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(54) **SECONDARY VIDEO SUPPLEMENTS DURING VOD SERVICES**

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(57) **ABSTRACT**

A method for providing media to a user via an interactive media services client device coupled to a programmable media services server device includes receiving user input requesting on-screen comments to be provided with a media presentation and providing the user with a media presentation along with comments related to the media presentation.

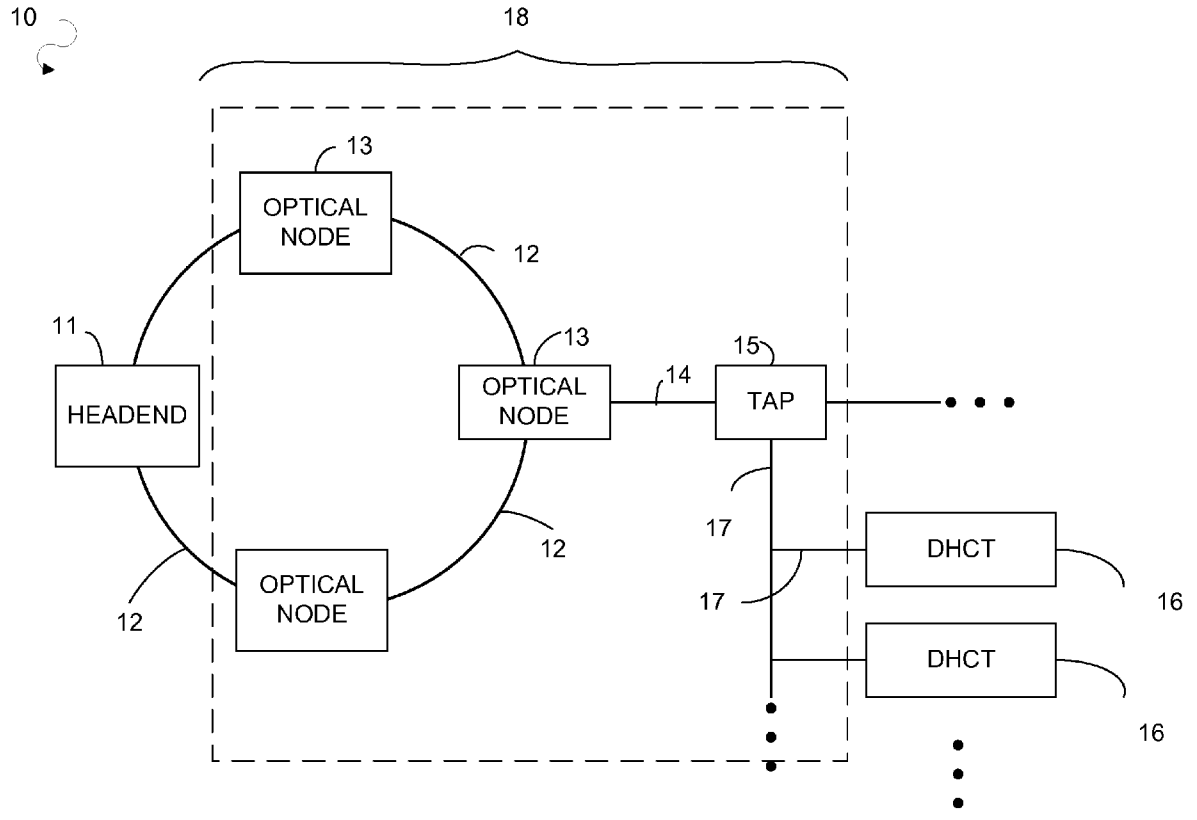


FIG. 1

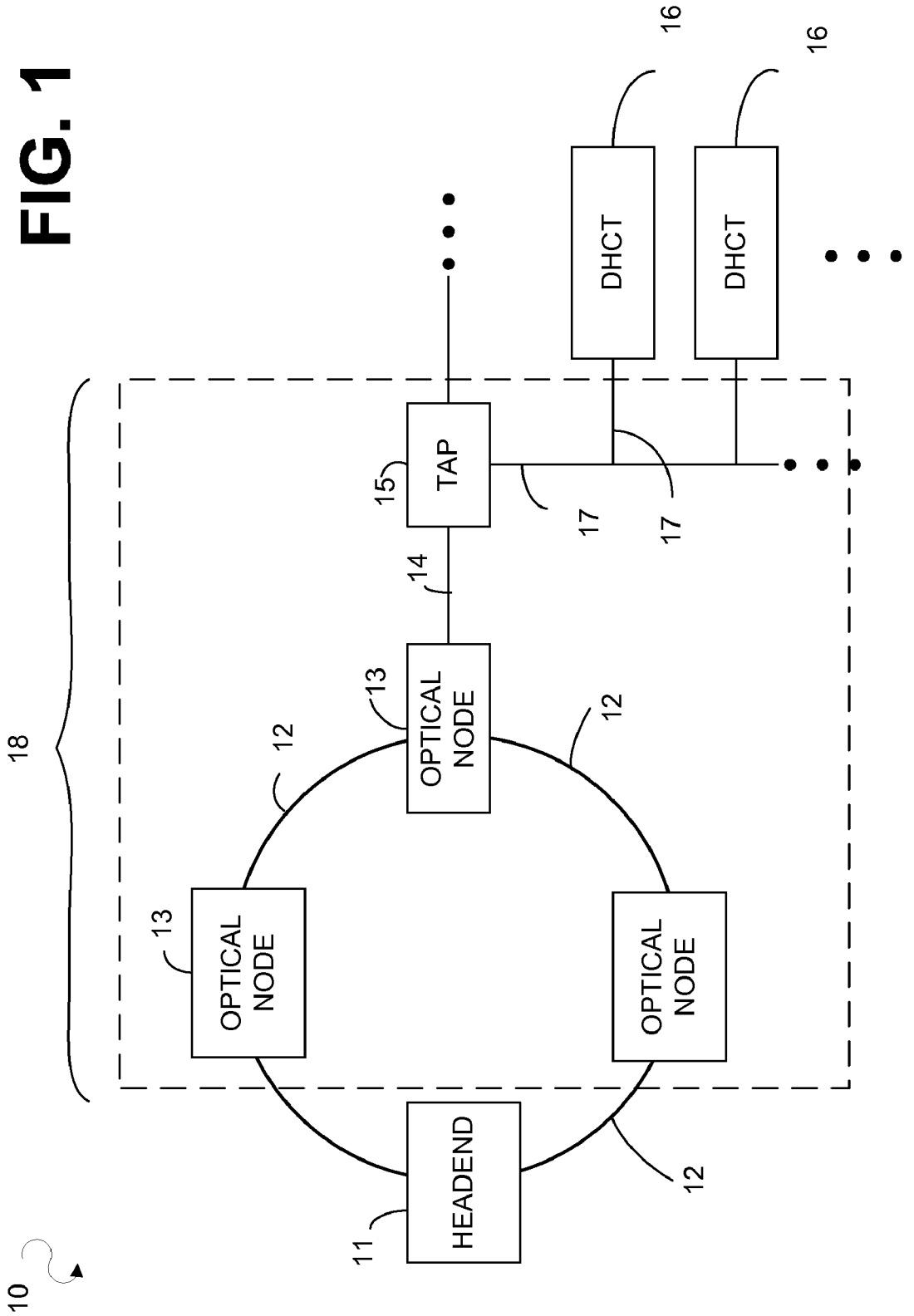

10
11
HEADEND
12
OPTICAL NODE
13
OPTICAL NODE
12
OPTICAL NODE
13
12
14
TAP
15
17
17
DHCT
DHCT
16
16
18

FIG. 2

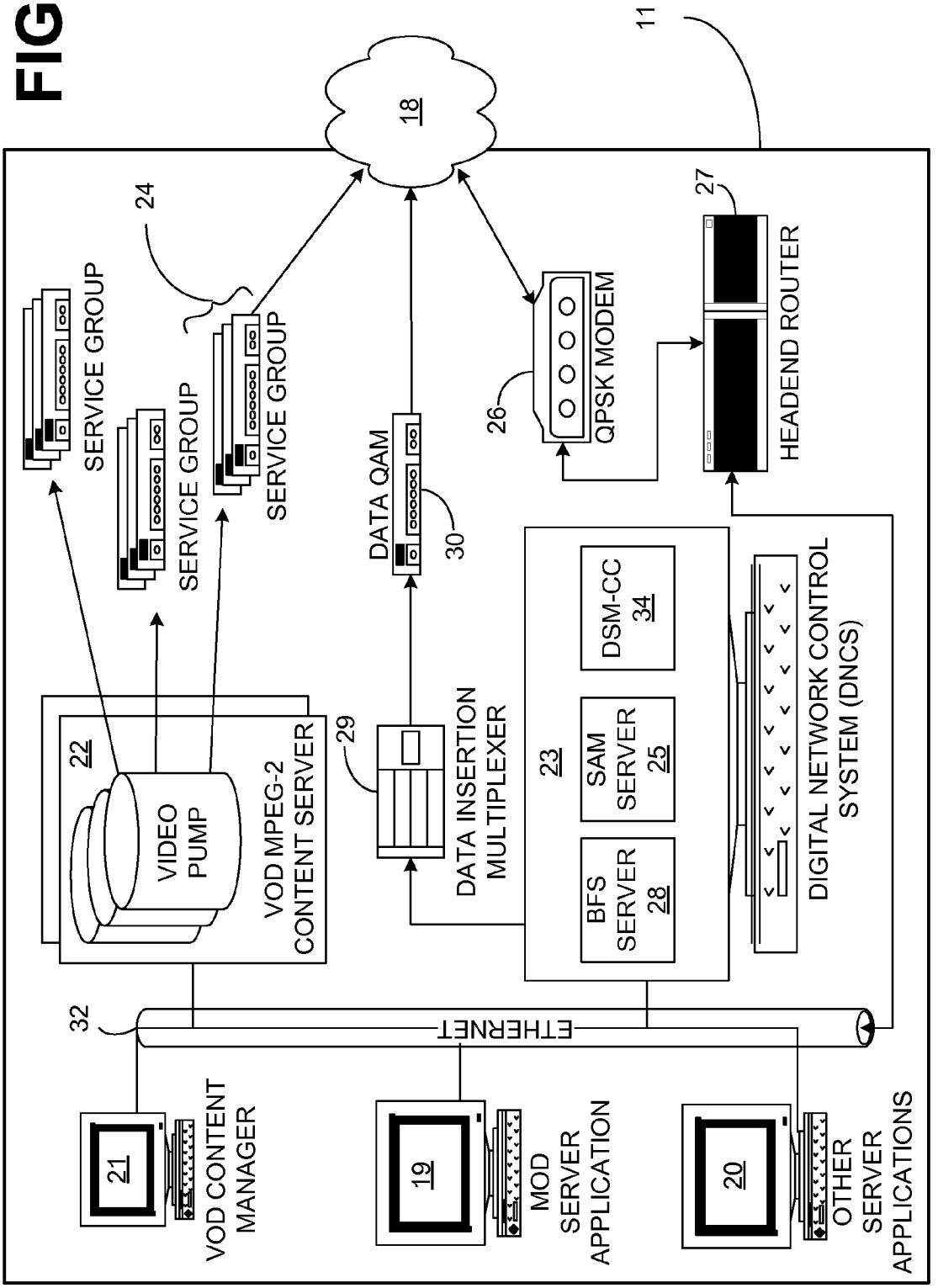

11
18
24
SERVICE GROUP
SERVICE GROUP
SERVICE GROUP
27
HEADEND ROUTER
26
QPSK MODEM
DATA QAM
30
22
VIDEO PUMP
VOD MPEG-2 CONTENT SERVER
29
DATA INSERTION MULTIPLEXER
23
BFS SERVER 28
SAM SERVER 25
DSM-CC 34
DIGITAL NETWORK CONTROL SYSTEM (DNCS)
32
ETHERNET
21
VOD CONTENT MANAGER
19
MOD SERVER APPLICATION
20
OTHER SERVER APPLICATIONS

FIG. 3

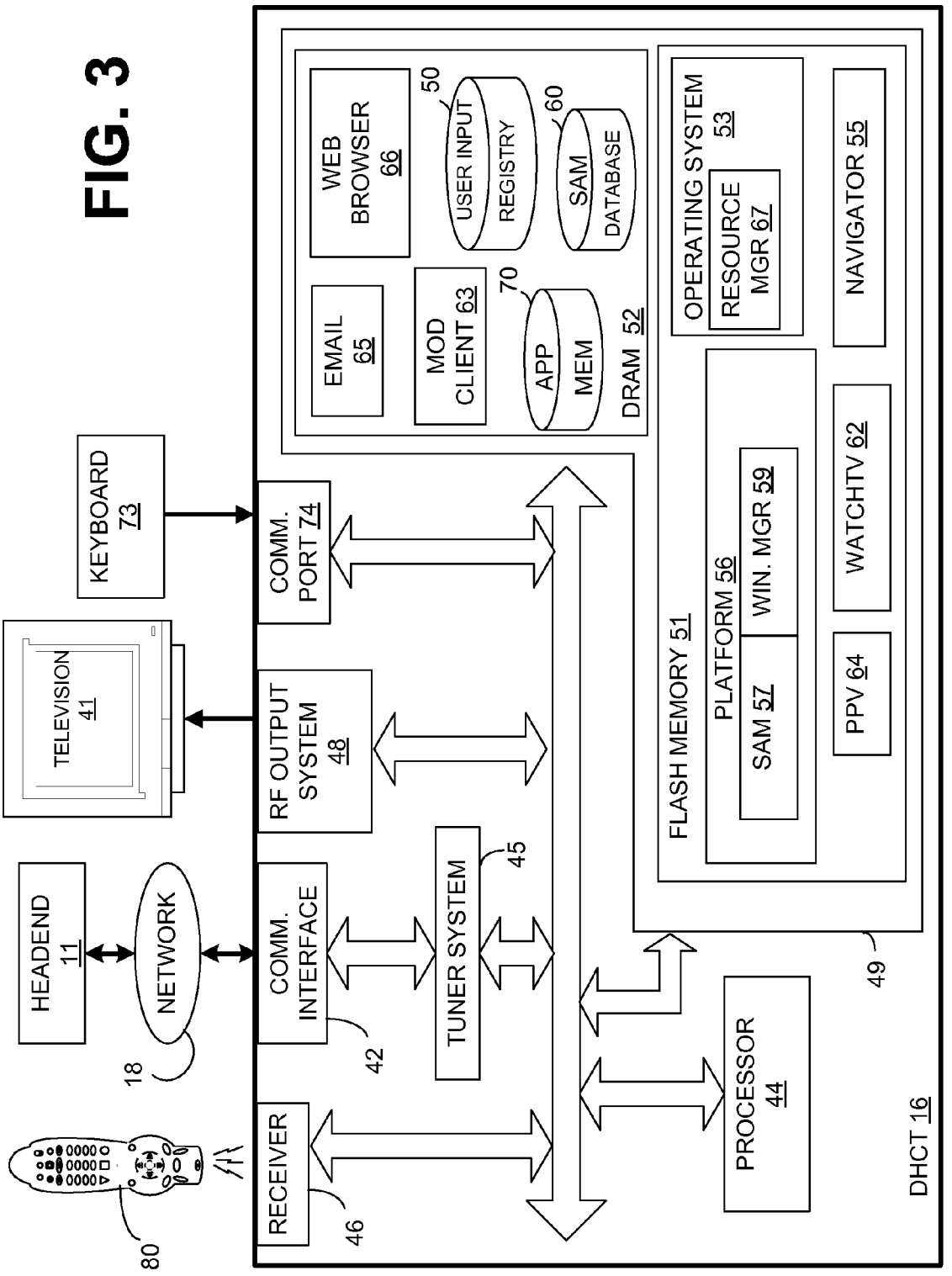

HEADEND 11
NETWORK
18
TELEVISION 41
KEYBOARD 73
80
RECEIVER
46
COMM. INTERFACE
42
RF OUTPUT SYSTEM 48
COMM. PORT 74
TUNER SYSTEM
45
PROCESSOR 44
DHCT 16
49
FLASH MEMORY 51
PLATFORM 56
SAM 57
WIN. MGR 59
PPV 64
WATCHTV 62
NAVIGATOR 55
OPERATING SYSTEM 53
RESOURCE MGR 67
DRAM 52
WEB BROWSER 66
EMAIL 65
MOD CLIENT 63
50
USER INPUT REGISTRY
60
SAM DATABASE
70
APP MEM

FIG. 3A

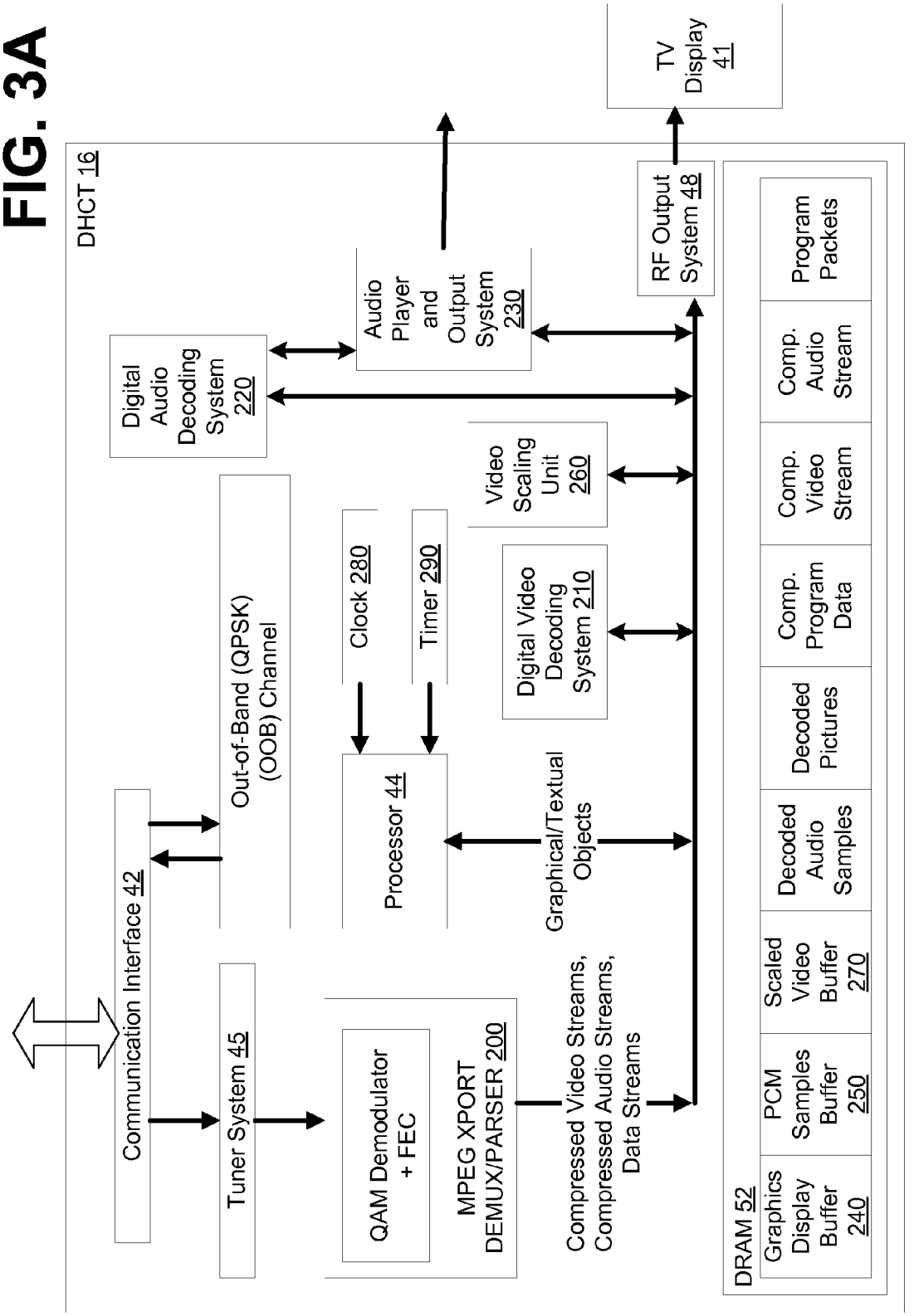

DHCT 16
Communication Interface 42
Tuner System 45
QAM Demodulator + FEC
MPEG XPORT DEMUX/PARSER 200
Compressed Video Streams, Compressed Audio Streams, Data Streams
Out-of-Band (QPSK) (OOB) Channel
Processor 44
Clock 280
Timer 290
Graphical/Textual Objects
Digital Audio Decoding System 220
Audio Player and Output System 230
Video Scaling Unit 260
Digital Video Decoding System 210
RF Output System 48
TV Display 41
DRAM 52
Graphics Display Buffer 240
PCM Samples Buffer 250
Scaled Video Buffer 270
Decoded Audio Samples
Decoded Pictures
Comp. Program Data
Comp. Video Stream
Comp. Audio Stream
Program Packets

FIG. 4

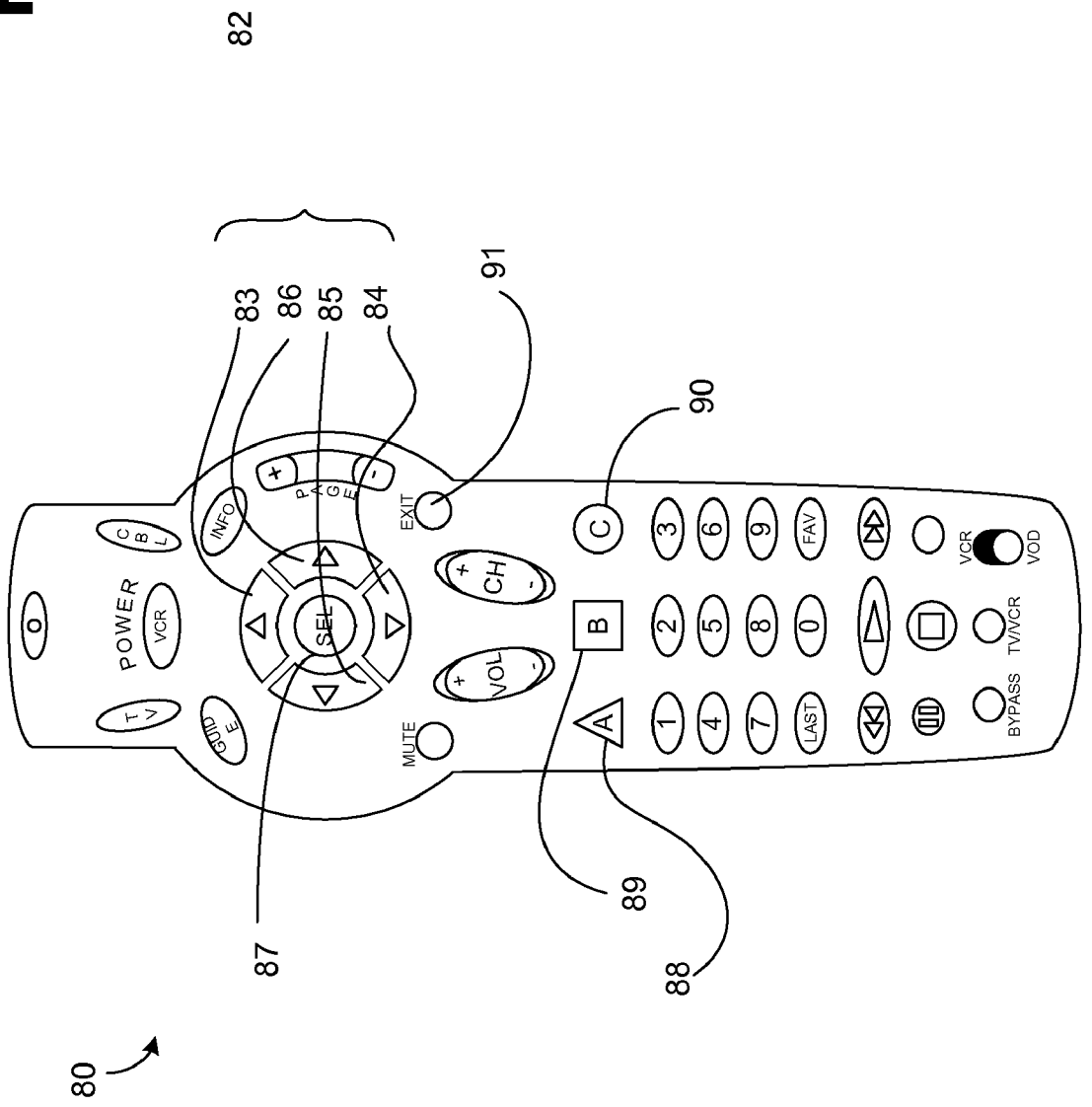

82
83
86
85
84
91
90
87
89
88
80
POWER
VCR
TV
GUIDE
CBL
INFO
SEL
PAGE
EXIT
CH
VOL
MUTE
A
B
C
FAV
LAST
BYPASS
TV/VCR
VCR
VOD

FIG. 5

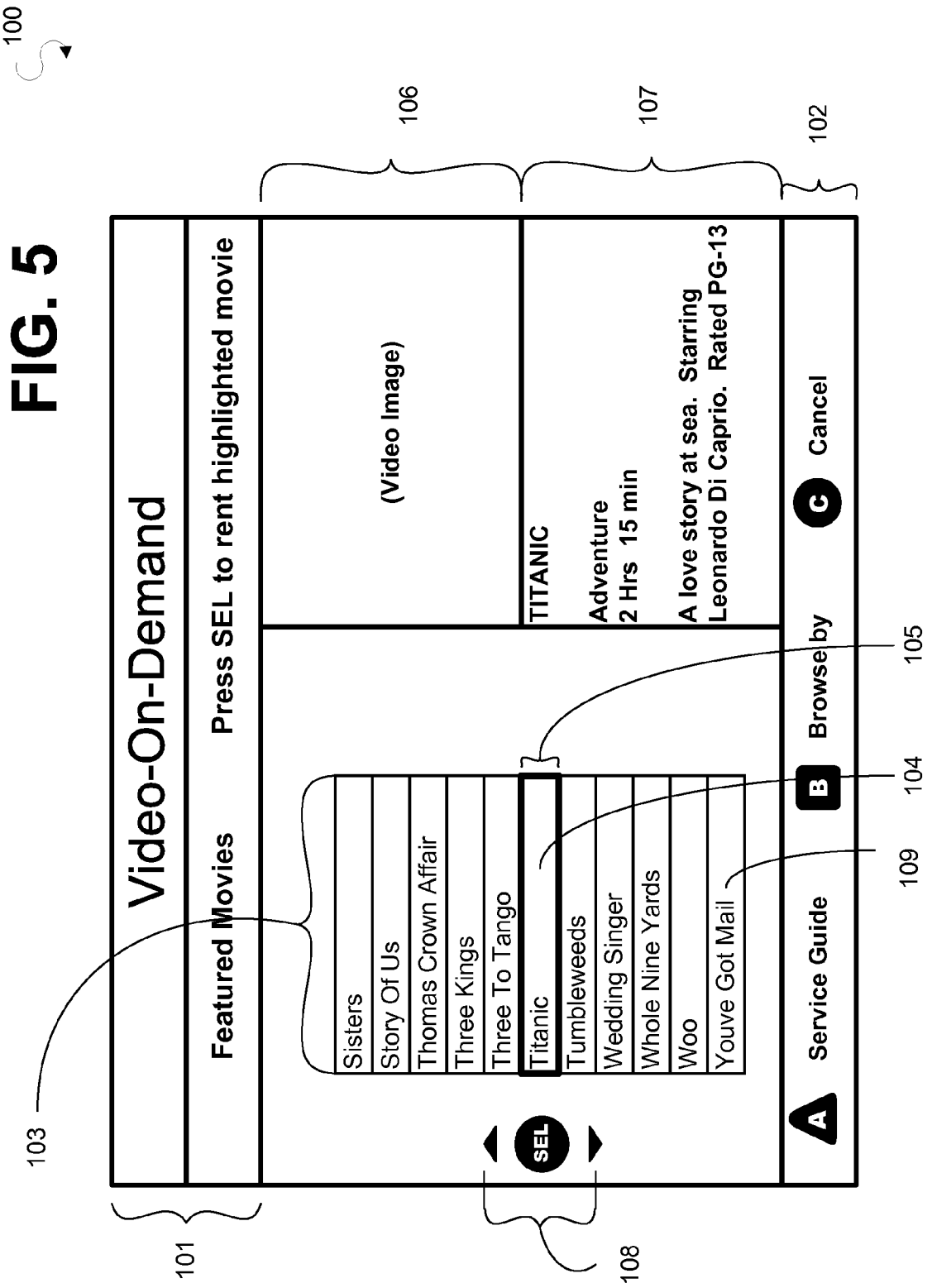
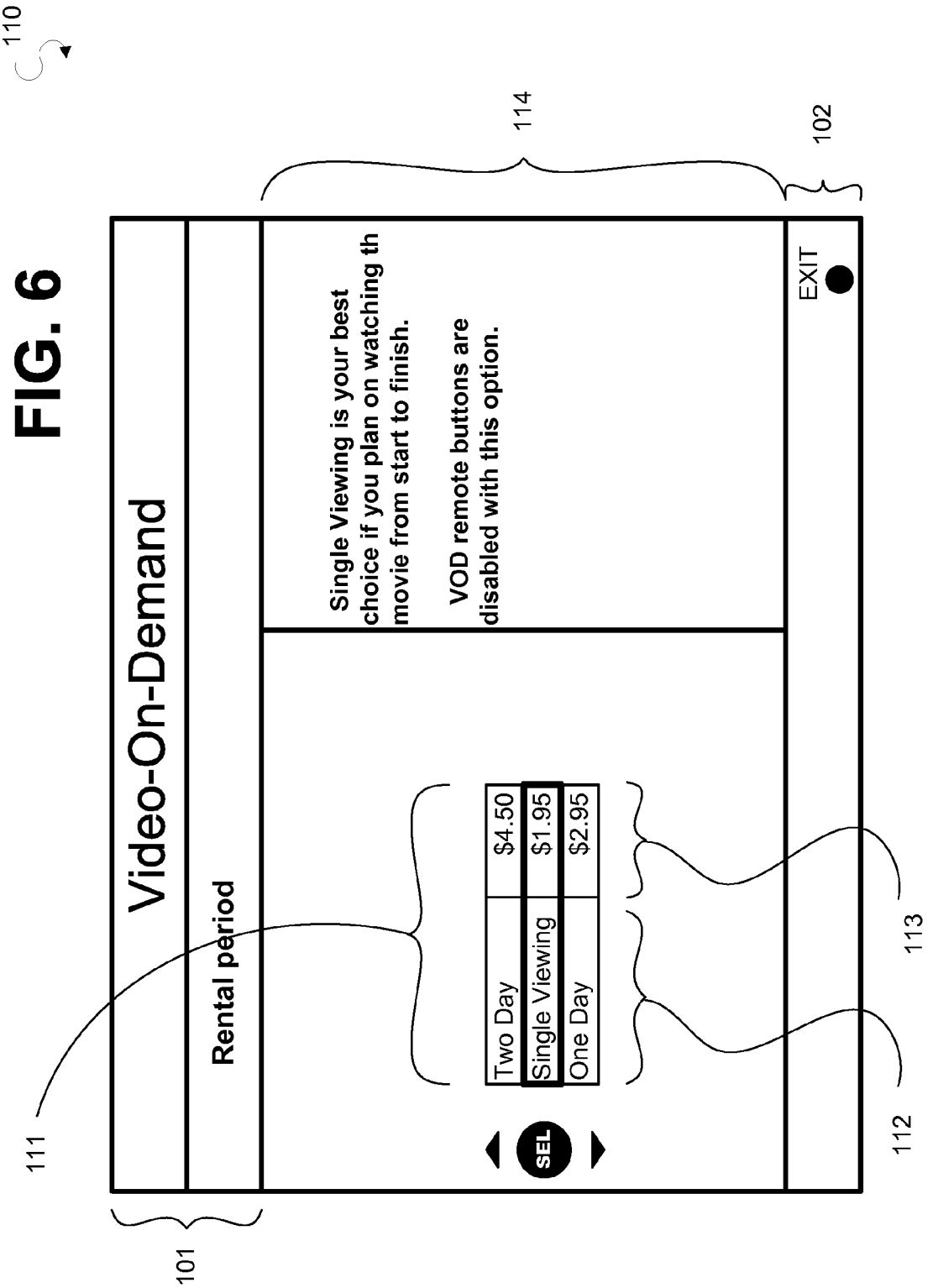

100
Video-On-Demand
Featured Movies
Press SEL to rent highlighted movie
Sisters
Story Of Us
Thomas Crown Affair
Three Kings
Three To Tango
Titanic
Tumbleweeds
Wedding Singer
Whole Nine Yards
Woo
Youve Got Mail
SEL
(Video Image)
TITANIC
Adventure
2 Hrs 15 min
A love story at sea. Starring
Leonardo Di Caprio. Rated PG-13
A Service Guide
B Browse by
C Cancel
101
102
103
104
105
106
107
108
109

FIG. 6


110
Video-On-Demand
Rental period
Two Day $4.50
Single Viewing $1.95
One Day $2.95
SEL
Single Viewing is your best choice if you plan on watching th movie from start to finish.
VOD remote buttons are disabled with this option.
EXIT
101
111
112
113
114
102

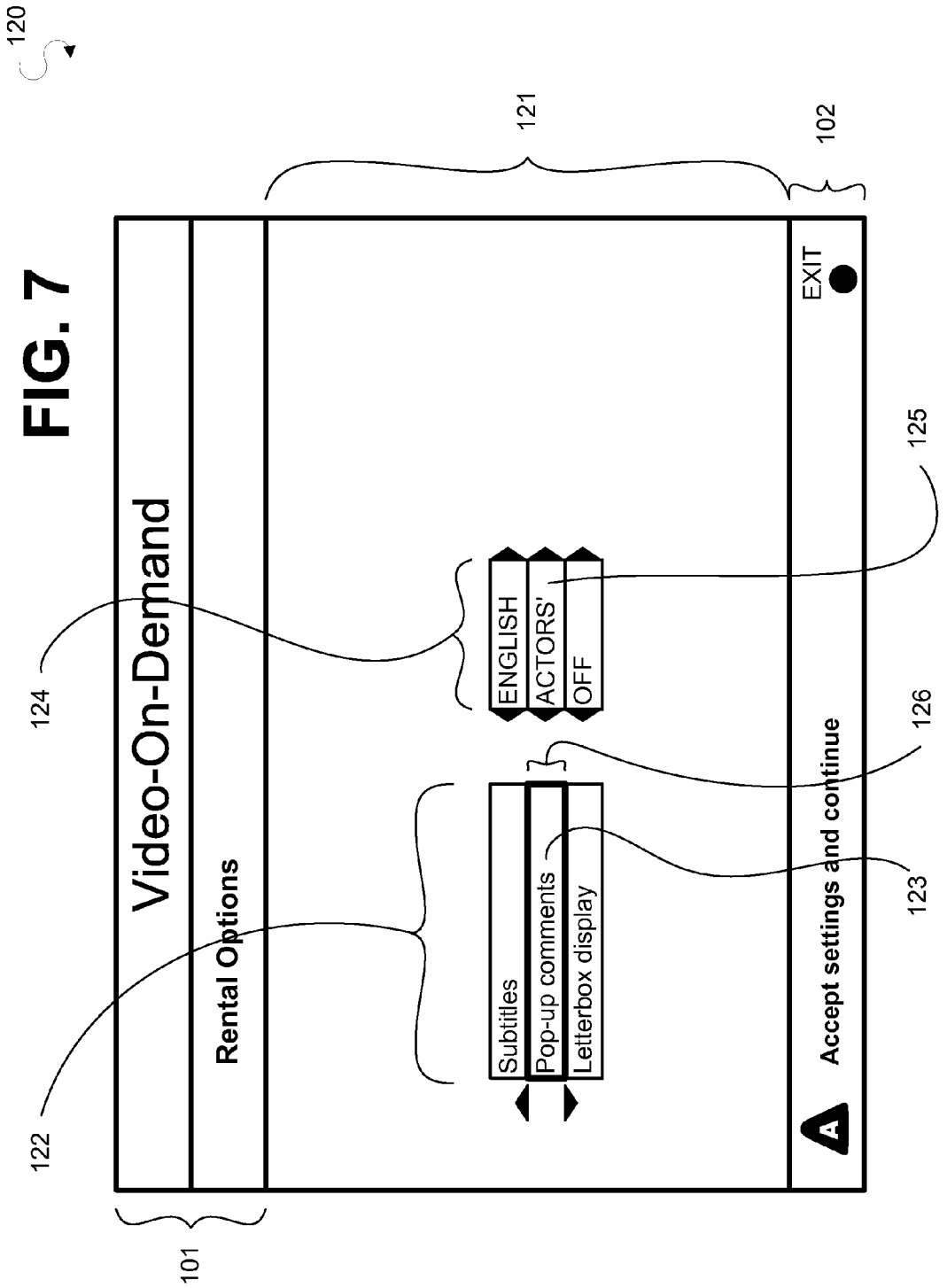

120
121
102
Video-On-Demand
Rental Options
EXIT
ENGLISH
ACTORS'
OFF
Subtitles
Pop-up comments
Letterbox display
Accept settings and continue
122
123
124
125
126
101

FIG. 7

FIG. 8

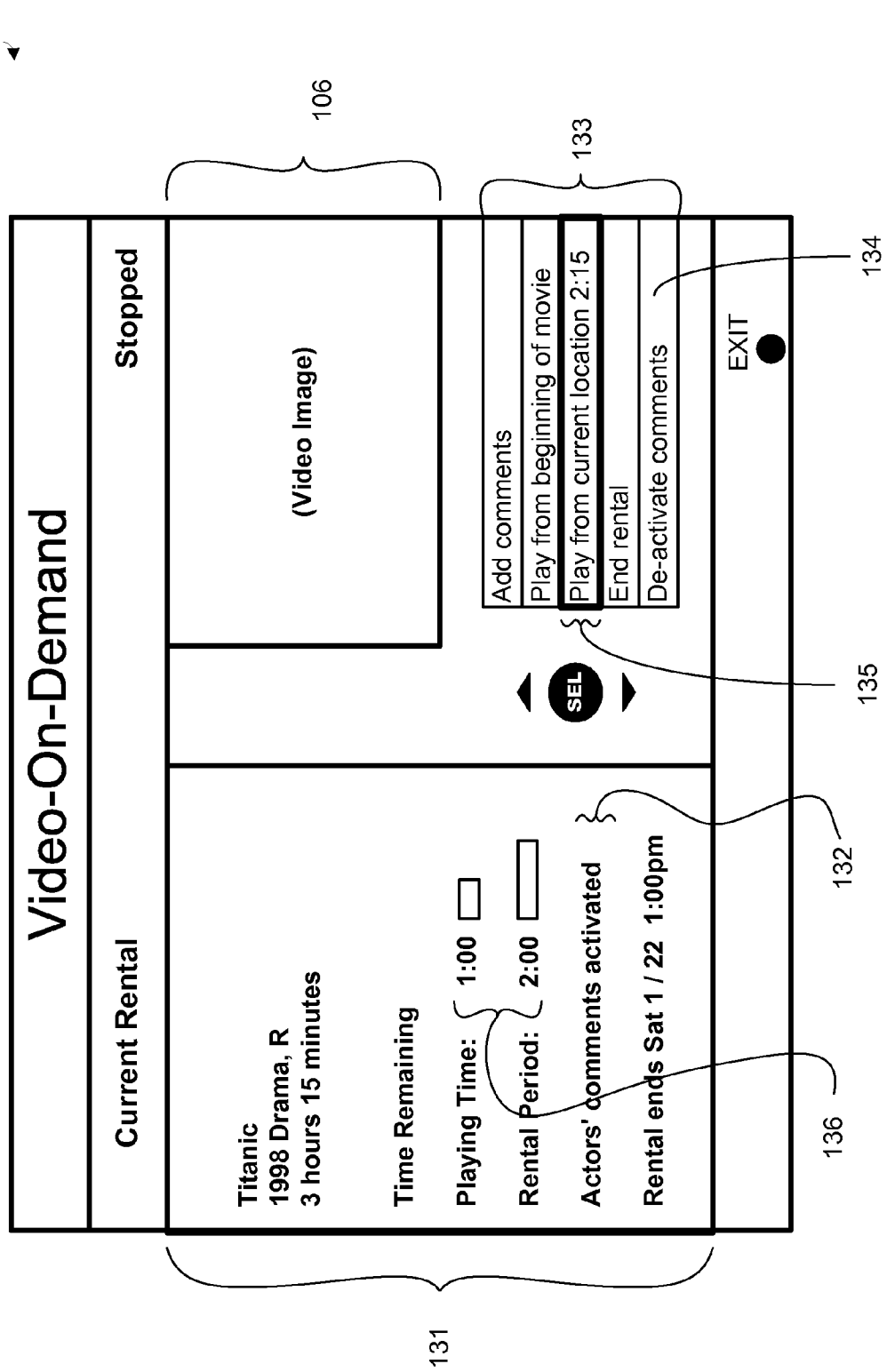

130
106
133
134
135
132
136
131
Video-On-Demand
Current Rental
Stopped
(Video Image)
Add comments
Play from beginning of movie
Play from current location 2:15
End rental
De-activate comments
SEL
EXIT
Titanic
1998 Drama, R
3 hours 15 minutes
Time Remaining
Playing Time: 1:00
Rental Period: 2:00
Actors' comments activated
Rental ends Sat 1 / 22 1:00pm

FIG. 9

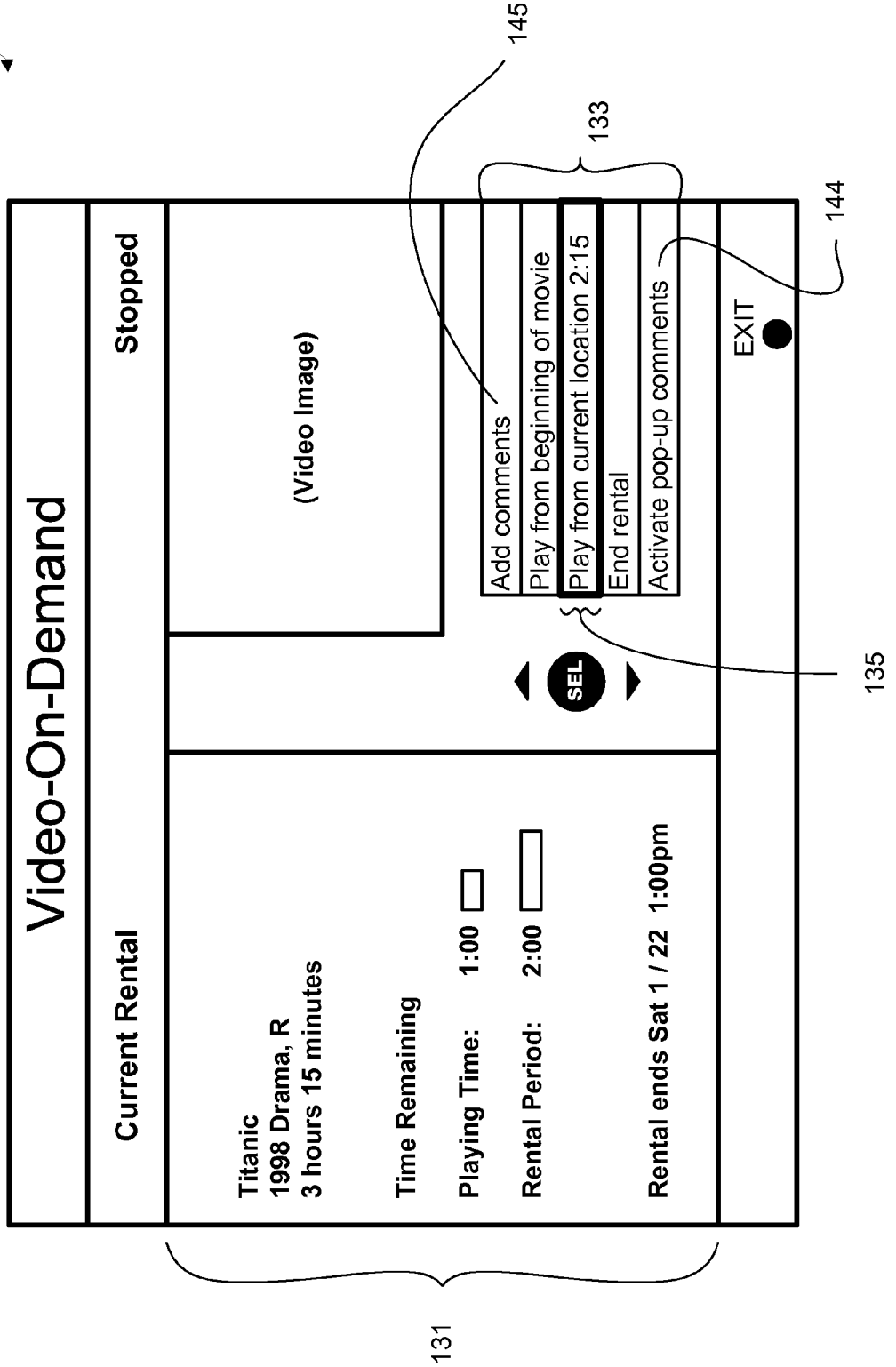
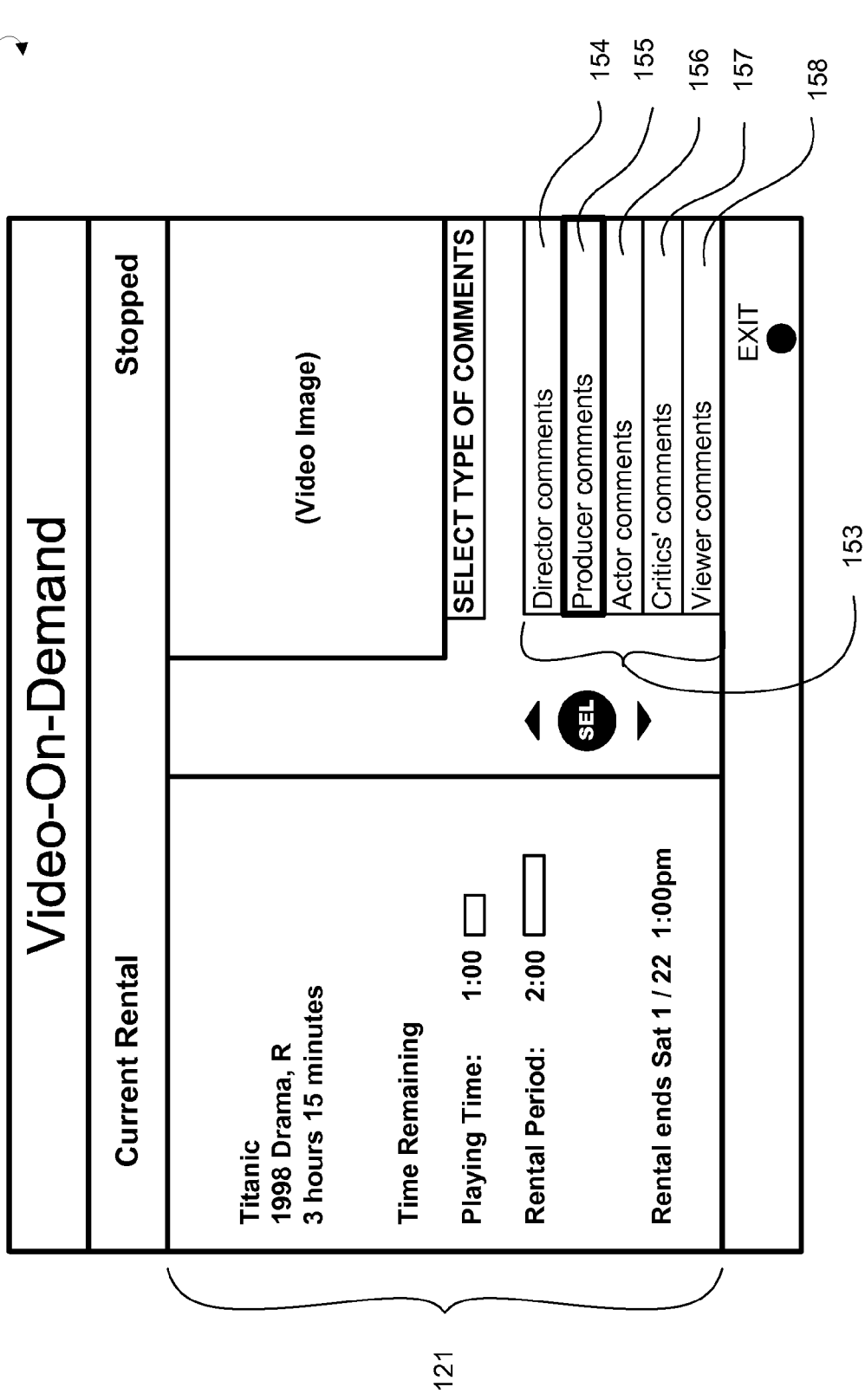

140
145
133
144
135
131
Video-On-Demand
Current Rental
Stopped
(Video Image)
Add comments
Play from beginning of movie
Play from current location 2:15
End rental
Activate pop-up comments
SEL
EXIT
Titanic
1998 Drama, R
3 hours 15 minutes
Time Remaining
Playing Time: 1:00
Rental Period: 2:00
Rental ends Sat 1 / 22 1:00pm

FIG. 10


150
Video-On-Demand
Current Rental
Stopped
Titanic
1998 Drama, R
3 hours 15 minutes
Time Remaining
Playing Time: 1:00
Rental Period: 2:00
Rental ends Sat 1 / 22 1:00pm
(Video Image)
SELECT TYPE OF COMMENTS
Director comments
Producer comments
Actor comments
Critics' comments
Viewer comments
SEL
EXIT
154
155
156
157
158
153
121

SECONDARY VIDEO SUPPLEMENTS DURING VOD SERVICES

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a divisional of U.S. utility application having Ser. No. 11/678,653, filed Feb. 26, 2007, which is entirely incorporated herein by reference, which is a continuation of application Ser. No. 09/693,780 (now issued as U.S. Pat. No. 7,200,857), filed Oct. 20, 2000, which is a continuation-in-part of application Ser. No. 09/590,520 (now issued as U.S. Pat. No. 7,010,801), filed on Jun. 9, 2000 and which claims the benefit of U.S. Provisional Application No. 60/214,987, filed on Jun. 29, 2000, each of which are entirely incorporated herein by reference.

FIELD OF THE INVENTION

[0002] This invention relates in general to television systems, and more particularly, to the field of media on demand.

BACKGROUND OF THE INVENTION

[0003] With recent advances in digital transmission technology, cable television systems are now capable of providing much more than the traditional analog broadcast video. In implementing enhanced programming, the home communication terminal ("HCT"), otherwise known as the set-top box, has become an important computing device for accessing video services and navigating a subscriber through a maze of available services. In addition to supporting traditional analog broadcast video functionality, digital HCTs (or "DHCTs") now also support an increasing number of two-way digital services such as video-on-demand.

[0004] Typically, a DHCT is connected to a cable or satellite television network and includes hardware and software necessary to provide the functionality of the digital television system at the client's site. Preferably, some of the software executed by a DHCT is downloaded and/or updated via the cable television network. Each DHCT also typically includes a processor, communication components and memory, and is connected to a television or other display device, such as a personal computer. While many conventional DHCTs are stand-alone devices that are externally connected to a television, a DHCT and/or its functionality may be integrated into a television or personal computer, as will be appreciated by those of ordinary skill in the art.

[0005] As the number of video-on-demand movie choices increases, it is becoming increasingly important for video-on-demand providers to distinguish their video presentations by providing viewers with more options or features, along with the video-on-demand presentations, that will make the viewing experience more entertaining for the viewers. In addition, many viewers today are interested in knowing more about the movies that they are watching but simply do not have enough free time to locate and read such information. Therefore there exists a need to make the video-on-demand viewing experience more informative and entertaining.

SUMMARY OF THE INVENTION

[0006] The preferred embodiment of the invention can be viewed as a method for providing media to a user via an interactive media services client device coupled to a programmable media services server device, the method including steps of receiving user input requesting on-screen supplementary information be provided with a media presentation and providing the user with a media presentation along with supplements valid during applicable time intervals of the media presentation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The invention can be better understood with reference to the following drawings. The components in the drawings are not necessarily drawn to scale, emphasis instead being placed upon clearly illustrating the principles of the present invention. In the drawings, like reference numerals designate corresponding parts throughout the several views.

[0008] FIG. **1** depicts a block diagram of a cable television system in accordance with one preferred embodiment of the present invention.

[0009] FIG. **2** depicts a diagram of the headend **11** as depicted in FIG. **1**.

[0010] FIG. **3** depicts a block diagram of selected elements of a DHCT and related equipment, in accordance with one preferred embodiment of the present invention depicted in FIG. **1**.

[0011] FIG. **3**A is another depiction of a block diagram of selected elements of a DHCT in accordance with one preferred embodiment of the present invention depicted in FIG. **1**.

[0012] FIG. **4** depicts a remote control device that can be used to provide user input to the DHCT shown in FIG. **3**.

[0013] FIG. **5** depicts an example video-on-demand (VOD) rental selection window that illustrates a media rental list presented to the user by the DHCT shown in FIG. **3**.

[0014] FIG. **6** depicts an example rental period selection window that is presented to the user after the user selects a media rental via the rental selection window shown in FIG. **5**.

[0015] FIG. **7** depicts an example rental options selection window that is presented to the user after the user selects a rental period via the rental period selection window shown in FIG. **6**.

[0016] FIG. **8** depicts a stopped video window that is presented to a user after the user stops a media presentation, containing added comments, that was being provided to the user by the DHCT depicted in FIG. **3**.

[0017] FIG. **9** depicts a stopped video window that is presented to a user after the user stops a media presentation, containing no added comments, that was being provided to the user by the DHCT depicted in FIG. **3**.

[0018] FIG. **10** depicts a comments selection window after the user requests added comments via the stopped video window depicted in FIG. **9**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0019] FIG. **1** is a block diagram of a cable television system **10** that includes a headend **11** connected through a network **18** to multiple DHCTs **16**. The headend **11** receives and generates television signals and transmits them as optical signals over fiber optic cables **12**. One or more optical nodes **13** are included in the system **10** for converting the optical signals to Radio Frequency (RF) signals that are thereafter routed over other media, such as coaxial cables **14**. Taps **15** are provided within the cable system **10** for splitting the RF signal off, via cables **17**, to subscriber equipment such as DHCTs **16**, cable-ready television sets, video recorders, or computers. It should be appreciated, however, that the cable

television system **10** shown in FIG. **1** is merely illustrative and should not be construed as implying any limitations upon the scope of the present invention.

[0020] FIG. **2** is a block diagram of portions of a headend **11** that is configured to provide media-on-demand (MOD) services in accordance with one embodiment of the present invention. MOD services include, among other things, video-on-demand (VOD) services and respective MOD information suitable to be presented to a user via display of an interactive media guide. MOD server application **19** and a plurality of other server applications **20** are connected to a digital network control system (DNCS) **23** via a high-speed network such as an Ethernet connection **32**. The MOD server application **19** is responsible for reserving and configuring system resources needed to provide MOD services and for providing configuration and service data to an MOD client application **63** (FIG. **3**), including MOD information comprising a catalog of titles available for on-demand viewing and/or on-demand rental by a user.

[0021] The DNCS **23** provides complete management, monitoring, and control of the network's elements and broadcast services provided to users. In one implementation, the DNCS **23** uses a data insertion multiplexer **29** and a data QAM **30** to insert in-band broadcast file system (BFS) data into an MPEG-2 transport stream that is broadcast and received via DHCT's communication interface **42** and tuner system **45**. The DNCS **23** also contains a session manager **34** that uses Digital Storage Media Command and Control (DSMCC) protocol to set up and maintain MOD sessions. The session manager **34** processes user to network (U-N) session signaling messages, manages allocation of session-related network resources, supports network management operations, acts as a point of contact to the network for the DHCT's **16** in the network **18** to establish individual sessions, and supports MOD services by providing the signaling interface to establish, maintain and release client initiated exclusive sessions.

[0022] A service application manager (SAM) server **25** is a server component of a client-server pair of components, with the client component being located at the DHCT **16**. Together, the client-server SAM components provide a system in which the user can access services, which are identified by an application to run and a parameter, such as particular data content, specific to that service. The client-server SAM components also manage the life cycle of the applications on the system, including the definition, activation, and suspension of services they provide and the downloading of the applications into the DHCT **16** as necessary. MPEG-2 transport may be used to multiplex video, audio, and data in digital transmission channels such as channels transmitted downstream employing quadrature amplitude modulation (QAM). An MPEG-2 transport stream allows multiplexing of digital video, digital audio, and data. Multiple different video programs, each with one or more digital video streams, one or more digital audio streams, and/or multiple data streams can be multiplexed and transmitted over the same 6 MHz (or 8 MHz) RF frequency in which the DHCT's tuner tunes to. Hence, a digital transmission channel can carry the video, audio and data streams of programs of multiple television (TV) stations or on-demand video programs.

[0023] Applications on both the headend **11** and the DHCT **16** can access the data stored in a broadcast file system (BFS) server **28** in a similar manner to a file system found on operating systems. The BFS server **28** is a part of a broadcast file system that has a counterpart BFS client module **43** (FIG. **3**) in a DHCT **16** connected to the network **18**. The BFS server **28** repeatedly sends data for applications on a data carousel (not shown) over a period of time in cyclical repeated fashion so that a DHCT **16** that is in need of reading any particular data file or parts thereof may receive it when requested by a user or one or more of its internal running processes.

[0024] A VOD content manager **21** is responsible for managing the content on the VOD content servers **22**. The MOD server application **19** controls both the VOD content manager **21** and the VOD content servers **22** and utilizes them to help deliver the video and audio streams that make up VOD services. In one embodiment, an MOD content manager and MOD content servers (not shown) could run respectively in parallel to the VOD content manager **21** and VOD content servers **22** to manage other types of on-demand media content. In an alternate embodiment an MOD content manager replaces the VOD content manager **21** and the MOD content servers replaces the VOD content servers **22**. The QAM modulators that comprise the QAM group **24** receive the MPEG-2 transport streams from the VOD content servers **22**, convert them into encrypted RF signals at a specified frequency (channel), and transmit them to a DHCT **16** via the network **18**.

[0025] The QPSK modem **26** is responsible for transporting the out-of-band IP (internet protocol) datagram traffic between the distribution headend **11** and a DHCT **16**. Data from the QPSK modem **26** is routed by headend router **27** within the headend **11**. The headend router **27** is also responsible for delivering upstream application traffic to the various server applications **19** & **20**.

[0026] FIG. **3** is a block diagram illustrating a DHCT **16** that is coupled to a headend **11** and to a television **41**. Some of the functionality performed by applications executed in the DHCT **16** (such as the MOD client application **63**) may instead be performed at the headend **11** and vice versa. A DHCT **16** is typically situated at a user's residence or place of business and may be a stand alone unit or integrated into another device such as, for example, a television set or a personal computer. The DHCT **16** preferably includes a communications interface **42** for receiving signals (video, audio and/or other data) from the headend **11** through the network **18** and for providing any reverse information to the headend **11** through the network **18**. The DHCT **16** further includes at least one processor **44** for controlling operations of the DHCT **16**, an RF output system **48** for driving the television display **41**, and a tuner system **45** for tuning into a particular television channel to be displayed and for sending and receiving various types of data or media from the headend **11**. The tuner system **45** includes, in one implementation, an out-of-band tuner for bi-directional quadrature phase shift keying (QPSK) data communication and a quadrature amplitude modulation (QAM) tuner for receiving television signals. Additionally, a receiver **46** receives externally-generated information, such as user inputs or commands from other devices.

[0027] The DHCT **16** may also include one or more wireless or wired interfaces, also called ports, for receiving and/or transmitting data to other devices. For instance, the DHCT **16** may feature USB (Universal Serial Bus), Ethernet (for connection to a computer), IEEE-1394 (for connection to media devices in an entertainment center), serial, and/or parallel ports. The user inputs may, for example, be provided by a computer or transmitter with buttons or keys located either on

the exterior of the terminal or by a hand-held remote control device or keyboard that includes user-actuated buttons.

[0028] In one implementation, the DHCT **16** includes system memory **49**, which includes flash memory **51** and dynamic random access memory (DRAM) **52**, for storing various applications, modules and data for execution and use by the processor **44**. Basic functionality of the DHCT **16** is provided by an operating system **53** that is primarily stored in flash memory **51**. Among other things, the operating system **53** includes at least one resource manager **67** that provides an interface to resources of the DHCT **16** such as, for example, computing resources.

[0029] An application referred to as navigator **55** is also resident in flash memory **51** for providing a navigation framework for services provided by the DHCT **16**. The navigator **55** registers for and in some cases reserves certain user inputs related to navigational keys such as channel increment/decrement, last channel, favorite channel, etc. The client applications may be resident in flash memory **51** or downloaded into DRAM **52**. The navigator **55** also provides users with television related menu options that correspond to DHCT functions such as, for example, providing an interactive program guide, blocking a channel or a group of channels from being displayed in a channel menu, and displaying a video-on-demand purchase list.

[0030] The flash memory **51** also contains a platform library **56**. The platform library **56** is a collection of utilities useful to applications, such as a timer manager, a compression manager, a configuration manager, an HTML parser, a database manager, a widget toolkit, a string manager, and other utilities (not shown). These utilities are accessed by applications via application programming interfaces (APIs) as necessary so that each application does not have to contain these utilities. Two components of the platform library **56** that are shown in FIG. **3** are a window manager **59** and a service application manager client (SAM) **57**.

[0031] The window manager **59** provides a mechanism for implementing the sharing of the screen regions and user input. The window manager **59** on the DHCT **16** is responsible for, as directed by one or more applications, implementing the creation, display, and de-allocation of the limited DHCT **16** screen resources. It allows multiple applications to share the screen by assigning ownership of screen regions, or windows. The window manager **59** also maintains, among other things, a user input registry **50** in DRAM **52** so that when a user enters a key or a command via the remote control device **80** or another input device such as a keyboard or mouse, the user input registry **50** is accessed to determine which of various applications running on the DHCT **16** should receive data corresponding to the input key and in which order. As an application is executed, it registers a request to receive certain user input keys or commands. When the user presses a key corresponding to one of the commands on the remote control device **80**, the command is received by the receiver **46** and relayed to the processor **44**. The processor **44** dispatches the event to the operating system **53** where it is forwarded to the window manager **59** which ultimately accesses the user input registry **50** and routes data corresponding to the incoming command to the appropriate application.

[0032] The SAM client **57** is a client component of a client-server pair of components, with the server component being located on the headend **11**. A SAM database **60** in DRAM **52** includes a data structure of services and a data structure of channels that are created and updated by the headend **11**. Many services can be defined using the same application component, with different parameters. Examples of services include, without limitation and in accordance with one implementation, presenting television programs (available through a WatchTV application **62**), pay-per-view events (available through a PPV application **64**), digital music (not shown), media-on-demand (available through an MOD application **63**), and an interactive program guide. In general, the identification of a service includes the identification of an executable application that provides the service along with a set of application-dependent parameters that indicate to the application the service to be provided. As a non-limiting example, a service of presenting a television program could be executed with a set of parameters to view HBO or with a separate set of parameters to view CNN. Each association of the application component (tune video) and one parameter component (HBO or CNN) represents a particular service that has a unique service I.D. The SAM client **57** also interfaces with the resource manager **67**, as discussed below, to control resources of the DHCT **16**.

[0033] Application clients can also be downloaded into DRAM **52** at the request of the SAM client **57**, typically in response to a request by the user or in response to a message from the headend. In this non-limiting example DRAM **52** contains a media-on-demand application (MOD) **63**, an e-mail application **65**, and a web browser application **66**, among others (not shown). It should be clear to one with ordinary skill in the art that these applications are not limiting and merely serve as examples for this present embodiment of the invention. Furthermore, one or more DRAM based applications may, as an alternative embodiment, be resident in flash memory **51**. These applications, and others provided by the cable system operator, are top level software entities on the network for providing services to the user.

[0034] In one implementation, applications executing on the DHCT **16** work with the navigator **55** by abiding by several guidelines. First, an application utilizes the SAM client **57** for the provision, activation, and suspension of services. Second, an application shares DHCT **16** resources with other applications and abides by the resource management policies of the SAM client **57**, the operating system **53**, and the DHCT **16**. Third, an application handles situations where resources are only available with navigator **55** intervention. Fourth, when an application loses service authorization while providing a service, the application suspends the service via the SAM (the navigator **55** will reactivate an individual service application when it later becomes authorized). Finally, an application client is designed to not have access to certain user input keys reserved by the navigator (i.e., power, channel +/−, volume +/−, etc.).

[0035] The MOD client application **63** provides the user with lists of available media titles to choose from and with video presentations requested by the user. The MOD client application **63** provides video presentations to the user by engaging, preferably, in a direct two-way IP (Internet Protocol) connection with VOD content servers **22** (FIG. **2**).

[0036] FIG. **3**A is another depiction of selected elements of DHCT **16**. DHCT **16** includes a tuner system **45** that can select one of a plurality of transmission channels provided by a broadband network such as a Digital cable TV network or a Digital Broadband Delivery System (DBDS). Tuner system **45** enables the DHCT of the present invention to tune to downstream media and data transmissions, thereby allowing

a user to receive digital or analog video programs and associated content transmitted in the downstream transmission via the DBDS.

[0037] The DHCT **16** includes demultiplexing system **200** comprising functionality for QAM demodulation, forward error correction (FEC), transport demultiplexing and parsing. Transport demultiplexing may include MPEG-2 transport demultiplexing. The DHCT **16** also includes a digital video decoding system **210**, a digital audio decoding system **220**, a display output system such as RF output system **48**, an "audio player and output system" **230** that can feed audio samples to RF output system **48**, and a processor **44**.

[0038] The demultiplexing system **200** in communication with communication interface **42**, tuner system **45** and processor **44** effects reception of compressed video streams, compressed audio streams, and data streams corresponding to a first video program to be separated from other programs and/or streams transported in the tuned transmission channel and to be stored in a first part of DRAM **52** of DHCT **16** assigned to receive packets of a first video program.

[0039] The demultiplexing system **200** in communication with the digital video decoding system **210** and processor **44** effect notification and/or transfer of received packets of one or more compressed video streams corresponding to a first video program from a first part of DRAM **52** to a second part of DRAM **52** assigned to digital video decoding system **210**.

[0040] The demultiplexing system **200** in communication with the digital audio decoding system **220** and processor **44** effects notification and/or transfer of received packets of one or more compressed audio streams corresponding to a first video program from a first part of DRAM **52** to a third part of DRAM **52** assigned to digital audio decoding system **220**.

[0041] The demultiplexing system **200** in communication with processor **44** and/or other data parsing and interpretation device (not shown) in DHCT **16** effects notification and/or transfer of received packets of one or more data streams corresponding to a first video program from a first part of DRAM **52** to a fourth part of DRAM **52** assigned for reception of data affiliated with a first video program.

[0042] The digital video decoding system **210** reads compressed video stored in a second part of DRAM **52** assigned to digital video decoding system **210** and effects decompression and reconstruction of compressed digital video streams into an assigned fifth part of DRAM **52**, and in communication with the display output system (such as RF output system **48**) effects presentation of video pictures in television **41**.

[0043] The digital audio decoding system **220** reads compressed audio stored in a third part of DRAM **52** assigned to the digital audio decoding system **220** and effects decompression and reconstruction of compressed digital audio streams into an assigned sixth part of DRAM **52**, and in communication with the audio player and output system **230** effects presentation of audio sample to television **41** and/or other audio output interfaces (not shown) in DHCT **16**.

[0044] An executable program or algorithm corresponding to an operating system (OS) component, or to a client platform component, or to a client application, or to respective parts thereof, can reside in and execute out of DRAM **52** and/or flash memory **51**. Likewise, data inputted into or outputted from any executable program can reside in DRAM **52** or flash memory **51**. Furthermore, an executable program or algorithm corresponding to an OS component, or to a client platform component, or to a client application, or to respective parts thereof, can reside in flash memory **51**, or in a local storage device connected to DHCT **16** and can be transferred into DRAM **52** for execution. Likewise, data input for an executable program can reside in flash memory **51** or a storage device and can be transferred into DRAM **52** for use by an executable program or algorithm. In addition, data outputted by an executable program can be written into DRAM **52** by an executable program or algorithm and can be transferred into flash memory **51** or into a storage device for storage purposes. The present invention is not limited by where or how data and/or applications are stored or retrieved.

[0045] Each of the above mentioned applications comprises executable instructions for implementing logical functions and can be embodied in any computer-readable medium for use by or in connection with an instruction execution system, apparatus, or device, such as a computer-based system, processor-containing system, or other system that can fetch and execute the instructions. In the context of this document, a "computer-readable medium" can be any means that can contain, store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus, or device. The computer readable medium can be, for example but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, device, or propagation medium. More specific examples (a non-exhaustive list) of the computer-readable medium would include the following: an electrical connection (electronic) having one or more wires, a portable computer diskette (magnetic), a random access memory (RAM) (electronic), a read-only memory (ROM) (electronic), an erasable programmable read-only memory (EPROM or Flash memory) (electronic), an optical fiber (optical), and a portable compact disc read-only memory (CDROM) (optical). Note that the computer-readable medium could even be paper or another suitable medium upon which the program is printed, as the program can be electronically captured, via for instance optical scanning of the paper or other medium, then compiled, interpreted or otherwise processed in a suitable manner, and then stored in a computer memory.

[0046] FIG. **4** is a non limiting example of a remote control device **80** that is used to provide user input to the DHCT **16**. The arrow buttons **82** include an up arrow button **83**, a down arrow button **84**, a left arrow button **85**, and a right arrow button **86** that are used to scroll through options and/or to highlight an option. The select button **87** may be used to select a currently highlighted option that is provided to the user. Other buttons that are available on the remote control device will be discussed further below. Many alternative methods of providing user input may be used including a remote control device with different buttons and/or button layouts, a keyboard device, a voice activated device, etc. The invention described herein is not limited by the type of device used to provide user input.

[0047] With continued reference to FIGS. **3**, **3**A and **4** throughout the remaining figures, FIG. **5** depicts an example VOD rental selection window **100**. As with other window examples discussed below, processor **44** executes program instructions of MOD client application **63** that cause it to direct the window manager **59** to create window **100** via display data that is formatted for television **41**. Processor **44** stores the display data or parts thereof in DRAM **52** (as necessary) and transfers the display data to a display output system such as RF output system **48** wherein display data is converted to respective television signals and transmitted to

television **41**. Of course, the scope of the invention also includes any other method of causing the described windows to appear to the user.

[0048] A user may utilize the rental selection window **100** in order to request a video-on-demand rental. Top portion **101** of example window **100** typically contains one or more headings, while the bottom portion **102** typically illustrates relevant navigation buttons available on the remote control device **80**. Video rental list **103** contains the titles of video presentations, such as video title **104**, that are available for rent as well as a highlighted title area **105**.

[0049] A user may scroll through the video rental list using the up and down arrow buttons **83**, **84** on the remote control device **80** and may request a currently highlighted video title by activating the select button **87**. For example, a user may activate the down arrow button **84** on the remote control device **80** until the selection "You've Got Mail" **109** is displayed in the highlighted title area **105** and then request to see the video titled "You've Got Mail" **109** by activating the select button **87**. In an alternative embodiment, activating the up and down arrow buttons **83**, **84** on the remote control device **80** results in the shifting of the highlighted title area **105** rather that the shifting of the video titles (at least until the top or bottom video titles are reached). A reduced screen area **106** displays an image corresponding to the video title displayed in the highlighted title area **105**. As the user scrolls through the video rental list **103**, the image displayed in the reduced screen area **106** changes accordingly. Without any limitation to other scrolling and selection forms, the scrolling and selection mechanism described above is similarly applicable to other lists and windows herein.

[0050] FIG. **6** depicts an example rental period selection window **110** that is presented to a user after the user selects a movie from the rental selection window **100**. The user is presented with a rental period list **111** containing rental periods **112**, rental prices **113**, and a highlighted selection area **113**. Rental period information section **114** provides information about the rental period displayed in the highlighted selection area. A user may scroll to the desired rental period until it becomes highlighted and may then select a highlighted rental period by activating the select button **87** or may cancel the rental request by activating the exit button **91**.

[0051] FIG. **7** depicts an example rental options selection window **120** that is presented to a user after the user selects a rental period via the rental period selection window **110**. Rental options list **122** contains rental options, such as option **123**, and a highlighted option area **126**. The user may use the up and down arrows **83**, **84** to designate a rental option as the highlighted rental option and may use the left and right arrow buttons **85**, **86** in order to hop over to the setting list **125** and change the setting of the highlighted rental option **123**. Example rental options include subtitles, pop-up comments, and letterbox display.

[0052] Information supplements such as pop-up comments settings may include comments from the director, the producer, actors, critics, or other viewers that are displayed at designated time intervals of the on-demand media presentation simultaneously with the on-demand media presentation.

[0053] Information supplements comprise media such as textual, graphical, video, or audio information, each to be presented as a single supplement or as a combined set of supplements with the VOD presentation. Information supplements comprise a specification of start time and duration interval in relation to the start of the on-demand title for which they are presented to the user or in relation to some other accessible starting point of the on-demand title such as a chapter. Herein such specification is referred to as the active time interval of the information supplement. An information supplement may exhibit one or more active time interval specifications during the course of the VOD title presentation. The time interval specification enables an information supplement to be presented to the user in a time-synchronized fashion.

[0054] Information supplements also comprise other specifications such as screen positioning relative to the picture display of the on-demand title enabling a supplement's respective presentation to overlay the picture display in a predetermined manner to minimize occlusion of the picture.

[0055] Popup alerts are optional graphical supplements such as arrows that point attention to inconspicuous parts of the on-demand video picture presentation. They possess active time interval and screen location specifications.

[0056] Auditory alerts are optional supplements that are mixed with the audio of the on-demand video program and possess active time interval designation of one or more speaker channels for which to mix the audio supplement, and volume specification.

[0057] Multiple video views are optional supplements that provide different camera angles of the media presentation. Their presentation is accomplished with a split-picture display presentation or a picture-in-picture (PIP) presentation. The specification for a multi-video view supplement comprises an active time interval, a screen position, and whether the presentation is effected as a split-screen or PIP supplement.

[0058] Advertisement pop-ups are optional supplements that enable the user to receive product information during the on-demand video presentation in exchange for a lower rental fee. The advertisements may be specific to products inherent during the course of the on-demand movie such as a watch worn by a leading actor. Furthermore, the advertisement supplement's active time interval may be concurrent to the time in the movie that the leading actor reads the time on the watch.

[0059] Upon a user setting an optional request for one or more information supplements, the MOD client application **63** initiates processor **44** to enable data streams carrying information supplements corresponding to an on-demand video program to be received by demultiplexing system **200**, to be transferred to the fourth part of DRAM assigned for reception of data. Supplementary textual or graphical data is then decoded, parsed and interpreted by processor **44** and/or other data parsing and interpretation device (not shown) in DHCT **16** and transferred into a graphics display buffer **240** as graphics data.

[0060] Alternatively, if the supplementary data or parts thereof comprise a digital audio component, it is decoded by a first digital audio decoding system **220** or a second digital audio decoding system (not shown) and the supplementary audio is transferred to an assigned Pulse Code Modulation (PCM) audio buffer **250** in DRAM **52**. The audio player and output system **240** effects mixing of the supplementary audio stored in the PCM buffer with the designated audio channel of the reconstructed digital audio of the on-demand video program stored in the sixth part of DRAM **52**.

[0061] Alternatively, if the supplementary data or parts thereof comprise a digital video component, it is received as a video stream of the on-demand video program and pro-

cessed in DHCT **16** as described above, each processing operation is performed by an aforementioned first processing component in DHCT **16**, respectively, or a similar second processing component in DHCT **16** (not shown).

[0062] A supplementary video picture may be decompressed by digital video decoding system **210** and scaled down as it is being reconstructed in a procedural fashion with video scaling unit **260** to effect a picture in picture presentation. The scaled down reconstructed picture can be stored in a scaled video picture buffer **270** in DRAM **52**. Simultaneous display of the on-demand video picture with a supplementary scaled down video picture **270** can be constructed with supplementary graphical and textual information stored in graphics display buffer **240**.

[0063] Downscaled video pictures overlay on-demand video presentation by the composition capabilities of DHCT **16** (not shown) and positioned (likely at a corner of screen) as specified by the information supplement specification and only visible during the respective specified active time interval.

[0064] Graphical and textual data corresponding to a pop-up supplement overlay the on-demand video presentation on designated screen location per their respective specification and are only visible during their respective specified active time interval

[0065] The DHCT **16** has an internal clock **280** and timers **290** that enable computation of the time relationship between its internal clock and clock specified by digital video program. Hence, by reading and interpreting the clock and time stamps specifications intrinsic in the digital video program (for example, as provisioned in MPEG-2), DHCT **16** can effect an output as a synchronized presentation to the user that includes the reconstructed on-demand video pictures, the reconstructed digital audio samples, and supplementary information.

[0066] FIG. **8** depicts an example stopped video window **130** that is presented to the user after the user stops the presentation of a video rental for which actors' pop-up comments had been activated. The reduced screen area **106** displays an image from the media rental that was being presented to the user prior to example window **130** being displayed. Information section **131** contains information related to the media rental associated with the image displayed in the reduced screen area **106**, including numerical and graphical indications **136** as to the playing time and rental time remaining for the media rental. Rental control options list **133** contains rental control options, such as the option to "De-activate comments" **134**, and a highlighted option area **135**. A user can de-activate pop-up comments by selecting the "De-activate comments" option **134** via the remote control device **80**. Once this option is selected, the "Actor's comments activated" message **132** is replaced with a message indicating that pop-up comments have been de-activated, and pop-up comments are no longer presented to the user during the remainder of the rental period unless the user subsequently requests otherwise.

[0067] FIG. **9** depicts an example stopped video window **140** that is presented to the user after the user stops the presentation of a video rental for which pop-up comments are not activated. Rental control options list **133** contains rental control options, such as the option to "Activate pop-up comments" **144**, and a highlighted option area **135**. A user can activate pop-up comments by selecting the "Activate pop-up comments" option **144** via the remote control device **80**. In one embodiment, the user may select an "Add comments" option **145** which enables the user to add comments to the rental selection via the keyboard **73** (FIG. **3**) or via an infrared keyboard (not shown). Comments added by a user during a video presentation are displayed on the television **41** and are stored by the MOD client application **63** in the application memory **70**. Once the rental period expires, user comments are transmitted by the MOD client application **63** to the MOD server application **19** (FIG. **2**) which edits them (if necessary), integrates them with comments from other users associated with the same video title, and stores them in memory (not shown) at the headend **11**. User comments may be edited for things such as vulgar language and excessive length. Integrated user comments associated with a specific media rental may then be presented to a subsequent user who request such comments along with the media rental. In one embodiment, user comments are edited or screened by a system operator.

[0068] FIG. **10** depicts an example pop-up comments selection window **150** that is presented to the user after the user selects the "Activate pop-up comments" option **144** via stopped video window **140**. Pop-up comments selection list **153** contains pop-up comments types such as director's comments **154**, producer's comments **155**, actors' comments **156**, critics' comments **157**, and viewers' comments **158**. Once the user selects the type of comments that the user desires to view along with the video rental, such comments are displayed with the video rental the next time that the video rental is presented to the user, unless the user subsequently requests otherwise. The comments may be displayed at the bottom of the television screen or may be proximally located to a displayed item or actor to which/whom the comments respectively pertain.

[0069] It should be emphasized that the above-described embodiments of the present invention, particularly any "preferred embodiments", are merely possible examples of the implementations, merely setting forth a clear understanding of the principles of the inventions. Many variations and modifications may be made to the above-described embodiments of the invention without departing substantially from the spirit of the principles of the invention. All such modifications and variations are intended to be included herein within the scope of the disclosure and present invention and protected by the following claims.

Therefore, having thus described the invention, the following is claimed:

1. A method implemented by a television set-top terminal (STT) coupled via a bi-directional communication network to a programmable remote server, wherein the STT is configured to receive a video program from a remote server, said method comprising steps of:

providing a selectable option to enable reception of a second video stream corresponding to a supplemental view of the video program;

receiving from the server via a tuner in the STT that is tuned to a single transmission channel a first plurality of streams corresponding to the video program, said first plurality of streams including an audio stream, a first video stream corresponding to a main view of the video program, and the second video stream;

receiving a viewer input from a viewer to select the selectable option;

responsive to receiving the viewer input, enabling the STT to process the second video stream; and

outputting by the STT audio corresponding to the audio stream and a composition corresponding to the first

and second video streams as a television signal, wherein the audio and composition of the first video and second video are time synchronized according to time stamps specifications.

2. The method of claim **1**, wherein the video program is a video-on-demand program established over a dedicated network session between the remote server and the STT.

3. The method of claim **2**, wherein the composition of the first and second video streams in the television signal is presented as a split-picture.

4. The method of claim **2**, wherein the composition of the first and second video streams in the television signal is presented as a picture-in-picture.

5. The method of claim **1**, wherein the first and second video streams correspond to a first and second camera angle of the scene contained in the video program, respectively.

6. The method of claim **1**, further comprising:

receiving from the server a supplementary data stream with respective portions associated with the presentation time of respective portions of the video program; and

outputting by the STT a television signal that contains the supplementary data stream and the first and second videos; wherein the supplementary data stream and the first video and second video streams are time synchronized according to time stamps specifications.

7. The method of claim **1**, further comprising establishing a dedicated network session between the server and the STT and providing a rented video program through the established network session.

8. A method implemented by a server coupled to a television set-top terminal (STT) via a bi-directional communication network, the method comprising the steps of:

providing to the STT information including respective descriptions of rentable video program;

providing a selectable option to receive from the server a first supplemental data stream that is associated with the presentation time of respective portions of a rented video program, said first supplemental data stream being different to each stream in a first plurality of streams corresponding to the rented video program;

receiving a request from the STT for the rented video program;

establishing a dedicated network session between the server and the STT;

providing the first plurality of streams through the established network session;

receiving a viewer input from a viewer to select the selectable option;

responsive to receiving the viewer input, receiving from the server at least a portion of the first supplemental data stream and at least a respective portion of each stream in the first plurality of streams via a tuner in the STT;

outputting by the STT a composition of the received said portion of the first supplemental data stream and the received said respective portion of each stream in the first plurality of streams as a television signal, wherein the composition of the received said portion of the first supplemental data stream and the received said respective portion of each stream in the first plurality of streams are time synchronized according to time stamps specifications.

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