different navigational command. One of the navigational control areas is selected. The navigational command associated with the selected navigational control area is transmitted to the processor. The processor receives and executes the transmitted navigational command to navigate the image.

[0012] The image may have a plurality of selectable image portions. At least one of the selectable image portions may be currently highlighted for possible selection.

[0013] A center circular portion of the touchscreen may be defined and divided into four central navigational control areas and at least one entry control area. Four corner navigational control areas of the touchscreen may be defined. Each corner navigational control area may be adjacent to the center circular portion and located in a respective corner of the touchscreen.

[0014] Each of the navigational commands associated with the four corner navigational control areas may be used to change the x-axis and y-axis coordinates of the position of the at least one of the selectable image portions. Each of the navigational commands associated with the four central navigational control areas may be used to change one of the x-axis and y-axis coordinates of the position of the at least one of the selectable image portions. Each navigational control area may be associated with a different navigational command that changes the image portion that is highlighted from the currently highlighted image portion to a image portion adjacent to the currently highlighted image portion when the different navigational command is executed by the processor.

[0015] The partitions of the touchscreen may further include at least one entry control area. The entry control area may be selected to activate a function associated with the currently highlighted selectable image portion.