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(54) **METHOD AND SYSTEM TO COMBINE BROADCAST TELEVISION AND INTERNET TELEVISION**

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H04N 21/81 (2011.01)
H04N 21/462 (2011.01)

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(52) **U.S. Cl.**
CPC *H04N 5/44591* (2013.01); *H04N 21/23424* (2013.01); *H04N 21/2665* (2013.01); *H04N 21/4316* (2013.01); *H04N 21/4622* (2013.01); *H04N 21/6125* (2013.01); *H04N 21/6137* (2013.01); *H04N 21/812* (2013.01)

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(58) **Field of Classification Search**
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USPC 725/39, 198, 112
See application file for complete search history.

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This patent is subject to a terminal disclaimer.

(56) **References Cited**

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Related U.S. Application Data

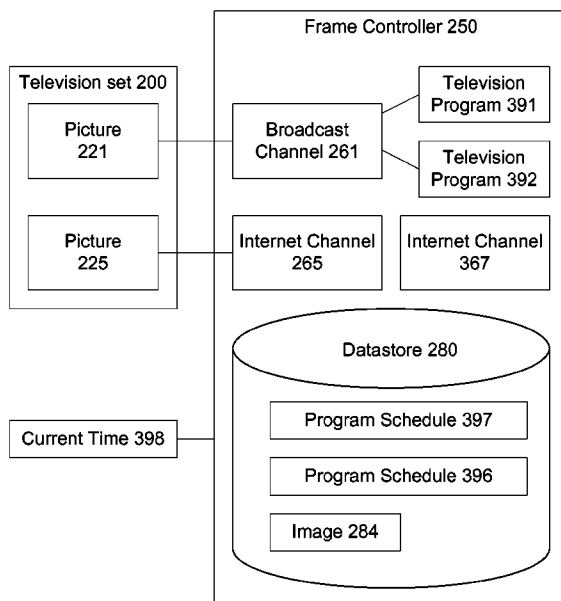
(63) Continuation of application No. 14/167,392, filed on Jan. 29, 2014, now Pat. No. 8,978,065, which is a continuation of application No. 13/586,192, filed on Aug. 15, 2012, now Pat. No. 8,683,536, which is a continuation of application No. 11/818,018, filed on Jun. 13, 2007, now Pat. No. 8,286,214.

(57) **ABSTRACT**

Provided is a method and system for receiving and displaying video from both an Internet and a broadcast video source. Also provided is a frame controller for receiving video data from an Internet video stream and from a cable broadcast video stream, the frame controller further in communication with a television display and causing the Internet video stream and the cable broadcast video stream to each be displayed in a separate frame on the television display.

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24 Claims, 5 Drawing Sheets



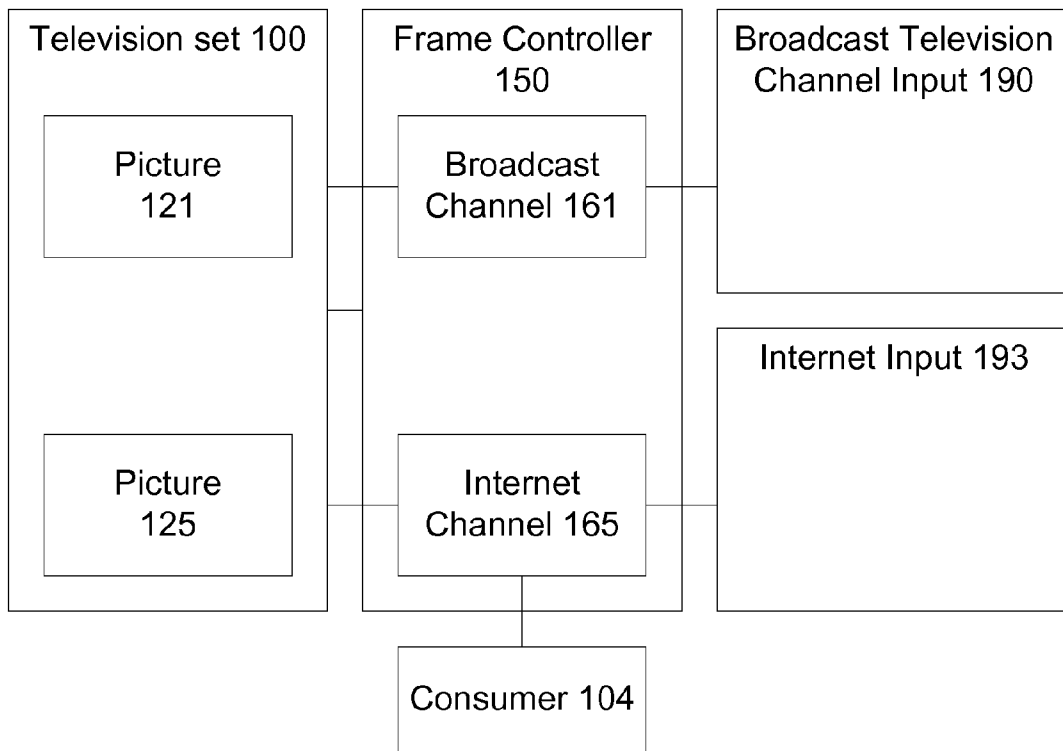


Figure 1

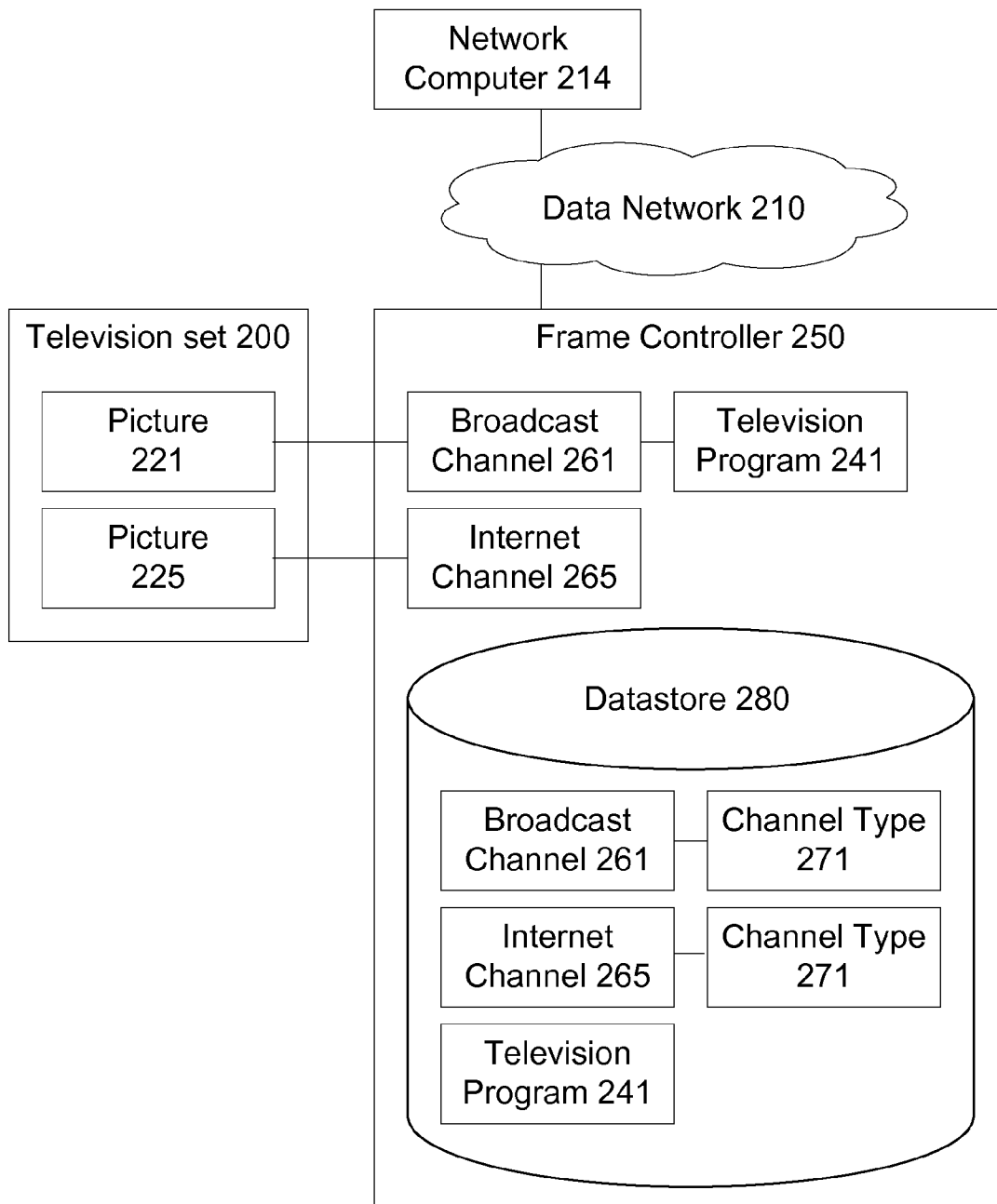


Figure 2

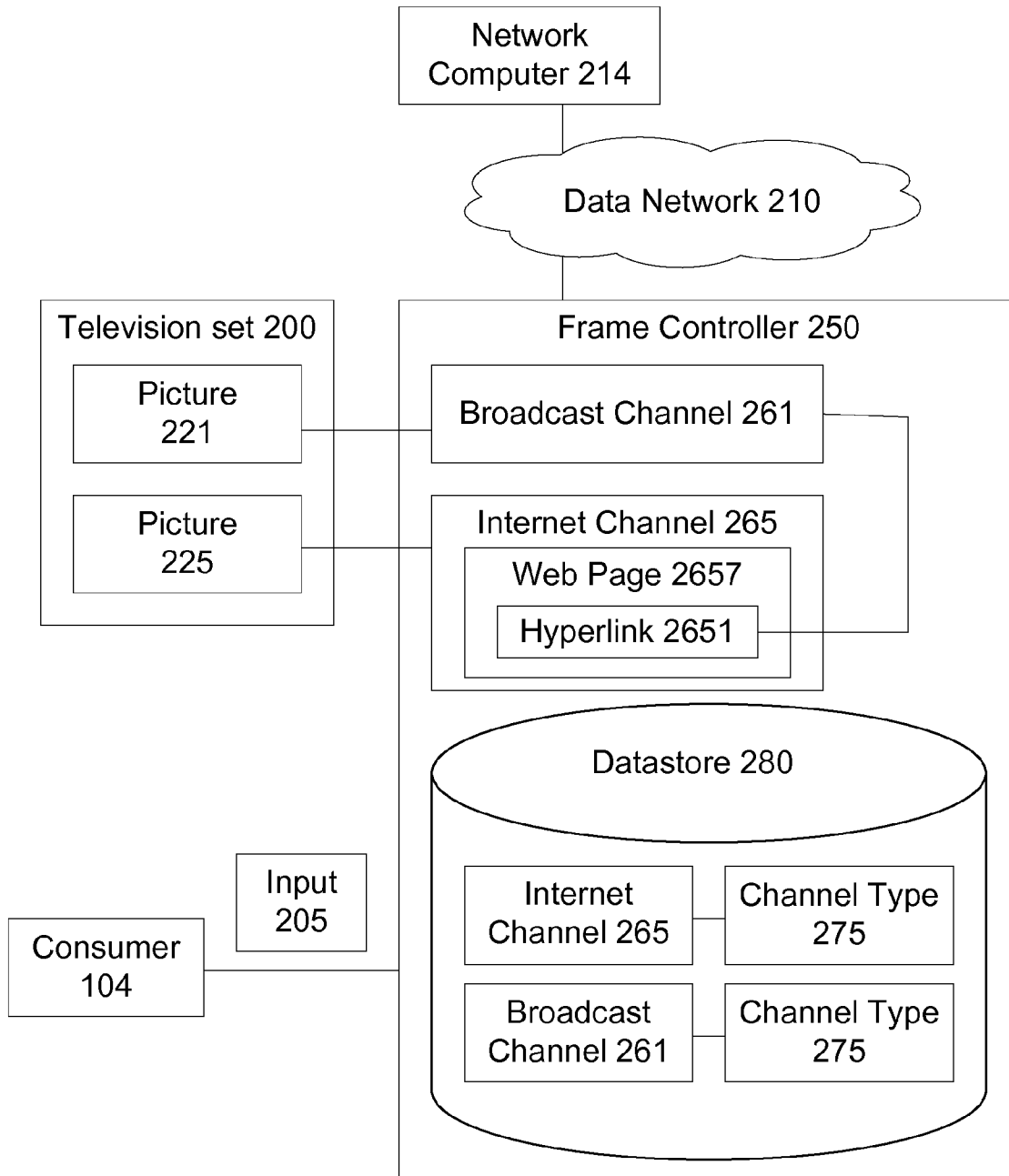


Figure 3

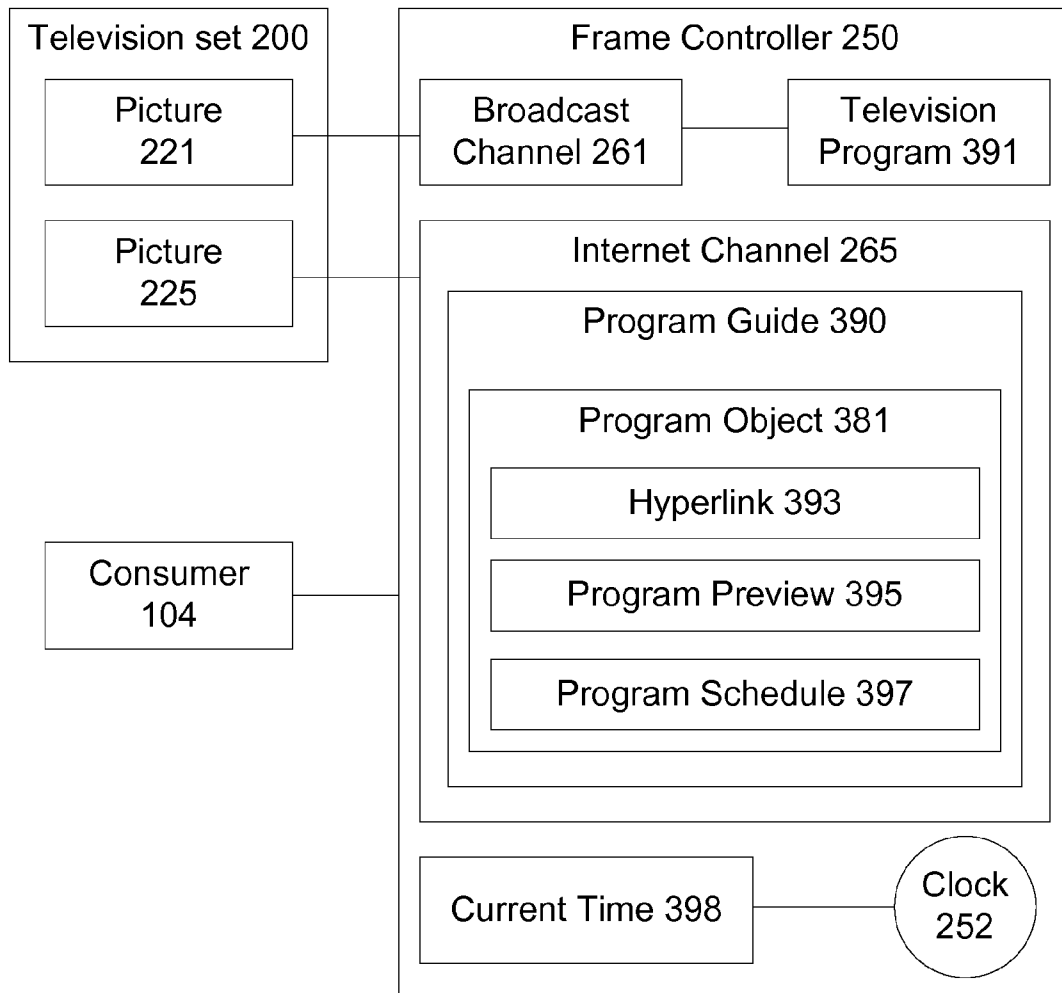


Figure 4

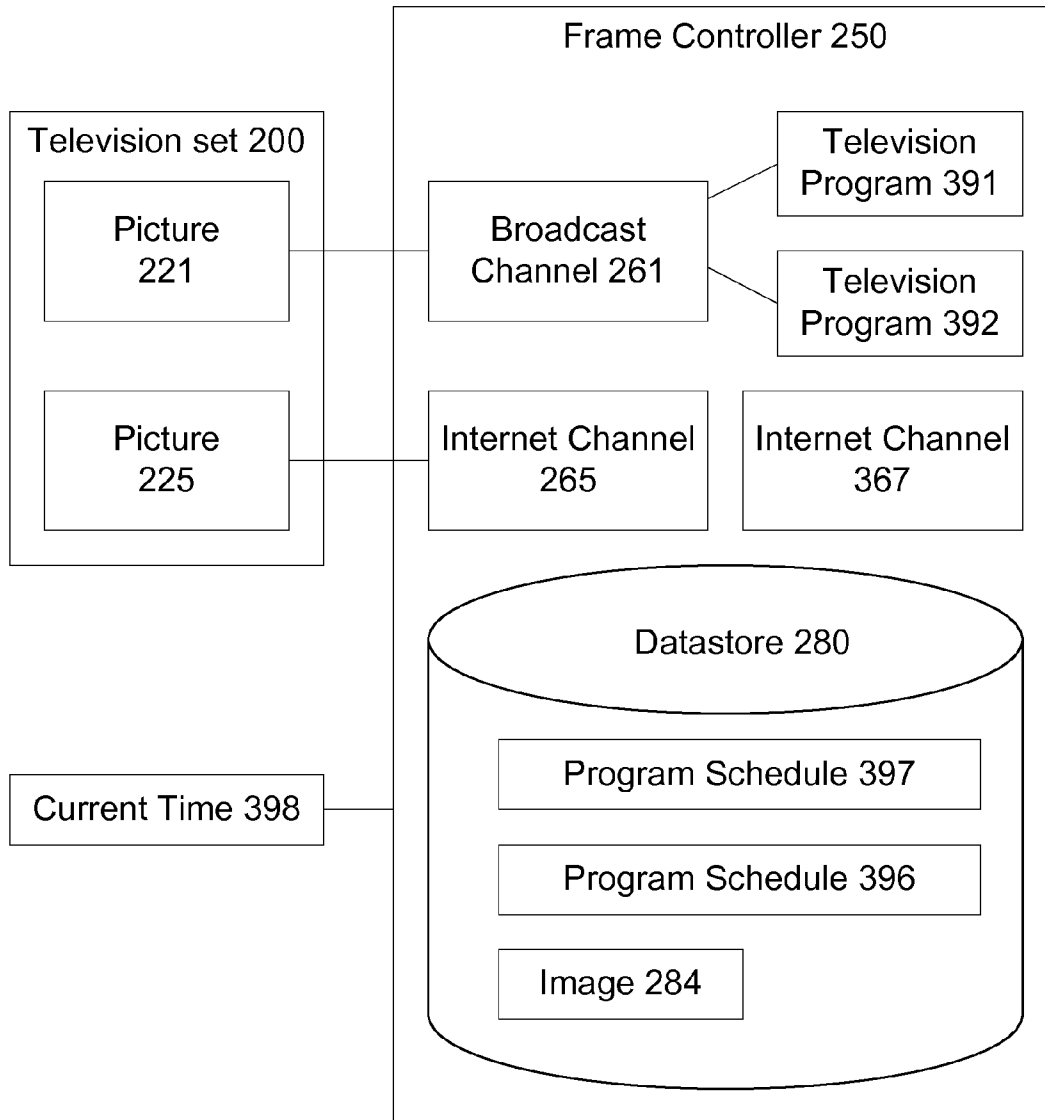


Figure 5

METHOD AND SYSTEM TO COMBINE BROADCAST TELEVISION AND INTERNET TELEVISION

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention generally relates to media, and more particularly, to a method and system to combine broadcast television and Internet television.

2. Background of the Invention

It is commonplace today for cable television and satellite television networks to carry several hundred channels. Typically, even a subscriber to basic services gets over 50 channels. It is not uncommon for a subscriber to have over 100 channels available with a subscription. Advances in Internet video and television make available thousands more channels and videos for consumer entertainment.

Many Internet videos and television channels are closely related to television programs shown on regular television channels, yet consumers cannot view a television program and switch to related Internet videos easily on their television set.

For example, in one scenario, while John is watching a NCAA sweet sixteen basketball match on an ESPN cable channel, he may want to see updates of other concurrent NCAA games, which are available on ESPN's Internet website. In order to view the concurrent games, John has to take his laptop computer into the same room and connect to ESPN's website.

In another exemplary scenario, Mary is watching a HBO channel showing the movie "Titanic". She is curious about actor Leonardo DiCaprio, and wishes to investigate his current events. Particularly Mary is interested in seeing a preview of a recent Leonardo DiCaprio movie titled "The Departed". Mary does not want to go to the computer in the kitchen, but is otherwise unable to view the Internet movie preview.

Thus, there is a need to allow combined showings of Internet videos and traditional television onto a television set.

SUMMARY OF THE INVENTION

An aspect of the present invention provides a television system and method including a frame controller for receiving video data from a plurality of video streams. At least one of the video streams is from an Internet source, and at least one other of the video streams is from a broadcast source. The frame controller is further in communication with a television display and causes the video stream from the Internet source and from the broadcast source to each be displayed in a separate frame on the television display.

In one aspect of the invention, the Internet video stream relates to an image and sounds signal source from one of the Internet, a web portal, or a web site.

In another aspect of the invention, the frame controller provides an interactive television between the Internet source and a consumer session.

In one aspect of the invention, the broadcast video stream relates to an image and sounds signal source from one of a broadcast television network, a cable television network, or a satellite television network.

In another aspect of the invention, the broadcast video stream relates to an image and sounds signal source from a multi-channel operator.

In one aspect of the invention, the broadcast video stream relates to an image and sounds signal source from a multi-service operator.

In another aspect of the invention, the frame controller selects the broadcast video stream based on the Internet video stream.

In another aspect of the invention, the frame controller selects the Internet video stream based on the broadcast video stream.

In another aspect of the invention, the frame controller selects the Internet video stream and the broadcast video stream based on a common attribute.

Another aspect of the invention includes a datastore in communication with the frame controller. The datastore includes paired broadcast and Internet video streams. The frame controller selects the broadcast video stream to display by querying the data store with the Internet video stream, then displaying the broadcast video stream paired with the Internet video stream as returned by the datastore.

In another aspect of the invention, the datastore is queried with a broadcast video stream and the frame controller selects for display the Internet video stream paired with the broadcast video stream as returned by the datastore.

In another aspect of the invention, the frame controller is in communication with a network computer and the network computer selects the Internet video stream to display.

In another aspect of the invention, a program guide is provided from an Internet source. The program guide includes information regarding broadcast video streams. It is used by the frame controller, which selects the Internet video stream to display based on information regarding the broadcast video stream obtained from the program guide.

In another aspect of the invention, the frame controller selects a second Internet video stream to display based on information regarding the broadcast video stream.

In another aspect of the invention, the frame controller selects a second broadcast video stream to display when the broadcast video stream ends.

Another aspect of the invention also includes a program guide provided by an Internet source, which includes information regarding Internet video streams. The frame controller selects the broadcast video stream to display based on information regarding the Internet video stream from the program guide.

In another aspect of the invention, the frame controller selects a second Internet video stream to display based on information regarding the broadcast video stream.

In another aspect of the invention, the frame controller selects a second broadcast video stream to display when the broadcast video stream ends.

In another aspect of the invention, the video stream from the Internet source and from the broadcast source are displayed simultaneously.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic diagram illustrating a television set displaying a broadcast television channel and an Internet television channel at the same time, in accordance with an embodiment of the present invention;

FIG. 2 is a schematic diagram illustrating a process of selecting an Internet channel based on broadcast channel, in accordance with an embodiment of the present invention;

FIG. 3 is a schematic diagram illustrating a process of selecting a broadcast channel based on an channel, in accordance with an embodiment of the present invention;

FIG. 4 is a schematic diagram illustrating an Internet channel providing a television programming guide, in accordance with an embodiment of the present invention; and

FIG. 5 is a for selecting schematic diagram illustrating a process for selecting a second Internet channel, in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION

In the following description, for purposes of explanation, specific numbers, materials and configurations are set forth in order to provide a thorough understanding of the invention. It will be apparent, however, to one having ordinary skill in the art, that the invention may be practiced without these specific details. In some instances, well-known features may be omitted or simplified so as not to obscure the present invention. Furthermore, reference in the specification to “one embodiment” or “an embodiment” means that a particular feature, structure or characteristic described in connection with the embodiment is included in at least one embodiment of the invention. The appearances of the phrase “in an embodiment” in various places in the specification are not necessarily all referring to the same embodiment.

The term “video data” referred to in the descriptions of various embodiments of the invention herein described is intended to generally describe electronic audio and video signals containing or incorporating video for display on a television or other video display device. This term is used in the broadest sense as known in the electronic arts, and may include analog and/or digital signals. Likewise, the term “video stream” is used in a non-limiting fashion and generally refers to the collection of video data, together with any carrier signals, data headers or other electronic information, which singularly or taken together allow the described embodiments to operate. For example, a digital video stream from a given video source might include multiple packets of compressed video data, each packet or group thereof having one or more packet headers. Typically, one or more of the headers includes information relating to the video data, such as the compression algorithm used, the aspect ratio, etc.

As used herein, the terms “picture frame” and “frame” refer to the borders of a displayed picture. Unless otherwise specified, a picture frame does not necessarily have a border of any particular width, i.e., a displayed picture might occupy the entire area of the picture frame, or the picture frame may include a border. Reference to locations on a display device may be made by referring to either the location of the picture frame or to the location of displayed picture itself, without limitation. Reference to the size of a picture frame refers to the height and width of the frame, and frames of differing width and/or differing height are referred to as being of different sizes.

As used herein, the term “picture” refers to the whole of the display image and its picture frame, unless otherwise indicated, without limitation.

FIG. 1 illustrates an exemplary television set displaying a broadcast television channel and an Internet television channel at the same time. In an embodiment of the invention, television set **100** is an electronic device that receives images and sound signals from a plurality of television channels, including a broadcast television channel **161** and an Internet television channel **165**. Broadcast television channel **161** or broadcast channel **161** relates to images and sounds signal source **191**, which, in one embodiment, is from a broadcast television network, a cable television network, a satellite television network, or any other multi-service or multi-channel operator. In one embodiment, Internet television channel **165** or Internet channel **165** relates to images and sounds signal source **195** from the Internet, a web portal, or a web

site, and provides an interactive television session between signal source **195** and consumer **104**.

In an embodiment, television set **100** includes picture **121** and picture **125**. Picture **121** and picture **125** are controlled by a frame controller **150**, which displays broadcast channel **161** onto picture **121**, and Internet channel **165** onto picture **125**. The frame controller **150** displays picture **121** and picture **125** simultaneously.

In one embodiment, the frame controller **150** is included in television set **100**. In another embodiment, the frame controller **150** connects to television set **100** through an interface. The interface may be an RF interface, a HDMI interface, an S-video interface, a component interface, a composite interface, a network interface, or a wireless network interface such as Wireless Local Area Network (WLAN), Worldwide Interoperability for Microwave Access (WiMax), an Ultra-Wideband (UWB) network, or other suitable interface, without limitation.

In various embodiments of the invention, the frame controller **150** connects to a broadcast television channel input **190**, such as an antenna, cable television network, satellite television network, IPTV. The broadcast television channel input **190** includes a signal source **191**. The frame controller **150** also connects to an Internet input **193**, which may include a home network, an Ethernet network, a WiFi network, a DSL network, an Intranet network, a hotspot network, a public data network, a cellular data network, or a private data network. Internet input **193** includes signal source **195**.

An exemplary frame controller **150** relates broadcast channel **161** and Internet channel **165**. In one embodiment, frame controller **150** selects broadcast channel **161** based on Internet channel **165**. In another embodiment, frame controller **150** selects Internet channel **165** based on broadcast channel **161**. In yet another embodiment, broadcast channel **161** and Internet channel **165** are related to a theme such as sports, news, or movie.

FIG. 2 illustrates an exemplary process of selecting an Internet channel based on broadcast channel. In an embodiment, frame controller **250** displays broadcast channel **261** onto picture **221**, and then selects Internet channel **265** based on broadcast channel **261**, displaying Internet channel **265** onto picture **225**.

In one embodiment, frame controller **250** selects Internet channel **265** based on the type of broadcast channel **261**. For example, broadcast channel **261** may be a movie channel, a sports channel, a news channel, a cartoon channel, or a shopping channel, having the type “movie”, “sports”, “news”, “child”, or “shopping”, respectively. The frame controller **250** includes a datastore **280**, which includes pairs of broadcast channel **261** and channel type **271**, wherein channel type **271** is broadcast channel **261** type. Frame controller **250** then matches broadcast channel **261** against its datastore **280** and retrieves channel type **271**.

The datastore **280** further includes a pairs of channel type **271** and Internet channel **265**. The frame controller **250** may then match retrieved channel type **271** against datastore **280** and retrieve Internet channel **265**. The frame controller **250** may then select Internet channel **265** for display onto picture **225**.

In another embodiment, the frame controller **250** connects to a network computer **214** over a data network **210**, such as the Internet, a home network, or other type of data network. The frame controller **250** then sends a query with broadcast channel **261** to the network computer **214**, and retrieves Internet channel **265** from network computer **214**. In such an embodiment, network computer **214** may select Internet channel **265** by any criteria, such as by type relatedness.

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In one example, broadcast channel 261 is a sports channel. Frame controller 250 selects Internet channel 265 to be an Internet video portal providing highlights of current sport events, or an Internet video portal providing archives of sports event videos' or televised sports programs. In another example, broadcast channel 261 is a US news channel. Frame controller 250 selects Internet channel 265 to be an Internet video portal providing news in Europe, news in Asia, news in Africa. In other examples, Internet channel 265 may provide news in entertainment, news in local community, news in traffic, or other news.

In another example, broadcast channel 261 is a movie channel, and frame controller 250 selects Internet channel 265 to be an Internet video portal providing information about movie stars, celebrities, or fashion. In other examples, Internet channel 265 may provide previews of movies currently shown in cinemas, or archives of classic movies.

In one embodiment, frame controller 250 selects Internet channel 265 based on the current television program 241 showing on broadcast channel 261. For example, if television program 241 is a movie, frame controller 250 may obtain information about television program 241, such as program type, casts, content description, and other information. In another example, television program 241 is a movie, such as "Titanic", starring "Leonardo DiCaprio" and "Kate Winslet".

In one embodiment, datastore 280 includes a television guide. Frame controller 250 obtains television program 241 information from datastore 280 by matching broadcast channel 261 and current time against datastore 280. In another embodiment, frame controller 250 queries a network computer 214 using broadcast channel 261 and current time to obtain information regarding television program 241. Frame controller 250 sends television program 241 information to network computer 214, and obtains Internet channel 265. Frame controller 250 receives signals from Internet channel 265 and displays these onto picture 225.

FIG. 3 illustrates a process of selecting a broadcast channel based on an Internet channel. Frame controller 250 displays Internet channel 265 onto picture 225. Frame controller 250 selects broadcast channel 261 based on Internet channel 265, and displays broadcast channel 261 onto picture 221.

In one embodiment, frame controller 250 selects broadcast channel 261 based on the type of Internet channel 265. For example, Internet channel 265 may be a movie channel providing movie videos, a sports channel providing information and videos about sports, a news channel, a children friendly video portal, or an online e-commerce shopping portal. In these instances, Internet channel 265 has type "movie", "sports", "news", "kids", or "shopping", respectively. In another embodiment, datastore 280 includes a pair of Internet channels 265 and channel type 275, wherein channel type 275 is Internet channel 265 type. Frame controller 250 matches Internet channel 265 against datastore 280 and retrieves channel type 275. Datastore 280 further includes a pair of channel type 275 and broadcast channel 261. Frame controller 250 matches retrieved channel type 275 against datastore 280 and retrieves broadcast channel 261. Frame controller 250 receives signals from broadcast channel 261 and displays the signals onto picture 221.

In one embodiment, frame controller 250 sends a query with Internet channel 265 to network computer 214, and retrieves broadcast channel 261 from network computer 214.

In another embodiment, Internet channel 265 includes a hyperlink 2651, which references broadcast channel 261. In one example, hyperlink 2651 includes a URL such as "tv://espn", "tv://Cable/channel-38", "tv://ATTIPTV/SanFrancisco/channel-7", or "tv://Verizon-tv/premiumservices/

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HBO". Frame controller 250 processes hyperlink 2651 and selects broadcast channel 261 based on hyperlink 2651. In one embodiment, Internet channel 265 includes an interactive web page 2657. Consumer 104 provides input 205 to frame controller 250, which processes the input 205 and obtains hyperlink 2651. In one embodiment, web page 2657 includes hyperlink 2651. Frame controller 250 processes input 205 to retrieve hyperlink 2651. In another embodiment, frame controller 250 processes input 205, sends a message to network computer 214, and retrieves hyperlink 2651, which is processed to select broadcast channel 261.

In another embodiment, frame controller 250 processes URL "tv://espn", and retrieves "espn". Broadcast channel 261 is associated with name "espn", and is selected by frame controller 250. Alternatively, datastore 280 may associate "espn" with broadcast channel 261. In another embodiment, frame controller 250 processes URL "tv://Cable/channel-38", and retrieves "Cable" and "channel-38". Frame controller 250 determines broadcast television channel input 190 includes cable television network, matching "Cable". Frame controller 250 then selects broadcast channel 261 as channel 38 from the broadcast television channel input 190.

FIG. 4 illustrates an exemplary Internet channel providing a television programming guide. In an embodiment, Internet channel 265 provides program guide 390. For example, program guide 390 is a web page including a program object 381, which includes hyperlink 393 referenced to broadcast channel 261, and program preview 395. In one embodiment, program preview 395 is a video clip, and frame controller 250 displays program preview 395 onto picture 225. The consumer 104 selects program object 381, and frame controller 250 processes the selected hyperlink 393 of program object 381, selects broadcast channel 261, and displays broadcast channel 261 onto picture 221.

In another embodiment, program object 381 is associated with television program 391 showing on broadcast channel 261. Television program 391 may include a television show, a movie, a televised sports program, a news program, an episode, a documentary program, a televised concert show, or a televised event. Television program 391 may also include an advertisement, a public announcement, or an alert.

In one embodiment, program object 381 includes a program schedule 397. Frame controller 250 checks the current time 398 against program schedule 397. For example, frame controller 250 may include a clock 252 form which current time 398 is obtained. In another embodiment, frame controller 250 obtains current time 398 from a broadcast television channel input 190 or from an Internet input 193. If the program schedule 397 matches the current time 398, frame controller 250 processes hyperlink 2651. For example, in one embodiment, program schedule 397 includes a beginning time such as 7:00 pm, and duration such as 30 minutes. In another embodiment, program schedule 397 includes a start time such as 11:30 am and an end time such as 1:30 pm. In such an embodiment, the current time 398 matches program schedule 397 when the current time 398 is within the duration of the beginning time, or between the start and end times.

FIG. 5 illustrates an exemplary process for selecting a second Internet channel. Frame controller 250 displays broadcast channel 261 and Internet channel 265. Broadcast channel 261 is playing a television program 391. Frame controller 250 selects a second Internet channel 367 based on television program 391. In an embodiment, frame controller 250 includes datastore 280, which further includes program schedule 397 of television program 391 on broadcast channel 261. Frame controller 250 obtains current time 398 and matches it against the program schedule 397 and determines

the current time **398** is not within program schedule **397**. Frame controller **250** determines that television program **391** ends and selects second Internet channel **367**, for example, an Internet television programming guide channel, as illustrated in FIG. 4. In one embodiment, frame controller **250** displays Internet channel **367** onto picture **225**.

In one embodiment, broadcast channel **261** includes a second television program **392**. Frame controller **250** detects that broadcast channel **261** changes from television program **391** to television program **392**. In an embodiment, datastore **280** includes program schedule **396** of program **392**. Frame controller **250** determines current time **398** matches program schedule **396**, and selects Internet channel **367**.

In another embodiment, frame controller **250** selects a second Internet channel **367** based on images of television program **391**. In an embodiment, data store **280** includes image **284**. Frame controller **250** matches image **284** against images of television program **391**. If there is a match, frame controller **250** selects second Internet channel **367**.

In one embodiment, selection of second Internet channel **367** is based on images of television program **392**. In another embodiment, image **284** includes control information of television program **391**.

Although the invention herein has been described with reference to particular embodiments, it is to be understood that these embodiments are merely illustrative of the principles and applications of the present invention. It is therefore to be understood that numerous modifications may be made to the illustrative embodiments and that other arrangements may be devised without departing from the spirit and scope of the present invention as defined by the appended claims.

What is claimed is:

1. An apparatus, comprising:
 - a video controller configured to receive data regarding a plurality of video streams over a cellular data network and to provide means to select a video for display, the plurality of video streams comprising a second video channel comprising non-advertisement content, the video controller further in communication with a display, wherein the video controller is further configured to select a first video channel of the plurality of video streams comprising advertisement content,
 - wherein the video controller is further configured to cause a first video of the first video channel and a second video of the second video channel to each be displayed in separate frames on the display.
2. The apparatus of claim 1, further comprising a datastore, the datastore comprising video channel and channel type pairs, wherein the first channel is selected by matching a first channel type of the first channel and a second channel type of the second channel.
3. The apparatus of claim 1, wherein the video controller connects to a network computer over the cellular data network, wherein the video controller is further configured to send a query with the second video channel to the network computer and to retrieve the first video channel from the network computer.
4. The apparatus of claim 1, wherein the video controller is further configured to select the first video of the first video channel based on the second video of the second video channel.
5. The apparatus of claim 4, wherein the video controller is further configured to select the first video channel based on images displayed from the second video of the second video channel.

6. The apparatus of claim 4, wherein the video controller is further configured to match the second video to a program in a program guide, obtain program information about the program, and select the program based on the program information.

7. The apparatus of claim 1, wherein the video controller is further configured to receive the data regarding the plurality of video streams over the cellular network from an online signal source.

8. The apparatus of claim 7, wherein the online signal source comprises Internet.

9. The apparatus of claim 1, wherein the second video channel comprises a reference to the first video channel, wherein the video controller is further configured to select the first video channel based on the reference.

10. The apparatus of claim 1, wherein the second video channel provides an interactive session between an online signal source and a consumer.

11. The apparatus of claim 1, wherein the video controller is further configured to detect that the second video channel changes from a first program to a second program and to select the first video channel based on the second program.

12. An apparatus, comprising:

a video controller configured to receive data regarding a plurality of video streams over a cellular data network and to provide means to select a video for display, the plurality of video streams comprising a first video channel comprising advertisement content and a second video channel comprising non-advertisement content, the video controller further in communication with a display,

wherein the video controller is further configured to select the first video channel according to a channel type of the second video channel,

wherein the video controller is further configured to cause a first video of the first video channel and a second video of the second video channel to each be displayed in separate frames on the display.

13. A system, comprising:

a video controller configured to receive data regarding a plurality of video streams over a cellular data network and to provide means to select a video for display, the plurality of video streams comprising a second video channel comprising non-advertisement content; and

a display in communication with the video controller, wherein the video controller is further configured to select a first video channel of the plurality of video streams comprising advertisement content,

wherein the video controller is further configured to cause a first video of the first video channel and a second video of the second video channel to each be displayed in separate frames on the display.

14. The system of claim 13, further comprising a datastore, the datastore comprising video channel and channel type pairs, wherein the first channel is selected by matching a first channel type of the first channel and a second channel type of the second channel.

15. The system of claim 13, wherein the video controller connects to a network computer over the cellular data network, wherein the video controller is further configured to send a query with the second video channel to the network computer and to retrieve the first video channel from the network computer.

16. The system of claim 13, wherein the video controller is further configured to select the first video of the first video channel based on the second video of the second video channel.

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17. The system of claim 16, wherein the video controller is further configured to select the first video channel based on images displayed from the second video of the second video channel.

18. The system of claim 16, wherein the video controller is further configured to match the second video to a program in a program guide, obtain program information about the program, and select the program based on the program information.

19. The system of claim 13, wherein the video controller is further configured to receive the data regarding the plurality of video streams over the cellular network from an online signal source.

20. The system of claim 19, wherein the online signal source comprises Internet.

21. The system of claim 13, wherein the second video channel comprises a reference to the first video channel, wherein the video controller is further configured to select the first video channel based on the reference.

22. The system of claim 13, wherein the second video channel provides an interactive session between an online signal source and a consumer.

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23. The system of claim 13, wherein the video controller is further configured to detect that the second video channel changes from a first program to a second program and to select the first video channel based on the second program.

24. A system, comprising:

a video controller configured to receive data regarding a plurality of video streams over a cellular data network and to provide means to select a video for display, the plurality of video streams comprising a first video channel comprising advertisement content and a second video channel comprising non-advertisement content; and

a display in communication with the video controller, wherein the video controller is further configured to select the first video channel according to a channel type of the second video channel,

wherein the video controller is further configured to cause a first video of the first video channel and a second video of the second video channel to each be displayed in separate frames on the display.

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