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(54) INTERACTIVE ENTERTAINMENT SYSTEM FOR PRESENTING SUPPLEMENTAL INTERACTIVE CONTENT TOGETHER WITH CONTINUOUS VIDEO PROGRAMS

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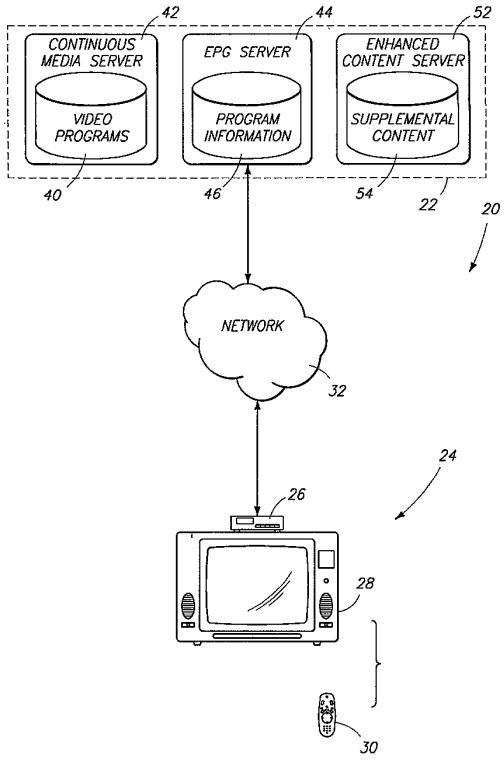
(52) **U.S. Cl.** **725/51**; 725/108; 725/40

(57) **ABSTRACT**

An interactive entertainment system enables presentation of supplemental interactive content along side traditional broadcast video programs, such as television shows and movies. The programs are broadcast in a conventional manner. The supplemental content is supplied as part of the same program signal over the broadcast network, or separately over another distribution network. A viewer computing unit is located at the viewer's home to present the program and supplemental content to a viewer. When the viewer tunes to a particular channel, the viewer computing unit consults an electronic programming guide (EPG) to determine if the present program carried on the channel is interactive. If it is, the viewer computing unit launches a browser. The browser uses a target specification stored in the EPG to activate a target resource containing the supplemental content for enhancing the broadcast program. The target resource contains display layout instructions prescribing how the supplemental content and the video content program are to appear in relation to one another when displayed. When the data from the target resource is downloaded, the viewer computing unit is responsive to the layout instructions obtained from the target resource to display the supplemental content concurrently with the video content program. Embedding the layout instructions in the supplemental content advantageously places control of the presentation to the content developers. The developers are free to arrange the data and video in any manner they choose.



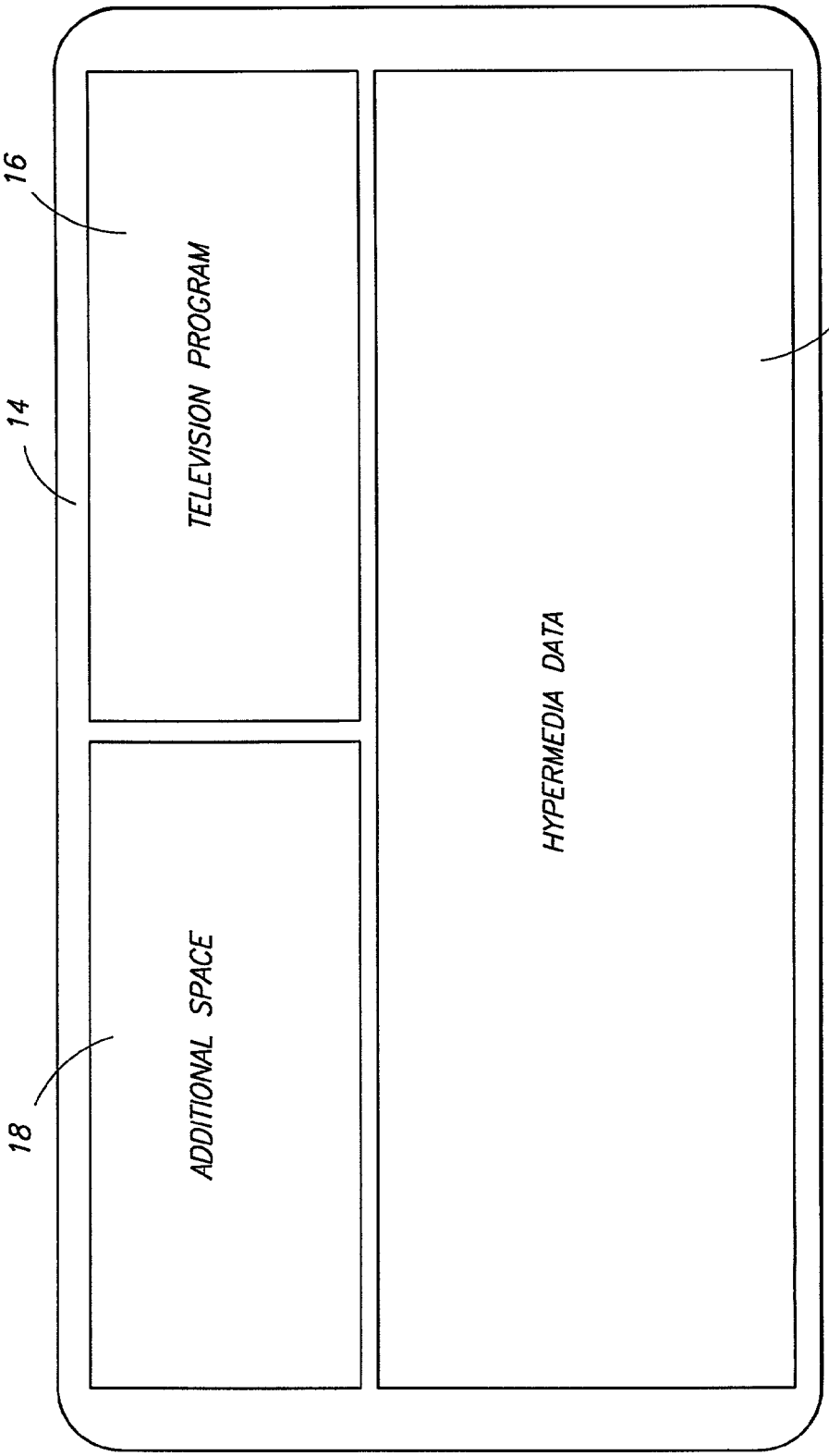


Fig 1
Prior Art

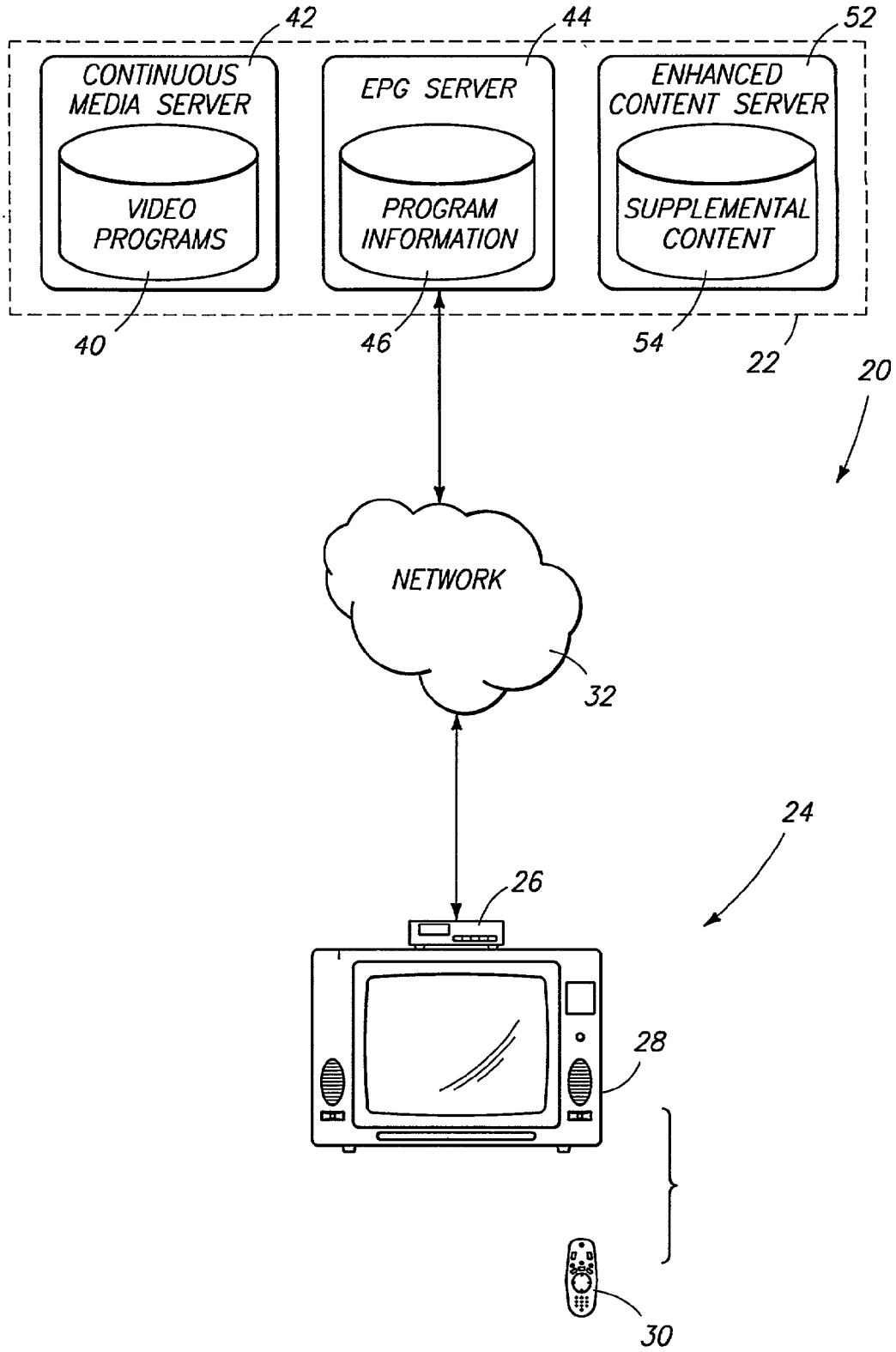

42
44
52
CONTINUOUS MEDIA SERVER
VIDEO PROGRAMS
EPG SERVER
PROGRAM INFORMATION
ENHANCED CONTENT SERVER
SUPPLEMENTAL CONTENT
40
46
54
22
20
NETWORK
32
24
26
28
30

Fig 2

48

STORAGE POINTER	TITLE	ACTOR	CC	STEREO	TIME	NETWORK	SUPPLEMENTAL CONTENT	DESCRIPTION
PROG1	MURDER, SHE WROTE	LANDSBURY	YES	YES	8:00PM THURSDAY	CBS	CONTENT1	"The Secret of Gila Junction" Jessica...
PROG2	SEINFELD	SEINFELD	YES	YES	9:00PM THURSDAY	NBC	http://www.nbc.com/seinfeld.html	"The Friars Club" Jerry tries...
PROG3	STAR TREK NEXT GEN.	STEWART	YES	YES	10:00PM FRIDAY	FOX	http://www/fox/com/startrek.html http://www.collections.com/trekkicollectables.html	"Delta Vega" Picard is faced...

50

58

Fig 3

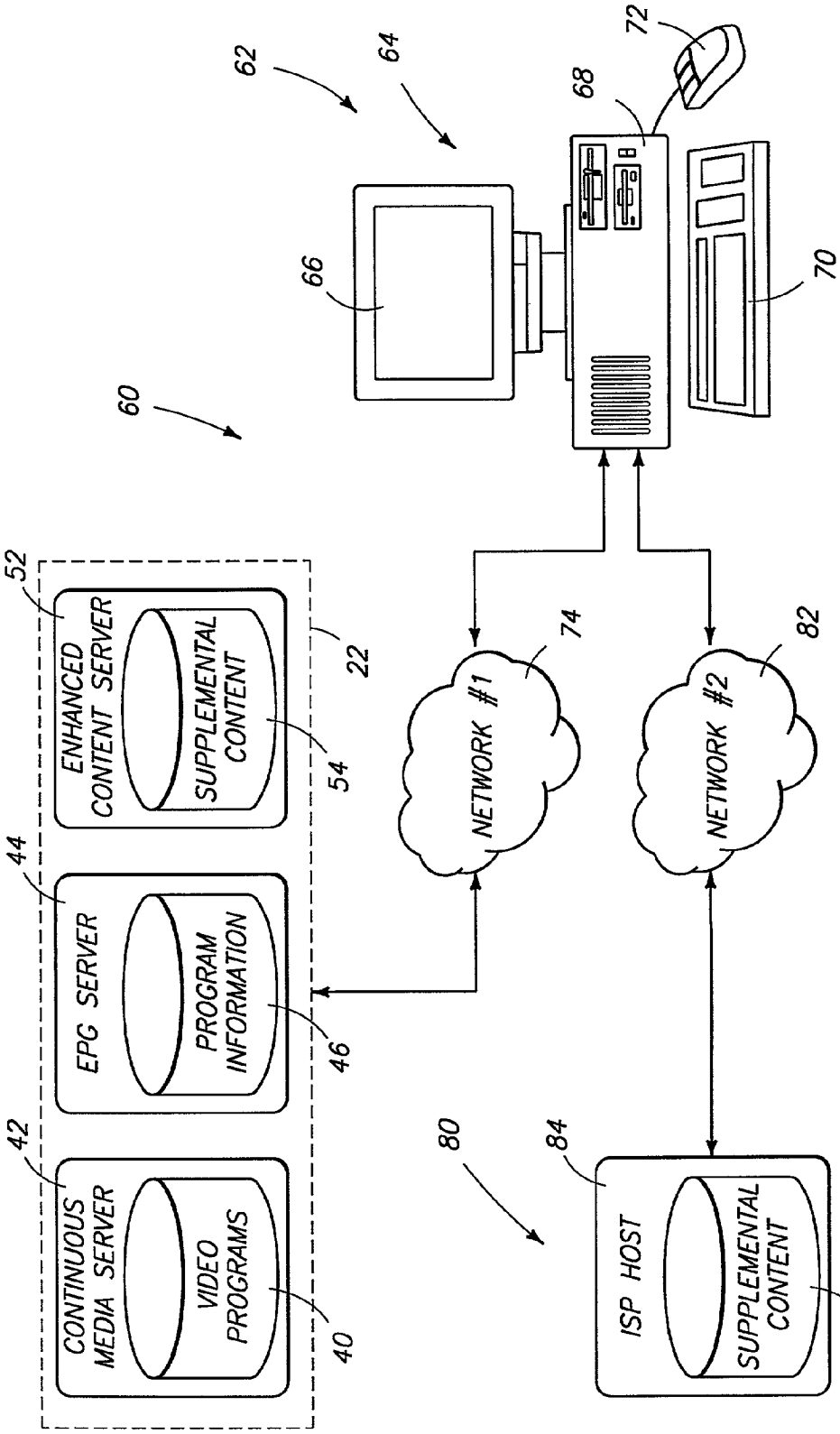

60
62
64
66
68
70
72
52
ENHANCED CONTENT SERVER
SUPPLEMENTAL CONTENT
54
22
44
EPG SERVER
PROGRAM INFORMATION
46
42
CONTINUOUS MEDIA SERVER
VIDEO PROGRAMS
40
74
NETWORK #1
82
NETWORK #2
80
84
ISP HOST
SUPPLEMENTAL CONTENT
86

Fig. 4

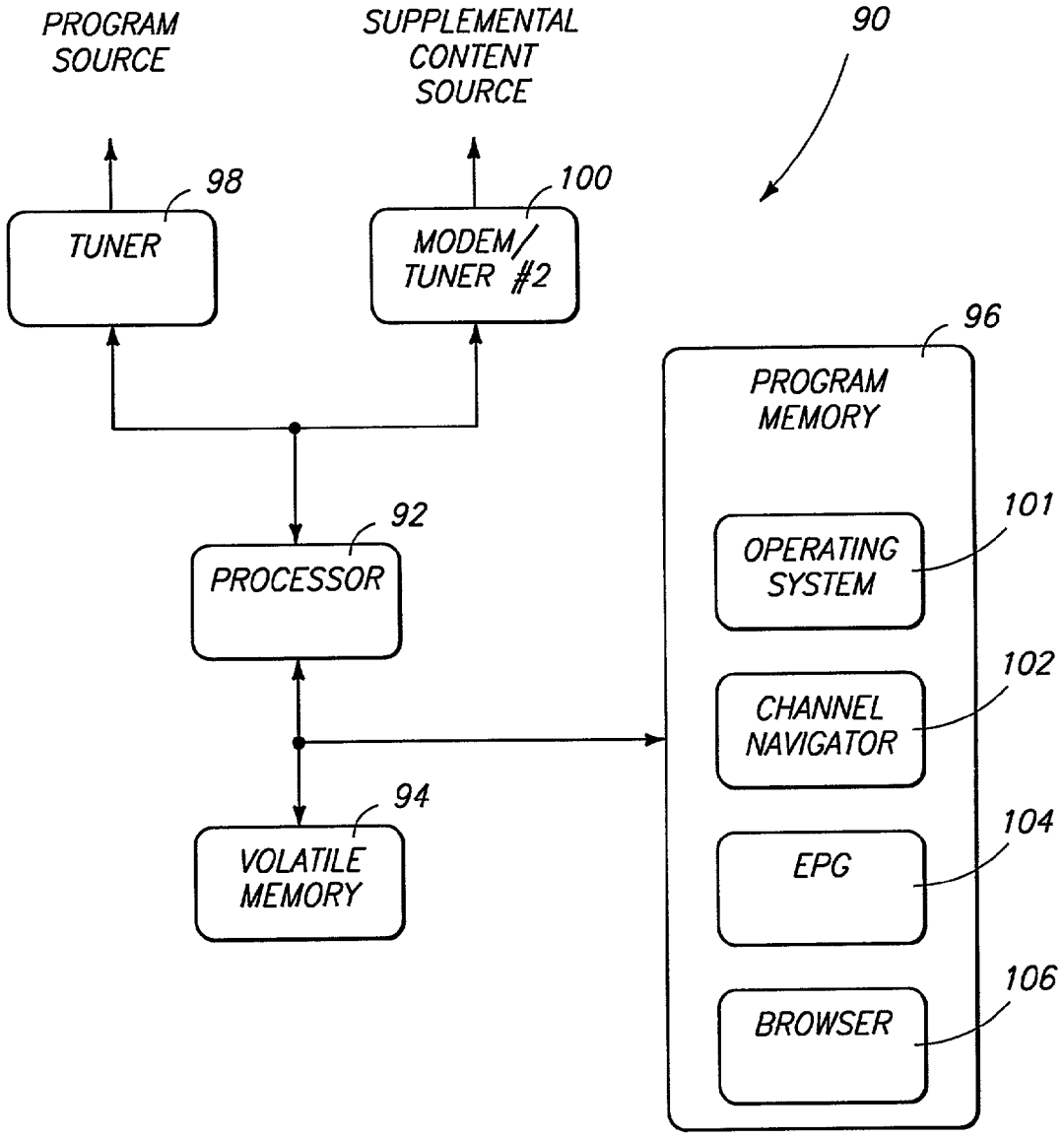

PROGRAM SOURCE
SUPPLEMENTAL CONTENT SOURCE
90
98
TUNER
100
MODEM/ TUNER #2
96
PROGRAM MEMORY
92
PROCESSOR
101
OPERATING SYSTEM
102
CHANNEL NAVIGATOR
94
VOLATILE MEMORY
104
EPG
106
BROWSER

Fig 5

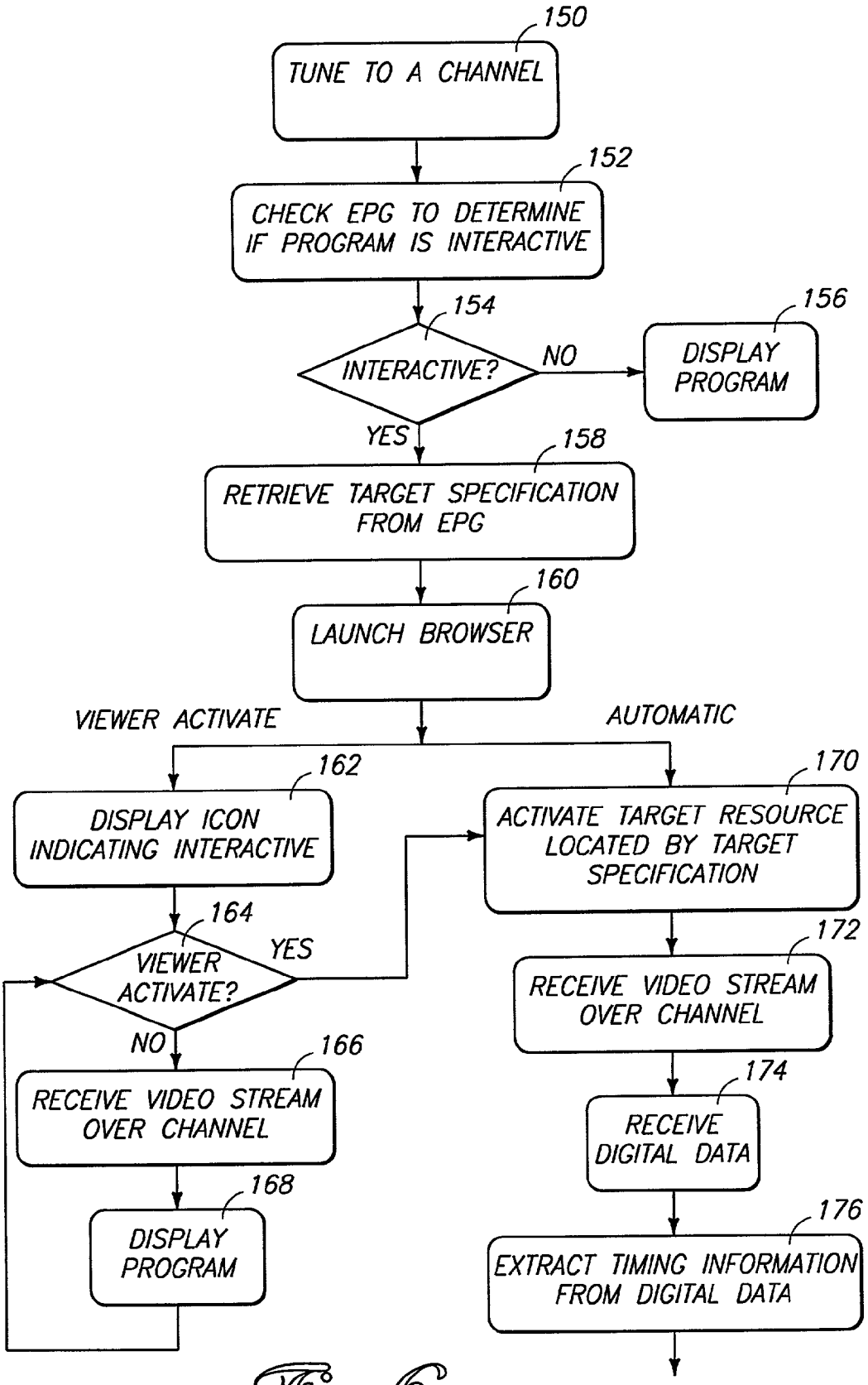

150
TUNE TO A CHANNEL
152
CHECK EPG TO DETERMINE IF PROGRAM IS INTERACTIVE
154
INTERACTIVE?
NO
156
DISPLAY PROGRAM
YES
158
RETRIEVE TARGET SPECIFICATION FROM EPG
160
LAUNCH BROWSER
VIEWER ACTIVATE
AUTOMATIC
162
DISPLAY ICON INDICATING INTERACTIVE
164
VIEWER ACTIVATE?
YES
NO
166
RECEIVE VIDEO STREAM OVER CHANNEL
168
DISPLAY PROGRAM
170
ACTIVATE TARGET RESOURCE LOCATED BY TARGET SPECIFICATION
172
RECEIVE VIDEO STREAM OVER CHANNEL
174
RECEIVE DIGITAL DATA
176
EXTRACT TIMING INFORMATION FROM DIGITAL DATA
TO STEP 178, FIG. 7

Fig 6

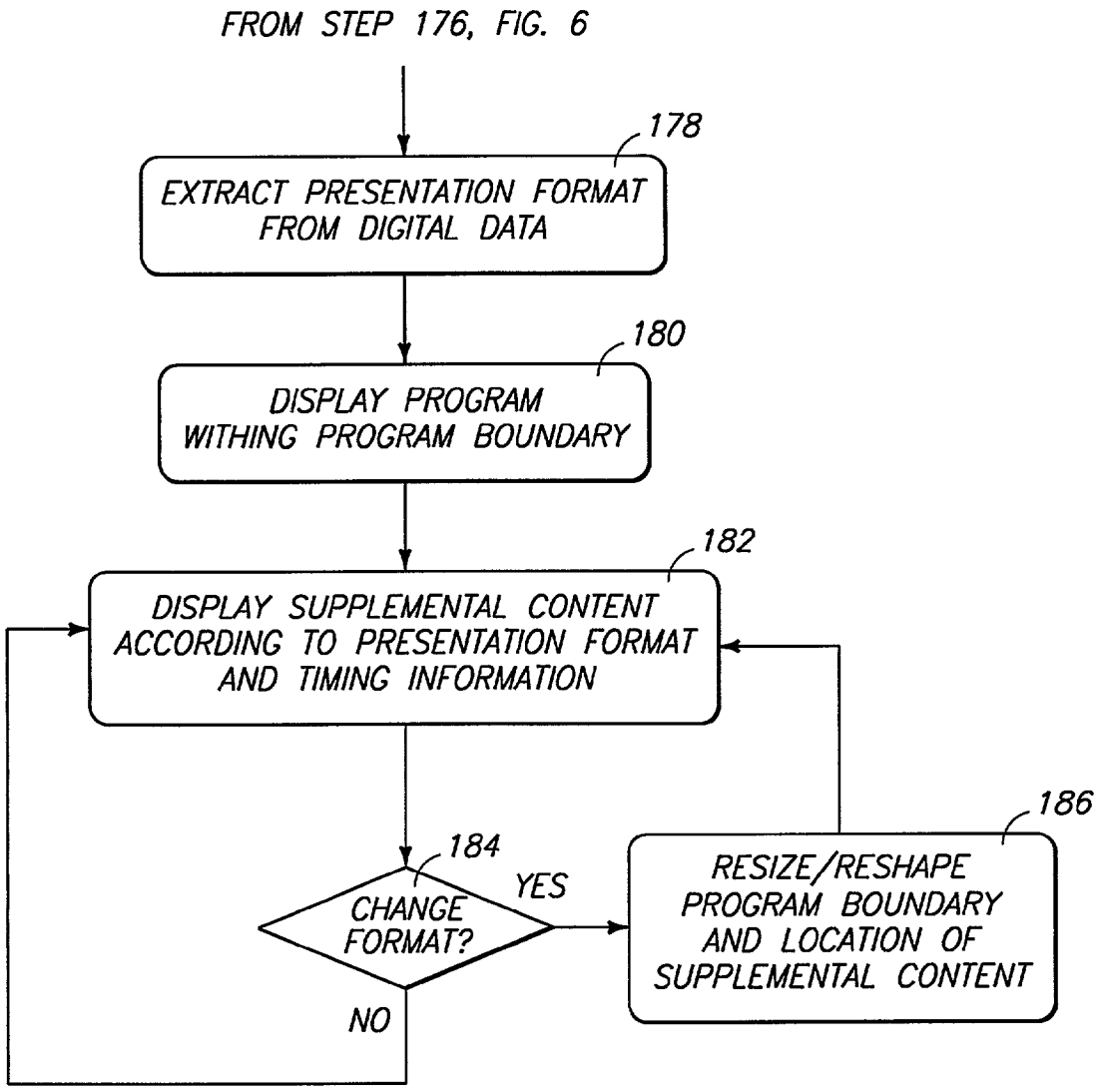

FROM STEP 176, FIG. 6
178
EXTRACT PRESENTATION FORMAT FROM DIGITAL DATA
180
DISPLAY PROGRAM WITHING PROGRAM BOUNDARY
182
DISPLAY SUPPLEMENTAL CONTENT ACCORDING TO PRESENTATION FORMAT AND TIMING INFORMATION
184
CHANGE FORMAT?
YES
NO
186
RESIZE/RESHAPE PROGRAM BOUNDARY AND LOCATION OF SUPPLEMENTAL CONTENT

Fig 7

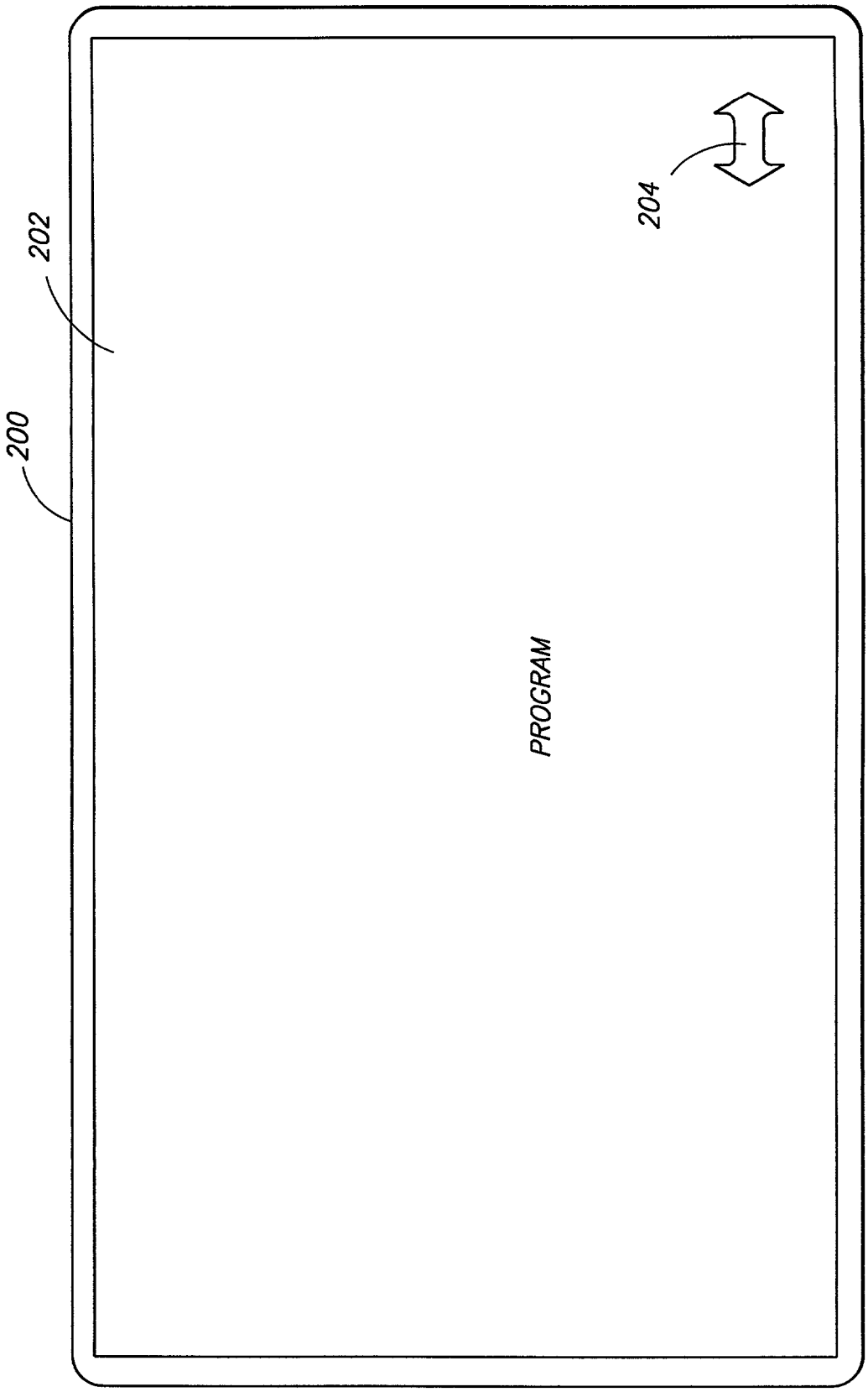


Fig. 8a

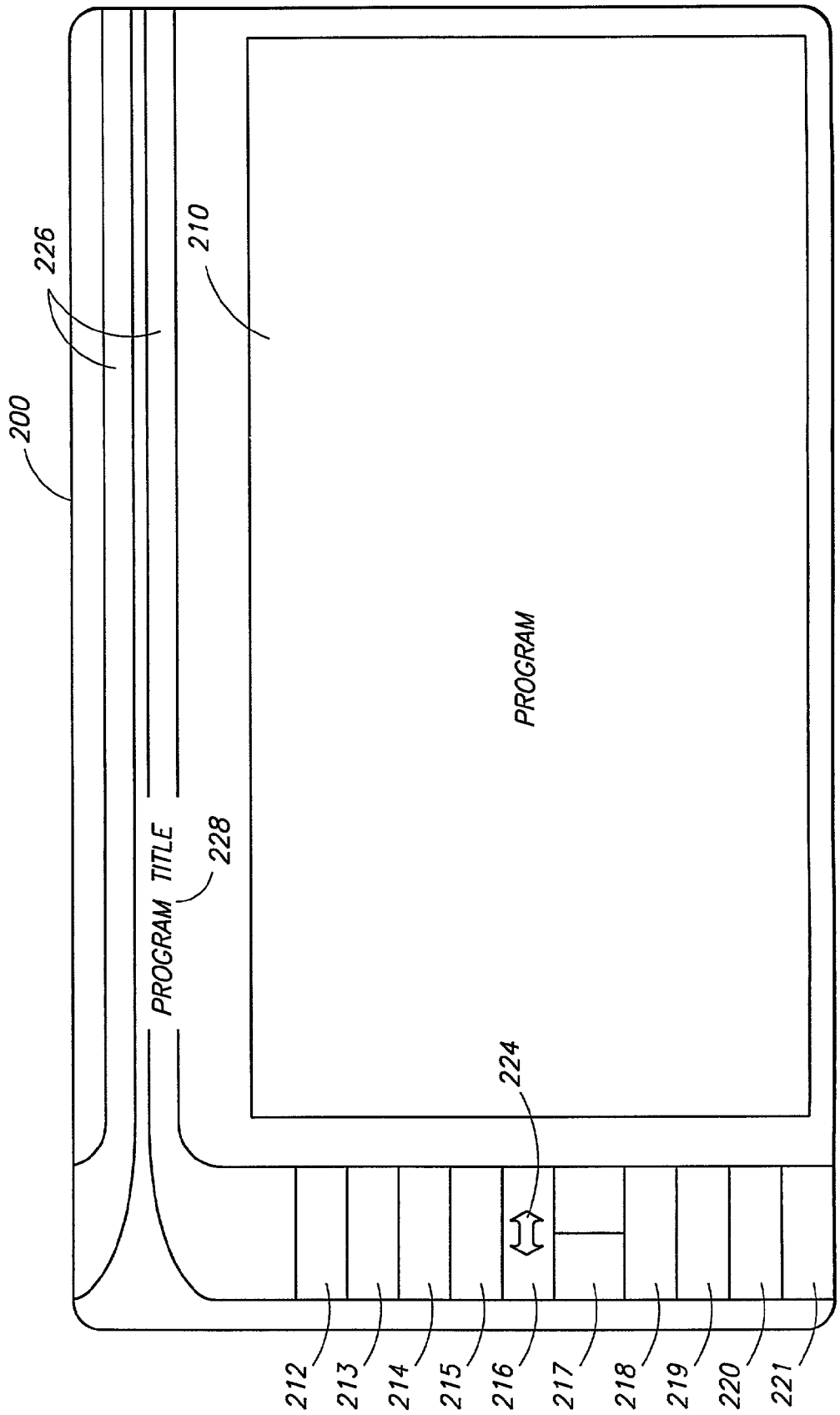

200
226
210
PROGRAM TITLE
228
PROGRAM
224
212
213
214
215
216
217
218
219
220
221

Fig 8b

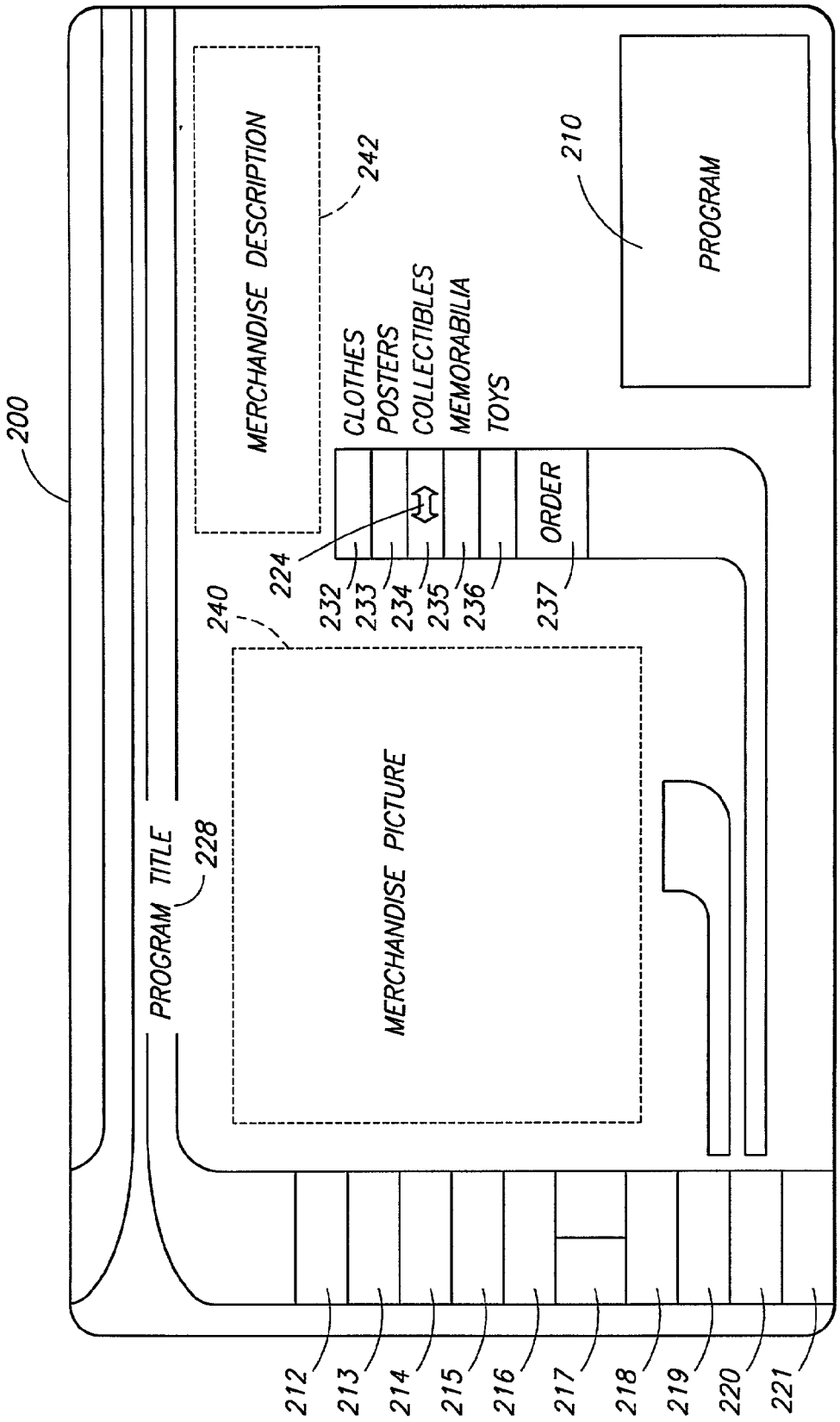

200
MERCHANDISE DESCRIPTION
242
210
PROGRAM
CLOTHES
POSTERS
COLLECTIBLES
MEMORABILIA
TOYS
ORDER
224
232
233
234
235
236
237
240
MERCHANDISE PICTURE
PROGRAM TITLE
228
212
213
214
215
216
217
218
219
220
221

Fig. 8c

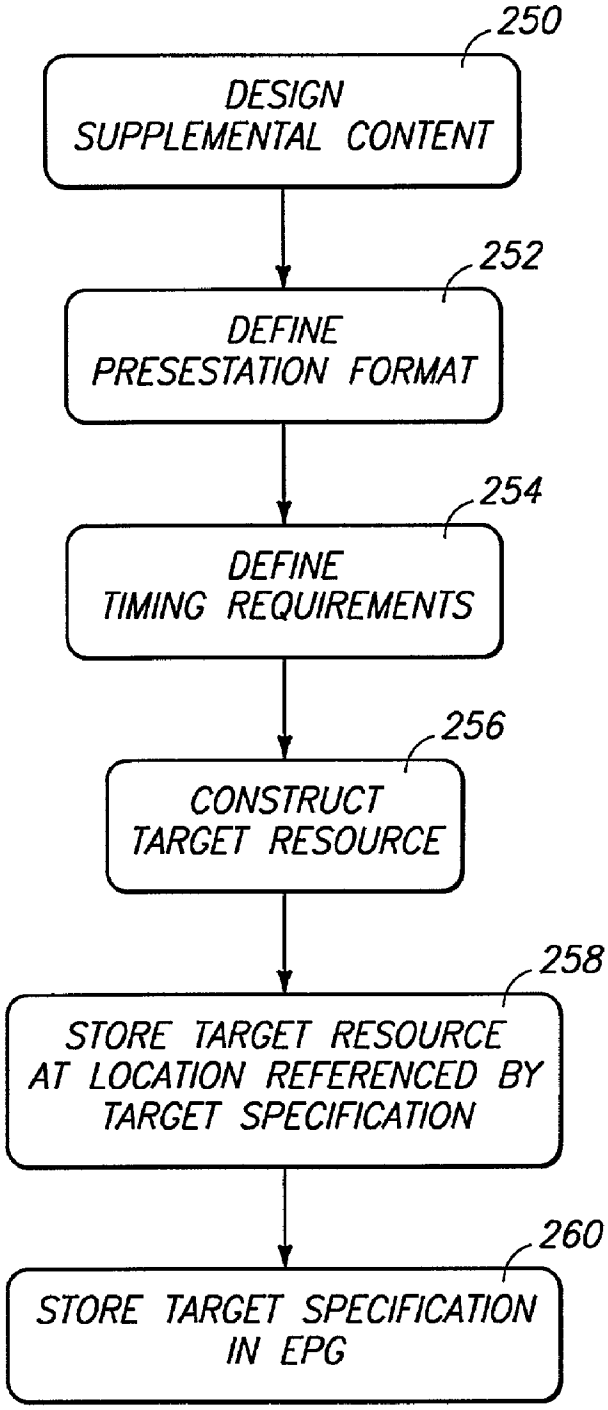

250
DESIGN SUPPLEMENTAL CONTENT
252
DEFINE PRESESTATION FORMAT
254
DEFINE TIMING REQUIREMENTS
256
CONSTRUCT TARGET RESOURCE
258
STORE TARGET RESOURCE AT LOCATION REFERENCED BY TARGET SPECIFICATION
260
STORE TARGET SPECIFICATION IN EPG

Fig 9

INTERACTIVE ENTERTAINMENT SYSTEM FOR PRESENTING SUPPLEMENTAL INTERACTIVE CONTENT TOGETHER WITH CONTINUOUS VIDEO PROGRAMS

TECHNICAL FIELD

[0001] This invention relates to interactive entertainment systems, such as interactive television or interactive computing network systems. More particularly, this invention relates to methods for presenting supplemental interactive content in conjunction with continuous video programs to enable viewer interactivity with the otherwise non-interactive video programs.

BACKGROUND OF THE INVENTION

[0002] Video content programs, such as TV shows and pay-per-view movies, are delivered to a viewer as a continuous data stream. Today, programs are most commonly distributed using a wireless broadcast system, or a cable system. In the first instance, the programs are broadcast over a wireless network and received at individual homes through an antenna or satellite dish. In the latter case, the programs are transmitted over cable to set-top boxes resident in the viewers' homes.

[0003] In broadcast distribution systems, there is no opportunity for interactive control of the content by the viewer. The viewer simply has an option to watch the program, change to a different program, or turn off the television. However, as consumers have learned from playing video games on their televisions, non-interactive viewing is not nearly as fun or sensory rich as interactive entertainment.

[0004] To enhance the traditional way of viewing television, there has been some effort toward the production of interactive programming content. As presently contemplated, additional interactive content is created to enhance the existing traditional program. This supplemental content is played along with the continuous video stream to enable viewers to interact with the program in a more involved manner than simply watching it. The supplemental content might, for example, ask the viewer questions about the episode, or play games with the viewer that relate to the show, or describe behind-the-scenes aspects of making the program. However, there remains a significant hurdle concerning how to create and distribute interactive programs.

[0005] Apart from the TV environment, however, computer users are familiar with interactive content on their computers. Many users own interactive multimedia CD-ROM applications that combine video, audio, pictures, text, and other content into a rich and responsive presentation. Familiar examples of interactive computer applications include games (e.g., Myst from Broderbund), educational programs (e.g., Reader Rabbit series from the Learning Company or Magic Schoolbus series from Microsoft), and home entertainment (e.g., Encarta from Microsoft).

[0006] Interactive content is also available from online services over a public network. Most notably, the Internet is emerging as a means for supplying video, sound, pictures, text, and other multimedia rich resources to a user's computer. Through the Internet, users can access a wide variety of resources that are maintained on computers located around the world.

[0007] Resources available on the Internet are most commonly presented as hypertext. "Hypertext," also referred to as "hypermedia," is a metaphor for presenting information in which text, images, sounds, and actions become linked together in a complex, non-sequential web of associations that permit a user to browse through related topics, regardless of the presented order of the topics. Hypermedia content is widely used for navigation and information dissemination on the "World-Wide Web" (WWW or Web) of the Internet. An application program referred to as a "Web browser" is normally used to retrieve and render hypermedia content from the WWW.

[0008] Despite the development of interactive entertainment in the computer sector, there has been little activity spilling over into the traditional television world. The TV environment poses a problem in that the programs are typically delivered as a broadcast of a continuous data stream, which inherently does not support interactive control. Interlacing interactive content presents a difficult design issue.

[0009] One proposed solution is a technology referred to as "Intercast technology" which is available from the Intercast Industry Group, a consortium of leading television networks, program hardware vendors, and software vendors. The Intercast technology presents both television programs and Internet data together on the same television or computer monitor, but with separate and predefined panes.

[0010] **FIG. 1** shows a screen **14** (television or computer monitor) which illustrates the Intercast technology. The screen **14** is divided into panes, as represented by panes **16-18**. Pane **16** contains the television program resulting from the video data. Pane **17** contains a hypermedia document, such as a Web page, that is provided by the Internet data. A third pane **18** can be used to show additional data, such as advertisements or the like.

[0011] The Internet data is combined with the video data of the television program to form a single signal that is broadcast to the viewer. The Internet data is transmitted during the vertical blank interval (VBI) between successive frames of the video data. The Internet data and video data are separated at the viewer's computer and presented simultaneously within their respective panes.

[0012] The drawback with the Intercast technology is that it rigidly adheres to the paned presentation. The television pane **16** is a self-contained pane which is dedicated to showing only the video program, and the Web pane **17** is a separately self-contained pane which is reserved exclusively for Web content. Content providers who develop the Internet data have no control over how the television program and interactive supplemental content is presented to the viewer. They can simply control how the data is presented within its own box **17**. Accordingly, the content providers are significantly limited in what they can create in the way of a full interactive media event.

[0013] The inventors have developed a better way of creating and distributing interactive programming that frees the content providers of these restrictions.

SUMMARY OF THE INVENTION

[0014] This invention concerns an interactive entertainment system for supplying interactive supplemental content

along with continuous video content programs to viewers. The programs are supplied from a program provider, such as a cable headend or a broadcast station, over a distribution network to a viewer computing unit. The programs are continuous, non-interactive data streams, such as television shows, movies, or other video content.

[**0015**] The viewer computing unit is implemented as a television, a television/set-top box unit, a personal computer, or the like. It has a processor and memory. An electronic programming guide (EPG) is stored in the memory and executable on the processor to organize programming information that is descriptive of the video content programs. The EPG maintains a data field that indicates whether the video content program is interactive. The EPG data field contains a pointer, universal resource locator, or other target specification to the target resource that supports the interactive content and correlates this data field with the particular program that the supplemental content is designed to enhance. Accordingly, if a target resource is listed in conjunction with a particular program, the program is recognized as being interactive. The supplemental content can be developed and provided by the same provider that distributes the video content program, or by an independent service provider.

[**0016**] When the viewer tunes to a particular channel, the viewer computing unit consults the EPG to determine if the present program is interactive. If it is, the viewer computing unit launches an interactive support module, such as an Internet browser. This browser is kept in memory and is dynamically loadable for execution on the processor when the viewer tunes to a channel carrying a video content program that the EPG identifies as interactive. The viewer computing unit also depicts a small icon or other indicia to alert the viewer that the program is interactive. The viewer can click on or otherwise activate the icon to enter the interactive mode and display the supplemental content. As an alternative, the supplemental content can be automatically displayed in response to launching the Internet browser.

[**0017**] The Internet browser uses the target specification in the EPG to start the target resource. The target resource contains the supplemental content to enhance the television program. The supplemental content might be, for example, questions about the program, games, trivia information, facts about the actors and producers, information on other episodes, advertisements, a listing of products or memorabilia about the program, and so on. The supplemental content and program can be transmitted together as a single signal, which is separated at the viewer computing unit, or separately over two channels or two different networks.

[**0018**] The target resource also contains display layout instructions prescribing how the supplemental content and the video content program are to appear in relation to one another when displayed on the television or monitor. When the data from the target resource is downloaded to the viewer computing unit, the processor is responsive to the layout instructions obtained from the target resource to display the supplemental content concurrently with the video content program.

[**0019**] Embedding the layout instructions in the supplemental content advantageously returns control of the presentation to the content developers. The developers can now arrange the data and video in any manner they choose. The developers are not restricted to specific fixed panes, as in the prior art.

BRIEF DESCRIPTION OF THE DRAWINGS

[**0020**] **FIG. 1** is an illustration of a screen showing a paned presentation format for presenting television programs and Internet data according to prior art Intercast technology.

[**0021**] **FIG. 2** is a diagrammatic illustration of an interactive entertainment system according to one implementation. The **FIG. 2** implementation is representative of an interactive TV system.

[**0022**] **FIG. 3** is a simplified example of data fields in a data structure maintained by an electronic programming guide.

[**0023**] **FIG. 4** is a diagrammatic illustration of an interactive entertainment system according to a second implementation, which is representative of an interactive integrated PC-TV system.

[**0024**] **FIG. 5** is a block diagram of a viewer computing unit according to an aspect of this invention.

[**0025**] **FIGS. 6 and 7** show a flow chart for operating an interactive entertainment system.

[**0026**] **FIG. 8*a*-8*c*** are a series of exemplary screen illustrations showing different display layouts of the video program and the supplemental content.

[**0027**] **FIG. 9** is a flow chart of a method for authoring an interactive entertainment program.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[**0028**] **FIG. 2** shows an interactive entertainment system **20** implemented as an interactive television (ITV) system. System **20** includes a centralized headend **22** which is configured to provide continuous video content programs to multiple subscribers. These programs might include traditional broadcast TV shows, movies, games, and the like. The programs are transmitted as a continuous data stream, which is non-interactive in itself.

[**0029**] Each subscriber has a viewer computing unit **24**. In the illustrated implementation, the viewer computing unit is embodied as a set-top box (STB) **26** coupled to a television (TV) **28**. The STB **26** receives digital video signals from headend **22** and controls which programs are displayed on the TV **28**. The STB **26** is controlled by the viewer through use of a panel control located on its face, or a hand held remote control unit **30**. Instead of a separate STB, however, a viewer computing unit can be incorporated in the TV itself. In addition to televisions, the viewer computing unit might be implemented with other types of visual display units, such as a computer monitor, as is described below with respect to the **FIG. 4** implementation.

[**0030**] Each viewer computing unit **24** is configured to run an electronic program guide (EPG). The EPG provides an on-screen listing of various programs or program titles. The listing is organized in a predetermined arrangement that is displayed on the television. The EPG might also include

other program descriptive information, including whether the program is provided in closed s caption or stereo.

[0031] Headend **22** is interconnected to the subscribers via a distribution structure or network **32**. The distribution structure **32** can be implemented in different ways. One implementation is a multi-tier network which includes a high-speed, high-bandwidth fiber optic cable network between the headend and regional distribution nodes (not shown), and conventional home entry lines, such as twisted-pair lines or coaxial cable, between the distribution nodes and viewer computing units. Other implementations include satellite communications (e.g., DSS technologies), RF communication, or other wireless technologies. Moreover, the network can be constructed using a combination of wireless and wire-based technologies.

[0032] In the illustrated implementation, the network **32** provides both the pipeline for distribution of programs from the headend to the subscriber, as well as a back channel which enables communication from the subscriber to the headend. The back channel permits the viewer to send requests and instructions to the headend to facilitate interactive control.

[0033] Headend **22** provides video content programs to the viewer computing unit **24**. The programs are embodied as video data streams that are transmitted from headend **22** over distribution structure **32** to the viewer computing unit. The headend maintains a database of programs **40** that can be served by a continuous media server **42** to individual viewers in an on-demand mode. The headend can also retransmit to its subscribers broadcast video signals that it receives from another source, such as a satellite feed or another cable system. The video data streams are sent to the viewer computing units in digital or analog format.

[0034] An EPG server **44** is provided at headend **22** to serve the programming information needed by the EPG at the viewer computing unit **24**. The EPG server **44** is implemented as a structured query language (SQL) database **46** with records containing information relating to available shows or programs.

[0035] The headend **22** further includes an enhanced content server **52** which serves supplemental interactive content to the viewer computing units to enhance or supplement the continuous video streams served by the continuous media server **42**. The supplemental content is stored digitally in database **54** and can be text, graphics, video, picture, sound, or other multimedia types. Examples of supplemental content include trivia questions or games related to the program, advertisements, merchandise or other memorabilia, hyperlinks to similar programs of similar type or starring the same actor/actress, and so on.

[0036] In the implementation described herein, the supplemental content is constructed as a hypertext file which is rendered by a browser. Hypertext, or hypermedia, is a metaphor for presenting information in which text, images, sounds, and actions become linked together in a complex, non-sequential web of associations that permit a user to browse through related topics, regardless of the presented order of the topics. Hypermedia content is widely used for navigation and information dissemination on the "World-Wide Web" (WWW or Web) of the Internet.

[0037] Hypermedia content is commonly organized as documents with embedded control information. The embedded control information includes formatting specifications, indicating how a document is to be rendered by the browser. In addition, such control information can include links or "hyperlinks," which are symbols or instructions telling the browser where to find other related documents on the Internet. A hyperlink includes a label, which is typically rendered as a graphical icon or as highlighted keywords, and an underlying target specification. The target specification is set forth in the underlying hypermedia document, but is normally invisible to the user. The target specification unambiguously identifies a targeted document or resource, specifying the name of the computer on which the document resides and the complete file name of the document.

[0038] In concept, the target resource can be virtually any type of object - including executable programs, text or multimedia documents, sound clips, audio segments, still images, computers, directories, and other hyperlinks. In WWW documents, hyperlink targets are most often files that can reside on any computers connected to the Internet. However, a hyperlink target can also be a particular location within a document, including the document that is currently being rendered. Hypertext usage is not limited to the Internet. Various multimedia applications utilize hypertext to allow users to navigate through different pieces of information content.

[0039] **FIG. 3** shows an example data structure **48** which is used by the EPG database **46** to organize programming information and to correlate target specifications with the programs. The data structure includes a number of data records comprising various data fields **50** for holding programming information. The data fields contain program titles, actor names, whether the program has closed captioning or stereo audio, the scheduled time of the program, the network name, and description text. Each program record in the data structure **48** also holds pointers to storage locations within the continuous media server **42** which hold the video data streams of the programs corresponding to the program records.

[0040] The data structure **48** includes a data field **58** for holding target specifications which reference target resources supporting the supplemental content. The data structure correlates the target specifications with the programs by associating them within the same program record. The presence of a target specification within the data field **58** indicates that the associated program is interactive and that complementary content can be displayed in addition to the program itself. The target specification can be implemented in different forms. The target specification to the supplemental content stored at the headend which enhances the "Murder, She Wrote" program is in the form of a pointer "CONTENT1." The presence of this pointer in field **58** indicates that the program "Murder, She Wrote" is interactive compatible and that the supplemental content resides at a memory location identified by the pointer "CONTENT1." Similarly, the programs "Seinfeld" and "Star Trek" are interactive compatible and have associated supplemental content which are located by the hyperlink URLs in corresponding data field **58**. These URLs reference resources provided by independent service providers (described below with reference to **FIG. 4**).

[0041] A URL (universal resource locator) is a type of target specification used in WWW documents to describe

everything about a particular resource that a browser needs to know to request and render it. The URL describes the protocol a browser should use to retrieve the resource, the name of the computer it is on, and the path and file name of the resource.

[0042] The following is an example of a URL listed in the EPG data structure **48** in association with the "Seinfeld" program:

http://www.nbc.com/seinfeld

[0043] The "http://" portion of the URL describes the protocol. The letters "http" stand for HyperText Transfer Protocol, the set of rules that a browser will follow to request a document and the remote server will follow to supply the document. The "www.nbc.com" portion of the URL is the name of the remote host computer which maintains the document. The last portion "/seinfeld" is the path and file name of the document on the remote host computer.

[0044] The development of the EPG data structure **48** includes designating separate data fields **50** within a storage medium for holding programming information, and dedicating at least one of the data fields **58** to storing target specifications to supplemental content. The target specifications can be in the form of memory pointers, hyperlinks, URLs, or any other designation for referencing a location containing supplemental content. For programs with no corresponding supplemental content, the target specifications data field **58** is left empty. However, for those programs with supplemental content, the target specification to the target resource containing the supplemental content is entered in the data field **58** and correlated with the program. The correlation is provided through the data structure by the placing the target specification within the same data record as the program title and other information for a particular program. It is further noted that the target resources can be embedded within other text-based data held in other data fields **50** which also relate to the corresponding programs.

[0045] The same or a subset of data structure **48** is employed at the EPG application running at the viewer computing unit in the home. The data records stored at the headend on the EPG server are transmitted periodically in batch, or individually, and cached at the local EPG. The local EPG is thus able to identify whether a particular program is interactive compatible by quick reference to the locally cached EPG data structure.

[0046] **FIG. 4** shows an interactive entertainment system **60** according to a second implementation which accommodates third party independent service providers. Interactive entertainment system **60** includes headend **22** which supplies programs and supplemental content to a viewer computing unit **62**. In this implementation, the viewer computing unit **62** is implemented as a computer **64** with a monitor **66**, a central processing unit **68**, a keyboard **70**, and a mouse **72** (although other input devices can be used in addition to, or instead of, the keyboard and mouse).

[0047] The headend **22** serves the programs over a first network **74**, which may be implemented like the fiber optic distribution structure described above, or as a satellite system or other wireless broadcast system, or as a conventional data network. It is noted that other program providers may be used instead of a headend, such as a broadcast station or an online service provider.

[0048] The interactive entertainment system **60** also includes multiple independent service providers (ISPs), as represented by ISP **80**, which distribute digital content to the viewer computing unit **62** over a second network **82**. An example of the second network **82** is a public network, such as the Internet. The ISP **80** has a host **84** and a content database **86** to serve various multimedia content to the viewer's computer. The ISP host **84** stores one or more target resources that can be rendered by the viewer computing unit **62**.

[0049] The supplemental content provided by the ISP **80** is correlated with the programs by data structure **48** as described above. As shown in **FIG. 3**, the data field **58** includes target specifications to supplemental content provided by servers other than the program provider which distributes the show. In the illustrated example, the programs Seinfeld and Star Trek have associated ISP-served content which are located by the hyperlink URLs in corresponding data field **58**. It is further noted that a program might have more than one source of supplemental content. The program record for "Star Trek" has two associated target specifications, one that references a target resource at the host computer "www.fox.com" and one that references a target resource at the host computer "www.collections.com."

[0050] According to this **FIG. 4** arrangement, the viewer computing unit **62** receives a non-interactive, continuous video stream from the headend **22**, and supplemental interactive content from either the headend **22** or from an independent service provider **80**. The supplemental content might therefore be carried to the viewer's computer over the same channel as the program, over a separate channel, or over a separate connection unrelated to the program channels. The back channel for facilitating interactive control is provided through either network **72** or **82**.

[0051] In another implementation, the interactive content can be supplied locally by a storage medium, such as a CD-ROM. Suppose, for example, a content developer creates an interactive CD-ROM that can be played along with a particular movie. The supplemental content is accessed via disk reads to the local storage drive, rather than using URLs to target resources over a network. The supplemental content is synchronized with the program using open loop control, such as a start time followed by measurable ticks or by frame count.

[0052] **FIG. 5** shows a viewer computing unit, referenced generally as numeral **90**, in more detail. The viewer computing unit **90** includes a processor **92**, a volatile memory **94**, and a program memory **96**. The viewer computing unit **90** also has at least one receiver, and possibly two receivers, for receiving the video stream from the headend and the digital supplemental data from the headend or ISP. The first receiver is in the form of a tuner **98** which tunes to the channel or broadcast frequency to receive a video data stream from a program source, such as the headend, broadcaster, or other program provider. The second receiver, referenced generally as **100**, can be implemented as a second tuner for receiving the content over a cable or wireless distribution network, or a modem for receiving the supplemental content over the Internet or other data network.

[0053] The viewer computer runs an operating system **101** which supports multiple applications. The operating system **101** is stored in memory and executes on the processor. The

operating system is preferably a multitasking operating system which allows simultaneous execution of multiple applications. The operating system **101** employs a graphical user interface windowing environment which presents the applications or documents in specially delineated areas of the display screen called "windows." One preferred operating system is a Windows® brand operating system sold by Microsoft Corporation, such as Windows® 95 or Windows® NT or other derivative versions of Windows®. However, other operating systems which provide windowing environments may be employed, such as the Macintosh operating system from Apple Corporation and the OS/2 operating system from IBM.

[**0054**] A channel navigator application **102** is stored in program memory **96** and executes on the processor **92** to control the tuners **98** and **100** to select a desired channel for receiving the video content programs. An EPG application **104** is stored in program memory **96** and executes on the processor **92** to organize programming information downloaded from the EPG server at the headend. The EPG **104** supports a displayable user interface (UI) which visually correlates programs titles to scheduled viewing times and tuning information, such as a channel, in a scrollable grid format. The viewer computing unit **90** also has an interactive support module in the form of browser **106** which is kept in memory **96**. The browser **106** is dynamically loaded on processor **92** when needed to render content, such as a hypertext document, from an ISP or other content provider. The browser can be implemented as a hyperlink browser, or more particularly, as an Internet Web browser.

[**0055**] Although not shown, the viewer computer might also include on or more storage drives, such as a CD-ROM drive, to play interactive CD-ROMs in the event that supplemental data is supplied locally on disk.

[**0056**] **FIGS. 6 and 7** show a method for operating an interactive entertainment system to enhance a conventional continuous video data stream, such as a television show, with interactive supplemental content. This method is described with additional reference to the screen displays shown in **FIGS. 8***a*-**8***c*.

[**0057**] The method begins when a viewer tunes to a particular channel (step **150** in **FIG. 6**). The channel navigator **102** controls the tuner **98** to tune to the channel. The viewer computing unit checks the appropriate channel and time slot of the EPG data structure **48** to determine if the program being carried on the selected channel at this time is interactive (step **152**). As described above, the presence of a target specification in the EPG data field **58** in association with the program is in indication that the program is interactive compatible and that there is supplemental content for the program. If the data field is empty, indicating that no supplemental content exists (i.e., the "no" branch from step **154**), the viewer computing unit simply displays the video data stream being received through the tuner **98** (step **156**).

[**0058**] A run-time technique can alternatively be used for detecting whether a program is interactive compatible. Rather than checking the EPG data field, the viewer computing unit checks a dedicated channel for the existence of new supplemental content data. The dedicated channel is separate from the selected channel carrying the program so that the supplemental content is received by the viewer computing unit currently with the program video data. The existence of a supplemental content data stream over the dedicated channel indicates that the program being received on the selected channel is interactive compatible. This technique can be carried out without reference to the EPG listing.

[**0059**] If the program is interactive compatible (i.e., the "yes" branch from step **154**), the viewer computing unit retrieves the target specification from the EPG data structure (step **158** in **FIG. 6**). The target specification might be a pointer to a memory location at the headend, or a pointer to a memory location on a locally running CD-ROM, or a hyperlink to a target resource located at an independent service provider. The hyperlink browser **106** is loaded onto the processor to render the target resource referenced by the target specification (step **160**).

[**0060**] At this point, there are several ways to initiate viewing the supplemental content. One approach is to permit the viewer to selectively activate the interactive mode (i.e., the "viewer activate" branch from step **160**). The viewer may know that the program is interactive compatible by checking a newspaper listing or other program guide. Another way is to have the viewer computing unit display an icon or other indicia on the screen to visually inform the viewer that the program is interactive compatible (step **162** in **FIG. 6**). The icon can be overlaid on the playing video program in an non-conspicuous manner, like the closed caption or stereo labels.

[**0061**] **FIG. 8***a* shows an example screen **200** having a video program **202** playing at full-size on the screen. An icon **204** is displayed at the lower right corner of the screen to inform the viewer that the program **202** is interactive compatible. The icon **204** can be displayed throughout the program, or faded out after a set time period. This initial screen represents a first mode of interactivity, where the viewer is presented with the choice of interactive entertainment or non-interactive viewing of the program. As long as the viewer does not activate the icon **204**, the viewer computing unit continues to receive the video content program over the selected channel and display that program alone, without any supplemental content (steps **166** and **168** in **FIG. 6**).

[**0062**] If the viewer decides to enter into an interactive mode, the viewer employs a remote control handset, mouse, keyboard, or other mechanism to actuate the icon **204**. This causes the browser **106** to start the target resource located by the target specification listed in the EPG data structure (step **170** via the "yes" branch from step **164**).

[**0063**] This leads to another approach to invoking the supplemental content. Rather than displaying an icon and waiting for input from the viewer, the viewer computing unit can automatically activate the target resource as soon as the browser is loaded on the processor (step **170** from the "automatic" branch from step **160**).

[**0064**] The target resource contains digital data which supports interactive functionality in conjunction with the associated video content program. The digital data defines the supplemental content to enable viewer interactivity with the video content program. The digital data also defines a display layout prescribing how the supplemental content and the video program are to appear in relation to one another when displayed on the screen.

[0065] The digital data further defines timing information to synchronize presentation of the supplemental content with the video content program. This timing information can be implemented in many different ways. One approach is to coordinate the supplemental content to a particular program start time, and then carefully measure time from that start time to synchronize presentation of the supplemental content with the appropriate points in the program. Another approach is to characterize the program in terms of frames, and key the introduction of supplemental content to the frame numbers.

[0066] The video stream and supplemental content can be transmitted together, as a single signal, or separately. In the former implementation, the digital data is packaged with the video stream and transmitted as one signal from the headend. The viewer computing unit receives the single signal at tuner **98** and separates the digital data from the video signal (steps **172** and **174**). In the latter implementation, the video data stream is received over the selected channel via tuner **98** from the program provider (step **172**). The digital data is received from the target resource that is activated by the browser (step **174**). This target resource might be located at the headend, in which case, the data is received over a separate channel using tuner **100**; or the target resource might be served by an independent service provider, in which case, the data is received over a public network using the modem **100**.

[0067] At the viewer computing unit, the digital data is deconstructed to extract the timing information and the display layout from the supplemental content (step **176** in **FIG. 6** and step **178** in **FIG. 7**). The display layout defines a program boundary within which the program is displayed to the viewer. The program boundary is sized and shaped according to parameters prescribed in the display layout. As the size and shape changes, the processor scales the video data for display within the program boundary at that instance (step **180** in **FIG. 7**).

[0068] The display layout also defines how the supplemental content is illustrated along with the program. The display layout prescribes the size, style, location, and other parameters for presenting the supplemental content. For instance, the supplemental content might be at least partly overlaid on the video program, or provided as a wrapper around, or along side, the program. The supplemental content is displayed according to this display layout and synchronized to the program according to the timing information (step **182** in **FIG. 7**). As an example, the supplemental content might be a trivia game which quizzes the viewer as to possible outcomes of various scenes. The questions are displayed on the screen according to the display layout and are timed using the timing information to coincide with the part of the program to which the questions pertain.

[0069] **FIG. 8***b* illustrates a screen **200** that is part of the interactive mode. Here, the video program is constrained within a program boundary **210** which is less than full-screen size. The program boundary **210** has been reduced in comparison to the full-size presentation of **FIG. 8***a* to make room for the supplemental content. In this illustration, the supplemental content consists of a main menu having soft buttons **212-221**, a highlighter or cursor icon **224**, graphics bars **226**, and a text block **228** to hold the program title. The soft buttons **212-221** present various control options to the viewer to invite interactive involvement with the program.

[0070] The illustrated screen is taken from an interactive program based on a Star Trek episode. To provide an example of the main menu, the soft buttons **212-216** represent actions for calling up related TV shows and movies. For instance, button **212** relates to the original Star Trek series; button **213** concerns The Next Generation series; button **214** represents the Deep Space Nine series; button **215** represents the Voyager series; and button **216** relates to the various motion pictures.

[0071] Soft button **217** is an access/classified toggle which allows selection of one of two levels of interactivity. "Access" serves as a default mode of interactivity which contains the main menu functionality. The screen of **FIG. 8***b* is an example of the access mode of interactivity. A voice-over narrative announces the mode when selected by button **217**. Once in the access mode, the broadcast video stream is shrunk to fit within the smaller program boundary **210** to accommodate the main menu graphics. The alternate mode of interactivity, or "classified" mode, contains time-linked contextual information to provide a second tier of information. **FIG. 8***c*, shown below, is an example of the classified mode of interactivity.

[0072] Soft buttons **218-220** enable selection of different types of supplemental content. Button **218** relates to an encyclopedia containing numerous facts and information about the program. In the Star Trek program, for example, the encyclopedia might contain information on aliens, behind-the-scenes tidbits, cast and crew biographies, facts on other episodes, interviews with the actors/actresses, a technical manual explaining intricacies of starship operation and travel, and various timelines.

[0073] Button **219** is associated with a program guide, which provides a listing of current Star Trek shows for a two week period. The program guide also permits the user to change channels to another channel carrying a Star Trek show, if available.

[0074] Button **220** allows selection of entertainment content, which includes trivia games related to the program and a merchandise catalog. The trivia games segment allows viewers to compete against other regional competitors. The catalog lists available merchandise related to the program that can be purchased by the viewer.

[0075] The tenth button **221** is a quit button which allows the viewer to leave the interactive mode and return to a full-screen display, as shown in **FIG. 8***a*.

[0076] The program and supplemental content are displayed as prescribed by the display layout. The digital data from the target resource, however, can dynamically change the display layout. When the display layout is changed (i.e., the "yes" branch from step **184**), the viewer computing unit re-sizes and/or reshapes the program boundary **210** and location of the supplemental content to achieve the presentation envisioned by the content developer (step **186**). The display layout can be changed for various reasons. The display layout might change in response to viewer selection of a soft button, as is the case causing the display layout change between **FIGS. 8***b* and **8***c*. The display layout might also be altered automatically as part of the timing information. For instance, the digital data might invoke a graphic or text to pop up on the screen at a timely point in the program. Such real-time content includes, for example, trivia ques-

tions, interesting facts, graphical or sound effects, and so forth that relate to specific parts of the program.

[0077] **FIG. 8***c* shows the screen **200** at another instance after the viewer has selected soft button **220** to enter into a classified mode of interactivity. The main menu is still present on the screen, but more contextual information is added in a graphical format to represent an extension of the selected soft button **220**. The program boundary **210** is further reduced to accommodate the additional graphical and textual information.

[0078] In this illustration, the viewer has selected the entertainment button **220** to display the merchandise store. This layout places the video program box **210** in the lower right hand corner of the screen, and leaves the remaining area of the screen to be used for supplemental content. The supplemental content comprises a secondary menu having actuatable soft buttons **232-237**. The cursor symbol **224** is movable among the various buttons and used to activate a selected button. The buttons correspond to various types of merchandise, such as clothes, posters, collectibles, memorabilia, and toys. There is also an order button **237** that permits the user to place an order for a particular product. A picture window **240** is arranged beside the secondary menu to show a picture of the merchandise associated with the category indicated by the cursor symbol **224**. A merchandise description window **242** contains a brief description of the merchandise shown in the picture window **240**.

[0079] The system and method for presenting interactive entertainment programs is advantageous as it returns the freedom of creativity to the content developer. By embedding the display layout instructions within the digital data provided by a target resource, the developer is empowered to create both the content and the presentation format of how the content and broadcast program are displayed to the viewer. The developer is free to control the location and shape of the broadcast program window, as well as the presentation format of the supplemental content relative to the program window. This facilitates a non-restrictive environment in which the developer can create screens with optimal appeal to the viewer. No longer is the developer simply developing content to be displayed within a fixed pane that cannot be dynamically altered relative to the program.

[0080] The creative power is thus placed in the hands of the target resource author. **FIG. 9** shows a method for authoring an interactive entertainment program. The author begins by developing the supplemental content which is to accompany a particular television show or movie (step **250** in **FIG. 9**). The author designs the presentation format for each scene of the program (step **252**), and the timing requirements for synchronizing the supplemental content with the broadcast video stream (step **254**).

[0081] In the implementation described herein, the supplemental content is constructed as a hypertext document which can be rendered by a browser. To control how the content is to be rendered, the author encodes the presentation format and timing instructions as extension attributes to hyperlink codes. More specifically, hypermedia content utilized by the WWW is commonly written using what is referred to as a "markup language.""SGML" (Standard Generalized Markup Language) is one such language, defined formally as "a language for document representation that formalizes markup and frees it of system and processing dependencies." SGML is a language for describing the structure of documents and for describing a tagging scheme to delineate that structure within text. For creating hypermedia content, WWW documents utilize a subset of SGML called "HTML" (Hypertext Markup Language). An HTML textual document can be thought of as plain text that contains formatting instructions in the form of HTML markup codes or "tags." Tags tell Web browsers how to render and print documents, and are also used to specify hyperlinks.

[0082] The following is a simple example of a start tag for an HTML hyperlink:

<A HREF="http://www.microsoft.com/upgrades">

[0083] The leading "A" in the start tag is the name of HTML element. The letter "A" indicates that the tag is an "anchor" tag-the type of tag that defines a hyperlink. The start tag contains an "attribute" indicating a target specification:

HREF="http://www.microsoft.com/upgrades".

[0084] The attribute name is "HREF" and the attribute value is "http://www.microsoft.com/upgrades." HTML documents are organized according to various tags. Tags define the start and end of headings, paragraphs, lists, character highlighting and links, and so on.

[0085] The interactive entertainment system described herein supports conventional HTML documents as target resources. Accordingly, authors can use familiar HTML elements, such as Head, Body, and Character-Level elements, to construct a target resource. However, the inventors have also developed new types of tags, as well as extension attributes to existing HTML tags. The author of a target resource can use the new tags and extension attributes to formulate how and when the browser renders the supplemental content along with the continuous video stream. The new HTML extension attributes are given below in Table 1.

TABLE 1

HTML Extension Attributes

HTML Tag	Extension Attribute	Function
BODY	background	Specifies a URL for an image tile or MMS stream to cover the document background to yield a distinctive appearance.
IMG	dynsrc	Specifies the address of a video clip or broadcast source to be displayed.
FRAMESET	usedefault	Used to determine where the focus is located in a tab-based user interface within a FRAME by specifying the URL for the file containing the map, followed by a '#', followed by the name of the USEDEFAULT. If the argument to USEDEFAULT starts with a '#', the map is assumed to be in the same document as the USEDEFAULT tag

[0086] The new tags supported by the interactive entertainment system are provided in Table 2.

TABLE 2

HTML Tags		
HTML Tag	Function	Permitted Attributes
ACTION	Controls update or display of sound or picture	CELL- identifies object in a GALLERY HREF - URL to resource or object ID - label or id for this element TARGET - where to perform action such as a FRAME or RENDERIMAGE element
EVENT	Associates trigger and action	TRIGGER - reference to TRIGGER element to be used with this event ACTION - reference to TRIGGER element to be used with this event - allow comment delimited list of actions to satisfy the need for multiple actions in response to a single trigger ID - name of event
GALLERY	Stores and coordinates collection of images	SOURCE - URL to actual graphic ID - name of gallery ROWS - height of each graphic cell COLUMNS - width of each graphic cell TRANSPARENCY - RGB value indicating background color
LOADFONT	Downloads and installs a font to be used	HREF - URL to font resource
RENDER-IMAGE	Displays an image from the GALLERY	REF - name of GALLERY CELL - specifies individual cells containing image
TRANSI-TION	Defines screen change interim, fade to black, cut, and so on.	TYPE - type of transition SPEED - how fast does the transition occur, SLOWEST, SLOW, MEDIUM, FAST, FASTEST
TRIGGER	Defines when something is to occur	ID - name of this TRIGGER TIME - time in milliseconds since the last event

[**0087**] Using the supplemental content and HTML tags for timing and presentation format, the author constructs the target resource (step **256** in **FIG. 9**). The target resource is stored in a storage medium at a host computer and a target specification for referencing that location is defined (step **258**). The author submits the target specification to the authority responsible for developing the programming information maintained in the EPG database. The target specification is stored in the appropriate data field of the EPG data structure which corresponds to the program to which it pertains (step **260**).

[**0088**] In compliance with the statute, the invention has been described in language more or less specific as to structure and method features. It is to be understood, however, that the invention is not limited to the specific features described, since the means herein disclosed comprise exemplary forms of putting the invention into effect. The invention is, therefore, claimed in any of its forms or modifications within the proper scope of the appended claims appropriately interpreted in accordance with the doctrine of equivalents and other applicable judicial doctrines.

1. A viewer computing unit for receiving and displaying continuous video content programs, comprising:

a memory;

a processor programmed to determine whether the video content programs are interactive;

a tuner to tune to channels carrying the video content programs; and

an interactive support module stored in the memory, the interactive support module being dynamically loadable for execution on the processor when the tuner is tuned to a channel carrying a video content program that is interactive.

2. A viewer computing unit as recited in claim 1, wherein the interactive support module comprises a hyperlink browser.

3. A viewer computing unit as recited in claim 1, wherein the interactive support module comprises an Internet browser.

4. A viewer computing unit as recited in claim 1, and further comprising:

an electronic programming guide (EPG) stored in the memory and executable on the processor to organize programming information, the EPG associating a target specification to a target resource with a video content program; and

the interactive support module activating the target resource when the tuner is tuned to the video content program.

5. A viewer computing unit as recited in claim 4, wherein the target resource contains supplemental content which is displayed concurrently with the video content program to provide viewer interactivity with the video content program and display layout instructions prescribing how the supplemental content and the video content program are to appear in relation to one another when displayed, the processor being responsive to the layout instructions obtained from the target resource to display the supplemental content concurrently with the video content program.

6. A viewer computing unit as recited in claim 4, further comprising:

a receiver coupled to the processor to receive both the video content program and data supplied from the target resource.

7. A viewer computing unit as recited in claim 4, further comprising:

a first receiver coupled to the processor to receive the video content program; and

a second receiver coupled to the processor to receive data supplied from the target resource.

8. In an interactive entertainment device having an ability to receive and display television signals, the interactive entertainment device supporting a displayable user interface (UI), a method for operating the interactive entertainment device comprising the following step of displaying a hyperlink to a target resource in the UI to enable a viewer to activate the target resource directly from the UI by activating the hyperlink.

9. A method for enhancing a continuous video content program with supplemental hyperlink content to provide viewer interactivity with the video content program, comprising the following steps:

configuring digital data which defines a display layout prescribing how the supplemental hyperlink content and the video content program are to appear in relation to one another when displayed;

transmitting the digital data and the video content program to a viewer computing unit; and

displaying the supplemental hyperlink content and the video content program according to the display layout.

10. A method as recited in claim 9, further comprising the following steps:

configuring the data to define multiple different display layouts that are selectively displayed to the viewer depending upon the viewer's selections of possible choices presented in the supplemental hyperlink content; and

dynamically changing the display layouts of the supplemental hyperlink content and the video content program in response to said viewer's selections.

11. A method as recited in claim 9, wherein the transmitting step comprises the step of transmitting the digital data along with the video content program as the same signal.

12. A method as recited in claim 11, further comprising the following steps:

receiving said signal containing the digital data and the video content program at the viewer computing unit; and

separating the digital data from the video content program at the viewer computing unit.

13. A method as recited in claim 9, wherein the transmitting step comprises the step of transmitting the digital data along with the video content program as two separate signals.

14. A method as recited in claim 13, further comprising the following steps:

receiving a first signal containing the digital data using a first receiver at the viewer computing unit; and

receiving a second signal containing the video content program using a second receiver at the viewer computing unit.

15. A method as recited in claim 9, wherein the transmitting step comprises the following steps:

transmitting the digital data as a first signal from a first source; and

transmitting the video content program as a second signal from a second source that is different than the first source.

16. A method as recited in claim 9, wherein the configuring steps comprises the step of creating an HTML document having HTML extension attributes that assist in defining the display layout.

17. A method as recited in claim 16, further comprising the step of creating the HTML document using at least one extension attribute selected from a group comprising: a background extension attribute which specifies how a background is to appear; an image source extension attribute which specifies an address of a video source to be displayed; and a focus extension attribute to specify where a focus indicia is located in the display.

18. A method as recited in claim 9, wherein the configuring steps comprises the step of creating an HTML document having one or more HTML tags that assist in defining the display layout.

19. A method as recited in claim 18, further comprising the step of creating the HTML document using at least one tag selected from a group of tags comprising: a tag to control update or display of sound or pictures; a tag to store and coordinate collections of images; a tag to control font styles; a tag to retrieve and display one of the images; and a tag to describe transition from one screen display to another.

20. A method for presenting an interactive program, comprising the following steps:

receiving a program as a continuous stream of video data;

receiving digital data for supporting interactive functionality in relation to the program;

displaying the program within a program boundary on a visual display screen;

presenting supplemental content from the digital data in a presentation format on the visual display screen which enables the interactive functionality; and

dynamically controlling location and shape of the program boundary and the presentation format of the supplemental content relative to the program boundary on the visual display screen.

21. A method as recited in claim 20, further comprising the step of overlaying the supplemental content at least partly on the program displayed within the program boundary.

22. A method as recited in claim 20, further comprising the step of presenting the supplemental content outside of the program boundary.

23. A method as recited in claim 20, further comprising the step of synchronizing presentation of the supplemental content to corresponding points in the program.

24. A computer programmed to perform the steps recited in claim 20.

25. A computer-implemented method for activating interactive supplemental content for a video content program upon tuning to a channel carrying the program, comprising the following steps:

determining if the program is interactive compatible, where interactive compatible programs are associated with target resources containing data which support interactive functionality in conjunction with the associated programs, the target resources being located by corresponding target specifications; and

in an event that the program is interactive compatible, retrieving a target specification associated with the program and launching code to activate the target resource in support of interactive functionality for the associated program.

26. A computer-implemented method as recited in claim 25, wherein the target specifications are correlated with associated programs in a program listing, and further comprising the following steps:

checking the program listing to ascertain whether the program is interactive compatible; and

determining that the program is interactive compatible by presence of a target specification being associated with the program in the program listing.

27. A computer-implemented method as recited in claim 25, wherein said determining step comprises the step of checking a channel separate from said program channel for presence of the supplemental content in conjunction with the program being received on said program channel.

28. A computer-implemented method as recited in claim 25, further comprising the step of displaying an icon to visually inform the viewer that the program is interactive compatible.

29. A computer-implemented method as recited in claim 28, further comprising the step of displaying the interactive supplement content in response to the viewer activating the icon.

30. A computer-implemented method as recited in claim 25, further comprising the step of automatically displaying the interactive supplement content together with the interactive compatible program.

31. A computer-implemented method as recited in claim 25, further comprising the step of loading a hyperlink browser to activate the target resource.

32. A computer programmed to perform the steps recited in claim 25.

33. A method for creating a data structure in a storage medium that is used to organize programming information, comprising the following steps:

forming data fields in a storage medium to hold programming information pertaining to video, content programs, some of the data fields holding text-based data; and

adding a target specification which references a target resource containing data that supports interactive functionality with respect to various ones of the video content programs by at least one of (1) forming a separate data field to hold the target specification for an associated video content program, or (2) embedding the target specification within the text-based data held in a data field.

34. A computer programmed to perform the steps recited in claim 33.

35. A storage medium having a data structure created according to the steps recited in claim 33.

36. A method for authoring an interactive entertainment program, comprising the following steps:

constructing digital data to support interactive functionality with a video content program, the digital data being configured to permit a viewer to interactively control display of supplemental content along with the video content program;

defining a display layout of how the supplemental content and the video content program are displayed; and

encoding the digital data with instructions to dynamically change the display layout of the supplemental content and the video content program.

37. A method as recited in claim 36, further comprising the step of encoding the digital data with instructions to dynamically change the display layout in response to viewer control.

38. A method as recited in claim 36, further comprising the following steps:

developing timing information to synchronize presentation of the supplemental content in conjunction with the video content program; and

encoding the digital data with instructions to alter the display layout of the supplemental content and the video content program in response to the timing information.

39. A method as recited in claim 36, further comprising the following step of storing the digital data with instructions as a target resource in a storage medium.

40. A target resource stored in a storage medium which is constructed according to the steps recited in claim 39.

41. A computer programmed to perform the steps recited in claim 36.

42. A computer-implemented method comprising the following steps:

tuning to a channel;

determining if a video content program being carried on the channel is interactive compatible as indicated by presence of a target specification provided in association with the video content program;

in an event that the program is interactive compatible, retrieving the target specification associated with the video content program on the channel;

launching a browser to activate a target resource located by the target specification, the target resource containing digital data which supports interactive functionality in conjunction with the associated video content program, the digital data defining supplemental content to enable viewer interactivity with the video content program and a display layout prescribing how the supplemental content and the video content program are to appear in relation to one another when displayed;

receiving the video content program over the channel;

receiving the digital data from the target resource; and

displaying the video content program and the supplemental content according to the display layout prescribed in the digital data received from the target resource.

43. A computer-implemented method as recited in claim 42, firer comprising the following steps:

correlating the target specifications with associated programs in an electronic program guide (EPG); and

checking the EPG to ascertain whether the program is interactive compatible; and

determining that the program is interactive compatible by presence of a target specification in the EPG which is related to the program.

44. A computer-implemented method as recited in claim 42, further comprising the following steps:

displaying the video content program within a program boundary on a visual display screen;

presenting the supplemental content in a presentation format on the visual display screen; and

controlling location and shape of the program boundary and the presentation format of the supplemental content

relative to the program boundary according to the display layout received from the target resource.

45. A computer-implemented method as recited in claim 44, further comprising the step of synchronizing presentation of the supplemental content to corresponding points in the video content program.

46. A computer-implemented method as recited in claim 42, further comprising the following steps:

receiving the video content program from a first source; and

receiving the digital data from the target resource at a second source different than the first source.

47. A computer-implemented method as recited in claim 42, wherein the digital data at the target resource further defines timing information to synchronize presentation of the supplemental content with the video content program, and comprising the step of displaying the supplemental content at prescribed times during the video content according to the timing information received from the target resource.

48. A computer-implemented method as recited in claim 42, further comprising the step of displaying an icon to visually inform the viewer that the program is interactive compatible.

49. A computer-implemented method as recited in claim 48, further comprising the step of displaying the supplement content in response to the viewer activating the icon.

50. A computer-implemented method as recited in claim 42, further comprising the step of automatically displaying the supplement content together with the video content program.

51. A computer-implemented method as recited in claim 42, further comprising the step of overlaying the supplemental content at least partly on the video content program.

52. A computer-implemented method as recited in claim 42, further comprising the step of presenting the supplemental content in an area surrounding the video content program.

53. A computer programmed to perform the steps recited in claim 42.

54. A computer-readable storage medium containing a target resource, the target resource comprising:

supplemental content for rendering to a viewer to supplement viewing of a continuous, non-interactive video stream;

one or more elements prescribing how the supplemental content is to be rendered along with, and relative to, the video stream.

55. A computer-readable storage medium as recited in claim 54 wherein the target resource comprises an HTML document and the elements comprise HTML tags and/or extension attributes for HTML tags.

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