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(54) SYSTEMS AND METHODS FOR CREATING CUSTOM VIDEO MOSAIC PAGES WITH LOCAL CONTENT

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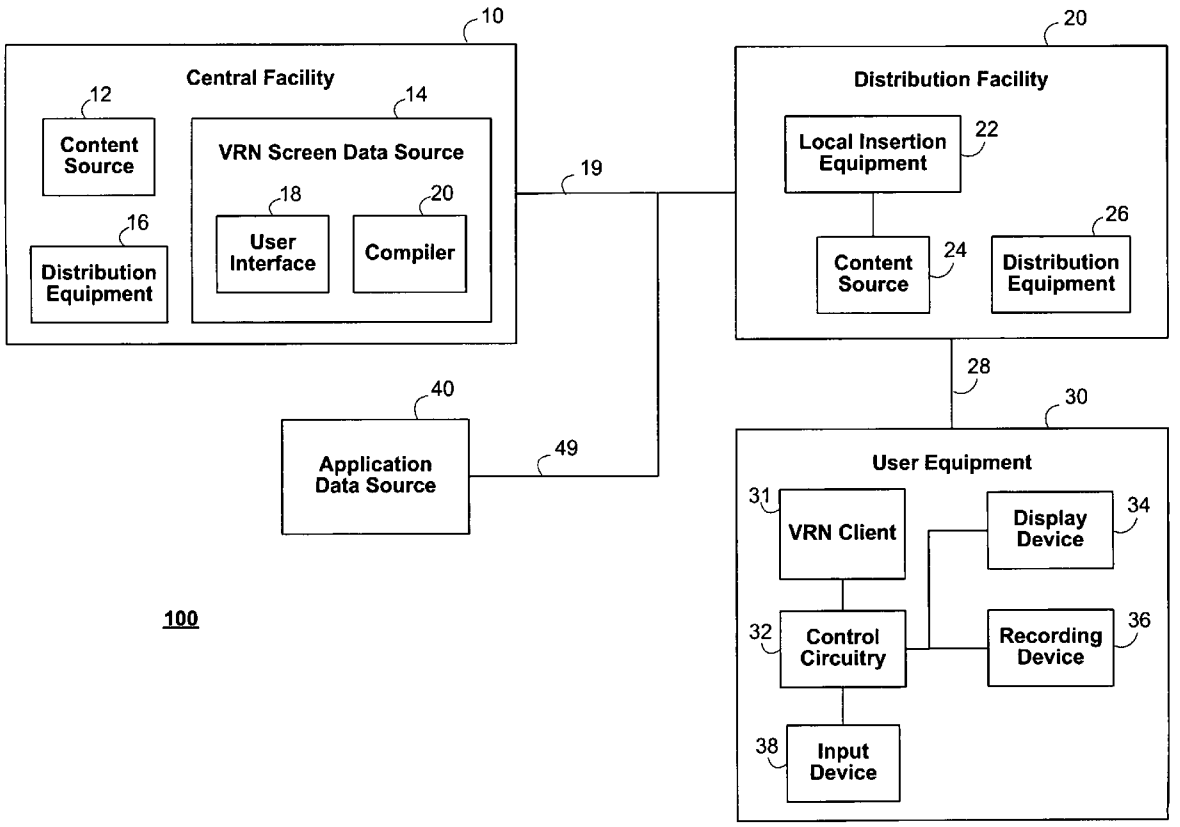
(57) **ABSTRACT**

Systems and methods for providing custom video mosaic pages are provided. The custom pages may be locally-generated, remotely-generated, or partially locally-generated and partially remotely-generated. The custom pages may include local content, such as content recorded to a digital video recorder (DVR), overlaid on a multi-video composite feed. A local compositing system may render the mosaic pages and dynamically customize the pages based on user profile data, user preferences, and active user monitoring.



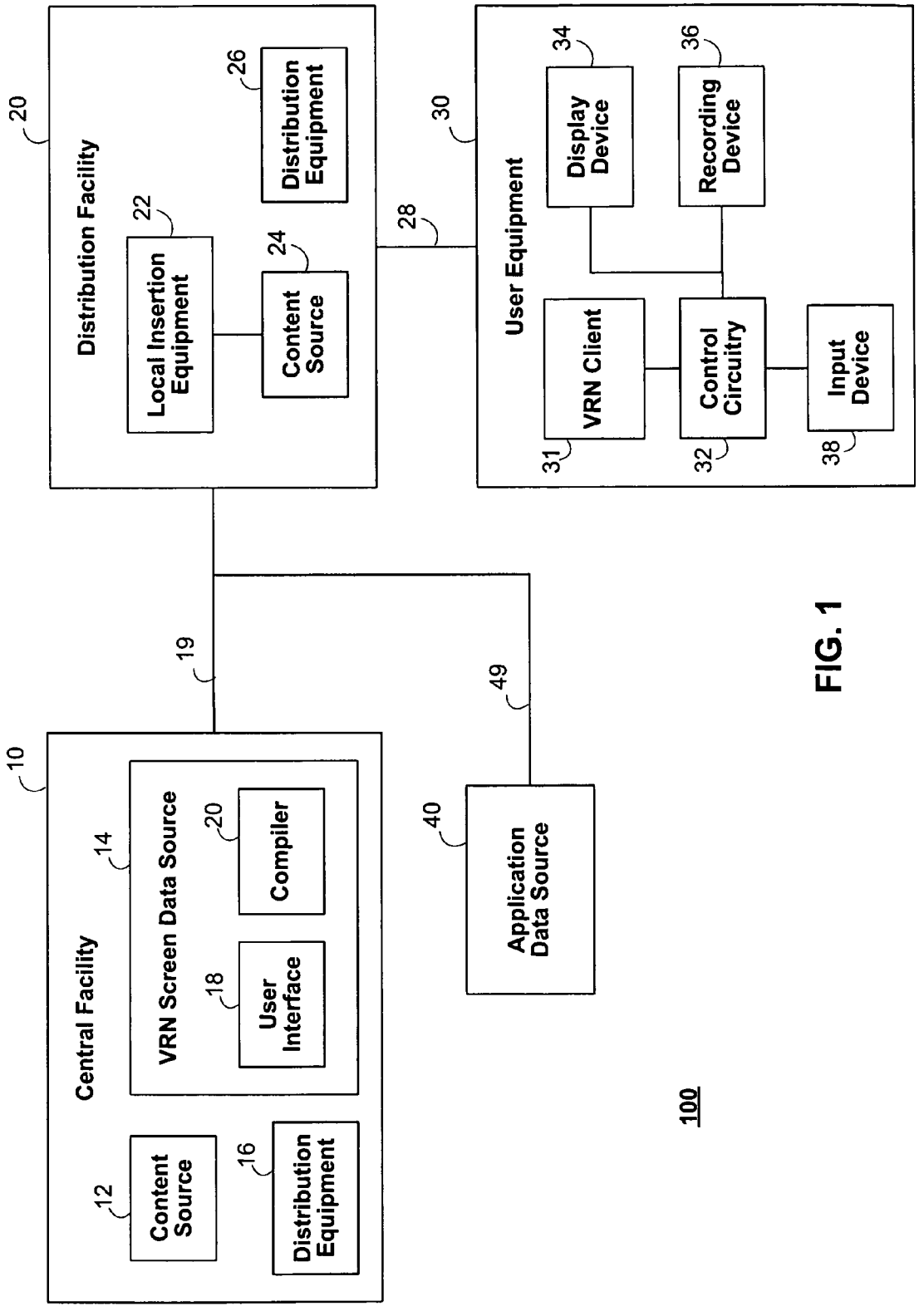

100
10
Central Facility
12
Content Source
16
Distribution Equipment
14
VRN Screen Data Source
18
User Interface
20
Compiler
19
49
40
Application Data Source
20
Distribution Facility
22
Local Insertion Equipment
24
Content Source
26
Distribution Equipment
28
30
User Equipment
31
VRN Client
32
Control Circuitry
38
Input Device
34
Display Device
36
Recording Device

FIG. 1

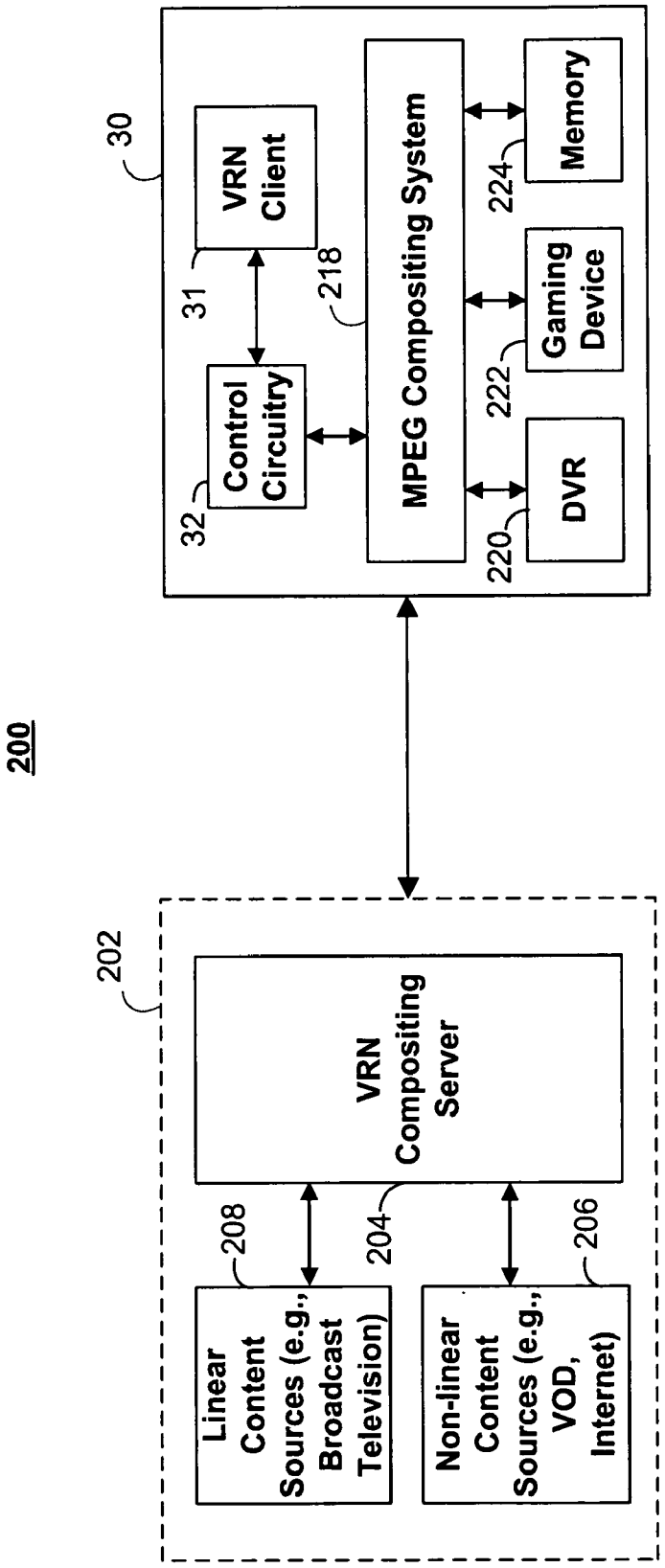

200
30
VRN Client
31
Control Circuitry
32
218
MPEG Compositing System
Memory
224
Gaming Device
222
DVR
220
202
VRN Compositing Server
208
204
206
Linear Content Sources (e.g., Broadcast Television)
Non-linear Content Sources (e.g., VOD, Internet)

FIG. 2

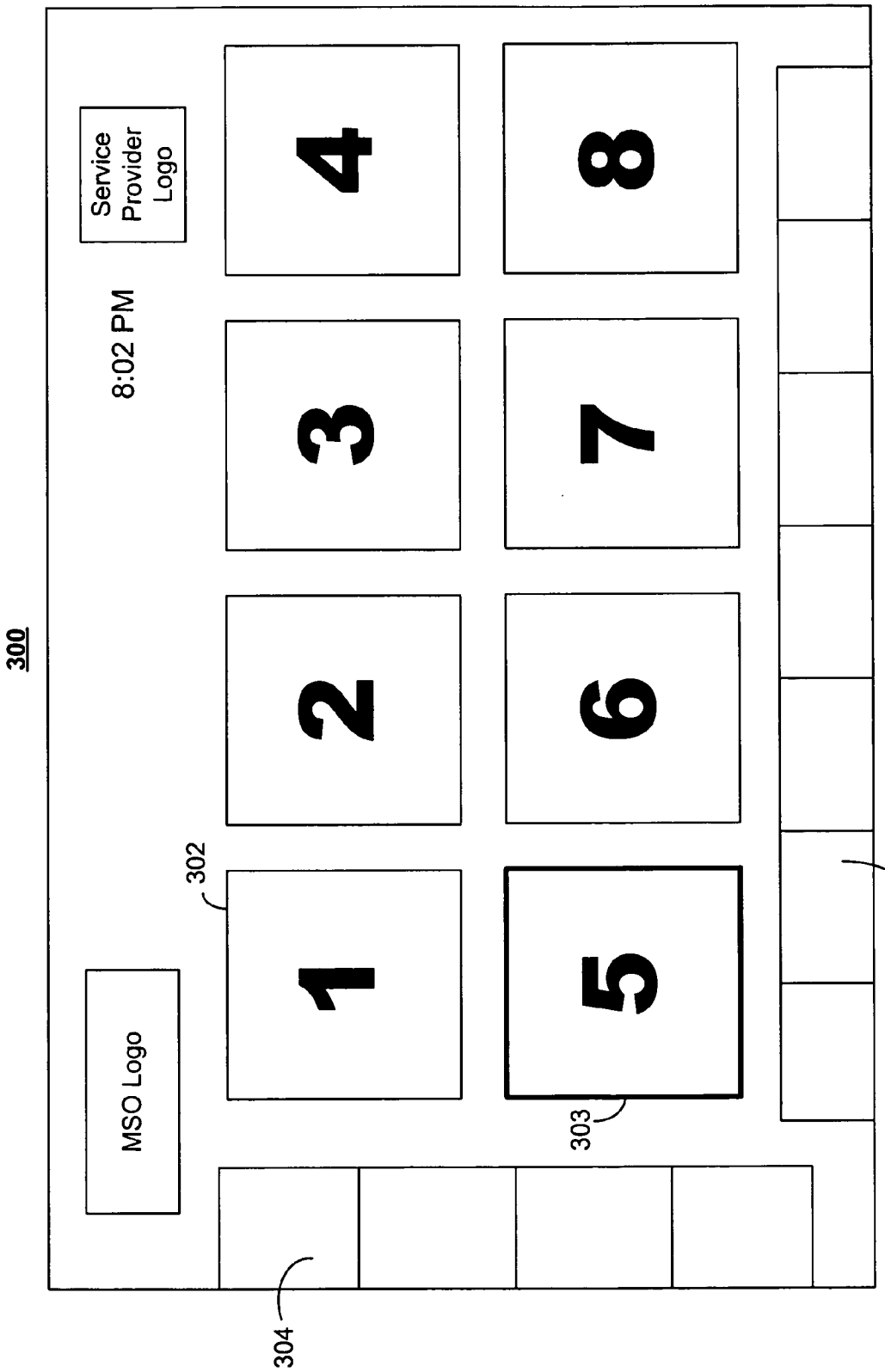

300
Service Provider Logo
8:02 PM
MSO Logo
1
2
3
4
5
6
7
8
302
303
304
306

FIG. 3

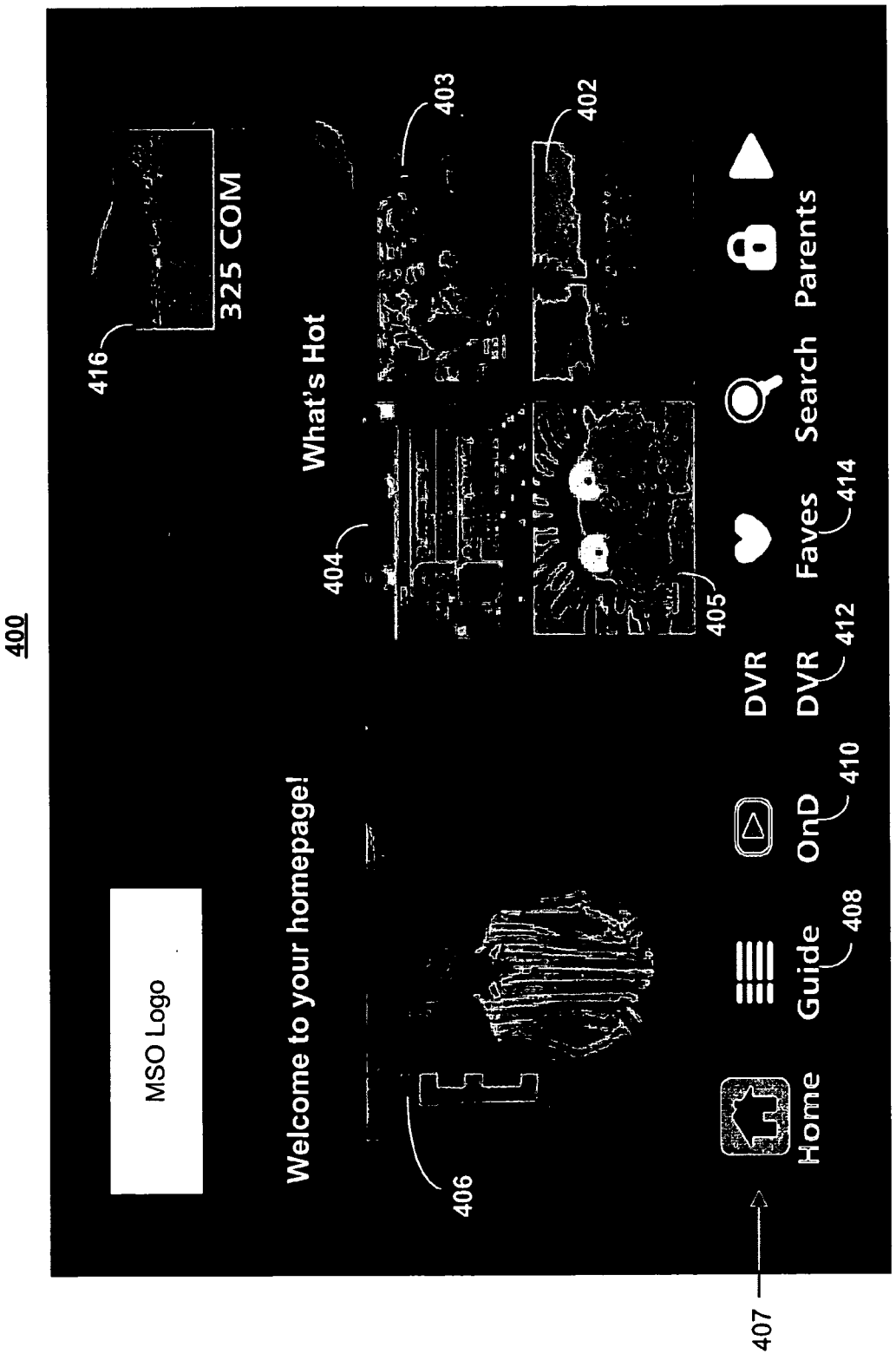

400
MSO Logo
Welcome to your homepage!
What's Hot
325 COM
416
403
402
404
405
406
407
408
410
412
414
Home
Guide
OnD
DVR
DVR
Faves
Search
Parents

FIG. 4

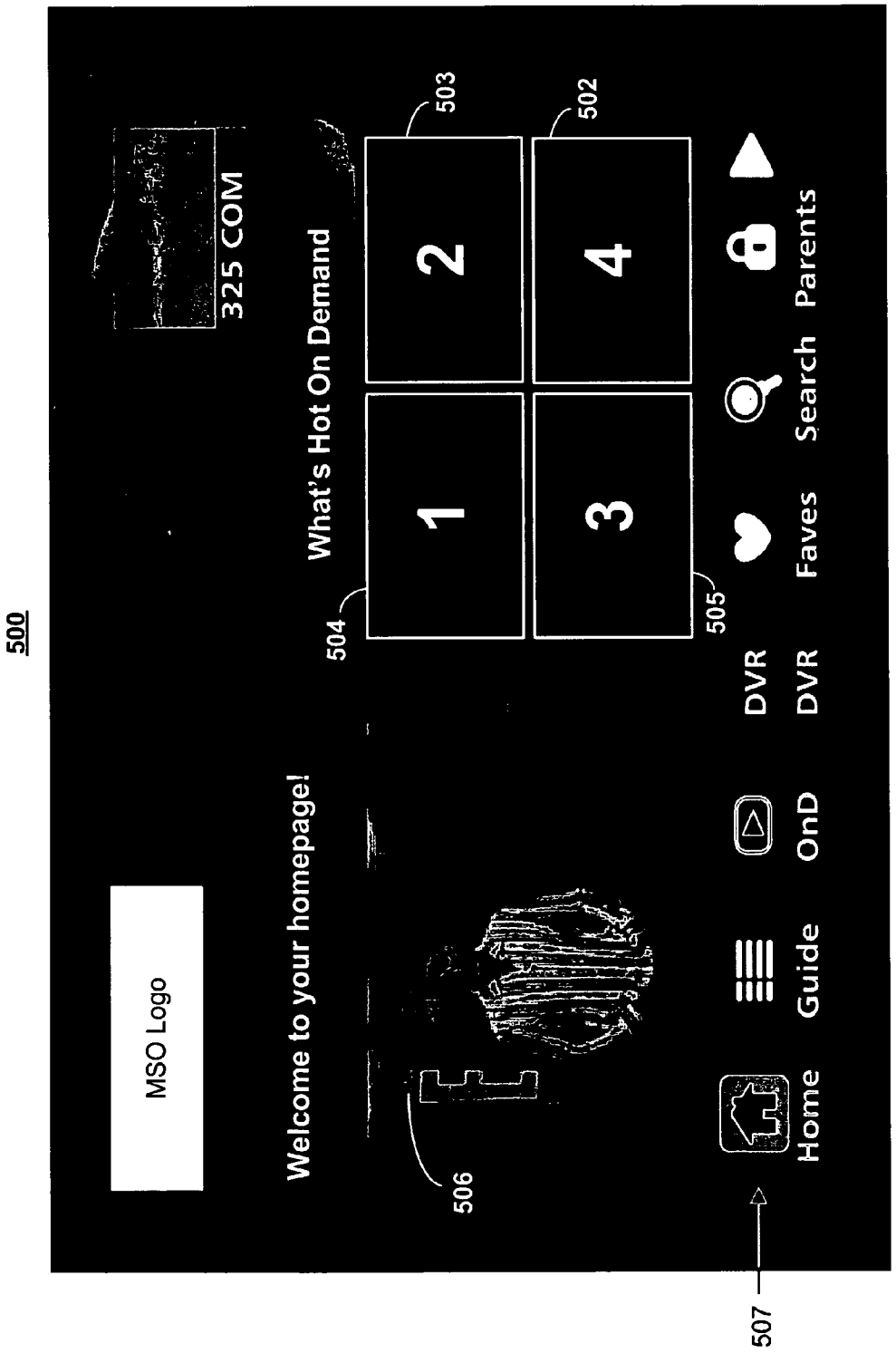

500
MSO Logo
Welcome to your homepage!
325 COM
What's Hot On Demand
1
2
3
4
504
503
502
505
506
507
Home
Guide
OnD
DVR
DVR
Faves
Search
Parents

FIG. 5

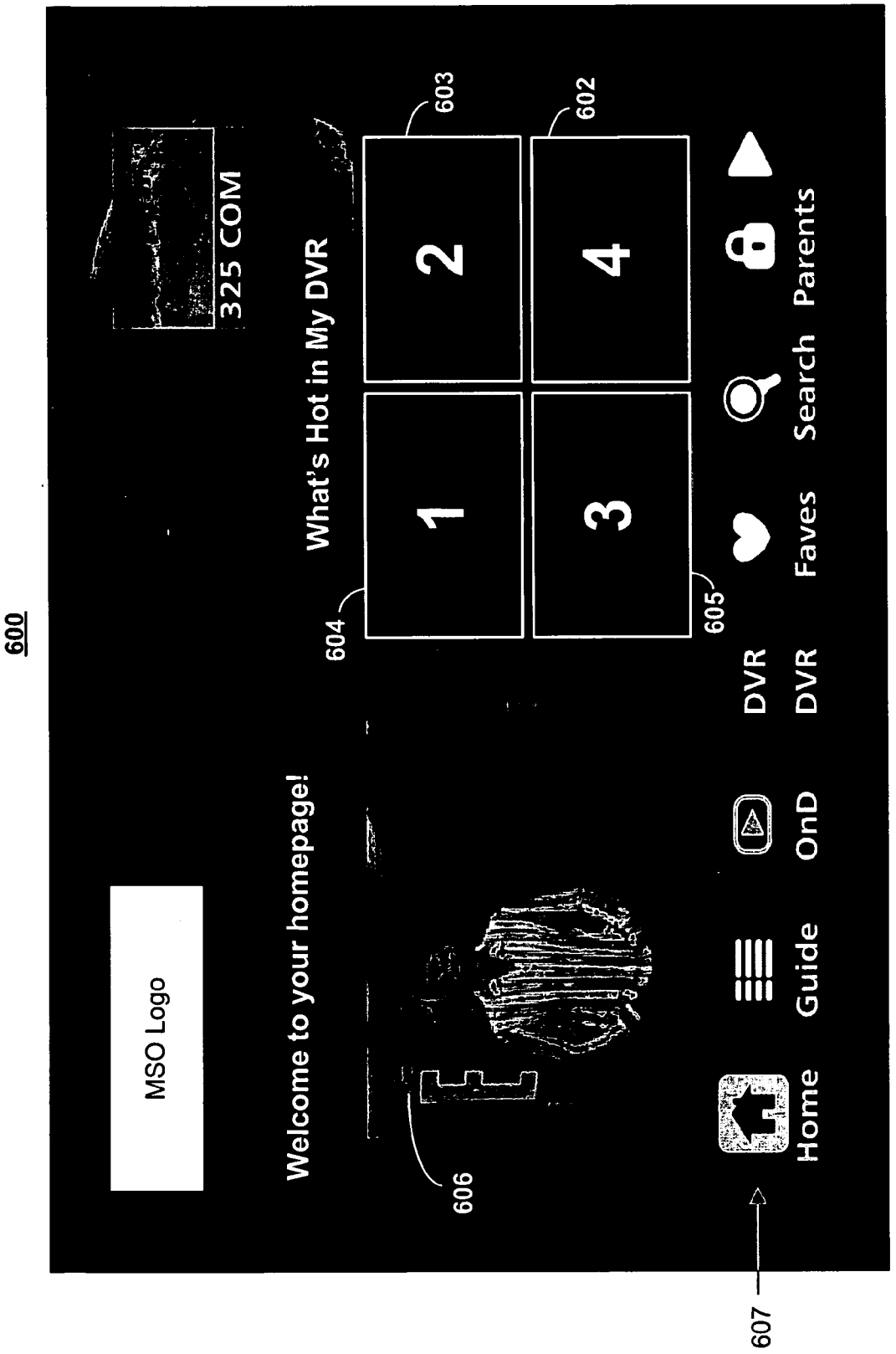

600
MSO Logo
Welcome to your homepage!
325 COM
What's Hot in My DVR
1
2
3
4
603
602
604
605
606
607
Home
Guide
OnD
DVR
DVR
Faves
Search
Parents

FIG. 6

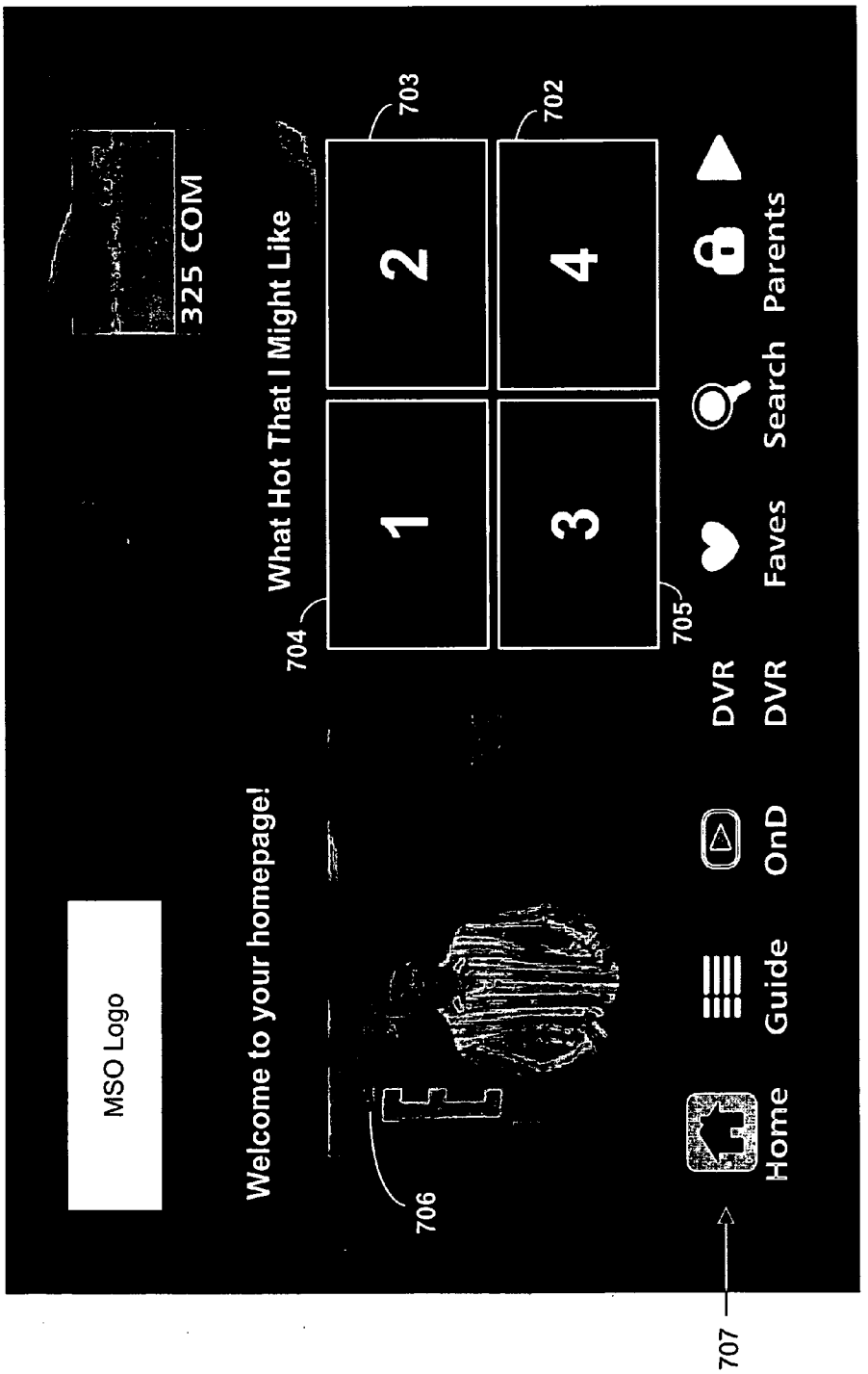

700
MSO Logo
Welcome to your homepage!
What Hot That I Might Like
325 COM
1
2
3
4
703
702
704
705
706
707
Home
Guide
OnD
DVR
DVR
Faves
Search
Parents

FIG. 7

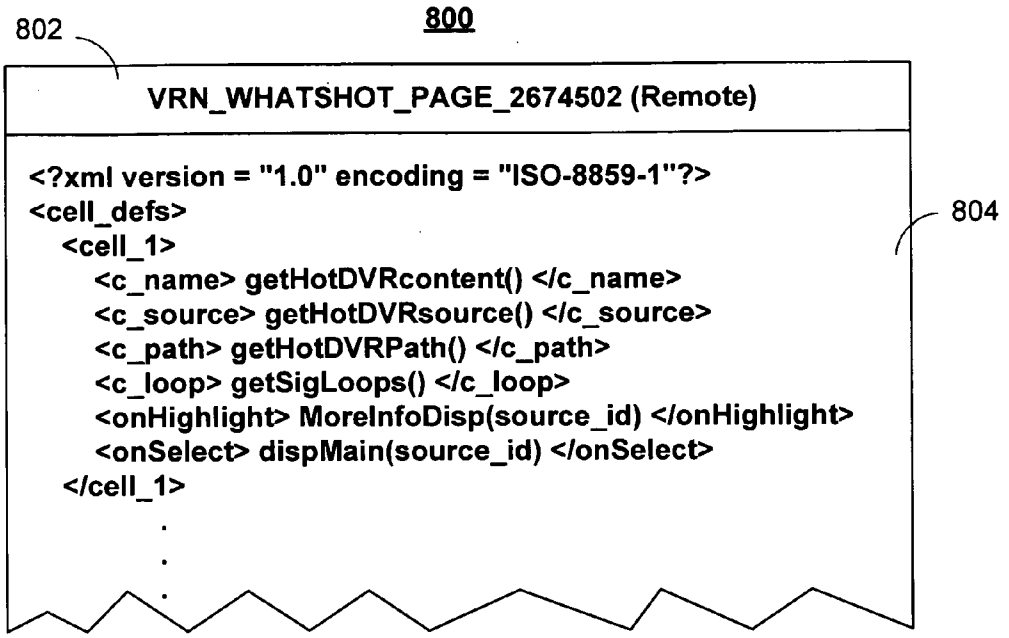

800
802
VRN_WHATSHOT_PAGE_2674502 (Remote)
<?xml version = "1.0" encoding = "ISO-8859-1"?>
<cell_defs>
<cell_1>
<c_name> getHotDVRcontent() </c_name>
<c_source> getHotDVRsource() </c_source>
<c_path> getHotDVRPath() </c_path>
<c_loop> getSigLoops() </c_loop>
<onHighlight> MoreInfoDisp(source_id) </onHighlight>
<onSelect> dispMain(source_id) </onSelect>
</cell_1>
804

FIG. 8A

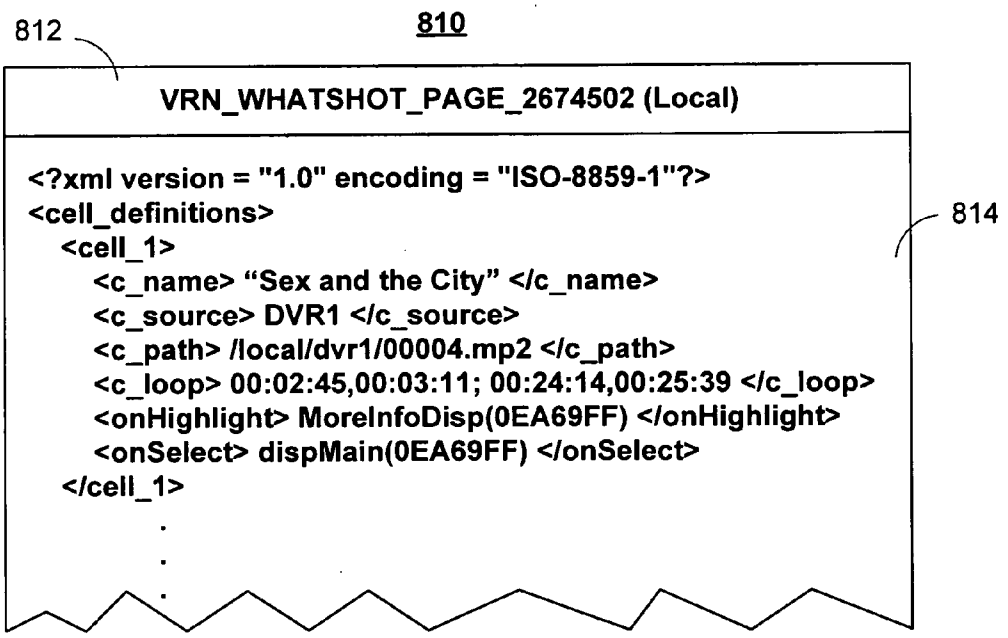

810
812
VRN_WHATSHOT_PAGE_2674502 (Local)
<?xml version = "1.0" encoding = "ISO-8859-1"?>
<cell_definitions>
<cell_1>
<c_name> "Sex and the City" </c_name>
<c_source> DVR1 </c_source>
<c_path> /local/dvr1/00004.mp2 </c_path>
<c_loop> 00:02:45,00:03:11; 00:24:14,00:25:39 </c_loop>
<onHighlight> MoreInfoDisp(0EA69FF) </onHighlight>
<onSelect> dispMain(0EA69FF) </onSelect>
</cell_1>
814

FIG. 8B

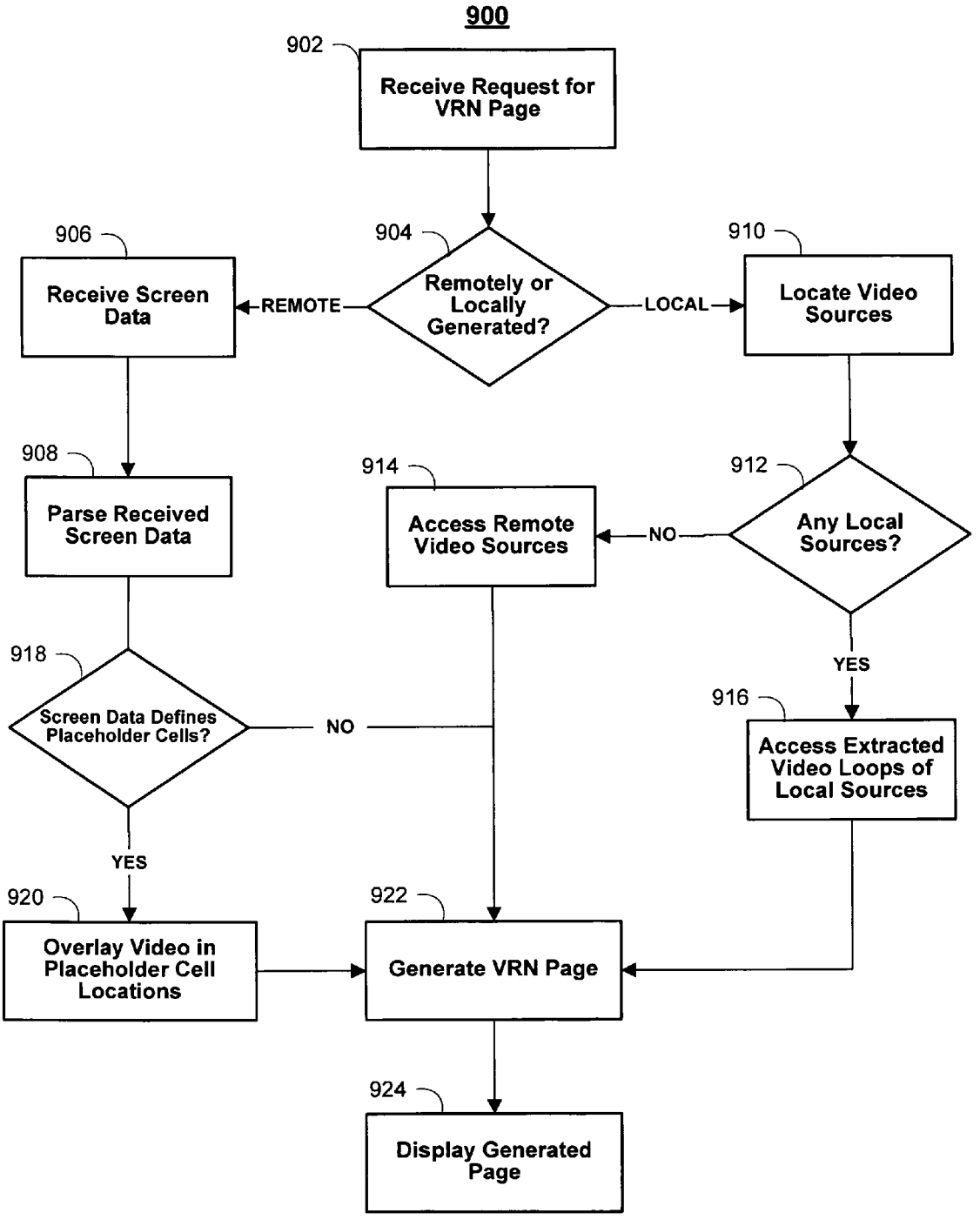

900
902
Receive Request for VRN Page
904
Remotely or Locally Generated?
REMOTE
LOCAL
906
Receive Screen Data
910
Locate Video Sources
908
Parse Received Screen Data
914
Access Remote Video Sources
NO
912
Any Local Sources?
YES
916
Access Extracted Video Loops of Local Sources
918
Screen Data Defines Placeholder Cells?
NO
YES
920
Overlay Video in Placeholder Cell Locations
922
Generate VRN Page
924
Display Generated Page

FIG. 9

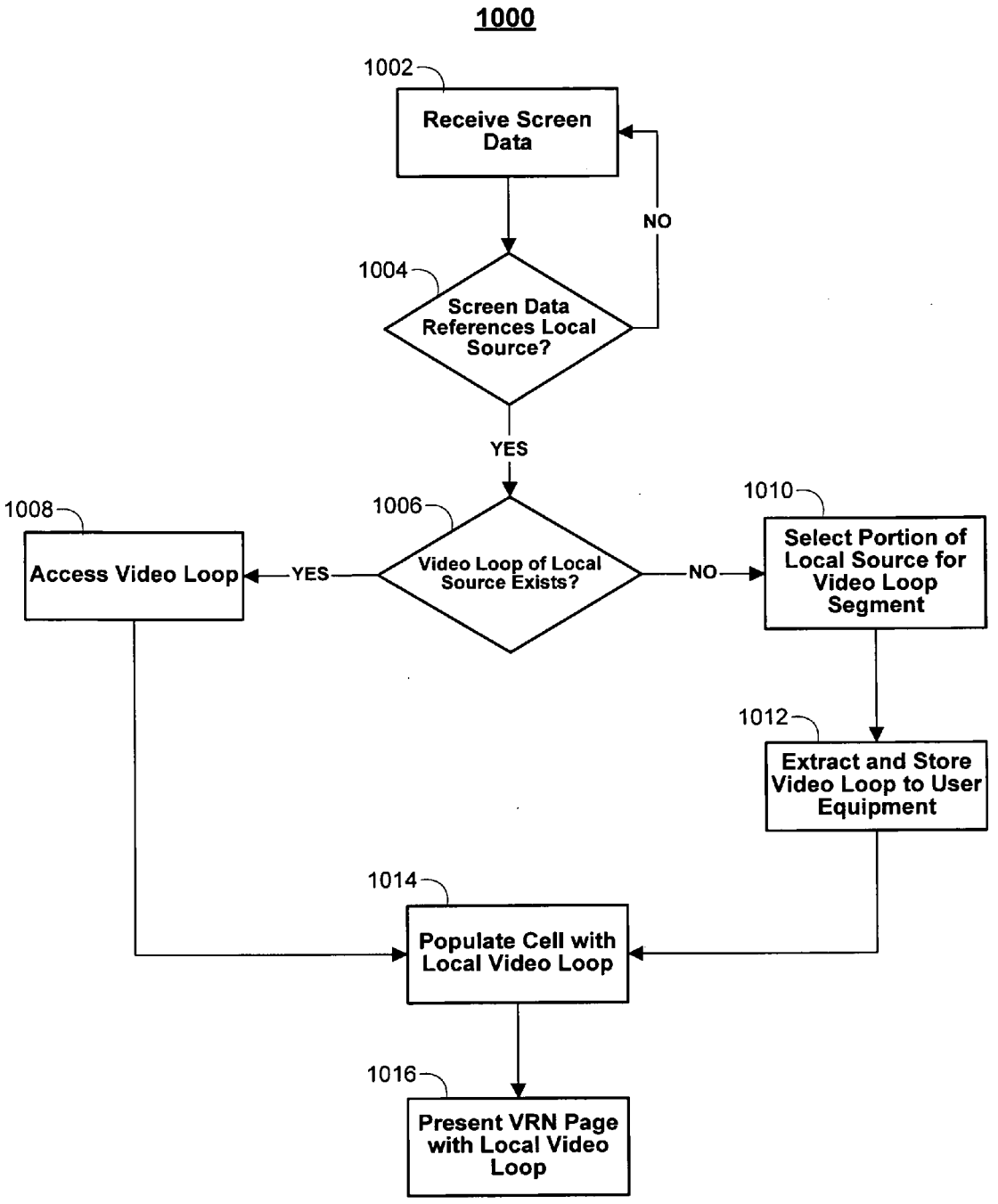

1000
1002
Receive Screen Data
NO
1004
Screen Data References Local Source?
YES
1006
Video Loop of Local Source Exists?
YES
1008
Access Video Loop
NO
1010
Select Portion of Local Source for Video Loop Segment
1012
Extract and Store Video Loop to User Equipment
1014
Populate Cell with Local Video Loop
1016
Present VRN Page with Local Video Loop

FIG. 10

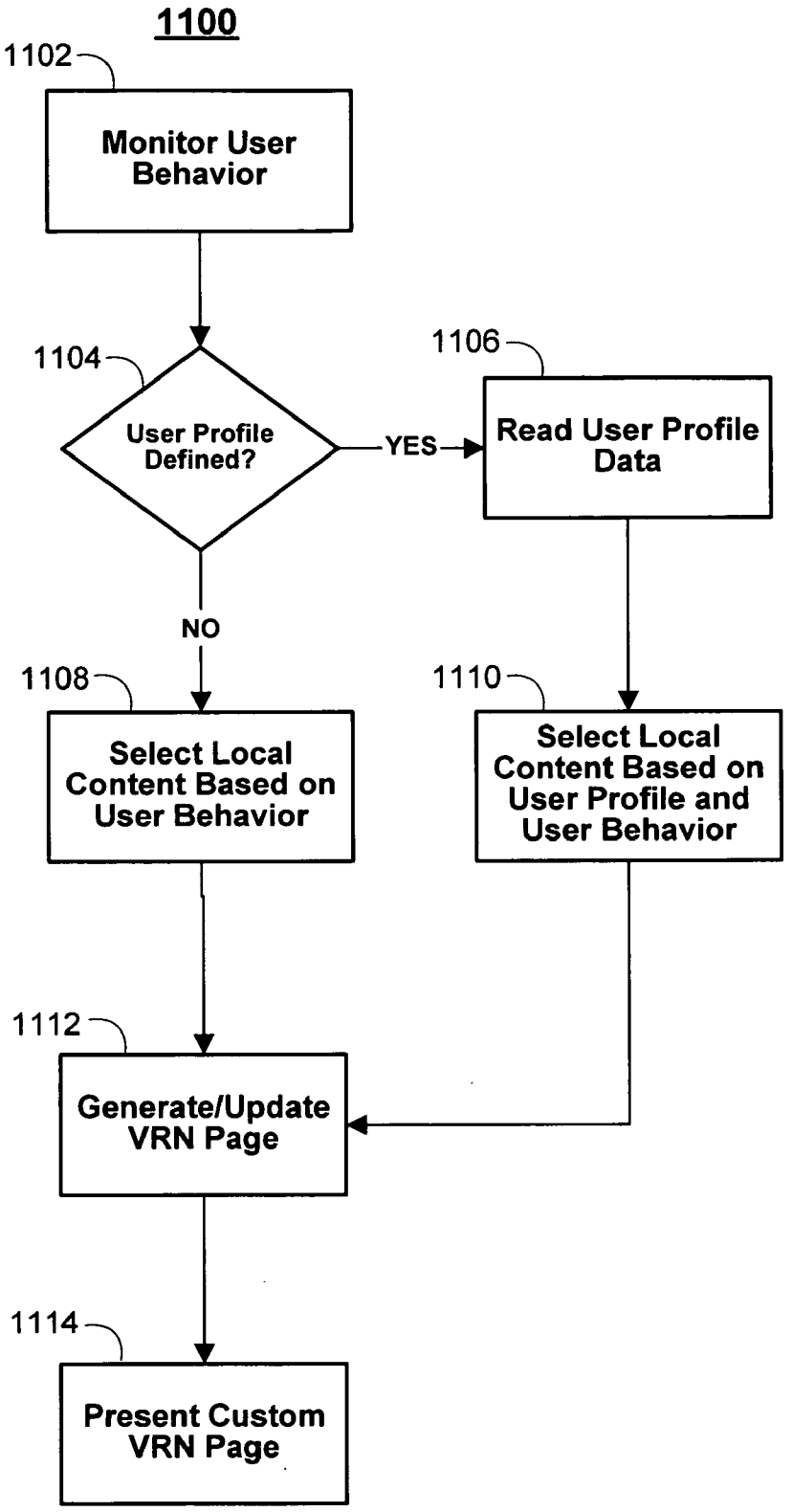

1100
1102
Monitor User Behavior
1104
User Profile Defined?
YES
1106
Read User Profile Data
NO
1108
Select Local Content Based on User Behavior
1110
Select Local Content Based on User Profile and User Behavior
1112
Generate/Update VRN Page
1114
Present Custom VRN Page

FIG. 11

SYSTEMS AND METHODS FOR CREATING CUSTOM VIDEO MOSAIC PAGES WITH LOCAL CONTENT

BACKGROUND OF THE INVENTION

[0001] This invention relates generally to media systems and, more particularly, to media systems supporting custom video mosaic pages.

[0002] Video mosaic pages allow users to access services and video assets from video-rich menu screens in an interactive application, such as an interactive media guidance application. These video-rich menu screens may present a plurality of video assets (e.g., broadcast television channels or on-demand content) each in its own video window, or cell, on a single page.

[0003] Video mosaic pages are typically remotely-generated at a distribution facility or central facility. At the distribution facility or central facility, the video assets in the mosaic page are composited into a single video feed before being transmitted to the user equipment device. The multi-video feed may be transmitted as a composite stream (e.g., MPEG-2 stream) to a number of user equipment devices. For example, the composite stream may be transmitted to user equipment devices over a digital television channel. After the stream is received by the user equipment devices, a local video mosaic client may overlay graphics, icons, and text onto the display to create custom video mosaic pages. For example, one implementation of a video mosaic system for providing video mosaic pages called "Video-Rich Navigation" (VRN) is described in U.S. patent application Ser. No. 11/395,380, filed Mar. 30, 2006, which is hereby incorporated by reference herein in its entirety.

[0004] Although video mosaic pages provide a more user-friendly way to present video assets to viewers, the pages may be limited in several respects. For example, because video mosaic pages are typically remotely-generated, there is very little flexibility for users to personalize the look and feel of the page. The remotely-generated nature of these pages also prevents dynamic page creation and customization, for example, at the viewer's user equipment.

[0005] In addition, typical video mosaic pages are limited in the type of content that is available for display in the pages. Because the pages are typically remotely-generated, local content, such as content stored on a digital video recorder (DVR), gaming device, or other suitable local storage device, are generally not available for use in video mosaic pages.

[0006] Accordingly, it would be desirable to provide systems and methods for dynamic video mosaic page creation and display. The video mosaic pages may combine local content with broadcast, multicast, switched digital video, and on-demand assets in a single interactive display. It would also be desirable to provide video mosaic pages capable of being automatically customized based on user behavior and user preferences.

SUMMARY OF THE INVENTION

[0007] In accordance with the principles of the present invention, a VRN client is implemented on a user equipment device. The VRN client supports the generation of video mosaic pages from various video asset sources. These asset sources may include linear content sources (e.g., broadcast television sources), non-linear content sources (e.g., on-demand and Internet sources), and local sources (e.g., recorded content, local gaming content, and content stored in memory).

[0008] The VRN client may create or present locally-generated and remotely-generated video mosaic pages or a combination of locally and remotely-generated video mosaics. The video sources in remotely-generated pages may be composited remote from the user equipment device into a single video feed. In this type of arrangement, screen data may be transmitted to the user equipment device, either in-band or out-of-band, that identifies the video sources in the mosaic page as well as any other information necessary to successfully display the page. Suitable information necessary to successfully display the page may include, for example, action data that defines the behavior and response to a viewer selection of a cell (or group of cells) in the mosaic page, graphics, on-screen text, advertisements, and any other elements that are to be displayed with or on the mosaic page.

[0009] The screen data may also include one or more placeholder cell definitions. The placeholder cell definitions may include information relating to one or more cells of the video mosaic page that do not correspond to video in the transmitted composite multi-video feed. Thus, the remotely-generated multi-video feeds in accordance with the invention may have one or more "blank" areas corresponding to placeholder cell locations. The video assets presented in the placeholder cells may be identified and selected dynamically at the user equipment by the VRN client. These video assets may include local content. For example, recorded content, local gaming content, and videophone messages may be presented in the placeholder cells. The selection of video assets for presentation in the placeholder cells may be based on active user monitoring, direct interaction from a user, user preferences, or any other suitable user-derived or user-generated data.

[0010] For example, placeholder cell definitions in the received screen data may include local function calls that are executed automatically as the screen data is received by the user equipment device. The local function calls may return suitable identifying information about local assets to be displayed in one or more placeholder cells of the mosaic page. This identifying information may include, for example, local file system paths for text, advertisements, and video assets to be presented in the placeholder cells or elsewhere on the mosaic page.

[0011] After receiving the screen data, the VRN client may determine the size and location of any placeholder cells (e.g., x and y coordinates) in the video mosaic page. The VRN client may then overlay suitable content, including local content, at the appropriate positions corresponding to the placeholder cells. In this way, VRN pages with one or more video assets selected at the user equipment device may be presented to the user.

[0012] Mosaic pages in accordance with the present invention may also be completely locally-generated, if desired. The video sources included in the locally-generated pages may be composited at the user equipment device that the page is to be displayed on. Local assets may populate some or all of the cells of the locally-generated mosaic page. The remaining cells may be populated with on-demand content, broadcast television content, or any other video content accessible by the user equipment.

[0013] In order to overlay a local video asset on a video mosaic page or create locally-generated pages, in some embodiments, a local MPEG (or other suitable video stan-

dard) compositing system may extract selected portions of local content for use in the video mosaic page. The extracted portion or portions may be saved to the user equipment device as a continuous or looping video file. The portions selected for extraction may be determined, for example, by a scene selection algorithm that identifies scene changes within a video asset. In some embodiments, the scene selection algorithm may also analyze user viewing behavior or user preferences to determine which portions of the local content to extract for use in the video mosaic page. For example, if a certain portion of a local video asset (e.g., the user's favorite scene) is watched more frequently then other portions, this portion may be selected by the scene selection algorithm for extraction.

[0014] In some embodiments, appropriate content for looping may be identified in advance by the content provider and communicated to the user equipment device by a sideband signal or markings within the video, or the location of looping content within an asset may be known in advance by a standard established for locating looping content by the system operator (e.g., looping content may always be placed in the last minute of a program).

[0015] In some embodiments, the VRN client is configured to generate and display various custom video mosaic pages. These custom pages may be populated, for example, with the user's most frequently watched broadcast programs, on-demand content, and recorded content. In some embodiments, videophone messages received for the user may also populate one or more cells of the custom mosaic pages.

[0016] In some embodiments, video mosaic pages may be dynamically customized on-the-fly based on such factors as, for example, active user monitoring, user behavior, and user preference information. The VRN client (or some other application) may monitor all user interaction with the user equipment device. The application may then log this user interaction information to the user equipment device and build a profile for each user accessing the user equipment device. From the profile data, the VRN client may select particular video assets, such as assets the user has recently watched, accessed, or recorded, assets that the user has bookmarked (e.g., VOD assets), assets that the user might like (based on, e.g., frequently accessed genre categories), video messages that have been received but not yet displayed, or any other suitable video assets, for display in a custom video mosaic page.

[0017] In multi-room DVR systems, a local VRN page may display portions of content that are stored on a user equipment device other than the local user equipment device. Selection of such content may be made on a user basis. For example, a user may have logged into different devices (e.g., a set-top in the living room and one in the bedroom) and started watching different content in each context. Upon accessing (e.g., logging in) to either device, a custom "In progress for this user" VRN page may pull content from both devices and composite the content into a locally-generated VRN page that is displayed upon the local device.

[0018] In some embodiments, compositing is done remote from the user equipment device that ultimately displays the VRN content, but the composited result includes content sourced from the local user equipment device. For example, consider a user that is local to a mid-range user equipment device that supports DVR, remote streaming, but not local compositing. However, within the home or within the network, there exists another high-end user equipment device that supports DVR, remote streaming, and local compositing, or there exists a compositing-only engine on the network. As such, some embodiments may involve providing at least part of the content to be composited into a VRN page from the device that ultimately displays the composited VRN result.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The above and other features of the present invention, its nature and various advantages will be more apparent upon consideration of the following detailed description, taken in conjunction with the accompanying drawings, in which:

[0020] FIG. **1** is a simplified diagram of an illustrative interactive video mosaic media system architecture in accordance with one embodiment of the invention;

[0021] FIG. **2** is a simplified diagram of illustrative network and local content sources for use in video mosaic page composition in accordance with one embodiment of the invention;

[0022] FIG. **3** is an illustrative generic display screen showing a number of video windows, or cells, of a video mosaic page in accordance with one embodiment of the invention;

[0023] FIG. **4** is an illustrative display screen showing a "what's hot" video mosaic homepage in accordance with one embodiment of the invention;

[0024] FIG. **5** is an illustrative display screen showing a "what's hot on-demand" video mosaic homepage in accordance with one embodiment of the invention;

[0025] FIG. **6** is an illustrative display screen showing a "what's hot in my DVR" video mosaic homepage in accordance with one embodiment of the invention;

[0026] FIG. **7** is an illustrative display screen showing a "what's hot that I might like" video mosaic homepage in accordance with one embodiment of the invention;

[0027] FIG. **8** shows illustrative mark-up language files including cell definition tags in accordance with one embodiment of the invention;

[0028] FIG. **9** shows a simplified illustrative process for displaying locally-generated or remotely-generated video mosaic pages in accordance with one embodiment of the invention;

[0029] FIG. **10** shows a simplified illustrative process for populating video mosaic cells with extracted portions of local content in accordance with one embodiment of the present invention; and

[0030] FIG. **11** shows a simplified illustrative process for monitoring user behavior and displaying custom video mosaic pages in accordance with one embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0031] The systems and methods described herein are directed toward providing custom video mosaic pages. Although the term "video-rich navigation" or "VRN" is sometimes used herein when referring to the mosaic pages, system elements (e.g., the VRN client), and the mosaic environment, the present invention is compatible with any video mosaic environment. The VRN environment is just one example of a suitable implementation of a video mosaic environment, which is described in more detail in U.S. patent application Ser. No. 11/395,380.

[0032] As described in more detail below, these custom mosaic pages may display various types of video assets, including locally-recorded assets, in one or more video win-

dows, or cells, of the mosaic page. In addition to full-motion video and associated audio, these cells may also include still images, text, icons, logos, advertising, or any combination of these (or any other suitable) elements. The particular video assets included in the cells of the custom mosaic pages may be selected based on a number of criteria, such as active user monitoring and user preferences. In this way, the video mosaic pages of the present invention may provide a more personalized look and feel with significant relevance to the user.

[0033] FIG. **1** shows illustrative media system **100** for providing custom video mosaic pages. Central facility **10** may include content source **12**, VRN screen data source **14**, and distribution equipment **16**. Content source **12** may include any equipment suitable for producing or generating VRN pages or screens including MPEG-4 based compositing technologies and may receive content over any suitable network (e.g., a Gigabit Ethernet network). The video content from content source **12** may be in analog or digital form. In other embodiments, content source **12** may be in a facility other than central facility **10**, and may also provide content for distribution of regular television channels (e.g., broadcast programming and VOD content).

[0034] VRN screen data source **14** may be any equipment suitable for generating VRN screen data. For example, VRN screen data source **14** may be a personal-computer (PC) based system or a workstation. User interface **18** may be any suitable interface, such as a Windows-based or Unix-based graphic user interface (GUI), which allows, for example, an operator to define VRN definitional files and synchronize the VRN screen data of the definitional files with content from content source **12**. The user interface may allow an operator to, for example, specify transitions between distinct configuration specifications for selectable items in synchronization with video content. The user interface may also allow an operator to define control data which controls, inter alia, the appearance, functionality, and interactivity of the screen elements, as well as the content or asset displayed in a screen element.

[0035] The screen data may also include local functions calls to be executed on user equipment **30** (by either VRN client **31** or control circuitry **32**). The local function calls may be inserted into the screen data by central facility **10** or distribution facility **20**. The local function calls may return suitable data values, such as the local path to recording device **36** or other local storage within user equipment **30**, an identification of local content to be included in a music page, or any other suitable information. In some embodiments, the local functions are part of an application program interface (API) used to interface with VRN client **31**. VRN client **31** may automatically execute any local function calls embedded in the screen data immediately after receiving the screen data, or the instructions and function calls may be executed at some later time (e.g., when a user attempts to access or display the mosaic page). FIG. **8**, described below, shows illustrative mark-up language tags used to transmit local function calls within the screen data in some embodiments.

[0036] Compiler **20**, which may include any suitable combination of hardware and software, may compile or translate the VRN screen data of the definitional files into another format, such as binary, XML, or HTML format. In some embodiments, input from user interface **18** may be used to directly generate the screen data without need for compiler **20**.

[0037] Distribution equipment **16** may be any suitable equipment for distributing VRN pages from content source **12** and VRN screen data from VRN screen data source **14** over communications path **19** to distribution facility **20**, and further over communication path **28** for distribution to user equipment **30**. Central facility **10** may distribute the VRN pages and screen data to multiple distribution facilities **20**, but only one has been shown to avoid over-complicating the drawing. In other embodiments, central facility **10** may distribute the VRN pages and screen data to users at user equipment **30** directly. Distribution equipment **16** may distribute the VRN screens and VRN screen data in any suitable analog or digital format and over any suitable communications path (e.g., satellite or terrestrial broadcast or the Internet). VRN screen data may be distributed in-band or out-of-band with respect to the VRN pages. The screen data may also be sent synchronously with the VRN pages or asynchronously. For example, screen data, VRN pages, or both, may be sent at times of reduced network utilization.

[0038] Distribution facility **20** may be any facility (e.g., a cable headend) suitable for receiving the VRN screens and screen data and distributing the screens and screen data to user equipment **30**. There may be multiple users at multiple instances of user equipment **30**, but only one instance of user equipment has been shown to avoid over-complicating the drawing. Distribution facility **20** may include local insertion equipment **22** and content source **24** for allowing a local operator to insert content and data into the VRN screens or VRN screen data, respectively, and compile VRN screen data into binary format for transmission (if required). Local insertion equipment **22** may run, for example, a local version of user interface **18** and compiler **20**.

[0039] Distribution equipment **26** may distribute the VRN pages and VRN screen data in any suitable analog or digital format and over any suitable communications path to user equipment **30** (e.g., broadcast, cable, or the Internet.). The communication paths **19**, **49**, and **28** may include, for example, a satellite path, a fiber-optic path, a cable path, an Internet path, or any other suitable wired or wireless path. For example, VRN pages may be provided as MPEG-2 or MPEG-4 feeds. Distribution equipment **26** may provide each VRN page (and the VRN screen data) as a tunable analog or digital channel, or as a VOD stream (both of which are referred to herein as VRN channels). The VRN channels provide the users of user equipment **30** with a set of interactive features that make up a VRN application.

[0040] In some embodiments, distribution facility **20** may provide the VRN channel full-time over a given analog or digital channel. Alternatively, distribution facility **20** may provide VRN channels on-demand or during specific time intervals or using switched digital video technology.

[0041] Distribution facility **20** may provide one or more VRN applications to user equipment **30**. A VRN application may include one or more VRN pages, buttons, and associated functionality. For example, FIG. **4**, described in more detail below, shows a homepage display screen associated with an illustrative VRN "what's hot" application.

[0042] User equipment **30** may include any equipment suitable for providing an interactive media experience and for implementing the VRN applications provided by distribution facility **20**. User equipment **30** may include television equipment such as a television, set-top box, recording device, video player, user input device (e.g., remote control, keyboard, mouse, touch pad, touch screen, or voice recognition inter-

face), or any other device suitable for providing an interactive multimedia experience. For example, user equipment **30** may include a DCT 2000, 2500, 5100, 6208 or 6412 set-top box provided by Motorola, Inc. In some embodiments, user equipment **30** may include computer equipment, such as a personal computer with a television card (PCTV). In some embodiments, user equipment **30** may include a gaming system, a portable electronic device, such as a portable DVD player, a portable gaming device, a cellular telephone, a video phone, a PDA, a music player (e.g., MP3 player), or any other suitable portable or fixed device.

[0043] In the example of FIG. **1**, user equipment **30** includes control circuitry **32**, display device **34**, recording device **36**, user input device **38**, and VRN client **31**, all of which may be implemented as separate devices or as a single device. VRN client **31** may be implemented on user equipment **30** to receive, execute, and support VRN applications.

[0044] Control circuitry **32** is adapted to receive user input from input device **38** and execute the instructions of VRN client **31** and any other interactive applications running on user equipment **30**. Control circuitry **32** may include one or more tuners (e.g., analog or digital tuners), decoders (e.g., MPEG decoders), processors (e.g., Motorola 68000 family processors), memory (i.e., RAM and hard disks), communications circuitry (e.g., cable modem circuitry), input/output circuitry (e.g., graphics circuitry), connections to the various devices of user equipment **30**, and any other suitable component for providing analog or digital media programming and interactive media features. In one embodiment, control circuitry **32** may be included as part of one of the devices of user equipment **30** such as, for example, part of recording device **36**, display device **34**, or any other suitable device (e.g., a set-top box, television, or video player).

[0045] Display device **34** may include any suitable device such as, for example, a television monitor, an LCD screen, a computer monitor, or a display incorporated in user equipment **30** (e.g., a cellular telephone display or music player display). Display device **34** may also be configured to provide for the output of audio and/or other sensory output (e.g., a holographic projector or virtual reality simulator).

[0046] Recording device **36** may be a personal video recorder (PVR), digital video recorder (DVR), video cassette recorder (VCR), DVD-recorder, gaming device, digital audio library, or any other suitable recording device. Recording device **36** may include one or more tuners. In addition to storing programming assets, recording device **36** may also store video messages received by an attached or integrated video phone.

[0047] VRN client **31** may be implemented on user equipment **30** as a stand alone application or part of another interactive application, such as an interactive media guidance application (IMGA) or interactive program guide (IPG). One or more of the interactive applications may receive interactive application data from application data source **40**. As shown in FIG. **1**, the data may be received via distribution facility **20** over communication path **49**. Alternatively, the data may be received by user equipment **30** from application data source **40** over a direct communication path (not shown). Application data source **40** may also be part of central facility **10** or distribution facility **20**. In some embodiments, the interactive application data may include elements that are referenced in the VRN screen data for inclusion in the VRN application such as graphics, text, logos, advertising, and the like. VRN templates, for example, may be provided as part of interactive television application data.

[0048] Homepages (and other VRN screens or pages) delivered to user equipment **30** may include a number of interactive elements. Interactive elements may be highlighted, selected, or both. If the user navigates to a specific interactive element (e.g., by using the arrow keys on a remote control device), the interactive element may be visually highlighted in some fashion (e.g., a colored border may appear around the element). If the user selects a highlighted interactive element (e.g., by pressing the "OK" button on a remote control device), the system may display a specific tunable channel, VOD asset, VOD screen, recorded asset (e.g., a video message or some other programming recorded or stored on recording device **36**), or another interactive application screen, based on selection behavior specified for the interactive element in the VRN screen data.

[0049] Although, in the illustrated embodiment of FIG. **1**, VRN client **31** is internal to user equipment **30**, VRN client **31** may be implemented externally or partially implemented externally to user equipment **30**. For example, VRN client **31** may be implemented at central facility **10** or distribution facility **20** and may run using a client-server or distributed architecture where some of the application is implemented locally on user equipment **30** in the form of a client process and some of the application is implemented at a remote location in the form of a server process. VRN client **31** may also be implemented completely on any suitable server, computer equipment, or set-top box accessible by user equipment **30**.

[0050] FIG. **2** shows illustrative media system **200** with available content sources for use in the VRN pages of the present invention. Remote facility **202** may exist at a cable system headend or a remote MSO facility responsible for creating custom VRN pages and delivering these pages to user equipment **30**. In some embodiments, remote facility **202** is the same facility as central facility **10** or distribution facility **20** (both of FIG. **1**).

[0051] Remote facility **202** may include VRN compositing server **204**. VRN compositing server **204** may combine one or more video assets from linear content sources **208** and non-linear content sources **206** into a single display or VRN page. After generating the appropriate screen data, the page may then be transmitted to user equipment **30**. VRN compositing server **204** may include MPEG decoding, MPEG encoding, and MPEG transcoding circuitry. Additionally or alternatively, VRN compositing server **204** may communicate with remote devices that perform any of the aforementioned compositing, encoding, decoding, or transcoding functions.

[0052] Linear content sources **208** may include any content sources containing video assets transmitted or broadcast on a schedule. The video assets available from linear content sources **208** may include, for example, broadcast television programming, switched digital television, and pay-per-view programming. Non-linear content sources **206** may include any content sources containing video assets not transmitted or broadcast on a schedule. Example of non-linear content sources include Internet content and on-demand programming. VRN compositing server **204** may use content from one or both of linear content sources **208** and non-linear content sources **206** in compositing video assets to create a VRN page. For example, one cell in a VRN page may display a video from an Internet website, another cell in the same VRN

page may display broadcast television content, while still another cell may display on-demand programming.

[0053] In addition to compositing video assets from linear content sources **208** and non-linear content sources **206**, VRN compositing server **204** may also designate one or more cells in a VRN page as a placeholder cell. These placeholder cells may correspond to blank cells without a corresponding video asset presented in the cell location. Appropriate video may then be overlaid in the placeholder cell locations at user equipment **30**. For example, user equipment **30** may include MPEG compositing system **218**, which may include MPEG encoding, decoding, and transcoding circuitry. MPEG compositing system may extract video from DVR **220**, gaming device **222**, or memory **224** for use in populating placeholder VRN cells or locally-generated VRN pages. The extracted video may be a continuous or looping video segment from one or more video assets stored on these devices. If generating a locally-generated page, MPEG compositing system **218** may then create a composite feed with a plurality of video assets, including the video extracted from local assets, for use in a VRN page.

[0054] For example, DVR **220** may include hours of stored broadcast, on-demand, and pay-per-view programming. MPEG compositing system **218** may extract video segments from selected assets stored on DVR **220** and store these extracted segments back on DVR **220** or some other storage device (e.g., memory **224**). These extracted segments of continuous or looping video may be overlaid on one or more cells of a VRN page, such as the pages shown in FIGS. **4-7**, which are described in more detail below.

[0055] Similarly, MPEG compositing system **218** may also extract segments of video from gaming device **222** and from memory **224**. Gaming device **222** may include a plurality of interactive games stored on CD-ROM, cartridge, DVD, or any other suitable storage mechanism. MPEG compositing system **218** may extract video from gaming device **222** and store the video on DVR **220** or in memory **224**. Memory **224** may include any suitable memory or storage device, including hard drives, tape devices, optical drives, flash memory, RAM, ROM, and hybrid types of memory. The video extracted from gaming device **222** may also be overlaid on one or more cells of a VRN page, such as the pages shown in FIGS. **4-7**.

[0056] In certain systems used to create VRN pages, multiple videos are resized and composited in a grid configuration and then the entire grid of video is recompressed to create one video stream (e.g., a video elementary stream in MPEG-2 parlance) which is carried in one video pipe (a digital channel or single service multiplex in MPEG-2 parlance) corresponding to approximately 3 Mbps of data bandwidth. Alternatively or additionally, headend systems may take multiple videos, create a single video stream for each of the multiple videos and then multiplex the multiple video streams into a single transport multiplex (e.g., a multiple service transport multiplex in MPEG-2 parlance, corresponding to, for example, one 6 MHz band in North American cable systems). In this configuration, each of the elementary stream videos requires approximately 3 Mbps of bandwidth, and a typical 10 video multiplex may occupy 30 Mbps. Also in this configuration, one or more of these roughly 3 Mbps multiplexed videos may be composited videos as described above. The latter multiplexing may be done not for the purposes of mosaic presentation, but rather as a means of packing multiple videos into a single band of frequency corresponding to a 64 or 256 QAM modulator. However, one embodiment of the present invention uses the multiplexing capability of MPEG-2 (or any multiplexing transport such as Internet protocol (IP) or ATM) to flexibly bundle the videos corresponding to the remotely supplied video elements of a VRN page but with the recognition that the bundled videos will be composited together in the user equipment device. Thus, the spatial resolution and size may be adjusted accordingly at the headend before multiplexing the videos. Each adjusted video will thus take less bandwidth to send than its corresponding full resolution source video (e.g., less than 80%), but by not compositing these adjusted videos in the headend, this approach allows flexibility in the user equipment device for compositing while also saving bandwidth. The multiplexed videos may then be demultiplexed and optionally decompressed at the user equipment device.

[0057] In some embodiments, additional local video assets may be available for display in one or more cells of a VRN page. For example, video messages stored in memory **224**, DVR **220**, or an attached or integrated videophone may populate cells of a VRN page. MPEG compositing system **218** may encode these video assets into a suitable MPEG (e.g., MPEG-2 or MPEG-4) format for presentation on a VRN page, if required.

[0058] In a typical usage scenario, a multi-video feed is composited (at least partially) by VRN compositing server **204** at remote facility **202**. As described above, the composited feed may include a plurality of video assets, each positioned in a cell location. Certain cell locations, such as those corresponding to placeholder cells may have no associated video when the feed is composited. The video assets for these cells may be selected and overlaid by VRN client **31**. After the user equipment device receives the VRN feed, VRN client **31** may process the transmission and prepare the page for display. In the process of preparing the page for display, VRN client **31** may analyze the cell definitions contained in the screen data (which may be transmitted with the VRN page or over a separate channel). VRN client **31** may then instruct control circuitry **214** to execute any local functions that may be referenced within the screen data. In executing the local functions, control circuitry **32** may access (or cause MPEG compositing system **218** to access) one or more video segments from DVR **220**, gaming device **222**, and/or memory **224**. After all the video sources for the VRN page are located, VRN client **31** may display the VRN page with local assets overlaid on the page in one or more cell locations. In this way, the cells of the VRN page may be populated with assets from various sources, including local sources.

[0059] In lieu of receiving the VRN page from remote facility **202**, VRN pages may also be entirely or partially locally-generated in accordance with the present invention. Locally-generated pages may be fully composited at user equipment **30** in some embodiments. To composite a page locally, MPEG compositing system **218** may create a composited multi-video interactive page. The video sources used in the composited multi-video interactive page may include any sources accessible by user equipment **30**, including local content, content from linear sources **208**, and content from non-linear sources **206**. This provides a more flexible alternative to remotely-generated pages.

[0060] In some cases, the difference between compositing a VRN page locally and remotely may be significant. For example, a VRN page with few or no local assets may be more efficiently composited at remote facility **202**, while pages

with more local assets may benefit from local composition. In addition, at least partial local composition allows for dynamic VRN page creation and customization based on active user monitoring, user behavior, and user preferences, as described in more detail below.

[0061] FIG. **3** shows illustrative generic video mosaic display screen **300**. In the example of FIG. **3**, screen **300** contains eight numbered cells, or windows. Each of these eight cells may be populated with a different video asset or channel. For example, cell **302** may include full-motion video from channel "225 Cinemax" while cell **303** may contain promotional advertising for new VOD movie releases. Each of the cells in display **300** may be individually selected using input device **38** (FIG. **1**). For example, the user may highlight a cell in display **300** using the arrow or cursor keys on a remote control. In the example of FIG. **3**, cell **303** is currently highlighted, as shown by the darkened border around the cell. One or more cells may be simultaneously selected, if desired. For example, upon pressing an "OK" key on input device **38** (FIG. **1**), the selected status of a cell may toggle on and off. The user may then select one or more additional cells in the same manner.

[0062] In some embodiments, a selected subset of cells can be used to form a new custom VRN page. For example, in such embodiments, a user may select cells **302** and **303** from FIG. **3** and then enter a "create custom VRN page" command (e.g., by selecting such a command from an on-screen menu or option button). Other combinations of cell selection as well as selection of cells from a combination of other different custom or system standard VRN screens and/or grid-listed assets are also possible.

[0063] The number, location, size, and shape of the cells in display **300** may be altered without departing from the spirit of the invention. As described above, screen data may be used to define the elements in a VRN page. This data may define more or fewer than eight cells and cells of different sizes, positions, and shapes than those shown in FIG. **3**.

[0064] VRN display screen **300** may also include one or more of vertical option buttons **304** and horizontal option buttons **306**. These buttons may link screen **300** to other VRN screens, the main interactive media guidance application screen, or perform any suitable functionality. For example, one button may select all the numbered cells in screen **300**, while another button may deselect all the numbered cells in screen **300**.

[0065] The cells in VRN display screen **300** may be populated with content from similar sources or mixed-mode sources. For example, one cell may contain broadcast television content, while another cell may contain on-demand content. Still another cell may contain local DVR content. The sources of the cells in VRN display screen **300** may be determined by the creator of the VRN page. For example cells **1**, **2**, **3**, and **4** may display video assets that were composited into a multi-video feed remote from the user equipment. The remaining cells (i.e., cells **5**, **6**, **7**, and **8**) may be placeholder cells, which are overlaid with video assets at the user equipment device. In some embodiments, the placeholder cells may be overlaid with local content, such as locally-recorded content.

[0066] FIGS. **4-7** show illustrative VRN homepages **400** (FIG. **4**), **500** (FIG. **5**), **600** (FIG. **6**), and **700** (FIG. **7**). Each of these homepages may be remotely-generated or locally-generated. In some embodiments, VRN pages displaying one or more local assets, such as video loops of content recorded on DVR **220** (FIG. **2**), may be locally-generated. Each of homepages **400** (FIG. **4**), **500** (FIG. **5**), **600** (FIG. **6**), and **700** (FIG. **7**) may be accessible through a particular digital television channel. Any of the video cells in the homepages of FIGS. **4-7** may be individually selected using input device **38** (FIG. **1**). After selecting a cell, one or more screens of additional information about the asset currently being presented in the selected cell may be displayed. Additionally or alternatively, after selecting any cell in the homepages of FIGS. **4-7**, the asset currently being presented in the selected cell may be automatically accessed and presented in full-screen mode. For example, a digital television channel may be tuned, local content may be accessed, or a request for an on-demand asset may be transmitted by the user equipment in response to the user selection of a video cell.

[0067] Although homepages **400** (FIG. **4**), **500** (FIG. **5**), **600** (FIG. **6**), and **700** (FIG. **7**) show a number of video cells (including main cells and thumbnail cells), the number, size, and position of these cells may be altered without departing from the spirit of the invention.

[0068] FIG. **4** shows illustrative "what's hot" VRN homepage **400** in accordance with one embodiment of the invention. A user may be presented with homepage **400** after selecting an appropriate button on input device **38** (FIG. **1**). For example, a "Home Page" button may provide direct access to homepage **400**. In some embodiments, homepage **400** may be optionally locked, requiring a valid parental control access code input in order to view the page. Homepage **400** may include main cell **406**, thumbnail cells **402**, **403**, **404**, and **405**, PIP window **416**, and option buttons **407**. Main cell **406** and thumbnail cells **402**, **403**, **404**, and **405** may both be VRN cells, capable of displaying full-motion video. In some embodiments, main cell **406** is approximately four times larger in size than thumbnail cells **402**, **403**, **404**, and **405**.

[0069] In the depicted embodiment, thumbnail cells **402**, **403**, **404**, and **405** present video assets from various local and remote sources. For example, thumbnail cell **402** may present a home video recorded to a local recording device, such as DVR **220** (FIG. **2**). Thumbnail cell **403** may present, for example, an Internet video clip. Thumbnail cell **404** may present, for example, a broadcast television sporting event, and thumbnail cell **405** may present, for example, an on-demand cartoon.

[0070] The selection of video assets to display in thumbnail cells **402**, **403**, **404**, and **405** may be based on a number of criteria. For example, the cells may contain the video assets most recently or most frequently accessed by a user of user equipment **30** (FIG. **2**). The cells may also contain the video assets most recently or most frequently accessed by all users of media system **100** (FIG. **1**). In some embodiments, VRN client **31** may maintain a listing or database table (not shown) of "hot content," including an identification of local assets (such as recorded programming), broadcast programming, on-demand assets, and Internet assets. The listing of hot content may be specific to a single user of user equipment **30**, a group of users of user equipment **30**, or a group of user equipment devices in media system **100** (FIG. **1**). The assets listed in the listing or table of hot content may include featured assets selected by the MSO or service provider, assets meeting a certain threshold criteria (e.g., assets recently accessed by the user within a certain period of time, assets accessed a certain number of times, or any other suitable criteria), or any combination of the aforementioned assets. The listing or table may be transmitted from central facility **10**

(FIG. **1**) or distribution facility **20** (FIG. **1**) in some embodiments. VRN client **31** may access the listing or record of hot content to determine what content should be presented in thumbnail cells **402**, **403**, **404**, and **405**.

[0071] If the video feed corresponding to homepage **400** is remotely-generated (i.e., composited remote from the user equipment), some of the video assets presented on the page may be overlaid at the user equipment. For example, if cell **404** corresponds to a locally-recorded content accessible from DVR **220** (FIG. **2**), then this video asset may be overlaid in the appropriate location for cell **404**. From the user's point of view, whether the page is remotely-generated or locally-generated may be completely transparent to the user.

[0072] Option buttons **407** may provide for single-selection access to a variety of commonly-used features. For example, option button **408** may link the user to an interactive media guidance application. Option button **410** may link the user to an on-demand listings screen or VRN page, such as homepage **500** (FIG. **5**). Option button **412** may link the user to a DVR listings screen or VRN page, such as homepage **600** (FIG. **6**). Option button **414** may link the user to a favorites listings screen or VRN page, such as homepage **700** (FIG. **7**).

[0073] FIG. **5** shows illustrative "what's hot on-demand" VRN homepage **500**. Homepage **500** may be similar to homepage **400** of FIG. **4** and may include main cell **506**, thumbnail cells **502**, **503**, **504**, and **505**, and option buttons **507**. Unlike thumbnail cells **402**, **403**, **404**, and **405** (FIG. **4**), which may display content from a variety of different sources, thumbnail cells **502**, **503**, **504**, and **505** may display on-demand assets only. In some embodiments, the assets displayed in thumbnail cells **502**, **503**, **504**, and **505** may be selected by the MSO or service provider. For example, the newest or most popular on-demand releases may be displayed in thumbnail cells **502**, **503**, **504**, and **505**. In other embodiments, thumbnail cells **502**, **503**, **504**, and **505** may display on-demand content recently accessed by, or currently bookmarked on, user equipment **30** (FIG. **1**).

[0074] FIG. **6** shows illustrative "what's hot in my DVR" VRN homepage **600**. Homepage **500** may be similar to homepage **400** of FIG. **4** and may include main cell **606**, thumbnail cells **602**, **603**, **604**, and **605**, and option buttons **607**. Unlike thumbnail cells **402**, **403**, **404**, and **405** (FIG. **4**), which may display content from a variety of different sources, thumbnail cells **602**, **603**, **604**, and **605** may display locally recorded assets only. For example, in some embodiments, thumbnail cells **602**, **603**, **604**, and **605** may display locally recorded assets recently (or frequently) accessed by user equipment **30** (FIG. **1**). Thumbnail cells **602**, **603**, **604**, and **605** may display continuous or looping portions of the locally recorded assets.

[0075] For example, MPEG compositing system **218** (FIG. **2**) may extract local loops of video from locally recorded assets and optionally store them in memory **224** (FIG. **2**) or onto DVR **220** (FIG. **2**). The local compositing system may then generate the VRN page locally with one or more of the extracted video loops presented in thumbnail cells **602**, **603**, **604**, and **605**. The portion of the locally recorded asset to extract for use in the VRN homepage may be determined by a scene selection algorithm. The algorithm may identify scene changes within a video asset (e.g., by analyzing the video and/or audio components of the asset using an unsupervised segmentation algorithm, motion estimation algorithm, or any other suitable algorithm). In some embodiments, the scene selection algorithm may also use user viewing behavior or preferences to determine which portions of the locally recorded content to extract for use in VRN homepage **600**. For example, if a certain portion of a locally recorded video asset (e.g., the user's favorite scene from a movie or favorite replay from a sporting event) is watched more frequently than other portions, this portion may be selected by the scene selection algorithm for extraction. In some embodiments, user preferences, such as a favorite programs list, are accessed in order to determine which locally recorded assets are selected for presentation in VRN homepage **600**. VRN homepage **600** may also present the user's four most recently or frequently accessed recordings in thumbnail cells **602**, **603**, **604**, and **605**.

[0076] FIG. **7** shows illustrative "what's hot that I might like" VRN homepage **700**. Homepage **700** may be similar to homepage **400** of FIG. **4** and may include main cell **706**, thumbnail cells **702**, **703**, **704**, and **705**, and option buttons **707**. Like thumbnail cells **402**, **403**, **404**, and **405** (FIG. **4**), thumbnail cells **702**, **703**, **704**, and **705** may display content from a variety of different sources (i.e., homepage **700** may be a "mixed-mode" page). For example, cell **702** may display a feature on-demand movie, cell **703** may display a live broadcast television program, cell **704** may display an Internet video, and cell **705** may display a locally recorded video.

[0077] The content displayed in thumbnail cells **702**, **703**, **704**, and **705** may be selected based on a number of criteria. For example, the user may create a user profile including the user's favorite genres, sports teams, actors, directors, or any other suitable information. Using the profile data, VRN client **31** (FIG. **2**) may select any assets accessible by user equipment **30** (FIG. **1**) for display in thumbnail cells **702**, **703**, **704**, and **705** that matches one or more of the user's preferences. The user's profile may also be supplemented with data obtained from active user monitoring. For example, all interaction with user equipment **30** (FIG. **1**) may be monitored and optionally logged. The amount of time assets are displayed, the sources of accessed assets, the genres of accessed assets, and any other suitable information may be included in the user's profile. In this way, the user's profile may contain a record of all the assets that have been accessed by the user equipment and the length of time each asset was presented. VRN client **31** (FIG. **1**) may use this information when selecting video assets for cells of VRN pages, like VRN homepage **700**.

[0078] FIGS. **8**A and **8**B shows illustrative mark-up language files **800** and **810**. File **800** may be associated with unique name **802** and one or more mark-up language tags in body **804**. Body **804** may include HTML, XML, and/or SGML tags in some embodiments. The tags in body **804** may include cell definitions for all or a subset of cells in a VRN page, such as VRN homepages **400** (FIG. **4**), **500** (FIG. **5**), **600** (FIG. **6**), and **700** (FIG. **7**). As shown in the example of FIG. **8**A, an identification of the content to include in cell **1** of the VRN page is provided in the "c_name" tag. This tag references a local function call to be executed on user equipment **30** (FIG. **1**). The source of the cell and the local path of the content to display in the cell are provided by the "getHotDVRsource" and "getHotDVRPath" functions, respectively. Body **804** may also include an indication of selected portions of the content to use as video loops in the VRN cell. Finally, body **804** may define action data for the cells in the VRN page, such as response behavior to highlighting or selecting a cell.

[0079] FIG. **8**B shows mark-up language file **810** associated with unique name **812**. File **810** may correspond to the

local version of file **800** after being processed by VRN client **31** (FIG. **1**). For clarity, the local function calls have been executed and the data returned by the function calls placed inside the appropriate tags. For example, the "getHotDVRPath" function returned the path to a locally recorded asset "/local/dvr1/00004.mp2". Each function call to "getHotDVRPath" may return the path to a different "hot" locally recorded asset, based on the user preference data and monitoring described above. VRN client **31** (FIG. **2**) may read the received cell definitions from the mark-up language files to determine the if any placeholder cells exist on the page. If so, VRN client (FIG. **2**) may execute the local functions to determine the identity of the video assets to be displayed in the placeholder cells. The VRN client may then overlay the appropriate video assets in the position of the placeholder cells and display the page. More or fewer tags than those defined in body **814** and **804** may be used in other embodiments.

[0080] FIG. **9** shows illustrative process **900** for generating a VRN page in accordance with one embodiment of the invention. At step **902**, a request is received for a VRN page. For example, the user may press a "Homepage" button on input device **38** (FIG. **1**) or tune to a certain digital channel. At step **904**, VRN client **31** (FIG. **2**) may determine if the requested VRN page is remotely-generated or locally-generated. If the page is remotely-generated, at step **906** screen data may be received for the page. For example, VRN screen data source **14** (FIG. **1**) may generate screen data and transmit the generated screen data to distribution facility **20** (FIG. **1**). Distribution facility **20** (FIG. **1**) may then, in turn, transmit the screen data to user equipment **30** (FIG. **1**). The screen data may define user response behaviors for any of the selectable cells in the mosaic page. In addition, one or more placeholder cells may be defined in the screen data. The placeholder cell definition may include an indication of the placeholder cell's size, location (e.g., x and y coordinates) or any other suitable information.

[0081] The received screen data is then parsed by VRN client **31** (FIG. **2**) at step **908**. The VRN client may then determine, at step **918**, whether the screen data defines one or more placeholder cells. For example, mark-up language file **800** (FIG. **8**) may designate one or more cells as placeholder cells. The screen data may also reference several local function calls for each placeholder cell. These local function calls may return any suitable data or variables on the local user equipment device. For example, file system paths, asset source identifiers, pointers to media assets, or any other suitable information may be returned by the local function calls. At step **920**, if the screen data defines a placeholder cell, video is overlaid on the mosaic display in the position of the placeholder cell.

[0082] If, at step **904**, a determination is made that the VRN page is to be locally-generated, at step **910** VRN client **31** (FIG. **2**) may locate the video sources for the requested VRN page. For example, if the user has requested "what's hot in my DVR" homepage **600** (FIG. **6**), user profile information (including user monitoring data) may be accessed to determine what assets should populate the cells in the VRN page. At step **912**, VRN client **31** (FIG. **2**) may determine whether any local sources are selected for inclusion in the VRN page. If the cells do not display any local content, at step **914** the remote video sources may be accessed. If one more of the cells do display local content, an extracted video loop of the content may be accessed at step **916**. For example, MPEG compositing system **218** (FIG. **8**) may extract selected portions of video from one or more locally recorded assets.

[0083] At step **922**, the VRN page may be generated. For example, if the page is remotely-generated, all the video sources may be composited at the remote compositing location into a single video feed and displayed in an interactive page, such as the homepages shown in FIGS. **4-7**. If the page is remotely-generated, the video feed and any video overlays may be combined into a single display at the user equipment device. In general, the page may be streamed to the source of at least one of the video sources to be displayed in the VRN for further compositing, if desired. The VRN page may then be displayed to the user at step **924**. For example, control circuitry **32** (FIG. **1**) may cause the page to be displayed on display device **34** (FIG. **1**).

[0084] In practice, a flexible mix of compositing at the remote location and local compositing may be combined with sourcing video from remote and local sources. As such, one or more steps shown in process **900** may be repeated, combined with other steps, performed in any suitable order, performed in parallel (e.g., simultaneously or substantially simultaneously) or removed. Additionally, in some embodiments, compositing may be done remotely while screen data is generated locally or vice versa.

[0085] FIG. **10** shows illustrative process **1000** for populating a VRN cell with local content. At step **1002**, screen data may be received or generated. If the page is remotely-generated, screen data may be received from a remote location (e.g., distribution facility **20** of FIG. **2**). This screen data may define one or more cells of a VRN page. For example, the screen data may include an identification of the source of one or more cells, an identification of the content of one or more cells, action data for responding to user behavior (e.g., the selection of one or more cells), and any other suitable information. At step **1004**, VRN client **31** (FIG. **1**) may determine if the screen data references any local sources. For example, content stored in DVR **220** (FIG. **2**), gaming device **222** (FIG. **2**), or memory **224** (FIG. **2**) may be referenced by the screen data. In lieu of actually referencing a local source, a local function call may return a local source, as described above.

[0086] If, at step **1004**, the screen data references a local source, a determination is made at step **1006** whether a video loop of the local source exists on the user equipment. If a local video loop does exist, it may be accessed at step **1008**. If a local video loop does not exist, a portion of the local source may be selected for a video loop segment at step **1010**. For example, a scene selection algorithm may be used in some embodiments to identify new or changing scenes within a video asset. The scene selection algorithm may also access user profile information to determine what portion to select for the video loop segment. For example, the scene selection algorithm may select a more frequently watched portion of a video asset, if one exists, for the video loop segment.

[0087] At step **1012**, the selected portion of video may be extracted from the video asset and stored to the user equipment device. For example, MPEG compositing system **218** (FIG. **2**) may extract the selected portion and store it as an MPEG-2 file in memory **224** (FIG. **2**) or on DVR **220** (FIG. **2**). At step **1014**, the VRN page may be rendered with the local video loop overlaid in the position of a video cell, such as thumbnail cell **402**, **403**, **404**, or **405** (FIG. **4**). Finally, at step **1016**, the VRN page may be displayed with the local video loops to the user.

[0088] In practice, one or more steps shown in process **1000** may be repeated, combined with other steps, performed in any suitable order, performed in parallel (e.g., simultaneously or substantially simultaneously) or removed.

[0089] FIG. **11** shows illustrative process **1100** for presenting a custom VRN page based on user profile information, user monitoring, or both. At step **1102**, user behavior is monitored and optionally logged to the user equipment. For example, some application process implemented on user equipment **30** may monitor all interaction with the user equipment, including content access requests, frequently watched programs and genres, and any other suitable characteristics. In addition, the user may have a profile saved to the user equipment. If a user profile is defined at step **1104**, the profile data is read at step **1106**. This profile data may include various content preferences for the user. For example, the user may select his or her favorite program, sports team, actor, director, genre, or any other suitable preference.

[0090] After reading the user profile data at step **1106**, local content may be selected for display in one or more custom VRN pages at step **1110**. The content selected may be based on both user profile data and user behavior. If a user profile is not defined for the current user at step **1104**, local content may be selected for presentation in one or more custom VRN pages at step **1108** based on monitored user behavior. For example, VRN homepage **400** (FIG. **4**) may include local content recently or frequently accessed by the user in one or more of thumbnail cells **402**, **403**, **404** and **405** (FIG. **4**).

[0091] At step **1112**, the VRN page is generated or updated. For example, MPEG compositing system **218** (FIG. **2**) may extract video loops of local content as described above. VRN client **31** (FIG. **2**) may then swap out one or more VRN cells with the new local content selections. In this way, the user may be presented with custom VRN pages including one or more cells of local content that are particularly relevant to the user. Each time the custom page is displayed, new video assets may be presented in the page, depending on the user's viewing habits, preferences, and user monitoring information.

[0092] In practice, one or more steps shown in process **1100** may be repeated, combined with other steps, performed in any suitable order, performed in parallel (e.g., simultaneously or substantially simultaneously) or removed.

[0093] The above described embodiments of the invention are presented for purposes of illustration and not of limitation, and the present invention is limited only by the claims which follow.

What is claimed is:

1. A method for displaying a video mosaic page on a user equipment device, the method comprising:

receiving a video feed comprising a plurality of video assets for display in a video mosaic page;

receiving screen data that defines at least one placeholder video cell in the video mosaic page and an action to be performed in response to a user selection of the at least one placeholder video cell;

overlaying at least one local video asset on the video feed in a position corresponding to the at least one placeholder video cell; and

displaying the video feed and local video asset in an interactive display.

2. The method of claim **1** wherein the action to be performed in response to a user selection of the at least one placeholder video cell is selected from the group consisting of tuning to a video asset, displaying more information, displaying an advertisement, setting a reminder, and recording a program.

3. The method of claim **1** further comprising:

receiving a user selection of one of the plurality of video assets in the interactive display; and

displaying the selected video asset in full-screen mode in response to receiving the user selection.

4. The method of claim **1** further comprising monitoring user interaction with the user equipment device and saving user interaction information to a user profile.

5. The method of claim **4** further comprising selecting the at least one local video asset based on the user interaction information in the user profile.

6. The method of claim **4** further comprising saving user viewing preferences to the user profile.

7. The method of claim **6** further comprising selecting the at least one local video asset based on the user interaction information and the user viewing preferences in the user profile.

8. The method of claim **1** wherein overlaying at least one local video asset comprises extracting a video loop from the at least one local video asset and overlaying the extracted video loop.

9. The method of claim **8** further comprising selecting a specific portion of the local video asset for the extracting using a scene change algorithm.

10. The method of claim **9** where the scene change algorithm is selected from the group consisting of an unsupervised segmentation algorithm and a motion estimation algorithm.

11. The method of claim **1** wherein the plurality of video assets are selected from the group consisting of broadcast video assets, multicast video assets, on-demand video assets, pay-per-view video assets, and Internet video assets.

12. The method of claim **1** wherein the local video asset is selected from the group consisting of locally-recorded video, games, interactive applications, and videophone messages.

13. The method of claim **1** wherein the screen data defines the size or the position of the at least one placeholder cell in the video mosaic page.

14. The method of claim **1** wherein the screen data is locally generated.

15. The method of claim **1** wherein the video feed comprises a remotely composited video that was composited by a compositing facility that is remote from the user equipment device, the composited video comprising two or more component videos wherein at least one of the component videos is sourced by the user equipment device to the remote compositing facility.

16. The method of claim **1** wherein the video feed comprises a video multiplex with the plurality of video assets multiplexed together, wherein each video asset is carried in a separate video stream that is distinct from the other video streams and wherein the number of pixels of each video asset corresponds to less than 80% of those that would nominally fill the entire display of the user equipment device.

17. The method of claim **16** further comprising decompressing at least one of the plurality of video assets and compositing the decompressed video assets with at least one local video asset, wherein the position of the composited local video asset corresponds to the position of the at least one placeholder video cell.

18. A system for displaying a video mosaic page on a user equipment device, the system comprising:

a memory for storing at least one local video asset; and

control circuitry configured to:

receive a video feed comprising a plurality of video assets for display in a video mosaic page;

receive screen data that defines at least one placeholder video cell in the video mosaic page and an action to be performed in response to a user selection of the at least one placeholder video cell;

overlay the at least one local video asset on the video feed in a position corresponding to the at least one placeholder video cell; and

display the video feed and local video asset in an interactive display.

19. The system of claim **18** wherein the action to be performed in response to a user selection of the at least one placeholder video cell is selected from the group consisting of tuning to a video asset, displaying more information, displaying an advertisement, setting a reminder, and recording a program.

20. The system of claim **18** wherein the control circuitry is further configured to:

receive a user selection of one of the plurality of video assets in the interactive display; and

display the selected video asset in full-screen mode in response to receiving the user selection.

21. The system of claim **18** wherein the control circuitry is further configured to monitor user interaction with the user equipment device and save user interaction information to a user profile.

22. The system of claim **21** wherein the control circuitry is further configured to select the at least one local video asset based on the user interaction information in the user profile.

23. The system of claim **21** wherein the control circuitry is further configured to save user viewing preferences to the user profile.

24. The system of claim **23** wherein the control circuitry is further configured to select the at least one local video asset based on the user interaction information and the user viewing preferences in the user profile.

25. The system of claim **18** wherein the control circuitry is configured to overlay at least one local video asset by extracting a video loop from the at least one local video asset and overlaying the extracted video loop.

26. The system of claim **25** wherein the control circuitry is further configured to select a specific portion of the local video asset for the extracting using a scene change algorithm.

27. The system of claim **26** where the scene change algorithm is selected from the group consisting of an unsupervised segmentation algorithm and a motion estimation algorithm.

28. The system of claim **18** wherein the plurality of video assets are selected from the group consisting of broadcast video assets, multicast video assets, on-demand video assets, pay-per-view video assets, and Internet video assets.

29. The system of claim **18** wherein the local video asset is selected from the group consisting of locally-recorded video, games, interactive applications, and videophone messages.

30. The system of claim **18** wherein the screen data defines the size or the position of the at least one placeholder cell in the video mosaic page.

31. The system of claim **18** wherein the screen data is locally generated.

32. The system of claim **18** wherein the video feed comprises a remotely composited video that was composited by a compositing facility that is remote from the user equipment device, the composited video comprising two or more component videos wherein at least one of the component videos is sourced by the user equipment device to the remote compositing facility.

33. The system of claim **18** wherein the video feed comprises a video multiplex with the plurality of video assets multiplexed together, wherein each video asset is carried in a separate video stream that is distinct from the other video streams and wherein the number of pixels of each video asset corresponds to less than 80% of those that would nominally fill the entire display of the user equipment device.

34. The system of claim **33** wherein the control circuitry is further configured to decompress at least one of the plurality of video assets and composite the decompressed video assets with at least one local video asset, wherein the position of the composited local video asset corresponds to the position of the at least one placeholder video cell.

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