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(54) IDENTIFYING ANCILLARY INFORMATION ASSOCIATED WITH AN AUDIO/VIDEO PROGRAM

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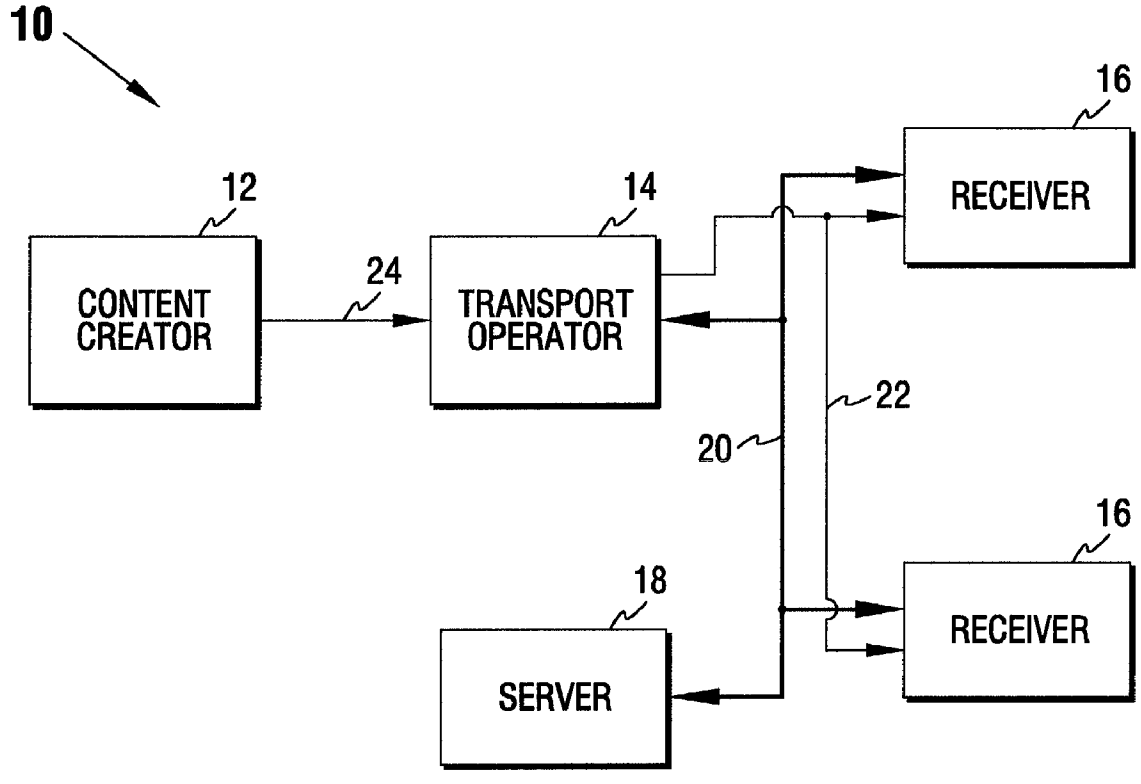
(57) ABSTRACT

A system communicates video information including television content associated with a plurality of channels and ancillary information. Information may be transmitted with the ancillary information that is indicative of the type of content included in the ancillary information. This provides the user, in one embodiment of the present invention, with a visual indication of the type of information that accompanies television content. This helps the user to decide whether the user wishes to view the ancillary information and provides the opportunity to select that enhancement for viewing.



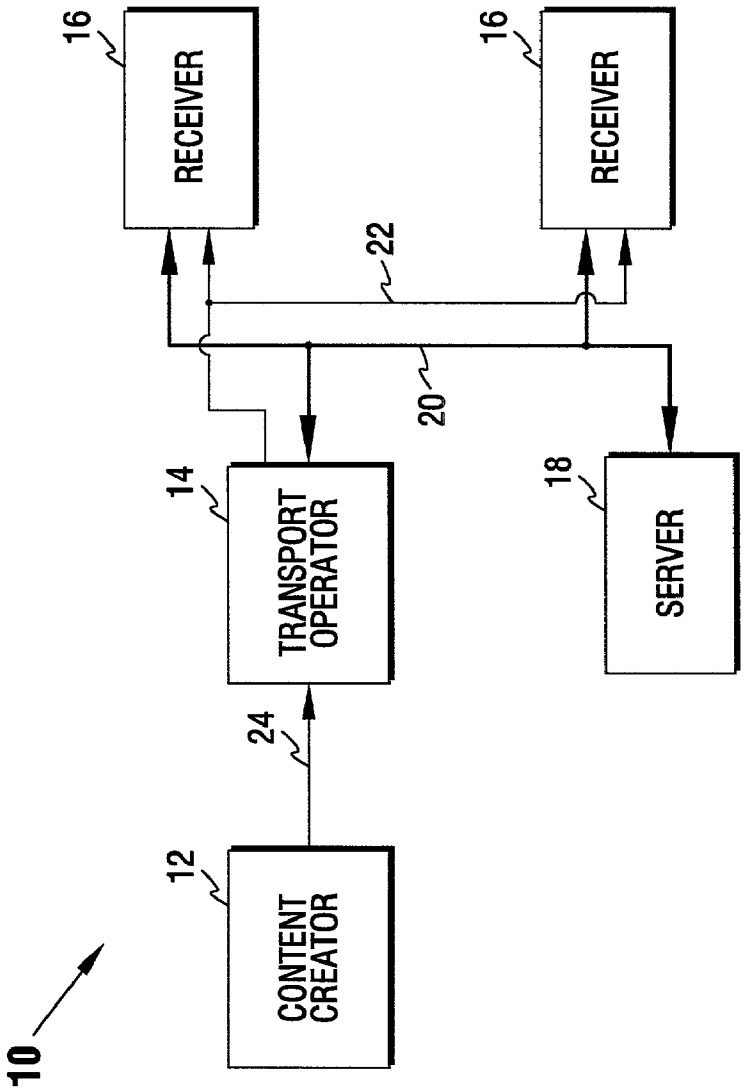

16
RECEIVER
16
RECEIVER
22
20
14
TRANSPORT OPERATOR
18
SERVER
24
12
CONTENT CREATOR
10

FIG. 1

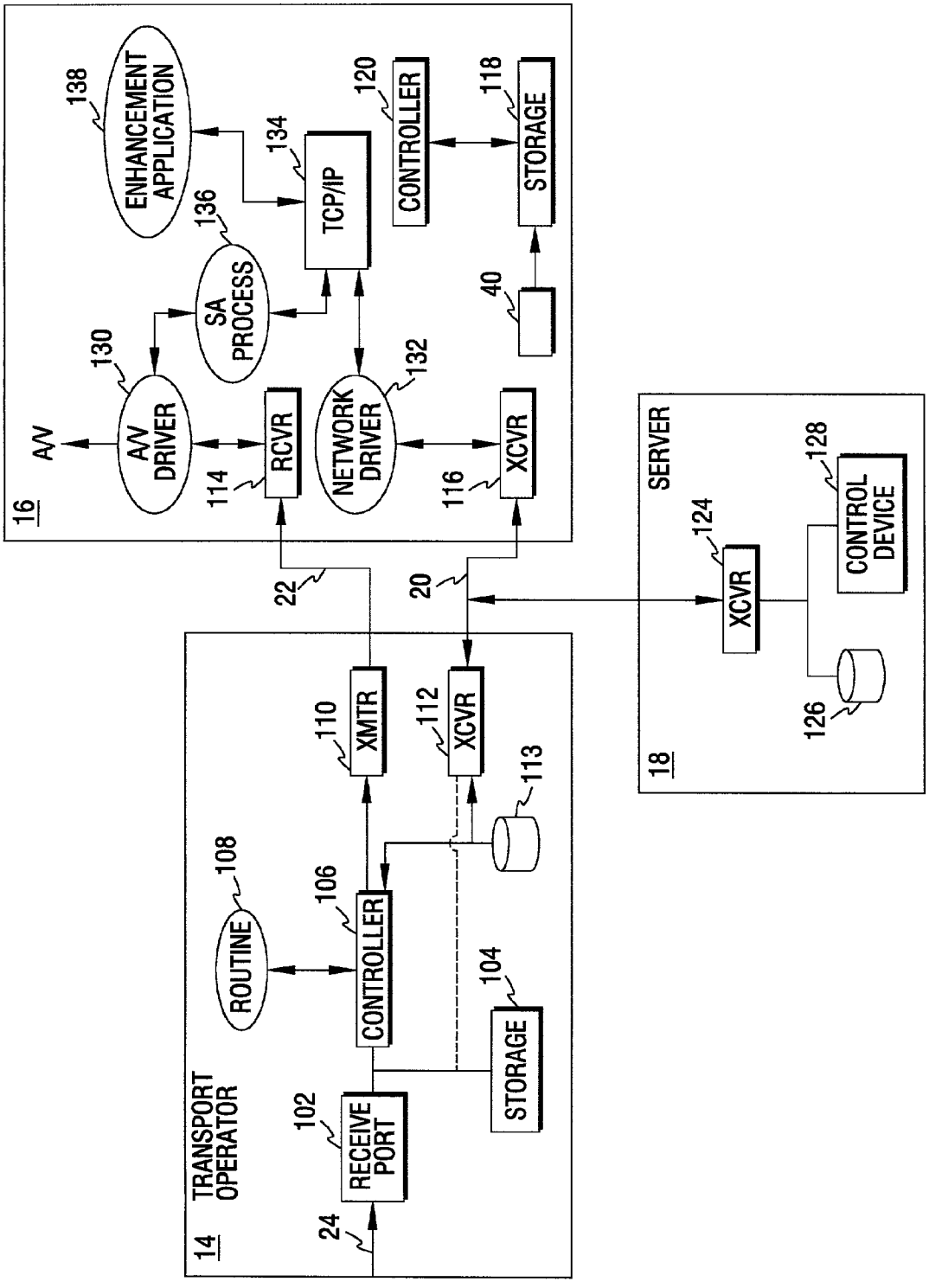

16
A/V
A/V DRIVER
130
RCVR
114
NETWORK DRIVER
132
XCVR
116
SA PROCESS
136
ENHANCEMENT APPLICATION
138
TCP/IP
134
CONTROLLER
120
STORAGE
118
40
22
20
14
TRANSPORT OPERATOR
ROUTINE
108
CONTROLLER
106
XMTR
110
XCVR
112
113
STORAGE
104
RECEIVE PORT
102
24
18
SERVER
XCVR
124
CONTROL DEVICE
128
126

FIG. 2

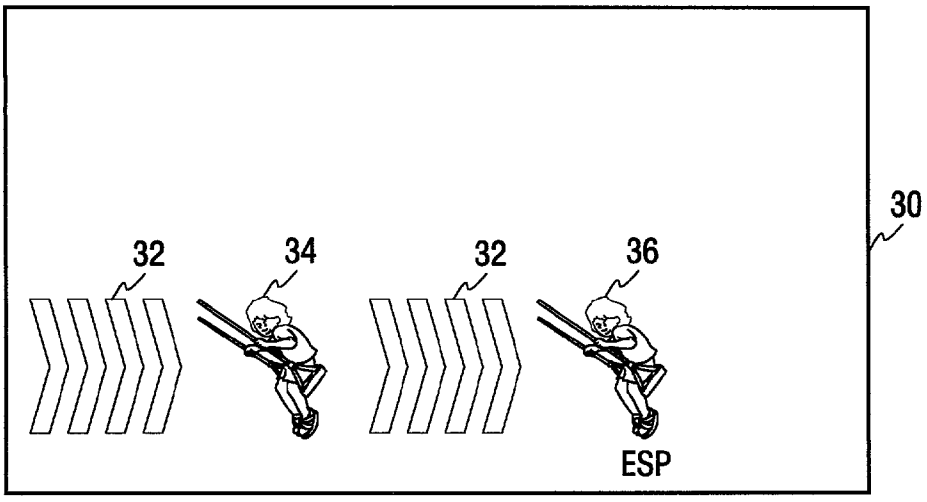

30
32
34
32
36
ESP

FIG. 3

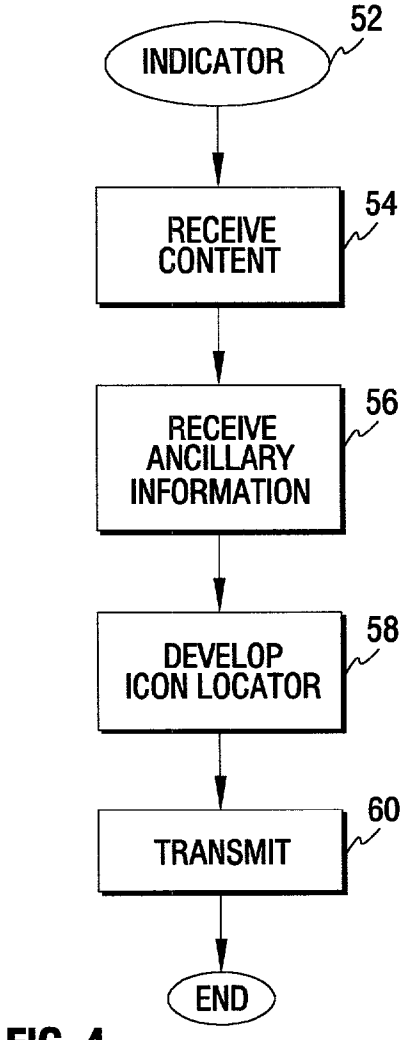

52
INDICATOR
54
RECEIVE CONTENT
56
RECEIVE ANCILLARY INFORMATION
58
DEVELOP ICON LOCATOR
60
TRANSMIT
END

FIG. 4

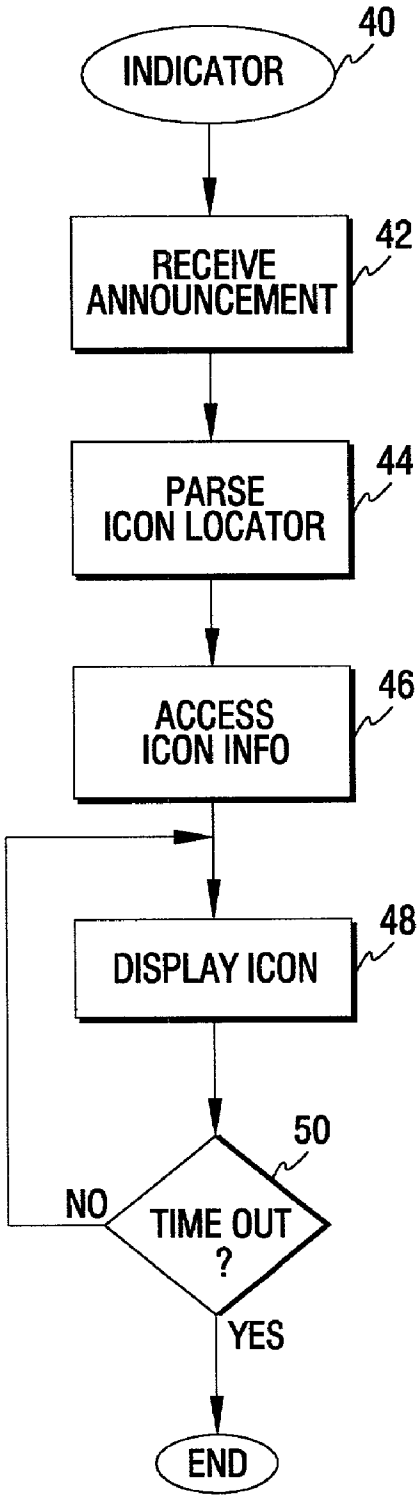

40
INDICATOR
42
RECEIVE ANNOUNCEMENT
44
PARSE ICON LOCATOR
46
ACCESS ICON INFO
48
DISPLAY ICON
50
TIME OUT ?
NO
YES
END

FIG. 5

IDENTIFYING ANCILLARY INFORMATION ASSOCIATED WITH AN AUDIO/VIDEO PROGRAM

BACKGROUND

[0001] The invention relates to communicating ancillary information associated with a plurality of audio/video programs, such as television content associated with a plurality of channels.

[0002] Ancillary information, such as program sub-titles, emergency messages, closed caption messages, and program guide information, may be transmitted with regular television content. Other types of ancillary information that may be sent with television content include enhancement data such as web pages, multimedia information, or other digital data files. Ancillary information may be sent in the vertical blanking interval (VBI) of an analog television broadcast signal. Alternatively, the ancillary information may be sent with digital television content over a digital transport medium.

[0003] Various standards exist that provide for transmission of ancillary information with television content. One standard is the Advanced Television Enhancement Forum (ATVEF) Specification, Draft Version 1.1r26, dated Feb. 2, 1999. The ATVEF Specification is designed to provide for transmission of enhancement data along with television content in both analog and digital systems, such as cable systems, satellite systems, terrestrial systems, and so forth. The combination of the enhancement data and the television content may be referred to as enhanced television content. Enhanced television content provides more information and options to viewers. For example, a viewer may be presented with the option of viewing advertisements, educational information, and so forth, while watching regular television programming.

[0004] The transmission of ancillary information may be signified to the user by displaying an icon indicating that enhanced information accompanies the programming currently displayed. This alerts the user to the possibility that additional information is available but provides nothing useful to help the user decide whether or not the user wishes to review the information.

[0005] Thus there is a continuing need for better ways to give the user more information about the ancillary information that may have been transmitted with television content.

SUMMARY

[0006] In accordance with one aspect, a method may include transmitting video data. Ancillary information associated with the video data is also transmitted. Information may be transmitted that may be used to identify the content included in the ancillary information.

[0007] Other features and embodiments will become apparent from the following description and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] **FIG. 1** is a block diagram of one embodiment of an information delivery system in accordance with the present invention;

[0009] **FIG. 2** is a block diagram of a transport operator system, receiving system, and server according to one embodiment of the information delivery system of **FIG. 1**;

[0010] **FIG. 3** is a view of a screen display in accordance with one embodiment of the present invention;

[0011] **FIG. 4** is a flow chart showing software resident on the content creator in accordance with one embodiment of the present invention; and

[0012] **FIG. 5** is a flow chart showing software resident on a receiver in accordance with one embodiment of the present invention.

DETAILED DESCRIPTION

[0013] Referring to **FIG. 1**, an information delivery system **10** according to one embodiment of the invention includes a content creator **12**, a transport operator system **14**, and a plurality of receivers **16**. The receivers **16** may be located at various receiving sites, including homes, offices, entertainment facilities, or other locations. The content creator **12** originates enhancement data (or other type of ancillary information) and television content (or other type of content including audio and/or video data) to be transmitted by the transport operator system **14**. Alternatively, the content creator **12** may create enhancement data with television content provided by another source to the transport operator system **14**. Enhancement data may include graphics (e.g., web pages, multimedia information, or other digital data files), presentation layout, and synchronization information. The combination of the enhancement data and television content is referred to as enhanced television content.

[0014] The transport operator system **14** provides an enhanced television content delivery infrastructure that may include terrestrial, cable, satellite, or other types of transmission facilities (either analog or digital). The television content and enhancement data may be transmitted over a transport medium **22**, which may be a terrestrial, cable, satellite, or other type of link, to the receivers **16**. The receivers **16** may include televisions, set-top boxes, personal computers, or other types of systems adapted to receive television content and associated enhancement data.

[0015] As used in this description, the term audio/video (A/V) content is intended to include any type of audio and/or video data that may be transmitted or distributed to one or more receiving sites for presentation to viewers and/or listeners. As used here, A/V content may refer to content that may include both an audio and a video portion or one of an audio or video portion. Further, ancillary information other than enhancement data may be transmitted with the A/V content. For example, ancillary information may include program sub-titles, emergency messages, closed caption messages, and program guide information.

[0016] The receivers **16** may further be coupled to a secondary link **20** that may be a data delivery communications channel such as the Internet, a DOCSIS network (which is an interface for cable modems), or other communications link (whether uni-directional or bi-directional). DOCSIS stands for Data Over Cable Systems Interface Specifications, and is described in DOCSIS, Version 1.0, dated March 1998, as provided by the International Telecommunication Union (ITU). The secondary link **20** may be

coupled to the transport operator system **14** and/or to one or more servers **18**. According to some embodiments, portions of enhancement data associated with the A/V content transmitted over the transport medium **22** may be communicated over the secondary link **20** from the transport operator system **14**, the one or more servers **18**, or some combination of such systems.

[**0017**] In an alternate embodiment, another type of secondary data path can be part of the A/V transmission itself, but not tightly tied to a particular A/V channel. For instance, in MPEG-2 based systems such as ATSC (Advanced Television Systems Committee) or DVB (Digital Video Broadcasting), transport stream programs correspond to what is commonly thought of as TV channels. MPEG stands for Moving Picture Experts Group, and the MPEG-2 standard is described in ISO/IEC 13818-1 (MPEG-2 Systems), ISO/IEC **13818**-2 (MPEG-2 Video) and ISO/IEC 13818-3 (MPEG-2 Audio), dated in 1994 and provided by the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). A description of ATSC may be found in "Guide to the Use of the ATSC Digital Television Standard," dated October 1995. DVB standards may be available from the web site {http://www.etsi.org}.

[**0018**] These transport stream programs can contain audio, video, and data (e.g., ancillary information), with all of them tightly associated with that single transport stream program. When a user tunes to the transport stream program, the receiving device knows the audio, video, and data that are associated because they are marked as all being part of the same program.

[**0019**] One standard for describing transmission of enhancement data with television content is the ATVEF specification, with one version described in ATVEF Specification, Draft Version 1.1r26, dated Feb. 2, 1999. Enhancement data may be transmitted in a number of different ways from the transport operator system **14** to the receivers **16**, depending on the type of transport medium **22**. For example, with an analog transport medium such as the National Television System Committee (NTSC) Standard of the Electronics Industries Association, portions of the enhancement data may be sent in the vertical blanking interval (VBI) of the NTSC transmission. A description of NTSC may be found in the book, "Video Demystified: A Handbook For the Digital Engineer" by Keith Jack, published by HighText Publications (2d Ed. 1996). Other types of transport media (analog or digital) may provide different mechanisms of communicating the enhancement data.

[**0020**] Enhancement data according to the ATVEF Specification may include enhancements each having the following components: an ATVEF announcement, a resource, and a trigger. The three components may be transmitted using Internet Protocol (IP) multicast to the receivers. An IP multicast standard is described in Request for Comment (RFC) 1301, entitled "Multicast Transport Protocol." RFCs may be available at website address {http://www.ietf.org/rfc.html}.

[**0021**] Generally, an ATVEF announcement indicates that enhancement data is being transmitted, a resource includes one or more files that contain the enhancement data, and a trigger synchronizes the enhancement data with the TV transmission. An announcement may describe the location of both the resource stream and the trigger stream. For each television (TV) channel, one or more enhancements may be offered as choices presented to the user, who can select which of the enhancements, if any, to view. The ATVEF Specification may utilize a one-way transmission protocol (the Unidirectional Hypertext Transfer Protocol or UHTTP, described in the ATVEF Specification) to deliver resource data.

[**0022**] The announcements, resources, and triggers associated with an A/V channel may be delivered at about the same time as, and with the transmission of, the A/V content on that channel. Conventionally, for each enhancement, the resource stream may be delivered along with the announcement, with the resource stream stored locally in the receiver **16**. If a viewer so desires, the enhancement data can be retrieved at the receiver from local storage for viewing.

[**0023**] To provide for greater flexibility and/or to alleviate bandwidth concerns of the transport medium **22**, some embodiments of the invention transmit (using IP multicast) enhancement data associated with multiple A/V channels (e.g., TV channels) over a link that is separate from the transport medium used to transmit A/V content. Alternatively, the link may be part of the same delivery mechanism as the A/V content but is not associated with any A/V channel, e.g., an MPEG-2 transport stream with ancillary information in a data-only program separate from the A/V programs. The separate delivery mechanism to deliver the A/V content may be a separate transport stream or a separate link **20** such as a general purpose data link or some other type of communications link. Thus, according to some embodiments, enhancement data is separated from the A/V data at the transport operator system **14** (or alternatively, at another source), with the A/V content transmitted over the transport medium **22** and the enhancement data transmitted over the secondary link **20** (or a separate transport stream).

[**0024**] In the ensuing description, reference is made to receiving enhancement data received over the secondary link **20**; however, it is contemplated that the enhancement data or other type of ancillary information may be received over a separate transport stream such as that used with MPEG-2 delivery systems. In addition, reference is made to tuning to a specific A/V channel (e.g., TV channel) at the receiving end. It is contemplated, however, that the receiver system can be tuning instead to one of the A/V transport stream programs in an MPEG-2 based systems.

[**0025**] Thus, generally, tuning to an A/V program may include tuning to A/V channels (e.g., TV channels), to transport stream programs (e.g., in an MPEG based system), or to other separations or segments of A/V content. Also, associating ancillary information with an A/V program can thus refer to associating ancillary information with an A/V channel, a transport stream program, or other A/V separations or segments.

[**0026**] Referring to **FIG. 2**, the transport operator system **14**, receiving system **16** and the server **18** in the system **10** of **FIG. 1** are illustrated. The transport operator system **14** may include a receiving port **102** to receive information from the content creator **12** over a link **24**. The received enhancement data may be provided to a controller **106** in the transport operator system **14**. A/V content may be received with the enhancement data through port **102** or through a separate A/V receive port (not shown). The controller **106** may be run under control of a software routine **108** (referred

to as a transport routine). The transport routine **108** may initially be stored in a storage medium **104** and loaded by the controller **106** for execution. Instructions and data of the transport routine **108** may also be stored in the storage medium **104**. The controller **106** may create special announcements to be transmitted with enhancement data over a separate link (e.g., link **20**). The enhancement data and special announcements may be stored in a storage medium **113**, which may be transmitted over the secondary link **20** through a transceiver **112**.

[**0027**] Alternatively, the enhancement data and special announcements may be transmitted over the transport medium **22** with the A/V content but in a separate transport stream program. In the latter embodiment, different parts of the transport routine **108** (or alternatively, different routines) may handle transmission of both the A/V content and the enhancement data and special announcements. The transceiver **112** may be a telephone modem, a cable modem, or any other type of analog or digital transceiver or transmitter, including a satellite transmitter, adapted to communicate over the secondary link **20**.

[**0028**] Enhancement data may be stored in a storage medium **126** in the server **18** in addition to, or instead of, the enhancement data stored in the transport operator system **14**. The server **18** further includes a transceiver **124** coupled to the secondary link **20** and a control device **128**. More than one server **18** may be coupled to the secondary link **20** to store additional enhancement data. Alternatively, a plurality of servers **18** may be coupled to the receivers **16** over separate links.

[**0029**] In the receiving system **16**, a receiver circuit **114** (e.g., a TV tuner card) is adapted to receive content over the transport medium **22** and a transceiver **116** is adapted to communicate over the secondary link **20**. The receiving circuit **114** may be associated with an A/V device driver routine **130** that forwards the received A/V content to application software adapted to process and present the A/V content in the receiving system. The transceiver **116** may be associated with a network device driver **132** to receive enhancement data from the link **20**.

[**0030**] In one embodiment, the network device driver **132** may send received data to a TCP/IP (Transmission Control Protocol/Internet Protocol) stack **134**. TCP is described in RFC 793, entitled "Transmission Control Protocol," dated September 1991. Data flows through the TCP/IP stack **134** to application software, including an enhancement routine **138** for receiving and processing enhancement data and a special announcement routine (SA process) **136** to receive and process special announcements. In an alternative arrangement, the SA process **136** may be part of the enhancement application **138**. The application routines, device drivers, and other routines or programs may be executable on a controller **120**. Such routines or programs may be initially stored in a storage medium **118** and loaded by the controller **120** for execution. The SA process **136** is capable of associating enhancement data received over the secondary link **20** to the currently tuned A/V channel. The SA process **136** may then combine the associated enhancement data with the A/V content of the currently-tuned TV channel for presentation. Alternatively, the enhancement data and special announcements may arrive in a separate transport stream program (e.g., such as those in MPEG based systems) over the transport medium **22**, in which case it may be different parts of the SA routine **136** (or different routines) that process receipt of the enhancement data and A/V content.

[**0031**] Referring next to **FIG. 3**, in accordance with one embodiment of the present invention, the user may be given information about the ancillary information that may have been transmitted with the television content. For example, in accordance with one embodiment of the present invention, a chevron-shaped indicator **32** may be displayed on the display **30** of a receiver **16** to indicate the transmission of ancillary information in general. An additional indicator **34** may be provided to give information about the particular type of content provided as ancillary information. Thus, the indicator **34** may be indicative of children's content. An additional indicator **36** may be provided to indicate that the children's content is available in Spanish. Additional indicators may be provided as well.

[**0032**] The indicators may provide information about the ancillary information, such as enhancement data, that has been provided with the television content. This gives the user greater information about the ancillary information, enabling the user to make an informed decision about whether or not to access the ancillary information. In some cases, the icons **32**, **34**, and **36** may be hyperlinks that allow the user to mouse click on the icon (or use another pointing device) and to jump immediately to the ancillary information.

[**0033**] Software **52** resident on the server **18** or content creator **12**, for example, may begin by receiving content to be transmitted as indicated in block **54** of **FIG. 4**. Next, as indicated in block **56**, the content creator receives the ancillary information that is to be transmitted in association with the content previously received. Based on the content of the ancillary information, an icon locator is developed as indicated in block **58**. The icon locator provides a pointer to the location of information about a content-identifying icon. The icon may be a graphical symbol that indicates the nature of all or part of the content in the ancillary information. Finally, the content, the ancillary information, and the icon locator are transmitted through the transport operator **14** to the receivers **16** (block **60**).

[**0034**] **FIG. 5** illustrates implementing one embodiment of the present invention. Software **40**, resident on a receiver **16**, begins by receiving an announcement stream as indicated in block **42**. The announcement stream is parsed to locate an icon locator, as indicated in block **44**.

[**0035**] The icon locator may take a variety of forms. In one embodiment of the present invention, the icon locator may be a uniform resource locator (URL). The URL may point to an Internet web address containing information about a suitable icon that may be displayed to provide the user with information about the content contained within the ancillary information. Alternatively, the URL may point to a location in the transmitted ancillary information that may be utilized to access and then display a suitable icon.

[**0036**] Alternatively, a local identifier (LID) may be provided. Particularly where the information is not necessarily available on an on-demand basis, a local identifier or LID may be utilized to provide a name for a resource such as a content-identifying icon. The use of a LID supports cross-

references within the content to the resource. The LID may be useful in creating hyperlinks or embedding one piece of content in another. The LID scheme enables content creators to assign unique identifiers to each resource relative to a given name space.

[0037] Thus, the LID may be utilized to access the icon information repeatedly. Once the icon has been stored on the receiver and is identified through the LID, it can be called up repeatedly and used over and over again. For example, in one embodiment of the present invention, the receiver may be loaded with a plurality of content-identifying icon images before those images are actually needed. The icon code for one of those icons may be sent with an announcement stream that identifies the icon already on the receiver.

[0038] A LID or URL may be transmitted as part of a trigger. Triggers are real time events delivered for enhanced television programs. A receiver may set its own policy for allowing users to enable or disable enhanced television content and triggers may be utilized as a signal to notify users of enhanced content availability. Triggers generally include a URL and may optionally also include a human readable name, an expiration date, and script. The expiration date in connection with triggers utilized to announce the arrival of a particular type of content may provide for a limited duration of display of the icon. For example, the expiration date may also cause the icon to disappear and reappear periodically.

[0039] In some embodiments of the present invention, the user may select from among a plurality of pre-received icons that identify content that the user is interested in knowing about. Other icons may be left unselected. When information of a type corresponding to a selected icon is received, the pre-selected icon may be displayed.

[0040] In accordance with one embodiment of the present invention, the announcement stream may include script that causes a transparent overlay to be produced over the display image on the display **30** of a receiver **16**. The transparent overlay may include one or more icons to identify the content that accompanies the enhanced television content. In one embodiment of the invention, a plurality of icons indicating available content may be displayed alternately.

[0041] Thus, returning to **FIG. 5**, after the icon locator has been parsed, the icon information may be accessed (block **46**) either from the local system or from the Internet as two examples. One or more icons are then displayed as indicated in block **48**. If an expiration time was transmitted with the trigger data, a check at diamond **50** determines whether the expiration time has occurred. If so, the flow ends. Otherwise, the icon persists.

[0042] While the present invention has been described with respect to a limited number of embodiments, those skilled in the art will appreciate numerous modifications and variations therefrom. It is intended that the appended claims cover all such modifications and variations as fall within the true spirit and scope of this present invention.

What is claimed is:

1. A method comprising:

transmitting video data;

transmitting ancillary information associated with said video data; and

transmitting information that may be used to identify the content included in said ancillary information.

2. The method of claim 1 wherein transmitting information indicative of the content includes providing a universal resource locator identifying a web page.

3. The method of claim 2 wherein transmitting information indicative of the content includes providing a uniform resource locator to a web page that includes an appropriate icon indicative of the content included in said ancillary information.

4. The method of claim 1 wherein transmitting information indicative of the content included in the ancillary information includes transmitting a local identifier in said ancillary information that points to a location storing a content-identifying icon.

5. The method of claim 1 further including providing information to produce an icon indicative of the content included in said ancillary information on a display screen.

6. The method of claim 5 further including providing information that causes an icon to be displayed as an overlay.

7. The method of claim 6 further including transmitting a duration for the display of said icon in said ancillary information.

8. The method of claim 7 further including determining whether the icon has been displayed for the duration set with the ancillary information.

9. The method of claim 5 further including providing information to produce a plurality of icons indicative of content in said ancillary information.

10. An article comprising a medium for storing instructions that cause a processor-based system to:

transmit video data;

transmit ancillary information associated with said video data; and

transmit information indicative of the content included in said ancillary information.

11. The article of claim 10 further storing instructions that cause a processor-based system to provide a universal resource locator identifying a web page.

12. The article of claim 11 further storing instructions that cause a processor-based system to provide a uniform resource locator to a web page that includes an appropriate icon indicative of the content included in said ancillary information.

13. The article of claim 10 further storing instructions that cause a processor-based system to transmit a local identifier in said ancillary information that points to a location storing a content-identifying icon.

14. A method comprising:

receiving video data, ancillary information associated with said video data, and information that may be used to identify the content included in said ancillary information; and

displaying an icon indicative of the content included in said ancillary information.

15. The method of claim 14 wherein receiving includes receiving a uniform resource locator identifying a web page.

16. The method of claim 15 including receiving a uniform resource locator identifying a web page that includes an appropriate icon indicative of the content included in the ancillary information.

17. The method of claim 14 including receiving a local identifier in the ancillary information that points to a location storing a content-identifying icon.

18. The method of claim 17 including storing said local identifier and using said local identifier to locate a content-identifying icon.

19. The method of claim 15 including automatically accessing said web page.

20. An article comprising a medium for storing instructions that cause a processor-based system to:

receive video data, ancillary information associated with the video data, and information that may be used to identify the content included in the ancillary information; and

cause an icon indicative of the content included in said ancillary information to be displayed.

21. The article of claim 20 further storing instructions that cause a processor-based system to receive a uniform resource locator identifying a web page.

22. The article of claim 21 further storing instructions that cause a processor-based system to receive a uniform resource locator identifying a web page that includes an appropriate icon indicative of the content included in the ancillary information.

23. The article of claim 20 further storing instructions that cause a processor-based system to receive a local identifier in the ancillary information that points to a location storing a content-identifying icon.

24. The article of claim 23 further storing instructions that cause a processor-based system to store the local identifier and use the local identifier to locate a content-identifying icon.

25. The article of claim 21 further storing instructions that cause a processor-based system to automatically access the web page.

26. A processor-based system comprising:

a processor; and

a transmitter coupled to said processor to transmit video data along with ancillary information associated with the video data together with information that may be used to identify the content included in said ancillary information.

27. The system of claim 26 wherein said transmitter transmits a local identifier that may be used to identify the content included in the ancillary information.

28. The system of claim 26 wherein said transmitter transmits a uniform resource locator that may be used to identify the content included in the ancillary information.

29. A processor-based system comprising:

a processor; and

a receiver to receive video data with ancillary information associated with the data together with information that may be used to identify the content included in the ancillary information.

30. The system of claim 29 wherein said receiver displays an icon indicative of the content included in said ancillary information.

* * * * *