FIG. 9

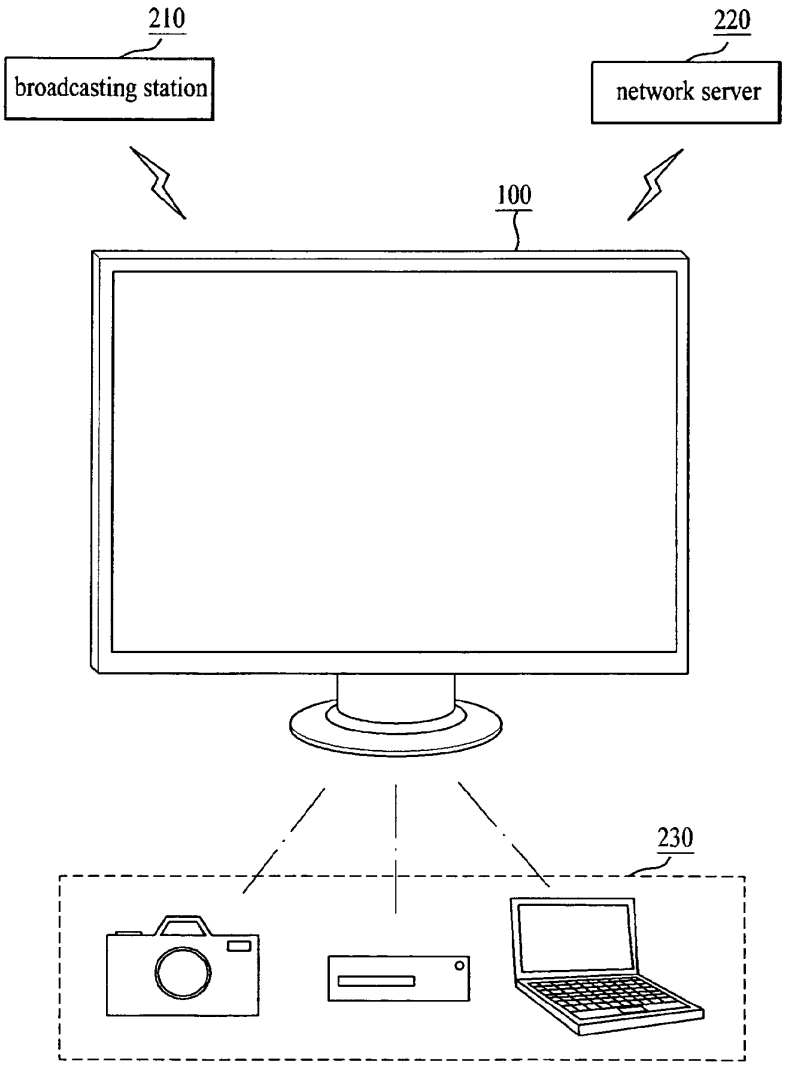

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FIG. 10

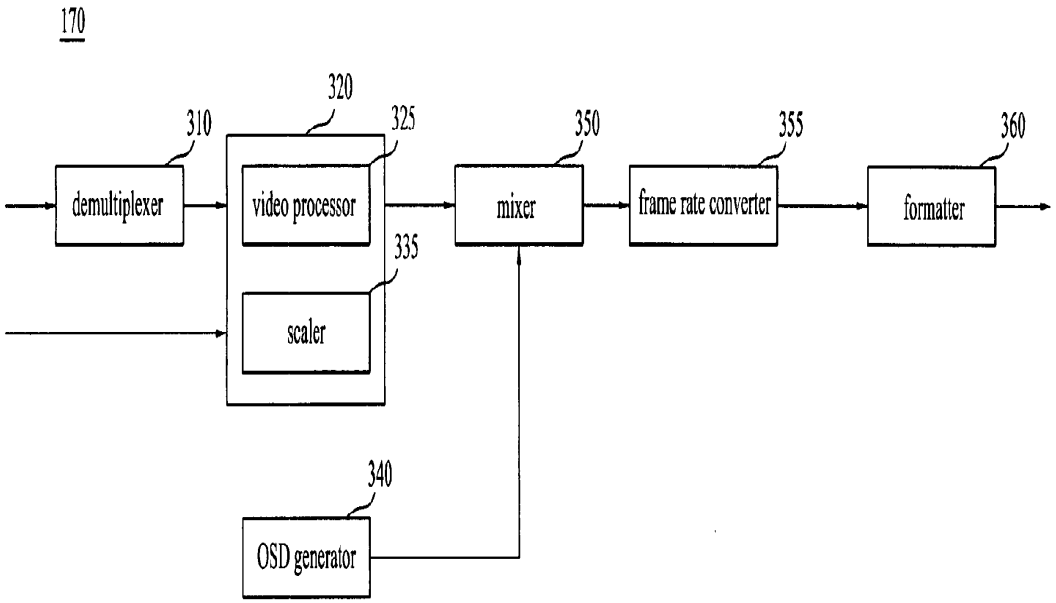
170
320
310
325
350
355
360
demultiplexer
video processor
mixer
frame rate converter
formatter
335
scaler
340
OSD generator

FIG. 11

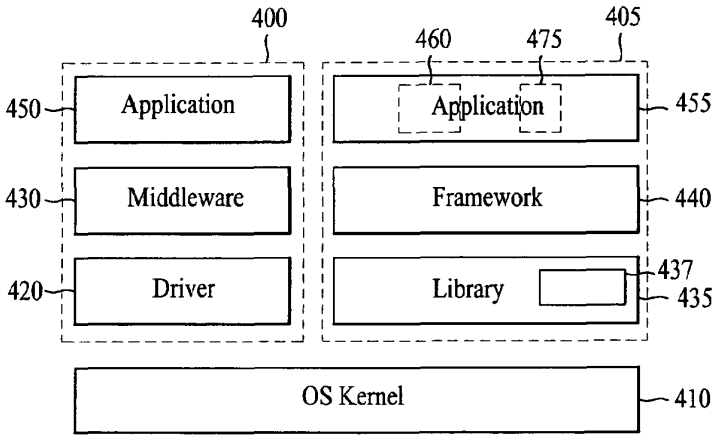

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FIG. 12

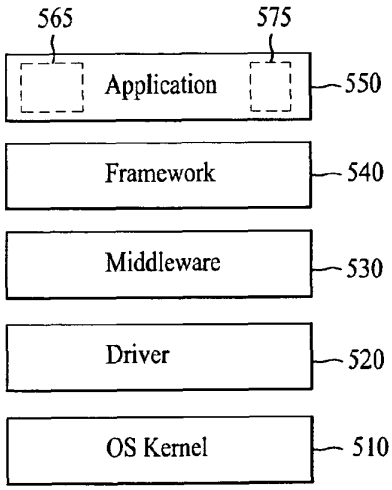

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FIG. 13

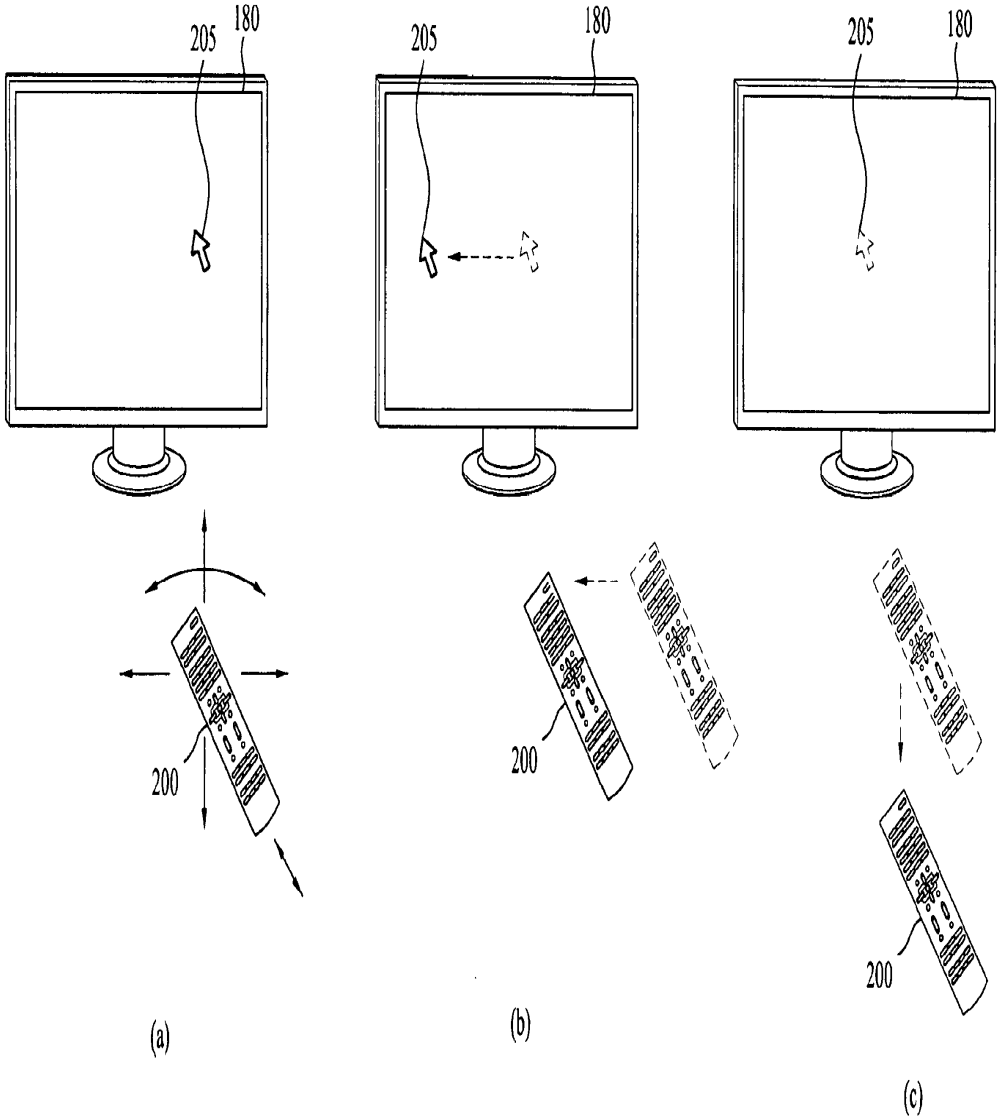

FIG. 14

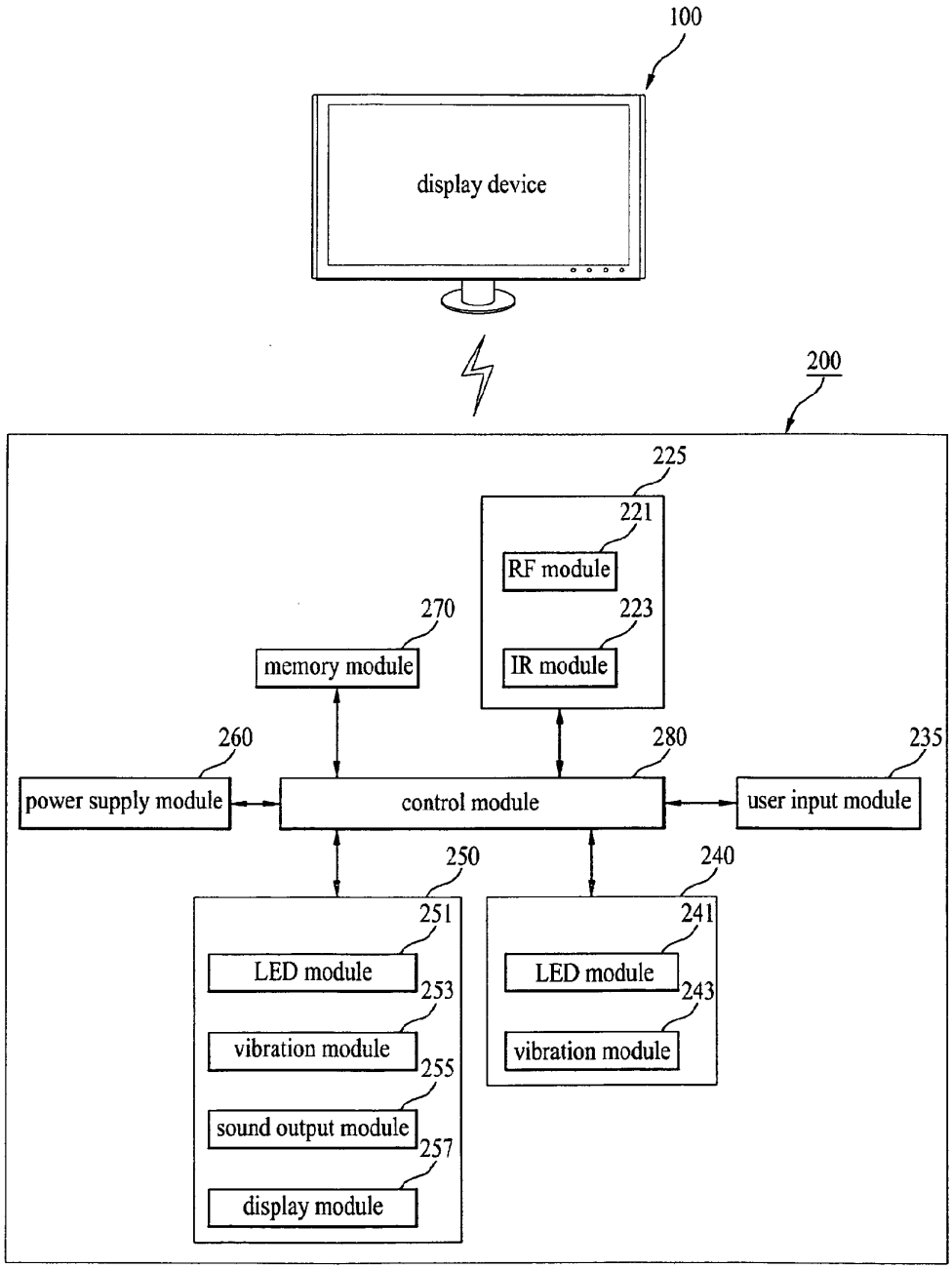

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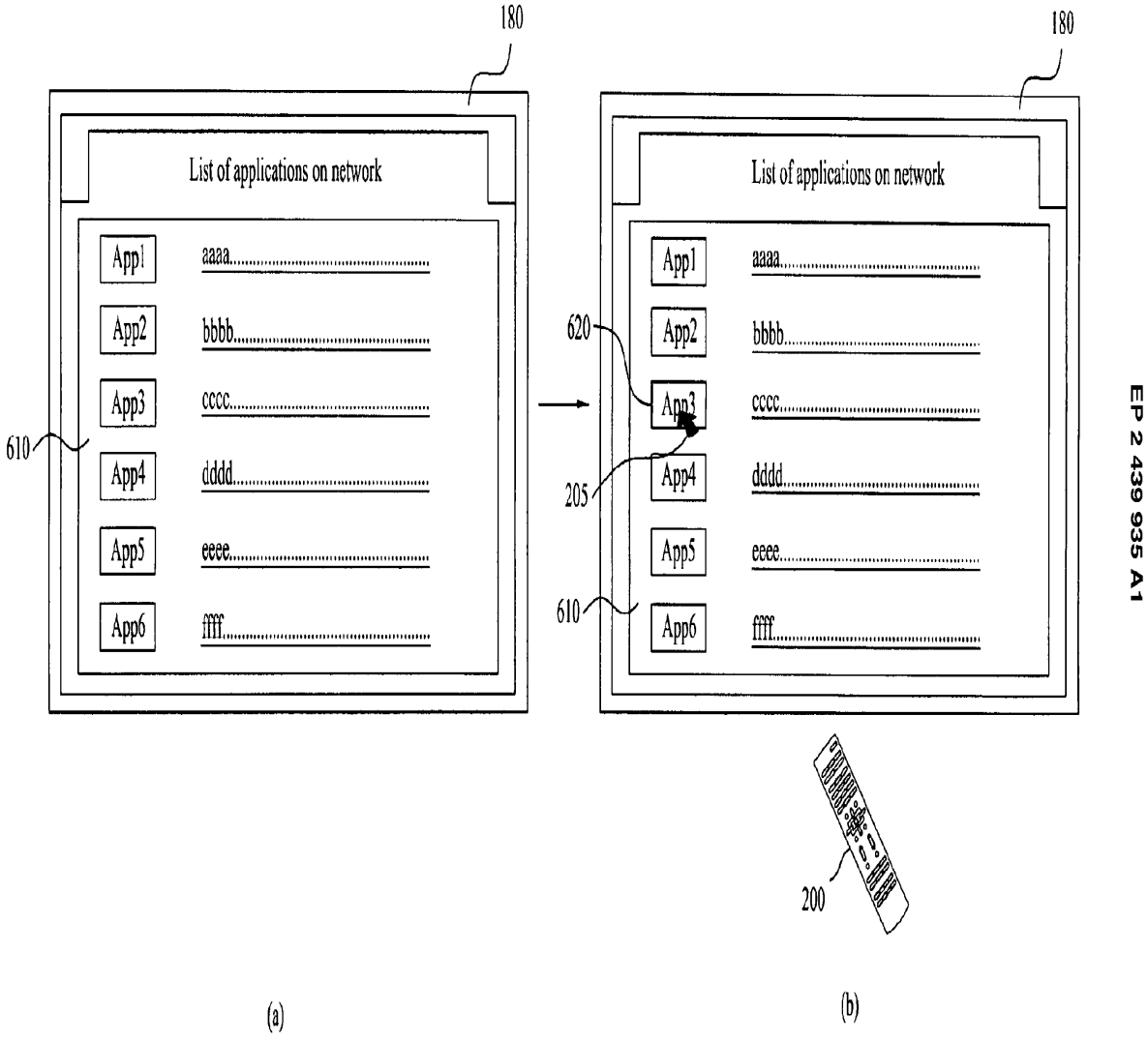
FIG. 15



EP 2 439 935 A1

FIG. 16

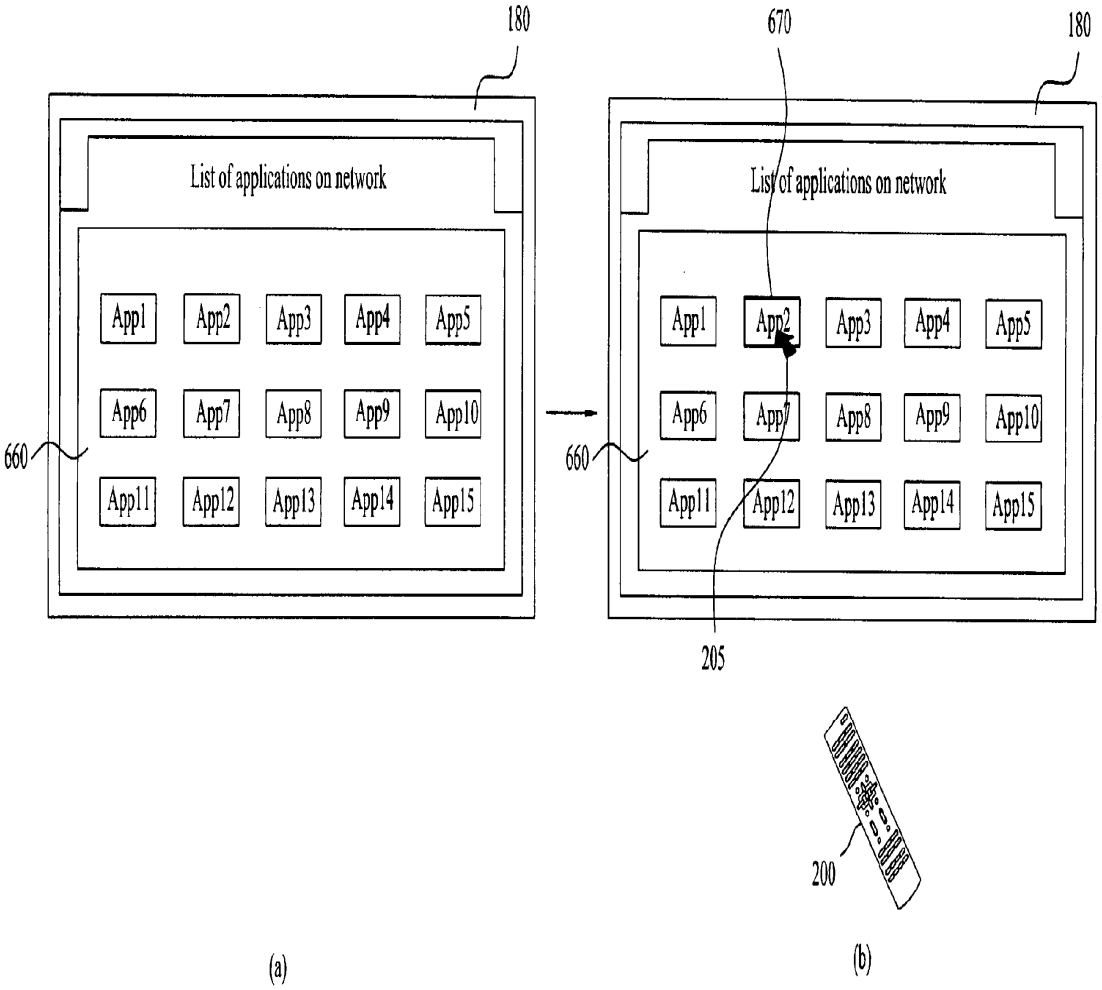

180
List of applications on network
App1
App2
App3
App4
App5
App6
App7
App8
App9
App10
App11
App12
App13
App14
App15
660
670
180
List of applications on network
App1
App2
App3
App4
App5
App6
App7
App8
App9
App10
App11
App12
App13
App14
App15
660
205
200
(a)
(b)

FIG. 17

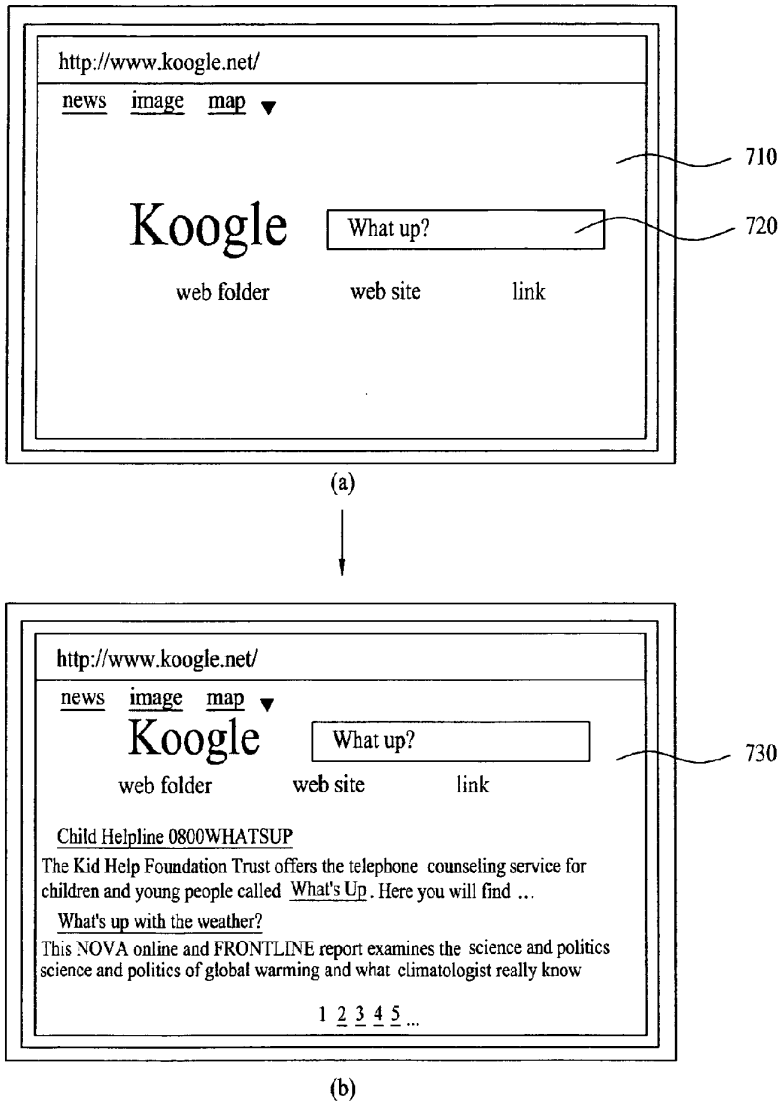


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FIG. 18

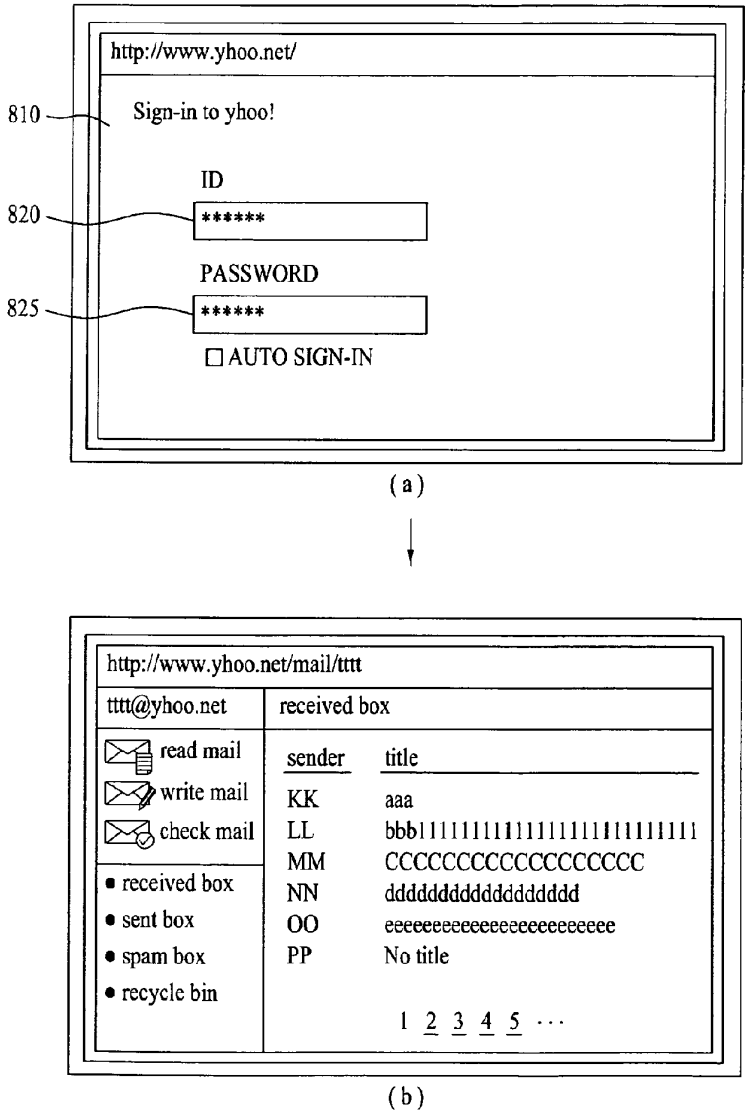

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FIG. 19

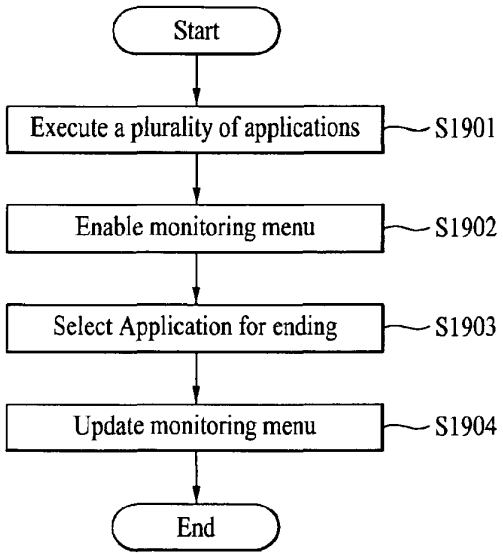

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FIG. 20

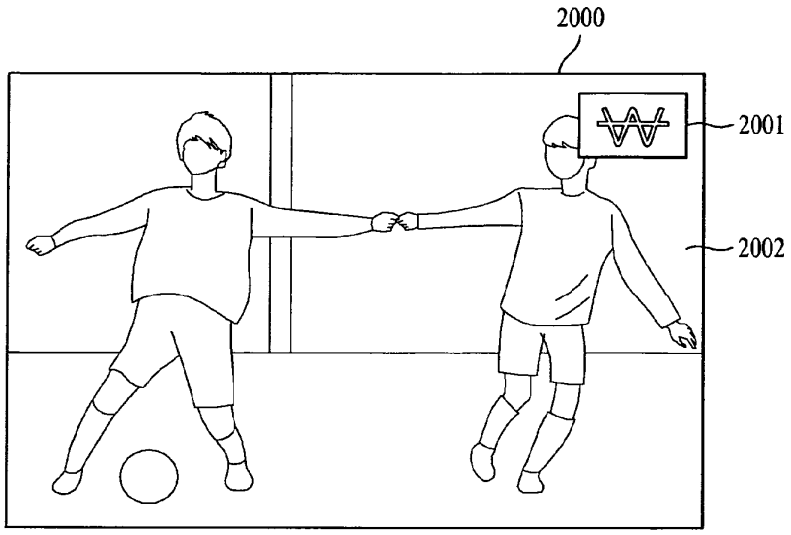

FIG. 21

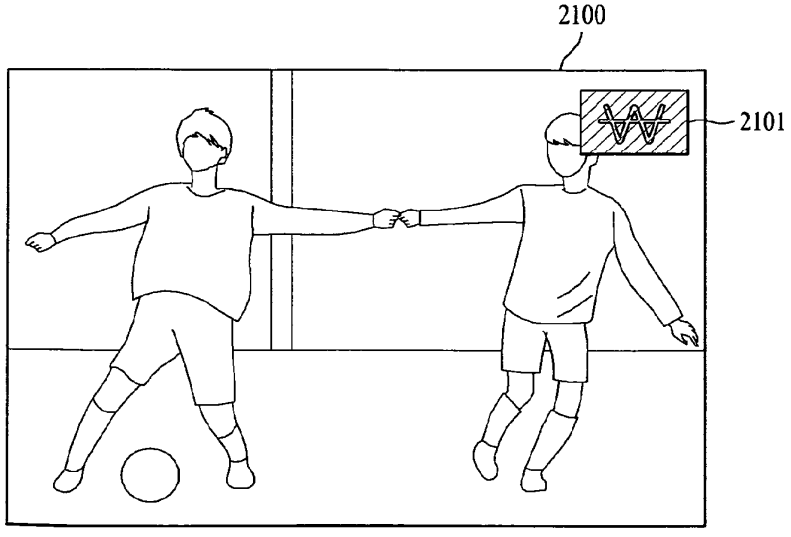

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FIG. 22

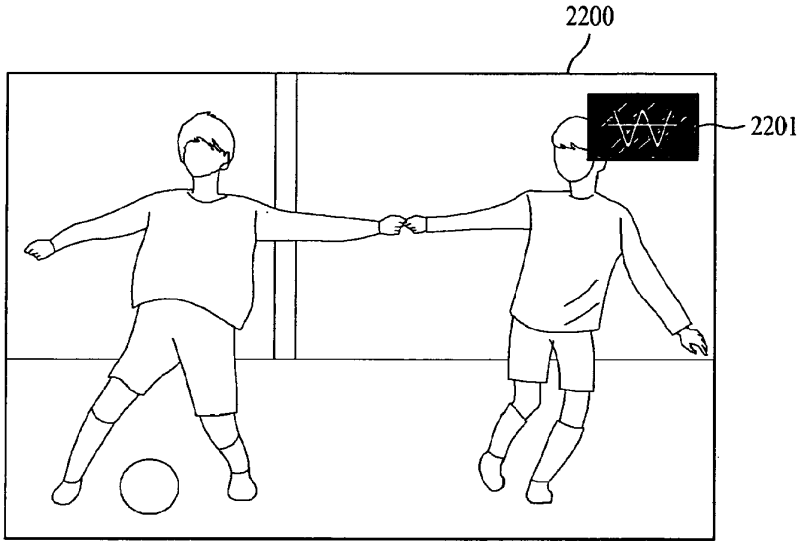

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FIG. 23

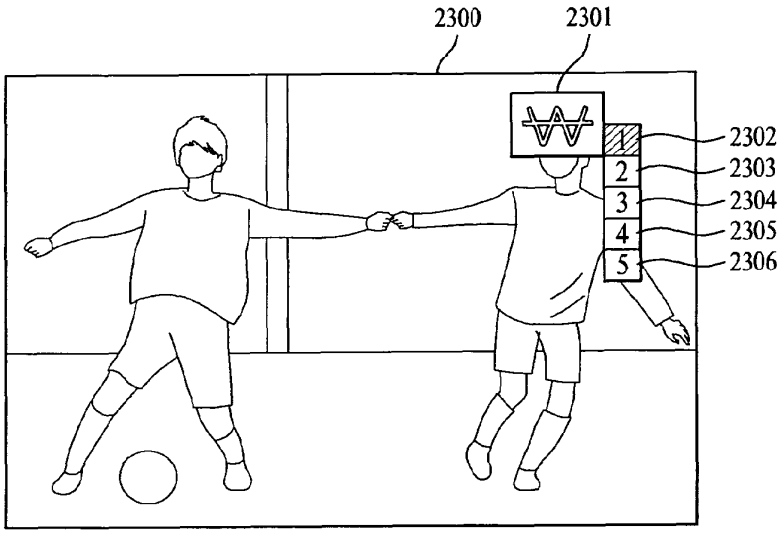

FIG. 24

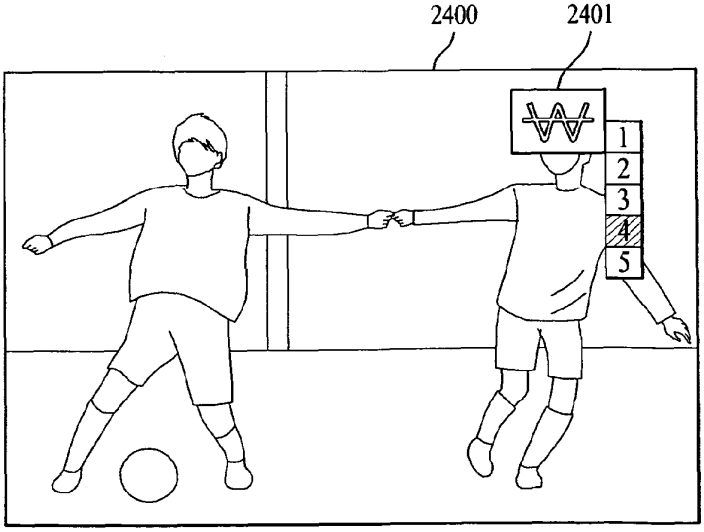

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FIG. 25

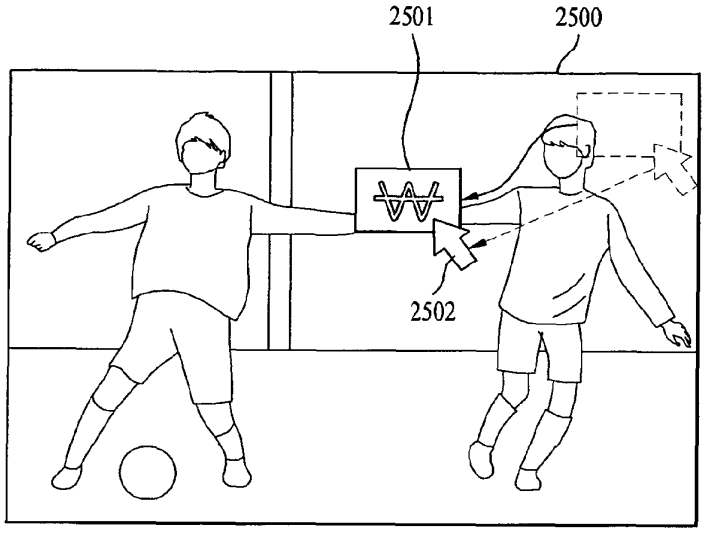
2501
2500
2502

FIG. 26

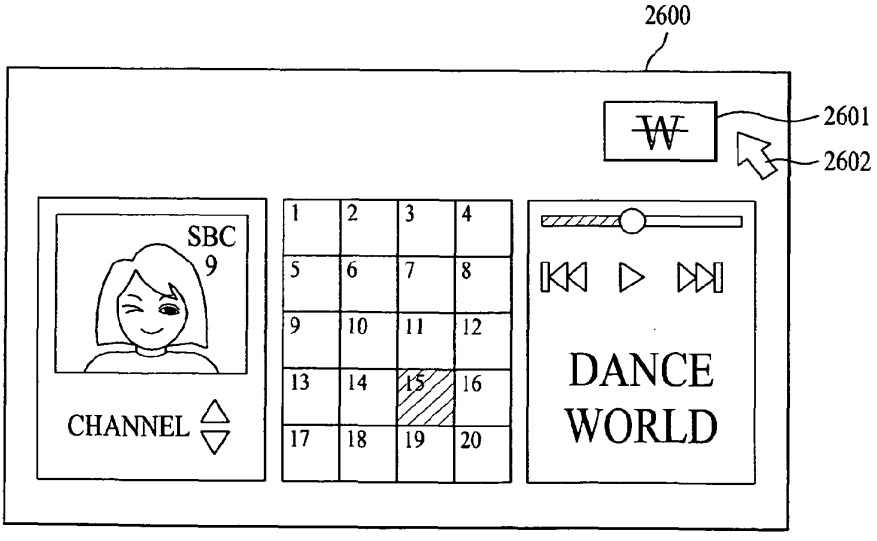
2600
2601
2602
SBC
9
CHANNEL
1 2 3 4
5 6 7 8
9 10 11 12
13 14 15 16
17 18 19 20
DANCE
WORLD

FIG. 27

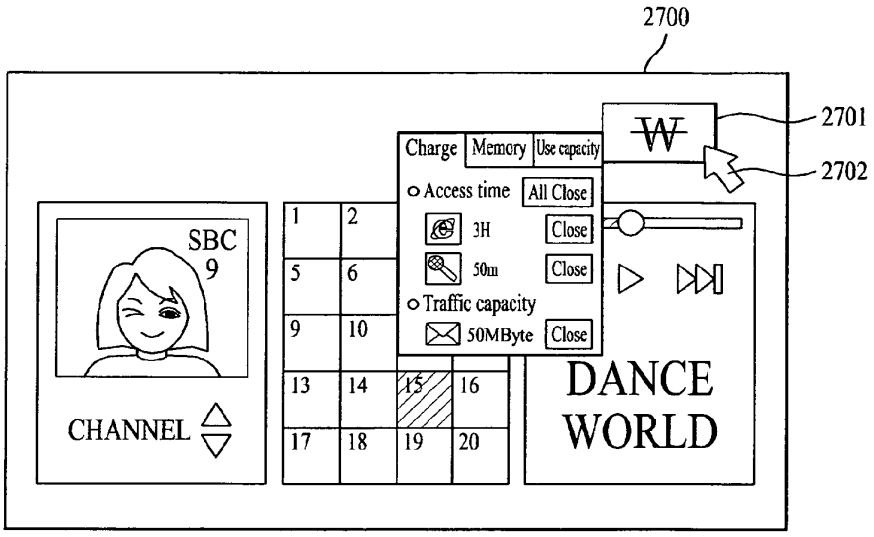

FIG. 28

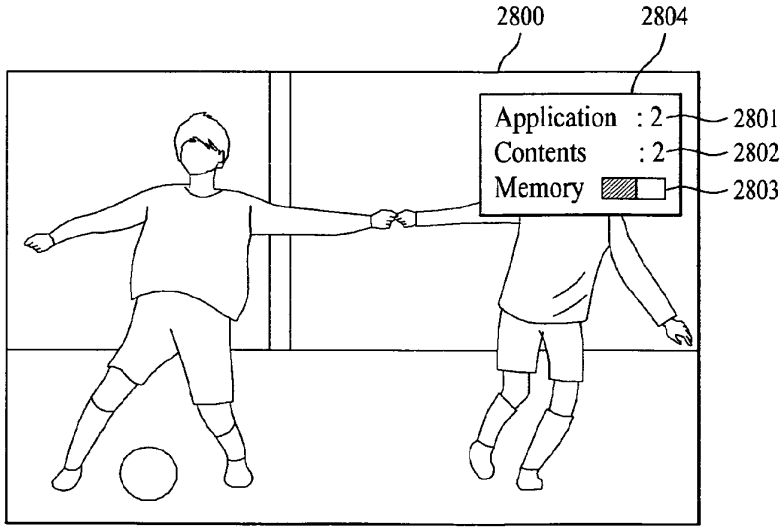

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FIG. 29

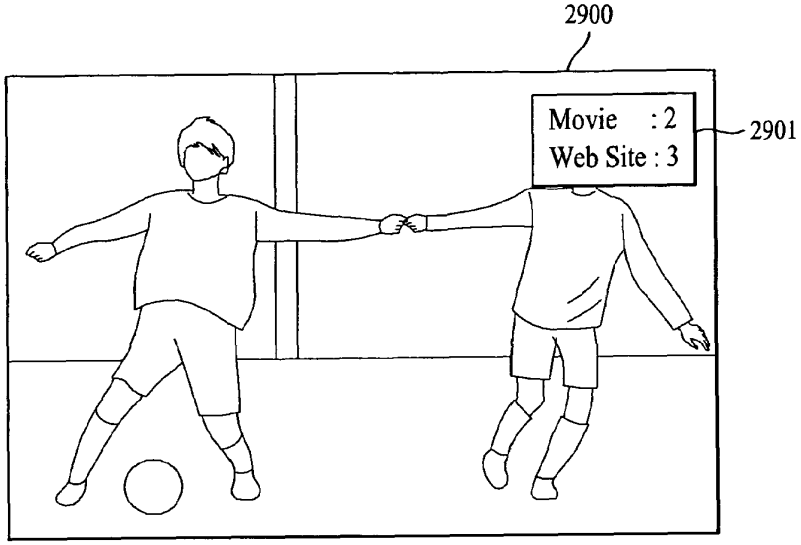

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FIG. 30

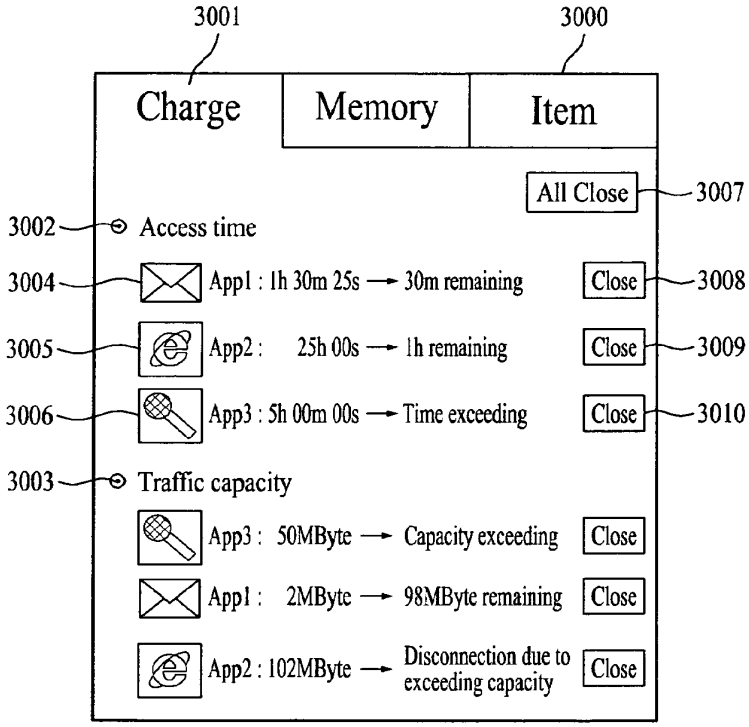

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FIG. 31

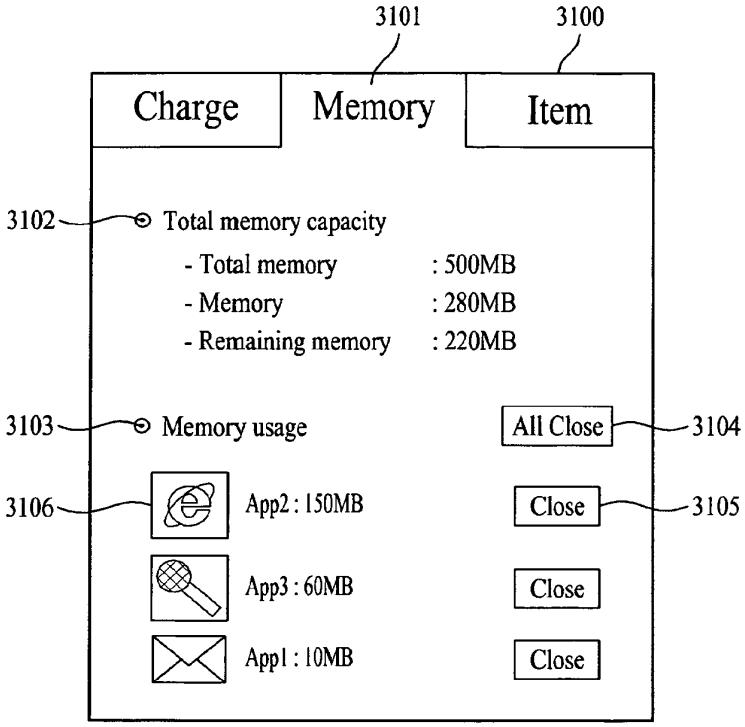

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FIG. 32

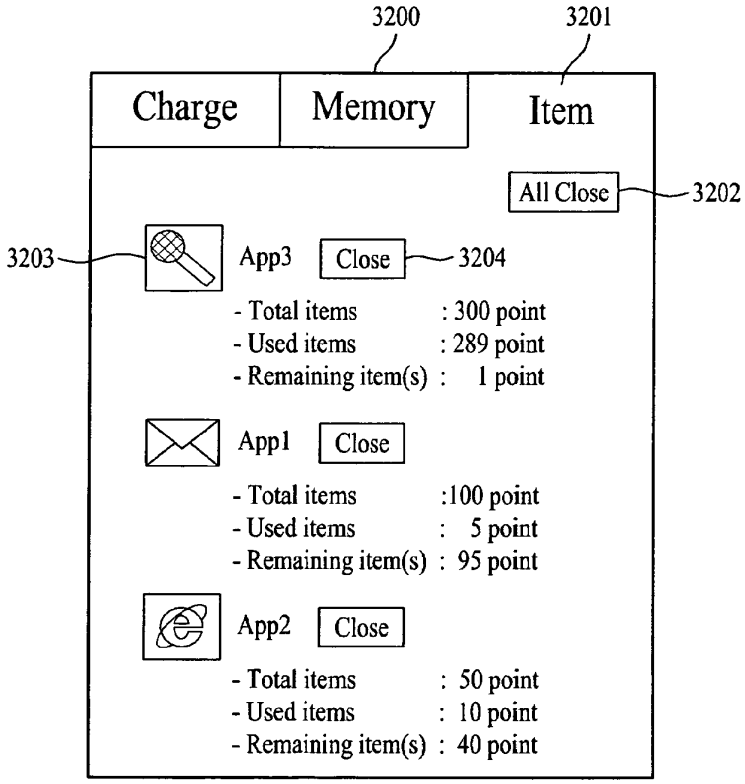
3200
3201
Charge
Memory
Item
All Close
3202
3203
App3
Close
3204
- Total items : 300 point
- Used items : 289 point
- Remaining item(s) : 1 point
App1
Close
- Total items :100 point
- Used items : 5 point
- Remaining item(s) : 95 point
App2
Close
- Total items : 50 point
- Used items : 10 point
- Remaining item(s) : 40 point

FIG. 33

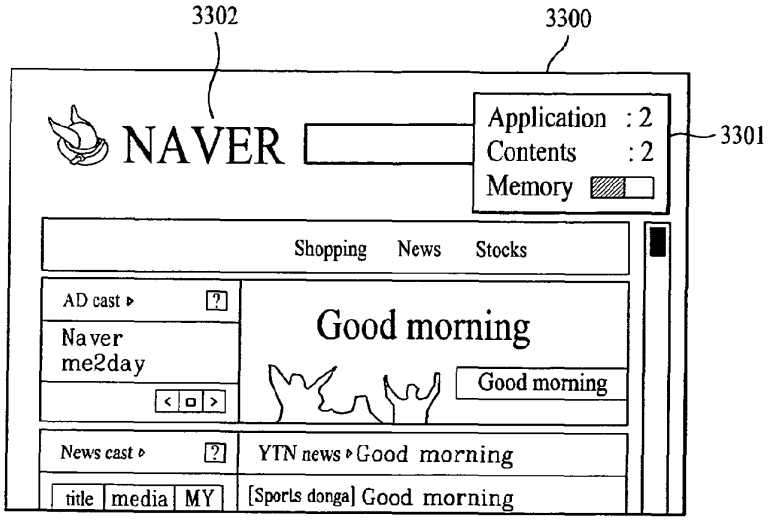

FIG. 34

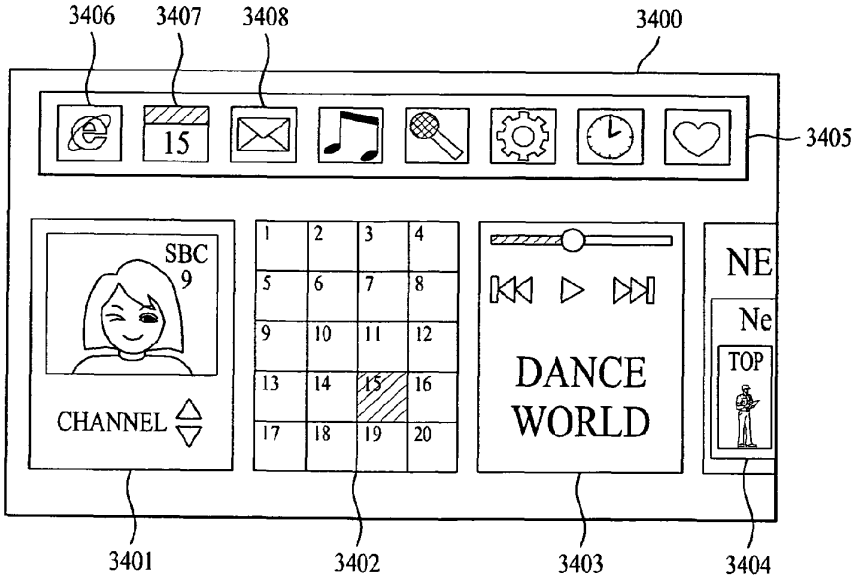

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FIG. 35

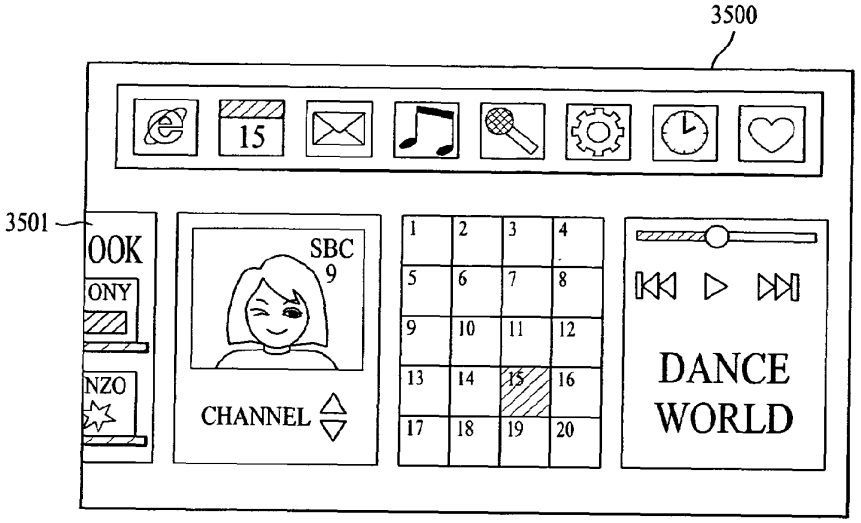

FIG. 36

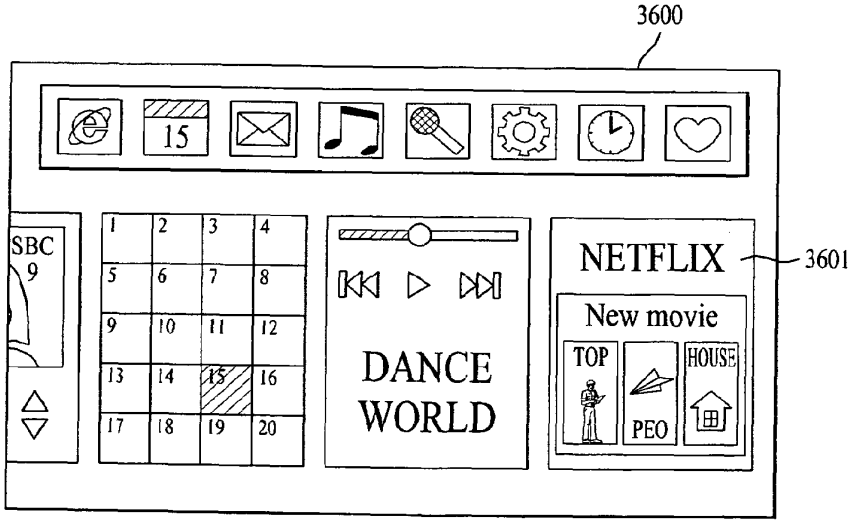

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FIG. 37

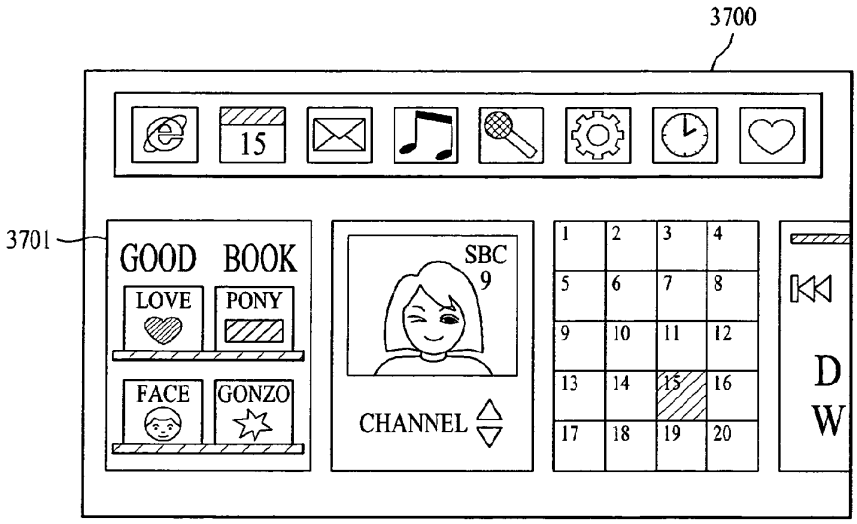

FIG. 38

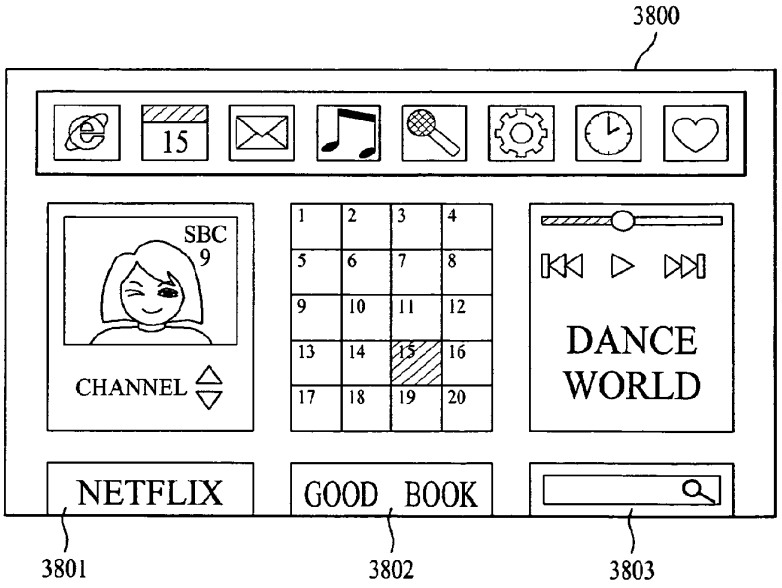

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FIG. 39

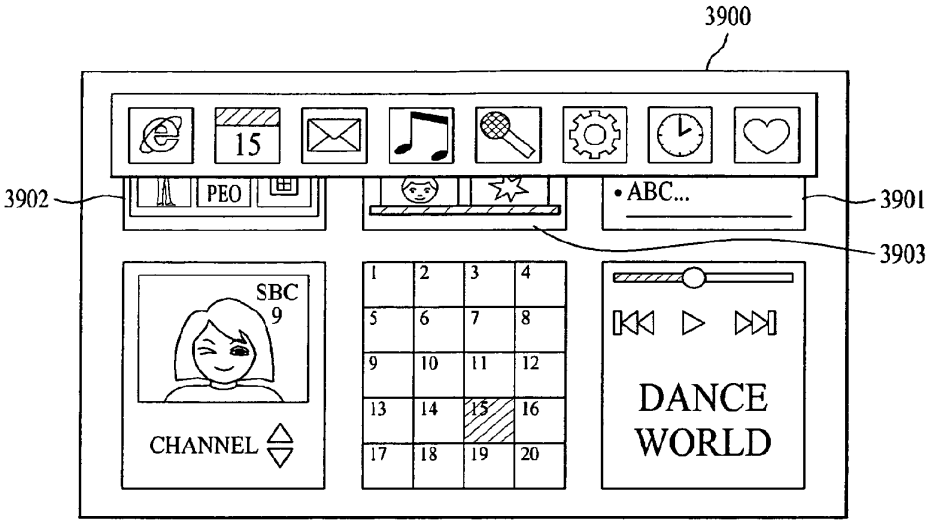

FIG. 40

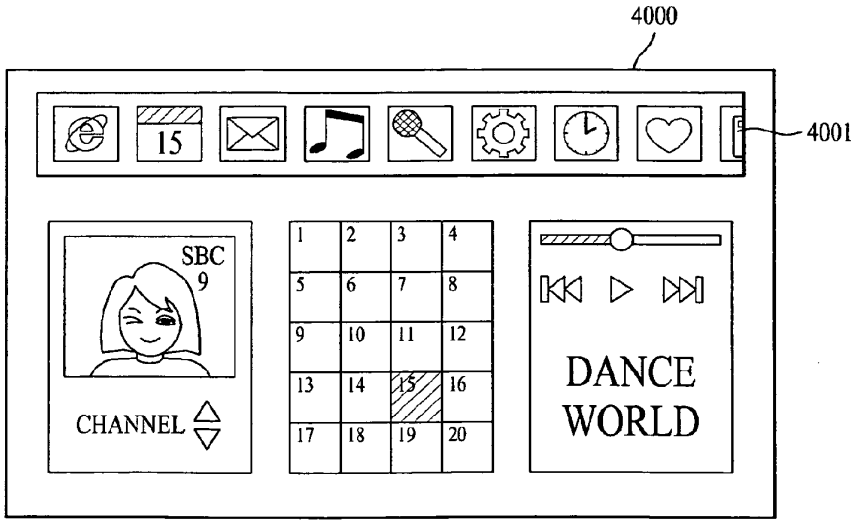

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FIG. 41

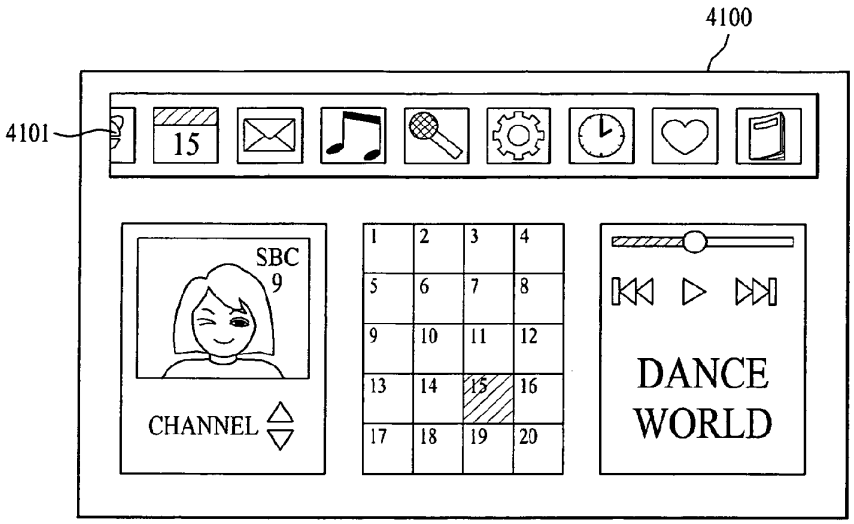

FIG. 42

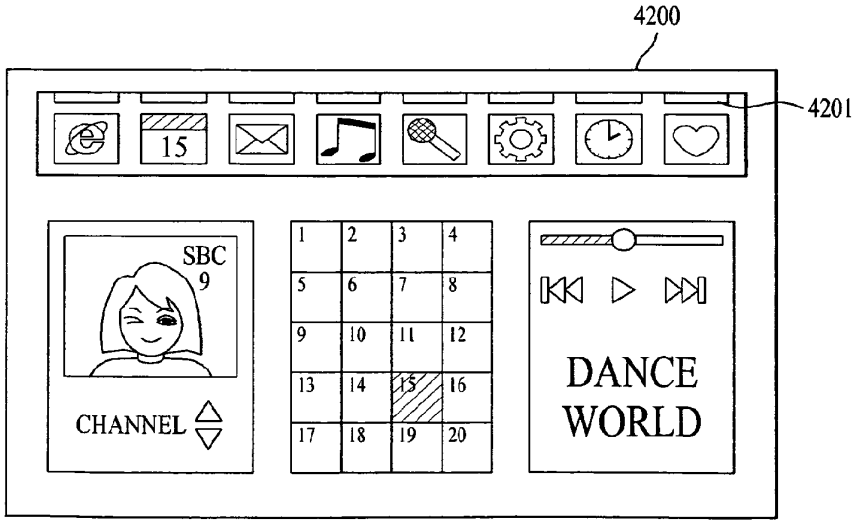

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FIG. 43

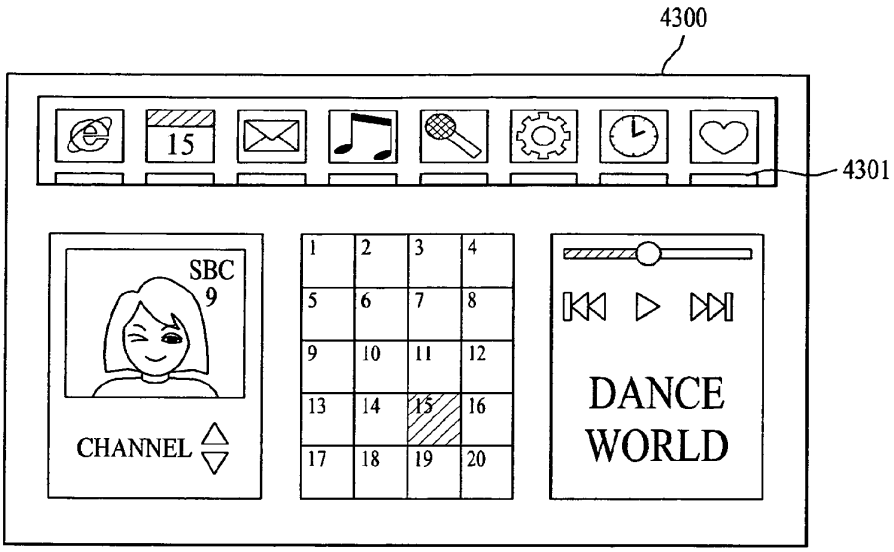

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FIG. 44

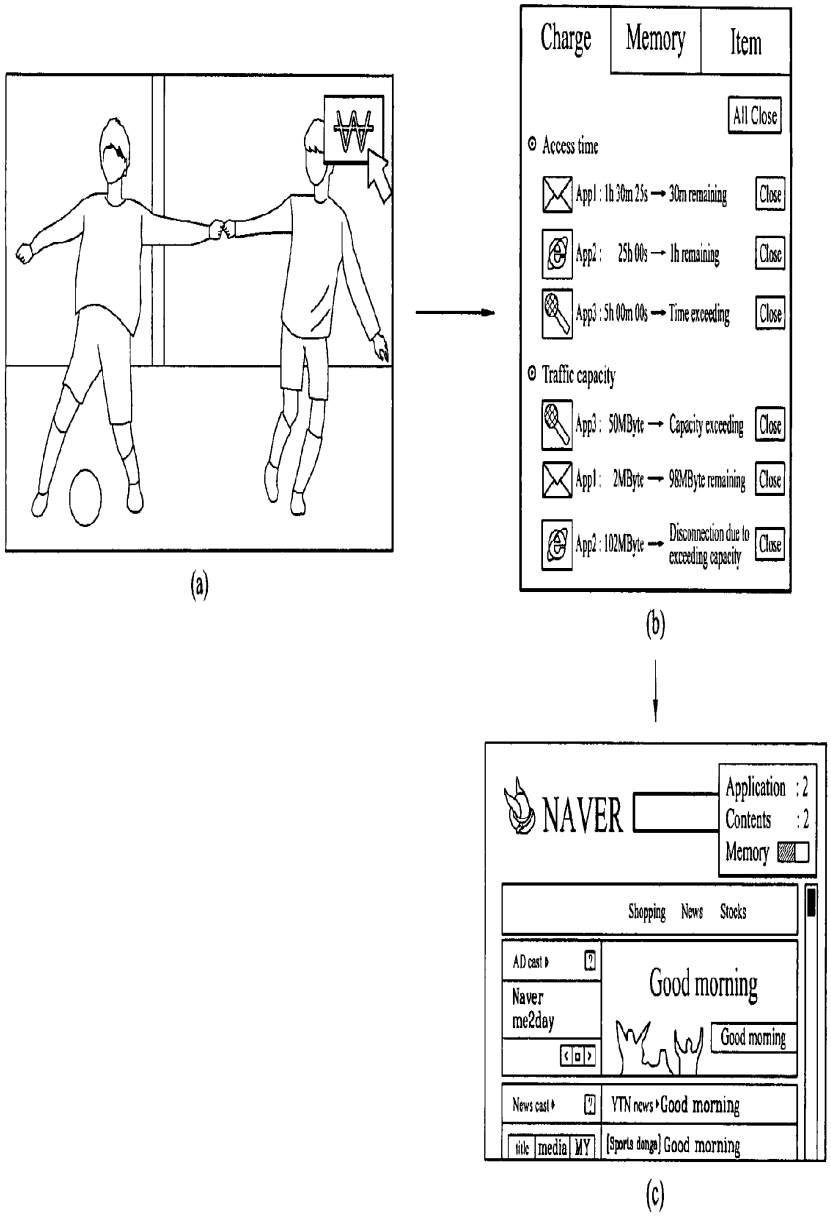
Charge
Memory
Item
All Close
Access time
App1 : 1h 30m 25s → 30m remaining
App2 : 25h 00s → 1h remaining
App3 : 5h 00m 00s → Time exceeding
Close
Traffic capacity
App3 : 50MByte → Capacity exceeding
App1 : 2MByte → 98MByte remaining
App2 : 102MByte → Disconnection due to exceeding capacity
(a)
(b)
NAVER
Application : 2
Contents : 2
Memory
Shopping News Stocks
AD cast
Naver me2day
Good morning
Good morning
News cast
YTN news Good morning
title media MV
[Sports dongA] Good morning
(c)

FIG. 45

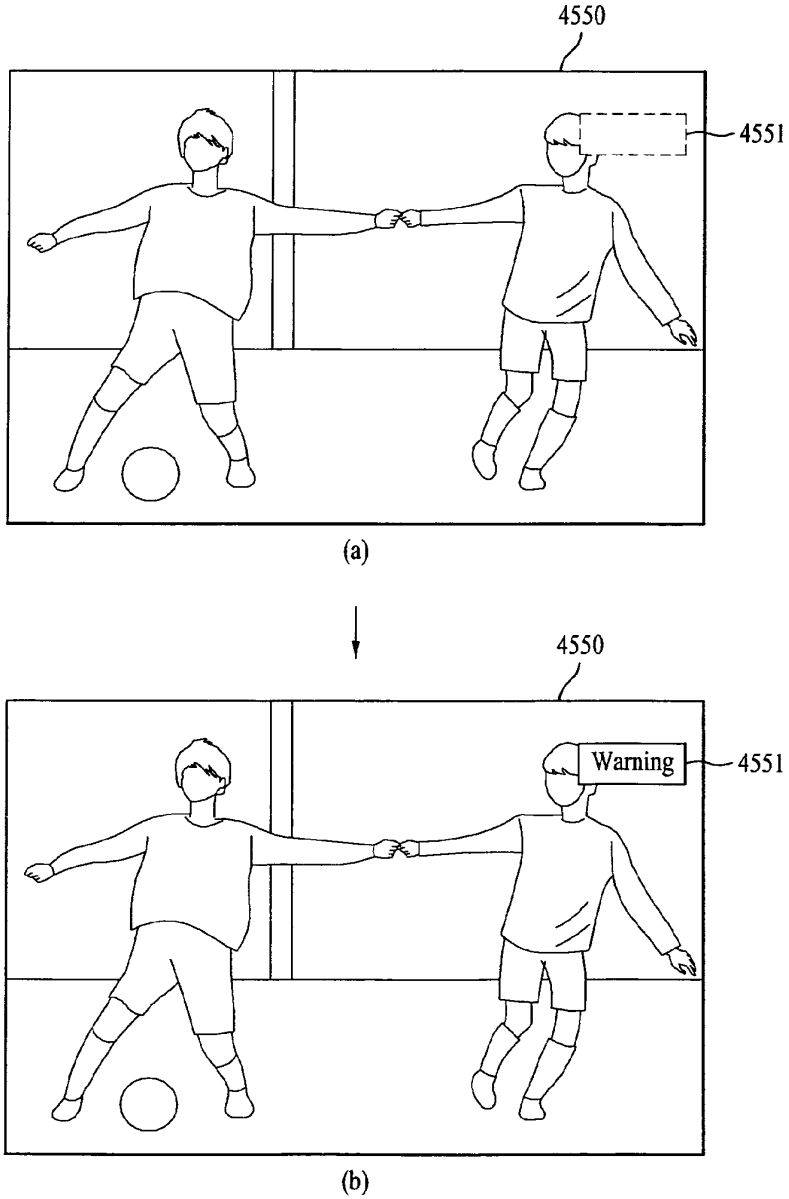

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FIG. 46

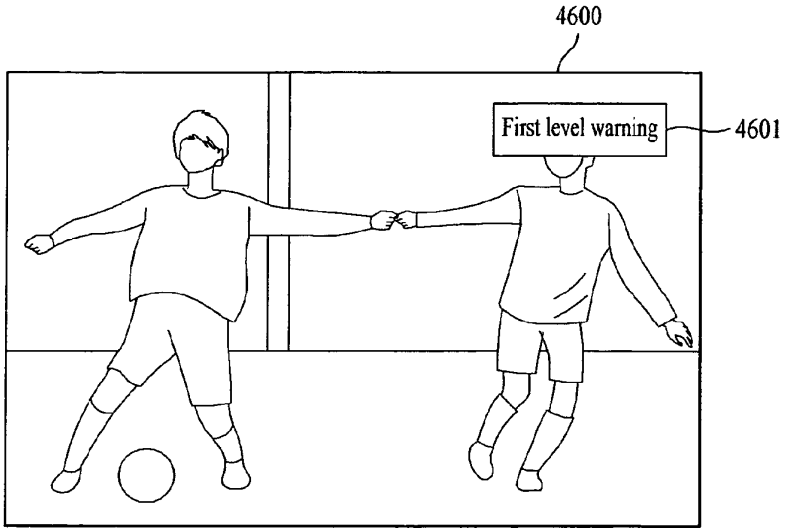

FIG. 47

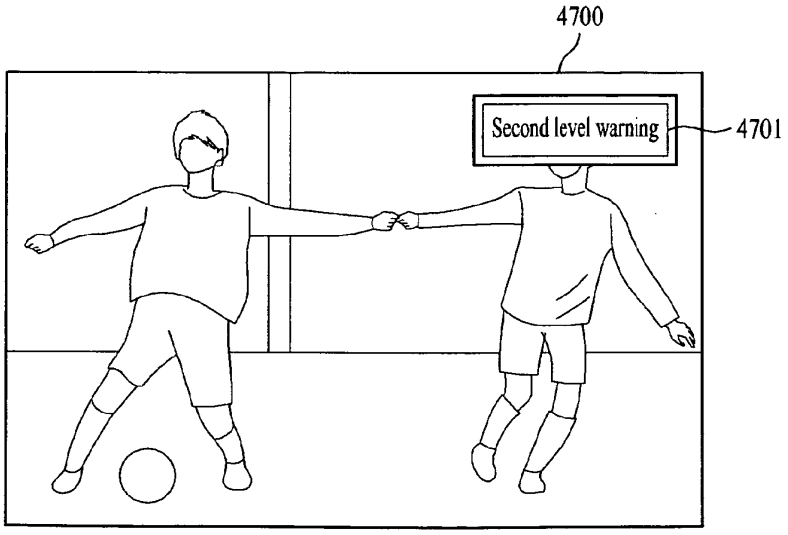

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FIG. 48

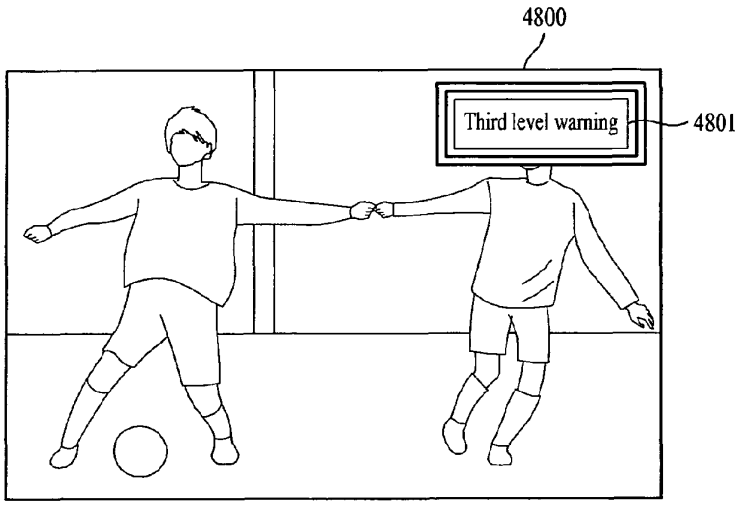

FIG. 49

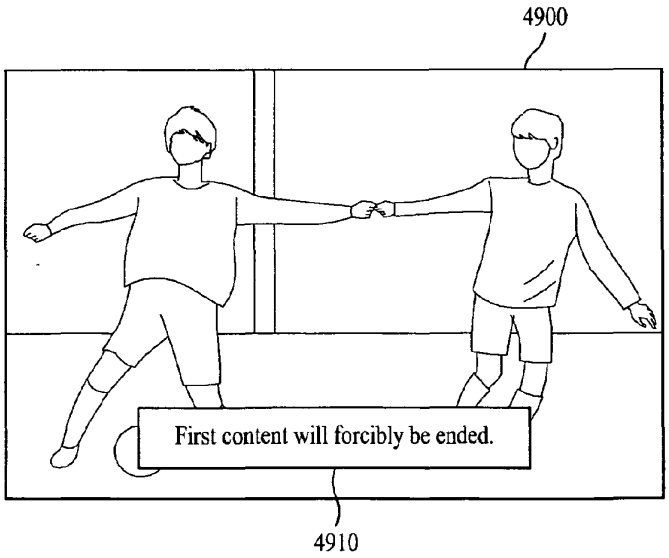

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FIG. 50

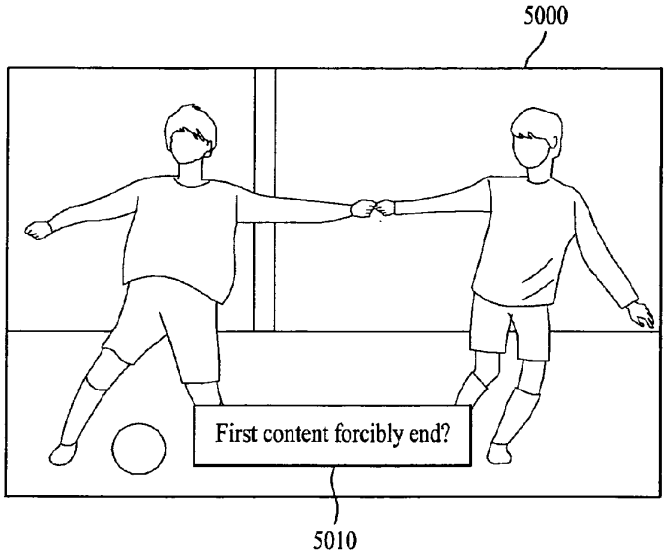
5000
First content forcibly end?
5010

FIG. 51

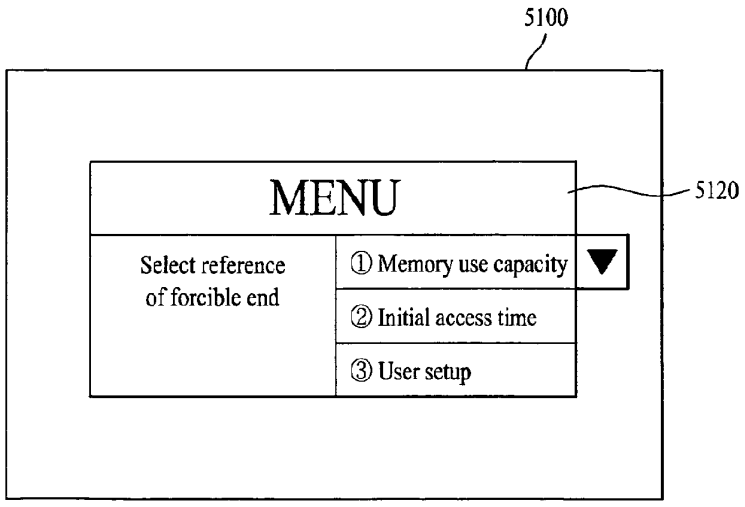
5100
MENU
5120
Select reference of forcible end
① Memory use capacity
② Initial access time
③ User setup

FIG. 52

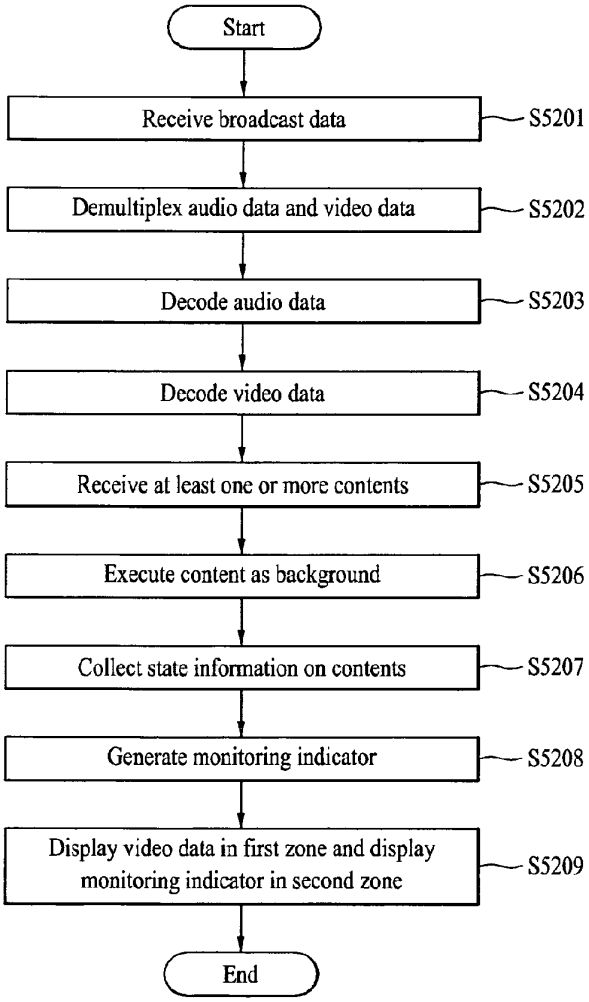

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FIG. 53

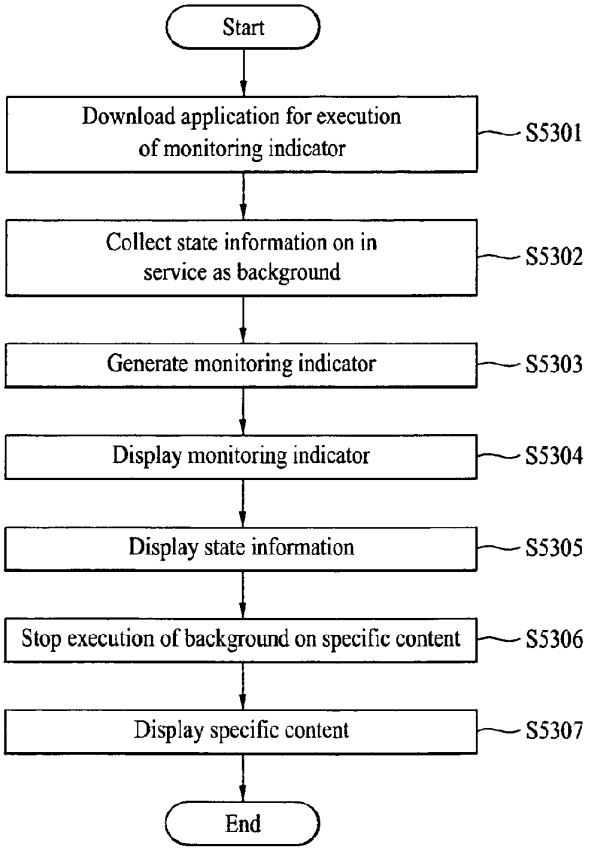

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FIG. 54

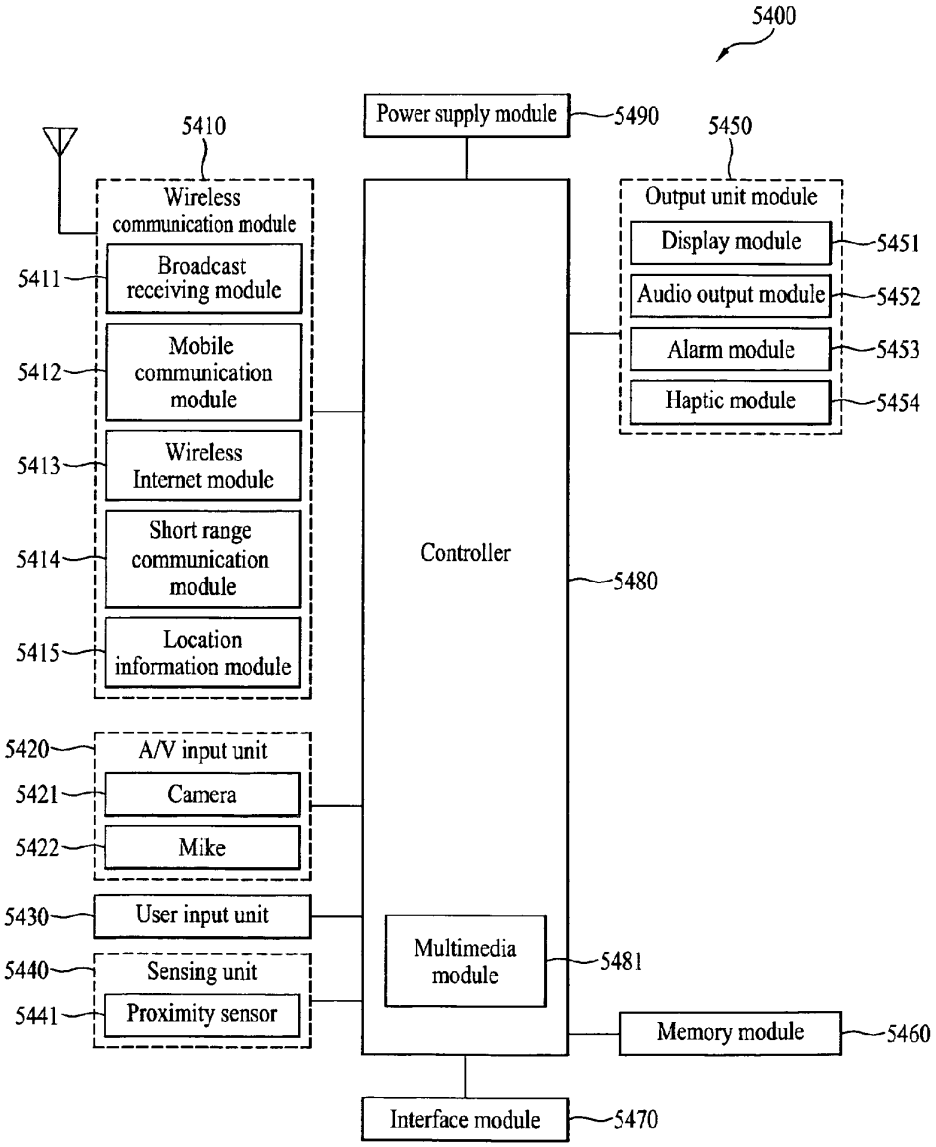
5400
Power supply module
5490
5410
5450
Wireless communication module
Output unit module
Broadcast receiving module
5411
Display module
5451
Audio output module
5452
Mobile communication module
5412
Alarm module
5453
Haptic module
5454
Wireless Internet module
5413
Short range communication module
5414
Controller
5480
Location information module
5415
5420
A/V input unit
5421
Camera
5422
Mike
5430
User input unit
Multimedia module
5481
5440
Sensing unit
5441
Proximity sensor
Memory module
5460
Interface module
5470

FIG. 55

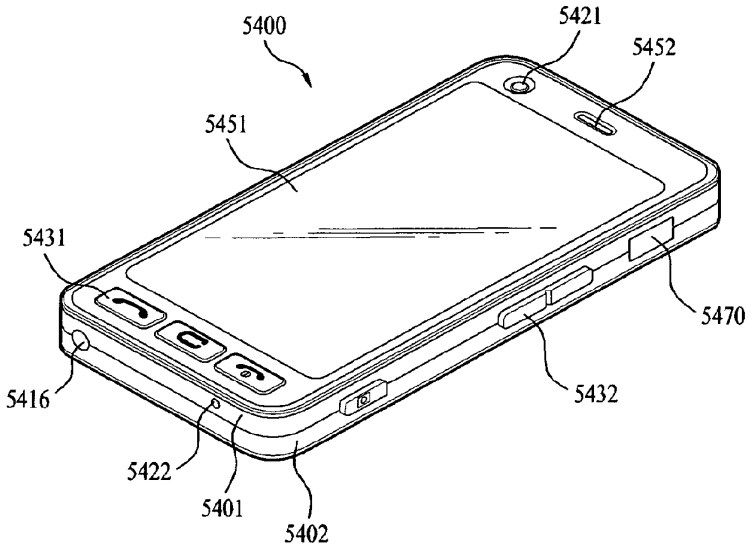

FIG. 56

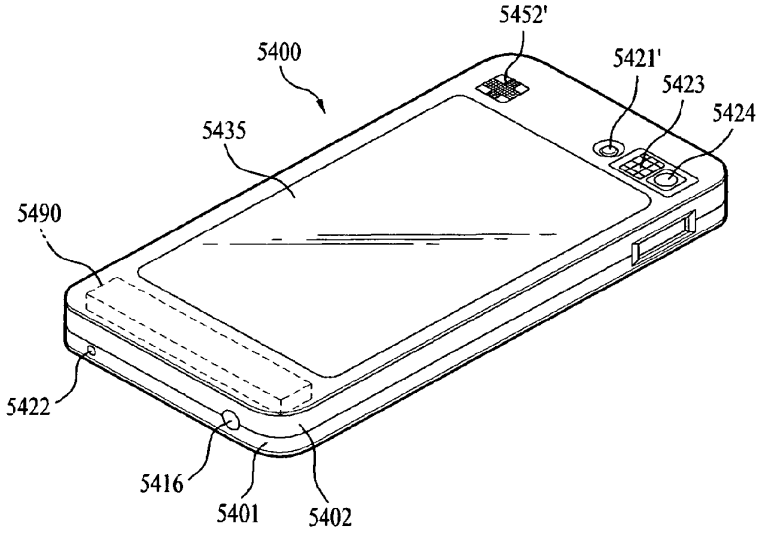

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FIG. 57

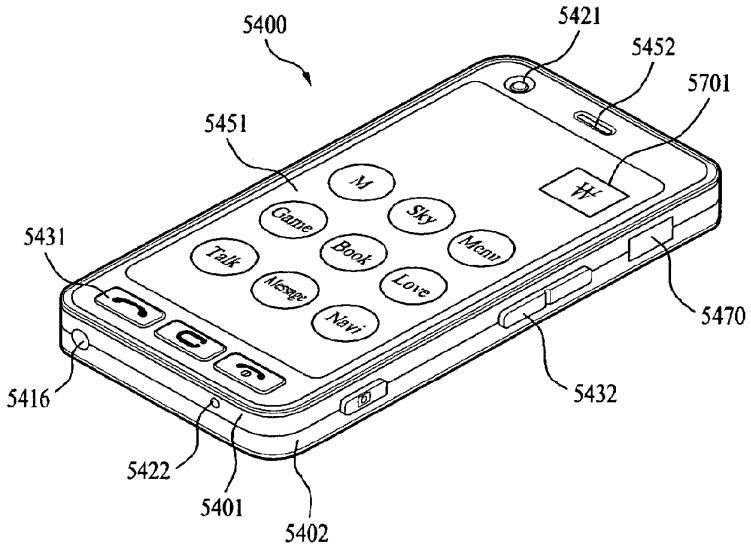
5400
5421
5452
5701
5451
5431
5470
5432
5416
5422
5401
5402
M
Sky
Game
Menu
Talk
Book
Love
Message
Navi

FIG. 58

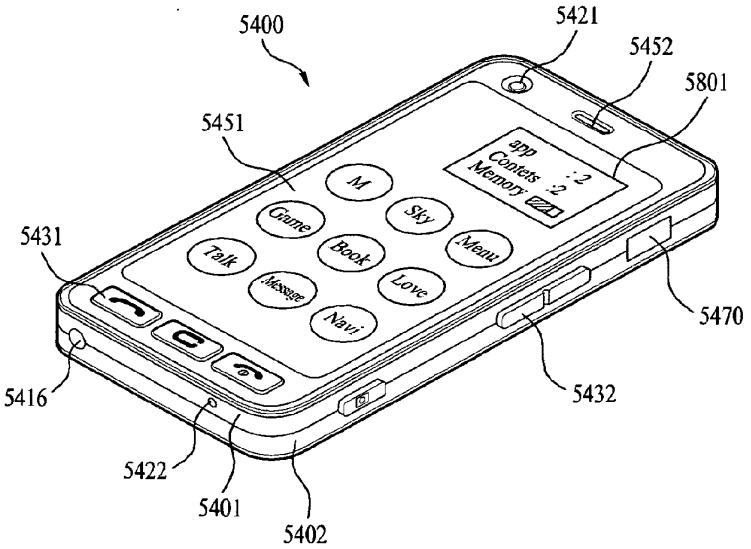
5400
5421
5452
5801
5451
5431
5470
5432
5416
5422
5401
5402
M
Sky
Game
Menu
Talk
Book
Love
Message
Navi
app :2
Contets :2
Memory

FIG. 59

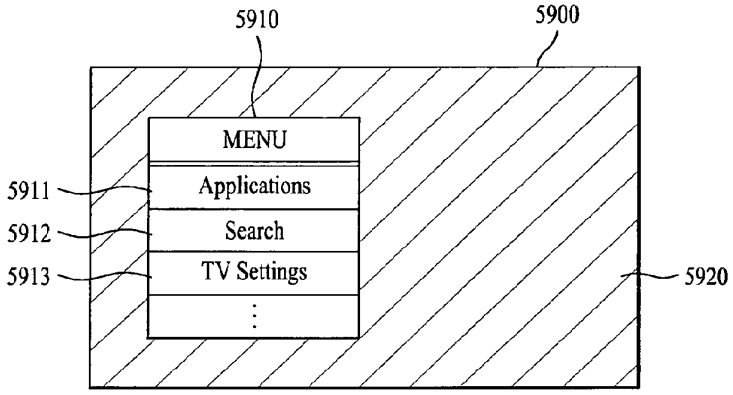

FIG. 60

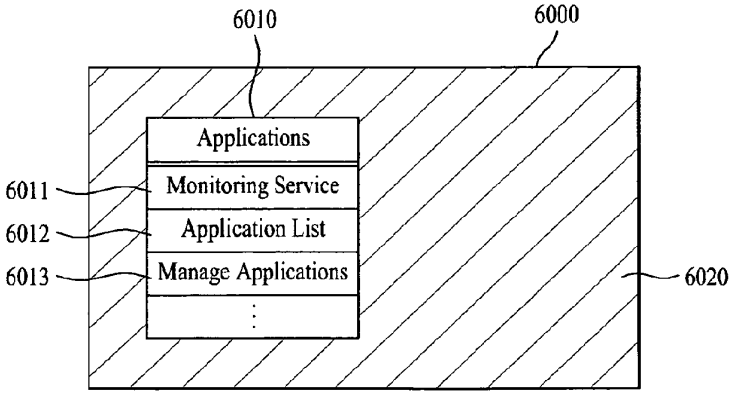

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FIG. 61

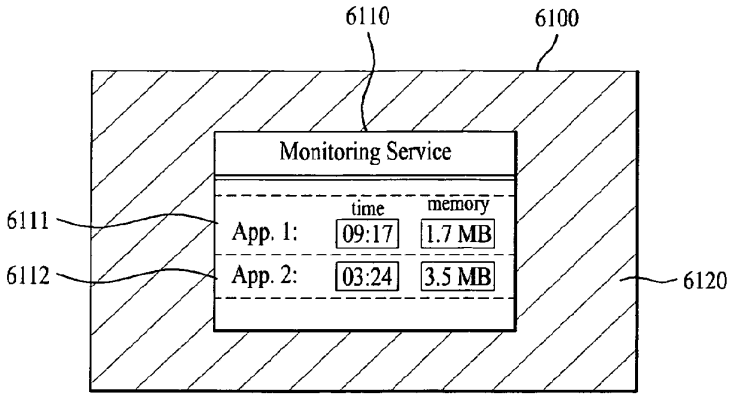
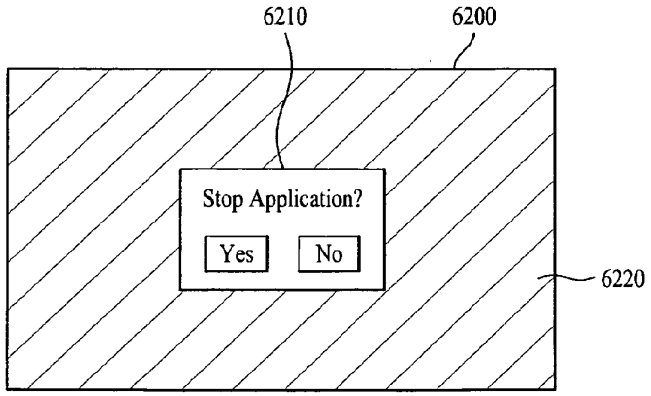


FIG. 62



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Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 11 00 1370

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	Teksoft: "Teksoft future technology - Smartbar", , 2006, XP002646090, Retrieved from the Internet: URL:http://www.teksoftco.com/index.php?section=products&platform=1&pid=1 [retrieved on 2011-06-29] * the whole document *	1-15	INV. H04N5/445 G06F9/00
X	US 2009/063978 A1 (DAWSON THOMAS PATRICK [US] ET AL) 5 March 2009 (2009-03-05) * abstract *	1-4	
A	US 2003/103088 A1 (DRESTI MAURO [US] ET AL) 5 June 2003 (2003-06-05) * paragraph [0307] *	7	
A	WO 2008/091248 A1 (AGERE SYSTEMS INC [US]; AGARWAL NITIN KUMAR [IN]; CRONIN MICHAEL [DE];) 31 July 2008 (2008-07-31) * the whole document *	1-10	
X	WO 01/82598 A2 (HUGHES ELECTRONICS CORP [US]) 1 November 2001 (2001-11-01) * paragraph [0105] - paragraph [0107]; figure 13 *	1-9	TECHNICAL FIELDS SEARCHED (IPC) H04N G06F
X	WO 02/069636 A1 (UNITED VIDEO PROPERTIES INC [US]) 6 September 2002 (2002-09-06) * figure 30 *	1	
A	EP 1 742 391 A1 (SAMSUNG ELECTRONICS CO LTD [KR]) 10 January 2007 (2007-01-10) * paragraph [0057] *	2-4	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	29 June 2011	Bardella, Xavier

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

1

EPO FORM 1503 03.82 (P04C01)

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 11 00 1370

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29-06-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009063978 A1	05-03-2009	CN 101796838 A	04-08-2010
		EP 2186334 A1	19-05-2010
		JP 2010538397 A	09-12-2010
		KR 20100063768 A	11-06-2010
		WO 2009032826 A1	12-03-2009
US 2003103088 A1	05-06-2003	US 2006150120 A1	06-07-2006
		US 2006161865 A1	20-07-2006
		US 2009254778 A1	08-10-2009
		US 2007136693 A1	14-06-2007
		US 2010321201 A1	23-12-2010
		US 2010313169 A1	09-12-2010
		US 2011138327 A1	09-06-2011
WO 2008091248 A1	31-07-2008	EP 2126695 A1	02-12-2009
		JP 2010517161 A	20-05-2010
		US 2010138834 A1	03-06-2010
WO 0182598 A2	01-11-2001	BR 0106092 A	21-05-2002
		EP 1216573 A2	26-06-2002
		MX PA02000079 A	30-07-2002
		US 2002054750 A1	09-05-2002
WO 02069636 A1	06-09-2002	AR 032904 A1	03-12-2003
		AU 2002250350 A2	12-09-2002
		AU 2008201306 A1	17-04-2008
		AU 2011200372 A1	17-02-2011
		BR 0207769 A	14-09-2004
		CA 2438947 A1	06-09-2002
		CA 2666635 A1	06-09-2002
		CN 1500350 A	26-05-2004
		CN 101257609 A	03-09-2008
		CN 101883233 A	10-11-2010
		CN 101860710 A	13-10-2010
		EP 1481547 A1	01-12-2004
		EP 1942673 A2	09-07-2008
		EP 1936981 A2	25-06-2008
		EP 1936982 A2	25-06-2008
		EP 2028856 A2	25-02-2009
		EP 2034726 A2	11-03-2009
		EP 2271095 A1	05-01-2011
		EP 2265008 A1	22-12-2010
		JP 4610852 B2	12-01-2011
		JP 2004531120 A	07-10-2004
		JP 2005176406 A	30-06-2005
		JP 2007336584 A	27-12-2007

EPO FORM P0459

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29-06-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 02069636 A1		JP 2008301514 A	11-12-2008
		KR 20070043055 A	24-04-2007
		KR 20080103607 A	27-11-2008
		KR 20090101392 A	25-09-2009
		MX PA03007512 A	04-12-2003
		TW 579654 B	11-03-2004
		US 2002174430 A1	21-11-2002
		US 2006140584 A1	29-06-2006
		US 2009310937 A1	17-12-2009
		US 2008181574 A1	31-07-2008
		US 2008184297 A1	31-07-2008
EP 1742391 A1	10-01-2007	CN 1893383 A	10-01-2007
		KR 20070006363 A	11-01-2007
		US 2007031126 A1	08-02-2007

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 61391091 B **[0001]**
- KR 1020100113792 **[0001]**

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(19) Europäisches Patentamt
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Office européen des brevets

(11) EP 2 487 922 A2

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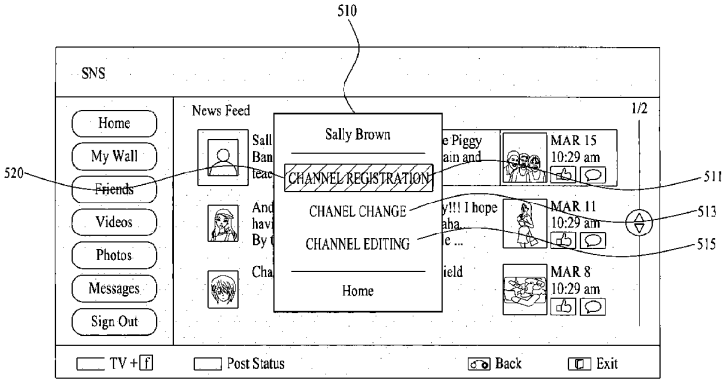
(54) Multi-functional display device having an electronic programming guide and method for controlling the same

(57) A multi-functional display device and a method for displaying an electronic programming guide (EPG) in the same are disclosed herein. The multi-functional display device may include a display for displaying broadcast programs or data, a network interface configured to receive event information associated with a social network service (SNS) account for an individual or entity, a storage device configured to store at least one channel number and at least one SNS account information assigned to the at least one channel number, and a controller for controlling the multi-functional display device. The controller may map the event information to one of the at least one channel numbers and may construct an EPG that includes the mapped event information and the corresponding channel number for display on the display.

FIG. 5



Printed by Jouve, 75001 PARIS (FR)

EP 2 487 922 A2

Description

BACKGROUND

Field

[0001] A multi-functional display device having an electronic programming guide and method for controlling the same are disclosed herein.

Background

[0002] Multi-functional display devices having electronic programming guides and methods for controlling the same are known. However they suffer from various disadvantages.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] The embodiments will be described in detail with reference to the following drawings in which like reference numerals refer to like elements wherein:

FIG. 1	is a schematic diagram illustrating a configuration of an exemplary embodiment for a broadcast system in accordance with the present invention;
FIG. 2	is a block diagram illustrating a configuration of an exemplary embodiment for a server in accordance with the present invention;
FIG. 3	is a block diagram illustrating a configuration of an exemplary embodiment for an electronic device in accordance with the present invention;
FIG. 4	is a diagram illustrating an exemplary embodiment of a screen on which a Web page of a Social Network Service (SNS) is displayed;
FIG. 5	is a diagram illustrating a screen on which an exemplary embodiment of a Graphical User Interface (GUI) for designation of a human address is displayed;
FIG. 6	is a diagram illustrating a screen on which an exemplary embodiment of a GUI for designation of a channel number is displayed;
FIG. 7	is a diagram illustrating one example of a screen on which the result of assigning a human address to a channel number is displayed;
FIG. 8	is a diagram illustrating an exemplary embodiment of a screen on which a menu is displayed;
FIG. 9	is a diagram illustrating a screen on which another exemplary embodiment of a GUI for designation of a human address is displayed;
FIG. 10	is a diagram illustrating a screen on which another exemplary embodiment of a GUI for designation of a human address is displayed;
FIG. 11	is a diagram illustrating a screen on which a further exemplary embodiment of a GUI for designation of a human address is displayed;
FIG. 12	is a diagram illustrating an exemplary embodiment for a human channel map;
FIG. 13	is a flowchart illustrating an implementation procedure of one exemplary embodiment for a method of constructing a human channel map in accordance with the present invention;
FIG. 14	is a flowchart illustrating an implementation procedure of another exemplary embodiment for a method of constructing a human channel map in accordance with the present invention;

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FIG. 15 is a diagram illustrating one exemplary embodiment of a screen on which a human channel map and content of a selected human channel are displayed;

FIG. 16 is a diagram illustrating another exemplary embodiment of a screen on which a human channel map and content of a selected human channel are displayed;

FIG. 17 is a diagram illustrating a further exemplary embodiment of a screen on which a human channel map and content of a selected human channel are displayed;

FIG. 18 is a diagram illustrating an implementation procedure of an exemplary embodiment for a method of providing a human channel service in accordance with the present invention;

FIG. 19 is a diagram illustrating an implementation procedure of one exemplary embodiment for a method of receiving content of a human channel;

FIG. 20 is a diagram illustrating an implementation procedure of another exemplary embodiment for a method of receiving content of a human channel;

FIG. 21 is a diagram illustrating an implementation procedure of a further exemplary embodiment for a method of receiving content of a human channel;

FIG. 22 is a diagram illustrating a method of setting up connection between two electronic devices;

FIG. 23 is a schematic diagram illustrating a configuration of another exemplary embodiment of a broadcast system in accordance with the present invention;

FIG. 24 is a diagram illustrating an exemplary embodiment of a Network Address Translation (NAT) table;

FIG. 25 is a diagram illustrating an exemplary embodiment of an address matching table recorded in a server;

FIG. 26 is a diagram illustrating an implementation procedure of an exemplary embodiment for a method of setting up connection between two electronic devices;

FIG. 27 is a diagram illustrating a screen on which one exemplary embodiment of a GUI for setting up a human channel is displayed;

FIG. 28 is a diagram illustrating a screen in a state in which a human address is being dragged on the displayed GUI of FIG. 27;

FIG. 29 is a diagram illustrating a screen on which another exemplary embodiment of a GUI for setting up a human channel is displayed;

FIG. 30 is a diagram illustrating a screen in a state in which a human address is being dragged on the displayed GUI of FIG. 29;

FIG. 31 is a diagram illustrating a screen on which an exemplary embodiment of a GUI for setting up a channel is displayed;

FIG. 32 is a diagram illustrating a screen in a state in which a human address is being dragged on the displayed GUI of FIG. 31;

FIG. 33 is a diagram illustrating a screen in a state in which a broadcast channel, a human address and an App channel are dragged onto a channel number region of the displayed GUI of FIG. 31;

FIGs. 34A and 34B are flowcharts illustrating an implementation procedure of a further exemplary em-

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bodiment for a method of constructing a channel map in accordance with the present invention;

Figure 35 is a diagram illustrating an exemplary embodiment of a broadcast screen on which a human channel map is displayed;

Figure 36 is a diagram illustrating an exemplary embodiment of a screen for invitation to view a channel;

Figure 37 is a schematic diagram illustrating a configuration of another exemplary embodiment of a broadcast system in accordance with the present disclosure;

Figure 38 is a diagram illustrating a configuration of an exemplary embodiment for a channel invitation packet;

Figure 39 is a diagram illustrating an exemplary embodiment of a screen displayed when invitation to view a channel is made;

Figure 40 is a diagram illustrating one exemplary embodiment of a guidance message with regard to invitation to view a channel;

Figure 41 is a diagram illustrating another exemplary embodiment of a guidance message with regard to invitation to view a channel;

Figure 42 is a diagram illustrating a further exemplary embodiment of a guidance message with regard to invitation to view a channel;

Figures 43A and 43B are diagrams illustrating an exemplary embodiment of a screen displayed when invitation to view a channel is accepted;

Figure 44 is a diagram illustrating an exemplary embodiment of a channel matching table;

Figure 45 is a diagram illustrating an implementation procedure of one exemplary embodiment for a method of making invitation to view a channel in accordance with the present disclosure;

Figure 46 is a flowchart illustrating an implement procedure of another exemplary embodiment for a method of making invitation to view a channel in accordance with the present disclosure; and

Figure 47 is a flowchart illustrating an implement procedure of an exemplary embodiment for a method of processing invitation to view a channel in accordance with the present disclosure.

Figure 48 is a diagram illustrating an embodiment of a screen on which content is displayed;

Figure 49 is a diagram illustrating one embodiment of a screen on which content is displayed in a simultaneous viewing mode;

Figure 50 is a diagram illustrating another embodiment of a screen on which content is displayed in a simultaneous viewing mode;

Figure 51 is a diagram illustrating a further embodiment of a screen on which content is displayed in a simultaneous viewing mode;

Figure 52 is a diagram explaining an embodiment of a method for confirming viewing of the same content;

Figure 53 is a diagram explaining a method for detecting user emotions;

Figure 54 is a diagram illustrating the contour of a silhouette mapped to user emotions;

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Figure 55 is a diagram illustrating an embodiment of a screen on which different silhouettes depending on user emotions are displayed;

Figure 56 is a diagram explaining a procedure for registering a facial image;

Figure 57 is a diagram explaining a procedure for training a facial image;

Figure 58 is a diagram explaining a method for detecting a user motion;

Figures 59A to 59D are diagrams explaining a method for reflecting a screen effect on content;

Figure 60 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for remotely viewing content at the same time;

Figure 61 is a flowchart illustrating an implementation procedure of another exemplary embodiment in relation to a method for remotely viewing content at the same time;

Figure 62 is a flowchart illustrating an implementation procedure of another exemplary embodiment in relation to a method for remotely viewing content at the same time;

Figure 63 is a flowchart illustrating an implementation procedure of a further exemplary embodiment in relation to a method for remotely viewing content at the same time;

Figure 64 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for confirming viewing of the same content;

Figure 65 is a flowchart illustrating an implementation procedure of another exemplary embodiment in relation to a method for confirming viewing of the same content;

Figure 66 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for providing a viewing list;

Figure 67 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for displaying a silhouette;

Figure 68 is a flowchart illustrating an implementation procedure of another exemplary embodiment in relation to a method for displaying a silhouette;

Figure 69 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for displaying a silhouette as a 3D image;

Figure 70 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for sharing a screen effect;

Figure 71 is a diagram illustrating a broadcast screen on which one exemplary embodiment of a channel map is displayed;

Figure 72 is a diagram illustrating a broadcast screen on which another exemplary embodiment of a channel map is displayed;

Figure 73 is a diagram illustrating a broadcast screen on which a further exemplary embodiment of a channel map is displayed;

Figure 74 is a diagram illustrating a screen on which one exemplary embodiment of a full channel map is displayed;

Figure 75 is a diagram illustrating a screen on which another exemplary embodiment of a full channel map is displayed;

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Figure 76	is a diagram illustrating a screen on which another exemplary embodiment of a full channel map is displayed;
Figure 77	is a diagram illustrating a screen on which a human channel sheet of the full channel map of Figure 76 is displayed;
Figure 78	is a diagram illustrating a screen on which an App channel sheet of the full channel map of Figure 76 is displayed;
Figure 79	is a diagram illustrating a screen on which an exemplary embodiment of a recently viewed channel map is displayed;
Figure 80	is a diagram illustrating a screen on which a further exemplary embodiment of a full channel map is displayed;
Figures 81A to 81D	are a diagrams explaining a connection state of an owner of a human channel; and
Figure 82	is a flowchart illustrating an implement procedure of an exemplary embodiment for a method of providing a channel map service in accordance with the present disclosure.
Figure 83	is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a user registration method in accordance with the present disclosure;
Figure 84	is a diagram illustrating an embodiment of a GUI to receive user registration information;
Figure 85	is a diagram illustrating an embodiment of a GUI to select an SNS site;
Figure 86	is a diagram illustrating an embodiment of a GUI to receive authentication information for an SNS site;
Figure 87	is a diagram illustrating an embodiment of a GUI to confirm execution of a channel scan;
Figure 88	is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for providing a channel scan interface in accordance with the present disclosure;
Figure 89	is a diagram illustrating an embodiment of a GUI to select a scan method;
Figure 90	is a diagram illustrating an embodiment of a GUI to select a service type;
Figure 91	is a diagram illustrating an embodiment of a screen which displays the progress of a human channel scan;
Figure 92	is a diagram illustrating an embodiment of a screen which displays the result of a human channel scan;
Figure 93	is a diagram illustrating another embodiment of a screen which displays the result of a human channel scan;
Figure 94	is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for scanning a human channel in accordance with the present disclosure;
Figure 95	is a flowchart illustrating an implementation procedure of another exemplary embodiment in relation to a method for constructing a channel map in accordance with the present disclosure;
Figure 96	is a diagram illustrating an embodiment of a GUI for display of other human addresses of a friend who has a human address associated with a channel number;

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Figure 97	is a diagram illustrating another exemplary embodiment for a human channel map;
Figure 98	is a flowchart illustrating an implementation procedure of another exemplary embodiment in relation to a method for providing a human channel service in accordance with the present disclosure;
Figure 99	is a diagram illustrating an embodiment of a GUI for designation of a human address;
Figure 100	is a diagram illustrating another embodiment of a screen on which a human channel map and content of a selected human channel are displayed;
Figure 101	is a diagram illustrating an embodiment of a screen on which an Electronic Program Guide (EPG) for a human channel in accordance with the present disclosure is displayed;
Figure 102	is a diagram illustrating an embodiment of a screen in which detailed information about an event is displayed on an electronic program guide in accordance with the present disclosure is displayed;
Figure 103	is a diagram illustrating an embodiment of a screen in which channel numbers are selected on an electronic program guide in accordance with the present disclosure;
Figure 104	is a diagram illustrating an embodiment of a screen on which content of a human channel is displayed;
Figures 105 to 107	are diagrams illustrating an embodiment in which an electronic program guide in accordance with the present disclosure is dragged;
Figure 108	is a diagram illustrating an embodiment of a screen on which a content list is displayed on an electronic program guide in accordance with the present disclosure;
Figure 109	is a diagram illustrating an embodiment of a screen on which a preview of content selected from among the content list of Figure 108 is displayed;
Figure 110	is a diagram illustrating an embodiment of a screen on which a graphical user interface to produce an event is displayed;
Figure 111	is a diagram illustrating an embodiment of a screen in which an event input into the graphical user interface of Figure 110 is displayed;
Figures 112A and 112B	are diagrams illustrating a screen on which an electronic program guide in accordance with the present disclosure, which reflects the event input in Figure 111, is displayed;
Figure 113	is a diagram illustrating an implementation procedure of an exemplary embodiment in relation to a method for providing service information in accordance with the present disclosure;
Figure 114	is a diagram illustrating an implementation procedure of an exemplary embodiment in relation to a method for constructing service information in accordance with the present disclosure;
Figure 115	is a diagram illustrating an implementation procedure of an exemplary embodiment in relation to a method for displaying service information in accordance with the present disclosure; and
Figure 116	is a diagram illustrating an implementation procedure of an exemplary embodiment in relation to a method for producing an event in accordance with the present disclosure.

DETAILED DESCRIPTION

[0004] An electronic device as disclosed herein may be a multi-functional display device. The multi-functional display device may be a television or a Smart TV that includes a broadcast receiver. The broadcast receiver may include, for

example, a function for receiving and processing a broadcast image viewable by a user. The broadcast receiver may display a broadcast, which is selected by the user from among broadcast signals transmitted from a broadcast station, on a display. Broadcasts may be transitioned from analog broadcasting to digital broadcasting.

[0005] Digital broadcasting may refer to digital audio and video signal broadcast. Digital broadcasting has low data loss due to robustness against external noise, favorable error correction, high resolution, and high-definition screen as compared with analog broadcasting. In addition, digital broadcasting may provide a bidirectional service unlike analog broadcasting.

[0006] In addition to providing digital broadcasting, the broadcast receiver may provide a Social Network Service (SNS). SNS may refer to a service for establishing and maintaining online social networks among various individuals and may enable personal media and information sharing. Examples of SNS may include Twitter, MySpace, and facebook widely used in America as well as Cyworld and Me2Day used in Korea, among others. SNS may be used for communication and information sharing among users. SNS assists users in making new connections or reinforcing existing connections with other users.

[0007] An electronic device as set forth herein is an intelligent electronic device equipped with a computer support function in addition to a broadcasting reception function, for example. Since an Internet function is added to a broadcasting reception function, the electronic device may have an interface which is more convenient than a handwriting input device, a touch screen, a touch pad, or a remote controller. Further, because the electronic device supports wired or wireless Internet, the electronic device may include e-mail transmission/reception, Web browsing, banking, and gaming functions and the like when connected to the Internet or a computer. To implement these functions, the electronic device may operate based on a standard, general-purpose Operating System (OS).

[0008] Various applications may be freely added to or deleted from, for example, a general-purpose OS kernel of the electronic device according to the present disclosure. Therefore, the electronic device may perform a number of user-friendly functions. The electronic device may be a network TV, a Hybrid Broadcast Broadband TV (HBBTV), a smart TV, an Open Hybrid TV (OHTV), etc. and as occasion demands, is applicable to smart phones, Personal Computers (PC) and home appliances.

[0009] Embodiments of the present disclosure will be described in detail with reference to the attached drawings, but it should be understood that they are merely illustrative of the present disclosure and should not be interpreted as limiting the scope of the present disclosure.

[0010] In addition, although the terms used in the present disclosure are selected from generally known and used terms, some of the terms mentioned in the description of the present disclosure, the detailed meanings of which are described in relevant parts of the description herein, have been selected at the discretion of the applicant. Furthermore, the present disclosure must be understood, not simply by the actual terms used but by the meanings of each term lying within. Accordingly, the terms used herein should be understood not simply by the actual terms used but by the meaning lying within and the description disclosed herein.

[0011] Figure 1 is a schematic diagram illustrating a configuration of an exemplary embodiment for a broadcast system in accordance with the present disclosure.

[0012] Referring to Figure 1, the broadcast system 1 in accordance with the present disclosure may include a first server 10, a second server 20, a first digital TV 100, a second digital TV 110, a personal computer system 120, a notebook computer 130 and a mobile terminal 140. The first server 10, the second server 20, the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140 may be connected to one another via a network 2. Broadcast system 1 may include other appropriate types of multi-functional display devices in addition to the examples as shown in Figure 1.

[0013] The network 2 may include a backbone network and an access network. The backbone network may include an X.25 network, a frame relay network, an Asynchronous Transfer Mode (ATM) network, a Multi Protocol Label Switching (MPLS) network and a Generalized Multi Protocol Label Switching (GMPLS) network, alone or in combination. The access network may be a Fiber To The Home (FTTH) network, an Asymmetric Digital Subscriber Line (ADSL) network, a cable network, a wireless LAN (IEEE 802.11b, IEEE 802.11a, IEEE 802.11g, IEEE 802.11n) network, a Wireless Broadband (WIBro) network, a WiMax network and a High Speed Downlink Packet Access (HSDPA) network. In some embodiments, the network 2 may be an Internet network or mobile communication network.

[0014] The first server 10 may provide a service for connection between the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140. The first server 10 may provide User Datagram Protocol (UDP) hole punching. In addition, the first server 10 may have a static IP address. The first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140 may be connected to the first server 10 using the static IP address.

[0015] The second server 20 may provide the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140 with a human channel service. Here, a human channel refers to a communication channel for transmission of content provided by an individual. The human channel may refer to an identification sign for identification of the communication channel in terms of a user, and may refer to a

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communication channel corresponding to a channel number mapped to a human address in terms of a device, i.e. a communication channel accessible using the human address. As broadly described herein the human channel service may include, for example, a service to provide access to a Social Network Service (SNS) provided by an SNS service provider on a channel of a multi-functional display device (e.g., a social network channel service or SNS channel service). The human channel may be a particular channel on the multi-functional display device (e.g., digital TV) for accessing an SNS account for an individual or an entity. The human channel may also be referred to as a social network channel or SNS channel. A human channel may be associated with a channel number similar to a conventional broadcast channel on the multi-functional display device (e.g., digital TV), but unlike the broadcast channel, the human channel is also associated with a human address that identifies an SNS account.

[0016] The human address as broadly described herein refers to an identification character string for identification of a human or individual. The human address may also be referred to herein as an SNS identifier or a user identifier. The human address may correspond to a channel assigned to an individual, a group of individuals, or an entity and may be referred to as an SNS channel name. The human address may include at least one of an e-mail address, an account name, a family name and a Session Initiation Protocol-Uniform Resource Locator (SIP-URL), or another appropriate type of identifier or address. The human address may be an address or identifier given to a human or individual and is different from an address assigned to an electronic device. For example, the human address may include an SNS address for an individual or user (e.g., a social network address or SNS address). Moreover, the human address may include multiple SNS addresses for a particular user (e.g., a user's facebook and twitter accounts), or multiple SNS addresses for a group of users (e.g., dad's facebook account and mom's facebook account). As described above, the human channel service may refer to a service for providing a human channel of at least one individual. The second server 20 may be a conventional Social Network Service (SNS) server.

[0017] The first digital TV 100 and the second digital TV 110 may be a network TV, a smart TV, an HBBTV, a 3-dimensional (3D) TV, an OHTV, etc.

[0018] The personal computer system 120 may be a desktop, computer, a laptop computer, a tablet, a handheld computer, etc.

[0019] The mobile terminal 140 may be a cellular phone, a smart phone, a Digital Multimedia Broadcasting (DMB) terminal, a Personal Digital Assistant (PDA), a Portable Multimedia Player (PMP), a navigator, etc.

[0020] The first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140 may serve not only as a subject for providing the human channel service, but also as an object affected by the human channel service of the second server 20 or another first digital TV 100, second digital TV 110, personal computer system 120, notebook computer 130 and mobile terminal 140.

[0021] The first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140 may have a static IP address or a dynamic IP address, or may have a private IP address.

[0022] The first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140 may receive a dynamic IP address or a private IP address from the first server 10, if a device for providing a human channel has the dynamic IP address or the private IP address.

[0023] Alternatively, if the device has a static IP address, the user may input the static IP address to the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140.

[0024] Figure 2 is a block diagram illustrating a configuration of an exemplary embodiment for a server in accordance with the present disclosure.

[0025] Referring to Figure 2, a server 200 may function as the first server 10 or the second server 20, or may perform functions of both the first and second servers 10 and 20. The server 200 may include a communication unit 210, a controller 220 and a storage unit 230 (or storage device).

[0026] The communication unit 210 may receive packets transmitted through the network 2 and may transmit the packets to the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140 through the network 2. The packets may be transmitted by a Session Initiation Protocol (SIP), User Datagram Protocol (UDP) and Transmission Control Protocol (TCP). The packets may include registration request signals, response signals, connection request signals, connection set-up signals, moving image streaming, Web pages and files.

[0027] The controller 220 may control transmission of the packets by the communication unit 210 based on at least one protocol of SIP, Simple Mail Transfer Protocol (SMTP), Hypertext Transfer Protocol (HTTP), File Transfer Protocol (FTP), Real-Time Streaming Protocol (RTSP) and Multi Media Streaming (MMS).

[0028] The controller 220 may control storing an address of an electronic device which transmits a registration request signal and a human address included in the registration request signal to the storage unit 230, in response to the received registration request signal. The address of the electronic device and the human address may be stored in association with each other. The controller 220 may extract the address of the electronic device from the registration request signal or from the packet including the registration request signal. The address of the electronic device may include at least

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one of a Media Access Control (MAC) address, an IP address, a port number, a Domain Name System (DNS) name and a URL. The IP address may include a static IP address, a dynamic IP address and a private IP address.

[0029] The controller 220 reads an address of an electronic device associated with a human address included in a connection request signal from the storage unit 230, in response to the received connection request signal. The controller 220 controls transmission of the read address of the electronic device to an electronic device which issues the connection request signal. Also, the controller 220 may control transmission of an address of the electronic device which issues the connection request signal to the electronic device, the address of which has been read.

[0030] The storage unit 230 may store the address of the electronic device address and the human address. The address of the electronic device address and the human address may be stored in association with each other.

[0031] Figure 3 is a block diagram illustrating a configuration of an exemplary embodiment for an electronic device in accordance with the present disclosure.

[0032] Referring to Figure 3, the electronic device 300 may function as at least one of the first broadcast receiver 100, the second broadcast receiver 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140.

[0033] The electronic device 300 may include a tuner 305, a demodulator 310, a demultiplexer 315, a network interface 320, an external signal input unit 325, a video decoder 330, an audio decoder 335, a controller 340, a storage unit 345, a scaler 350, a mixer 360, a formatter 370, a communication unit 380 and a sound sensor 390. The electronic device 300 may further include an image capture device 301, a display 302, spectacles 303 and a remote controller 304.

[0034] The tuner 305 selects a Radio Frequency (RF) broadcast signal corresponding to a channel selected by the user from among RF broadcast signals transmitted through an antenna and converts the selected RF broadcast signal into an Intermediate Frequency (IF) signal or a base-band video or audio signal.

[0035] The demodulator 310 receives a Digital IF (DIF) signal converted by the tuner 305 and demodulates the DIF signal.

[0036] The demodulator 310 may also perform channel decoding. To this end, the demodulator 310 may include a Trellis decoder, a deinterleaver and a Reed Solomon decoder, to perform Trellis decoding, deinterleaving and Reed-Solomon decoding.

[0037] The demodulator 310 may output a Transport Stream (TS) signal after performing demodulation and channel decoding. An audio signal, a video signal or a data signal may be multiplexed in the TS signal.

[0038] The demultiplexer 315 may receive a stream signal from the demodulator 310, the network interface 320 and the external signal input unit 325. The demultiplexer 315 may demultiplex the received stream signal to a video signal, an audio signal and a data signal to output the demultiplexed signal to the video decoder 330, the audio decoder 335 and the controller 340.

[0039] The video decoder 330 receives a video signal from the demultiplexer 315 and restores the received video signal to output the restored video signal to the scaler 350. The video signal may include a 3D video signal.

[0040] The audio decoder 335 receives an audio signal from the demultiplexer 315 and restores the received audio signal to output the restored audio signal to the display 302 or the scaler 350.

[0041] The network interface 320 receives the packets from the network 2 and transmits the packets to the network 2. The network interface 320 may transmit a registration request signal and a connection request signal to the server 10 and may receive a response signal with respect to the transmitted registration request signal and connection request signal from the server 10. The registration request signal may include a human address, an address of the electronic device 300, an Identifier (ID) and a password. The connection request signal may include a human address.

[0042] The network interface 320 may receive content from the second server 20, the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140 through the network 2. The content may include applications, moving image streams, moving image files, music files and picture files. The content may be provided through a particular human channel.

[0043] The network interface 320 may also receive an IP packet for transmission of broadcast data from a service provider through the network 2. The broadcast data may be real-time broadcast service data and Internet service data.

[0044] If the IP packet includes a stream signal, the network interface 320 may extract the stream signal from the IP packet to output the stream signal to the demultiplexer 315. The stream signal may be transmitted from the second server 20, the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140. The stream signal may be provided through a particular human channel.

[0045] The network interface 320 may output the received signal and content to the controller 340.

[0046] The external signal input unit 325 may provide a user interface and an interface capable of connecting an external device and the electronic device 300 to each other. The external device may be a variety of types of video or audio output devices, such as a Digital Versatile Disk (DVD) player, a Blu-ray player, a gaming device, a camcorder and a computer (e.g., a notebook computer). The electronic device 300 may display video and audio signals transmitted from the external signal input unit 325 and may store or use data signals.

[0047] The external device may be the image capture device 301. The image capture device 301 may include a

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plurality of cameras. The image capture device 301 may capture an image of a human. In one example, the image capture device 301 may recognize, focus on, and capture a human hand shape by zooming in. Here, the captured hand shape may be recognized as a spatial gesture. More specifically, the controller 340 may recognize the captured hand shape as a spatial gesture and may execute commands for performing operations associated with the recognized spatial gesture. The spatial gesture may be defined as a gesture recognized from a video frame or an image which is mapped to one or more particular computing operations and is transmitted from the image capture device 301.

[0048] In some embodiments, the electronic device 300 may include the image capture device 301.

[0049] The external signal input unit 325 may be a touch pad or a touch screen. The touch screen may be integrally formed with the display 302, or may be a separate element. If the touch screen is integrally formed with the display 302, the display 302 may be called a touch screen display. The touch screen is arranged at the front of the display 302, which allows the user to directly operate a Graphical User Interface (GUI) displayed on a screen. For example, the user may place his or her finger on an object to be controlled.

[0050] With regard to the touch pad, the touch pad is separately put on a different plane from the display 302. For example, the display unit 302 is generally located on a vertical plane and the touch pad is generally located on a horizontal plane. Thus, the touch pad is less intuitive and therefore, is difficult to use as compared with the touch screen.

[0051] The touch pad and the touch screen may be a multi-point input device.

[0052] The controller 340 may recognize a touch gesture applied to the external signal input unit 325 and may control the electronic device 300 based on the touch gesture. The touch gesture may be defined as a stylized interaction with the external signal input unit 325, mapped to one or more particular computing operations. The touch gesture may be implemented through hand, more particularly, finger movement. Alternatively or additionally, the touch gesture may be implemented through a stylus. A subject implementing the touch gesture, such as a finger or a stylus, is called an object.

[0053] The external signal input unit 325 receives the touch gesture, and the controller 340 executes commands for performing operations associated with the touch gesture. The storage unit 345 may include a gesture operating program which may be a part of an operating system or an additional application. The gesture operating program includes a series of commands for recognizing the occurrence of a gesture (e.g., a touch gesture or a spatial gesture) and informing one or more software agents of the gesture and/or which actions should be taken in response to the gesture.

[0054] When the user performs one or more gestures, the external signal input unit 325 transmits gesture information to the controller 340. The controller 340 analyzes the touch gesture using commands from the storage unit 345, more particularly, using the gesture operating program and then, controls different constituent elements of the electronic device 300, such as the display 302, the demultiplexer 315, the network interface 320, the external signal input unit 325, the storage unit 345, the scaler 350, the mixer 360, the formatter 370 and the sound sensor 390. The gesture may be identified as commands for performing operations of applications stored in the storage unit 345, for correcting a GUI object represented on the display 302 and data stored in the storage unit 345 and for performing operations in the multiplexer 315, the network interface 320, the scaler 350, the mixer 360 and the formatter 370. In one example, these commands may be associated with zooming-in, panning, scrolling, page-eject, rotation, scaling, video channel switch, content reception, Internet connection and the like.

[0055] In another example, the commands may be associated with designating a channel number, designating a human address, selecting a displayed object, dragging a displayed object, dropping a displayed object, switching a channel, displaying a channel map, switching a displayed channel map, transmitting a channel viewing request signal, booting a particular program, requesting a particular GUI, opening a file or a document, looking at a menu, selecting a menu, executing a command, log-in to an Internet site, allowing an authorized person to access a limited system region, loading a user profile associated with a user preference arrangement on the desktop, and/or the like. The displayed object may include images, channels listed in a channel map, selected regions on a GUI, menu items and displayed content.

[0056] A wide range of different touch gestures may be used. For example, touch gestures may include a single-point or multi-point gesture, a static or dynamic gesture, a continuous or segmented gesture, and/or the like. The single point gesture may be performed through a single contact point. For example, the single-point gesture is performed by a single touch using a single finger, palm or stylus. The multi-point gesture may be performed through a plurality of points. For example, the multi-point gesture is performed by multiple touches using plural fingers, a finger and a palm, a finger and a stylus, plural styluses and/or combinations thereof. The static gesture does not contain movement, and the dynamic gesture contains movement. The continuous gesture is performed by a single stroke and the segmented gesture is performed by a sequence of separate steps or strokes.

[0057] Contact between the object and the touch screen conventionally has various different patterns. For example, the single-point gesture on the touch screen includes a down event and a subsequent up event, the down event and the up event occurring at the same or almost the same position. The dynamic gesture on the touch screen includes a down event, at least one dragging event subsequent to the down event, and other following events.

[0058] In some embodiments, parameters are used to describe a process in which a finger accesses, comes into contact with and moves away from a touch screen display. These parameters may be a mathematical function of at

least one of a distance between the finger and the touch screen display, pressure applied to the touch screen display by the finger, a contact area between the finger and the touch screen display, a voltage between the finger and the touch screen, a capacitance between the finger and the touch screen display or other physical parameters.

[0059] In some embodiments, according to the magnitude of each parameter (e.g., capacitance) between the finger and the touch screen display, a down event occurs when the parameter exceeds a predetermined threshold value, a dragging event occurs when a position of a cursor corresponding to the finger is moved from position A to position B while the parameter exceeds the predetermined threshold voltage, and an up event occurs when the parameter falls below the threshold level.

[0060] The controller 340 executes a command and performs an operation associated with the electronic device 300. For example, the controller 340 may control data reception and processing and input and output of signals between constituent elements of the electronic device 300 using commands found in the storage unit 345. The controller 340 may be implemented as a single chip, a plurality of chips, or a plurality of electric components. For example, a variety of architectures including a dedicated or embedded processor, a single purpose processor, a controller, an Application Specific Integrated Circuit (ASIC), etc. may be used as the controller 340. The controller 340 may include at least one processor.

[0061] The controller 340 may detect a user action and may control the electronic device 300 based on the detected user action. The user action may include selecting a physical button of a display appliance or a remote controller, executing a prescribed touch gesture or selecting a soft button on a touch screen display, executing a prescribed spatial gesture recognized from an image captured through an image capture device, and producing prescribed sound by recognizing sound received by the sound sensor 390. The controller 340 may analyze a user action as at least one executable command. The controller 340 may control constituent elements of the electronic device 300 in response to the at least one analyzed command. That is, the controller 340 may control data reception and processing and input and output of signals between constituent elements of the electronic device 300 using the at least one command.

[0062] The controller 340 may detect a user action for requesting a GUI for designation of a human address and may control displaying the GUI for designation of the human address in response to the detected user action. The controller 340 may detect a user action for designating a human address and may control displaying a GUI for designation of a channel number in response to the detected user action. The controller 340 may detect a user action for designating a channel number and may store the designated channel number, the designated human address and information associating the designed channel number and human address with each other to a human channel map, in response to the detected user action. The human channel map as broadly described herein may be a channel map that correlates a channel with a human address (or SNS identifier). The human channel map may also be referred to herein as a social network channel map, SNS channel map, or SNS channel listing, and may be displayed in a similar manner and format as a broadcast channel map (e.g., broadcast channel listing).

[0063] The controller 340 may detect a user action for designating a channel number, may read a human address associated with the designated channel number from the human channel map in response to the detected user action, and may control acquiring an address of an electronic device to access, based on the read human address. In some embodiments, the controller 340 may read the address of the electronic device based on the human address from the storage unit 345. In some embodiments, the controller 340 may control transmitting a connection request signal including the read human address to the server 10 and may acquire the address of the electronic device to access from the server 10.

[0064] The controller 340 may control transmitting a registration request signal to the server 10 upon booting or when a user action for requesting server registration is detected. The registration request signal may include an address of an electronic device, a human address, an ID and a password.

[0065] The controller 340 may control transmitting a connection set-up signal to another electronic device. The connection set-up signal may include a human address. When the controller 340 receives a connection set-up signal from another electronic device, the controller 340 may initialize connection with the electronic device which transmits the connection set-up signal, in response to the received connection set-up signal, and may transmit a response signal to the electronic device. During initialization, the controller 340 may open a particular port based on information included in the connection set-up signal and may transmit a response signal including a port number of the port.

[0066] If the controller 340 receives the response signal with respect to the connection set-up signal from the electronic device, the controller 340 may confirm whether or not the response signal includes a particular port number. If the response signal includes the particular port number, the controller 340 may receive and transmit data from and to the electronic device through a port corresponding to the particular port number. In one example, the particular port number may correspond to a port for providing a human channel. In this case, the electronic device 300 may receive content of a human channel through the port.

[0067] The controller 340 may control routing a packet transmitted to the network interface 320 using at least one of an IP address or a port number included in the packet. That is, the controller 340 may control outputting a packet having a particular port to the demultiplexer 315 and may control storing the packet in the storage unit 345.

[0068] The controller 340 may extract data included in the packet and may perform routing of the extracted data using

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at least one of the IP address or the port number included in the packet. That is, the controller 340 may control outputting the packet having the particular port to the demultiplexer 315 and may control storing the packet in the storage unit 345. The controller 340 may directly process the data included in the packet and may control displaying the processed result on a screen.

[0069] The controller 340 executes a computer code together with an Operating System (OS) and generates and uses data. The OS is generally known and therefore a detailed description thereof is omitted. An example of the OS may include Windows OS, Unix, Linux, Palm OS, DOS, Android, and Mac OS. The OS, other computer codes and data may be present within the storage unit 345 which is linked to and operated by the controller 340.

[0070] The storage unit 345 generally stores program codes and data used by the electronic device 300. For example, the storage unit 345 may be implemented as a Read-Only Memory (ROM), a Random Access Memory (RAM), a hard disk drive, etc. The program codes and data may be stored in a separable storage medium and, if necessary, may be loaded or installed onto the electronic device 300. The separable storage medium may include a CD-ROM, a PC card, a memory card, a floppy disk, a magnetic tape and a network component.

[0071] The storage unit 345 may store a human channel map. The storage unit 345 may also catch port numbers and addresses of other electronic devices connected to the electronic device 300. The port numbers and addresses of the electronic devices may be stored in association with human addresses. If a human channel associated with a particular human address is redisplayed, the controller 340 may read a port number and address of an electronic device associated with the particular human address from among the caught port numbers and addresses of the electronic devices and may receive content of the human channel using the read port number and address of the electronic device.

[0072] The scaler 350 performs scaling of signals processed in the video decoder 330 and the audio decoder 335, so as to provide the signals with a magnitude suitable to be output through the display 302 or a speaker (not shown).

[0073] The scaler 350 adjusts and outputs combinations of at least two of a GUI, a video signal and an aspect ratio of a 3D image, according to the kind of content to be displayed or user set-up conditions. An aspect ratio value may be 21:9, 16:9, 4:3 or 3:2. The scaler 350 may perform scaling such that a ratio of a horizontal screen length to a vertical screen length has a particular value.

[0074] The mixer 360 mixes outputs of the scaler 350 and the controller 340.

[0075] The formatter 370 changes the format of audio and video signals output from the mixer 360 to suit the display 302. The formatter 370 passes input signals without implementing a format change function when a 2D image is displayed. When a 3D image is displayed, the formatter 370 may serve as a 3D formatter for processing a signal into a 3D video signal based on the format of a 3D image and the output frequency of the display 302 under control of the controller 340.

[0076] The formatter 370 may output the resultant 3D video signal to form a 3D image to the display 302 and may produce a Sync signal relating to the 3D video signal to output the sync signal to the communication unit 380. The sync signal is a signal for synchronizing display times of left eye viewpoint video data and right eye viewpoint video data and opening/closing times of a left eye lens and a right eye lens of the shutter spectacles 303.

[0077] The communication unit 380 is a communication module for providing omnidirectional (or non-directional) communication and performs wireless communication with other communication appliances based on predetermined communication standards. The communication standards may be Zigbee, Bluetooth, Ultra WideBand (UWB), Radio Frequency Identification (RFID) and wireless Lan. The communication appliances may be the electronic device 300, the spectacles 303 and the remote controller 304.

[0078] The communication unit 380 may include an infrared receiver capable of receiving infrared light from the remote controller 304.

[0079] The sound sensor 390 may receive sound and output the received sound to the controller 340. The controller 340 may recognize sound output from the sound sensor 390 and may control the electronic device 300 based on the recognized sound.

[0080] Figure 4 is a diagram illustrating an exemplary embodiment of a screen on which a Web page of a Social Network Service (SNS) is displayed.

[0081] Referring to Figure 4, the display 302 may display a Web page 400 of the server 200. The network interface 320 may receive the Web page 400 from the server 200, the controller 340 may produce video image data of the Web page 400 to enable displaying the received Web page 400, and the scaler 350 may adjust a resolution of the produced video image data. The display 302 may display the video image data 400, the resolution of which has been adjusted by the scaler 350.

[0082] The Web page 400 may list one or more human addresses 411, 412 and 413. The human address 411 represents 'Sally Brown', the human address 412 represents 'Andy Fox', and the human address 413 represents 'Charlie Brown'. The listed human addresses 411, 412 and 413 are selectable by an indicator 401.

[0083] In some embodiments, an indicator 401may be provided to highlight one of the human addresses 411, 412 and 413, and/or a corresponding item (e.g., news feed). Once highlighted, the address or item may be selected to perform a prescribed process, for example, for designating the corresponding human address. The selection may be made through a remote controller by pressing a particular button (for example, an 'OK' button) or by performing a spatial

gesture corresponding to a selection. The selection may be made by other methods, such as a touch input.

[0084] Figure 5 is a diagram illustrating a screen on which an exemplary embodiment of a GUI for designation of a human address is displayed.

[0085] Referring to Figure 5, if the electronic device 300 detects a user action for designating a human address, the electronic device 300 may display a GUI 510 in response to the detected user action. The GUI 510 may be a pop-up window.

[0086] The GUI 510 may include a menu item 511 for channel registration, a menu item 513 for channel switch, and a menu item 515 for channel editing. The menu items 511, 513 and 515 are selectable by an indicator 520.

[0087] If the electronic device 300 detects a user action for selecting the menu item 511, the electronic device 300 may display a GUI for designation of a channel number in response to the detected user action.

[0088] If the electronic device 300 detects a user action for selecting the menu item 513, the electronic device 300 may display a GUI for switching a channel number in response to the detected user action.

[0089] Also, if the electronic device 300 detects a user action for selecting the menu item 515, the electronic device 300 may display a GUI for editing a channel number in response to the detected user action.

[0090] Figure 6 is a diagram illustrating a screen on which an exemplary embodiment of a GUI for designation of a channel number is displayed.

[0091] Referring to Figure 6, if the electronic device 300 detects a user action for designating a human address, the electronic device 300 may display a GUI 610 in response to the detected user action. Also, if the electronic device 300 detects a user action for selecting the menu item 511, the electronic device 300 may display the GUI 610 in response to the detected user action.

[0092] The GUI 610 lists channel numbers from 41 to 61. The channel numbers from 41 to 61 are selectable by an indicator 620. The GUI 610 may display the channel numbers in such a manner that a channel number to which a human address has been assigned is discriminated from an empty channel number. In the drawing, the channel numbers '41', '43' to '45', '48' to '55', '58', '59' and '61' are channel numbers to which human addresses have been assigned, and the other channel numbers '42', '46', '47', '56', '57' and '60' may be empty channel numbers and distinguished by a bold font. The controller 340 may confirm the channel numbers and whether or not human addresses have been assigned to the channel numbers using a human channel map stored in the storage unit 345 and may produce the GUI 610 based on the confirmed results.

[0093] The channel numbers listed in the GUI 610 may be channel numbers to which human addresses have been assigned, or may be channel numbers to which channels are not assigned.

[0094] In some embodiments, a channel number to which a channel is not assigned may be a channel number which does not belong to any one of a sky wave broadcast channel, a cable channel, an IPTV channel or a satellite channel. Thus, the electronic device 300 may simultaneously perform browsing of a human channel and one of a sky wave broadcast channel, a cable channel, an IPTV channel or a satellite channel.

[0095] In some embodiments, a channel number to which a channel is not assigned may be a channel number which belongs to some kinds of channels including a broadcast channel and an App channel, but does not belong to a human channel.

[0096] Figure 7 is a diagram illustrating one example of a screen on which the result of assigning a human address to a channel number is displayed.

[0097] Referring to Figure 7, if the user performs a user action for issuing a selection order to the indicator 620 in a state in which the indicator 620 is located at one of the channel numbers from 41 to 61 listed in the GUI 610, the electronic device 300 may detect a user action for designating a channel number and may display a message 710 in response to the detected user action. The message 710 may indicate that the designated channel number is assigned to the designated human address. For example, the message 710 indicates that the channel number '60' is assigned to 'Sally Brown'.

[0098] The electronic device 300 may store the human address 'Sally Brown', the channel number '60' and information associating the human address 'Sally Brown' and the channel number '60' with each other in a human channel map, in response to the detected user action.

[0099] Figure 8 is a diagram illustrating an exemplary embodiment of a screen on which a menu is displayed.

[0100] Referring to Figure 8, the electronic device 300 may display a menu 800 including a menu item 810 for requesting displaying a GUI for designation of a human address.

[0101] If the user performs a user action for selecting the menu item 810, the electronic device 300 may detect the user action for selecting the menu item 810 and may display a message 820 in response to the detected user action.

[0102] Figure 9 is a diagram illustrating a screen on which another exemplary embodiment of a GUI for designation of a human address is displayed.

[0103] Referring to Figure 9, if the user performs a user action for selecting a button 821, the electronic device 300 may detect the user action for selecting the button 821 and may display a GUI 910 in response to the detected user action. In another embodiment, if the user performs a user action for selecting the menu item 810, the electronic device 300 may detect the user action for selecting the menu item 810 and display the GUI 910 in response to the detected

user action.

[0104] The user may input an IP address to the GUI 910. After the user completes the user action for inputting the IP address, the electronic device 300 may detect the user action and may display the GUI 610 in response to the detected user action.

[0105] If the user performs a user action for issuing a selection order to the indicator 620 in a state in which the indicator 620 is located at one of the channel numbers from 41 to 61 listed in the GUI 610, the electronic device 300 may detect the user action for designating a channel number and may display a message in response to the detected user action. The message may indicate that the designated channel number is assigned to the input IP address.

[0106] The electronic device 300 may store the input IP address, the channel number '60' and information associating the input IP address and the channel number '60' with each other in the human channel map, in response to the detected user action.

[0107] In some embodiments, the user may further input the human address 'Sally brown' via the GUI 910. If the user completes the user action for inputting the human address 'Sally Brown' and the IP address, the electronic device 300 may detect the user action and may display the GUI 610 in response to the detected user action. If the electronic device 300 detects a user action for designating the channel number '60' among the displayed channel numbers, the electronic device 300 may display a message 710 in response to the detected user action. The electronic device 300 may store the human address 'Sally Brown', the IP address, the channel number '60', and information associating the human address 'Sally Brown' and the IP address with each other and information associating the channel number '60' and the human address 'Sally Brown' with each other in the human channel map, in response to the detected user action.

[0108] Figure 10 is a diagram illustrating a screen on which another exemplary embodiment of a GUI for designation of a human address is displayed.

[0109] Referring to Figure 10, if the user performs a user action for selecting the menu item 810, the electronic device 300 may detect the user action for selecting the menu item 810 and may display a GUI 1010 in response to the detected user action.

[0110] The user may input a human address to the GUI 1010. The human address may include at least one of an e-mail address, an account name, a family name or an SIP-URL. If the user completes the user action for inputting the human address, the electronic device 300 may detect the user action and may display the GUI 610 in response to the detected user action.

[0111] If the user performs a user action for issuing a selection order to the indicator 620 in a state in which the indicator 620 is located at one of the channel numbers from 41 to 61 of the GUI 610, the electronic device 300 may detect the user action for designating a channel number and may display a message in response to the detected user action. The message may indicate that the designated channel number is assigned to the input human address. The message may be the message 710 illustrated in Figure 7.

[0112] The electronic device 300 may store the input human address, the channel number '60' and information associating the input human address and the channel number '60' with each other in the human channel map, in response to the detected user action.

[0113] Figure 11 is a diagram illustrating a screen on which a further exemplary embodiment of a GUI for designation of a human address is displayed.

[0114] Referring to Figure 11, if the user performs a user action for selecting the menu item 810, the electronic device 300 may detect the user action for selecting the menu item 810 and may display a GUI 1110 in response to the detected user action.

[0115] The user may input a human address to the GUI 1110. The GUI 1110 may be a pull-down menu, or the like, that lists one or more selectable human addresses. The human address may include at least one of an e-mail address, an account name or an SIP-URL. If the user completes the user action for inputting the human address, the electronic device 300 may detect the user action and may display the GUI 610 in response to the detected user action.

[0116] In some embodiments, the user may perform a user action for selecting one human address from among the human addresses listed in the GUI 1110. If the user completes the user action for inputting the human address, the electronic device 300 may detect the user action and may display the GUI 610 in response to the detected user action.

[0117] If the user performs a user action for issuing a selection order to the indicator 620 in a state in which the indicator 620 is located at one of the channel numbers from 41 to 61 listed in the GUI 610, the electronic device 300 may detect the user action for designating a channel number and may display a message in response to the detected user action. The message may indicate that the designated channel number is assigned to the input human address. The message may be the message 710 illustrated in Figure 7.

[0118] The electronic device 300 may store the input human address, the channel number '60' and information associating the input human address and the channel number '60' with each other in the human channel map, in response to the detected user action.

[0119] Figure 12 is a diagram illustrating an exemplary embodiment for a human channel map.

[0120] Referring to Figure 12, a human channel map 1210 may include channel numbers, human addresses and

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pointers. In the human channel map, a channel number, a human address to which the channel number is assigned, and a pointer associated with the human address may be arranged in a single line. That is, information representing a line may be information associating a channel number and a human address with each other. In one example, since a channel number '71' and a human address 'Zoe' are located in the second line, the electronic device 300 may confirm that the channel number '71' is assigned to the human address 'Zoe'.

[0121] Access information maps 1230, 1240, 1250, 1260 and 1270 store information required to access the human channels. The access information maps 1230, 1240, 1250, 1260 and 1270 may respectively store different kinds of information according to access methods thereof. The first access information map 1230 may store type information indicating an access method, IP addresses, port numbers and authentication information. The second access information map 1240 may store type information indicating an access method, SIP-URLs and authentication information. The third access information map 1250 may store type information indicating an access method, IP addresses, port numbers, accounts and authentication information. The fourth access information map 1260 may store type information indicating an access method, IP addresses, port numbers, e-mail addresses and authentication information. The fifth access information map 1270 may store type information indicating an access method, shortcuts and authentication information. The information stored in the access information maps 1230, 1240, 1250, 1260 and 1270 may be input by the user, or may be transmitted from the server 10 and the server 20. In addition, the information may be stored in the access information maps before and after the information associating the channel number and the human address with each other is stored in the human channel map 1210.

[0122] An access method may be one of a first access method using IP addresses and port numbers, a second access method using SIP-URLs, a third access method for accessing a server and receiving a service associated with a particular account, a fourth access method for accessing an SNS server and receiving a service associated with a particular e-mail address and a fifth access method using shortcuts. The first access method, the second access method, the third access method, the fourth access method and the fifth access method may respectively be denoted by type 1, type 2, type 3, type 4 and type 5.

[0123] The pointers may indicate positions where information associated with the human addresses is stored. A pointer 1221 indicates a position where information associated with 'Me' is stored. That is, the pointer 1221 indicates the first line of the first access information map 1230. An IP address associated with 'Me' is 127.0.0.1, and a port number associated with 'Me' is 88. Access to a human channel of 'Me' may be implemented by the access method denoted by type 1. A pointer 1222 indicates a position where information associated with 'Zoe' is stored. That is, the pointer 1222 indicates the second line of the first access information map 1230. An IP address associated with 'Zoe' is 210.1.7.29, and a port number associated with 'Zoe' is 545. Access to a human channel of 'Zoe' may be implemented by the access method denoted by type 1. Also, a pointer 1223 indicates a position where information associated with 'Susan' is stored. That is, the pointer 1223 indicates the third line of the first access information map 1230. An IP address associated with 'Susan' is 198.10.8.102, and a port number associated with 'Susan' is 546. Access to a human channel of 'Susan' may be implemented by the access method denoted by type 1.

[0124] A pointer 1225 indicates a position where information associated with 'Chuck' is stored. That is, the pointer 1225 indicates the first line of the second access information map 1240. An SIP-URL associated with 'Chuck' is chuck@TV.com. Access to a human channel representing 'Chuck' may be implemented by the access method denoted by type 2. A pointer 1226 indicates a position where information associated with 'Dad' is stored. That is, the pointer 1226 indicates the second line of the second access information map 1240. An SIP-URL associated with 'Dad' is Dad@TV.com. Access to a human channel of 'Dad' may be implemented by the access method denoted by type 2.

[0125] A pointer 1224 indicates a position where information associated with 'Sophie' is stored. That is, the pointer 1224 indicates the first line of the third access information map 1250. An IP address associated with 'Sophie' is 202.131.29.70, a port number associated with 'Sophie' is 80, and an account name is Sophie. Access to a human channel of 'Sophie' may be implemented by the access method denoted by type 3. A pointer 1227 indicates a position where information associated with 'George' is stored. That is, the pointer 1227 indicates the second line of the third access information map 1250. An IP address associated with 'George' is 209.62.105.13, and a port number associated with 'George' is 80. Access to a human channel of 'George' may be implemented by the access method denoted by type 3.

[0126] A pointer 1228 indicates a position where information associated with 'Carrie' is stored. That is, the pointer 1228 indicates the first line of the fourth access information map 1260. An IP address associated with 'Carrie' is 69.171.224.12, a port number associated with 'Carrie' is 80, and an e-mail address associated with 'Carrie' is Carrie@SNS.com.

[0127] A pointer 1229 indicates a position where information associated with 'Paul' is stored. That is, the pointer 1229 indicates the first line of the fifth access information map 1270. A shortcut associated with 'Paul' is ftp://Paul.sns.com:21.

[0128] The authentication information of the access information maps 1230, 1240, 1250, 1260 and 1270 may include IDs and passwords as well as stored character strings. In addition, the authentication information may be encoded and stored.

[0129] Figure 13 is a flowchart illustrating an implementation procedure of one exemplary embodiment for a method

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of constructing a human channel map in accordance with the present disclosure.

[0130] Referring to Figure 13, the display 302 displays a first GUI for designation of a human address (S100). The displayed first GUI may list at least one selectable human address. The listed human address may be transmitted from one of the first server 10 and the second server 20. The network interface 320 may receive the human address from one of the first server 10 and the second server 20. The controller 340 may control displaying the first GUI which provides the human address. The first GUI may be one of the Web page 400 in Figure 4, the GUI 910 in Figure 9, the GUI 1010 in Figure 10 and the GUI 1110 in Figure 11.

[0131] The controller 340 detects a first user action for designating a human address (S110).

[0132] The display 302 displays a second GUI for designation of a channel number in response to the detected first user action (S120). The displayed second GUI may list a plurality of selectable channel numbers. The second GUI may include an indicia that indicates the channel numbers which are currently available. The second GUI may be the GUI 610 in Figure 6.

[0133] The controller 340 detects a second user action for designating a channel number (S130).

[0134] The controller 340 stores a human address, a channel number and information associating the human address and the channel number with each other in a human channel map in response to the detected second user action (S140). The human channel map may be the human channel map 1210 in Figure 12, or may include the human channel map 1210, the first access information map 1230, the second access information map 1240, the third access information map 1250, the fourth access information map 1260 and the fifth access information map 1270 as illustrated in Figure 12.

[0135] Figure 14 is a flowchart illustrating an implementation procedure of another exemplary embodiment for a method of constructing a human channel map in accordance with the present disclosure.

[0136] Referring to Figure 14, the display 302 displays a first GUI for designation of a channel number (S200). The displayed first GUI may list a plurality of selectable channel numbers. The channel numbers may include an indicia identifying channel numbers which are available such as highlighting, bold text, or the like. The first GUI may be the GUI 610 in Figure 6.

[0137] The controller 340 detects a first user action for designating a channel number (S210).

[0138] The display 302 displays a second GUI for designating a human address in response to the detected first user action (S220). The displayed second GUI may list at least one selectable human address. The listed human address may be transmitted from one of the first server 10 and the second server 20. The network interface 320 may receive the human address transmitted from one of the first server 10 and the second server 20, and the controller 340 may control displaying the second GUI which provides the received human address. The second GUI may be one of the Web page 400 in Figure 4, the GUI 910 in Figure 9, the GUI 1010 in Figure 10 and the GUI 1110 in Figure 11.

[0139] The controller 340 detects a second user action for designating a human address (S230).

[0140] The controller 340 stores a human address, a channel number and information associating the human address and the channel number with each other in a human channel map in response to the detected second user action (S240). The human channel map may be the human channel map 1210 in Figure 12, or may include the human channel map 1210, the first access information map 1230, the second access information map 1240, the third access information map 1250, the fourth access information map 1260 and the fifth access information map 1270 as illustrated in Figure 12.

[0141] Figure 15 is a diagram illustrating one exemplary embodiment of a screen on which a human channel map and content of a selected human channel are displayed.

[0142] Referring to Figure 15, the controller 340 may control displaying a screen 1500. The screen 1500 may include a channel map region 1510, a channel display region 1520, a content list region 1530 and a human display region 1540.

[0143] The channel map region 1510 provides a human address and a channel number mapped to the human address. In one example, the channel map region 1510 provides a human address 'Me', denoted by reference numeral 1511, and a channel number '00', denoted by reference numeral 1512, mapped to the human address 'Me'. The controller 340 may produce an image displayed on the channel map region 1510 using information of the human channel map. The human address and channel number of the channel map region 1510 may be selected using a cursor 1501 and an indicator 1502. For example, when the cursor 1501 is positioned over a particular human address (e.g., human address'Sophie', denoted by reference numeral 1513, and channel number '72' denoted by reference numeral 1514), the indicator 1502 may be located over a designated human address and channel number, as illustrated in Figure 15. The cursor 1501 may be a pointer, arrow, or the like, and the indicator 1502 may be a highlight, bold text, or the like.

[0144] The channel display region 1520 may display a human channel corresponding to a designated channel number. In Figure 15, since the indicator 1502 and cursor 1501 are positioned over the channel number '72', a designated channel number is 72 and thus, the channel display region 1520 displays a human channel corresponding to the channel number '72'. The human channel corresponding to the channel number '72' is a human channel of the human address mapped to the channel number '72'. That is, the channel display region 1520 displays the human channel of'Sophie'.

[0145] The content list region 1530 provides a content list provided by a human channel corresponding to a designated channel number. The content list region 1530 may provide a thumbnail of content. If a user action for selecting particular content from among content provided in the content list region 1530 is detected, the controller 340 may control displaying

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the selected content on the channel display region 1520 in response to the detected user action. In addition, it is possible to discriminate between content displayed on the channel display region 1520 and content displayed on the content list region 1530. To this end, for example, the content displayed on the channel display region 1520 may be highlighted in the content list region 1530.

[0146] The human display region 1540 displays a human having a human address associated with a selected channel number. The human display region 1540 may display a picture of an owner of a human channel indicated by the indicator 1501.

[0147] Figure 16 is a diagram illustrating another exemplary embodiment of a screen on which a human channel map and content of a selected human channel are displayed.

[0148] Referring to Figure 16, the controller 340 may detect a user action for requesting channel switch to Channel 73. The user action for requesting channel switch may include executing a spatial gesture for requesting channel increment, or pressing a button of a remote controller for requesting channel increment.

[0149] The controller 340 may control displaying a screen 1600 in response to the detected user action. In a channel map region 1610, an indicator 1601 is located at the channel number '73' designated by the user action. A channel display region 1620 displays a human channel corresponding to the channel number '73', i.e. the human channel of 'Chuck'. A content list region 1630 displays a content list provided by the human channel mapped to the channel number '73'.

[0150] Figure 17 is a diagram illustrating a further exemplary embodiment of a screen on which a human channel map and content of a selected human channel are displayed.

[0151] Referring to Figure 17, the controller 340 may detect a user action for requesting channel switch to Channel 75. The controller 340 may control displaying a screen 1700 in response to the detected user action. In a channel map region 1710, an indicator 1701 is located at the channel number '75' designated by the user action. A channel display region 1720 displays a human channel corresponding to the channel number '75', i.e. the human channel of 'Susan'. A content list region 1730 displays a content list provided by the human channel mapped to the channel number '75'.

[0152] Figure 18 is a diagram illustrating an implementation procedure of an exemplary embodiment for a method of providing a human channel service in accordance with the present disclosure.

[0153] Referring to Figure 18, the controller 340 detects a user action for designating a channel number (S300). Step S300 may be performed while the display 302 is displaying at least one of a human channel, a broadcast channel or an App channel. For example, the controller 340 may detect the user action for designating a channel number while the display 302 is displaying the screen 1500 of Figure 15, the screen 1600 of Figure 16 or the screen 1700 of Figure 17. The broadcast channel may include at least one of a sky wave broadcast channel, a cable channel, a satellite channel or an IPTV channel.

[0154] The controller 340 receives content of a human channel indicated by the designated channel number in response to the detected user action (S310). The content may be first content of a content list provided by the human channel or initial content introducing the human channel.

[0155] The controller 340 controls displaying the received content (S320). The display 302 may display the screen 1500 of Figure 15, the screen 1600 of Figure 16 or the screen 1700 of Figure 17.

[0156] Figure 19 is a diagram illustrating an implementation procedure of one exemplary embodiment for a method of receiving content of a human channel.

[0157] Referring to Figure 19, the controller 340 reads a human address associated with a designated channel number from a human channel map (S400). The human channel map may be the human channel map 1210 of Figure 12 or may include the human channel map 1210, the first access information map 1230, the second access information map 1240, the third access information map 1250, the fourth access information map 1260 and the fifth access information map 1270 as illustrated in Figure 12.

[0158] The controller 340 reads an address of an electronic device to access, based on the read human address (S410). The electronic device to access may be one of the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130, the mobile terminal 140, or another appropriate type of multi-functional display device. The address of the electronic device to access may be stored in the access information map 1230 illustrated in Figure 12. The address of the electronic device to access may include an IP address and a port number.

[0159] The network interface 320 receives content from the electronic device using the read address of the electronic device (S420). The electronic device 300 may set up communication with the electronic device using the address of the electronic device read in Step S410 and may receive content of a human channel from the electronic device. The content may be transmitted based on a protocol such as SMTP, HTTP, FTP, RTSP or MMS.

[0160] The method of receiving content of a human channel illustrated in Figure 19 may be one example of the first access method as described with reference to Figure 12.

[0161] Figure 20 is a diagram illustrating an implementation procedure of another exemplary embodiment for a method of receiving content of a human channel.

[0162] Referring to Figure 20, the controller 340 reads a human address associated with a designated channel number

from a human channel map (S500). The human channel map may be the human channel map 1210 of Figure 12, or may include the human channel map 1210, the first access information map 1230, the second access information map 1240, the third access information map 1250, the fourth access information map 1260 and the fifth access information map 1270 as illustrated in Figure 12.

[0163] The controller 340 reads an address of a server to be connected, based on the read human address (S510). The server may be the server 10 or the server 20. The address of the server may be stored in the access information map 1250, the access information map 1260 and the access information map 1270. The address of the server may include an IP address, a port number and an account name, or may include an IP address, a port number and an e-mail address, or may include a shortcut.

[0164] The network interface 320 receives content from the server using the read address of the server (S520). The electronic device 300 may access the server using the address of the server read in Step S510 and may receive content of a human channel from the server. The content may be transmitted based on a protocol such as SMTP, HTTP, FTP, RTSP or MMS.

[0165] The method of receiving content of a human channel illustrated in Figure 19 may be one example of one of the third access method, the fourth access method and the fifth access method as described with reference to Figure 12, according to the address of the server read in Step S510.

[0166] Figure 21 is a diagram illustrating an implementation procedure of a further exemplary embodiment for a method of receiving content of a human channel.

[0167] Referring to Figure 21, the controller 340 reads a human address associated with a designated channel number from a human channel map (S600). The human channel map may be the human channel map 1210 of Figure 12, or may include the human channel map 1210, the first access information map 1230, the second access information map 1240, the third access information map 1250, the fourth access information map 1260 and the fifth access information map 1270 as illustrated in Figure 12. Also, the read human address may include an SIP-URL.

[0168] The network interface 320 transmits a connection request signal including the read human address to a server (S610). The connection request signal may include an SIP-URL. Also, the server may be the server 10.

[0169] The network interface 320 receives a signal including an address of an electronic device from the server (S620). The signal may be a response signal with respect to the connection request signal. The address of the electronic device 300 may include an IP address and a port number. The electronic device 300 may be one of the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140.

[0170] The controller 340 controls receiving content using the received address of an electronic device (S630). The electronic device 300 may set up communication with the electronic device using the received address of the electronic device read in operation 620 and may receive content of a human channel from the electronic device. The content may be transmitted based on a protocol such as SMTP, HTTP, FTP, RTSP or MMS.

[0171] Figure 22 is a diagram illustrating a method of setting up connection between two electronic devices.

[0172] Referring to Figure 22, an electronic device 2210 may set up (or configure) a first connection 2211 with a server 2230. During set up of the first connection 2211, the server 2230 acquires and stores an IP address and port number of the electronic device 2210. The first connection 2211 may be set up during booting of the electronic device 2210, or may be set up when a user requests connection between the electronic device 2210 and the server 2230. The electronic device 2210 may be one of the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 or the mobile terminal 140, and the server 2230 may be the server 10, for example.

[0173] An electronic device 2220 may set up a second connection 2231 with the server 2230. During set up of the second connection 2231, the server 2230 acquires and stores an IP address and a port number of the electronic device 2220. The second connection 2231 may be set up during booting of the electronic device 2220, or may be set up when a user requests connection between the electronic device 2220 and the server 2230.

[0174] The second connection 2231 may be set up after the server 2230 completes set up of the first connection 2211 with the electronic device 2210. When requesting the second connection 2231, the server 2230 may use the previously stored IP address and port number of the electronic device 2220. The electronic device 2220 may be one of the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 or the mobile terminal 140.

[0175] The electronic device 2210 may set up a third connection 2221 with the electronic device 2220. In this case, the electronic device 2210 may receive the IP address and port number of the electronic device 2220 from the server 2230 which has previously acquired the IP address and port number through the second connection 2231, and may transmit a signal to the electronic device 2220 using the received IP address and port number. The transmitted signal may be a connection set-up signal or a human channel request signal.

[0176] The electronic device 2220 may receive the IP address and port number of the electronic device 2210 from the server 2230 which has previously acquired the IP address and port number through the first connection 2211, and may transmit a response signal to the electronic device 2210 using the received IP address and port number. In some embodiments, the electronic device 2220 may extract the IP address and port number of the electronic device 2210

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from the connection set-up signal transmitted from the electronic device 2210 and may transmit a response signal to the electronic device 2210 using the extracted IP address and port number.

[0177] Figure 23 is a schematic diagram illustrating a configuration of another exemplary embodiment of a broadcast system in accordance with the present disclosure, and Figure 24 is a diagram illustrating an exemplary embodiment of a Network Address Translation (NAT) table, and Figure 25 is a diagram illustrating an exemplary embodiment of an address matching table recorded in a server.

[0178] Referring to Figures 23 to 25, the broadcast system 2300 may include a first electronic device 2310, a second electronic device 2320, a network device 2330, a network device 2340 and a server 2350.

[0179] The first electronic device 2310 and the second electronic device 2320 respectively have private IP addresses. Specifically, the private IP address of the electronic device 2310 is private_ip1 and the private IP address of the electronic device 2320 is private_ip2. The electronic device 2310 and the electronic device 2320 may be one of the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 or the mobile terminal 140.

[0180] The network device 2330, as set up in the NAT table, translates the private IP address of the first electronic device 2310 into a public IP address, i.e. from private_ip1 to public_ip1. More specifically, the network device 2330 translates a source IP address of a packet, transmitted from the first electronic device 2310 to the server 2350, from pivate_ip1 into public_ip1. The network device 2330 may be one of a router, a sharer or a gateway.

[0181] The network device 2340, as set up in the NAT table, translates the private IP address of the second electronic device 2320 into a public IP address, i.e. from private_ip2 to public_ip2. More specifically, the network device 2340 translates a source IP address of a packet, transmitted from the second electronic device 2320 to the server 2350, from pivate_ip2 into public_ip2. The network device 2340 may be one of a router, a sharer or a gateway.

[0182] The server 2350 may be the server 10 illustrated in Figure 1. The server 2350 may store an address matching table 2500. The address matching table 2500 may be permanently or temporarily stored in the storage unit. The address matching table 2500 may store a human address, an IP address and information associating the human address and the IP address with each other. The information associating the human address and the IP address with each other may be information representing a line of the table.

[0183] In the address matching table 2500, a human address 1 is associated with public_ip1, and a human address 2 is associated with public_ip 2. The human address 1 is user1@TV.com, which is a human address transmitted by the first electronic device 2310, and the human address 2 is user2@TV.com, which is a human address transmitted by the second electronic device 2320.

[0184] If the server 2350 receives a connection request signal including the human address 2 'user2@TV.com' from the first electronic device 2310, the server 2350 reads the IP address 'public_ip2' matching to the human address 2 from the address matching table 2500 and transmits a response signal including the read IP address 'public_ip2' to the first electronic device 2310. Also, the server 2350 reads the IP address 'public_ip1' of the first electronic device 2310 from the address matching table 2500 and transmits a signal including the read IP address 'public_ip1' to the second electronic device 2320. In conclusion, the first electronic device 2310 may implement data reception/transmission with the second electronic device 2320 having the private IP address using the received IP address 'public_ip2'.

[0185] Figure 26 is a diagram illustrating an implementation procedure of an exemplary embodiment for a method of setting up connection between two electronic devices.

[0186] Referring to Figure 26, the first electronic device 2610 transmits a registration request signal to a server 2630 (S700). The server 2630 may receive the registration request signal. The first electronic device 2610 may be one of the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 or the mobile terminal 140. The registration request signal may include a human address 'user1@TV.com' and information required to log-in to the server 2630. The log-in information may be authentication information stored in a human channel map.

[0187] The server 2630 transmits a response signal with respect to the registration request signal to the first electronic device 2610 (S705). The server 2630 may store the human address 'user1@TV.com' included in the registration request signal and the address of the first electronic device 2610 in an address matching table. Also, the server 2630 may implement a log-in procedure using information included in the registration request signal. The address matching table may be the address matching table 2500 illustrated in Figure 26. The server 2630 may be the server 10 illustrated in Figure 1.

[0188] The second electronic device 2620 transmits a registration request signal to the server 2630 (S710). The server 2630 may receive the registration request signal. The second electronic device 2620 may be one of the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 or the mobile terminal 140. The registration request signal may include the human address 'user2@TV.com' and information required to log-in to the server 2630.

[0189] The server 2630 transmits a response signal with respect to the received registration request signal to the second electronic device 2620 (S715). The server 2630 may store the human address 'user2@TV.com' included in the registration request signal and the address of the second electronic device 2620 in the address matching table. Also,

the server 2630 may implement a log-in procedure using information included in the registration request signal.

[0190] The first electronic device 2610 transmits a connection request signal including the human address 'user2@TV.com' to the server 2630 (S720). The server 2630 receives the connection request signal.

[0191] The server 2630 transmits a connection response signal including 'public_ip2' to the first electronic device 2610 in response to the received connection request signal (S725). 'Public_ip2' is the public IP address of the second electronic device 2620. The first electronic device 2610 receives the connection response signal and acquires the address of the second electronic device 2620 using the connection response signal.

[0192] The server 2630 transmits a connection response signal including 'public_ip1' to the second electronic device 2620 (S730). 'Public_ip1' is the public IP address of the first electronic device 2610. The second electronic device 2620 receives the connection response signal and acquires the address of the first electronic device 2610 using the connection response signal.

[0193] The first electronic device 2610 transmits a connection set-up signal to the second electronic device 2620 using the IP address 'public-ip2' (S735). The second electronic device 2620 receives the connection set-up signal.

[0194] The second electronic device 2620 transmits a connection response signal with respect to the connection set-up signal to the first electronic device 2610 using the IP address 'public_ip1' (S740). The first electronic device 2610 receives the connection response signal. With Step S735 and Step S740, communication between the first electronic device 2610 and the second electronic device 2620 is initialized. The connection response signal may include a particular port number, and the second electronic device 2620 may open a port corresponding to the particular port number.

[0195] The first electronic device 2610 transmits a human channel request signal to the second electronic device 2620 in response to the received connection response signal (S745). The second electronic device 2620 receives the human channel request signal. The human channel request signal may be transmitted to a port corresponding to the port number included in the connection response signal.

[0196] The second electronic device 2620 transmits a response signal with respect to the received human channel request signal to the first electronic device 2610 (S750).

[0197] The response signal may include content of a human channel or a content list of a human channel. The first electronic device 2610 receives the response signal. The first electronic device 2610 may display content when the content is transmitted as the response signal, or may display a content list when the content list is transmitted as the response signal.

[0198] Figure 27 is a diagram illustrating a screen on which one exemplary embodiment of a GUI for setting up a human channel is displayed.

[0199] Referring to Figure 27, the display 302 may display a GUI 2700. If the controller 340 detects a user action for setting up a human channel in a state in which the Web page 400 is displayed, the controller 340 may control displaying the GUI 2700 in response to the detected user action. In some embodiments, the controller 340 may control displaying the GUI 2700 after the Web page 400 is received.

[0200] The GUI 2700 includes a channel number region 2710 including at least one channel number and a human channel region 2720 including at least one human address. In one example, the Web page 400 illustrated in Figure 4 may be displayed on the human channel region 2720, and the GUI 610 illustrated in Figure 6 may be displayed on the channel number region 2710.

[0201] The user may drag each human address 411, 412 or 413 to the channel number region 2710 on the GUI 2700 and drop the dragged human address onto one of the channel numbers listed on the channel number region 2710. The human address 411, 412, and 413 may be represented by an icon, or another appropriate type of selectable object. The icon may have an image associated with the individual. Then, the controller 340 may store the channel number onto which the human address was dropped, the dropped human address and information associating the channel number and human address with each other in a human channel map. The human channel map may be the human channel map 1210 in Figure 12, or may include the human channel map 1210, the first access information map 1230, the second access information map 1240, the third access information map 1250, the fourth access information map 1260 and the fifth access information map 1270 as illustrated in Figure 12.

[0202] Figure 28 is a diagram illustrating a screen in a state in which a human address is being dragged on the displayed GUI of Figure 27.

[0203] Referring to Figure 28, an image 2810 represents a state in which the human address 411 is being dragged. If the image 2810 drops onto a channel number '60', the human address 411, the channel number '60' and information associating the human address 411 and the channel number '60' with each other may be stored in the human channel map.

[0204] Figure 29 is a diagram illustrating a screen on which another exemplary embodiment of a GUI for setting up a human channel is displayed.

[0205] Referring to Figure 29, the display 302 may display a GUI 2900. If the controller 340 detects a user action for setting up a human channel, the controller 340 may control display of the GUI 2900 in response to the detected user action. The user action is, for example, a user action for selecting the menu item 810 illustrated in Figure 8, or a user action for selecting a separate channel set-up menu item.

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[0206] The GUI 2900 includes a channel number region 2910 including at least one channel number and a human channel region 2920 including at least one human address. The GUI 1110 illustrated in Figure 11 may be displayed on the human channel region 2920 and the GUI 610 illustrated in Figure 6 may be displayed on the channel number region 2910.

[0207] The user may drag each human address "user99@TV.com', 'user91@TV.com', 'user23@TV.com', etc., to the channel number region 2910 on the GUI 2900 and drop the dragged human address onto one of the channel numbers listed on the channel number region 2910. Then, the controller 340 may store the channel number to which the human address was dropped, the dropped human address and information associating the channel number and the human address with each other in a human channel map. The human channel map may be the human channel map 1210 in Figure 12, or may include the human channel map 1210, the first access information map 1230, the second access information map 1240, the third access information map 1250, the fourth access information map 1260 and the fifth access information map 1270 as illustrated in Figure 12.

[0208] Figure 30 is a diagram illustrating a screen in a state in which a human address is being dragged on the displayed GUI of Figure 29.

[0209] Referring to Figure 30, an image 3010 represents a state in which the human address 'user91@TV.com' is being dragged. If the image 3010 is dragged onto the channel number '60', the human address 'user91@TV.com', the channel number '60' and information associating the human address 'user91@TV.com' and the channel number '60' with each other may be stored in the human channel map.

[0210] Figure 31 is a diagram illustrating a screen on which an exemplary embodiment of a GUI for setting up a channel is displayed.

[0211] Referring to Figure 31, the display 302 may display a GUI 3100. If the controller 340 detects a user action for setting up a channel, the controller 340 may control displaying the GUI 3100 in response to the detected user action. The user action is, for example, the user action for selecting the menu item 810 illustrated in Figure 8, the user action for selecting the menu item 513 or the menu item 515 illustrated in Figure 5, a user action for selecting a channel set-up menu item, or the like, which may be configured to display the GUI 3100.

[0212] The GUI 3100 includes a broadcast channel region 3110 including at least one broadcast channel, a human channel region 3120 including at least one human address and an App channel region 3130 including at least one App channel. The broadcast channel refers to a channel for providing real-time broadcasting received through a satellite, a terrestrial broadcast system or an IP network. The App channel may refer to a content provider or a service provider connectable through an IP network, or may refer to a channel for providing data reception/transmission with the content provider or the service provider. Also, the App channel may refer to a channel capable of receiving an Internet service provided by the content provider or the service provider. The Internet service refers to a Content on Demand (CoD) service, a YouTube service, an information service for providing weather, news and local information and enabling information retrieval and the like, an entertainment service related to gaming, singing and the like, a communication service related to TV mail and TV SMS services and the like, and other Internet services including an application providing service and the like.

[0213] The broadcast channel region 3110 lists broadcast channels, such as 'NBC', 'FOX', 'CNN', 'SBS', 'KBS' and 'OCN'. The human channel region 3120 lists human addresses, such as 'Marek Foss', 'Ellisabeth Daveine' and 'Anne'. The App channel region 3130 lists App channels, such as 'Farmville', 'Chess', 'Angry birds' and 'Unblock Me'.

[0214] The GUI 3100 further includes a channel number region 3140, a next channel call button 3150 and a cancel button 3160. The channel number region 3140 serves to indicate a particular channel number, and the next channel call button 3150 serves to switch the channel number indicated on the channel number region 3140 to another channel number. The cancel button 3160 serves to cancel a user action implemented on the GUI 3100.

[0215] The user may drag each human address 'Marek Foss', 'Ellisabeth Daveine' or 'Anne' to the channel number region 3140 on the GUI 3100 and may drop the dragged human address onto the channel number region 3140. Then, the controller 340 may store the channel number indicated on the channel number region 3140, the dropped human address and information associating the channel number and the human address with each other in a human channel map. The human channel map may be the human channel map 1210 in Figure 12, or may include the human channel map 1210, the first access information map 1230, the second access information map 1240, the third access information map 1250, the fourth access information map 1260 and the fifth access information map 1270 as illustrated in Figure 12.

[0216] Also, the user may drag each broadcast channel 'NBC', 'FOX', 'CNN', 'SBS', 'KBS' or 'OCN' to the channel number region 3140 on the GUI 3100 and may drop the dragged broadcast channel onto the channel number region 3140. Then, the controller 340 may store the channel number indicated on the channel number region 3140, the dropped broadcast channel and information associating the channel number and the broadcast channel with each other in a broadcast channel map. The broadcast channel map refers to a channel map in which the broadcast channel and the channel number are stored in association with each other.

[0217] The user may also drag each App channel 'Farmville', 'Chess', 'Angry bird' or 'Unblock Me' to the channel number region 3140 on the GUI 3100 and may drop the dragged App channel onto the channel number region 3140.

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Then, the controller 340 may store the channel number indicated on the channel number region 3140, the dropped App channel and information associating the channel number and the App channel with each other in an App channel map. The App channel map refers to a channel map in which the App channel and the channel number are stored in association with each other.

[0218] Figure 32 is a diagram illustrating a screen in a state in which a human address is being dragged on the displayed GUI of Figure 31.

[0219] Referring to Figure 32, a screen 3200 displays an image 3125 on the GUI 3100. The image 3125 represents a state in which the human address 'Marek Foss' is being dragged. If the image 3125 drops onto the channel number region 3140, the human address 'Marek Foss', the channel number '100' and information associating the human address 'Marek Foss' and the channel number '100' with each other may be stored in the human channel map.

[0220] Figure 33 is a diagram illustrating a screen in a state in which a broadcast channel, a human address and an App channel are dropped onto the channel number region of the displayed GUI of Figure 31.

[0221] Referring to Figure 33, a screen 3300 displays images 3115, 3125 and 3135 dropped onto the channel number region 3140. The image 3115 and the image 3135 respectively represent a state in which the broadcast channel 'NBC' and the App channel 'Chess' were dropped. In this case, the broadcast channel, the human address and the App channel may be mapped to the same channel number. In other words, the same channel number may be assigned to a broadcast channel, a human channel and an App channel.

[0222] It should be appreciated that a particular channel number may be assigned multiple SNS accounts associated with a particular individual or multiple individuals. For example, an individual may have multiple SNS accounts, such as a facebook account and a twitter account, each represented by an image or icon in the human channel region 3120. In this case, the images or icons corresponding to each of the SNS accounts may be dragged into the channel number region 3140 and associated with the corresponding channel number (e.g., channel 100). Alternatively, the multiple SNS accounts for a particular individual may be assigned to different channels. In another embodiment, icons for multiple SNS accounts of different users (e.g., SNS accounts corresponding to Marek Foss and Anne) may be dropped in the channel number region 3140 and associated with a particular channel number (e.g., channel 100). In this case, the group of SNS addresses may be given a human address (or SNS identifier) that represents the group, for example, "family." The human address for the group may be associated with a particular channel number.

[0223] Figure 34A and Figure 34B are flowcharts illustrating an implementation procedure of a further exemplary embodiment for a method of constructing a channel map in accordance with the present disclosure.

[0224] Referring to Figure 34A and Figure 34B, the display 302 displays a GUI for setting up a channel (S800). The displayed GUI may be one of the GUI 2700 illustrated in Figure 27, the GUI 2900 illustrated in Figure 29 or the GUI 3100 illustrated in Figure 31.

[0225] The controller 340 detects a first user action for selecting a human address (S801). The first user action may be a user action for generating a down event (e.g., a selection) in a region at which the human address is located.

[0226] The controller 340 detects a second user action for requesting dragging (S802). The second user action may occur consecutively after the first user action. The second user action may be a user action for successively generating a dragging event. The controller 340 controls dragging the human address selected by the first user action.

[0227] The controller 340 detects a third user action for selecting a channel number (S803). The third user action may be a user action for generating a drop event in a region at which the channel number is located. The controller 340 controls dropping the dragged human address onto the region at which the channel number selected by the third user action is located, in response to the detected third user action.

[0228] The controller 340 confirms whether or not a human address associated with the selected channel number is present in a human channel map, in response to the detected third user action (S804). The human channel map may be the human channel map 1210 in Figure 12 or may include the human channel map 1210, the first access information map 1230, the second access information map 1240, the third access information map 1250, the fourth access information map 1260 and the fifth access information map 1270 as illustrated in Figure 12.

[0229] If the associated human address is present, the controller 304 deletes the associated human address, the selected channel number and information associating the associated human address and the selected channel number with each other from the human channel map (S805).

[0230] Then, the controller 340 stores the selected human address, the selected channel number and information associating the selected human address and the selected channel number with each other in the human channel map (S806).

[0231] The controller 340 detects a fourth user action for selecting a broadcast channel (S807). The fourth user action may be a user action for generating a down event in a region at which the broadcast channel is located.

[0232] The controller 340 detects a fifth user action for requesting dragging (S808). The fifth user action may occur consecutively after the fourth user action. The fifth user action may be a user action for successively generating a dragging event. The controller 340 controls dragging the broadcast channel selected by the fourth user action, in response to the detected fifth user action.

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[0233] The controller 340 detects a sixth user action for selecting a channel number (S809). The sixth user action may be a user action for generating a drop event in a region at which the channel number is located. The controller 340 controls dropping the dragged broadcast channel onto the region at which where the selected channel number is located, in response to the detected sixth user action.

[0234] The controller 340 confirms whether or not a broadcast channel associated with the selected channel number is present in a broadcast channel map, in response to the detected sixth user action (S810).

[0235] If the associated broadcast channel is present, the controller 304 deletes the associated broadcast channel, the selected channel number and information associating the associated broadcast channel and the selected channel number with each other from the broadcast channel map (S811).

[0236] Then, the controller 340 stores the selected broadcast channel, the selected channel number and information associating the selected broadcast channel and the selected channel number with each other in the broadcast channel map (S812).

[0237] The controller 340 detects a seventh user action for selecting an App channel (S813). The seventh user action may be a user action for generating a down event in a region at which the App channel is located.

[0238] The controller 340 detects an eighth user action for requesting dragging (S814). The eighth user action may occur consecutively after the seventh user action. The eighth user action may be a user action for successively generating a dragging event. The controller 340 controls dragging the App channel selected by the seventh user action, in response to the detected eighth user action.

[0239] The controller 340 detects a ninth user action for selecting a channel number (S815). The ninth user action may be a user action for generating a drop event in a region at which the channel number is located. The controller 340 controls dropping the dragged App channel onto the region at which the channel number selected by the ninth user action is present, in response to the detected ninth user action.

[0240] The controller 340 confirms whether or not an App channel associated with the selected channel number is present in an App channel map, in response to the detected ninth user action (S816).

[0241] If the associated App channel is present, the controller 304 deletes the associated App channel, the selected channel number and information associating the associated App channel and the selected channel number with each other from the App channel map (S817).

[0242] Then, the controller 340 stores the selected App channel, the selected channel number and information associating the selected App channel and the selected channel number with each other in the App channel map (S818).

[0243] Figure 35 is a diagram illustrating an exemplary embodiment of a broadcast screen on which a human channel map is displayed.

[0244] Referring to Figure 35, the display 302 may display a screen 3500. The screen 3500 displays a broadcast program 3510 of a broadcast channel and a human channel map. If the controller 340 detects a user action for requesting display of a human channel map in a state in which the broadcast program 3510 is displayed on the screen 3500, the controller 340 may control displaying a human channel map 3520 in response to the detected user action.

[0245] The human channel map 3520 displays a human address 3531 and a channel number 3533 associated with the human address 3531, which are stored in the human channel map 1210 of Figure 12. The human channel map 3520 also displays a broadcast channel 3535 that a person indicated by the human address 3531 is viewing, a broadcast program 3537 and display time information 3539 of the broadcast program 3537. A channel guiding signal (or a signal or message for identifying a channel), which includes at least one of the broadcast channel 3535, the broadcast program 3537 or the display time information 3539, may be received according to Step S310 of Figure 18. That is, instead of content, the channel guiding signal is received in Step S310.

[0246] In some embodiments, the channel guiding signal may be received from the server 10 illustrated in Figure 1.

[0247] The controller 340 may transmit a channel guiding signal, which includes at least one of the broadcast program 3510 which is being displayed, a broadcast channel which broadcasts the broadcast program 3510 or display time information of the broadcast program 3510, to an electronic device or a server. The channel guiding signal may be transmitted in a constant period or whenever a broadcast program being displayed is switched. The controller 340 may transmit the channel guiding signal to the electronic device or the server according to an access method associated with the channel numbers included in the human channel map. The server for receiving the channel guiding signal may be the server 10 illustrated in Figure 1. The human channel map may be the human channel map 1210 in Figure 12, or may include the human channel map 1210, the first access information map 1230, the second access information map 1240, the third access information map 1250, the fourth access information map 1260 and the fifth access information map 1270 as illustrated in Figure 12.

[0248] Figure 36 is a diagram illustrating an exemplary embodiment of a screen for invitation to view a channel.

[0249] Referring to Figure 36, the display 302 may display a GUI 3600. If the controller 340 detects a user action for requesting display of a human channel map while a broadcast program 3610 is being displayed on the screen 3600, the controller 340 may control displaying a human channel map 3620 in response to the detected user action.

[0250] The human channel map 3620 displays the human address 'Me' and the channel number '00' associated with

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the human address 'Me', which are stored in the human channel map 1210 of Figure 12.

[0251] The user may drag a broadcast program from an original display region 3610 thereof to the human channel map 3620 and then, may drop the dragged broadcast program 3630 onto a position at which a human channel 3622 is located. The controller 340 may control displaying an image 3630 representing the dragged broadcast program on the screen, in response to the user dragging action. The controller 340 also generates and controls transmitting a channel viewing request signal for requesting viewing of the broadcast program 3630 to an electronic device (e.g., a remote multi-functional display device) associated with the human channel 3622. The channel viewing request signal may be transmitted to the electronic device or the server according to an access method associated with the channel numbers included in the human channel map. The human channel map may be the human channel map 1210 in Figure 12, or may include the human channel map 1210, the first access information map 1230, the second access information map 1240, the third access information map 1250, the fourth access information map 1260 and the fifth access information map 1270 as illustrated in Figure 12.

[0252] In some embodiments, the controller 340 may control transmission of the signal for requesting viewing of the broadcast program 3630 to the server. The server may be the server 10 illustrated in Figure 1.

[0253] In some embodiments, when the image 3630 is located at the human channel, the controller 340 may control displaying a message 'User B' which represents a human address associated with the human channel.

[0254] In some embodiments, if the controller 340 detects a user action for selecting the broadcast program 3610 and a user action for selecting the channel number, the controller 340 controls transmitting a channel viewing request signal for requesting viewing of the broadcast program 3610 to an electronic device associated with the human channel indicated by the selected channel number, in response to the detected user action for selecting the channel number. The user action for selecting the broadcast program 3630 is, for example, touching a region where the broadcast program 3630 is displayed, pressing a predetermined button (e.g., a 'select' button) in a state in which an indicator is located at the region where the broadcast program 3630 is displayed, and pressing a predetermined button (e.g., a 'select' button) in a state in which the region where the broadcast program 3630 is displayed is focused. The user action for selecting the channel number is, for example, pressing a numeric key of a remote controller, touching the human channel listed in the human channel map 3620, pressing a predetermined button (e.g., a 'select' button) in a state in which an indicator is located at the human channel listed in the human channel map 3620, and pressing a predetermined button (e.g., a 'select' button) in a state in which the human channel listed in the human channel map 3620 is focused.

[0255] Figure 37 is a schematic diagram illustrating a configuration of another exemplary embodiment of a broadcast system in accordance with the present disclosure.

[0256] Referring to Figure 37, a broadcast system 3700 in accordance with the present disclosure may include the first server 10, the second server 20, the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130, the mobile terminal 140, a third digital TV 150 and a fourth digital TV 160. The first server 10, the second server 20, the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140 respectively correspond to the first server 10, the second server 20, the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 and the mobile terminal 140 as described above with reference to Figure 1 and thus, a detailed description thereof is omitted. Even the third digital TV 150 and the fourth digital TV 160 correspond to the first digital TV 100 and thus, a detailed description thereof is omitted hereinafter.

[0257] The first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130, the mobile terminal 140, the third digital TV 150 and the fourth digital TV 160 may receive broadcast channels through different transmission media. The first digital TV 100 may receive broadcast channels through a satellite 3, the second digital TV 110 may receive broadcast channels through a terrestrial broadcast system 4, and the personal computer system 120 and the notebook computer 130 may receive broadcast channels through an IP network 5. Also, the mobile terminal 140 may receive broadcast channels through a Digital Multimedia Broadcasting (DMB) system 6, and the third digital TV 150 and the fourth digital TV 160 may receive broadcast channels through a cable 7.

[0258] The first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130, the mobile terminal 140, the third digital TV 150 and the fourth digital TV 160 may receive broadcast channels from different service providers respectively.

[0259] The first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130, the mobile terminal 140, the third digital TV 150 and the fourth digital TV 160 may receive broadcast channels from the same service provider, and kinds and range of broadcast channels transmitted from the service provider may be identical or different.

[0260] Even if the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130, the mobile terminal 140, the third digital TV 150 and the fourth digital TV 160 receive different kinds of broadcast services from different transmission media or service providers, the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130, the mobile terminal 140, the third digital TV 150 and the fourth digital TV 160 may search for a channel, which provides a broadcast program corresponding to the

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received channel viewing request signal, using Electronic Program Guide (EPG) data and information included in the received channel viewing request signal, and may receive the broadcast program through the channel.

[0261] Figure 38 is a diagram illustrating a configuration of an exemplary embodiment for a channel invitation packet.

[0262] Referring to Figure 38, the transmitted channel viewing request signal may have a format 3800. The packet 3800 may include a Details_of_user field, a Physical_channel_details field, a Service_Name field, a Service_ID field, a Channel_number field, an Event_Name field, an Event_ID field, a Transport_Stream_ID field, a Network_ID field, a ServiceProvider field, an Originating_medium field and an Originating_Country field.

[0263] The Details_of_user field includes detailed user information. Specifically, the Details_of_user field includes detailed information about a user who sends a channel viewing request signal.

[0264] The Physical_channel_details field includes detailed information about a physical channel which transmits a broadcast program requested to view.

[0265] The Service_Name field includes a service name of a broadcast program requested to view.

[0266] The Service_ID field includes a service ID of a broadcast program requested to view.

[0267] The Channel_number field includes a channel number of a broadcast program requested to view.

[0268] The Event_Name field includes an event name of a broadcast program requested to view.

[0269] The Event_ID field includes an event ID of a broadcast program requested to view.

[0270] The Transport_Stream_ID field includes a transport stream ID of a broadcast program requested to view.

[0271] The Network_ID field includes a network ID of a broadcast program requested to view.

[0272] The ServiceProvider field includes information about a service provider for providing a broadcast program requested to view.

[0273] The Originating_medium field includes information about a transmission medium for transmitting a broadcast program requested to view.

[0274] The Originating_Country field includes information about a nation or an area (e.g., geographical area or region) from which a broadcast program, requested to view, is transmitted.

[0275] Figure 39 is a diagram illustrating an exemplary embodiment of a screen displayed when invitation to view a channel is made.

[0276] Referring to Figure 39, the display 302 may display a screen 3900. The screen 3900 displays a broadcast program 3910 and a menu map 3920. The screen 3900 also displays a guidance message 3930, which indicates a broadcast channel included in a broadcast viewing request signal, and a message 3940 which indicates a user who sends a broadcast viewing request signal. The guidance message 3930 may be displayed as a message associated with a TV menu item 3922.

[0277] The controller 340 controls displaying the guidance message 3930 and the message 3940 when receiving the broadcast viewing request signal.

[0278] Figure 40 is a diagram illustrating one exemplary embodiment of a guidance message with regard to invitation to view a channel.

[0279] Referring to Figure 40, the display 302 may display a guidance message 4010. If a broadcast viewing request signal is transmitted to the controller 340, the controller 340 may generate the guidance message 4010 and control displaying the generated guidance message 4010. In some embodiments, if the controller 340 detects a user action for selecting the guidance message 3930 illustrated in Figure 39, the controller 340 may control displaying the guidance message 4010 in response to the detected user action.

[0280] The guidance message 4010 informs of a user A who sends a broadcast viewing request signal and makes inquiry about whether or not to view a requested broadcast program (e.g., a dance show on ESPN). The guidance message 4010 includes a 'Yes' button 4012 for accepting viewing and a 'No' button 4014 for rejecting viewing. In one embodiment, the guidance message 4010 may also display other users who are currently viewing the broadcast program or users who have been invited to view the broadcast program.

[0281] If the controller 340 detects a user action for accepting invitation to view a channel, the controller 340 controls displaying the requested broadcast program, in response to the detected user action. The user action may be a user action of pressing the button 4012.

[0282] If the controller 340 detects a user action for rejecting the invitation to view a channel, the controller 340 controls a screen 4000 to continuously display the broadcast program 3910. The user action may be a user action of pressing the button 4014.

[0283] Figure 41 is a diagram illustrating another exemplary embodiment of a guidance message with regard to invitation to view a channel.

[0284] Referring to Figure 41, the display 302 may display a message 4110. The controller 340 may control displaying the message 4110 when receiving a broadcast viewing request signal. In some embodiments, if the controller 340 detects a user action for selecting the guidance message 3930 illustrated in Figure 39, the controller 340 may control displaying the guidance message 4110 in response to the detected user action.

[0285] The guidance message 4110 informs of a user A who sends a broadcast viewing request signal and makes

inquiry about whether or not to view a channel similar to a requested broadcast channel because the requested broadcast channel is not found. The guidance message 4110 includes a 'Yes' button 4112 for accepting viewing and a 'No' button 4114 for rejecting viewing.

[0286] If the controller 340 detects a user action for accepting invitation to view a channel, the controller 340 controls displaying a similar broadcast program, in response to the detected user action. The user action may be a user action of pressing the button 4112.

[0287] If the controller 340 detects a user action for rejecting invitation to view a channel, the controller 340 controls a screen 4100 to continuously display the broadcast program 3910. The user action may be a user action of pressing the button 4114.

[0288] Figure 42 is a diagram illustrating a further exemplary embodiment of a guidance message with regard to invitation to view a channel.

[0289] Referring to Figure 42, the display 302 may display a guidance message 4210. The controller 340 may control displaying a guidance message 4210 when receiving a broadcast viewing request signal. In some embodiments, if the controller 340 detects a user action for selecting the guidance message 3930 illustrated in Figure 39, the controller 340 may control displaying the guidance message 4210 in response to the detected user action.

[0290] The guidance message 4210 informs of a user A who sends a broadcast viewing request signal and also, informs that a channel, which is the same as or similar to a requested broadcast program, is not found. The guidance message 4210 includes an 'OK' button 4212.

[0291] If the controller 340 detects a user action for confirming that viewing of an invited channel is not possible, the controller 340 removes the guidance message 4210 from a screen 4200 in response to the detected user action and controls the screen 4200 to continuously display the broadcast program 3910. The user action may be a user action of pressing the button 4212.

[0292] Figures 43A and 43B are diagrams illustrating an exemplary embodiment of a screen displayed when invitation to view a channel is accepted.

[0293] Referring to Figures 43A and 43B, if Patrick accepts a viewing request of Susan, an electronic device of Susan may display a screen 4310 and an electronic device of Patrick may display a screen 4320. Patrick may accept the viewing request of Susan by pressing the button 4012 of the guidance message 4010 illustrated in Figure 40 or the button 4112 of the guidance message 4110 illustrated in Figure 41.

[0294] As Patrick accepts the viewing request, the electronic device of Patrick stops displaying the broadcast program 3910 and displays the broadcast program 3610 indicated by a broadcast viewing request signal. Thus, the electronic devices of Susan and Patrick display the same broadcast program 3610.

[0295] The screen 4310 displays a picture 4315 of Patrick who views the same broadcast, a chat input window 4318 and a chat window 4319. Susan may chat with Patrick using the chat input window 4318 and the chat window 4319.

[0296] The screen 4320 displays a picture 4325 of Susan who views the same broadcast, a chat input window 4328 and a chat window 4329. Patrick may chat with Susan using the chat input window 4328 and the chat window 4329.

[0297] Figure 44 is a diagram illustrating an exemplary embodiment of a channel matching table.

[0298] Referring to Figure 44, the server 10 may store a channel matching table 4400. The server 10 may match channels of electronic devices to each other using the channel matching table 4400. The server 10 matches a channel indicated by a broadcast viewing request signal to a channel which is receivable by an electronic device to which the broadcast viewing request signal is transmitted, using the channel matching table 4400.

[0299] A first electronic device receives a broadcast channel from a service provider 1 and a second electronic device receives a broadcast channel from a service provider 2. If the first electronic device transmits a channel viewing request signal for inviting a user to view a channel to a user of the second electronic device, the server 10 receives the channel viewing request signal and reads a channel 901 of the service provider 2, which matches to a channel 101 indicated by the channel viewing request signal, from the channel matching table 4400. The server 10 amends the channel viewing request signal so as to indicate the channel 901 and transmits the amended channel viewing request signal to the second electronic device.

[0300] If the channel viewing request signal has the format 3800 illustrated in Figure 38, the server 10 may confirm a service provider of the first electronic device based on information included in the ServiceProvider field. The server 10 may amend information, stored in the Physical_channel_detail field and in the Channel_number field, to detailed information (e.g., 11100 MHZ) about the physical channel 901 matching to the channel 101 indicated by the channel viewing request signal and the channel 901 respectively, and may transmit the amended channel viewing request signal to the second electronic device.

[0301] The channel matching table 4400 stores information in such a manner that the same channels of different service providers are associated with each other. If the channel 101 and the channel 202 of the service provider 1 are associated respectively with the channel 901 and the channel 345 of the service provider 2, the channel matching table 4400 may store the channel 910, the channel 101 and information associating the channels 101 and 910 with each other and also, may store the channel 202, the channel 345 and information associating the channels 202 and 234 with each

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other

[0302] The channel matching table 4400 may store the frequency of each channel. In one example, the channel matching table 4400 stores the frequency of the channel 101 of 10800 MHZ and the frequency of the channel 901 of 11100 MHZ. The channel matching table 4400 may be stored on the originating electronic device (inviter), the destination electronic device (invitee), and/or a server.

[0303] Figure 45 is a diagram illustrating an implementation procedure of one exemplary embodiment for a method of making invitation to view a channel in accordance with the present disclosure.

[0304] Referring to Figure 45, Steps S900 to S940 correspond to Steps S700 to S740 and thus, a description with respect to Steps S900 to S940 refers to Steps S700 to S740 and is omitted hereinafter.

[0305] A first electronic device 4510 transmits a broadcast viewing request signal to a second electronic device 4520 in response to the received connection response signal transmitted in Step S940 (S945). The second electronic device 4520 receives the broadcast viewing request signal. The broadcast viewing request signal may be transmitted to a port indicated by a port number included in the connection response signal. The broadcast viewing request signal may have the format 3800 illustrated in Figure 38.

[0306] The second electronic device 4520 transmits a response signal with respect to the broadcast viewing request signal to the first electronic device 4510 in response to the received broadcast viewing request signal (S950). The first electronic device 4510 receives the response signal. The response signal may be one of a viewing acceptance signal, a viewing not possible signal and a viewing rejection signal.

[0307] The electronic device 4510 and the electronic device 4520 may receive broadcast services from the same service provider or different service providers. Even when the electronic devices 4510 and 4520 receive broadcast services from the same service provider, the electronic devices 4510 and 4520 may receive different kinds of broadcast services and broadcast channels. The electronic device 4520 may confirm whether or not it receives a broadcast service from the same service provider as that in the first electronic device 4510 using information about the service provider included in the broadcast viewing request signal and EPG data. The electronic device 4520 may also confirm that it can receive a viewing requested channel using EPG data and at least one of detailed information about physical channels, service names, service IDs, channel numbers, event names, transport stream IDs or network IDs included in the broadcast viewing request signal.

[0308] If it is confirmed that the electronic device 4520 receives broadcast services from the same service provider as that in the electronic device 4510, but cannot receive a viewing requested channel from the service provider, the electronic device 4520 may search for and display a similar channel using EPG data and at least one of detailed information about physical channels, service names, service IDs, channel numbers, event names, transport stream IDs or network IDs included in the broadcast viewing request signal.

[0309] If the electronic device 4520 and the electronic device 4510 receive broadcast services from different service providers, the electronic device 4520 searches for a channel, which is the same as or similar to a viewing requested channel, from among channels provided by other service providers, based on EPG data and at least one of detailed information about physical channels, service names, service IDs, channel numbers, event names, transport stream IDs, network IDs, nation information or local information included in the channel viewing request signal. The electronic device 4520 may display the located channel. The electronic device 4520 may display one of the guidance message 4010, the guidance message 4110 and the guidance message 4210 based on the search results.

[0310] The electronic device 4520 and the electronic device 4510 may receive broadcast services from different transmission media. The electronic device 4520 may confirm this kind of reception using information about a transmission medium included in a broadcast viewing request signal. If it is confirmed that the electronic device 4520 and the electronic device 4510 receive broadcast services from different transmission media, the electronic device 4520 searches for a channel, which is the same as or similar to a viewing requested channel, from among channels provided by other service providers, based on EPG data and at least one of detailed information about physical channels, service names, service IDs, channel numbers, event names, transport stream IDs, network IDs, nation information or local information included in the channel viewing request signal. The electronic device 4520 may display the located channel. The electronic device 4520 may display one of the guidance message 4010, the guidance message 4110 and the guidance message 4210 based on the search results.

[0311] If the response signal is a viewing acceptance signal, the first electronic device 4510 may display a screen on which a chat window and a chat input window are displayed, and the second electronic device 4520 may display a screen on which a chat window and a chat input window are displayed. The screen displayed by the first electronic device 4510 may be the screen 4310 and the screen displayed by the second electronic device 4520 may be the screen 4320.

[0312] If the response signal is a viewing not possible signal, the first electronic device 4510 may transmit a broadcast program invited to view to the second electronic device 4520.

[0313] Figure 46 is a flowchart illustrating an implement procedure of another exemplary embodiment for a method of making invitation to view a channel in accordance with the present disclosure.

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[0314] Referring to Figure 46, the display 302 displays a human channel map (S1000). The human channel map may be the human channel map 3520 illustrated in Figure 35 or the human channel map 3620 illustrated in Figure 36.

[0315] The external signal input unit 325 receives a signal for requesting channel switch (S1010). The controller 340 detects the received channel switch request signal. The channel switch request signal may be generated when the user performs an action of pressing a predetermined key of a remote controller, or may be a video signal with regard to a spatial gesture for requesting channel switch.

[0316] The controller 340 controls a screen to display content of a requested channel in response to the detected channel switch request signal (S1020). The channel may be a broadcast channel, a human channel or an App channel. The screen may be the screen 1600 illustrated in Figure 16 or the screen 3500 illustrated in Figure 35.

[0317] The controller 304 detects a user action for requesting invitation to view a channel (S1030). The user action is, for example, an action of dragging a screen on which content is displayed and dropping the dragged screen onto a human channel listed in a human channel map. In one example, the controller 340 may drag the image 3630 illustrated in Figure 36 to the human channel '43' and may detect a user action for requesting invitation to view the human channel '43' when the image 3630 drops onto the human channel '43'. In another example, the user action may be a combination of a user action for selecting a displayed broadcast program and a user action for selecting a human channel (or a channel number).

[0318] The controller 340 transmits a channel viewing request signal in response to the detected user action (S1040). The channel viewing request signal may have the format 3800 illustrated in Figure 38.

[0319] In some embodiments, the controller 340 may control transmitting the channel viewing request signal to the electronic device which provides the human channel indicated by the channel number designated by the user action in Step S1030. The address of the electronic device may be acquired by the above described method as illustrated in Figures 19 to 21.

[0320] In some embodiments, the controller 340 may control transmitting the channel viewing request signal to a server. The server may be the server 10 illustrated in Figure 1.

[0321] The controller 340 receives a response signal with respect to the transmitted channel viewing request signal (S1050). The response signal may be one of a viewing acceptance signal, a viewing not possible signal and a viewing rejection signal.

[0322] If the response signal is a viewing acceptance signal, the controller 340 may display a screen on which a chat window and a chat input window are displayed. The screen may be the screen 4310 illustrated in Figures 43A and 43B.

[0323] If the response signal is a viewing not possible signal, the controller 340 may transmit a broadcast program invited to view to the electronic device which provides the human channel indicated by the channel number designated by the user action in Step S1030.

[0324] Figure 47 is a flowchart illustrating an implement procedure of an exemplary embodiment for a method of processing invitation to view a channel in accordance with the present disclosure.

[0325] Referring to Figure 47, the display 302 displays a broadcast program (S1100).

[0326] The network interface 302 receives a channel viewing request signal (S1110). The controller 340 generates a guidance message with regard to invitation to view a channel using information included in the received channel viewing request signal. The generated guidance message may be the message 3930 and the message 3940 illustrated in Figure 39, the guidance message 4010 illustrated in Figure 40, the guidance message 4110 illustrated in Figure 41, or the guidance message 4210 illustrated in Figure 42.

[0327] The controller 340 may confirm whether or not it can receive a viewing requested channel using information included in the channel viewing request signal. The controller 340 may confirm whether or not it can receive a viewing requested channel from a service provider using stored EPG data and information about the service provider included in the channel viewing request signal. The controller 340 generates a guidance message 4010 when it can receive the viewing requested channel from the service provider.

[0328] Even when the electronic device 300 can receive a broadcast service from a service provider indicated by the channel viewing request signal, the electronic device 300 may fail to receive the viewing requested channel from the service provider according to terms of a contract with the service provider. If this failure to receive the channel is confirmed, the controller 340 may search for a similar channel using EPG data and at least one of detailed information about physical channels, service names, service IDs, channel numbers, event names, transport stream IDs or network IDs included in the channel viewing request signal. If the electronic device 300 succeeds in searching for the similar channel, the controller 340 may generate the guidance message 4110 and if not, may generate the guidance message 4210.

[0329] If the controller 340 cannot receive the viewing requested channel from the service provider, the controller 304 confirms whether or not the viewing requested channel is receivable from another service provider. The controller 340 searches for the same channel as the viewing requested channel from among channels provided by another service provider based on EPG data and at least one of detailed information about physical channels, service names, service IDs, channel numbers, event names, transport stream IDs or network IDs included in the channel viewing request signal. If the channel is found, the controller 340 may generate the guidance message 4010. If the same channel is not found,

but a similar channel is found, the controller 340 may generate the guidance message 4110. If the same channel and the similar channel are not found, the controller 340 may generate the guidance message 4210. Here, another service provider may be a service provider which provides a broadcast service to the electronic device 300.

[0330] The controller 340 may confirm whether or not it can receive the viewing requested channel, using information about a transmission medium included in the channel viewing request signal. If the controller 340 receives a broadcast service from a transmission medium different from that indicated by the channel viewing request signal, the controller 340 searches for the same channel as the viewing requested channel from among channels provided by the different transmission medium, based on EPG data and at least one of detailed information about physical channels, service names, service IDs, channel numbers, event names, transport stream IDs or network IDs included in the channel viewing request signal. If the same channel is found, the controller 340 may generate the guidance message 4010. If the same channel is not found, but a similar channel is found, the controller 340 may generate the guidance message 4110. If the same channel and the similar channel are not found, the controller 340 may generate the guidance message 4210.

[0331] The display 302 displays the guidance message generated in Step S1110 on a screen (S1120). The screen may be one of the screen 3900, the screen 4000, the screen 4100 and the screen 4200 as illustrated in Figures 39 to 42. After the display 302 displays the screen 3900, one of the screen 4000, the screen 4100 and the screen 4200 may be displayed under control of the controller 340. If the controller 340 detects a user action for selecting the message 3930 in a state in which the screen 3900 is displayed, the controller 340 may control displaying one of the screen 4000, the screen 4100 and the screen 4200.

[0332] The controller 340 confirms whether or not a user action for accepting invitation to view a channel is detected (S1130). The controller 340 may detect a user action for rejecting invitation to view a channel and also, may detect a user action for confirming that viewing of an invited channel is not possible. The user actions may be performed according to the above described method as illustrated in Figures 40 to 42.

[0333] The controller 340 controls displaying content of a channel indicated by the channel viewing request signal in response to the detected user action for accepting invitation to view the channel (S1140). If the guidance message 4110 is displayed in Step S1120, the controller 340 controls displaying content of a channel similar to the channel indicated by the channel viewing request signal.

[0334] The controller 340 controls transmitting a response signal with respect to the channel viewing request signal to the electronic device which transmits the channel viewing request signal (S1150). The response signal may include a viewing acceptance signal, a viewing not possible signal or a viewing rejection signal. The controller 340 transmits the viewing acceptance signal when detecting a user action for accepting invitation to view a channel, the viewing rejection signal when detecting a user action for rejecting invitation to view a channel, and the viewing not possible signal when detecting a user action confirming that viewing of a channel is not possible.

[0335] When the viewing not possible signal is transmitted, the electronic device, which transmits the channel viewing request signal, may directly transmit the viewing requested broadcast program to the network interface 320. The controller 340 may control displaying the broadcast program received by the network interface 320.

[0336] Figure 48 is a diagram illustrating an embodiment of a screen on which content is displayed, Figure 49 is a diagram illustrating one embodiment of a screen on which content is displayed in a simultaneous viewing mode, and Figure 50 is a diagram illustrating another embodiment of a screen on which content is displayed in a simultaneous viewing mode.

[0337] Referring to Figures 48 to 50, the display 302 may display a screen 4800. The screen 4800 displays content.

[0338] If the controller 340 detects a user action for requesting display of content, the controller 340 may control displaying the screen 4800 in response to the detected user action. Also, if the controller 340 detects a user action for requesting a simultaneous viewing mode during display of the screen 4800, the controller 340 may control display of a screen 4900 or a screen 5000. The controller 340 may convert the screen 4900 to the screen 5000 or convert the screen 5000 to the screen 4900 according to a user action for requesting mode conversion.

[0339] The screen 4900 includes a content display region 4910 and a chat region 4920. The content display region 4910 displays content of the screen 4800, and the chat region 4920 includes a chat window 4930 and a chat input window 4940. The chat window 4930 shows a chat partner 4931 and a chat phrase 4932 input by a chat partner. The user can input a chat phrase into the chat input window 4940.

[0340] The screen 5000 may include a content display region 5010, a chat input window 5020, silhouette selecting marks 5021 to 5028, and silhouettes 5031, 5033, 5035 and 5037. The silhouettes 5031, 5033, 5035 and 5037 respectively represent chat partners. The silhouette 5031 represents a chat partner 'Arry', the silhouette 5033 represents a chat partner 'David', the silhouette 5035 represents the user who is in charge of the chat, and the silhouette 5037 represents a chat partner 'Susan'. A chat phrase may be displayed at a location associated with the user or the chat partner who inputs the chat phrase. For example, if the chat partner 'David' inputs a chat phrase 5043, the chat phrase 5043 is displayed at a location associated with the silhouette 5033 of 'David'.

[0341] If the controller 340 detects a user action for selecting one of the silhouette selecting marks 5021 to 5028, the controller 340 controls display of the silhouette 5035 of the user in response to the detected user action such that the

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silhouette 5035 is converted to a silhouette image associated with the selected silhouette selecting mark. Additionally, the controller 340 may transmit a signal to request conversion to the silhouette image to the server 10, the server 20, or other electronic devices.

[0342] A human channel owner who is viewing the same content may be determined as a chat partner. More particularly, the human channel owner who is viewing the same content as that displayed on the screen 4800 may be automatically determined as a chat partner. In some embodiments, the controller 340 may confirm the owner based on information included in the above described channel guiding signal of Figure 35.

[0343] In some embodiments, the controller 340 may receive an owner list, including the human channel owner who is viewing the same content, from the server 10 and confirm the owner via the received owner list.

[0344] Figure 51 is a diagram illustrating a further embodiment of a screen on which content is displayed in a simultaneous viewing mode.

[0345] Referring to Figure 51, silhouettes 5110, 5120, 5130, 5140 and 5150 may be displayed as 3D images having a particular depth value 5160. More particularly, the silhouettes 5031, 5033, 5035 and 5037 of Figure 50 may be respectively displayed as the 3D images 5110, 5120, 5130 and 5140.

[0346] Figure 52 is a diagram explaining an embodiment of a method for confirming viewing of the same content.

[0347] Referring to Figure 52, a controller of an electronic device 5210 may control transmission of an image frame request signal 5221 to an electronic device 5250. The electronic device 5250 may be an electronic device associated with a human channel included in a human channel map that is stored in the electronic device 5210. The image frame request signal 5211 may be transmitted to the electronic device or the server according to a connection method associated with a channel number included in the human channel map.

[0348] The image frame request signal 5211 may be a signal to request that an image frame be displayed for a particular period of time M starting from a particular time T. The electronic device 5250 receives the image frame request signal 5211 and acquires an image frame 5253 to be displayed for a particular period of time M starting from a particular time T according to the received image frame request signal 5211. The controller of the electronic device 5210 controls acquisition of an image frame 5213 to be displayed for a particular period of time M starting from a particular time T.

[0349] The electronic device 5250 transmits an image frame transmission signal 5255 to the electronic device 5210. The image frame transmission signal 5255 includes the image frame 5253.

[0350] The electronic device 5210 receives the transmitted image frame transmission signal 5255 and executes a comparison algorithm 5215 to confirm whether or not the image frame 5253 included in the received image frame transmission signal 5255 is equal to the image frame 5213. If the two image frames are equal to each other, the controller of the electronic device 5210 confirms that an owner of a human channel associated with the electronic device 5210 is viewing the same content. If the two image frames are not equal to each other, the controller of the electronic device 5210 can confirm that the owner is not viewing the same content. The comparison algorithm 5215 can confirm the equality of image frames in sequence starting from a particular time T. In this case, if the image frames have different resolutions, confirmation of the equality may be performed after equalizing the resolutions of the image frame 5213 and the image frame 5253.

[0351] With the method for confirming viewing of the same content as described in relation to Figure 52, a controller of one electronic device can confirm whether or not content displayed thereon is equal to content displayed on another electronic device, irrespective of different service providers and transmission media.

[0352] Figure 53 is a diagram explaining a method for detecting user emotions.

[0353] Referring to Figure 53, while a viewer 5301 is viewing content 5300, the image capture device 301 may capture an image of the viewer 5301.

[0354] The controller 340 detects a face zone from the captured image frame of the viewer 5301 output by the image capture device 301. Then, the controller 340 confirms the emotions of the viewer 5301 based on the detected face zone. The controller 340 may produce emotion data indicating the confirmed emotions and then, control transmission of the produced emotion data to an electronic device of a chat partner.

[0355] The image capture device 301 may capture the image of the viewer 5301 at a preset interval. The controller 340 may confirm the emotions of the viewer 5301 at the preset interval and then, produce emotion data if emotion change occurs, thereby controlling transmission of the emotion data to the electronic device of the chat partner.

[0356] Figure 54 is a diagram illustrating the contour of a silhouette mapped to user emotions.

[0357] Referring to Figure 54, the storage unit 345 may store the contour of a silhouette associated with particular emotions. For example, the storage unit 345 may store the contour of a silhouette 5410 associated with sadness, the contour of a silhouette 5420 associated with anger, and the contour of a silhouette 5430 associated with happiness.

[0358] Figure 55 is a diagram illustrating an embodiment of a screen on which different silhouettes depending on user emotions are displayed.

[0359] Referring to Figure 55, the controller 340 may acquire the contour of a silhouette associated with the confirmed emotions from the storage unit 345 and control display of a silhouette of an owner of the electronic device 300 such that the silhouette is converted to the acquired contour of a silhouette. Also, the controller 340 may acquire the contour of a

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silhouette, associated with emotions indicated by emotion data transmitted from the electronic device of the chat partner, from the storage unit 345 and control display of a silhouette of the chat partner such that the silhouette is converted to the acquired contour of a silhouette.

[0360] In one example, if it is confirmed that the owner of the electronic device 300 is angry, the controller 340 controls display of a silhouette 5520. If the controller 340 receives emotion data indicating sadness from an electronic device of a first chat partner, the controller 340 controls display of a silhouette of the first chat partner as a silhouette 5510. In addition, if the controller 340 receives emotion data indicating happiness from an electronic device of a second chat partner, the controller 340 controls display of a silhouette of the second chat partner as a silhouette 5530.

[0361] Figure 56 is a diagram explaining a procedure for registering a facial image, and Figure 57 is a diagram explaining a procedure for training a facial image.

[0362] Referring to Figures 56 and 57, the electronic device 300 may receive a user facial image 5620 on a per emotion basis registered by a user 5610. In one example, the electronic device 300 may receive an angry facial image 5710, a sad facial image 5720 and a happy facial image 5730, which are registered by the user 5610. The storage unit 345 may store the respective registered facial images 5710, 5720 and 5730 on a per emotion basis.

[0363] The controller 340 may compare the facial images on a per emotion basis stored in the storage unit 345 with a facial image 5740 detected from an image frame of a viewer which is captured while the viewer is viewing content and then, confirm one of the stored facial images that is most similar to the facial image 5740. The controller 340 may confirm the emotions of the confirmed facial image as the emotions of the viewer. Also, the controller 340 may store the facial image 5740 as a facial image having the confirmed emotions in the storage unit 345. In one example, if it is confirmed that the facial image 5740 is most similar to the facial image 5710, the controller 340 may add the facial image 5740 as an angry emotional facial image, similar to the facial image 5710, to the storage unit 345. With such addition of the facial image, the electronic device 300 can more accurately confirm the emotions of the viewer.

[0364] Figure 58 is a diagram explaining a method for detecting a user motion.

[0365] Referring to Figure 58, while a viewer 5801 is viewing content 5800, the image capture device 301 may capture an image of the viewer 5801.

[0366] The controller 340 detects a user motion 5810 from a captured image frame of the viewer 5801 output by the image capture device 301. Then, the controller 340 may produce motion data indicating the confirmed motion 5810 and then, control transmission of the produced motion data to the electronic device of the chat partner.

[0367] The image capture device 301 may capture the image of the viewer 5801 at a preset interval. The controller 340 may confirm the motion of the viewer 5301 at the preset interval and then, produce motion data if motion change occurs, thereby controlling transmission of the motion data to the electronic device of the chat partner.

[0368] The controller 340 may control display of a silhouette of the owner of the electronic device 300 such that the silhouette represents the confirmed motion 5810. Also, the controller 340 may control display of a silhouette of the chat partner such that the silhouette is converted to the contour of a silhouette representing a motion indicated by the motion data transmitted from the electronic device of the chat partner.

[0369] Figures 59A to 59D are diagrams explaining a method for reflecting a screen effect on content.

[0370] Referring to Figures 59A to 59D, a screen effect window 5910 may be displayed on a screen 5900. The screen effect window 5910 may include one or more screen effect selecting regions 5911, 5912 and 5913. The user may perform a user action for selecting one of the screen effect selecting regions 5911, 5912 and 5913, and the controller 340 may detect the user action as a user action for requesting a screen effect. The controller 340 may detect the user action for requesting a screen effect, produce screen effect data indicating the screen effect in response to the detected user action, and control transmission of the produced effect data to the electronic device of the chat partner. In one example, if the user performs a user action 5920 for selecting the screen effect selecting region 5911, the controller 340 may produce screen effect data indicating a screen effect of the screen effect selecting region 5911 and then, control transmission of the produced screen effect data to the electronic device of the chat partner.

[0371] In addition, if the user performs the user action 5920 for selecting the screen effect selecting region 5911, the controller 340 controls display of a mark 5930 indicating that the screen effect selecting region 5911 is selected and then, controls reflection of a screen effect 5940 of the screen effect selecting region 5911 on the displayed content 5900. Here, a position of the screen effect 5940 may be selected as the user clicks a corresponding region.

[0372] If the controller 340 receives the screen effect data from the electronic device of the chat partner, the controller 340 may control reflecting an effect indicated by the received screen effect data on the displayed content 5900.

[0373] The controller 340 may control the video decoder 330 to change pixel data of the image frame according to the screen effect. Additionally, the controller 340 may produce On Screen Display (OSD) according to the screen effect, thereby controlling display of the OSD on a content display region.

[0374] Figure 60 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for remotely viewing content at the same time.

[0375] Referring to Figure 60, the controller 340 detects a user action for requesting display of content (S1200).

[0376] The controller 340 confirms whether or not a viewing mode is a simultaneous viewing mode in response to the

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detected user action (S1210). The simultaneous viewing mode may be setup by initial values, or may be setup by the user as necessary.

[0377] If the viewing mode is the simultaneous viewing mode, the controller 340 confirms the presence of a human channel owner who is viewing the requested content (S1220). Here, Step S1220 may include an implementation procedure of a method for confirming viewing of the same content that will be described hereinafter with reference to Figure 64 or 65.

[0378] The controller 340 controls display of content in the simultaneous viewing mode (S1230). The display 302 may display one of the screen 4900, the screen 5000 and the screen 5100. The screen 4900, the screen 5000 and the screen 5100 may represent the owner confirmed in Step S1220 as a chat partner. That is, the owner confirmed in Step S1220 becomes a chat partner.

[0379] If the viewing mode is not the simultaneous viewing mode, the controller 340 controls display of the requested content (S1240). The display 302 may display the screen 4800.

[0380] The method for remotely viewing content at the same time of Figure 60 may further include an implementation procedure of a method that will be described hereinafter with reference to Figures 67 to 70.

[0381] Figure 61 is a flowchart illustrating an implementation procedure of another exemplary embodiment in relation to a method for remotely viewing content at the same time.

[0382] Referring to Figure 61, the display 302 displays content (S1300). The display 302 may display the screen 4800.

[0383] The controller 340 detects a user action for requesting a simultaneous viewing mode (S1310).

[0384] The controller 340 confirms the presence of a human channel owner who is viewing the displayed content in response to the detected user action (S1320). Here, Step S1320 may include the implementation procedure of the method for confirming viewing of the same content that will be described hereinafter with reference to Figure 64 or 65.

[0385] The controller 340 controls display of content in the simultaneous viewing mode (S1330). The display 302 may display one of the screen 4900, the screen 5000 and the screen 5100. The screen 4900, the screen 5000 and the screen 5100 may represent the owner confirmed in Step S1320 as a chat partner. That is, the owner confirmed in Step S1320 becomes a chat partner.

[0386] The method for remotely viewing content at the same time of Figure 61 may further include the implementation procedure of the method that will be described hereinafter with reference to Figures 67 to 70.

[0387] Figure 62 is a flowchart illustrating an implementation procedure of another exemplary embodiment in relation to a method for remotely viewing content at the same time.

[0388] Referring to Figure 62, the display 302 displays content (S1400). The display 302 may display the screen 4800.

[0389] The controller 340 confirms the presence of a human channel owner who is viewing the displayed content (S1410). Here, Step S1410 may include the implementation procedure of the method for confirming viewing of the same content that will be described hereinafter with reference to Figure 64 or 65.

[0390] The controller 340 detects a user action for requesting a simultaneous viewing mode (S1420).

[0391] The controller 340 controls display of content in the simultaneous viewing mode in response to the detected user action (S1430). The display 302 may display one of the screen 4900, the screen 5000 and the screen 5100. The screen 4900, the screen 5000 and the screen 5100 may represent the owner confirmed in Step S1410 as a chat partner. That is, the owner confirmed in Step S1410 becomes a chat partner.

[0392] The method for remotely viewing content at the same time of Figure 62 may further include the implementation procedure of the method that will be illustrated hereinafter with reference to Figures 67 to 70.

[0393] Figure 63 is a flowchart illustrating an implementation procedure of a further exemplary embodiment in relation to a method for remotely viewing content at the same time.

[0394] Referring to Figure 63, the display 302 displays content (S1500). The display 302 may display the screen 1600, the screen 3500, or the screen 4800.

[0395] The controller 340 detects a user action for requesting invitation to view a channel (S1510). In one example, the user action may be an action for dragging a screen on which content is displayed and dropping the content to a human channel listed in a human channel map. More particularly, the controller 340 may detect the user action for requesting invitation to view a channel if the image 3630 illustrated in Figure 36 is dragged to and drops onto the human channel number '43'. In another example, the user action may be a combination of a user action for selecting a displayed broadcast program and a user action for selecting a human channel (or a channel number).

[0396] The controller 340 controls transmission of a channel viewing request signal in response to the detected user action (S1520). The channel viewing request signal may have the format 3800 illustrated in Figure 38.

[0397] In some embodiments, the controller 340 may control transmission of the channel viewing request signal to the electronic device which provides the human channel indicated by the channel number designated by the user action in Step S1510. An address of the electronic device may be acquired by the above described method of Figures 19 to 21.

[0398] In some embodiments, the controller 340 may control transmission of the channel viewing request signal to the server. The server may be the server 10 illustrated in Figure 1.

[0399] The network interface 320 receives a response signal with respect to the channel viewing request signal

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(S1530). The response signal may be one of a viewing acceptance signal, a viewing not possible signal and a viewing rejection signal.

[0400] If the response signal is a viewing acceptance signal, the controller 340 controls display of content in the simultaneous viewing mode (S1540). The display 302 may display one of the screen 4900, the screen 5000 and the screen 5100. Also, the screen 4900, the screen 5000 and the screen 5100 may represent an owner of a human channel associated with the electronic device which has transmitted the viewing acceptance signal. The owner becomes a chat partner.

[0401] The method for remotely viewing content at the same time of Figure 63 may further include the implementation procedure of the method that will be described hereinafter with reference to Figures 67 to 70.

[0402] Figure 64 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for confirming viewing of the same content.

[0403] Referring to Figure 64, the controller 340 acquires an address of the electronic device based on a human channel map (S1600). The human channel map may be the human channel map 1210 of Figure 12, or may include the human channel map 1210, the first connection information map 1230, the second connection information map 1240, the third connection information map 1250, the fourth connection information map 1260 and the fifth connection information map 1270 as illustrated in Figure 12. The address of the electronic device may be acquired by the above described method of Figures 19 to 21. The electronic device may be limited to an online electronic device.

[0404] The controller 340 controls transmission of a viewing information request signal using the acquired address of the electronic device (S1610). The viewing information request signal may be the image frame request signal as described above in relation to Figure 52.

[0405] The network interface 320 receives a viewing information signal (S1620). In some embodiments, the viewing information signal may have the format 3800 illustrated in Figure 38. In some embodiments, the viewing information signal may be the image frame transmission signal as described above in relation to Figure 52.

[0406] The controller 340 confirms the presence of a human channel owner who is viewing the displayed content based on the received viewing information signal (S1630). In some embodiments, the controller 340 may confirm the owner by comparing the above described information of Figure 38. In some embodiments, the controller 340 may confirm the owner based on the above described comparison algorithm 5215 of Figure 52.

[0407] Figure 65 is a flowchart illustrating an implementation procedure of another exemplary embodiment in relation to a method for confirming viewing of the same content.

[0408] Referring to Figure 65, the controller 340 controls transmission of an owner list request signal to the server (S1700). The transmitted owner list request signal may be a signal to request a list of owners who are viewing the displayed content. The server may be the server 10.

[0409] The network interface 320 receives an owner list from the server (S1710). The owner list includes owners who are viewing the displayed content. In some embodiments, the owner list may further include at least one of emotion data or motion data of owners included therein.

[0410] The controller 340 confirms the owners included in the received owner list as owners who are viewing the displayed content (S1720).

[0411] Figure 66 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for providing a viewing list.

[0412] Referring to Figure 66, the server 10 receives a channel viewing signal including content viewing information from the electronic device (S1800). The received content viewing information may include the above described information of Figure 38. In some embodiments, the content viewing information may further include at least one of emotion data or motion data of the owner of the human channel associated with the electronic device.

[0413] The server 10 constructs a viewing map using the received content viewing information (S1810). The constructed viewing map may include at least one of identification information about content that every human channel owner is viewing, emotion data, motion data or group information. The group information indicates a group of owners who are viewing the same content.

[0414] The server 10 receives an owner list request signal from the electronic device (S1820). The owner list request signal corresponds to the above described owner list request signal of Figure 65.

[0415] The server 10 constructs an owner list using the constructed viewing map (S1830). The owner list corresponds to the above described owner list of Figure 65. The server 10 may add owners having the same group information to the owner list.

[0416] The server 10 transmits the constructed owner list to the electronic device that has transmitted the owner list request signal (S1840).

[0417] Figure 67 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for displaying a silhouette.

[0418] Referring to Figure 67, the controller 340 detects a face zone of an owner from an image captured by the owner (S1900). The owner may be a human channel owner or a viewer who is viewing content. In one example, the owner

may be the viewer 5301 of Figure 53. The image capture device 301 may capture an image of the owner at a preset interval, and the controller 340 may detect a face of the owner from the captured image at the preset interval.

[0419] The controller 340 confirms the emotions of the owner based on the detected face zone (S1910). The controller 340 may confirm the emotions of the owner by the above described method of Figures 56 and 57. Then, the controller 340 may produce emotion data indicating the confirmed emotions. In some embodiments, the controller 340 may produce emotion data if emotion change occurs.

[0420] The controller 340 controls transmission of the emotion data indicating the confirmed emotions (S1920). In some embodiments, the controller 340 may control transmission of the emotion data if emotion change occurs.

[0421] The controller 340 controls change of the contour of a silhouette according to the confirmed emotions (S1930). The controller 340 may change the contour of a silhouette using the above described method of Figure 55.

[0422] The network interface 320 receives emotion data (S1940). In some embodiments, the emotion data may be transmitted from the electronic device of the chat partner. In some embodiments, the emotion data may be transmitted from the server 10.

[0423] The controller 340 controls change of the contour of a silhouette of an owner who has transmitted the emotion data according to the received emotion data (S1950). The controller 340 may change the contour of a silhouette using the above described method of Figure 55.

[0424] Figure 68 is a flowchart illustrating an implementation procedure of another exemplary embodiment in relation to a method for displaying a silhouette.

[0425] Referring to Figure 68, the controller 340 detects a motion of an owner (S2000). The owner may be an owner of a human channel and may be a viewer who is viewing content. In one example, the owner may be the viewer 5801 of Figure 58, and the controller 340 may detect a motion of the owner by the above described method of Figure 58.

[0426] In some embodiments, the image capture device 301 may capture an image of the owner, and the controller 340 may detect a motion of the owner from an image frame included in the captured image of the owner.

[0427] The controller 340 produces motion data indicating the detected motion (S2010). In some embodiments, the controller 340 may produce motion data if motion change occurs.

[0428] The controller 340 controls transmission of the produced motion data (S2020). In some embodiments, the controller 340 may control transmission of the motion data if motion change occurs.

[0429] The controller 340 controls change of the contour of a silhouette according to the detected motion (S2030). The controller 340 may change the contour of a silhouette using the above described method of Figure 58.

[0430] The network interface 320 receives motion data (S2040). In some embodiments, the motion data may be transmitted from the electronic device of the chat partner. In some embodiments, the motion data may be transmitted from the server 10.

[0431] The controller 340 controls change of the contour of a silhouette of an owner who has transmitted motion data according to the received motion data (S2050). The controller 340 may change the contour of a silhouette using the above described method of Figure 58.

[0432] Figure 69 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for displaying a silhouette as a 3D image.

[0433] Referring to Figure 69, the controller 340 selects a silhouette image (S2100). The silhouette image may be selected by the above described method of Figure 67 or 68. More particularly, the silhouette image may be selected according to the detected emotions or emotions indicated by the received emotion data, or may be selected according to the detected motion or a motion indicated by the detected motion data.

[0434] The controller 340 produces a left view image and a right view image using the selected silhouette image (S2110). In one example, the produced left view image and the produced right view image may be utilized to display the silhouette 5110 of Figure 51.

[0435] The controller 340 controls mixing of each of the produced left view image and the produced right view image with an image frame of content to be displayed (S2120). The mixer 360 may mix the left view image with the image frame of the content to thereby produce a left view image frame, or may mix the right view image with the image frame of the content to thereby produce a right view image frame. In one example, the image frame may be the image frame displayed on the screen of Figure 51.

[0436] The formatter 370 may perform sampling of the left view image frame and the right view image frame output by the mixer 360 to obtain a 3D output format that can be displayed as a 3D image by the display 302.

[0437] The display 302 displays a mixed image frame (S2130). The mixed image frame may be an image frame having the 3D output format obtained by sampling the left view image frame and the right view image frame produced by the mixer 360 in Step S2120. In one example, the display 302 may display the screen 5100 in Step S2130.

[0438] Figure 70 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for sharing a screen effect.

[0439] Referring to Figure 70, the controller 340 detects a user action for requesting a screen effect (S2200). The user action may be a user action for selecting one of the screen effect selecting regions 5911, 5912 and 5913 of Figures 59A

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to 59D.

[0440] The controller 340 produces screen effect data indicating the requested screen effect in response to the detected user action (S2210).

[0441] The controller 340 transmits the produced screen effect data to the electronic device of the chat partner or the server 10 (S2220).

[0442] The controller 340 controls reflection of the requested screen effect on the displayed content (S2230). The display 302 may display the screen 5900 of Figure 59D.

[0443] The network interface 320 receives screen effect data from the electronic device of the chat partner or the server 10 (S2240).

[0444] The controller 340 controls reflection of the screen effect indicated by the received screen effect data on the displayed content (S2250). The display 302 may display the screen 5900 of Figure 59D.

[0445] Figure 71 is a diagram illustrating a broadcast screen on which one exemplary embodiment of a channel map is displayed.

[0446] Referring to Figure 71, the display 302 may display a screen 7100. If the controller 340 detects a user action for requesting a channel map in a state in which a broadcast program 7110 is displayed on the screen 7100, the controller 340 controls displaying a broadcast channel map 7120 on the screen 7100 in response to the detected user action. In some embodiments, the user action for requesting the channel map may be an action in which the user presses a hot key for the channel map or a menu item for the channel map.

[0447] If the controller 340 detects a user action for requesting channel map switch in a state in which a human channel map 7220 illustrated in Figure 72 or an App channel map 7320 illustrated in Figure 73 is displayed, the controller 340 controls displaying the broadcast channel map 7120.

[0448] The broadcast channel map 7120 lists broadcast channels (e.g., CNN), today's broadcast content on broadcast channels (e.g., CNN News) and channel numbers associated with the broadcast channels (e.g., 39). With relation to the broadcast program 7110 being displayed, a corresponding broadcast channel 'NBC', broadcast program name or title 'Home' and channel number '37' are listed in a line indicated by an indicator. If the user performs a user action for selecting one of the broadcast channels listed in the broadcast channel map 7120, the controller 340 controls displaying a broadcast program of the selected broadcast channel.

[0449] Figure 72 is a diagram illustrating a broadcast screen on which another exemplary embodiment of a channel map is displayed.

[0450] Referring to Figure 72, the display 302 may display a screen 7200. If the controller 340 detects a user action for requesting channel map switch in a state in which the broadcast channel map 7120 illustrated in Figure 71 or the App channel map 7320 illustrated in Figure 73 is displayed, the controller 340 controls displaying the human channel map 7220. In some embodiments, the user action may be an action in which the user presses one of a left key and a right key of a remote controller.

[0451] During display of the human channel map 7220, the controller 340 may control displaying content of one human channel listed in the human channel map 7220. The content may be received according to Step S310 of Figure 18. The human channel map 7220 may be identical to the human channel map 1510 illustrated in Figure 15.

[0452] Figure 73 is a diagram illustrating a broadcast screen on which a further exemplary embodiment of a channel map is displayed.

[0453] Referring to Figure 73, the display 302 may display a screen 7300. If the controller 340 detects a user action for requesting channel map switch in a state in which the broadcast channel map 7120 illustrated in Figure 71 or the human channel map 7220 illustrated in Figure 72 is displayed, the controller 340 controls displaying the App channel map 7320. In some embodiments, the user action may be an action in which the user presses one of a left key and a right key of a remote controller.

[0454] The App channel map 7320 lists App channels (e.g., Netflix), App content and channel numbers associated with the App channels (e.g., 55). The controller 340 may control display of the App channel map 7320 in such a manner that a line, on which an App channel 'Google' which provides App content 'Google Earth', denoted by reference numeral 7310, displayed on the screen 7300, and a channel number '56' are listed, is indicated by an indicator. The controller 340 may control display of the App channel map 7320 in such a manner that App content of one App channel listed in the App channel map 7320 is displayed. If the user performs a user action for selecting one of the App channels listed in the App channel map 7320, the controller 340 may control displaying App content of the selected App channel.

[0455] Figure 74 is a diagram illustrating a screen on which one exemplary embodiment of a full channel map is displayed.

[0456] Referring to Figure 74, the display 302 may display a screen 7400. If the controller 340 detects a user action for requesting a full channel map, the controller 340 may control displaying a full channel map on the screen 7400 in response to the detected user action. The full channel map may be a channel map that is displayed in a full channel mode, for example, on the entire display area or a full screen image. In some embodiments, the user action may be an action in which the user presses a hot key for the full channel map or a menu item for the full channel map.

[0457] The full channel map 7400 may display multiple channels maps corresponding to different types of content, for example, broadcast content, SNS content, and application content. The different types of content may be associated with different types of channels. The full channel map 7400 includes a line 7410 on which at least one broadcast channel is listed, a line 7420 on which at least one human channel is listed and a line 7430 on which at least one App channel is listed. These lines 7410, 7420 and 7430 are respectively provided at the first cell thereof with a mark 7411, 7421, 7431 indicating which one of the broadcast channel, human channel or App channel is listed. The mark 7411, 7421, 7431 may be an icon or a selectable link, and may include an image representative of the type of channel. In one embodiment, a selection of a mark may display a channel map of the corresponding type on the full screen. For example, if the mark 7411 for broadcast channel is selected, each of the three rows 7410, 7420, 7430 may broadcast channels.

[0458] In some embodiments, the full channel map may be organized in such a manner that at least one broadcast channel is listed on one line, at least one human channel is listed on another line and at least one App channel is listed on the other line.

[0459] In the full channel map 7400, movement between channels in the same line may depend upon input of a left key or a right key, and movement between different lines may depend upon input of an up key or a down key. If the user performs a user action for designating one of the channels listed in the full channel map 7400, the controller 340 may control displaying content of the designated channel. The content may be received according to Step S310 illustrated in Figure 18.

[0460] Figure 75 is a diagram illustrating a screen on which another exemplary embodiment of a full channel map is displayed.

[0461] Referring to Figure 75, the display 302 may display a screen 7500. If the controller 340 detects a user action for requesting a full channel map, the controller 340 may control displaying a full channel map on the screen 7500 in response to the detected user action. In some embodiments, the user action may be an action in which the user presses a hot key for the full channel map or a menu item for the pull channel map.

[0462] The full channel map 7500 lists broadcast channels 7510, human channels 7520 and 7530 and App channels 7540. The full channel map 7500 may list these channels in order of channel numbers. The full channel map 7500 may be sorted alphabetically, by user rating (e.g., favorites), based on type of channel, or the full channel map 7500 may be displayed in a custom order as set by a user. In the example as illustrated in Figure 75, in the full channel map 7500, a broadcast channel 'Star Plus' corresponding to a channel number '20' is located at an uppermost position, a radio channel 'MTV Radio' corresponding to a channel number '21' is located immediately below the broadcast channel 'Star Plus', and a human channel 'Brandon' corresponding to a channel number '22' is located immediately below the radio channel 'MTV Radio'. An App channel 'Picasa' corresponding to a channel number '26' is located at a lowermost position. Channels of different types may be assigned the same channel numbers (e.g., SNS channel 26 for Susan and App Channel 26 for Picasa). In this case, channels may be sorted based on type as predetermined or set by the user.

[0463] When the user inputs a particular number, channel numbers associated with the particular number may be listed in the full channel map 7500. A region 7505 of the full channel map 7500 shows a number input by the user. In the drawing, as the region 7505 shows "2-", channels, which have channel numbers in a range of 20 to 29 associated with "2-", are displayed on the full channel map 7500.

[0464] If the user performs a user action for designating one of the channels listed in the full channel map 7500, the controller 340 may control displaying content of the designated channel. The content may be received according to Step S310 illustrated in Figure 18.

[0465] Figure 76 is a diagram illustrating a screen on which another exemplary embodiment of a full channel map is displayed.

[0466] Referring to Figure 76, the display 302 may display a full channel map 7600. If the controller 340 detects a user action for requesting a full channel map, the controller 340 may control displaying a full channel map 7600 on a screen in response to the detected user action. In some embodiments, the user action may be an action in which the user presses a hot key for the full channel map or a menu item for the full channel map.

[0467] The full channel map 7600 includes a broadcast channel sheet (or page), a human channel sheet and an App channel sheet. The broadcast channel sheet, human channel sheet and App channel sheet may be selected respectively using a sheet tab 7601, a sheet tab 7602 and a sheet tab 7603. Specifically, if the user performs an action of pressing one of the sheet tabs 7601, 7602 and 7603, the controller 340 may control displaying a sheet associated with the pressed sheet tab.

[0468] During display of the full channel map 7600 on the screen, the controller 340 may control displaying one of the broadcast channel sheet, human channel sheet and App channel sheet. In Figure 76, a broadcast channel sheet 7610 is displayed. The broadcast channel sheet 7610 may include a mark 7612 indicating that the broadcast channel is a TV channel and a mark 7614 indicating that the broadcast channel is a radio channel. Each cell of the broadcast channel sheet 7610 includes a broadcast channel (e.g., Colors) and a channel number (e.g., T01) associated with the broadcast channel. If the user performs an action of pressing one of cells on the broadcast channel sheet 7610, the controller 340 controls displaying a broadcast program on the broadcast channel of the pressed cell.

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[0469] Figure 77 is a diagram illustrating a screen on which the human channel sheet of the full channel map of Figure 76 is displayed.

[0470] Referring to Figure 77, if the user performs a user action for selecting the sheet tab 7602, the controller 340 detects the user action and controls displaying a human channel sheet 7710 of the full channel map 7700 in response to the detected user action.

[0471] Each cell of the human channel sheet 7710 includes a human channel (e.g., Brandon) and a channel number (e.g., 22) associated with the human channel. If the user performs an action of pressing one of cells on the human channel sheet 7710, the controller 340 may control displaying content of the human channel of the pressed cell. The content may be received according to Step S310 illustrated in Figure 18.

[0472] Figure 78 is a diagram illustrating a screen on which the App channel sheet of the full channel map of Figure 76 is displayed.

[0473] Referring to Figure 78, if the user performs an action for selecting the sheet tab 7603, the controller 340 detects the user action and controls displaying an App channel sheet 4210 on the full channel map 7800 in response to the detected user action.

[0474] Each of the App channel sheet 7810 includes an App channel (e.g., NFS9) and a channel number (e.g., 01) associated with the App channel. If the user performs an action of pressing one of cells on the App channel sheet 7810, the controller 340 may control displaying content of the App channel of the pressed cell.

[0475] Figure 79 is a diagram illustrating a screen on which an exemplary embodiment of a recently viewed channel map is displayed.

[0476] Referring to Figure 79, the display 302 may display a recently viewed channel map 7900. If the controller 340 detects a user action for requesting a recently viewed channel map, the controller 340 may control displaying the recently viewed channel map 7900 on a screen in response to the detected user action. In some embodiments, the user action may be an action in which the user presses a hot key for the recently viewed channel map or a menu item for the recently viewed channel map.

[0477] The recently viewed channel map 7900 lists broadcast channels, human channels and App channels displayed within a preset period. The preset period may be 1 day, 7 days, 10 days, 15 days and 30 days. The preset period may be an initially set value, or may be set by the user.

[0478] The recently viewed channel map 7900 displays channels on a per line basis. The first cell of each line indicates that the channel corresponds to which one of the broadcast channel, human channel and App channel. For example, a mark 'TV' on the first cell indicates a broadcast channel, a mark 'Radio' indicates a radio channel, a mark 'SNS' indicates a human channel and a mark 'APP' indicates an App channel.

[0479] The recently viewed channel map 7900 may list the channels in reverse order of displayed time. For example, in the recently viewed channel map 7900, a broadcast channel 'Set Max', which was broadcast before a broadcast channel 'Star Plus', is located behind the broadcast channel 'Start Plus'.

[0480] If the user performs a user action of pressing one of the lines listed in the recently viewed channel map 7900, the controller 340 may control displaying content of the channel indicated by the pressed line. The content may be received according to Step S310 illustrated in Figure 18.

[0481] Figure 80 is a diagram illustrating a screen on which a further exemplary embodiment of a full channel map is displayed.

[0482] Referring to Figure 80, the display 302 may display a full channel map 8000. If the controller 340 detects a user action for requesting a full channel map, the controller 340 may control displaying the full channel map 8000 on a screen in response to the detected user action. The user action may be an action in which the user presses a hot key for the full channel map or a menu item for the full channel map.

[0483] The full channel map 8000 has the same configuration as the full channel map 7400 and further includes connection state marks 8050 and 8055 (also status indicator) for indicating the online state of an owner of a human channel. A first connection state mark 8050 indicates a first online state which represents whether or not the owner of the human channel is online via an electronic device. A second connection state mark 8055 indicates a second online state which represents whether or not the owner is logged in to a server. The server may be the server 10 or the server 20 illustrated in Figure 1, and the electronic device may be the first digital TV 100, the second digital TV 110, the personal computer system 120, the notebook computer 130 or the mobile terminal 140 illustrated in Figure 1. That the owner is online via the electronic device means that another electronic device is connectable to the electronic device through a human channel. That the owner is logged in to the server means that another owner may communicate with the owner through the network 1. For example, if the first connection state mark 8050 is inactive (off) and the second connection state mark 8055 is active (on), the owner is not connected through their digital TV but is connected through their SNS account.

[0484] Information about the online state of the owner may be received from the electronic device or the server. The electronic device may periodically receive information about the first online state or information about the second online state from the server.

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[0485] The electronic device may transmit information about the first online state to an electronic device or server associated with the human channel stored in the human channel map. In some embodiments, the electronic device may transmit information about the first online state to all electronic devices associated with the human channel. In some embodiments, the electronic device may transmit information about the first online state to an electronic device which is online, among the electronic devices associated with the human channel.

[0486] Figures 81A to 81D are diagrams illustrating the online state of the owner of the human channel.

[0487] The online state of the owner of the human channel may be illustrated as in Figures 81A to 81D. The human channel map 8000 may provide human channels listed therein with connection state marks as illustrated in Figures 81A to 81D.

[0488] In Figure 81A, a connection state mark 8111 indicates the first online state for representing that the owner of the human channel is not online, and a connection state mark 8115 indicates the second online state for representing that the owner is not logged in to the server.

[0489] In Figure 81B, a connection state mark 8121 indicates the first online state for representing that the owner of the human channel is online, and a connection state mark 8125 indicates the second online state for representing that the owner is not logged in to the server.

[0490] In Figure 81C, a connection state mark 8131 indicates the first online state for representing that the owner of the human channel is not online, and a connection state mark 8135 indicates the second online state for representing that the owner is logged in to the server.

[0491] In Figure 81D, a connection state mark 8141 indicates the first online state for representing that the owner of the human channel is online, and a connection state mark 8145 indicates the second online state for representing that the owner is logged in to the server.

[0492] Figure 82 is a flowchart illustrating an implement procedure of an exemplary embodiment for a method of providing a channel map service in accordance with the present disclosure.

[0493] Referring to Figure 82, the display 302 displays a broadcast channel map including at least one broadcast channel on a screen on which content is being displayed (S2300). The broadcast channel map may be the broadcast channel map 7120 illustrated in Figure 71.

[0494] The controller 340 detects a first user action for requesting channel map switch (S2305). In some embodiments, the first user action may be an action in which the user presses one of an up key, a down key, a left key and a right key of a remote controller.

[0495] The controller 340 switches the displayed broadcast channel map to a human channel map including at least one human channel in response to the detected first user action (S2310). The controller 340 may control displaying content of one of human channels included in the human channel map on the screen. The selected human channel may have a first channel number, a medium channel number or a last channel number, and may be a human channel more recently displayed than other human channels. The human channel map may be the human channel map 7220 illustrated in Figure 72.

[0496] The controller 340 detects a second user action for requesting channel switch (S2315). In some embodiments, the second user action may be an action in which the user presses one of an up key, a down key, a left key and a right key of a remote controller. In some embodiments, if the first user action for requesting channel map switch is an action of pressing the left key or right key of a remote controller, the second user action for requesting channel switch may be an action of pressing the up key or down key of the remote controller.

[0497] The controller 340 switches a selected human channel to another human channel in the human channel map in response to the detected second user action (S2320).

[0498] The controller 340 controls displaying content of the switched human channel (S2325). The content may be received according to Step S310 in Figure 18.

[0499] The controller 340 detects a third user action for requesting channel map switch (S2330).

[0500] The controller 340 switches the human channel map to an App channel map including at least one App channel in response to the detected third user action (S2335). The App channel map may be the App channel map 7320 illustrated in Figure 73.

[0501] The controller 340 detects a fourth user action for requesting a full channel map (S2340). In some embodiments, the fourth user action may be an action in which the user presses a hot key for the full channel map or a menu item for the full channel map.

[0502] The controller 340 controls displaying a full channel map including the at least one broadcast channel, the at least one human channel and the at least one App channel in response to the detected fourth user action (S2345). The full channel map may be one of the full channel map 7400 illustrated in Figure 74, the full channel map 7500 illustrated in Figure 75, the full channel map 7600 illustrated in Figure 76 and the full channel map 8000 illustrated in Figure 80.

[0503] The controller 340 detects a fifth user action for requesting a recently viewed channel map (S2350). In some embodiments, the fifth user action may be a user action of pressing a hot key for the recently viewed channel map or a menu item for the recently viewed channel map.

[0504] The controller 340 controls displaying the recently viewed channel map including broadcast channels, human channels and App channels displayed within a preset period in response to the detected fifth user action (S2355). The recently viewed channel map may be the recently viewed channel map 7900 illustrated in Figure 79. The preset period may be 1 day, 7 days, 10 days, 15 days and 30 days. The preset period may be an initially set value, or may be set by the user.

[0505] Figure 83 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a user registration method in accordance with the present disclosure.

[0506] Referring to Figure 83, the controller 340 controls display of a GUI for reception of user registration information (S2400). The GUI may be displayed upon initial execution (booting) of the electronic device 300 or upon receiving a user request. The user registration information may include at least one of a device serial number, a user name, a user ID, a password, connection information, gender information, the date of a birth, nation information or locale information. The connection information may include at least one of an e-mail address, an SIP address, an IP address, a port number, a MAC address, an SNS account or URL.

[0507] Figure 84 is a diagram illustrating an embodiment of a GUI for reception of user registration information.

[0508] Referring to Figure 84, the display 302 may display a GUI 8400 in Step S2400. The GUI 8400 serves to receive user registration information. The GUI 8400 includes input boxes to input a user ID, a password, a first name and a last name, check boxes to select gender information and list boxes to select the date of a birth. A 'Next' button serves to display a next screen, an 'Exit' button serves to end the user registration method. The controller 340 may control display of a screen of a next step in response to a detected user action pushing the 'Next' button, and may control end of the user registration method in response to a detected user action pushing the 'Exit' button.

[0509] The controller 340 controls display of a GUI for selection of an SNS site (S2410). If the controller 340 detects a user action for pushing the 'Next' button, the controller 340 may control display of the GUI in response to the detected user action. A list of SNS sites may be previously stored and the controller 340 may control display of the previously stored list on the GUI.

[0510] Figure 85 is a diagram illustrating an embodiment of a GUI for selection of an SNS site.

[0511] Referring to Figure 85, the display 302 may display a GUI 8500 in Step S2410. The GUI 8500 includes SNS sites 8511 to 8519, check boxes 8521 to 8529 to select the SNS sites 8511 to 8519 respectively, and a check box 8530 to select the SNS sites 8511 to 8519 in all. A list of the SNS sites 8511 to 8519 may be previously stored in the storage unit 345. Also, the list of the SNS sites 8511 to 8519 may be updated.

[0512] The controller 340 controls display of a GUI for reception of SNS site authentication information (S2420). If the controller 340 detects a user action for pushing the 'Next' button, the controller 340 may control display of the GUI in response to the detected user action. The authentication information may include a user ID and a password. The user ID may be an e-mail address registered in an SNS site.

[0513] The number of the GUI to be displayed may be equal to the number of SNS sites selected in Step S2410. That is, the GUI for reception of authentication information with respect to each selected SNS site may be displayed.

[0514] Figure 86 is a diagram illustrating an embodiment of a GUI for reception of authentication information for an SNS site.

[0515] Referring to Figure 86, the display 302 may display a GUI 8600 in Step S2420. The GUI 8600 includes an icon 8610, and input boxes to input an e-mail ID and a password for an SNS site indicated by the icon 8610.

[0516] The controller 340 controls display of a GUI for confirmation of channel scan execution (S2430). If the controller 340 detects a user action for pushing the 'Next' button, the controller 340 may control display of the GUI in response to the detected user action.

[0517] Figure 87 is a diagram illustrating an embodiment of a GUI for confirmation of channel scan execution.

[0518] Referring to Figure 87, the display 302 may display a GUI 8700 in Step S2430. The GUI 8700 includes a guidance phrase 8710 to ask whether or not to execute a channel scan, a 'Yes' button to select execution of a channel scan, and an 'Exit' button to prevent execution of the channel scan. The controller 340 may control the progress of a method for providing a channel scan interface of Figure 88 in response to a detected user action selecting the 'Yes' button.

[0519] The user registration information and the SNS site authentication information, which are input during implementation of the user registration method of Figure 83, may be transmitted to the server 10 in each input step and may be transmitted to the server 10 after completion of Step S2430.

[0520] Figure 88 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for providing a channel scan interface in accordance with the present disclosure.

[0521] Referring to Figure 88, the controller 340 controls display of a GUI for selection of a scan method (S2500). The GUI may be displayed automatically or by a user request after implementation of a server registration method. Alternatively, the GUI may be displayed at an optional time by a user request, or may be displayed during update. The scan method may include at least one of auto scan or manual scan. The GUI may include a scan method option to select at least one scan method.

[0522] Figure 89 is a diagram illustrating an embodiment of a GUI for selection of a scan method.

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[0523] Referring to Figure 89, the display 302 may display a GUI 8900 in Step S2500. The GUI 8900 includes a scan method option 8910 to select auto scan and a scan method option 8920 to select manual scan.

[0524] The controller 340 confirms whether or not the scan method option is selected (S2510).

[0525] If the scan method option indicating auto scan is selected, the controller 340 controls display of a GUI for selection of a service type (S2520). The GUI may include a service type option to select at least one service type. The service type indicates one of a broadcast channel, an App channel or a human channel.

[0526] Figure 90 is a diagram illustrating an embodiment of a GUI for selection of a service type.

[0527] Referring to Figure 90, the display 302 may display a GUI 9000 in Step S2520. The GUI 9000 may include a service type option 9010 (TV) to select a channel scan of a broadcast channel, a service type option 9020 (APPS) to select a channel scan of an App channel, and a service type option 9030 (Human) to select a channel scan of a human channel.

[0528] The controller 340 confirms whether or not a particular service type option among the service type options provided by the GUI 9000 for selection of a service type option is selected (S2530).

[0529] If the particular service type option is selected, the controller 340 controls execution of a channel scan with respect to a channel associated with the selected service type option (S2540). In one example, if the service type option 9010 is selected, the controller 340 controls execution of a channel scan with respect to a broadcast channel. If the service type option 9030 is selected, the controller 340 controls execution of a channel scan with respect to a human channel.

[0530] Figure 91 is a diagram illustrating an embodiment of a screen, which displays the progress of a human channel scan.

[0531] Referring to Figure 91, the display 302 may display a screen 9100 in Step S2540. The screen 9100 displays a status bar 9110 representing the degree of progress of the human channel scan. The screen 9100 displays a list 9120 of SNS sites as an object of the human channel scan. The SNS sites included in the SNS site list 9120 may be SNS sites selected during implementation of the user registration method of Figure 83. The screen 9100 may further display a region 9130 to display the result of scan up to now. In the screen 9100, a 'Skip' button serves to stop a channel scan and select display of the result of scan up to that time, and an 'Exit' button serves to select end of a channel scan. The controller 340 may stop channel scan in response to a detected user action selecting the 'Skip' button and then, proceed to Step 2550. Also, the controller 340 controls end of a channel scan in response to a detected user action selecting the 'Exit' button.

[0532] The controller 340 controls display of the result of a channel scan (S2550). The controller 340 may control display of the result of a channel scan if channel scan is completed.

[0533] If the controller 340 detects a user action for selecting the 'Skip' button of the screen 9100, the controller 340 may control display of the result of a channel scan in response to the detected user action. The displayed result of a channel scan is the result of channel scan up to a time when the channel scan is stopped. In one embodiment, the 'Skip' button may be configured to skip current SNS service provider to scan the next SNS service provider, rather than skipping all remaining SNS service providers.

[0534] Figure 92 is a diagram illustrating an embodiment of a screen, which displays the result of a human channel scan.

[0535] Referring to Figure 92, the display 302 may display a screen 9200 in Step S2550. The screen 9200 displays the result of a human channel scan.

[0536] The screen 9200 displays an SNS account selecting region 9210, an update statistical information region 9220, a channel input box 9230, an SNS site selecting region 9250, an icon 9201 to display a selected SNS site, an 'Add' button, a 'Back' button and a 'Home' button. The SNS account selecting region 9210 includes a picture 9211 of a selected SNS account, a button 9213 to select a previous SNS account, a button 9215 to select a next SNS account, and a mark 9217 to display the total number of SNS accounts scanned in a selected SNS site and the order of a selected SNS account.

[0537] The update statistical information region 9220 displays update statistical information about the selected SNS account 9211. The update statistical information may include at least one of the number of updated videos, the number of updated pictures or the number of updated messages.

[0538] The channel input box 9230 displays a channel number assigned to the selected SNS account 9211. If a channel number is not assigned to the selected SNS account 9211, the channel input box 9230 may be a blank. The user may input a channel number to be assigned to the selected SNS account 9211 into the channel input box 9230. In one embodiment, a selection of channel input box 9230 may display a pop-up window to display available channel number from which to choose from to assign to the SNS account.

[0539] The SNS site selecting region 9250 displays icons of SNS sites or SNS providers. If the user selects any one of the icons displayed on the SNS site selecting region 9250, the controller 340 controls selection of SNS accounts, scanned in the SNS site indicated by the selected icon, from the SNS account selecting region 9210.

[0540] The icon 9201 displays a selected SNS site. The user may select an SNS account, scanned in the SNS site indicated by the icon 9201, from the SNS account selecting region 9210.

[0541] The 'Add' button serves to receive a request for construction of a channel map, the 'Back' button serves to

receive a request for display of a previous screen, and the 'Home' button serves to receive a request for display of a home page.

[0542] Figure 93 is a diagram illustrating another embodiment of a screen which displays the result of a human channel scan.

[0543] Referring to Figure 93, the display 302 may display a screen 9300 in Step S2550. The screen 9300 is a screen to display the result of a human channel scan. The screen 9300 may include a friend list (or contact list) region 9310, a mutual friend list region 9320, a scan result statistical information region 9330 and an SNS site selecting region 9350.

[0544] The SNS site selecting region 9350 is a region corresponding to the SNS site selecting region 9250 of Figure 92 and thus, a detailed description thereof is substituted by the description of Figure 92. The friend list region 9310 displays a list of friends registered in an SNS site selected from the SNS site selecting region 9350. The user can select a particular friend (or contact) from the friend list region 9310. For example, a pointer 9360 may be used to select an icon 9317 for Iva's SNS account. The friend list region 9310 may display SNS accounts of the friends.

[0545] Connection state marks 9311 and 9315 serve to display whether or not a corresponding friend is connected. More particularly, the connection state mark 9311 may represent an online state displayed by one of the connection state marks 8111, 8121, 8131 and 8141 of Figure 81, and the connection state mark 9315 may represent an online state displayed by one of the connection state marks 8115, 8125, 8135 and 8145 of Figure 81.

[0546] The mutual friend list region 9320 displays a list of mutual friends of the friend selected from the friend list region 9310. The mutual friend list region 9320 may display SNS accounts of the mutual friends. For example, if icon 9317 for Iva's SNS account is selected, mutual friends of both Iva and John may be displayed in the mutal friend list region 9320.

[0547] In one embodiment, region 9320 may display a list of SNS accounts for friends of the friends for whom the information is requested. For example, referring to Figure 93, if icon 9317 is selected for Iva's SNS account (e.g., Hi5 account) region 9320 may display a list of potential or possible friends between John and Iva's friends, e.g., a list of friends of friends. The icons for these friends may also include connection state marks 9311, 9315 to indicate whether the users are online using their electronic device or logged in to their SNS account at a server. In one embodiment, the list of mutual friends and the list of friends of friends may list only those users who have registered to use their electronic device to access human channels, e.g., their SNS accounts through a channel on their multi-purpose display device, or the list may include only those users who are currently logged in. These preference settings for the user may store the configuration and other settings for the display regions.

[0548] The information region 9330 displays a message 9331 for representing whether or not a human channel of the friend selected from the friend list region 9310 is available, a message 9333 for representing a human channel number assigned to the selected friend, and a message 9335 for representing the number of mutual friends of the selected friend. For example, if the icon 9317 for Iva's SNS account is selected, the scan result statistical information region 9330 may display information related to Iva's account. In this Example, Iva has 12 friends in common with John's SNS account and Iva's SNS account is accessible on channel number 27 of the electronic device 100.

[0549] The user may select a particular SNS account from among SNS accounts displayed on the friend list region 9310 and the mutual friend list region 9320 and then, assign a channel number to the selected particular SNS account.

[0550] The controller 340 constructs a channel map (S2560). The controller 340 may proceed to Step S2560 if the controller 340 detects a user action for requesting assignment of a channel with respect to the particular SNS account from a screen on which the result of a channel scan is displayed. The user action may be a user action for selecting the 'Add' button of Figure 92.

[0551] If the controller 340 detects the user action for selecting the 'Add' button of Figure 92, the controller 340 assigns a channel number, which has input into the channel input box 9230, to the selected SNS account 9211 in response to the detected user action. The controller 340 may store the selected SNS account 9211, the channel number input into the channel input box 9230 and information associating the selected SNS account 9211 and the channel number input into the channel input box 9230 with each other. The human channel map may be a human channel map illustrated in Figure 12, or may be a human channel map illustrated in Figure 97 that will be described hereinafter.

[0552] Step S2560 may include the implementation procedure of the method for constructing a human channel map in relation to Figure 13 or the implementation procedure of the method for constructing a human channel map in relation to Figures 34A and 34B. The screen 9200 of Figure 92 and the screen 9300 of Figure 93 may be a first GUI for designation of the human address in Step S100. The SNS accounts displayed on the SNS account selecting region 9210, the friend list region 9320 and the mutual friend list region 9330 may be selectable human addresses listed in the first GUI.

[0553] Figure 94 is a flowchart illustrating an implementation procedure of an exemplary embodiment in relation to a method for scanning a human channel in accordance with the present disclosure.

[0554] Referring to Figure 94, an electronic device 9410 transmits a friend information request signal to request information about friends to a relay server 9420 (S2600). The information about friends may include, for example, a list of new or potential friends, mutual friends, or updates for existing friends such as status updates, newly uploaded content, whether they are using human channel services, or another appropriate type of information. The transmission of the

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friend information request signal may be performed in Step S2540 of Figure 88 to scan one or more SNS servers for friend information. Step S2540 may include the implementation procedure of the method for scanning a human channel in relation to Figure 94. The friend information request signal may include a user ID. The user ID may be an account of the relay server 9420, or may be information registered in the server 10 during implementation of the user registration method of Figure 83. In some embodiments, the friend information request signal may further include a single or a plurality of SNS accounts, passwords with respect to the included SNS accounts and site names of the SNS sites.

[0555] The relay server 9420 transmits the friend information request signal to request friend information to a first SNS server 9430 (S2610). The server 9420 may be the server 10, and the transmitted friend information request signal may include an account information for an account on the first SNS server 9430 and may further include a password for the account. The account information on the first SNS server 9430 and the password for the account may be previously stored in the relay server 9420, may have been transmitted to the server 10 during implementation of the user registration method of Figure 83, or may be included in the friend information request signal transmitted in Step S2600.

[0556] The relay server 9420 may associate a single or a plurality of SNS accounts with user IDs and store the associated information. If the relay server 9420 receives the friend information request signal from the electronic device 9410, the relay server 9240 may search for a user ID and an associated SNS account, and then, transmit the friend information request signal to an SNS server including the searched SNS account.

[0557] For example, the relay server 9420 may request information from multiple SNS servers if the request for friend information from the electronic device 9410 (or the user account associated with the user ID received from the electronic device 9410) includes SNS accounts served on multiple servers (e.g., facebook, twitter). the relay server 9420 transmits the friend information request signal to request friend information to the second SNS server 9440 (S2620). The transmitted friend information request signal may include account information for an account on the second SNS server 9440 and may further include a password for this account. The account information for the account on the second SNS server 9440 may be stored in the relay server 9420, received from another server, or included in the friend information request.

[0558] The first SNS server 9430 transmits a friend information signal including friend information to the relay server 9420 (S2630). The friend information may include SNS accounts with respect to friends included in the friend information request signal transmitted in Step S2610. The friend information may further include at least one of names of the friends, SNS site IP addresses, port numbers, SNS site names or update information about SNS accounts. The first SNS server 9430 may be the server 20, or may be one of SNS servers selected during implementation of the user registration method of Figure 83. Additionally, the first SNS server 9430 may have an SNS site name included in the friend information request signal transmitted in Step S2600.

[0559] The second SNS server 9440 transmits a friend information signal including friend information to the relay server 9420 (S2640). The friend information may include SNS accounts with respect to friends included in the friend information request signal transmitted in Step S2620. The friend information may further include at least one of names of the friends, SNS site IP addresses, port numbers, SNS site names or update information about SNS accounts. The second SNS server 9440 may be the server 20, or may be one of SNS servers selected during implementation of the user registration method of Figure 83. Additionally, the second SNS server 9440 may have an SNS site name included in the friend information request signal transmitted in Step S2600.

[0560] The relay server 9420 combines the received friend information (S2650). The relay server 9420 may combine the friend information transmitted from the first SNS server 9430 with the friend information transmitted from the second SNS server 9440. In addition, the relay server 9420 may combine previously stored information with the friend information transmitted from the first SNS server 9430 or the friend information transmitted from the second SNS server 9440. Here, the previously stored information may be the SNS site authentication information and the user registration information transmitted by the electronic device 300 during the user registration method of Figure 83. The relay server 9420 may combine the previously stored information and the received friend information with each other based on names or SNS accounts.

[0561] The relay server 9420 transmits the friend information signal including the friend information to the electronic device 9410 (S2660). The friend information may be information combined in Step 2650, or may be information selected from the combined information. In some embodiments, the friend information may include at least one of names of friends, SNS site names, SNS accounts or user IDs. In some embodiments, the friend information may include names of friends, connection information and user IDs. In some embodiments, the friend information may include names of friends, connection information, SNS site names, SNS accounts and user IDs.

[0562] The electronic device 9410 stores the received friend information (S2670). The electronic device 9410 may temporarily or permanently store the received friend information. The stored information may be displayed as the result of a channel scan in Step S2550 of Figure 88.

[0563] The electronic device 9410 may construct a human channel map using the received friend information. Information included in the connection information maps 1230, 1240, 1250, 1260 and 1270 of Figure 97 may be acquired from the received friend information.

[0564] In some embodiments, the relay server 9420 may perform Step S2650 and Step 2660 whenever the friend

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information is received. For example, the relay server 9420 may perform Step S2640 and Step S2660 using the friend information received in Step S2630, or may perform Step S2640 and Step S2660 using the friend information received in Step S2640. Steps S2640 and S2660 may be initiated based on friend information received within a predetermined period of time of each other, for example.

[0565] Figure 95 is a flowchart illustrating an implementation procedure of another exemplary embodiment in relation to a method for constructing a channel map in accordance with the present disclosure.

[0566] Referring to Figure 95, the display 302 displays a GUI for designation of a human address (S2700). The GUI may be one of a Web page of Figure 4, the GUI 910 of Figure 9, the GUI 1010 of Figure 10, the GUI 1110 of Figure 11, the GUI 2700 of Figure 27, the GUI 2900 of Figure 29, the GUI 3100 of Figure 31, the screen 9200 of Figure 92 and the screen 9300 of Figure 93.

[0567] The controller 340 detects a first user action for designation of a human address (S2710) of a friend or contact.

[0568] The controller 340 confirms whether or not a channel number assigned to the friend who is associated with the designated human address is present, in response to the detected first user action (S2720).

[0569] If the channel number is present, the controller 340 displays the channel number (S2730). In one example, the channel number may be displayed on the input box 9230 of Figure 92, may be displayed on the input box 9333 of Figure 93, or may be displayed on a separately displayed message. The channel number may be highlighted among the channel numbers listed in the channel number region 2710 of the GUI 2700 of Figure 27 or among the channel numbers listed in the channel number region 2910 of the GUI 2900 of Figure 29, or may be displayed on the channel number region 3140 of the GUI 3100 of Figure 31.

[0570] The controller 340 detects a second user action for designation of a channel number (S2740). In the embodiment of the screen 9200 of Figure 92, the second user action may be a user action for pushing the 'Add' button. In the embodiment of the screen 9300 of Figure 93, the second user action may be a user action for pushing a button for completing input of a channel number into the input box 9333 (for example, an 'OK' button on a remote controller). In the embodiments of the GUI 2700 of Figure 27, the GUI 2900 of Figure 29 and the GUI 3100 of Figure 31, the second user action may be a user action including the second user action of Step S802 of Figures 34A and 34B and the third user action of Step S803. The channel number may be equal to the channel number searched in Step S2720.

[0571] The controller 340 stores the human address, the channel number and information associating the human address and the channel number with each other in a human channel map in response to the detected second user action (S2750). If the channel number is equal to the channel number searched in Step S2720, a plurality of human addresses of a single person is assigned to a single channel number.

[0572] The controller 340 confirms whether or not other human addresses of the friend who is associated with the designated human address are present (S2760). For example, the friend may have multiple SNS accounts such as a human address corresponding to a facebook account and another human address corresponding to an MSN account.

[0573] If other human addresses are present, the controller 340 controls display of the other human addresses (S2770).

[0574] Figure 96 is a diagram illustrating an embodiment of a GUI for display of other human addresses of a friend who has a human address associated with a channel number.

[0575] Referring to Figure 96, the display 302 may display a message 9600 in Step S2770. The message 9600 lists SNS accounts of the other human addresses. In this example, it may be assumed that the human address designated in Step S2710 is a human address of Lisa. The message 9600 may list SNS accounts 9601, 9603, 9605 and 9607 as the other human addresses of Lisa, and may include a button 9610 to add additional addresses and a button 9620 to cancel the process. In Step S2770, check boxes 9631, 9633, 9635 and 9637 need not be displayed.

[0576] The controller 340 displays a GUI for designation of a human address (S2780). The GUI may be displayed if the controller 340 detects a user action for pushing the button 9610 of Figure 96. The display 302 may display the message 9600 including the SNS accounts 9601, 9603, 9605 and 9607, the check boxes 9631, 9633, 9635 and 9637, the button 9610 and the button 9620.

[0577] In some embodiments, Step S2770 and Step S2780 may be combined into a single step for displaying a GUI for provision of other human addresses and designation of a particular human address among the other human addresses. The GUI may be the message 9600 including the SNS accounts 9601, 9603, 9605 and 9607, the check boxes 9631, 9633, 9635 and 9637, the button 9610 and the button 9620.

[0578] The controller 340 detects a third user action for designation of a human address (S2790). The third user action may be a user action for pushing the button 9610 of the message 9600 displayed in Step S2780.

[0579] The controller 340 stores the human address, the channel number and information associating the human address and the channel number with each other in the human channel map in response to the detected third user action (S2795). The human address may be a human address checked in the check boxes 9631, 9633, 9635 and 9637, and the channel number may be the channel number stored in Step S2750.

[0580] Figure 97 is a diagram illustrating another exemplary embodiment for a human channel map.

[0581] The human channel map 1210 of Figure 97 further includes a channel number '80' associated with a plurality of human addresses. The channel number '80' is associated with the friend 'Lisa', and the friend 'Lisa' has a plurality of

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human addresses (Lisa@TV.com, Lisa@SNS.com and Lisa@facebook.com). That is, the channel number '80' is assigned to each of Lisa@TV.com, Lisa@SNS.com and Lisa@facebook.com.

[0582] If a pointer indicates a particular table, the controller 340 can confirm that a corresponding channel number is associated with a plurality of human addresses. In one example, if a pointer 9701 of the channel number '80' indicates a table 9700, the controller 340 confirms that the channel number '80' is associated with a plurality of human addresses.

[0583] The table 9700 includes the human addresses, i.e. Lisa@TV.com, Lisa@SNS.com and Lisa@facebook.com, associated with the channel number '80', and pointers respectively corresponding to Lisa@TV.com, Lisa@SNS.com and Lisa@facebook.com. The pointers may indicate positions where information associated with the human addresses is stored.

[0584] The pointer 9711 indicates a position where information associated with Lisa@TV.com is stored. More particularly, the pointer 9711 indicates the third row of the third connection information map 1250. An IP address associated with Lisa@TV.com is 207.63.107.105, and a port number and an account associated with Lisa@TV.com are 80 and Lisa, respectively. Connection to a channel of Lisa@TV.com may be implemented by the access method denoted by type 3.

[0585] The pointer 9712 indicates a position where information associated with Lisa@facebook.com is stored. More particularly, the pointer 9712 indicates the fourth row of the third connection information map 1250. An IP address associated with Lisa@facebook.com is 204.62.101.95, and a port number and an account associated with Lisa@facebook.com are 80 and Lisa, respectively. Connection to a channel of Lisa@facebook.com may be implemented by the method denoted by type 3.

[0586] The pointer 9713 indicates a position where information associated with Lisa@SNS.com is stored. More particularly, the pointer 9713 indicates the fifth row of the third connection information map 1250. An IP address associated with Lisa@SNS.com is 205.52.108.96, and a port number and an account associated with Lisa@SNS.com are 80 and Lisa, respectively. Connection to a channel of Lisa@SNS.com may be implemented by the access method denoted by type 3.

[0587] In the present disclosure, the pointers 9711, 9712 and 9713 are not limited to the embodiments indicating the rows of the third connection information map 1250, and may indicate rows of different connection information maps. In one embodiment, channel 80 may be linked to human addresses for a plurality of different individuals. For example, the human address 'Lisa' may be replaced by human address "family' representing a group of individuals. The human addresses in table 9700 may be linked to an SNS account of each of the individual in the group, e.g., human addresses dad and me, in tables 1240 and 1230, respectively.

[0588] Figure 98 is a flowchart illustrating an implementation procedure of another exemplary embodiment in relation to a method for providing a human channel service in accordance with the present disclosure.

[0589] Referring to Figure 98, the controller 340 detects a user action for requesting conversion to a human channel mode (S2800) (or social network channel mode). In some embodiments, the user action may be a user action for pushing one of an up key, a down key, a right key or a left key of a remote controller, or may be a user action for pushing a mode conversion key (for example, a colored button) of the remote controller.

[0590] The controller 340 controls display of a human channel map in response to the detected user action (S2810). The display 302 may display the human channel map 7220 illustrated in Figure 72.

[0591] The controller 340 detects a user action for designation of a channel number (S2820).

[0592] The controller 340 confirms whether or not a plurality of human addresses is associated with the channel number in response to the detected user action (S2830). The controller 340 can confirm whether or not the plurality of human addresses is associated with the channel number by use of the human channel map. In one example, if a channel number '77' is designated in Step S2820, it can be confirmed from the human channel map of Figure 97 that the channel number '77' is associated with a single human address. If a channel number '80' is designated in Step S2820, it can be confirmed from the human channel map of Figure 97 that the channel number '80' is associated with the plurality of human addresses (i.e. Lisa@TV.com, Lisa@SNS.com and Lisa@facebook.com).

[0593] If the plurality of human addresses is present, the controller 340 controls display of a GUI for designation of a human address (S2840).

[0594] Figure 99 is a diagram illustrating an embodiment of a GUI for designation of a human address.

[0595] Referring to Figure 99, the display 302 may display a GUI 9900 as the GUI for designation of the human address if the user action for designating the channel number '80' is detected in Step S2820. The GUI 9900 lists the human addresses Lisa@TV.com, Lisa@SNS.com and Lisa@facebook.com associated with the channel number '80'.

[0596] The controller 340 detects a user action for designation of a human address (S2850). In one example, the user action may be a user action for pushing a particular key (for example, an 'OK' key) on a remote controller in a state in which an indicator 9901 of Figure 99 is located at a particular human address. The user action designates a human address where the indicator 9901 is located.

[0597] The controller 340 performs connection to the human address (S2860). If a plurality of human addresses is not associated with the channel number designated in Step S2820, the controller 340 performs connection to the human

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address associated with the channel number designated in Step S2820. Also, if a plurality of human addresses is associated with the channel number designated in Step S2820, the controller 340 performs connection to the human address designated in Step S2850.

[0598] The controller 340 may display at least one of a Web page associated with the SNS account of the SNS server, a screen captured by the electronic device, a broadcast channel that the user of the electronic device is viewing, content or content list stored in the electronic device, based on the result of connection. The Web page associated with the SNS account of the SNS server may be a home page.

[0599] Step S2860 may include at least one step included in the implementation procedure of the method for receiving content of a human channel in relation to Figures 19 to 21, and may include at least one step included in the implementation procedure of the method for setting connection between electronic devices of Figure 26.

[0600] Figure 100 is a diagram illustrating another embodiment of a screen on which a human channel map and content of a selected human channel are displayed.

[0601] Referring to Figure 100, the controller 340 may control display of a screen 10000 based on the result of connection of Step S2860. The screen 10000 is a screen on which a Web page received from the SNS server is displayed.

[0602] The screen 10000 may include a list region 10010, a user information region 10020, a statistical information region 10030, a friend list region 10040, a video link 10051, a picture link 10053 and a message link 10054. The list region 10010 displays a user question and answers of friends with respect to the question, the user information region 10020 displays brief introduction information with respect to the user, and the statistical information region 10030 displays statistical information. The friend list region 10040 displays a number of followers (other users who are registered to receive information about the user) and following (other users whom the user is registered to receive information about) , the video link 10051 is a connection link for a Web page on which unloaded video files can be seen, the picture link 10053 is a connection link for a Web page on which uploaded pictures can be seen, and the message link 10054 is a connection link for a Web page on which messages between the user and the friend(s) can be seen.

[0603] Figure 101 is a diagram illustrating an embodiment of a screen on which an Electronic Program Guide (EPG) for a human channel in accordance with the present disclosure is displayed.

[0604] Referring to Figure 101, the controller 304 may control display of an electronic program guide 10100 for a human channel. The electronic program guide 10100 may be displayed if a user action for requesting the EPG is detected during display of the human channel. If the user action for requesting the EPG is detected during display of a broadcast channel, the controller 340 may control display of an EPG for the broadcast channel.

[0605] The remote controller 304 may include a button for requesting the electronic program guide 10100 for the human channel. If the controller 340 detects a user action for pushing the button, the controller 340 may control display of the electronic program guide 10100 in response to the detected user action. In one embodiment, the button for requesting the EPG 10100 for the human channel may be a dedicated button. In this case, the EPG for the human channel may be displayed regardless of the type of content that is being displayed, e.g., broadcast, application, or human channel content. Alternatively, the button may be configured to display a particular type of EPG corresponding to the type of content being displayed, e.g., human channel type EPG.

[0606] The EPG 10100 may be configured as a grid or calendar. The EPG 10100 may include a human indicating cell 10111 at the first row of the first column and a human channel indicating cell 10112 at the first row of the second column, and the other columns of the first row may include date cells 10113 to 10118. The human indicating cell 10111 displays information indicating that human cells are listed in the first column, the human channel indicating cell 10112 displays information indicating that channel cells are listed in the second column, and the date cells 10113 to 10118 display dates.

[0607] In some embodiments, if there is no event associated with a particular date, a date cell displaying the particular date need not be displayed. In addition, date cells may be orderly displayed from the date cell 10113 representing a present date to the date cell 10114 representing a future date.

[0608] The electronic program guide 10100 includes human cells 10121, 10131 and 10141 in the other rows of the first column, channel cells 10122, 10132 and 10142 in the other rows of the second column and event cells 10123 and 10134 in the other rows of the other columns. The human cells 10121, 10131 and 10141 display information associated with owners of the respective human channels. Here, the human cells may display pictures of the owners of the human channels. The channel cells 10122, 10132 and 10142 display human channel numbers respectively (e.g., channel numbers 101, 110, and 116). The channel cells 10122, 10132 and 10142 may further display human addresses of the owners of the human channels (e.g., Mike, Miranda, and Sweety). In some embodiments, the human cells 10121, 10131 and 10141 need not be displayed.

[0609] The event cells are associated, according to positions thereof, with particular human cells, particular channel cells and particular date cells. More particularly, each event cell is associated with a human cell and a channel cell of the same row and is also associated with a date cell of the same column. The event cell is associated with an event, which is associated with a date displayed by the date cell of the same column, from among events associated with the human channel having the channel number displayed by the channel cell of the same row.

[0610] The event cell may display at least a part of event information, i.e. information about an associated event. The

event information may include an SNS account associated with an event, information about an SNS site to which the event has been uploaded, information about the type of the event, the title of the event, the date of the event and detailed information about the event. The event may include at least one of a schedule, a function, a memorial day or holiday, content, or the like. The content may be a multimedia content such as a picture or video, or the content may be a message or note, for example.

[0611] The event cells may display at least one of event titles 10151, 10152 and 10153, event icons 10161 and 10162 or event source marks 10171, 10172 and 10173. The event cells may further display a reminder mark 10191 (or indicia). The reminder mark 10191 may be displayed in the case where a reminder for an event is set up. If the reminder is set up, an alarm for the event may be displayed as a message, for example, on the multi-functional display device or may be transmitted to a mobile appliance, an email address, or the like. The reminder may be set up according to a user request.

[0612] If one event cell is associated with a plurality of events, event information about the plurality of events may be displayed respectively. For example, an event cell 10134 displays a plurality of events 10172 and 10173.

[0613] Figure 102 is a diagram illustrating an embodiment of a screen in which detailed information of an event is displayed on an electronic program guide in accordance with the present disclosure.

[0614] Referring to Figure 102, the controller 340 may detect a user action for selecting a date cell of the electronic program guide 10200, for example, using a cursor or an arrow as illustrated. The controller 340 may control display of detailed information 10210 of an event associated with the date cell in response to the detected user action. In one example, if the controller 340 detects a user action for selecting a date cell 10243, the controller 340 controls display of the detailed information 10210 about a "Match" event associated with the date cell 10243 in response to the detected user action.

[0615] Figure 103 is a diagram illustrating an embodiment of a screen in which channel numbers are selected on an electronic program guide in accordance with the present disclosure.

[0616] Referring to Figure 103, the controller 340 may detect a user action for selecting a human cell of the electronic program guide 10300. The controller 340 may control display of content of a human channel of a person indicated by the human cell in response to the detected user action. In one example, if the controller 340 detects a user action for selecting a human cell 10341, the controller 340 controls display of content of a human channel of a person 'Sweety' indicated by the human cell 10341 in response to the detected user action.

[0617] Figure 104 is a diagram illustrating an embodiment of a screen on which content of a human channel is displayed.

[0618] Referring to Figure 104, if the controller 340 detects a user action for selecting the human cell 10341, the controller 340 may control display of content 10400 of a human channel of an owner 'Sweety' indicated by the human cell 10341 in response to the detected user action. The screen 10400 may further display a picture 10410 of the owner 'Sweety', a human address 10420 of the owner 'Sweety' and a channel number 10430 of the human channel of the owner 'Sweety'.

[0619] If the content 10400 is a video file, the controller 340 may further display a time guidance graph 10450 which represents a displayed time of the entire playing time of the video file. In the time guidance graph 10450, a region 10451 means a displayed amount, a region 10453 means an amount to be displayed, and a divider 10455 represents a position of an image being displayed.

[0620] Figures 105 to 107 are diagrams illustrating an embodiment in which an electronic program guide in accordance with the present disclosure is dragged.

[0621] Referring to Figures 105 to 107, in a state in which a pointer 10501 is located at the third row of the electronic program guide 10500, if the controller 340 detects a down event and subsequently, detects at least one drag event, the controller 340 moves the pointer 10501 to a position 10601 in response to the detected down event and the detected drag event. Then, the controller 340 controls display of a part of a date cell 10610 indicating a date after a certain time corresponding to a movement distance of the pointer 10501 has elapsed and at least a part of an event cell 10620 associated with an event of the date. The down event may be a user action for selecting a channel cell 10513, or may be a user action for selecting one of event cells 10523, 10533 and 10543.

[0622] If the controller 340 detects an up event after detection of the at least one drag event, the controller 340 controls display of an electronic program guide 10700 including an added column 10710. The added column 10710 includes a date cell 10713 representing a particular date after the certain time has elapsed and event cells 10723, 10724 and 10743 associated with the event of the particular date. The event cell 10723 displays content 10751 and 10752 uploaded at the corresponding date. The number of columns that are added (and the corresponding dates which are displayed) may correspond to an amount in which the cell is dragged in a prescribed direction. Additionally, the direction in which a cell is dragged may determine whether previous or later dates are added to the EPG. For example, dragging a cell to the right in the EPG may display columns for later dates.

[0623] In one embodiment, a date range for the dates included in the EPG may be entered to display events corresponding to the entered date range. A scroll bar may be provided to scroll the EPG to the desired date range. Moreover, a scroll bar may also be provided to scroll the EPG vertically to display additional channels assigned to different users and their respective SNS accounts. In one embodiment, each channel as well as a particular date (e.g., each row or

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column of the EPG) may be hidden based on a manual designation or based on user preferences or filters (e.g., friend lists). For example, the entire row for channel number 110 corresponding to Miranda may be hidden in the EPG.

[0624] Figure 108 is a diagram illustrating an embodiment of a screen in which a content list is displayed on an electronic program guide in accordance with the present disclosure.

[0625] Referring to Figure 108, the controller 340 may detect a user action for selecting an event cell 10823 of an electronic program guide 10800. The controller 340 may control display of a content list 10850 associated with the event cell 10823 in response to the detected user action. The content list 10850 may be a list of events associated with the event cell 10823, or may be a list of content uploaded to the server on a date associated with the event cell 10823. The server may be the server 10 or the server 20, and the content may be content uploaded to the server belonging to an account associated with a human channel having a channel number '101'. The account may be an SNS account.

[0626] Figure 109 is a diagram illustrating an embodiment of a screen on which a preview of content selected from among the content list of Figure 108 is displayed.

[0627] Referring to Figure 109, the controller 340 may detect a user action for selecting a particular item from among items 10911, 10913 and 10915 included in a content list 10910 displayed on the electronic program guide 10900. The controller 340 may control display of a preview 10950 of content indicated by the selected particular item. The preview may be prepared independently of the content, may be a part of the content, or may be the entire content.

[0628] In one example, if the controller 340 detects a user action for selecting an item 10914, the controller 340 controls display of a preview of content indicated by the item 10914 in the region 10950 in response to the detected user action. If the controller 340 detects a user action for selecting the region 10950 where the preview will be displayed, the controller 340 may control display of the content indicated by the item 10914 over the entire screen. In this case, the content may overlap over the electronic program guide 10900, or the electronic program guide 10900 may temporarily disappear from the screen during display of the content. In one embodiment, if the controller 340 detects a prescribed type of selection on an item 10911, 10913, 10914 (e.g., a double click or selection of a prescribed button on the remote controller), the content may be immediately displayed without displaying a preview of the item in region 10950.

[0629] Figure 110 is a diagram illustrating an embodiment of a screen on which a graphical user interface to produce an event is displayed.

[0630] Referring to Figure 110, the controller 340 may detect a user action for selecting a cell included in a row associated with a user human channel on an electronic program guide 11000. The controller 340 may control display of a graphical user interface 11010 to produce an event in response to the detected user action. In one example, an event cell 11024 is located on the same row as a channel cell 11022 indicating a channel number '0', a human channel having the channel number '0' means a human channel of the owner of the electronic device 300, and the channel cell 11022 further indicates a human address 'Mike' and therefore, the owner of the electronic device 300 is Mike. If the controller 340 detects a user action for selecting the event cell 11024, the controller 340 controls display of the graphical user interface 11010 in response to the user action.

[0631] The graphical user interface 11010 may include a first region 11011 used to input the title (or subject) of an event, a second region 11013 used to input the date of an event, and a third region 11015 used to input detailed information about an event.

[0632] Figure 111 is a diagram illustrating an embodiment of a screen on which an event input into the graphical user interface of Figure 110 is displayed.

[0633] Referring to Figure 111, a first region 11111 of the graphical user interface 11010 receives the title of an event "Match", a second region 11113 receives the date of the event "12 Mar' 11", and a third region 11115 receives detailed information about the event "I am going to watch the India-Aus Match from 3:00 PM. You guys are invited to my place. I have..."

[0634] Figures 112A and 112B are diagrams illustrating a screen on which an electronic program guide in accordance with the present disclosure, which reflects the event input in Figure 111, is displayed.

[0635] Referring to Figures 112A, if the input of the event illustrated in Figure 111 is completed, the controller 340 controls display of at least a part of the event information input in Figure 111 on an event cell 11224 associated with the date "12 Mar '11" of the electronic program guide 11200. The event cell 11224 is located on the row indicated by the human channel of the owner 'Mike' of the electronic device 300.

[0636] If the input of the event illustrated in Figure 111 is completed, the controller 340 may control transmission of the event information input in Figure 111 to the server 10, the server 20 and other electronic devices. The controller 340 may detect an SNS account associated with Mike from the human channel map and then, control upload of the event information to the detected SNS account. In addition, the controller 340 may acquire an address of the electronic device transmitted to each human channel of the human channel map and then, control transmission of the event information to the acquired address.

[0637] As shown in Figure 112B, an electronic program guide 11201 is displayed on the electronic device of Molly. The event information input in Figure 111 is displayed on an event cell 11234 associated with the date "12 Mar '11" at the row indicating the human channel of Mike. The electronic device of Molly may directly receive the event information

from the electronic device of Mike, or may indirectly receive the event information through the server 10 or the server 20.

[0638] Figure 113 is a diagram illustrating an implementation procedure of an exemplary embodiment in relation to a method for providing service information in accordance with the present disclosure.

[0639] Referring to Figure 113, the controller 340 controls display of content of a human channel. The display 302 may display the screen 1500 of Figure 15, the screen 1600 of Figure 16, the screen 1700 of Figure 17, the screen 10000 of Figure 100 and the screen 10400 of Figure 104.

[0640] The controller 340 detects a user action for requesting service information (S2910).

[0641] The controller 340 constructs service information in response to the detected user action (S2920). The constructed service information may be event information and information associated with the event information and the human channel. The constructed service information may be stored in the storage unit 345.

[0642] In some embodiments, Step S2920 may include an implementation procedure of a method for constructing service information in relation to Figure 114.

[0643] The controller 340 controls display of the constructed service information (S2930). The display 302 may display the electronic program guide 10100 of Figure 101. The constructed service information may be displayed in the form of the electronic program guide 10100.

[0644] In some embodiments, Step S2930 may include an implementation procedure of a method for displaying service information in relation to Figure 115 as described hereinafter.

[0645] The controller 340 controls production of an event and transmission of the produced event (S2940).

[0646] In some embodiments, step S2940 may include an implementation procedure of a method for producing an event in relation to Figure 116 as described hereinafter.

[0647] In some embodiments, Step S2920 may be performed before Step S2910, the service information constructed in Step S2920 may be stored in the storage unit 345, and Step S2930 may be performed after Step S2910. In this case, the stored service information may be displayed in Step S2930.

[0648] Step S2920 may be initially performed, may be performed when an event is additionally produced or received, or may be executed at a predetermined interval. The service information stored in the storage unit 345 may be updated upon execution of Step S2920.

[0649] Figure 114 is a diagram illustrating an implementation procedure of an exemplary embodiment in relation to a method for constructing service information in accordance with the present disclosure.

[0650] Referring to Figure 114, the controller 340 controls transmission of an event information request signal to request event information (S3000). The controller 340 may request event information on a per human channel basis or on a per SNS account basis, or may request event information with respect to a human channel included in a human channel map using a single signal. The controller 340 may transmit the event information request signal to at least one of the server 10, the server 20 or the electronic device.

[0651] The network interface 320 receives an event signal including the event information in response to the event information request signal (S3010). The event signal may be received from at least one of the server 110, the server 20 or the electronic device.

[0652] The event information may include information about at least one event. For example, the event information may include the event 10152 and the event 10123 associated with the channel cell 10122 of Mike in Figure 101 and the event 10153 associated with the channel cell 10132 of Miranda.

[0653] The event information includes an SNS account associated with the event, and may further include at least one of information about the SNS site to which the event has been uploaded, information about the type of the event, the title of the event, the date of the event or detailed information about the event. The event may be an event uploaded to a site including the SNS account.

[0654] The controller 340 maps the event and the channel number to each other (S3020). By using a channel map including at least one channel number and at least one SNS account assigned to the at least one channel number and also, using an SNS account included in the received event information, the controller 340 may map one of the at least one event or one or more events to one of the at least one channel number. The channel map, which includes at least one channel number and at least one SNS account assigned to the at least one channel number, may be a human channel map, and the human channel map may be the human channel map illustrated in Figure 12 or the human channel map illustrated in Figure 97.

[0655] The controller 340 maps the event to the channel number if the SNS account of the event is equal to the SNS account assigned to the channel number. In one example, the event 10123 and the event 10152 assigned with the channel cell 10122 of Mike in Figure 101 may be mapped to the channel number '101', and the event 10153 associated with the channel cell 10132 of Miranda may be mapped to a channel number'110'.

[0656] The controller 340 constructs a guide screen to display the channel numbers and the events mapped to the channel numbers (S3030). The controller 340 may align the channel numbers and the mapped events in the order of dates of the events, or may align the events in the order of the channel numbers mapped to the events. The controller 340 may select and process event information to be displayed on event cells. The event information to be displayed on

the event cells may be the titles of the events and may include at least one of icons indicating SNS sites to which the events have been uploaded or event icons.

[0657] Figure 115 is a diagram illustrating an implementation procedure of an exemplary embodiment in relation to a method for displaying service information in accordance with the present disclosure.

[0658] Referring to Figure 115, the controller 340 controls display of en electronic program guide (S3100). The display 302 may display the electronic program guide 10100 of Figure 101.

[0659] The controller 340 detects a user action for selecting en event cell (S3105).

[0660] The controller 340 displays detailed information about an event associated with the selected event cell in response to the detected user action (S3110). The display 302 may display the detailed information 10210 of Figure 102.

[0661] The controller 340 detects a user action for selecting a human cell or a channel cell (S3115).

[0662] The controller 340 controls display of content of the human channel indicated by the channel number associated with the selected human cell or the selected channel cell in response to the detected user action (S3120). The display 302 may display the - content 10400 of Figure 104.

[0663] The controller 340 detects a user action for selecting a date cell or an event cell (S3125). The user action for selecting the date cell or the event cell may be a down event.

[0664] The controller 340 detects a user action for dragging the cell selected in Step S3125 (S3130). The display 302 may display the electronic program guide 10600 of Figure 106.

[0665] The controller 340 detects a user action for dropping the dragged cell (S3135). The user action for dropping the dragged cell may be an up event.

[0666] The controller 340 displays the event cell and the date cell, associated with a particular date after a certain time has elapsed, on the electronic program guide in response to the detected user action (S3140). The display 302 may display the electronic program guide 10700 of Figure 107.

[0667] The controller 340 detects a user action for selecting the event cell associated with the particular date after a certain time has elapsed (S3145).

[0668] The controller 340 displays a list of content associated with the selected event cell in response to the detected user action (S3150). The display 302 may display the content list 10850 of Figure 108.

[0669] The controller 340 detects a user action for selecting one of items included in the content list (S3155).

[0670] The controller 340 controls display of content associated with the selected item (S3160). The controller 340 may display a preview of the content. The content may be displayed over the entire screen, or may be displayed on a certain region on the electronic program guide. In one example, the content may be displayed on the region 10950 of Figure 109.

[0671] Figure 116 is a diagram illustrating an implementation procedure of an exemplary embodiment in relation to a method for producing an event in accordance with the present disclosure.

[0672] Referring to Figure 116, the controller 340 detects a user action for selecting an event cell associated with a channel number indicating a user human channel (S3200). For example, the event cell associated with a channel number indicating a user human channel may be the event cell 11024 of Figure 110.

[0673] The controller 340 controls display of a graphical user interface to produce an event in response to the detected user action (S3210). The display 302 may display the graphical user interface 11010 of Figure 110.

[0674] The controller 340 maps the event indicated by the event information input via the graphical user interface to the channel number indicating the user human channel (S3220).

[0675] The controller 340 transmits the input event information and an SNS account assigned to the user human channel to the server (S3230). The server may be a server including the SNS account or may be the server 10. If the input event information and the SNS account are transmitted to the server 10, the server 10 transmits the event information and the SNS account assigned to the user human channel to the SNS site including the SNS account.

[0676] The controller 340 displays at least a part of the input event information on an event cell that is associated with the mapped channel number and a date included in the input event information (S3230). The display 302 may display the electronic program guide 11200 of Figures 112A and 112B.

[0677] Configurations of the electronic device and operating methods thereof in accordance with the present disclosure are not limited to the above described embodiments, and all or a part of the embodiments may be selectively combined to realize various modifications thereof.

[0678] The present disclosure may be implemented as code that can be written on a computer-readable recording medium and can thus be read by a computer. The computer-readable recording medium includes all types of recording devices in which data is stored in a computer-readable manner. Examples of the computer-readable recording medium include a ROM, a RAM, a CD-ROM, a magnetic tape, a floppy disc, an optical data storage, and a carrier wave (e.g., data transmission through the Internet). The computer-readable recording medium can be distributed over a plurality of computer devices connected through a network so that computer-readable code is written thereto and executed therefrom in a decentralized manner.

[0679] As is apparent from the above description, with an electronic device, a method of providing a human channel

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service, a method of constructing a human channel map and a method of relaying a human channel in accordance with the present disclosure, on-line networks between designated individuals can be accomplished using channel numbers. A user can communicate with a designated person by selecting a channel number assigned to the designated person, which assures convenient and easy utilization of a social network service. Further, according to the present disclosure, by allowing the user to acquire an address of an electronic device using a human address independent of an IP address as well as the IP address, the user can utilize the electronic device for a social network service even when the electronic device has a dynamic IP address or a private IP address. Furthermore, according to the present disclosure, the user can conveniently and easily access a social network service anytime and anywhere. Moreover, according to the present disclosure, by allowing a user to access an acquaintance connected to a social network through a human channel, the user and the acquaintance can easily view the same broadcast channel through human channels thereof.

[0680] The present disclosure provides a chat screen for allowing the user to confirm a friend who is viewing the same content as the user using a human channel map and to chat with the confirmed friend, whereby the user can view a broadcast while chatting with the friend who is viewing the same content.

[0681] Moreover, according to the present disclosure, as a result of providing a variety of kinds of channel maps and a user interface for assisting channel map switch, the user can easily select a variety of kinds of channel maps. Further, allowing the user to select a variety of kinds of channels listed in a channel map can further facilitate easy user selection of a variety of kinds of channels.

[0682] The present disclosure provides a menu for the scan of an App service and an SNS service, similar to a broadcast channel scan menu, which can allow the user not only to easily operate a scan menu, but also to easily set an App channel and a human channel based on the result of scan.

[0683] In addition, the present disclosure provides event information about friends in the form of an Electronic Program Guide (EPG), which can allow the user to easily acquire and manage information about friends, to easily produce a user event and to easily share the produced event with friends.

[0684] As embodied and broadly described herein, the present disclosure is directed to an electronic device, a method of providing a human channel service, a method of constructing a human channel map and a method of relaying a human channel, a method for inviting to view channel, a method for remotely viewing content at the same time, a method for providing channel map service, a method for providing a channel scan interface and a method for providing service information that substantially obviate one or more problems due to limitations and disadvantages of the related art.

[0685] One object of the present disclosure is to provide an electronic device, a method of providing a human channel service, a method of constructing a human channel map and a method of relaying a human channel, which enable a user to more conveniently and easily use a social network service.

[0686] Another object of the present disclosure is to provide an electronic device, a method of providing a human channel service, a method of constructing a human channel map and a method of relaying a human channel, which enable a user to use a social network service anywhere and anytime.

[0687] Another object of the present disclosure is to provide an electronic device, a method of providing a human channel service, a method of constructing a human channel map and a method of relaying a human channel, which enable a social network service between electronic devices even when the electronic devices have dynamic Internet Protocol (IP) addresses.

[0688] Another object of the present disclosure is to provide an electronic device, a method of providing a human channel service, a method of constructing a human channel map and a method of relaying a human channel, which enable a social network service between electronic devices even when the electronic devices have private IP addresses.

[0689] A further object of the present disclosure is to provide an electronic device and a method of making invitation to view a channel, which enable a user to invite an acquaintance connected to a social network to view a broadcast channel that the user is viewing.

[0690] Another object of the present disclosure is to provide an electronic device, which enables a user to view a broadcast while chatting with a friend who views the same content, and a method for remotely viewing content at the same time.

[0691] Another object of the present disclosure is to provide an electronic device and a method of providing a channel map service, which provide a variety of kinds of channel maps and enable a user to easily select a variety of kinds of channel maps.

[0692] A further object of the present disclosure is to provide an electronic device and a method of providing a channel map service, which provide a variety of kinds of channels and enable a user to easily select a variety of kinds of channels.

[0693] Another object of the present disclosure is to provide an electronic device, which can easily perform a channel scan with respect to various kinds of services and can provide a menu to perform a channel scan with respect to various kinds of services, similar to a conventional broadcast channel scan menu, and a method for providing a channel scan interface.

[0694] A further object of the present disclosure is to provide an electronic device, which provides information about friends in a social network, and a method for providing service information.

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[0695] To achieve these objects and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, a method of providing a human channel service may include detecting a user action for designating a channel number, reading a human address associated with the designated channel number from a human channel map in response to the detected user action, acquiring an address of an electronic device to access based on the read human address, receiving content from the electronic device using the acquired address, and displaying the received content. The human address may include at least one of an e-mail address, an account name, a family name (or surname), a Session Initiation Protocol-Uniform Resource Locator (SIP-URL), or another appropriate type of identifier or address.

[0696] The address of the electronic device may include at least one of a Media Access Control (MAC) address, an Internet Protocol (IP) address, a port number, a Domain Name System (DNS) name or a Uniform Resource Locator (URL).

[0697] The acquiring the address of the electronic device may include reading the address of the electronic device based on the human address from a storage unit.

[0698] The acquiring the address of the electronic device may include transmitting a connection request signal including the human address to a server, and receiving the address of the electronic device from the server.

[0699] The human channel map may include a channel number, a human address and information associating the channel number and the human address with each other.

[0700] In one embodiment, a method of constructing a human channel map may include displaying a first Graphical User Interface (GUI) for designation of a human address, detecting a first user action for designating a human address, displaying a second GUI for designation of a channel number in response to the detected first user action, detecting a second user action for designating a channel number, and storing the channel number, the human address and information associating the channel number and the human address with each other in the human channel map in response to the detected second user action. The displayed first GUI may list at least one selectable human address. The displayed second GUI may list a plurality of selectable channel numbers.

[0701] In this embodiment, the human channel map constructing method may further include receiving the at least one human address from a server.

[0702] The human channel map constructing may further include displaying a Web page of a Social Network Service (SNS) server, the displayed Web page listing at least one human address, detecting a third user action for selecting one of the listed at least one human address, and displaying the first GUI in response to the detected third user action.

[0703] In one embodiment, a method of relaying a human channel may include receiving a first registration request signal, including a first human address and an address of a first electronic device, from the first electronic device, storing the first human address and the address of the first electronic device in response to the received first registration request signal, receiving a second registration request signal, including a second human address and an address of a second electronic device, from the second electronic device, storing the second human address and the address of the second electronic device in response to the received second registration request signal, receiving a connection request signal including the second human address from the first electronic device, and transmitting a response signal including the address of the second electronic device to the first electronic device in response to the received connection request signal, and transmitting a response signal including the address of the first electronic device to the second electronic device.

[0704] In one embodiment, an electronic device may include a controller configured to detect a user action for designating a channel number, read a human address associated with the designated channel number from a human channel map in response to the detected user action, and control acquisition of an address of an electronic device to access, based on the read human address, and a network interface configured to receive content from the electronic device using the acquired address.

[0705] The electronic device may further include a display configured to display the received content. Moreover, the controller may be configured to control transmitting a connection request signal including the human address to a server, and control receiving the address of the electronic device from the server.

[0706] In one embodiment, an electronic device may include an interface configured to receive a user action, a controller configured to detect a first user action for designating a human address, control displaying a second GUI for designation of a channel number in response to the detected first user action, detect a second user action for designating a channel number, and control storing the human address, the channel number, and information associating the human address and the channel number with each other in a human channel map in response to the detected second user action, and a storage device configured to store the human channel map.

[0707] The interface may include at least one of an image capture device, a touch screen, a touch pad, or a remote controller receiver.

[0708] In one embodiment, a method of constructing a human channel map may include displaying a GUI for setting up a channel, the displayed GUI including a human channel region listing at least one human address and a channel region listing at least one channel number, detecting a first user action for selecting one of the at least one human address, detecting a second user action for dragging the selected human address, detecting a third user action for

selecting one of the at least one channel number, and storing the selected human address, the selected channel number, and information associating the channel number and the human address with each other in the human channel map in response to the detected third user action. The displayed GUI may further include a broadcast channel region including at least one broadcast channel and an App channel region including at least one App channel.

[0709] In this embodiment, the human channel map constructing method may further include confirming whether or not a human address associated with the selected channel number is present in the human channel map, in response to the detected third user action, and deleting the associated human address, the selected channel number and information associating the associated human address and the selected channel number with each other from the human channel map if the associated human address is present.

[0710] In accordance with another aspect of the present disclosure, a method of making invitation to view a channel includes detecting a first user action for selecting a displayed broadcast program, detecting a second user action for selecting one of at least one channel number included in a displayed human channel map, and transmitting a channel viewing request signal for requesting viewing of the selected broadcast program to an electronic device or a server associated with the selected channel number, in response to the second user action, and the transmitted channel viewing request signal includes at least one of detailed user information, detailed information about a physical channel for transmitting the broadcast program, a service name of the broadcast program, a service Identifier (ID) of the broadcast program, a channel number of the broadcast program, an event name of the broadcast program, a transport stream ID of the broadcast program, a network ID of the broadcast program, information about a service provider providing the broadcast program, information about a transmission medium for transmitting the broadcast program or information about a nation or an area where the service provider is located. The displayed human channel map may further include at least one of a channel name, event name or residual broadcast time of the broadcast program displayed by the electronic device associated with the channel number.

[0711] The method may further include transmitting a channel guiding signal, including at least one of the channel name, event name or residual broadcast time of the broadcast program, to the electronic device or the server according to an access method associated with the channel number included in the human channel map.

[0712] The method may further include receiving a channel viewing request signal from the electronic device, and confirming whether or not a broadcast service is receivable from a service provider indicated by information included in the received channel viewing request signal.

[0713] The method may further include searching for a channel, which broadcasts the broadcast program indicated by information included in the received channel viewing request signal, from stored Electronic Program Guide (EPG) data based on information included in the channel viewing request signal, if reception of the broadcast service from the service provider is not possible.

[0714] The method may further include receiving a channel viewing request signal from a server, receiving a broadcast program of a channel indicated by information included in the received channel viewing request signal, and displaying the received broadcast program. Information included in the channel viewing request signal may be information obtained as the server amends information included in the channel viewing request signal received from the electronic device according to a difference of at least one of the service provider providing the broadcast service, transmission medium or area.

[0715] The transmitting the signal to the electronic device may include reading a human address associated with the channel number from a stored human channel map, acquiring an address of the electronic device based on the read human address, and transmitting the channel viewing request signal using the acquired address. The human address may include at least one of an e-mail address, an account name, a family or and a Session Initiation Protocol-Uniform Resource Locator (SIP-URL). The address of the electronic device may include at least one of a Media Access Control (MAC) address, an Internet Protocol (IP) address, a port number, a Domain Name System (DNS) name or a Uniform Resource Locator (URL).

[0716] In accordance with a further aspect of the present disclosure, an electronic device includes an interface configured to receive a user action, a controller configured to control displaying a broadcast program and a human channel map including at least one channel number, detect a first user action for selecting the broadcast program, detect a second user action for selecting one of the at least one channel number, and control transmitting a channel viewing request signal for requesting viewing of the selected broadcast program to an electronic device or a server associated with the selected channel number in response to the detected second user action, and a network interface configured to output the channel viewing request signal, and the transmitted channel viewing request signal includes at least one of detailed user information, detailed information about a physical channel for transmitting the broadcast program, a service name of the broadcast program, a service Identifier (ID) of the broadcast program, a channel number of the broadcast program, an event name of the broadcast program, a transport stream ID of the broadcast program, a network ID of the broadcast program, information about a service provider providing the broadcast program, information about a transmission medium for transmitting the broadcast program or information about a nation or an area where the service provider is located. The human channel map may further include at least one of a channel name, event name or residual

broadcast time of the broadcast program displayed by the electronic device associated with the channel number.

[0717] The controller may be configured to control transmitting a channel guiding signal, including at least one of the channel name, event name or residual broadcast time of the broadcast program, to the electronic device or the server according to an access method associated with the channel number included in the human channel map.

[0718] The network interface may be configured to receive a channel viewing request signal from an electronic device, and the controller is configured to confirm whether or not a broadcast service is receivable from a service provider indicated by information included in the received channel viewing request signal.

[0719] The controller may be configured to search for a channel, which broadcasts the broadcast program indicated by information included in the received channel viewing request signal, from stored Electronic Program Guide (EPG) data based on information included in the channel viewing request signal, if reception of the broadcast service from the service provider is not possible.

[0720] The network interface may be configured to receive a channel viewing request signal from a server, and the controller may be configured to control receiving a broadcast program of a channel indicated by information included in the received channel viewing request signal. Information included in the channel viewing request signal may be information obtained as the server amends information included in the channel viewing request signal received from the electronic device according to a difference of at least one of the service provider providing the broadcast service, transmission medium or area.

[0721] The controller may be configured to read a human address associated with the channel number from a stored human channel map, acquire an address of the electronic device based on the read human address, and control transmitting the channel viewing request signal using the acquired address. The human address may include at least one of an e-mail address, an account name, a family name or a Session Initiation Protocol-Uniform Resource Locator (SIP-URL). The address of the electronic device may include at least one of a Media Access Control (MAC) address, an Internet Protocol (IP) address, a port number, a Domain Name System (DNS) name or a Uniform Resource Locator (URL).

[0722] In accordance with another aspect of the present disclosure, a method for remotely viewing content at the same time includes displaying content, detecting a user action for requesting a simultaneous viewing mode, confirming the presence of an owner who is viewing the displayed content from among owners of human channels included in a human channel map in response to the detected user action, and displaying a silhouette of the confirmed owner. The displayed silhouette may be changed and displayed according to the emotions of the owner. The displayed silhouette may be changed and displayed according to a motion of the owner. The silhouette may be displayed as a 3D image. A chat phrase of the owner may be displayed at a location associated with the silhouette.

[0723] The method for remotely viewing content at the same time may further include reflecting a screen effect requested by the owner on the displayed content.

[0724] The confirming the presence of the owner may include transmitting an image frame request signal to request an image frame at a particular time, acquiring the image frame at the particular time from among image frames of the displayed content, receiving an image frame transmission signal including the image frame at the particular time, and comparing the acquired image frame with the image frame included in the received image frame transmission signal so as to confirm the presence of the owner.

[0725] The confirming the presence of the owner may include transmitting an owner list request signal including information about the content to a server, receiving an owner list from the server, and confirming an owner included in the owner list as the owner who is viewing the displayed content. The information about the content may include at least one of detailed user information, detailed information about a physical channel that transmits the content, a service name of the content, a service ID of the content, a channel number of the content, an event name of the content, a transport stream ID of the content, a network ID of the content, information about a service provider to provide the content, information about transmission media to transmit the content or information about a nation or locale where the service provider is located.

[0726] The human channel map may include a channel number, a human address and information associating the channel number and the human address with each other. The human address may be an identification mark given to the owner.

[0727] In accordance with another aspect of the present disclosure, an electronic device includes an interface configured to receive a user action for requesting a simultaneous viewing mode, and a controller configured to confirm the presence of an owner who is viewing content from among owners of human channels included in a human channel map in response to the user action if the user action is detected during display of the content and to control display of a silhouette of the confirmed owner.

[0728] The controller may control change of the displayed silhouette according to the emotions of the owner and display of the changed silhouette.

[0729] The controller may control change of the displayed silhouette according to a motion of the owner and display of the changed silhouette.

[0730] The controller may control display of a chat phrase of the owner at a location associated with the silhouette.

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[0731] The controller may control reflection of a screen effect requested by the owner on the displayed content.

[0732] The controller may control display of the silhouette as a 3D image.

[0733] The controller may control transmission of an image frame request signal for requesting an image frame at a particular time, acquiring the image frame at the particular time from among image frames of the displayed content, and if an image frame transmission signal including the image frame at the particular time is received, comparing the acquired image frame with the image frame included in the received image frame transmission signal so as to confirm the presence of the owner.

[0734] The controller may control transmission of an owner list request signal including information about the content to a server, and if an owner list is received from the server, confirming an owner included in the owner list as the owner who is viewing the displayed content.

[0735] The information about the content may include at least one of detailed user information, detailed information about a physical channel to transmit the content, a service name of the content, a service ID of the content, a channel number of the content, an event name of the content, a transport stream ID of the content, a network ID of the content, information about a service provider to provide the content, information about a transmission media to transmit the content or information about a nation or locale where the service provider is located.

[0736] The human channel map may include a channel number, a human address and information associating the channel number and the human address with each other. The human address may be an identification mark given to the owner.

[0737] In accordance with another aspect of the present disclosure, a method of providing a channel map service includes displaying a first channel map on a screen on which content is being displayed, detecting a first user action for requesting channel map switch, and switching the displayed first channel map to a second channel map, in response to the detected first user action. One of the first channel map and the second channel map is a human channel map including at least one human channel. The first user action may be an action in which a user presses one of directional keys of a remote controller.

[0738] The switching to the human channel map may include displaying content of one of human channels included in the human channel map.

[0739] The channel map service providing method may further include detecting a third user action for requesting channel switch in a state in which the human channel map is displayed, switching a selected human channel to another human channel in the human channel map in response to the detected third user action, and displaying content of the switched human channel.

[0740] The displaying may include reading a human address associated with a channel number of the human channel, acquiring an address of an electronic device to access, based on the read human address, receiving the content from the electronic device using the acquired address, and displaying the received content.

[0741] The channel map service providing method may further include detecting a second user action for requesting channel map switch, and switching the displayed second channel map to a third channel map in response to the detected second user action.

[0742] The channel map service providing method may further include detecting a third user action for requesting a full channel map, and displaying a full channel map including the at least one human channel, in response to the detected third user action.

[0743] The displayed full channel map may further include at least one broadcast channel and at least one App channel.

[0744] The displayed full channel map may include a sheet on which the at least one human channel is marked, and the sheet is selected by a sheet tab.

[0745] The full channel map may include sheets on which the at least one broadcast channel and the at least one App channel are marked respectively.

[0746] The channel map service providing method may further include detecting a third user action for requesting a recently viewed channel map, and displaying a recently viewed channel map including a broadcast channel, a human channel and an App channel displayed within a preset period, in response to the detected third user action.

[0747] In accordance with another aspect of the present disclosure, a method of providing a channel map service includes detecting a first user action for requesting a channel map, and displaying a channel map including at least one human channel in response to the detected first user action. The channel map may include a connection state mark indicating an online state of an owner of the at least one human channel. The channel map may further include at least one broadcast channel and at least one App channel.

[0748] The connection state mark may include a first connection state mark indicating a first online state for representing whether or not the owner is online via an electronic device, and a second connection state mark indicating a second online state for representing whether or not the owner is logged in to a server. Information about the first online state may be received from the electronic device or the server.

[0749] The channel map service providing method may further include transmitting information, indicating that the owner of the human channel is online via the electronic device, to at least one electronic device associated with the at

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least one human channel or to the server.

[0750] The transmitting to the electronic device may include reading a human address associated with a channel number from a stored human channel map, acquiring an address of the electronic device based on the read human address, and transmitting information, indicating that the owner is online, using the acquired address. The human address may include at least one of an e-mail address, an account name, a family name or a Session Initiation Protocol-Uniform Resource Locator (SIP-URL). The address of the electronic device may include at least one of a Media Access Control (MAC) address, an Internet Protocol (IP) address, a port number, a Domain Name System (DNS) name or a Uniform Resource Locator (URL).

[0751] In accordance with a further aspect of the present disclosure, an electronic device includes an interface configured to detect a user action, and a controller configured to control displaying a first channel map on a screen on which content is being displayed, detect a first user action for requesting channel map switch, and switch the displayed first channel map to a second channel map in response to the detected first user action, and one of the first channel map and the second channel map is a human channel map including at least one human channel.

[0752] In accordance with another aspect of the present disclosure, a method for providing a channel scan interface includes displaying a plurality of menu items to select service types, detecting a user action for selecting one of the plurality of displayed menu items, scanning information to construct a channel of the service type indicated by the selected menu item in response to the detected user action, and displaying the result of scan. One of the service types may be a human channel. The service types may further include at least one of a broadcast channel or an App channel.

[0753] The scanning may include transmitting a signal to request information about a friend to a server and receiving the information about the friend from the server. The information about the friend may include a single SNS account, or may include one or more SNS accounts.

[0754] The displaying the result of scan may include displaying the single SNS account, or displaying at least one of the one or more SNS accounts.

[0755] The method for providing the channel scan interface may further include assigning a first channel number to the single SNS account or to one of the one or more SNS accounts.

[0756] The method for providing the channel scan interface may further include assigning the first channel number to at least one SNS account among other SNS accounts of a friend associated with the SNS account to which the first channel number has been assigned.

[0757] The first channel number may be equal to a channel number assigned to another SNS account of the friend associated with the single SNS account. The first channel number may be a channel number assigned to a broadcast channel or an App channel.

[0758] In accordance with another aspect of the present disclosure, an electronic device includes a controller configured to control display of a plurality of menu items for selecting service types, detect a user action for selecting one of the plurality of displayed menu items, control scan of information to construct a channel of the service type indicated by the selected menu item in response to the detected user action, and a display to display the result of scan. One of the service types may be a human channel.

[0759] In accordance with another aspect of the present disclosure, a method for providing service information, includes receiving event information including information about at least one event, mapping one of the at least one events or one or more events to one of at least one channel numbers by use of a channel map including the at least one channel number and at least one Social Network Service (SNS) account assigned to the at least one channel number and an SNS account included in the received event information, and displaying one of the at least one channel numbers or one or more channel numbers and at least a part of information about the event mapped to one of the at least one channel numbers or the one or more channel numbers. The event may be uploaded to an SNS site including the SNS account. The event may include at least one of a schedule, a function, a memorial day or content. The event information may include an SNS account associated with the event, and further includes at least one of information about an SNS site to which the event has been uploaded, information about the type of the event, the title of the event, the date of the event or detailed information about the event. The channel map may be a human channel map. At least a part of the displayed information may be the title of the event. The method may further include displaying at least one of an icon indicating an SNS site to which the mapped event has been uploaded or an icon of the mapped event.

[0760] A broadcast channel may be further assigned to one of the at least one channel numbers or the one or more channel numbers. A plurality of SNS accounts may be assigned to one of the at least one channel numbers or the one or more channel numbers.

[0761] One of the at least one events or one or more events may be mapped to a channel number, to which an SNS account associated with the event is assigned.

[0762] One of the at least one channel numbers or the one or more channel numbers and at least a part of the displayed information may be displayed in a calendar form.

[0763] The calendar form may be configured such that the displayed one channel number or one or more channel numbers are listed in columns, dates are listed in rows, and at least a part of the displayed information is displayed on

a corresponding region on the basis of the channel number columns and the date rows. At least a part of information about a plurality of events may be separately displayed on the region. A reminder mark may be further displayed on the region.

[0764] The method for providing service information may further include detecting a first user action for selecting the region or a region on which the date is displayed, detecting a second user action for dragging the selected region, detecting a third user action for dropping the dragged region, and displaying a particular date after a certain time has elapsed in response to the detected third user action and at least a part of information about an event of the date.

[0765] The method for providing service information may further include detecting a user action for selecting a region located at a row, containing a region on which a user channel number is displayed, from among a region on which one of the at least one channel numbers or the one or more channel numbers are displayed, and displaying a graphical user interface to produce an event in response to the detected user action.

[0766] The method for providing service information may further include detecting a user action for selecting a region on which at least a part of information about the mapped event is displayed, and displaying detailed information about the event in response to the detected user action.

[0767] The method for providing service information may further include detecting a user action for selecting a region on which one of the at least one channel numbers or the one or more channel numbers are displayed, and displaying content of a human channel indicated by the channel number in response to the detected user action.

[0768] The method for providing service information may further include detecting a user action for selecting a region on which at least a part of information about the mapped event is displayed, and displaying a list of at least one piece of content associated with the event in response to the detected user action.

[0769] In accordance with a further aspect of the present disclosure, an electronic device includes a network interface configured to receive event information including information about at least one event, a storage unit configured to store at least one channel number and at least one SNS account assigned to the at least one channel number, and a controller configured to map one of the at least one events or one or more events to one of the at least one channel numbers by use of the stored SNS account and an SNS account included in the received event information and to construct a guide screen for displaying one of the at least one channel numbers or the one or more channel numbers and at least a part of information about the event mapped to one of the at least one channel numbers or the one or more channel numbers.

[0770] Any reference in this specification to "one embodiment," "an embodiment," "example embodiment," etc., means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the invention. The appearances of such phrases in various places in the specification are not necessarily all referring to the same embodiment. Further, when a particular feature, structure, or characteristic is described in connection with any embodiment, it is submitted that it is within the purview of one skilled in the art to effect such feature, structure, or characteristic in connection with other ones of the embodiments.

[0771] Although embodiments have been described with reference to a number of illustrative embodiments thereof, it should be understood that numerous other modifications and embodiments can be devised by those skilled in the art that will fall within the spirit and scope of the principles of this disclosure. More particularly, various variations and modifications are possible in the component parts and/or arrangements of the subject combination arrangement within the scope of the disclosure, the drawings and the appended claims. In addition to variations and modifications in the component parts and/or arrangements, alternative uses will also be apparent to those skilled in the art.

Claims

1. A method for displaying event information in a multi-functional display device, the method comprising:

receiving information related to at least one event;
mapping the at least one event to a channel number using a channel map; and
displaying at least a portion of the event information and the corresponding channel number on a display,
wherein the channel map includes a first channel number for displaying broadcast programs and a second channel number for displaying content associated with a Social Network Service (SNS) account, and
wherein the event information is mapped to the second channel number and the SNS account associated with the second channel number.

2. The method of claim 1, further comprising:

detecting a selection of the displayed event information associated with the SNS account;
tuning the multi-functional display device to the second channel; and displaying the event information on the display.

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3. The method of claim 1, wherein the event is received from an SNS server or a associated with the SNS account.

4. The method of claim 1, wherein the event includes at least one of a schedule, a function, a holiday, or multimedia content.

5. The method of claim 1, wherein the event information includes account information for the SNS account associated with the event, and at least one of an SNS server address, an event type information, a title of the event, a date of the event, or a description about the event.

6. The method of claim 1, wherein the first channel number and the second channel number are the same channel number.

7. The method of claim 1, wherein a plurality of SNS accounts are assigned to the second channel number.

8. The method of claim 1, wherein the portion of the information related to the at least one event is a title of the event.

9. The method of claim 1, wherein the mapped event information and the corresponding channel number are displayed in a calendar.

10. The method of claim 1, wherein the mapped event information and the corresponding channel number are displayed in an electronic programming guide (EPG).

11. The method of claim 1, wherein the mapped event information and the corresponding channel number are displayed in a grid, and wherein the channel numbers are listed in a first column of the grid, dates are listed in a first row of the grid, and the event information is displayed in a region of the grid that corresponds to the channel number and date associated with the event.

12. The method of claim 11, further comprising:

detecting an input on the grid to select and drag the grid in a prescribed direction; and
displaying one or more columns corresponding to one or more additional dates based on the selection.

13. The method of claim 11, further comprising:

detecting a selection of a second region on the grid;
displaying a graphical user interface (GUI) to create an event based on the selection;
associating the new event to a channel number and date; and
transmitting information associated with the new event to an SNS server associated with the new event.

14. The method according to claim 11, further comprising:

detecting a selection of the displayed event information on the grid; and
displaying additional information related to the selected event in response to the detected selection.

15. A multi-functional display device comprising:

a display for displaying broadcast programs or data;
a network interface configured to receive event information associated with a social network service (SNS) account for an individual or entity;
a storage device configured to store at least one channel number and at least one SNS account information assigned to the at least one channel number; and
a controller configured to map the event information to one of the at least one channel numbers and to construct an electronic programming guide (EPG) that includes the mapped event information and the corresponding channel number for display on the display.

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FIG. 1

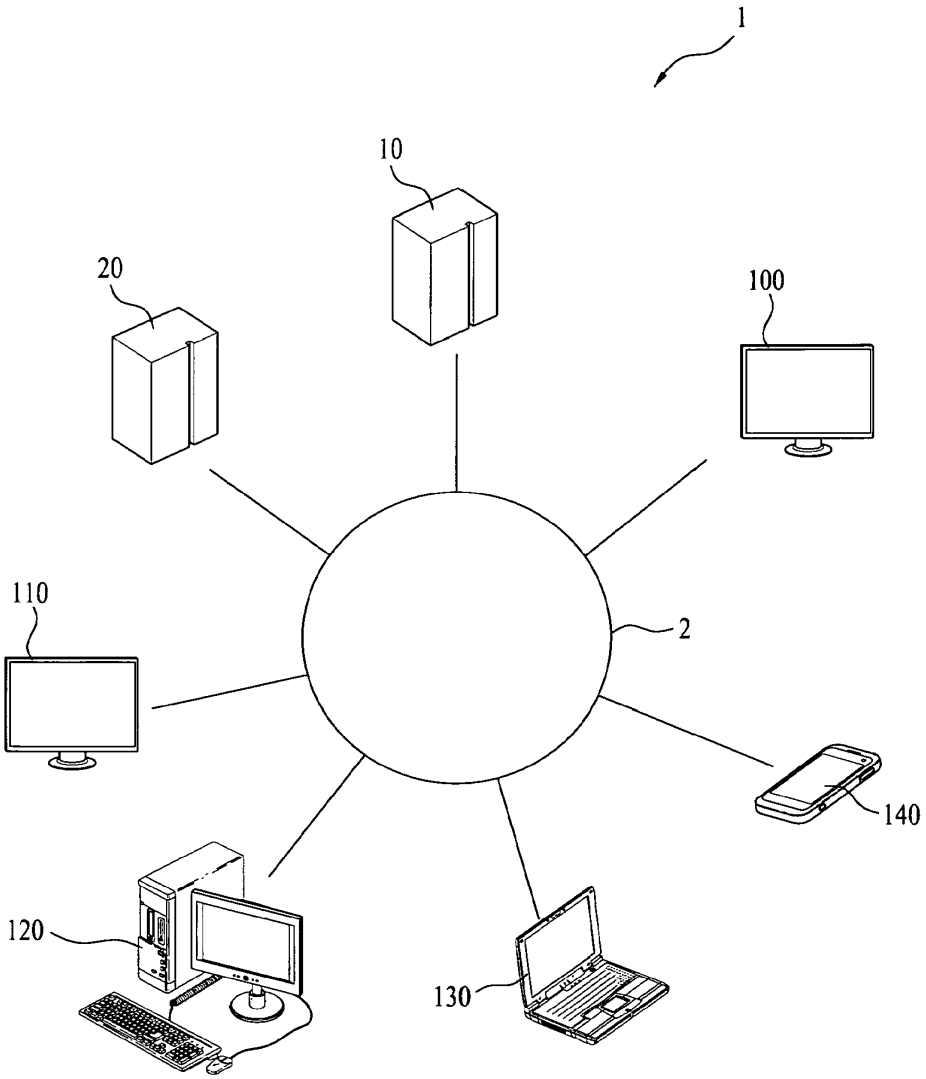

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FIG. 2

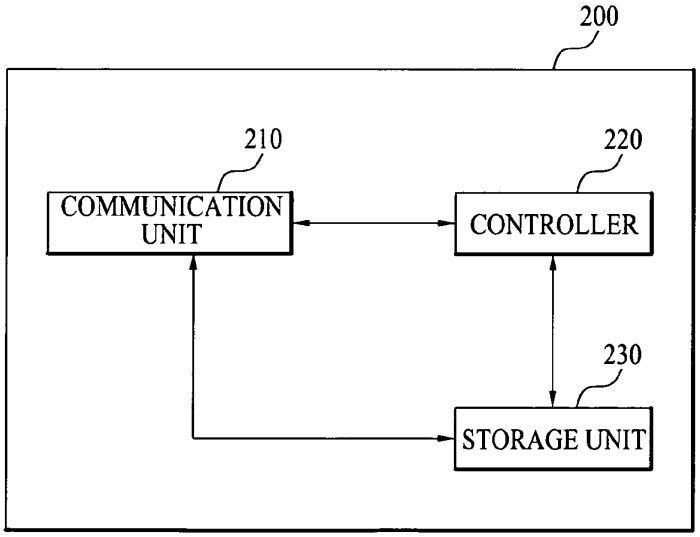
200
210
COMMUNICATION UNIT
220
CONTROLLER
230
STORAGE UNIT

FIG. 3

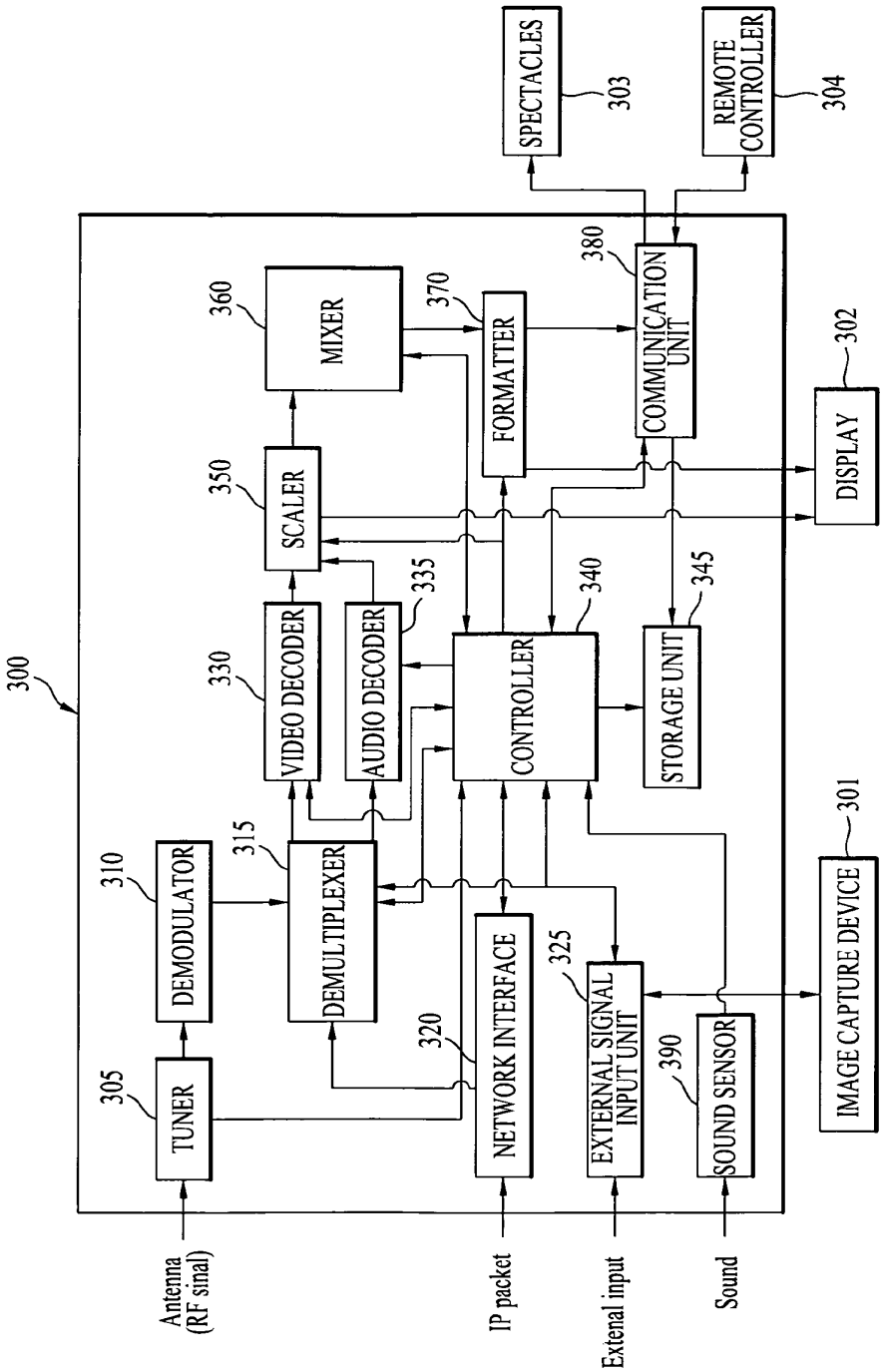

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FIG. 4

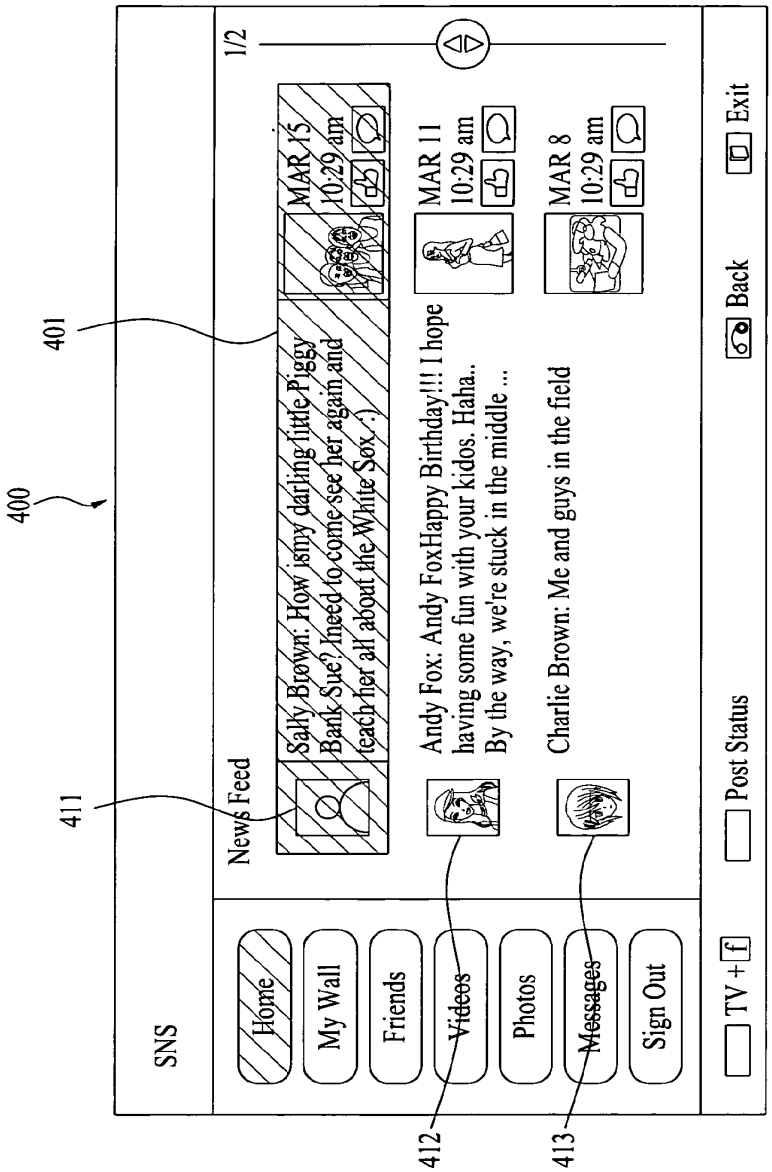

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FIG. 5

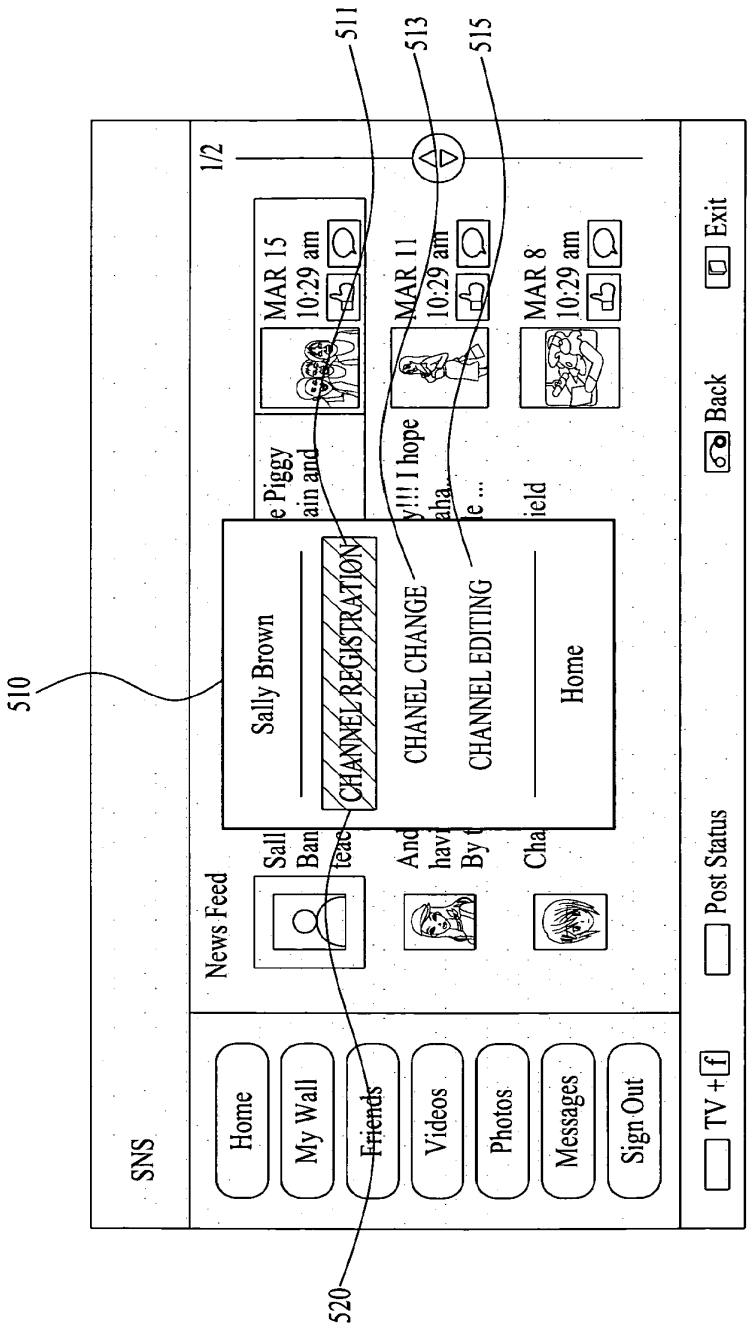
510
511
513
515
520
SNS
Home
My Wall
Friends
Videos
Photos
Messages
Sign Out
News Feed
1/2
Sally Brown
CHANNEL REGISTRATION
CHANEL CHANGE
CHANNEL EDITING
Home
MAR 15
10:29 am
MAR 11
10:29 am
MAR 8
10:29 am
TV + f
Post Status
Back
Exit

FIG. 6

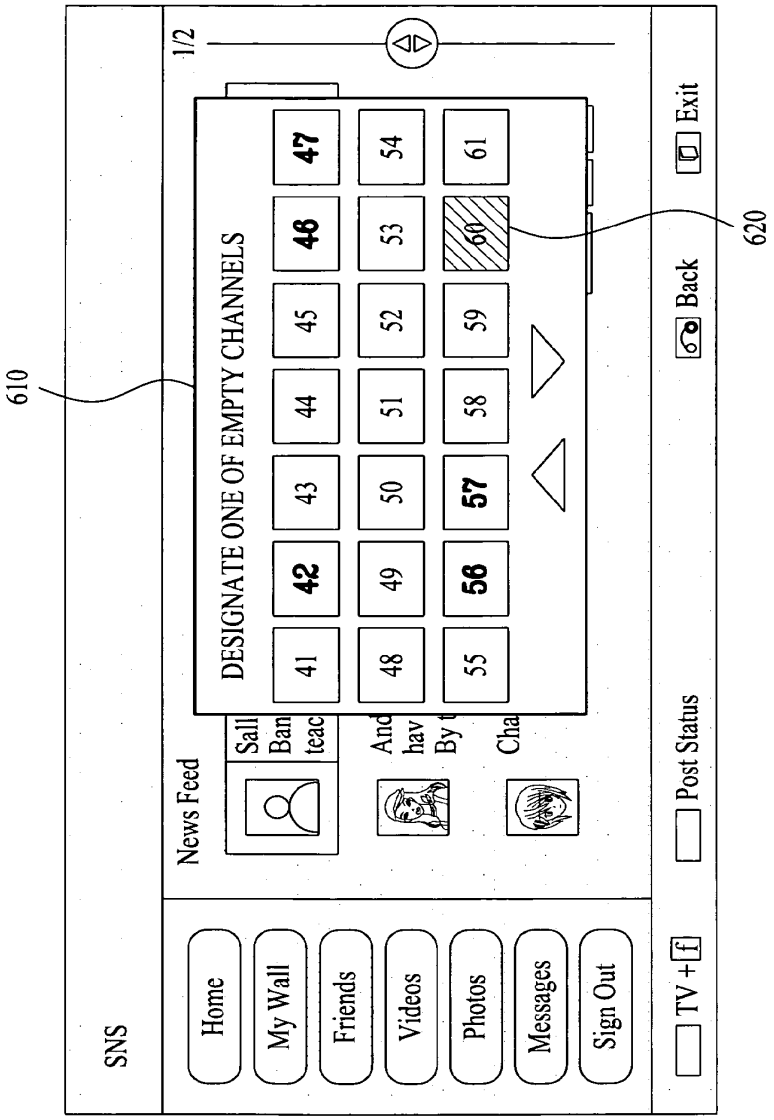
610
620
SNS
Home
My Wall
Friends
Videos
Photos
Messages
Sign Out
News Feed
1/2
DESIGNATE ONE OF EMPTY CHANNELS
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
TV + f
Post Status
Back
Exit

FIG. 7

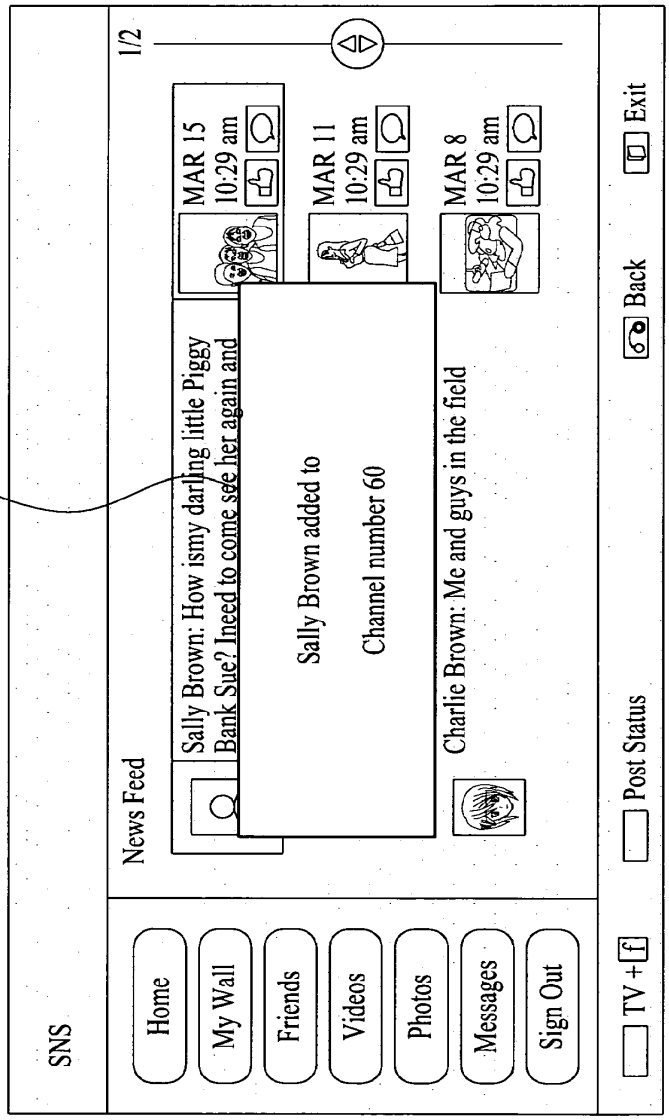

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FIG. 8

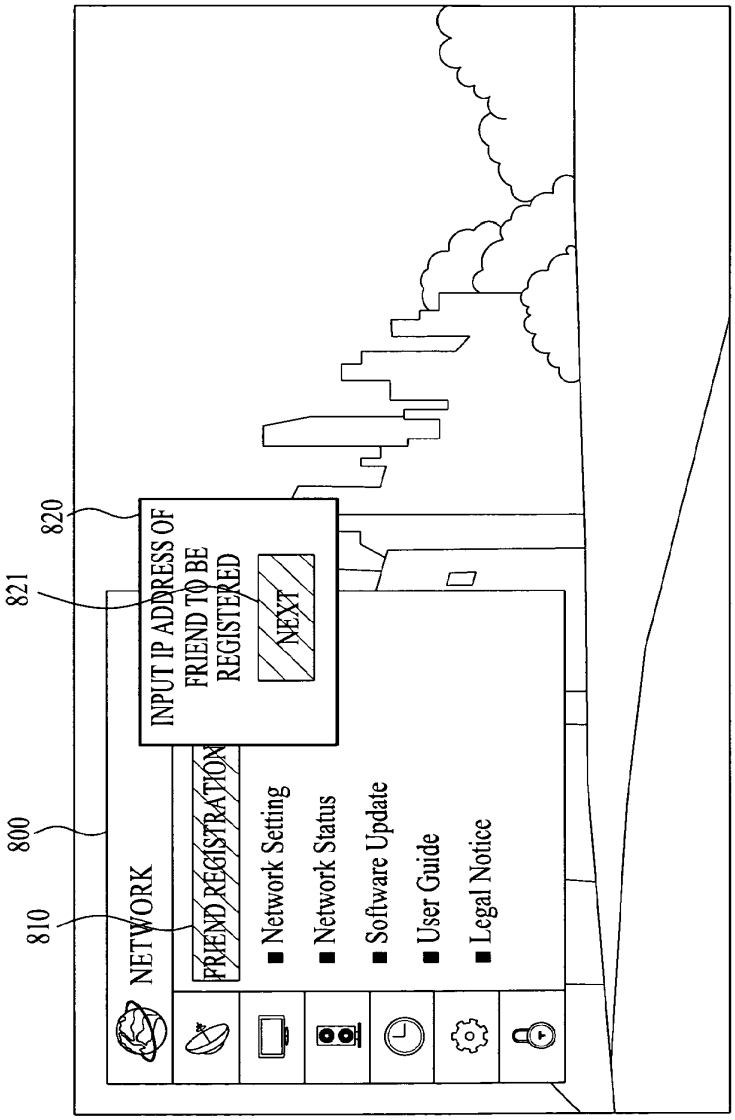
820
821
800
810
INPUT IP ADDRESS OF FRIEND TO BE REGISTERED
NEXT
NETWORK
FRIEND REGISTRATION
■ Network Setting
■ Network Status
■ Software Update
■ User Guide
■ Legal Notice

FIG. 9

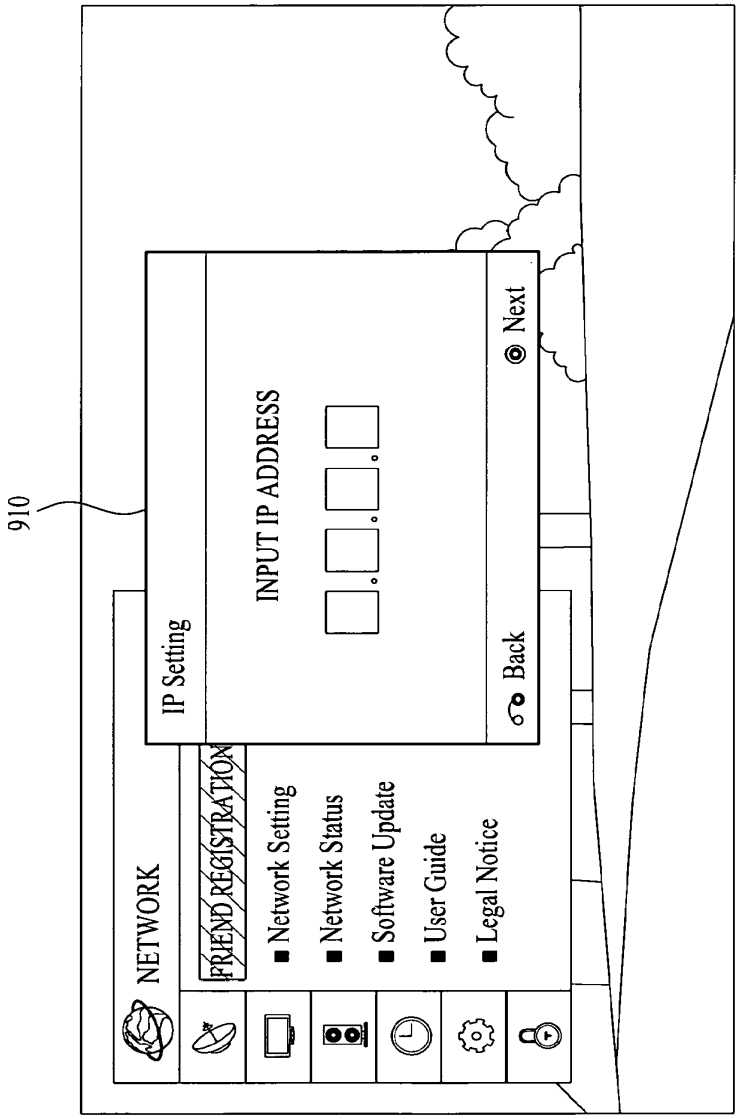
910
NETWORK
IP Setting
FRIEND REGISTRATION
■ Network Setting
■ Network Status
■ Software Update
■ User Guide
■ Legal Notice
INPUT IP ADDRESS
Next
Back

FIG. 10

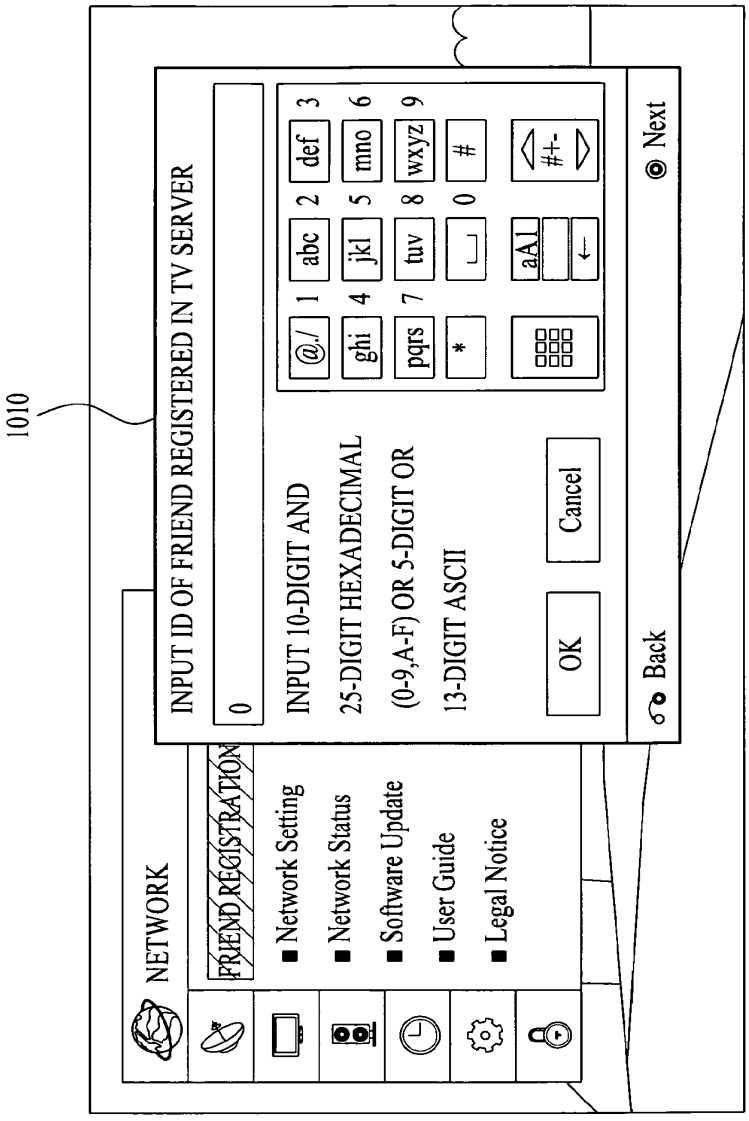
1010
NETWORK
FRIEND REGISTRATION
■ Network Setting
■ Network Status
■ Software Update
■ User Guide
■ Legal Notice
INPUT ID OF FRIEND REGISTERED IN TV SERVER
0
INPUT 10-DIGIT AND
25-DIGIT HEXADECIMAL
(0-9,A-F) OR 5-DIGIT OR
13-DIGIT ASCII
OK
Cancel
@./ 1
abc 2
def 3
ghi 4
jkl 5
mno 6
pqrs 7
tuv 8
wxyz 9
* 0 #
aA1
#+-
Back
Next

FIG. 11

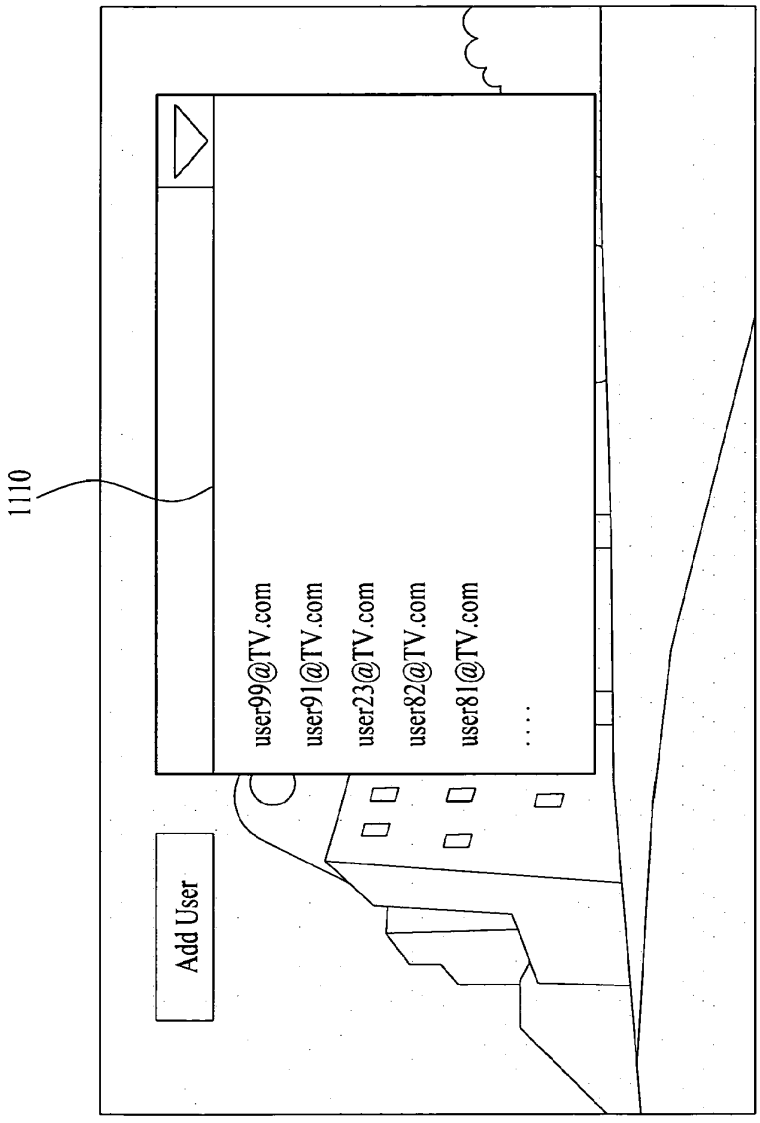
1110
user99@TV.com
user91@TV.com
user23@TV.com
user82@TV.com
user81@TV.com
....
Add User

FIG. 12

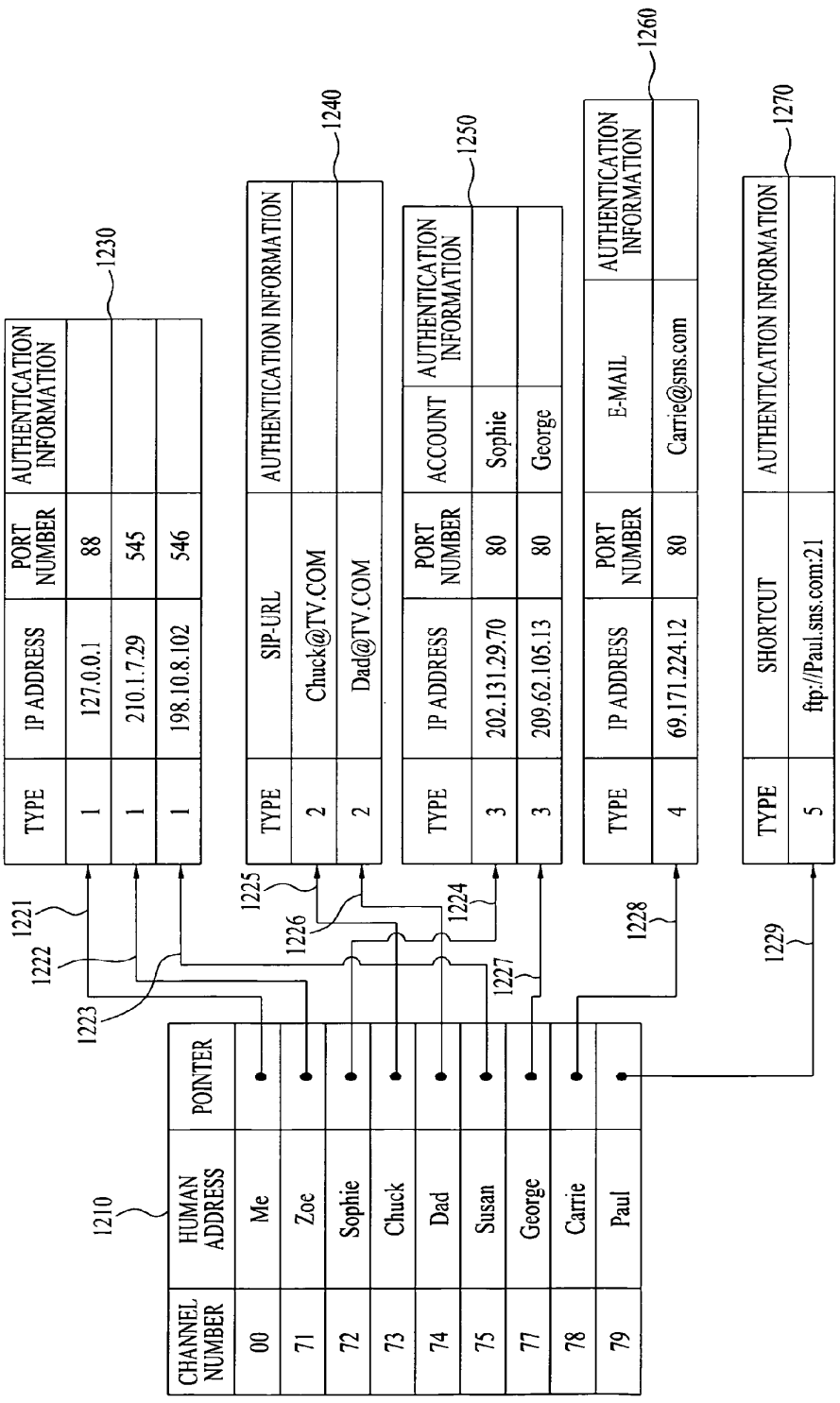

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FIG. 13

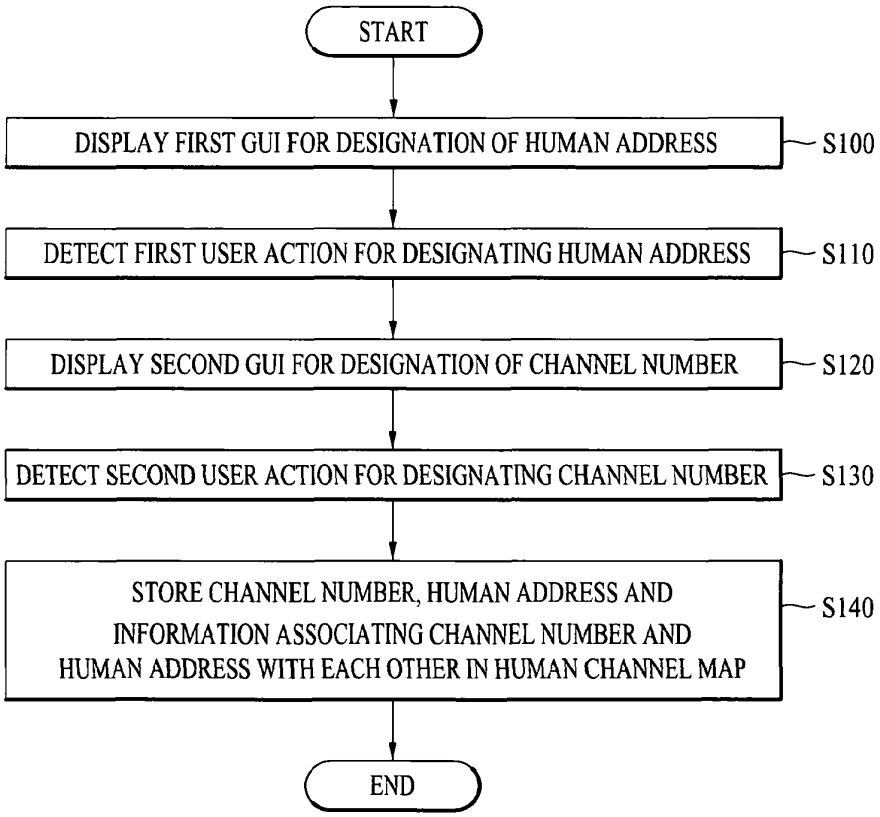

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FIG. 14

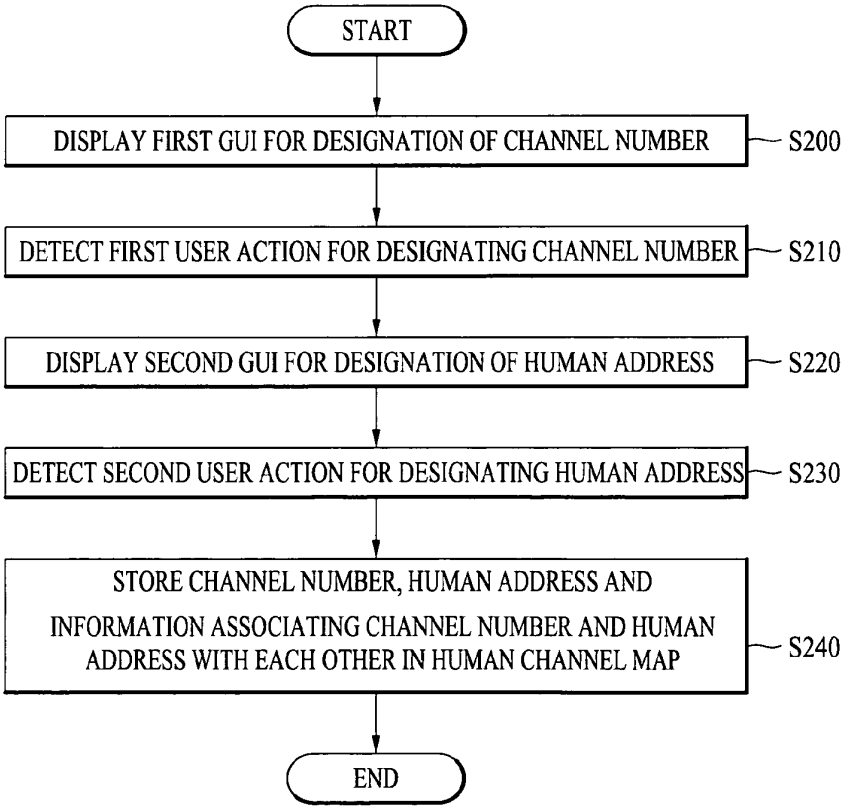

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FIG. 15

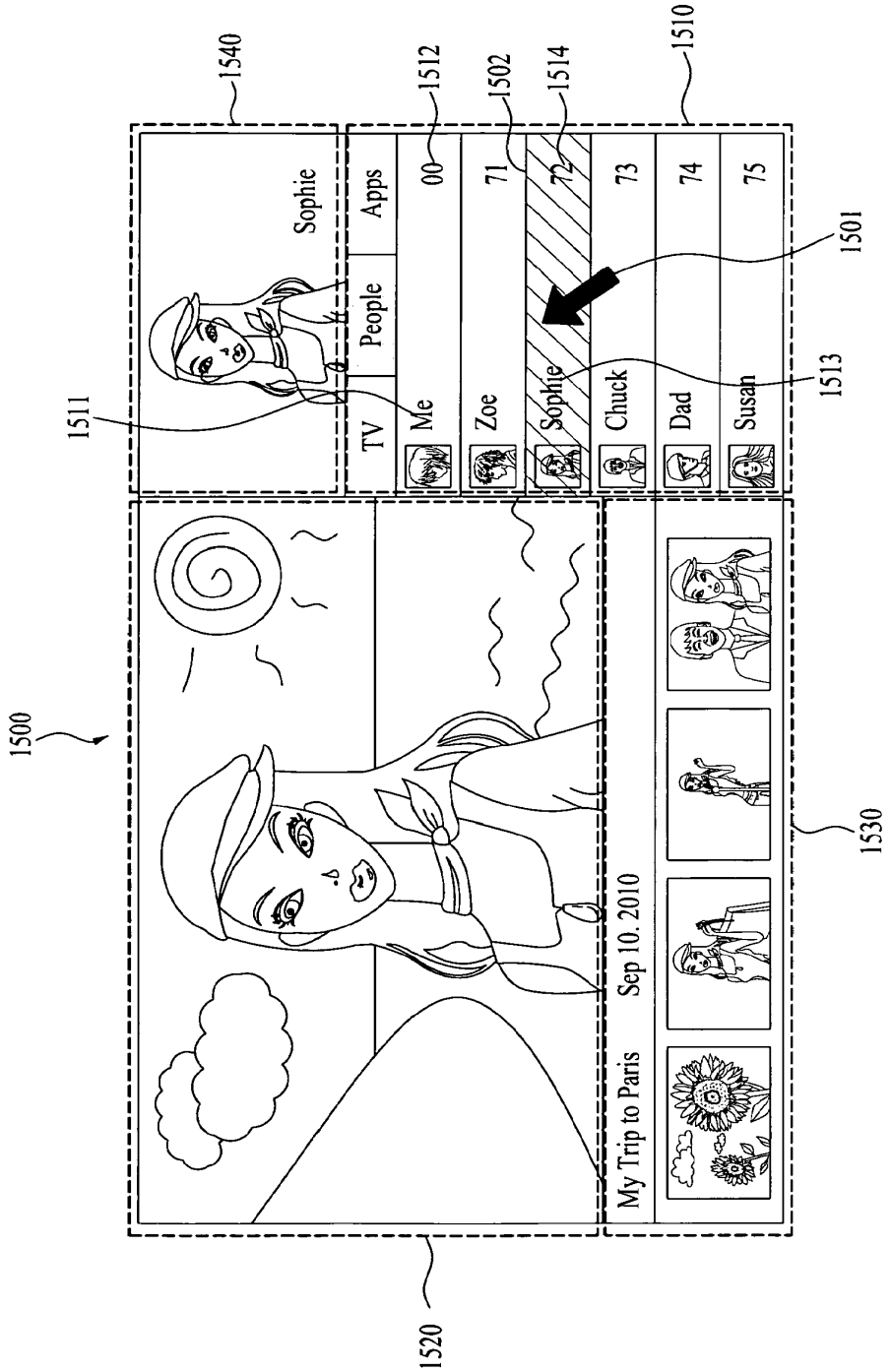
1500
1501
1510
1511
1512
1513
1514
1520
1530
1540
1502
Sophie
TV
People
Apps
Me
Zoe
Sophie
Chuck
Dad
Susan
00
71
72
73
74
75
My Trip to Paris
Sep 10. 2010

FIG. 16

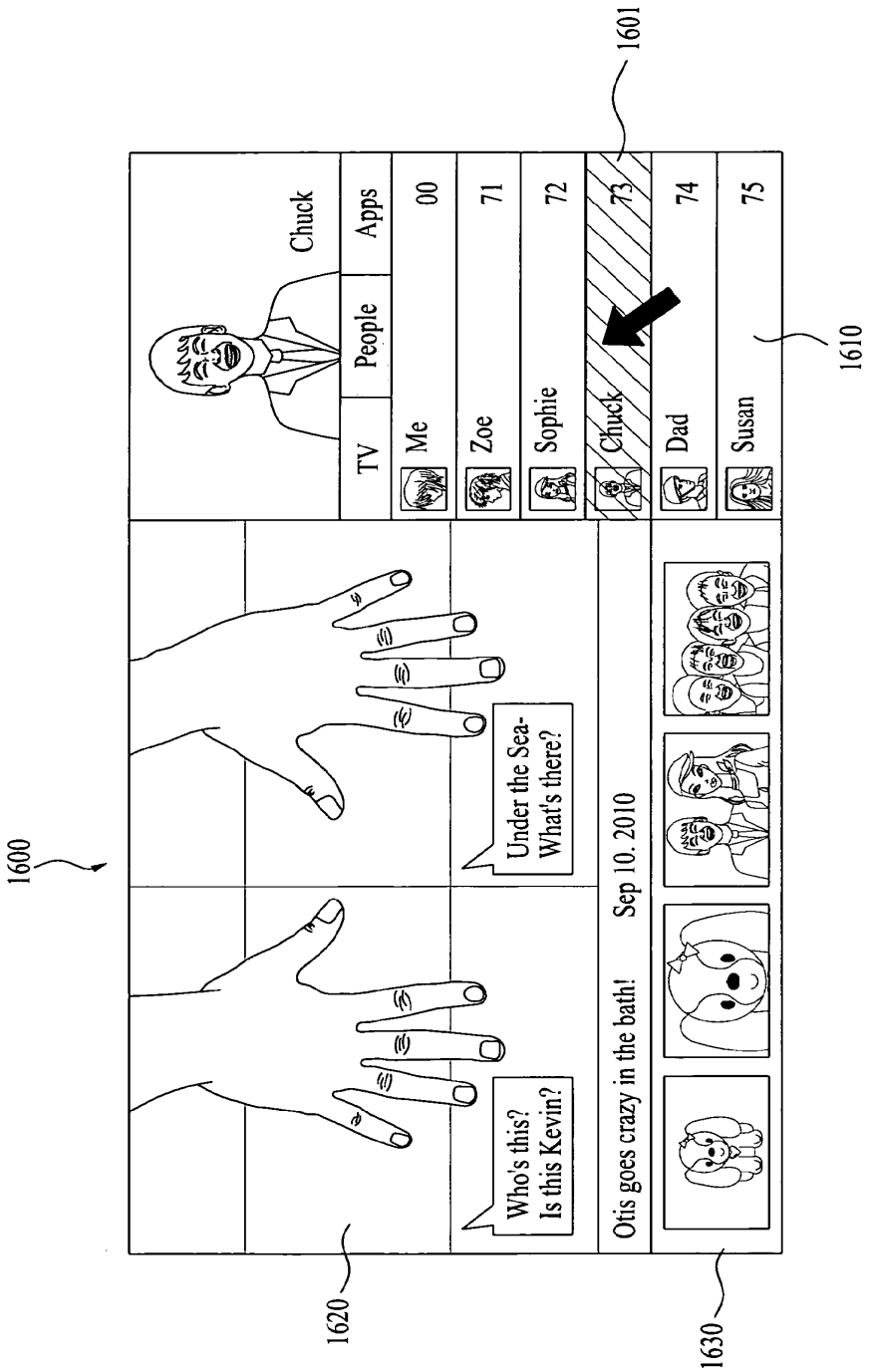
1600
1601
1610
1620
1630
Chuck
TV
People
Apps
Me
00
Zoe
71
Sophie
72
Chuck
73
Dad
74
Susan
75
Who's this?
Is this Kevin?
Under the Sea-
What's there?
Otis goes crazy in the bath!
Sep 10. 2010

FIG. 17

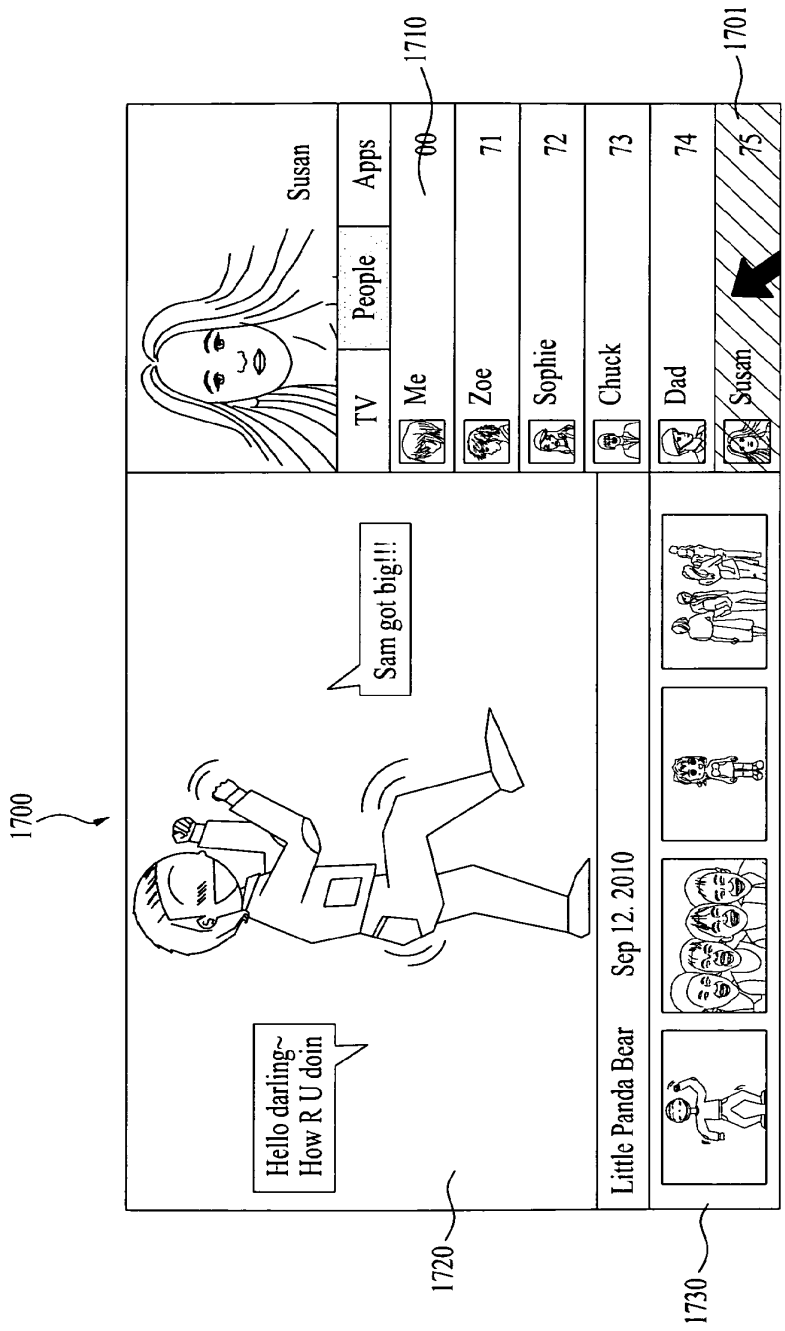

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FIG. 18

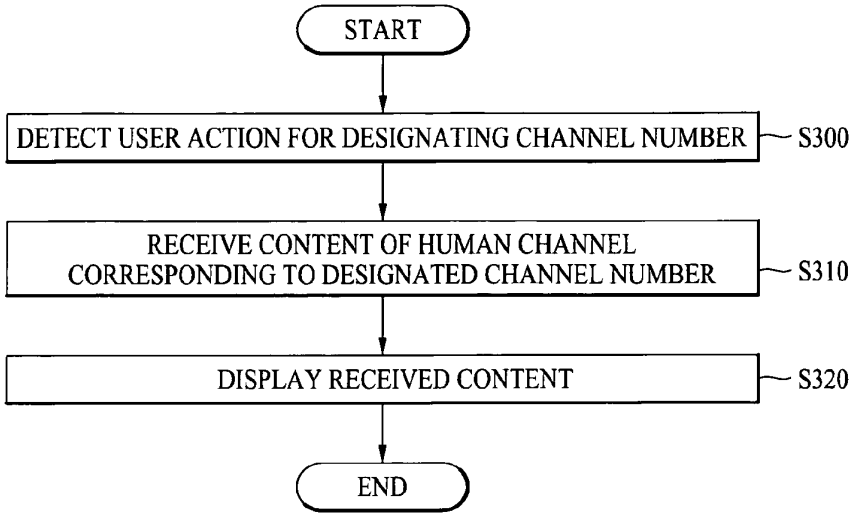

FIG. 19

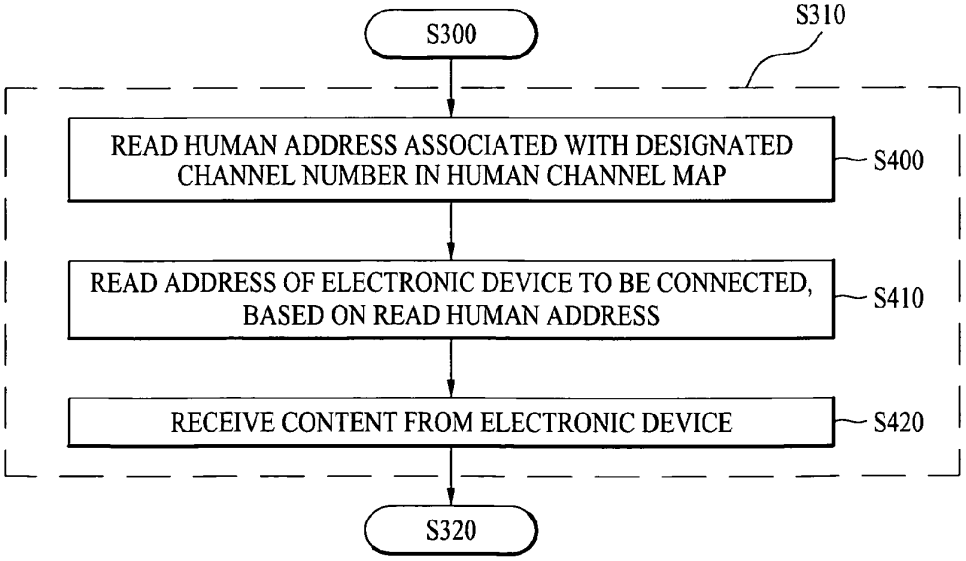

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FIG. 20

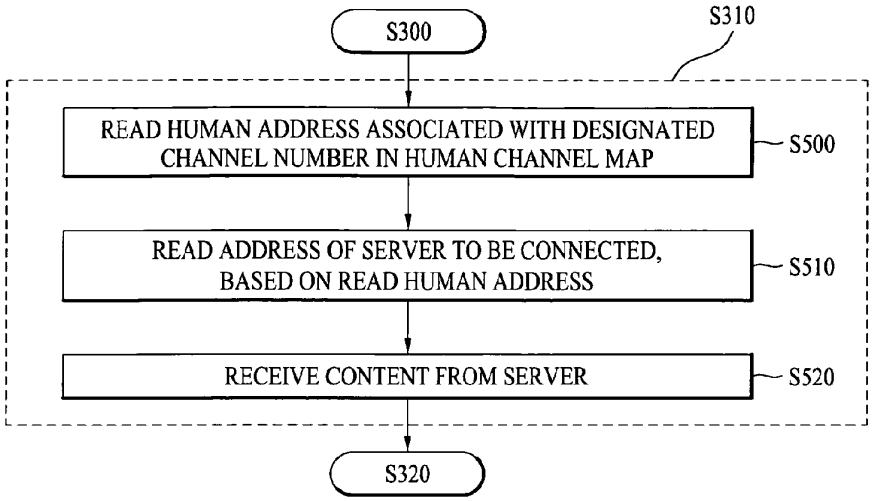

FIG. 21

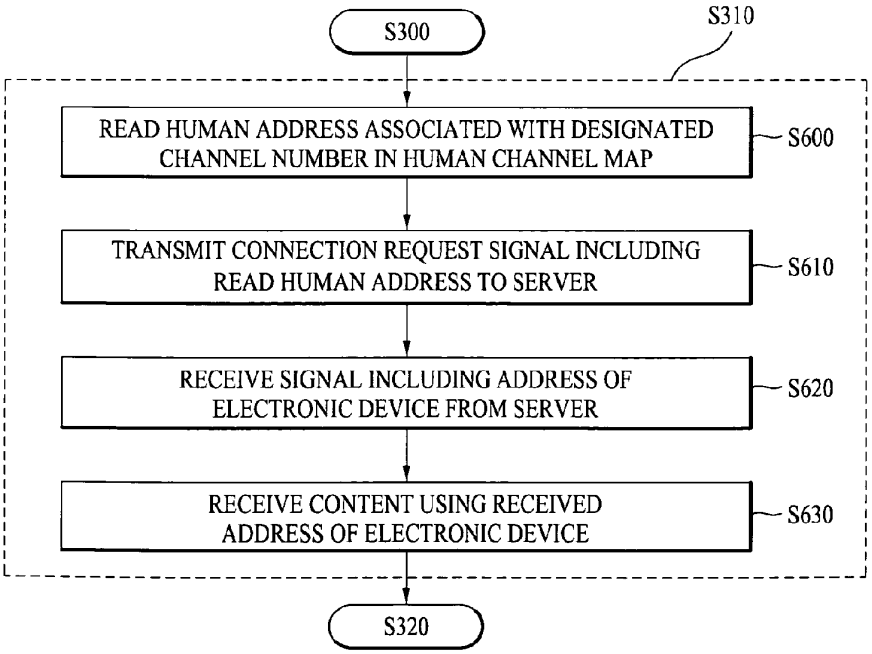

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FIG. 22

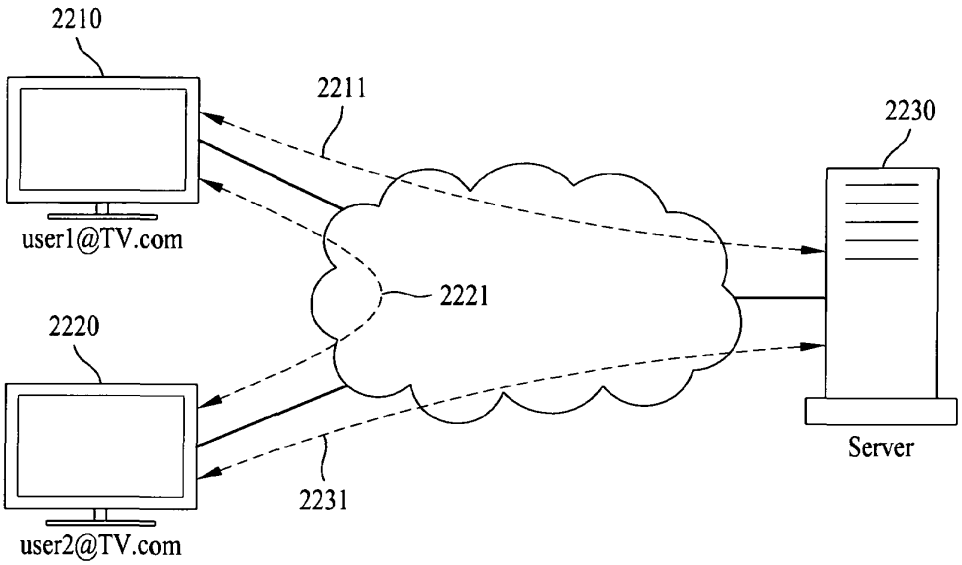
2210
2211
2230
user1@TV.com
2221
2220
Server
2231
user2@TV.com

FIG. 23

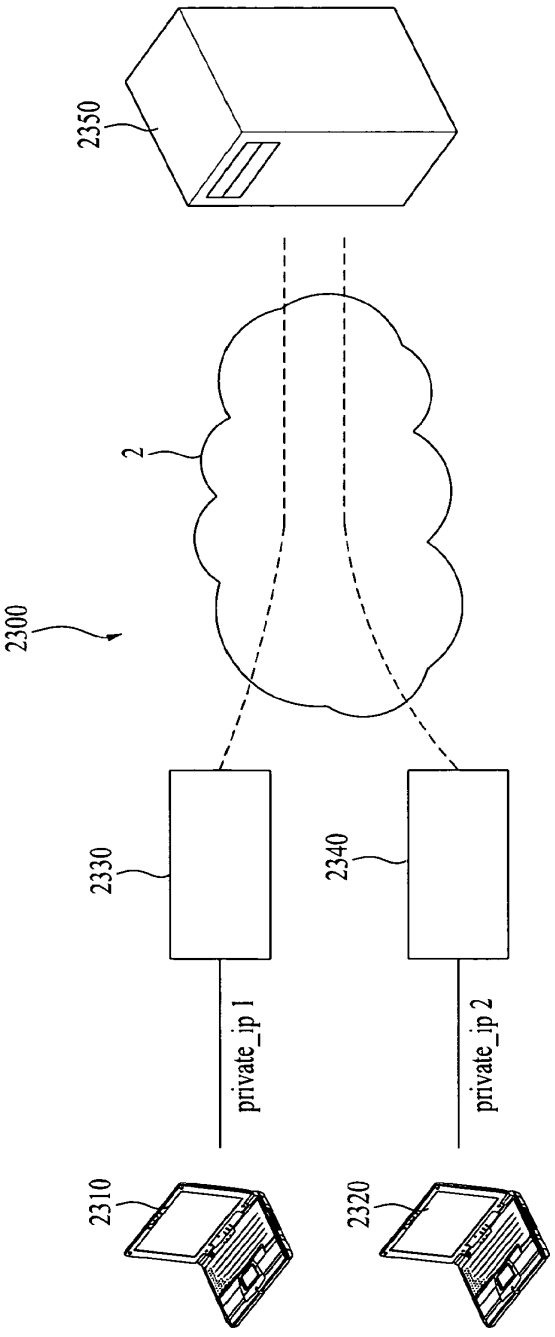

FIG. 24

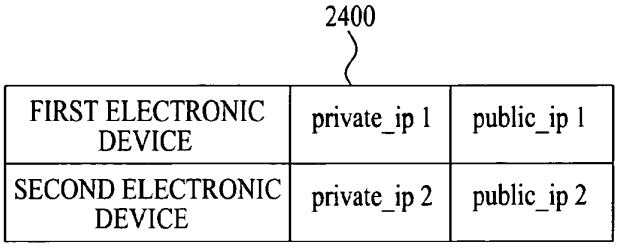

FIG. 25

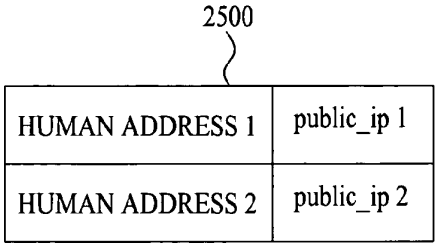

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FIG. 26

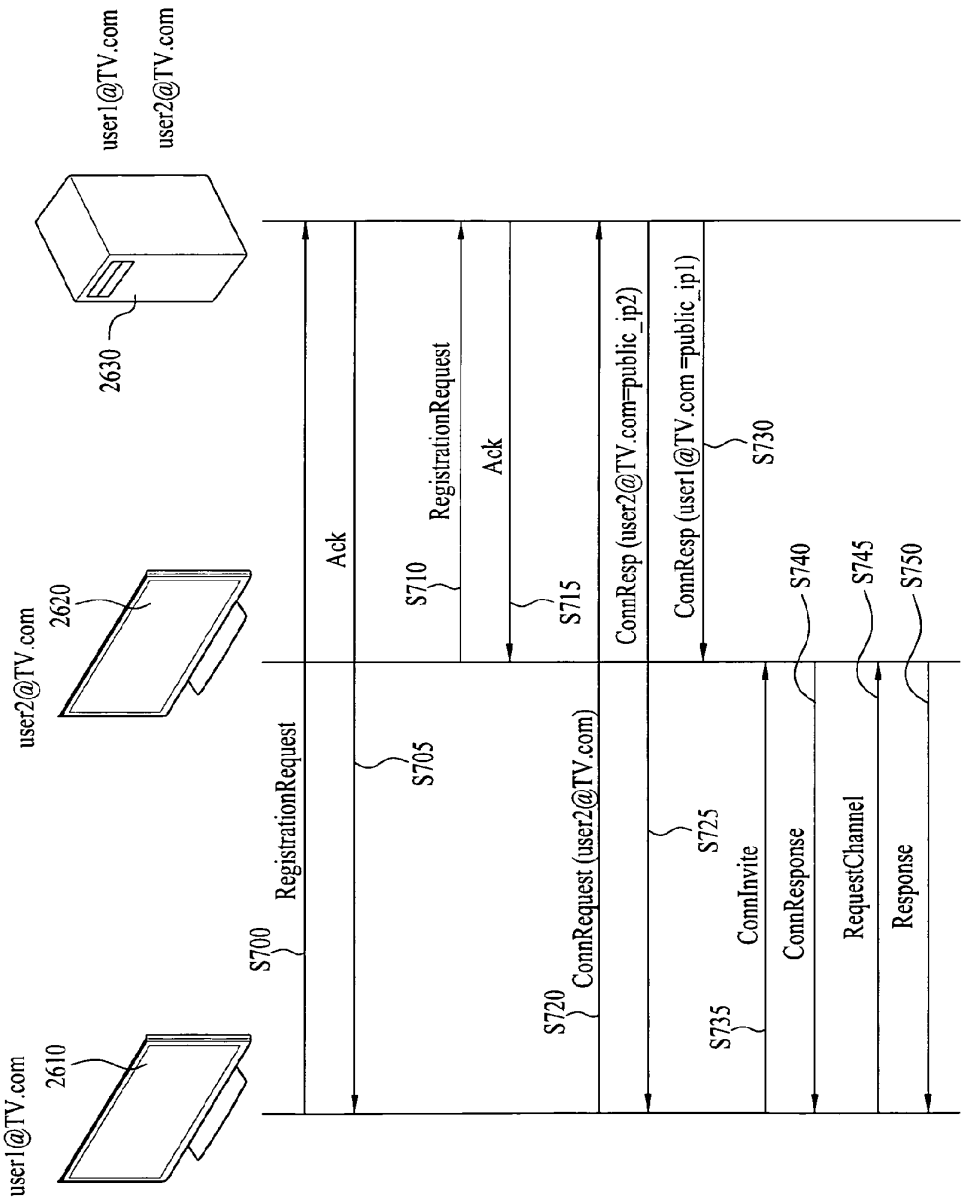
user1@TV.com
2610
user2@TV.com
2620
user1@TV.com
user2@TV.com
2630
S700
RegistrationRequest
S705
RegistrationRequest
Ack
S710
Ack
S715
S720
ConnRequest (user2@TV.com)
ConnResp (user2@TV.com=public_ip2)
S725
ConnResp (user1@TV.com =public_ip1)
S730
S735
ConnInvite
S740
ConnResponse
S745
RequestChannel
S750
Response

FIG. 27

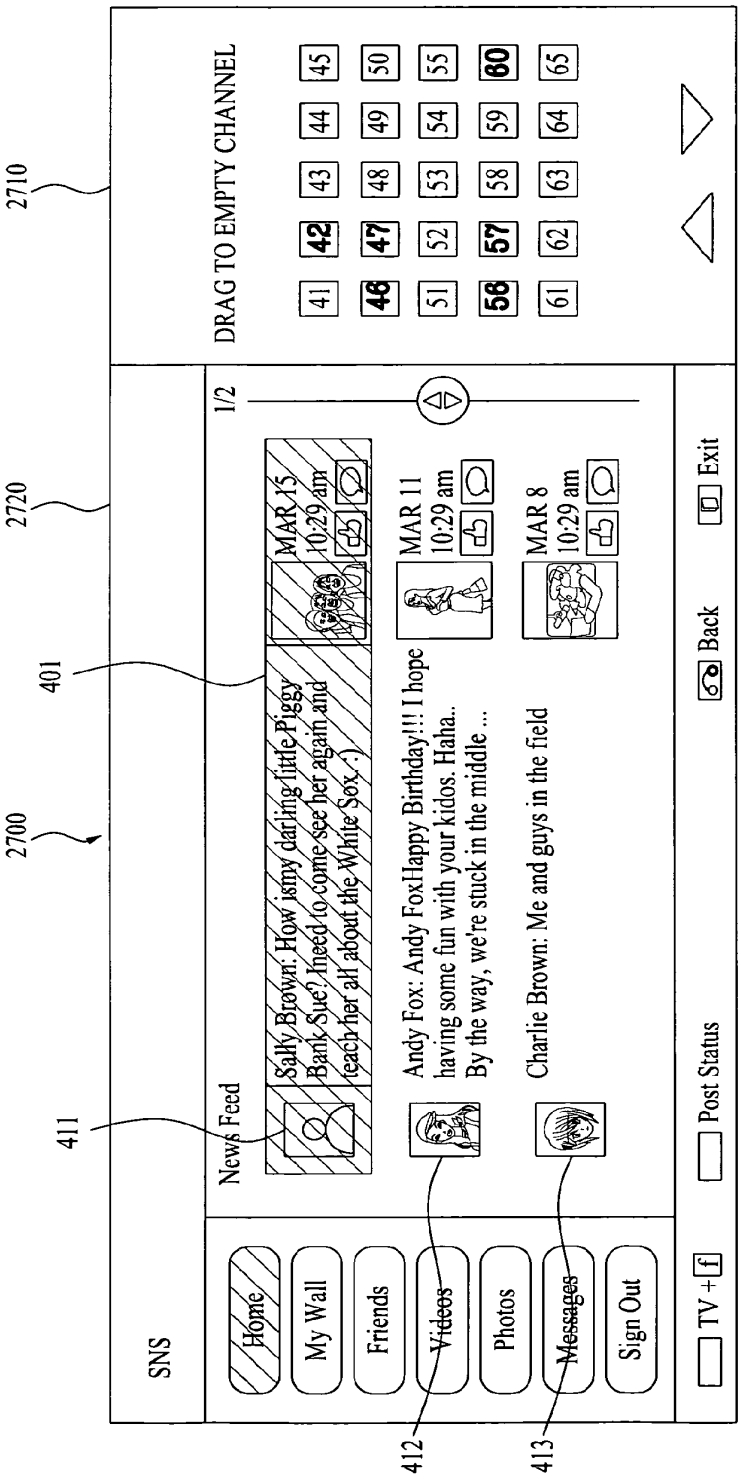

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FIG. 28

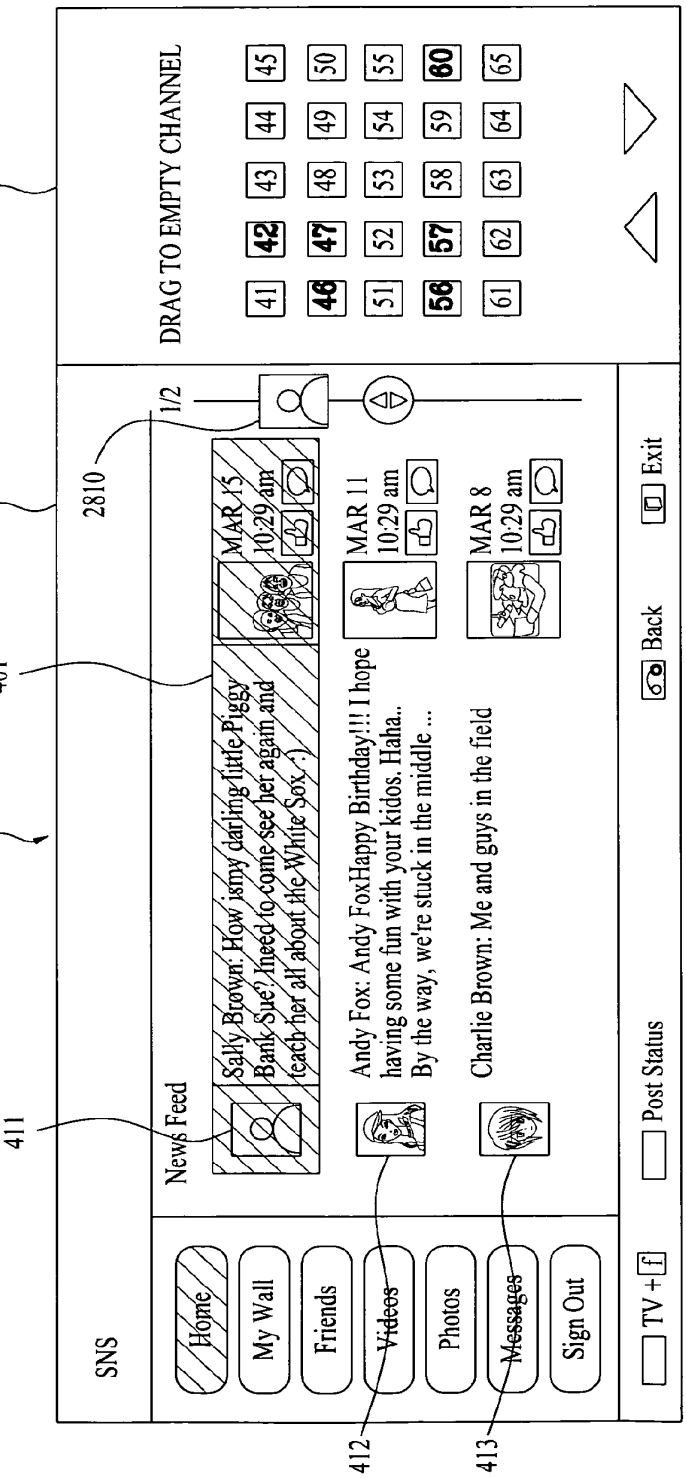

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FIG. 29

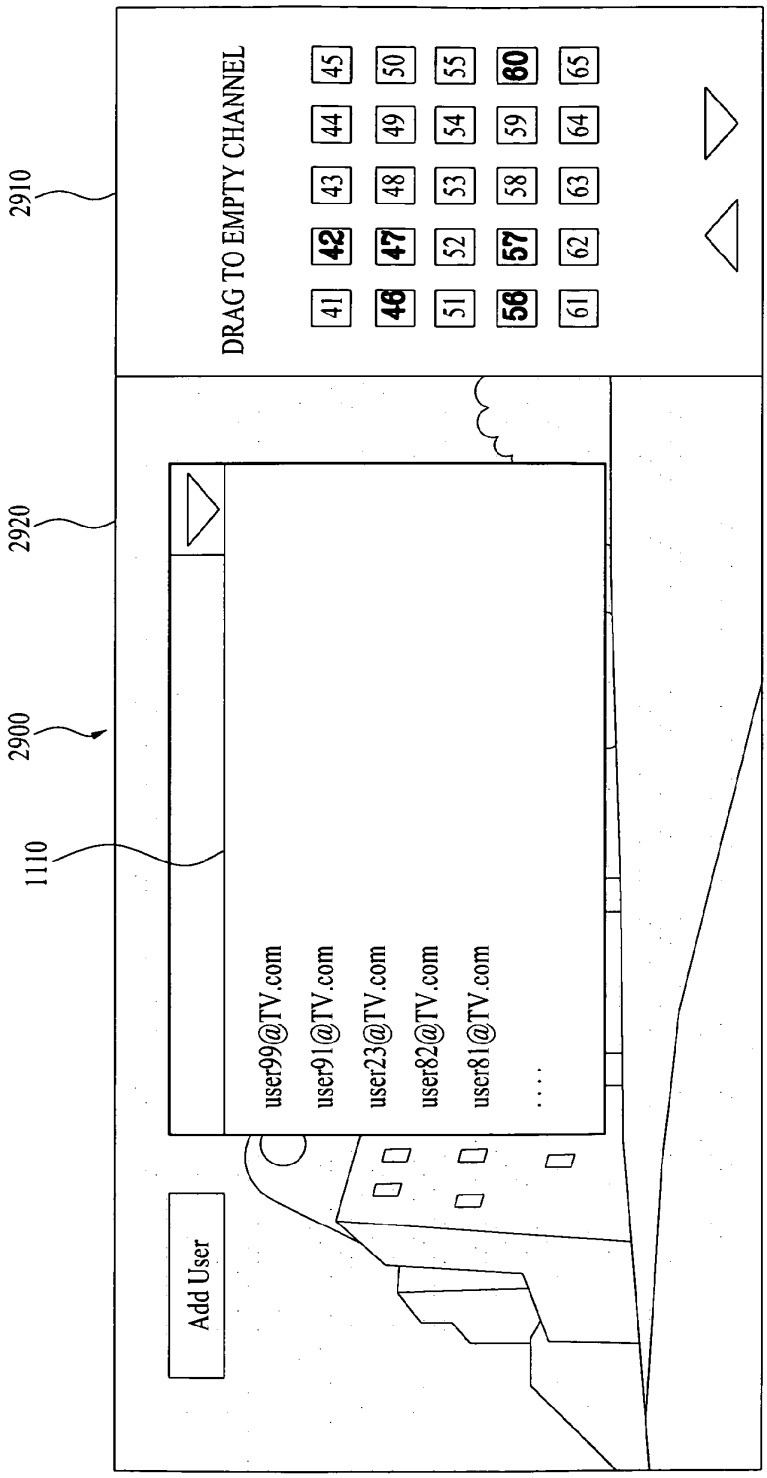

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FIG. 30

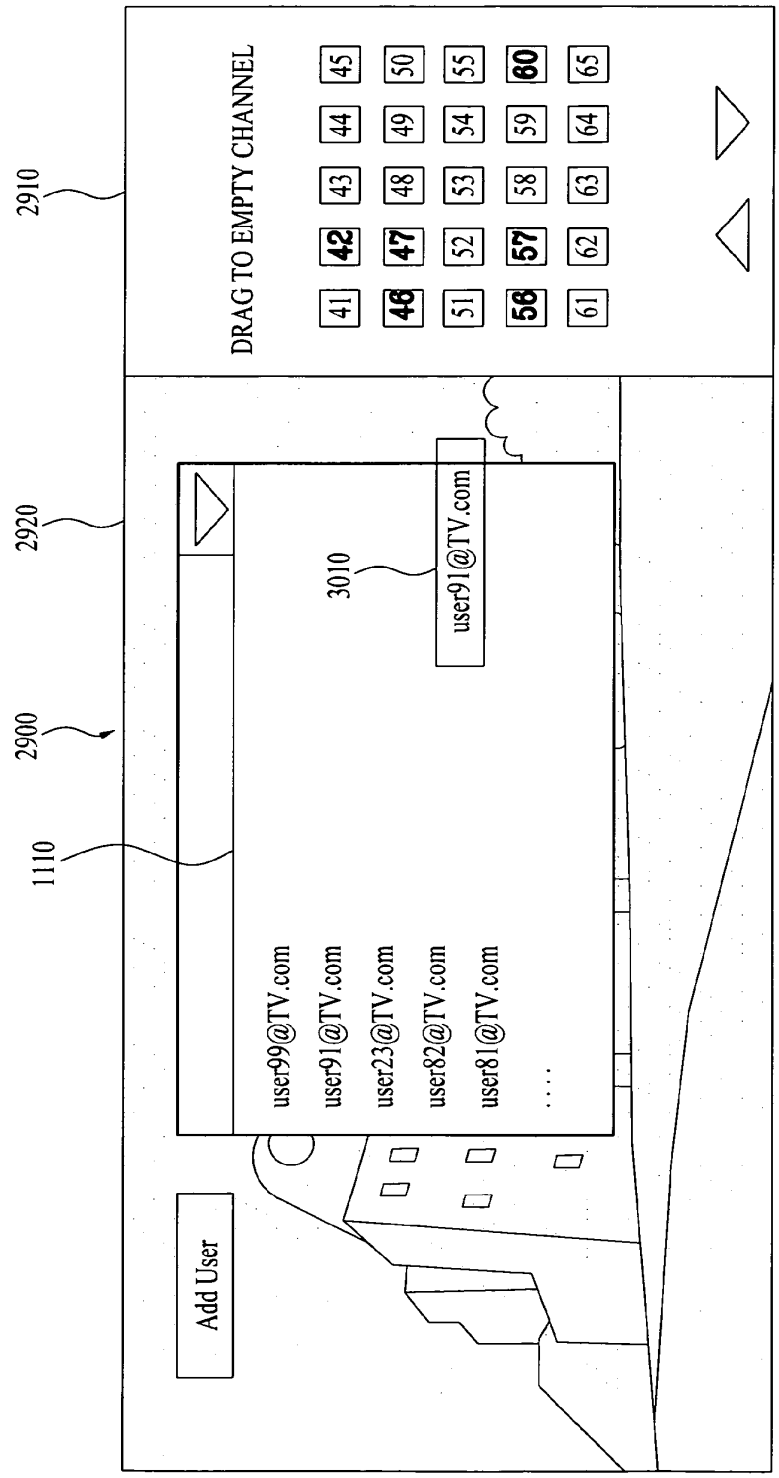

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FIG. 31

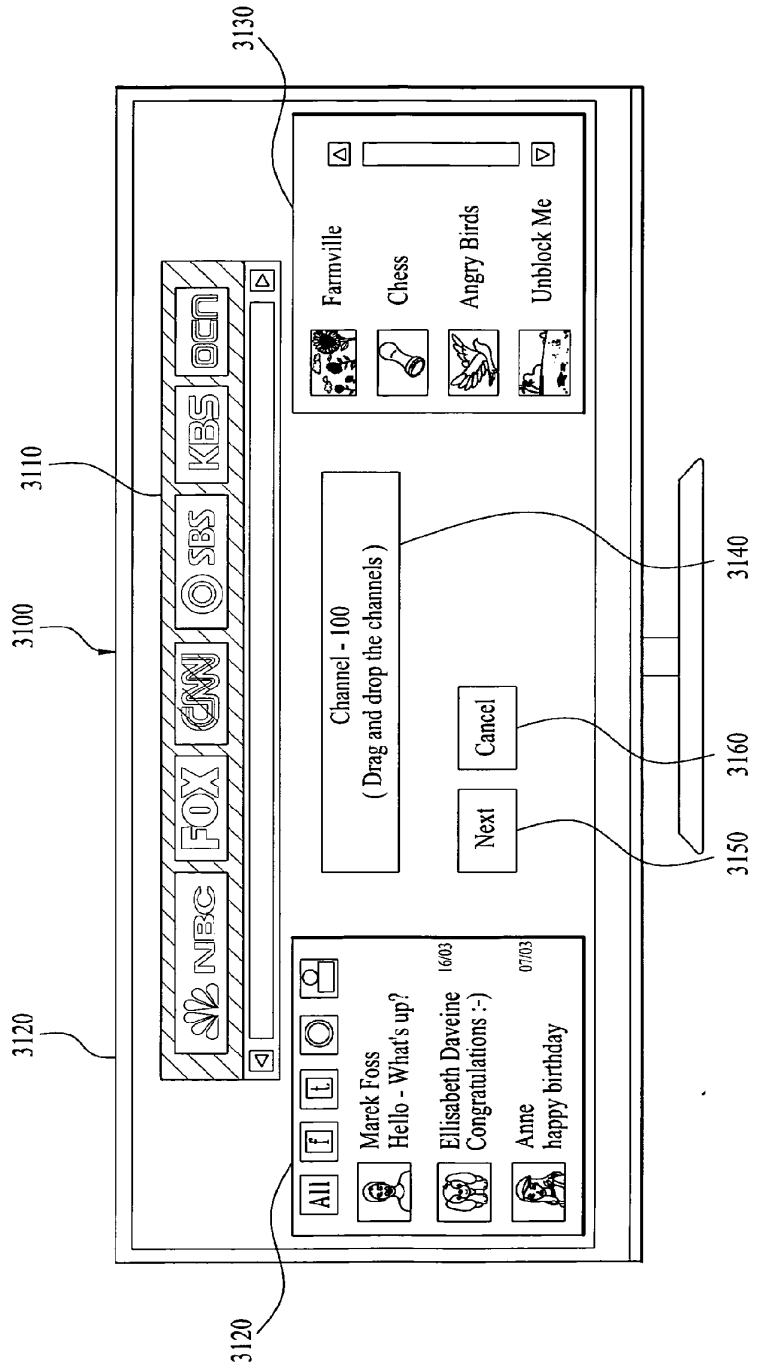

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FIG. 32

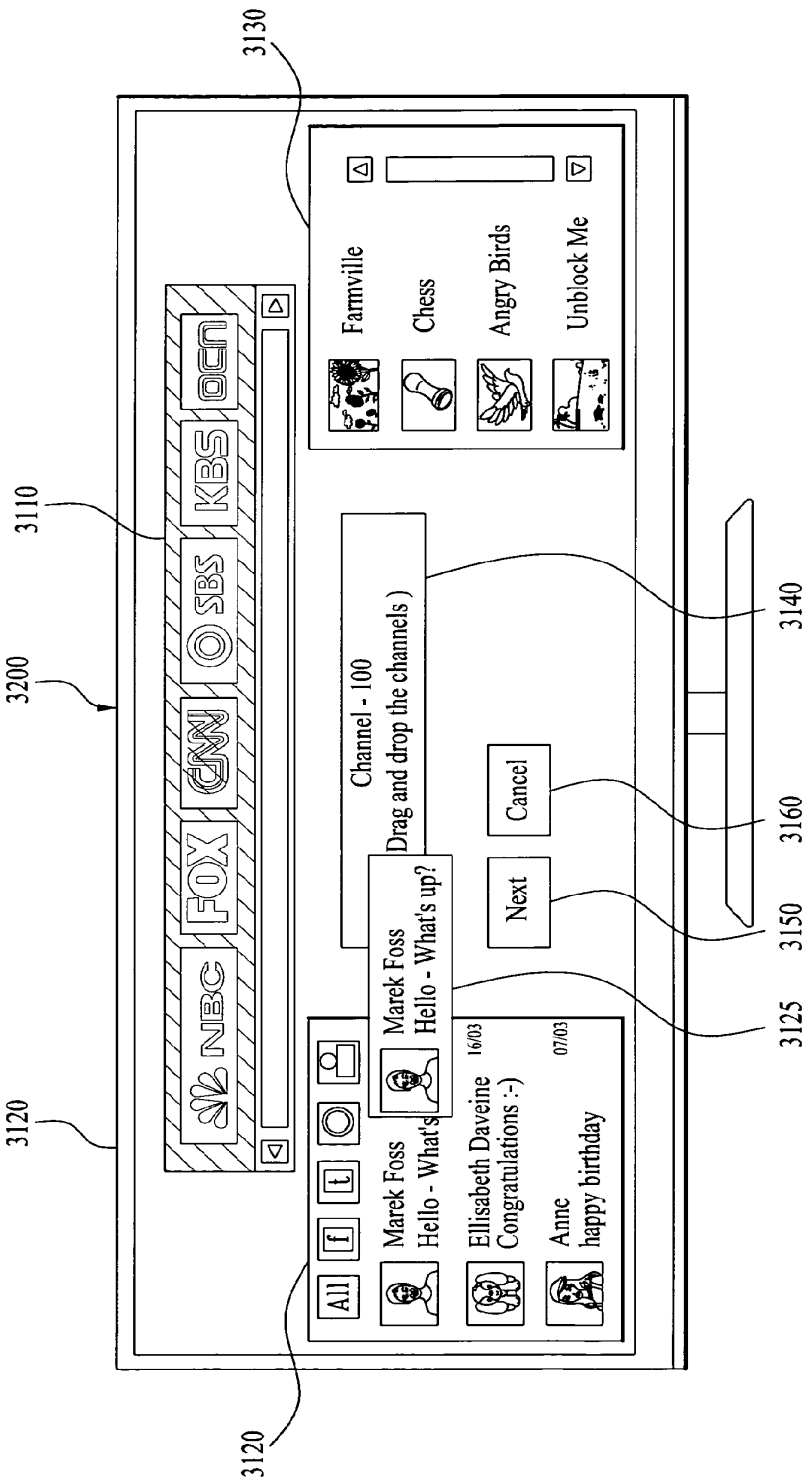
3130
3110
3200
3120
3120
3140
3160
3150
3125
NBC
FOX
CNN
SBS
KBS
OCN
Farmville
Chess
Angry Birds
Unblock Me
Channel - 100
Drag and drop the channels)
Marek Foss
Hello - What's up?
Next
Cancel
All
Marek Foss
Hello - What's
16/03
Ellisabeth Daveine
Congratulations :-)
07/03
Annc
happy birthday

FIG. 33

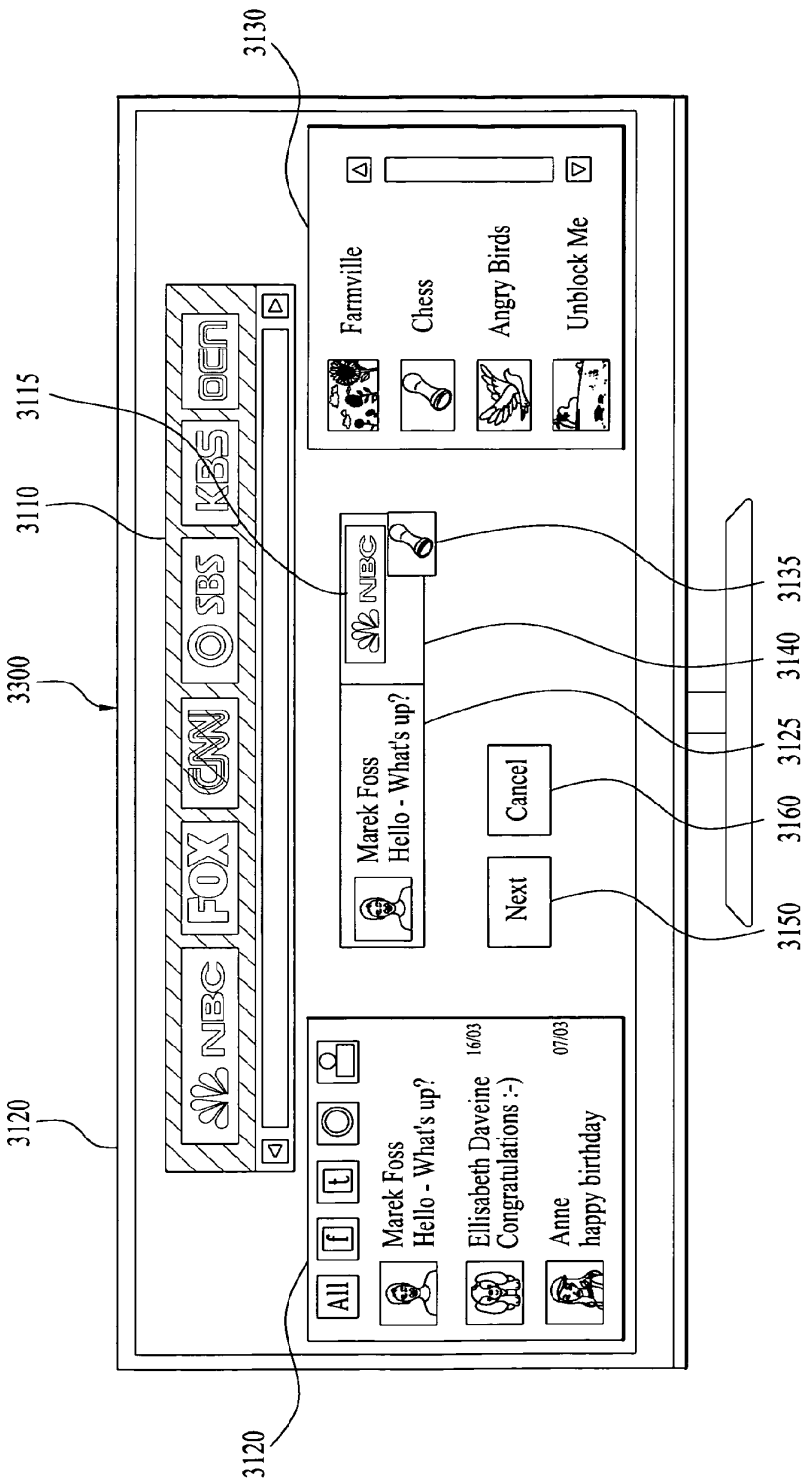
3130
3115
3110
3300
3120
3120
3135
3140
3125
3160
3150
NBC
FOX
CNN
SBS
KBS
OCN
Farmville
Chess
Angry Birds
Unblock Me
Marek Foss
Hello - What's up?
Cancel
Next
All
Marek Foss
Hello - What's up?
Ellisabeth Daveine
Congratulations :-)
16/03
Anne
happy birthday
07/03

FIG. 34A

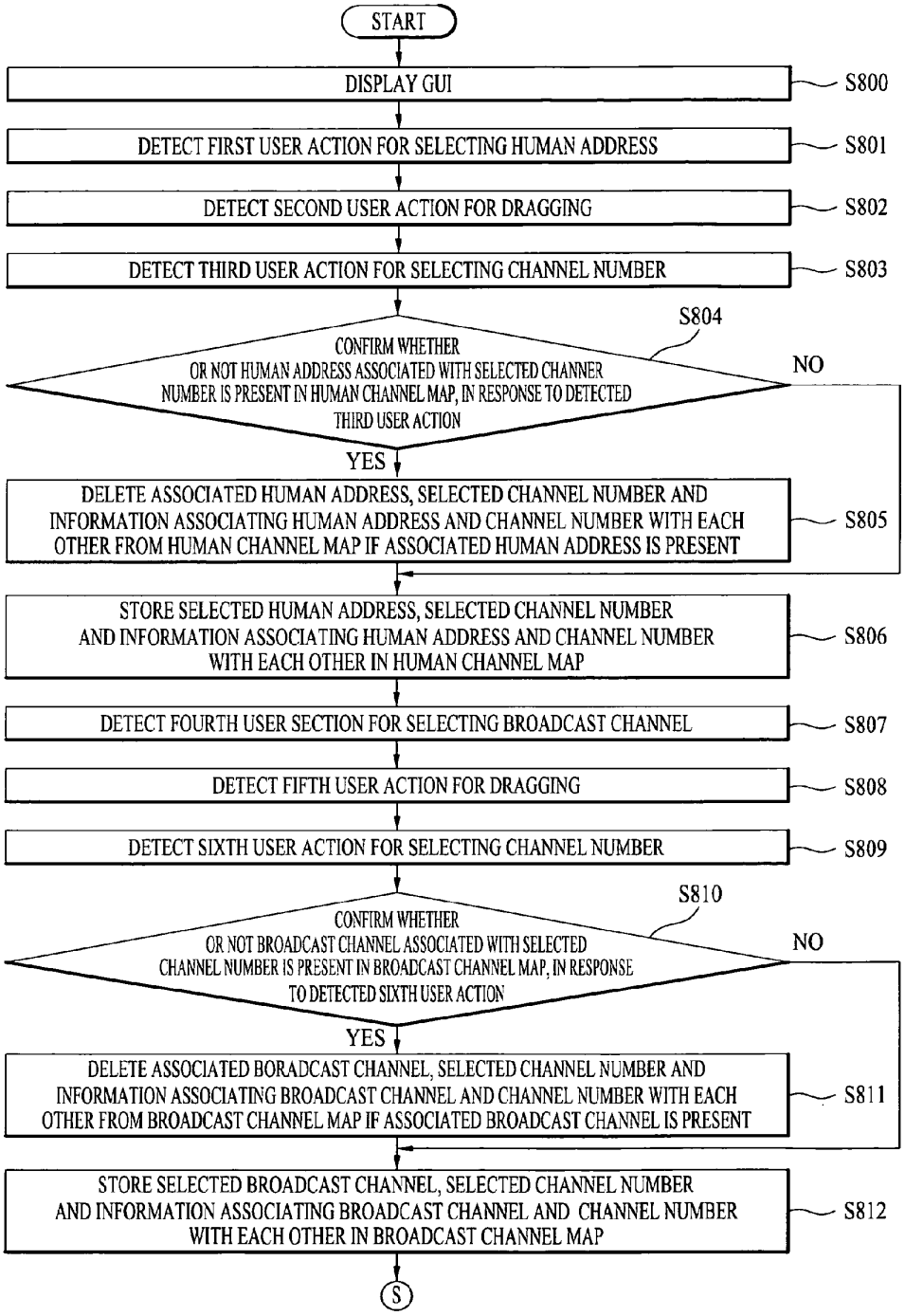

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FIG. 34B

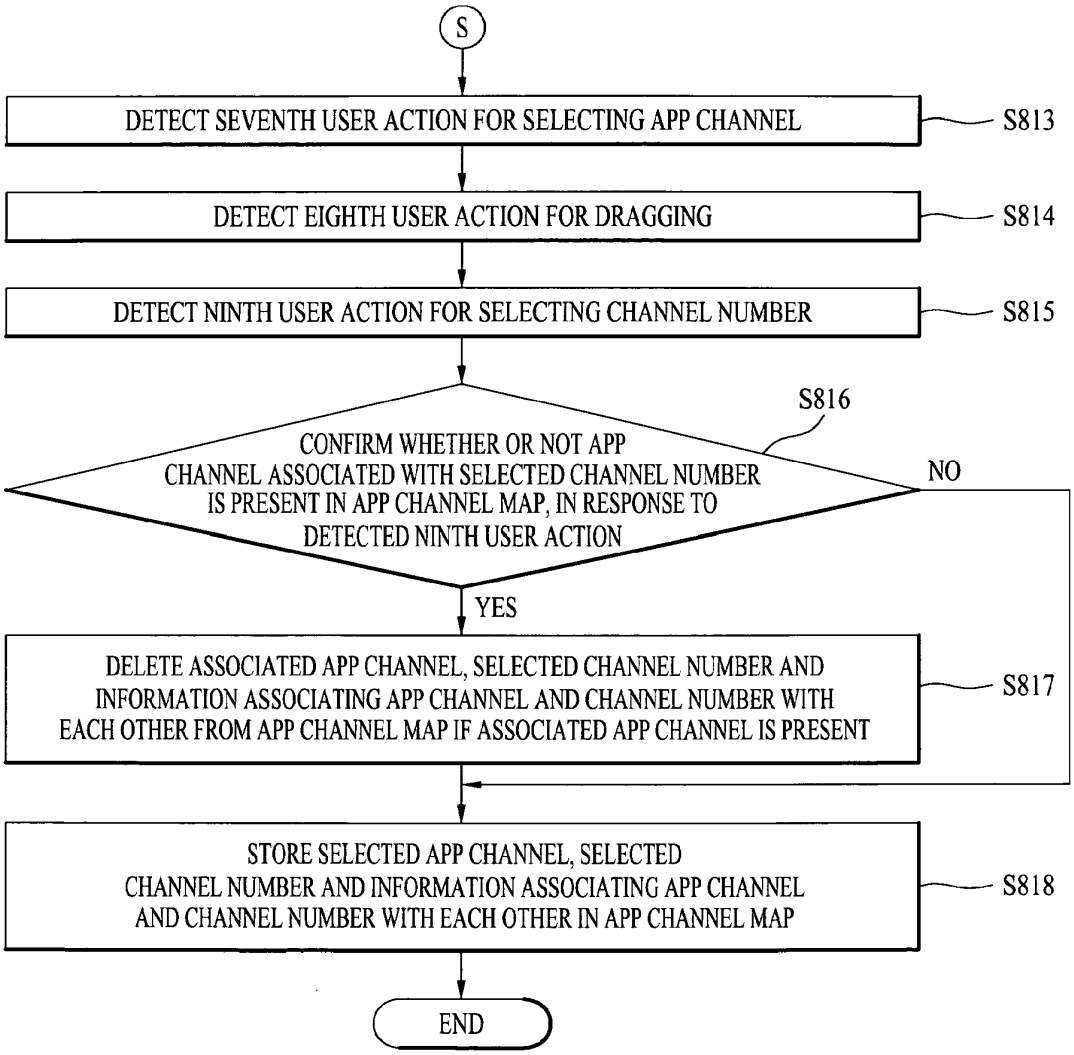

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FIG. 35

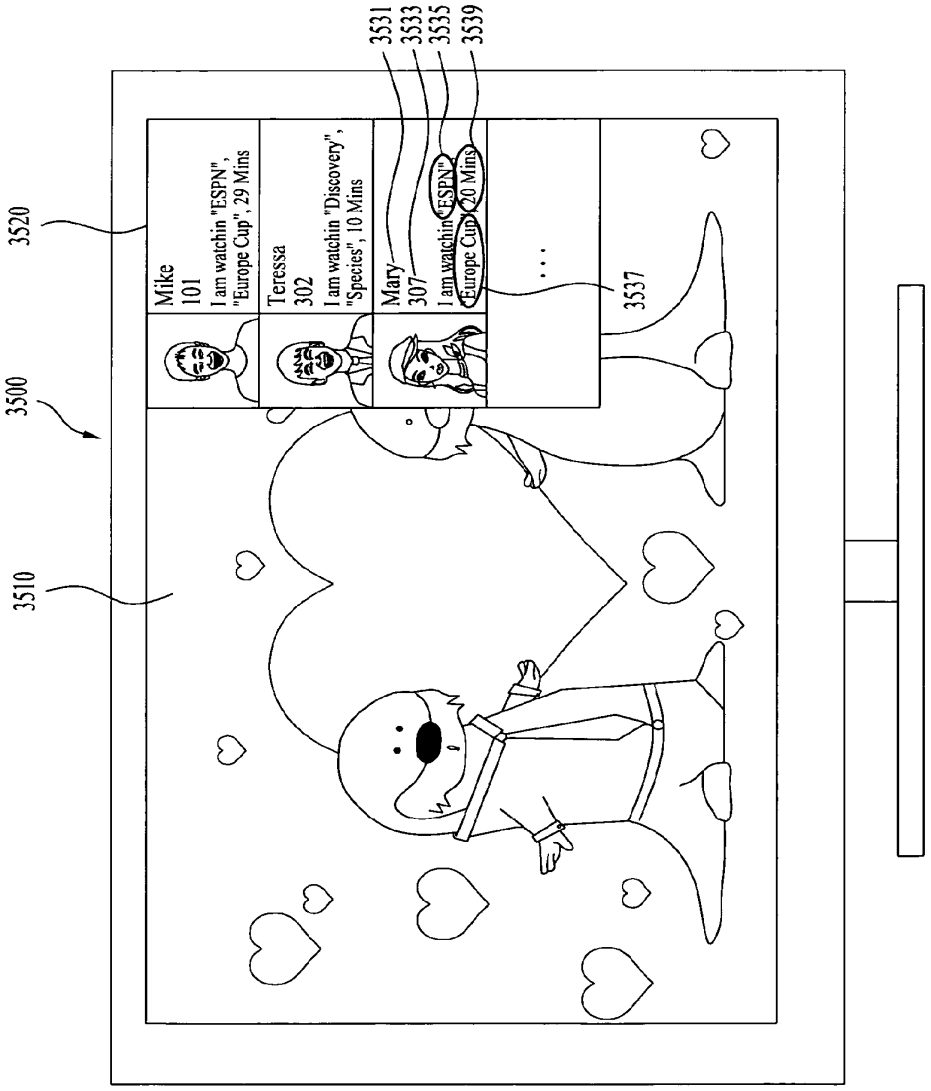

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FIG. 36

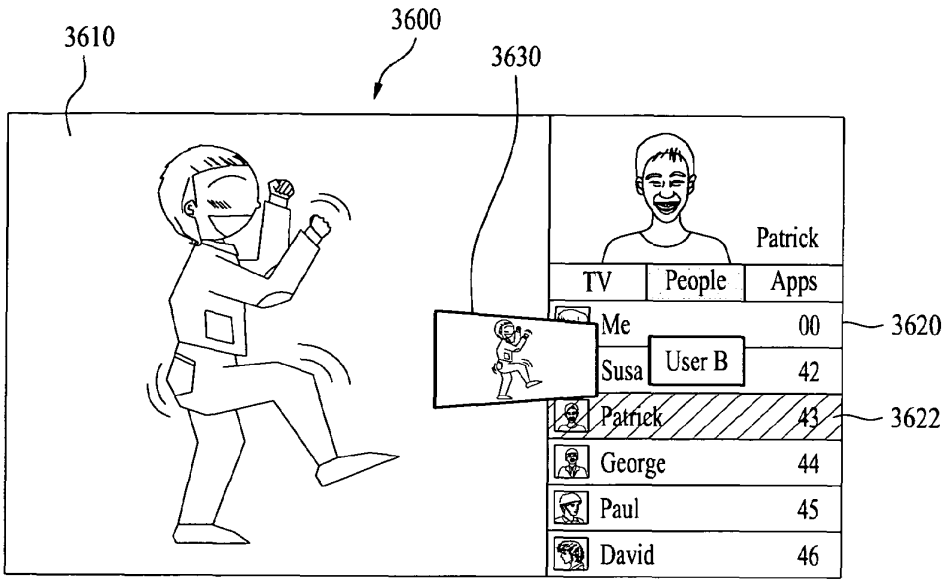
3610
3600
3630
Patrick
TV
People
Apps
Me
00
3620
Susa
User B
42
Patrick
43
3622
George
44
Paul
45
David
46

FIG. 37

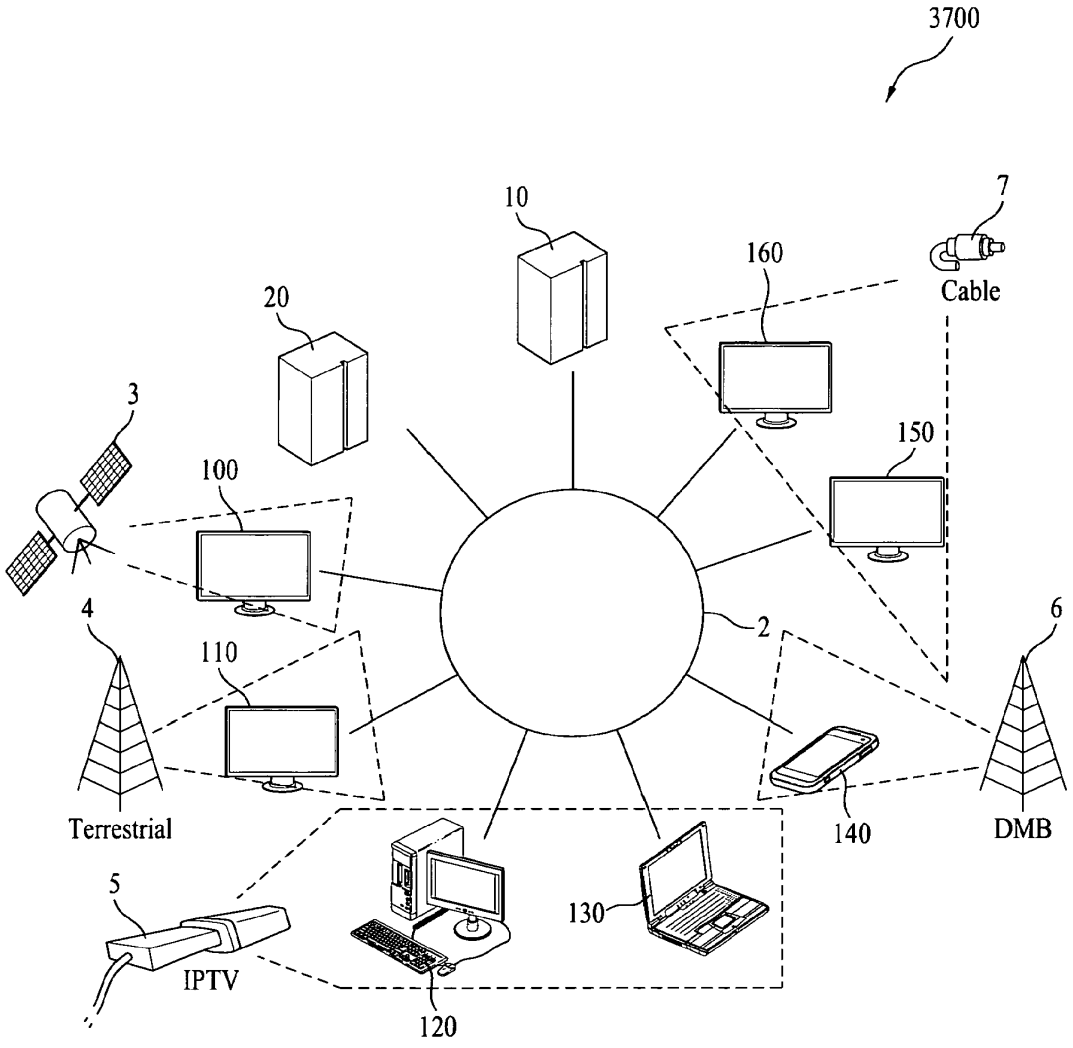

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FIG. 38

3800

Field Name	bits
Details_of_user	Var
Physical_channel_details	Var
Service_Name	Var
Service_ID	64
Channel_number	64
Event_Name	Var
Event_ID	64
Transport_Stream_ID	64
Network_ID	64
ServiceProvider	Var
Originating_medium	64
Originating_Country	Var

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FIG. 39

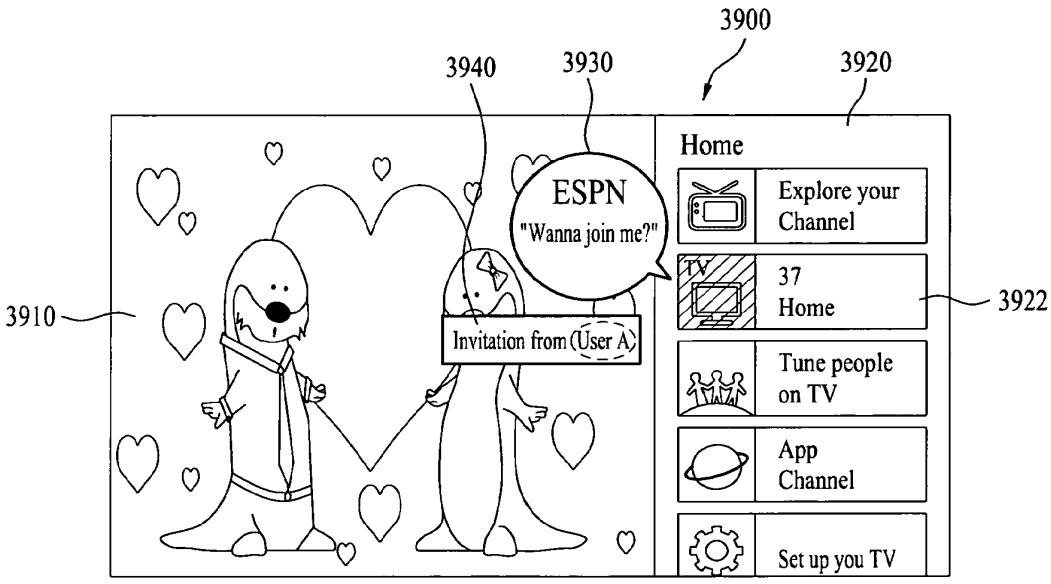
3900
3940
3930
3920
3910
ESPN
"Wanna join me?"
Invitation from (User A)
Home
Explore your Channel
TV
37 Home
3922
Tune people on TV
App Channel
Set up you TV

FIG. 40

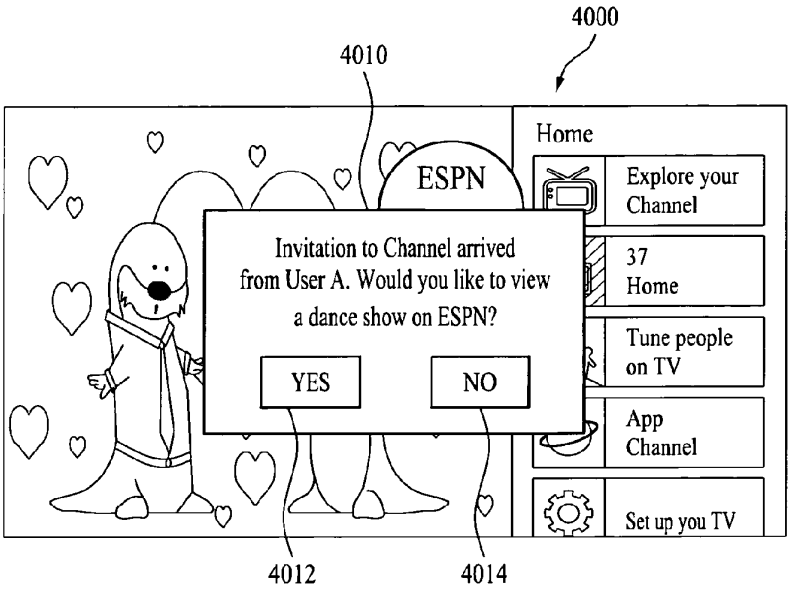

FIG. 41

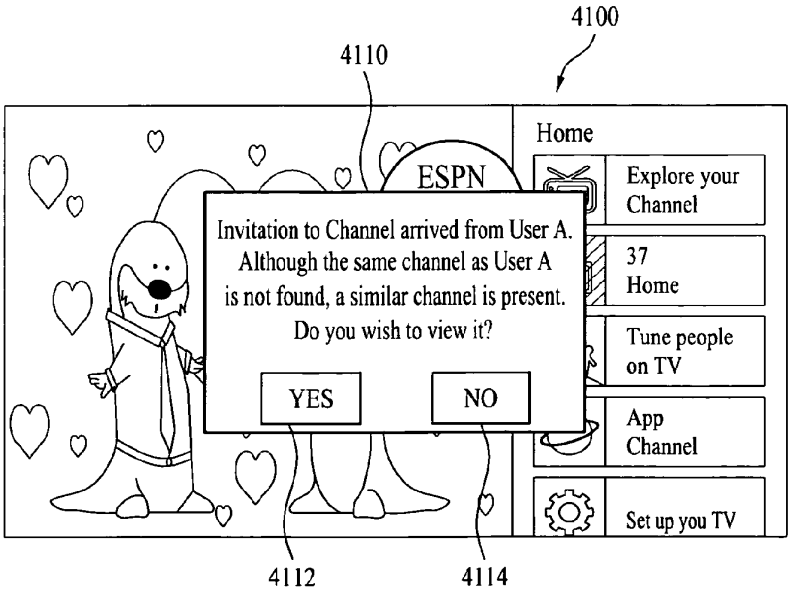

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FIG. 42

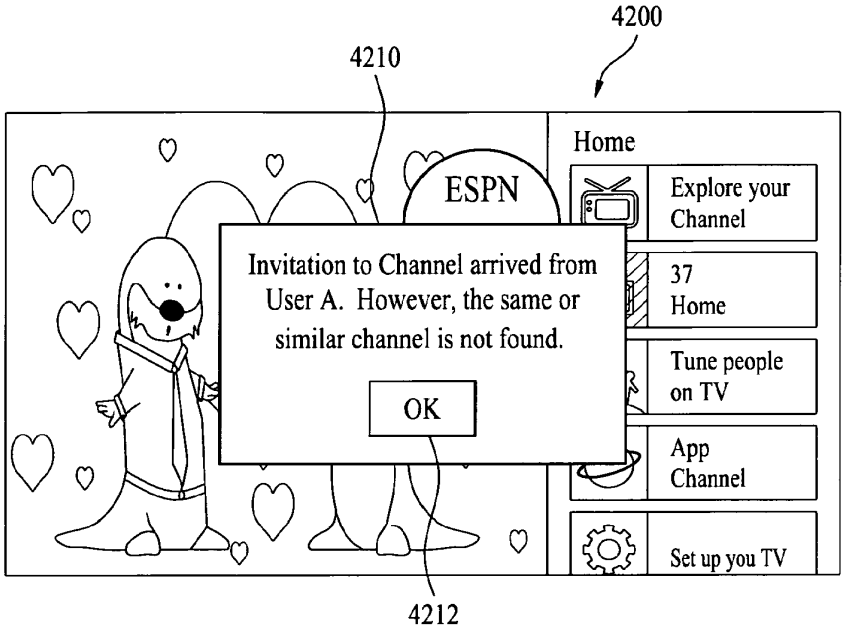

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FIG. 43A

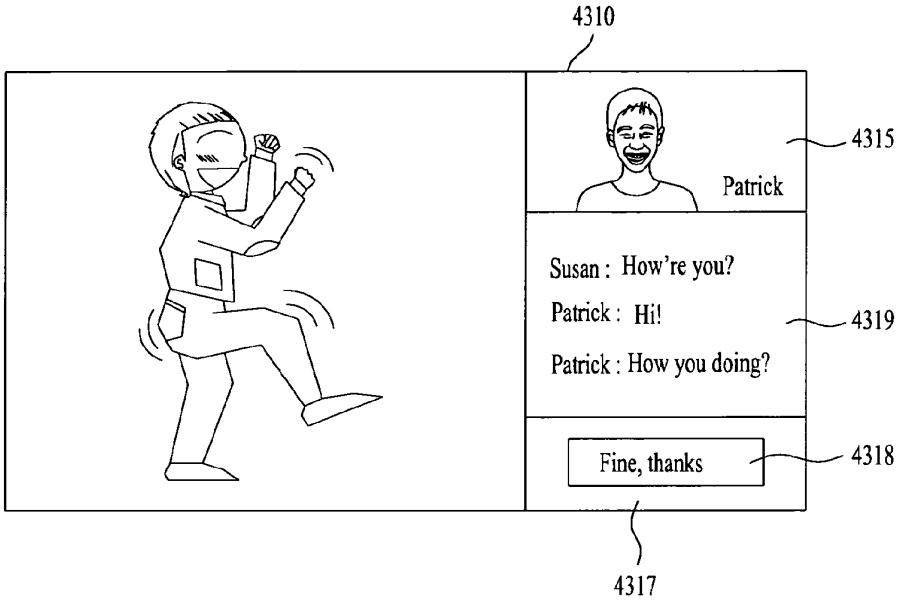

FIG. 43B

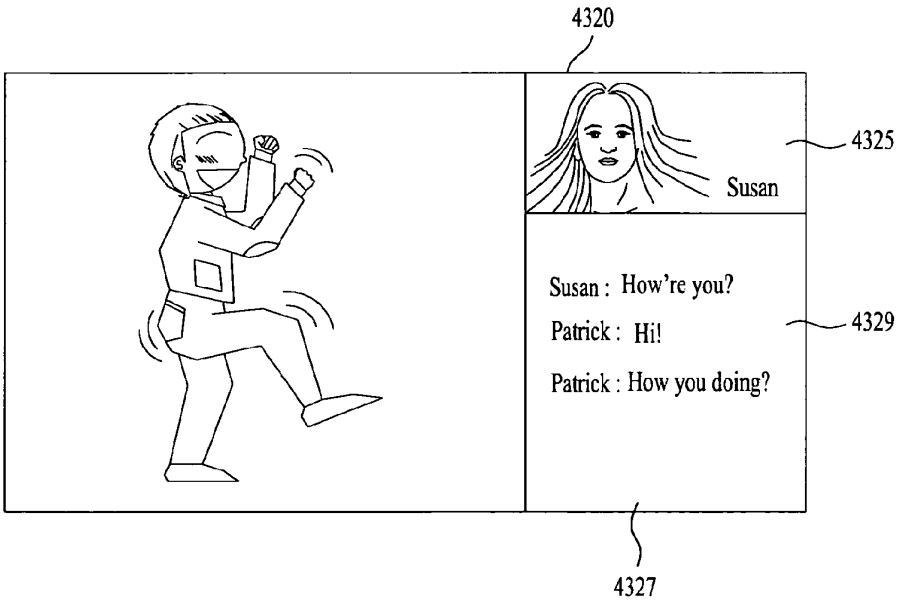

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FIG. 44

4400

Service provider 1		Service provider 2	
Channel number	Frequency	Channel number	Frequency
101	10800MHZ	901	11100MHZ
202	11800MHZ	345	11010MHZ

FIG. 45

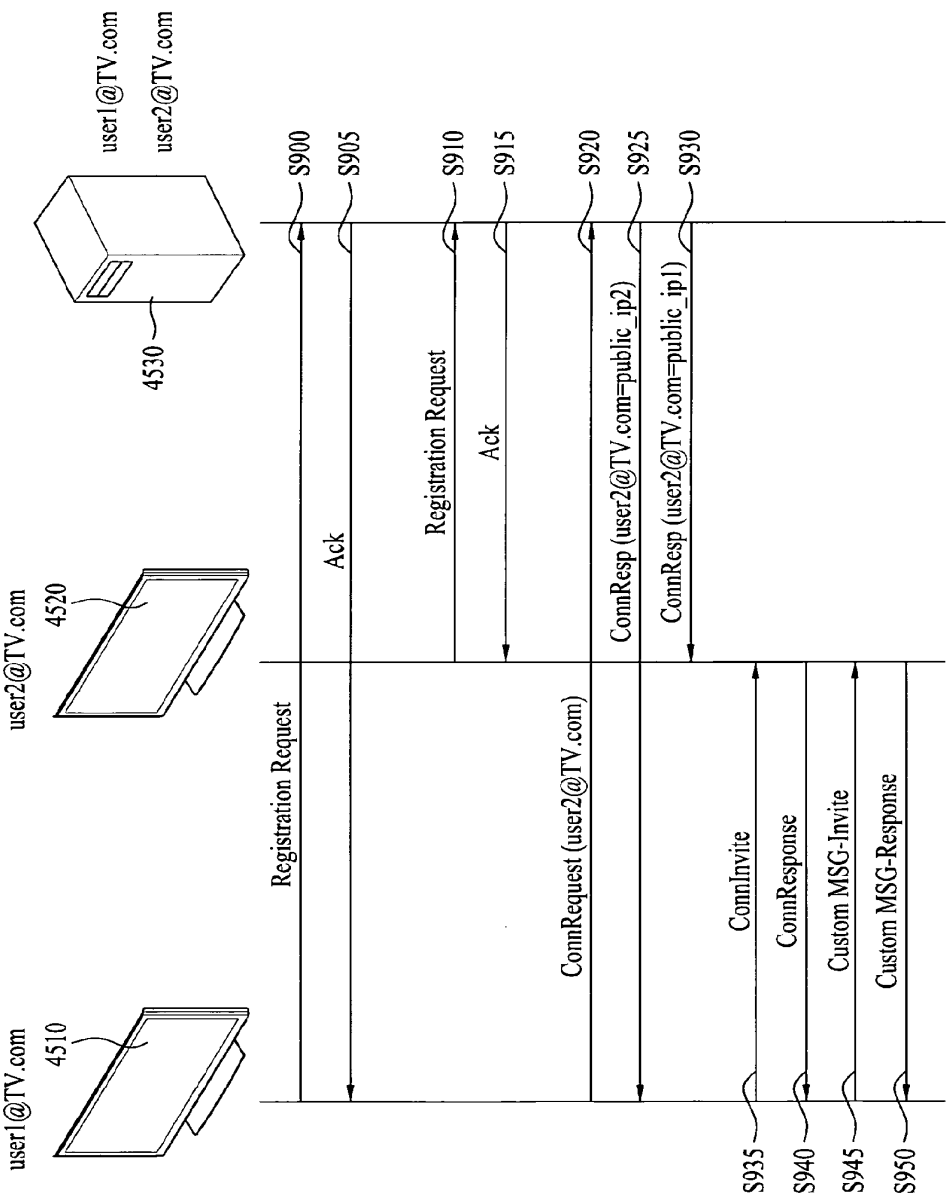
user1@TV.com
4510
user2@TV.com
4520
user1@TV.com
user2@TV.com
4530
S900
S905
S910
S915
S920
S925
S930
S935
S940
S945
S950
Registration Request
Ack
Registration Request
Ack
ConnRequest (user2@TV.com)
ConnResp (user2@TV.com=public_ip2)
ConnResp (user2@TV.com=public_ip1)
ConnInvite
ConnResponse
Custom MSG-Invite
Custom MSG-Response

FIG. 46

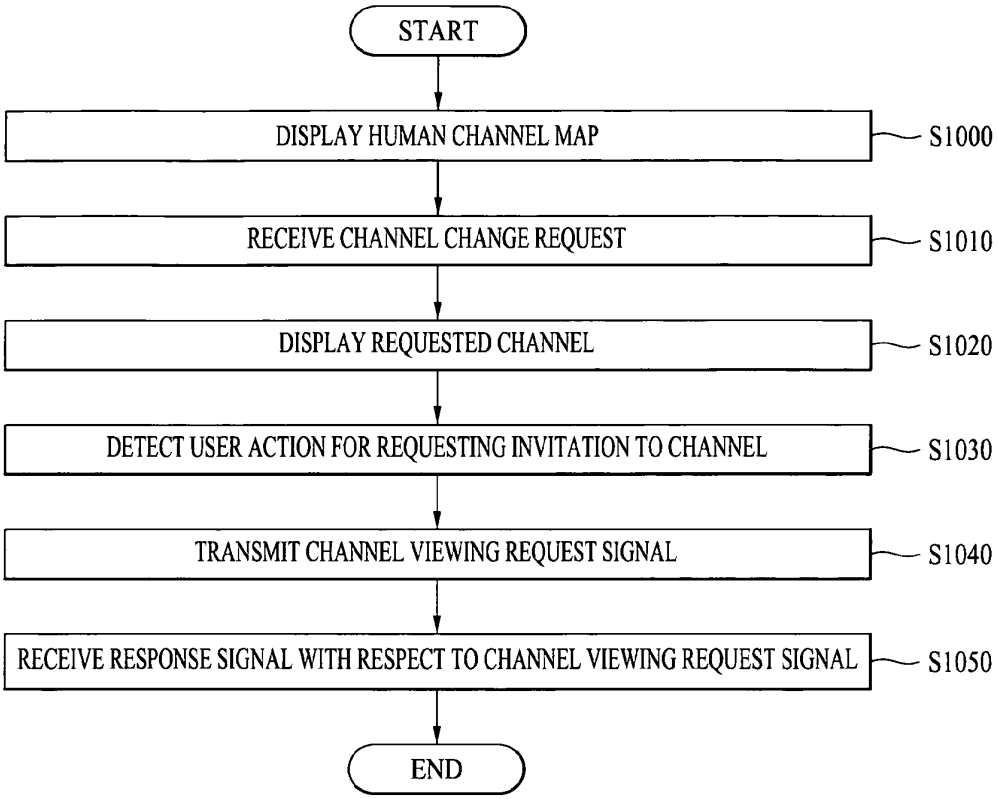

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FIG. 47

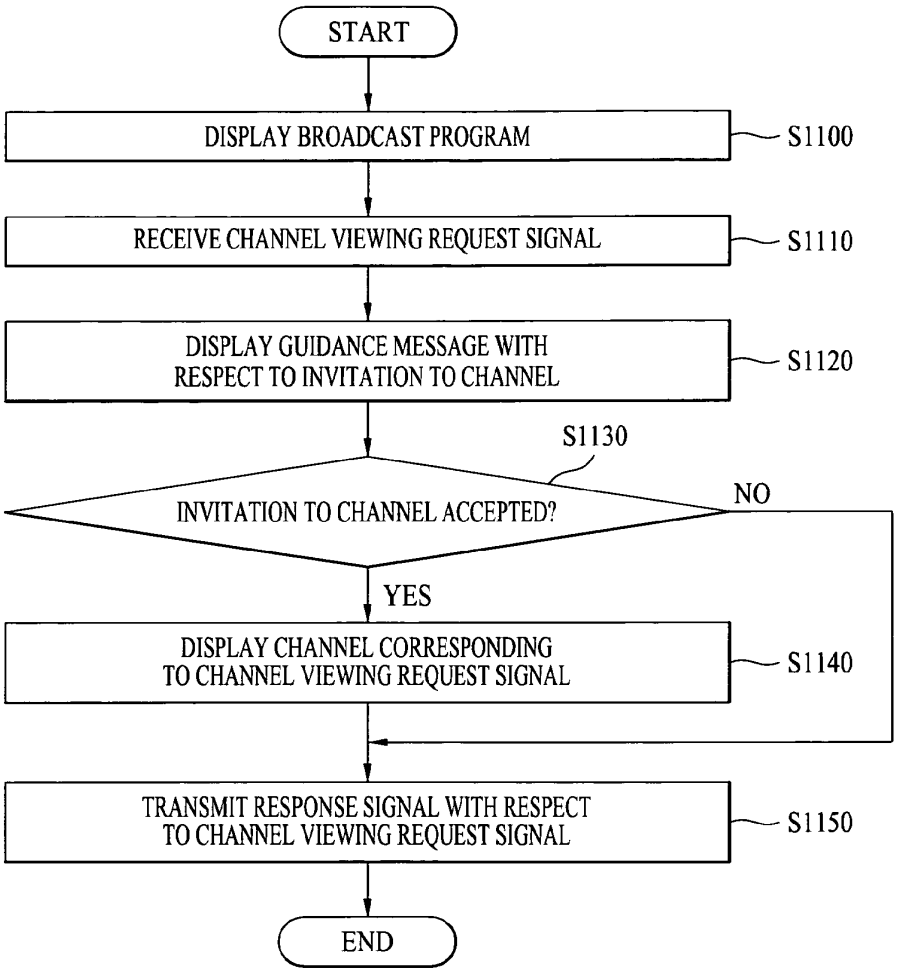

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FIG. 48

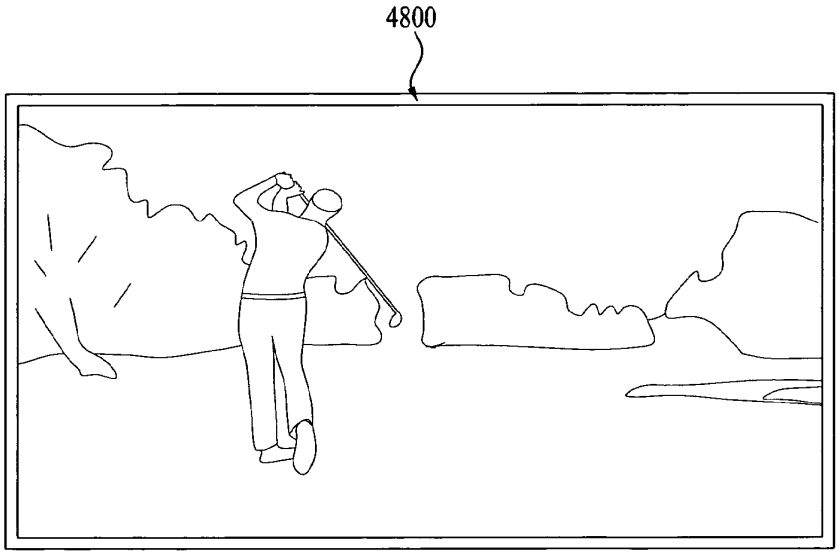

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FIG. 49

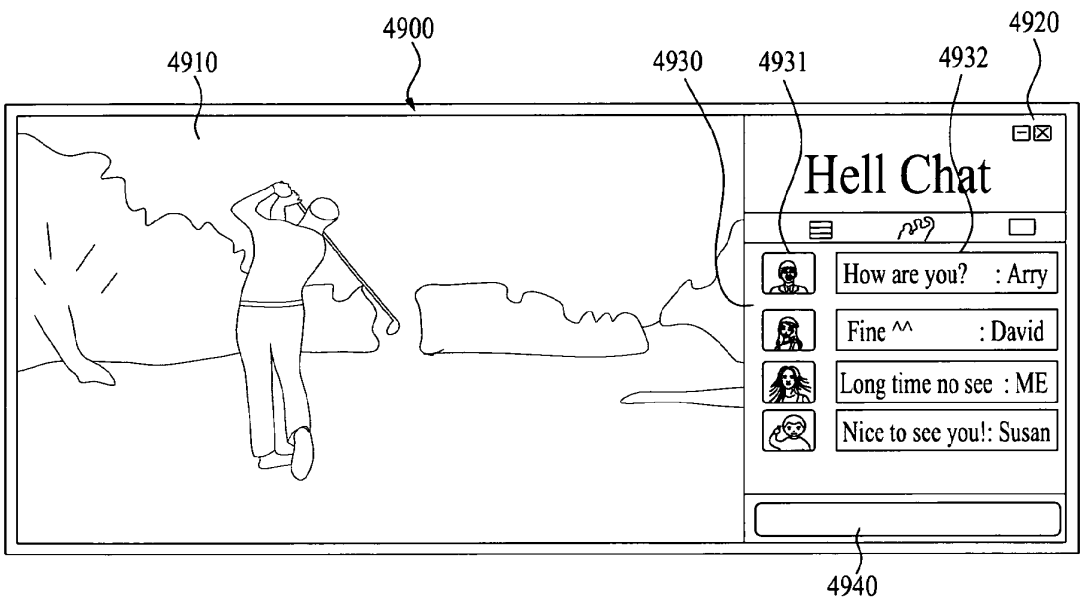
4900
4910
4930
4931
4932
4920
Hell Chat
How are you? : Arry
Fine ^^ : David
Long time no see : ME
Nice to see you!: Susan
4940

FIG. 50

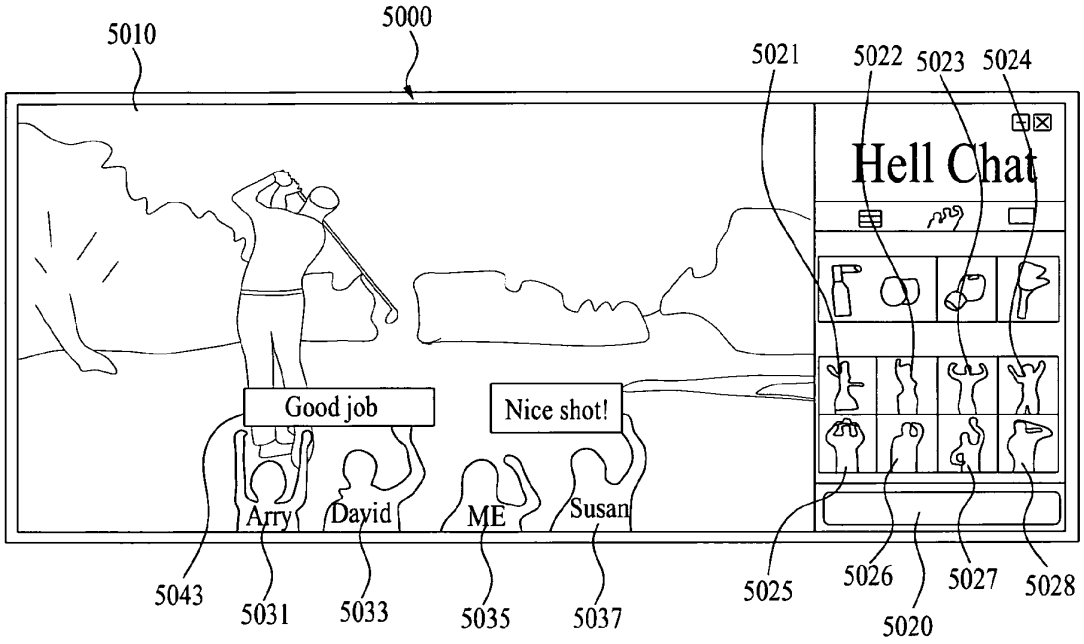
5010
5000
5021
5022
5023
5024
Hell Chat
Good job
Nice shot!
Arry
David
ME
Susan
5043
5031
5033
5035
5037
5025
5026
5027
5028
5020

FIG. 51

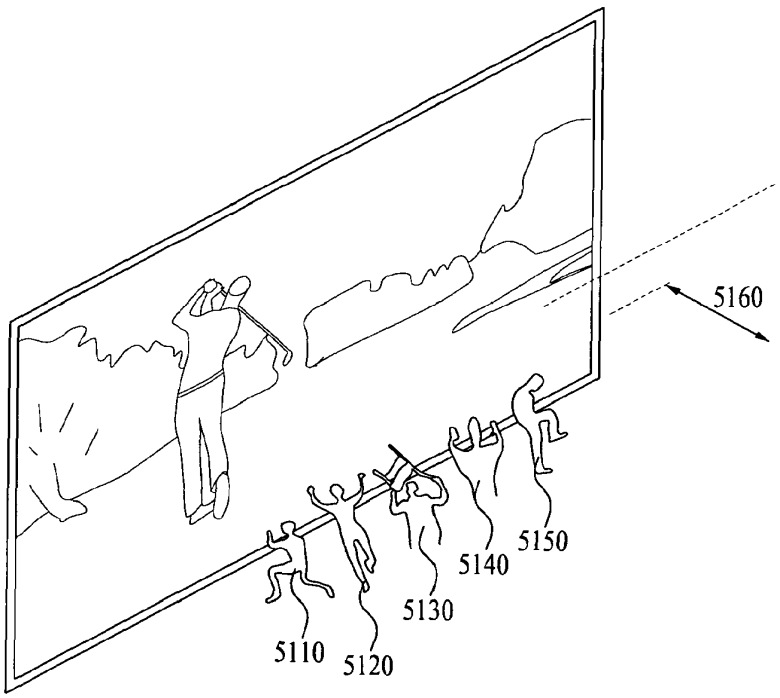

FIG. 52

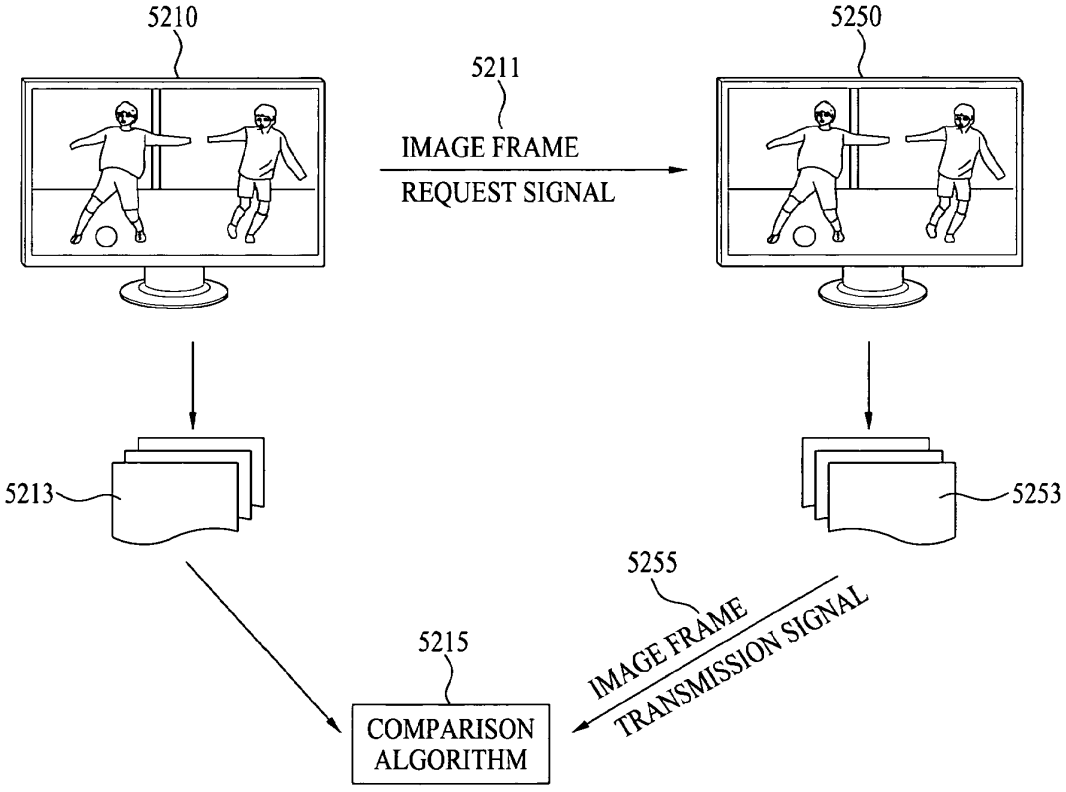

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FIG. 53

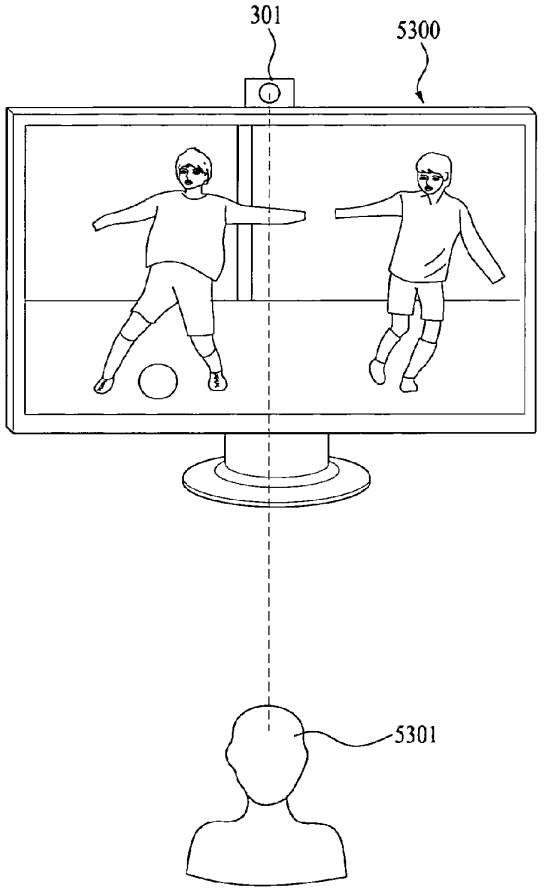

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FIG. 54

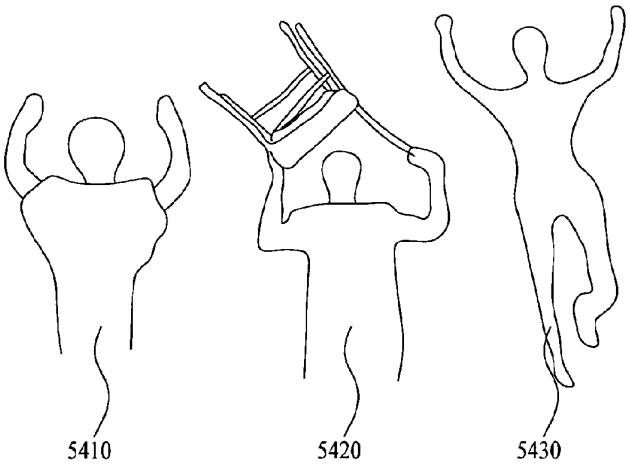

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FIG. 55

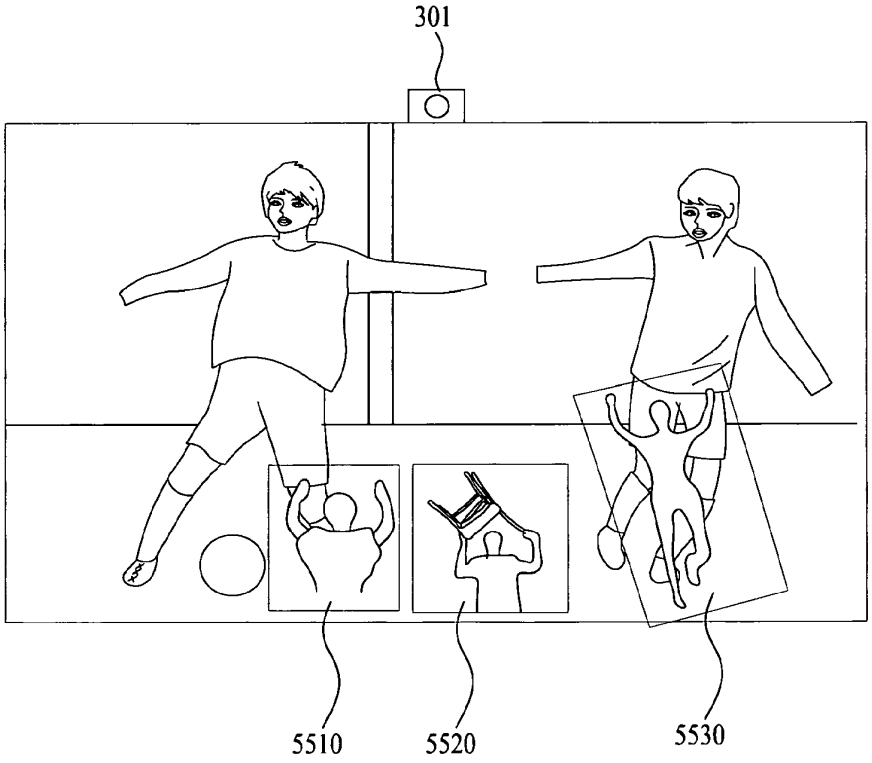

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FIG. 56

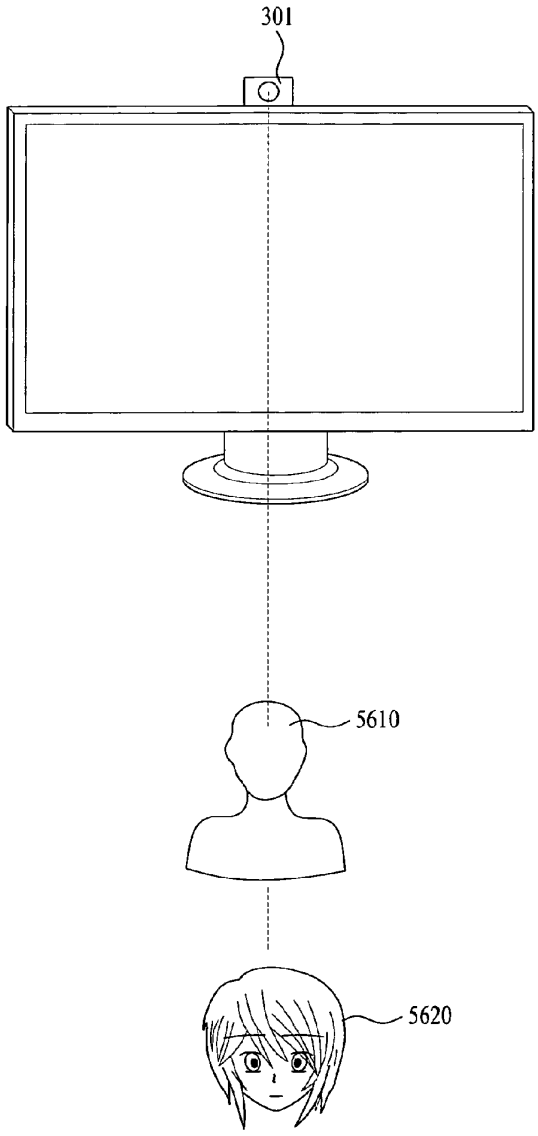

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FIG. 57

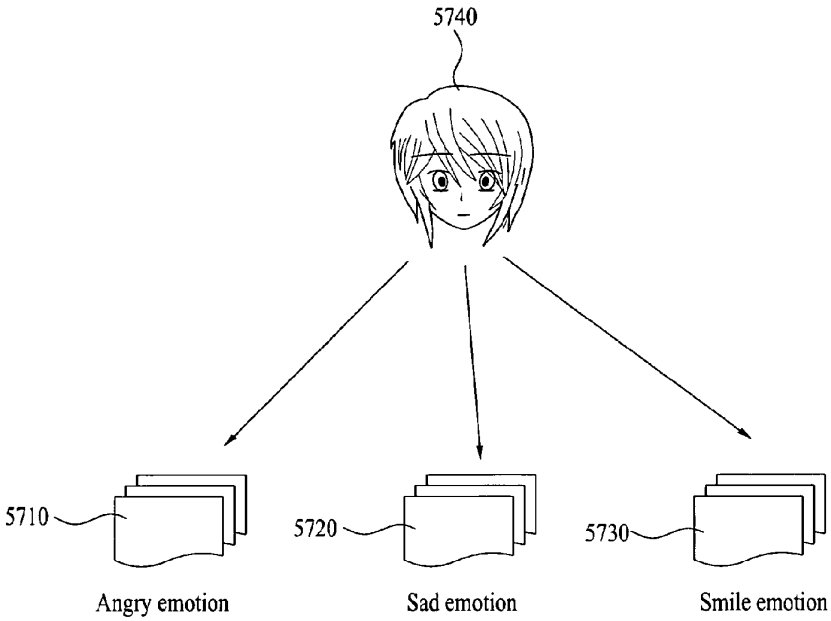
5740
5710
5720
5730
Angry emotion
Sad emotion
Smile emotion

FIG. 58

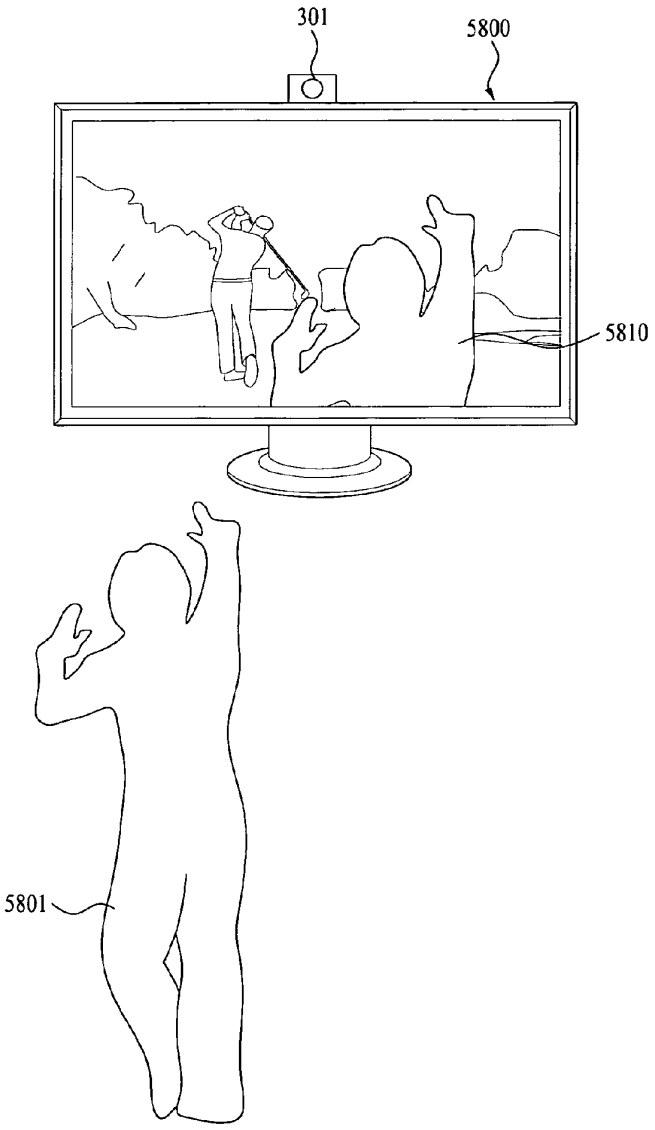

FIG. 59A

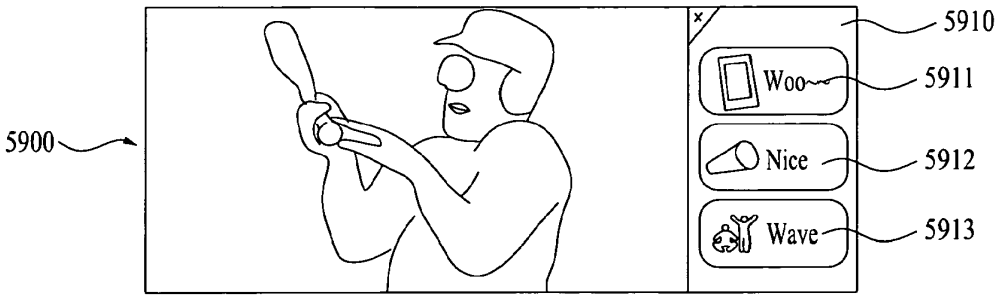

FIG. 59B

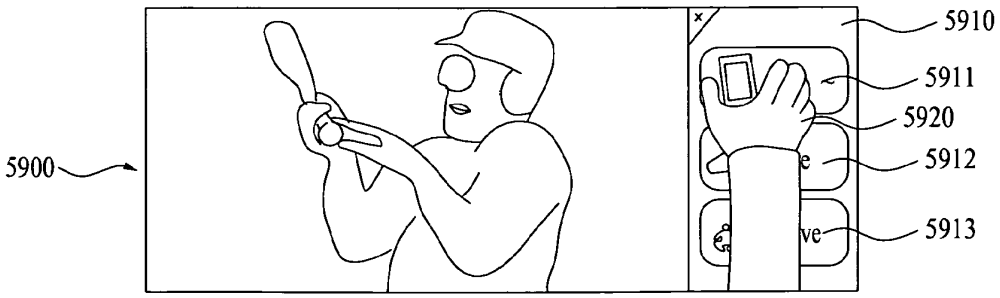

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FIG. 59C

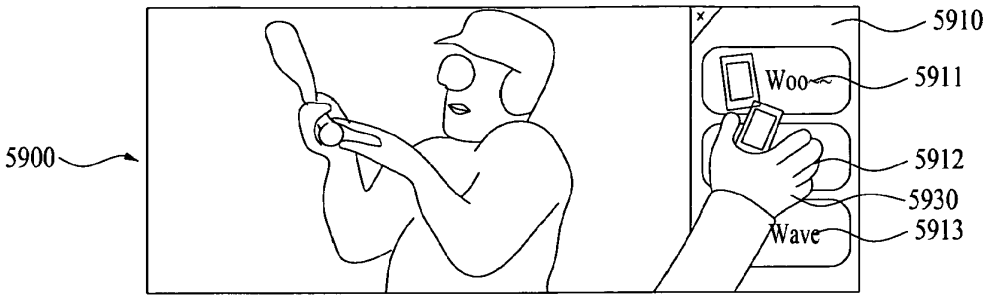

FIG. 59D

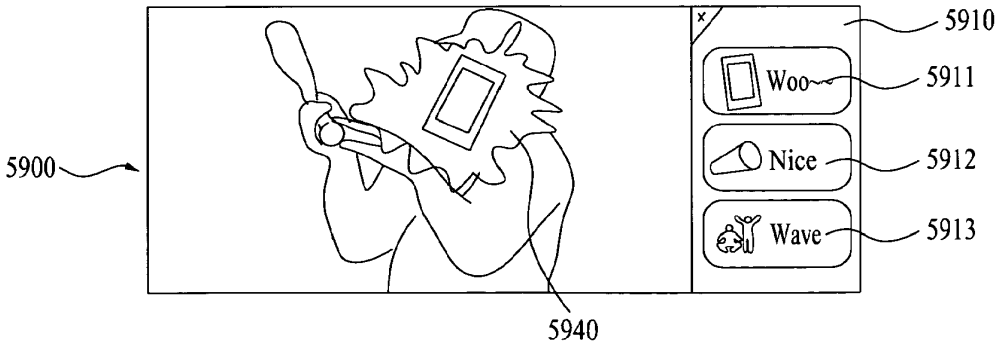

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FIG. 60

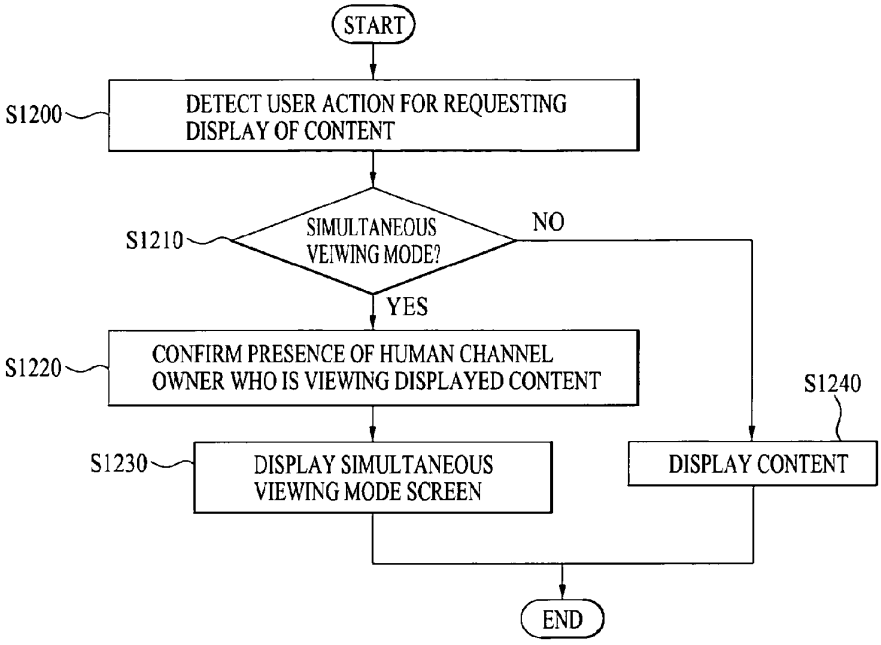

FIG. 61

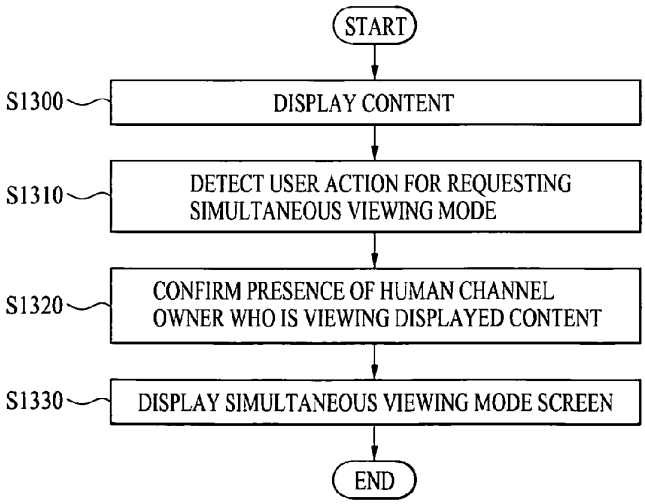

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FIG. 62

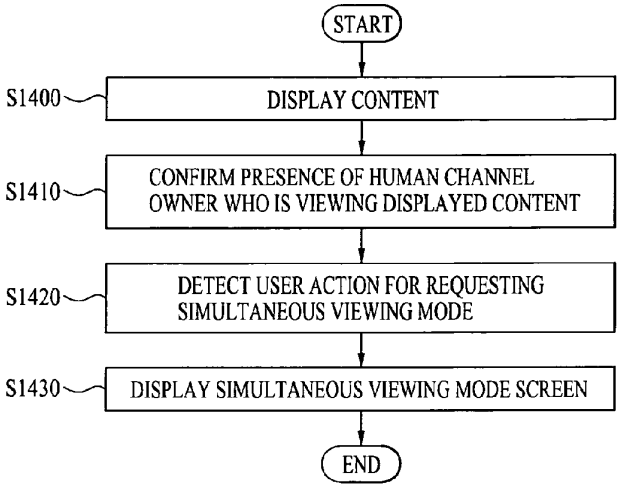

FIG. 63

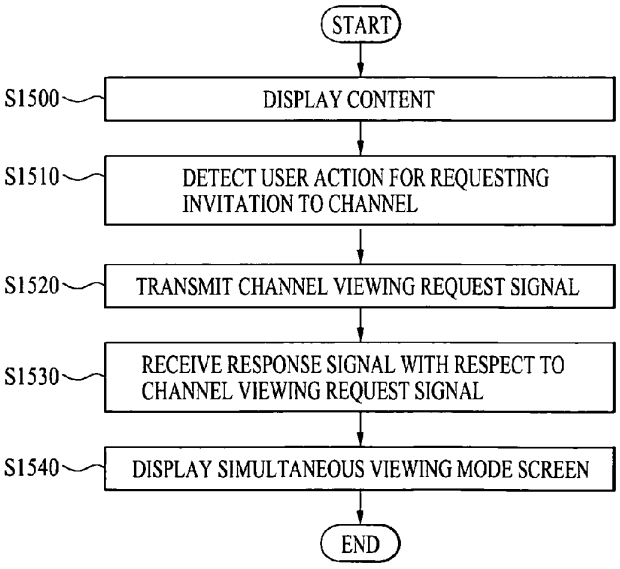

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FIG. 64

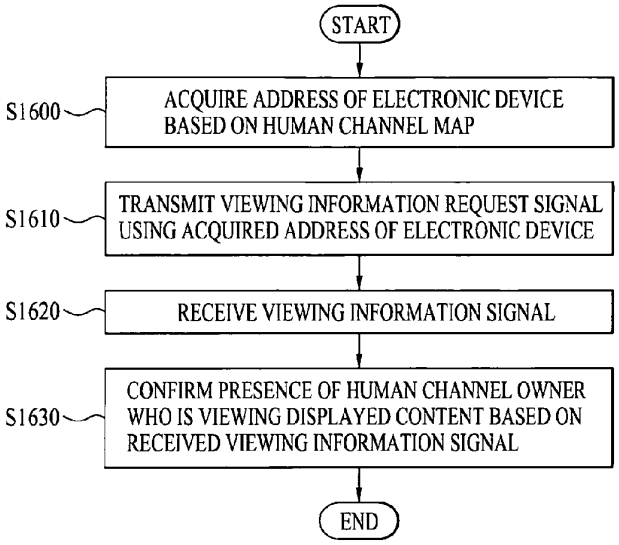

FIG. 65

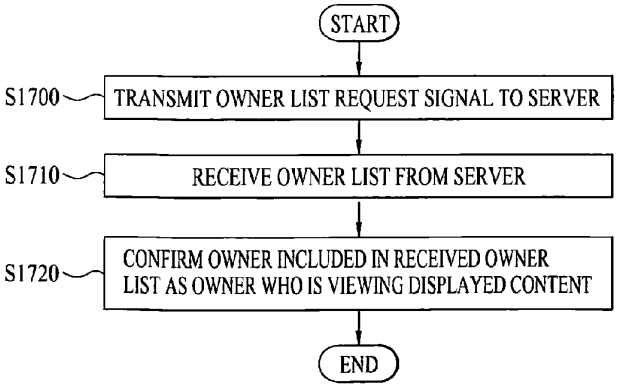

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FIG. 66

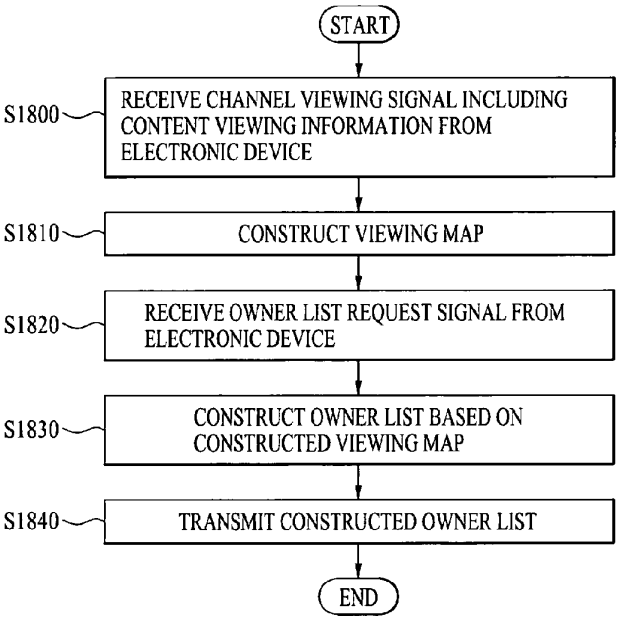

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FIG. 67

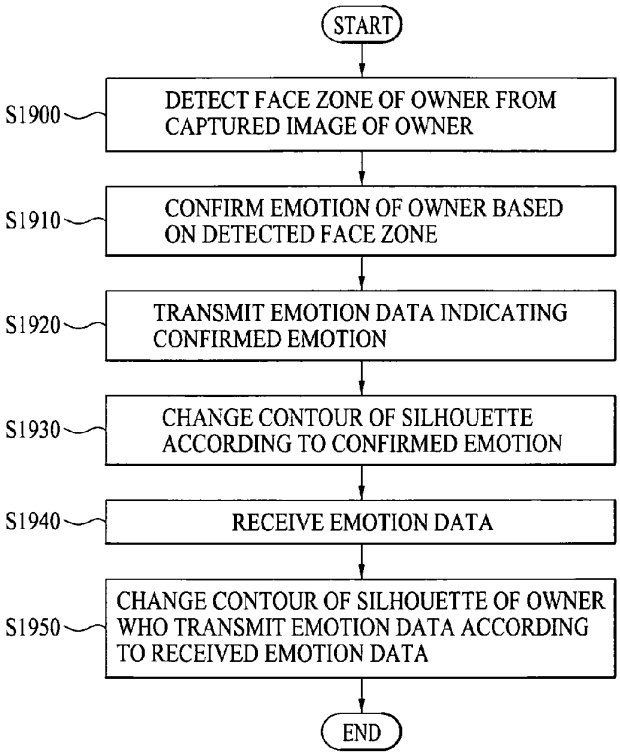

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FIG. 68

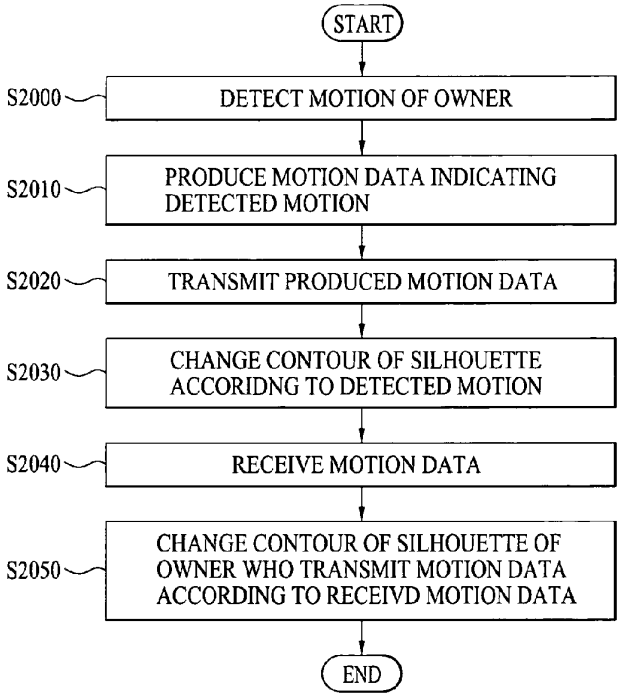

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FIG. 69

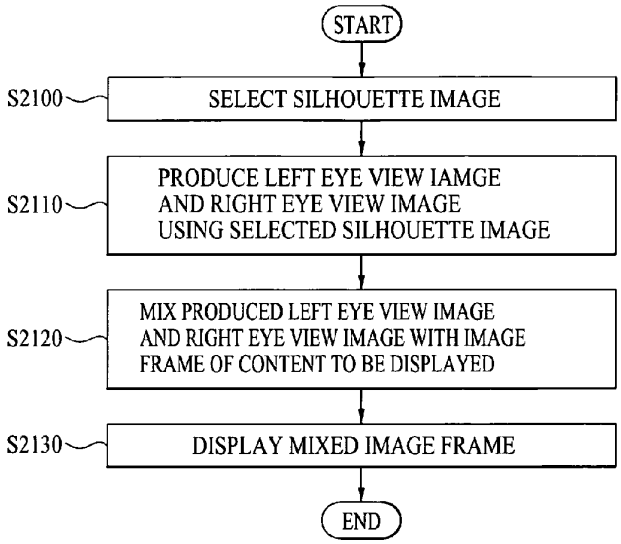

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FIG. 70

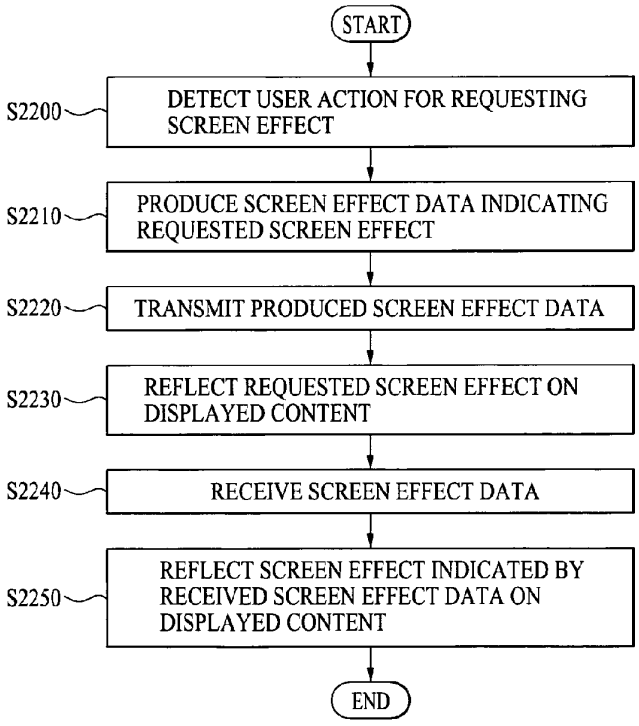

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FIG. 71

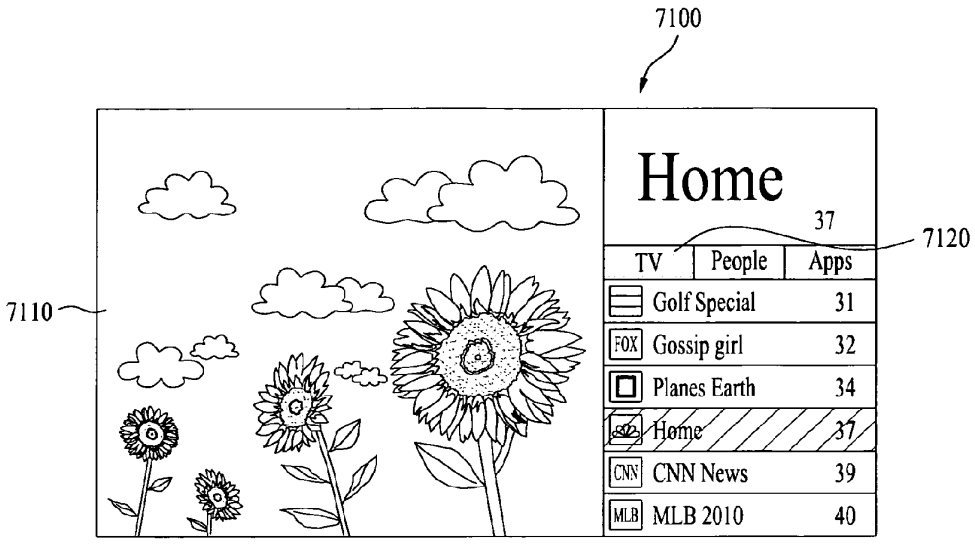

FIG. 72

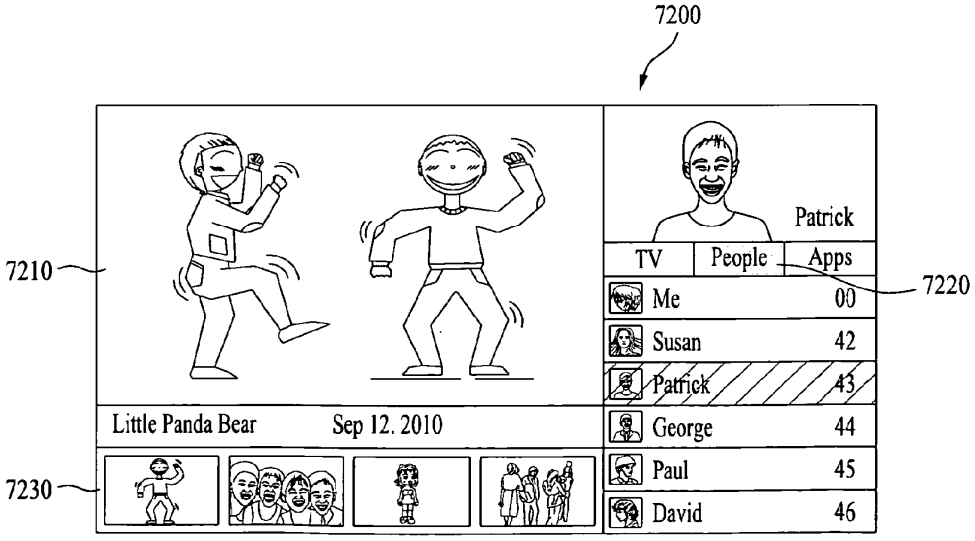

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FIG. 73

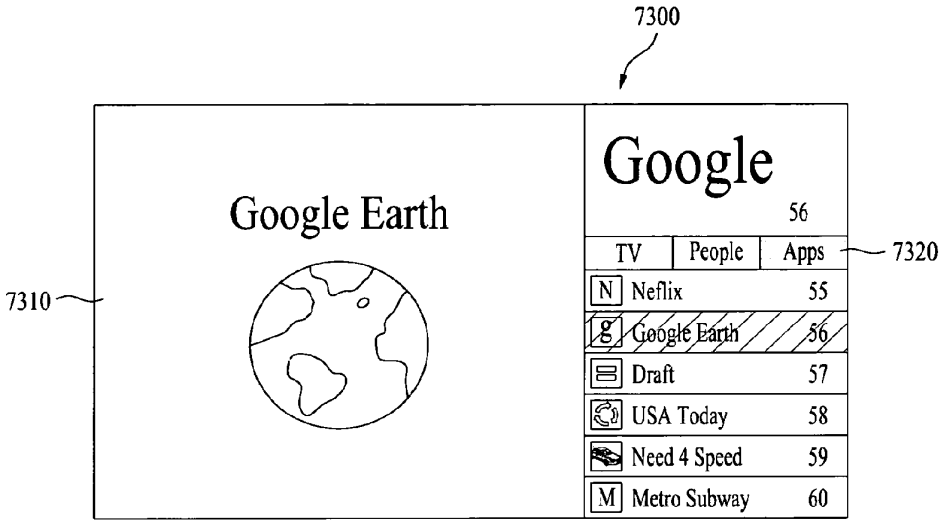
7300
Google Earth
7310
Google
56
TV
People
Apps
7320
N Neflix 55
Google Earth 56
Draft 57
USA Today 58
Need 4 Speed 59
M Metro Subway 60

FIG. 74

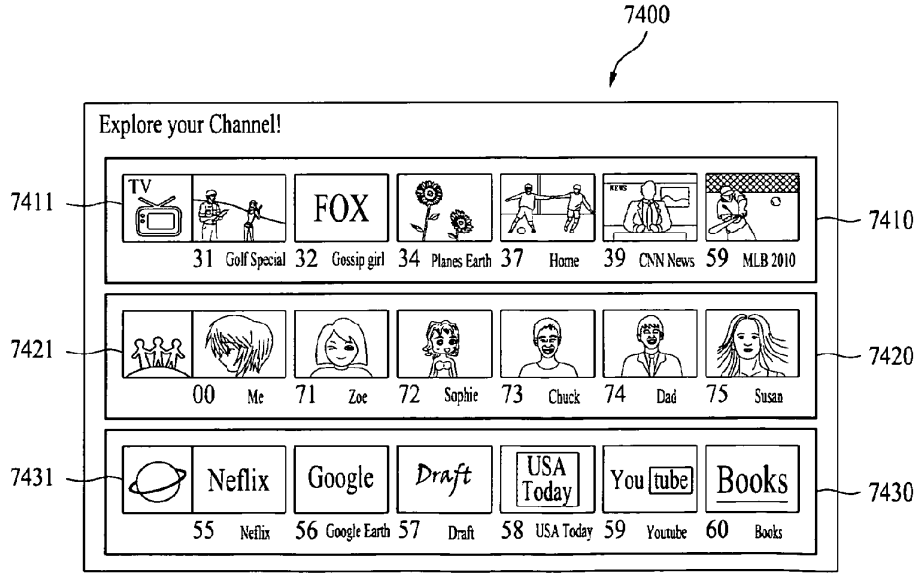
7400
Explore your Channel!
7411
TV
FOX
31 Golf Special 32 Gossip girl 34 Planes Earth 37 Home 39 CNN News 59 MLB 2010
7410
7421
00 Me 71 Zoe 72 Sophie 73 Chuck 74 Dad 75 Susan
7420
7431
Neflix
Google
Draft
USA Today
You tube
Books
55 Neflix 56 Google Earth 57 Draft 58 USA Today 59 Youtube 60 Books
7430

FIG. 75

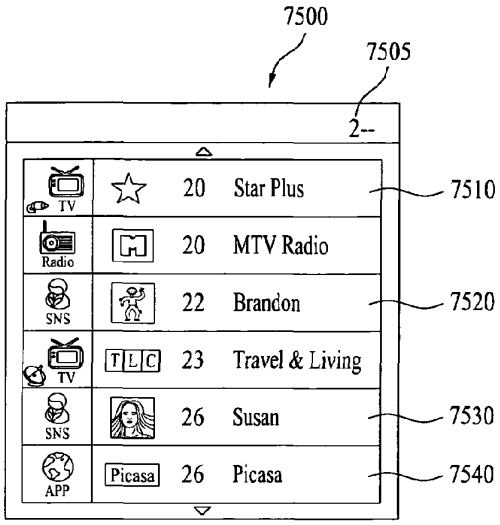

FIG. 76

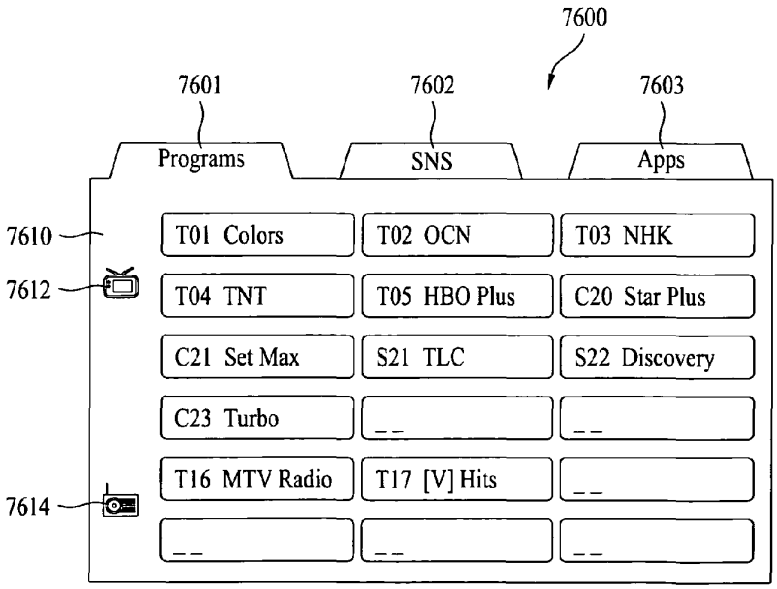

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FIG. 77

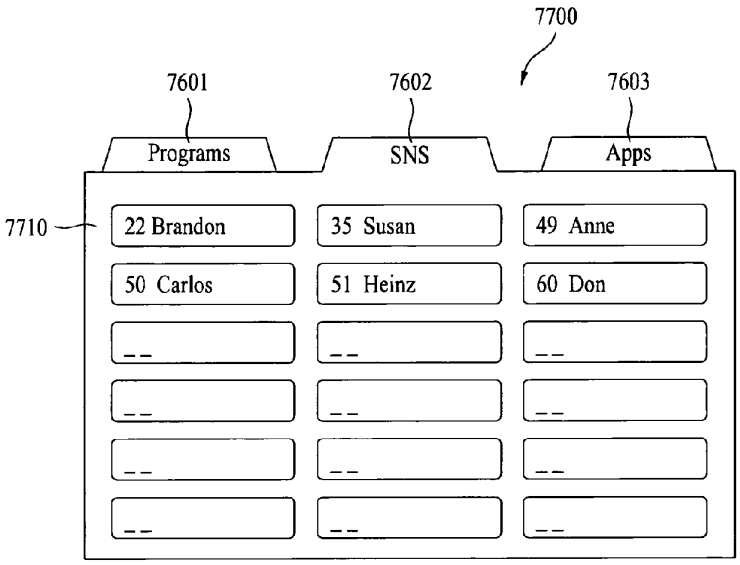

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FIG. 78

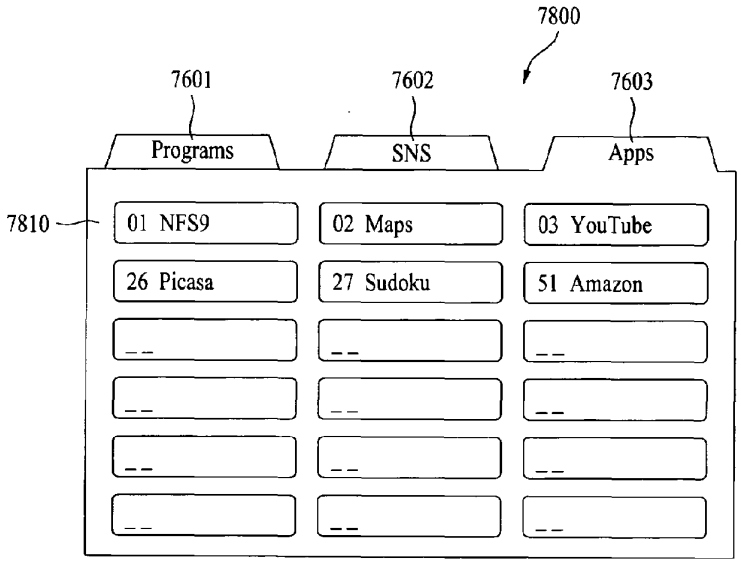
7800
7601
7602
7603
Programs
SNS
Apps
7810
01 NFS9
02 Maps
03 YouTube
26 Picasa
27 Sudoku
51 Amazon

FIG. 79

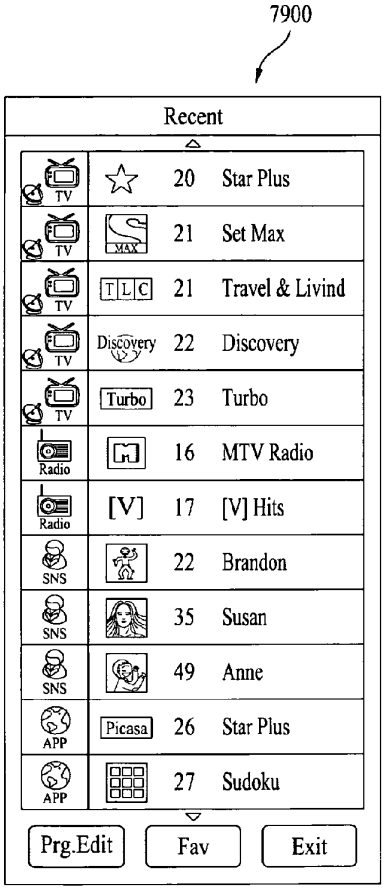

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FIG. 80

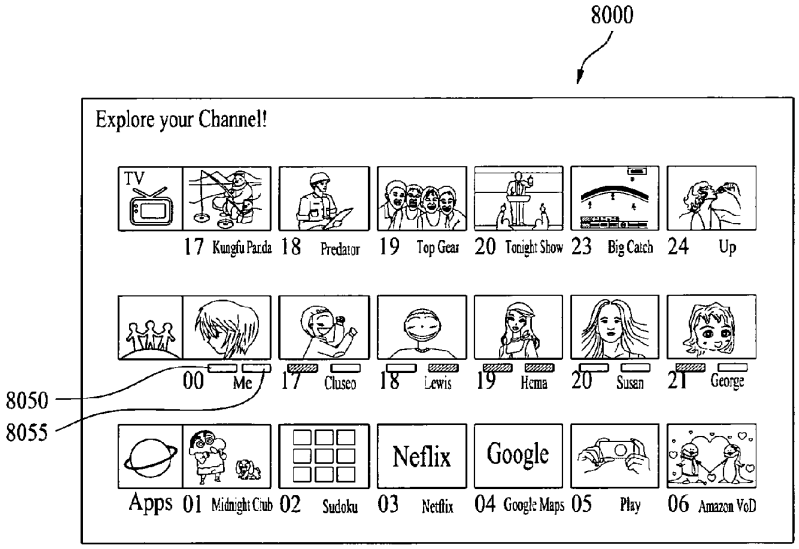
8000
Explore your Channel!
TV
17 Kungfu Panda
18 Predator
19 Top Gear
20 Tonight Show
23 Big Catch
24 Up
00 Me
17 Cluseo
18 Lewis
19 Hema
20 Susan
21 George
8050
8055
Apps
01 Midnight Club
02 Sudoku
Neflix
03 Netflix
Google
04 Google Maps
05 Play
06 Amazon VoD

FIG. 81A

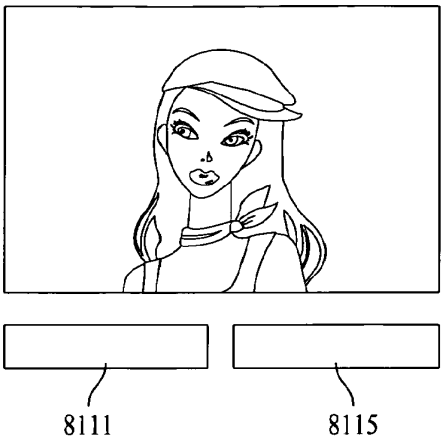

FIG. 81B

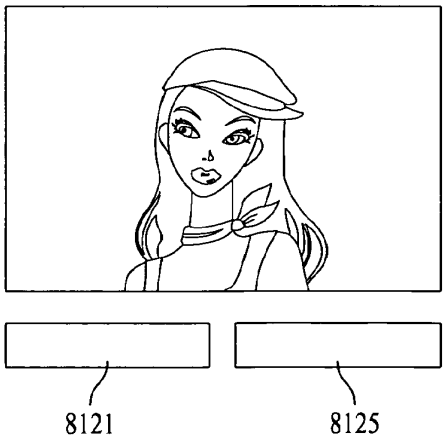

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FIG. 81C

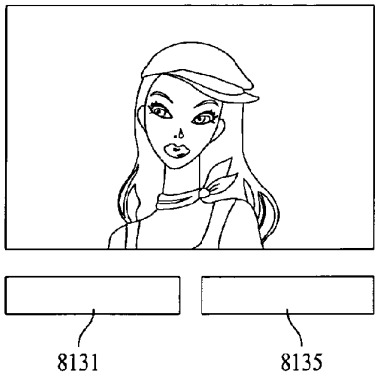

FIG. 81D

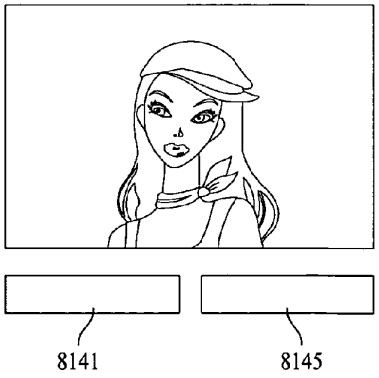

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FIG. 82

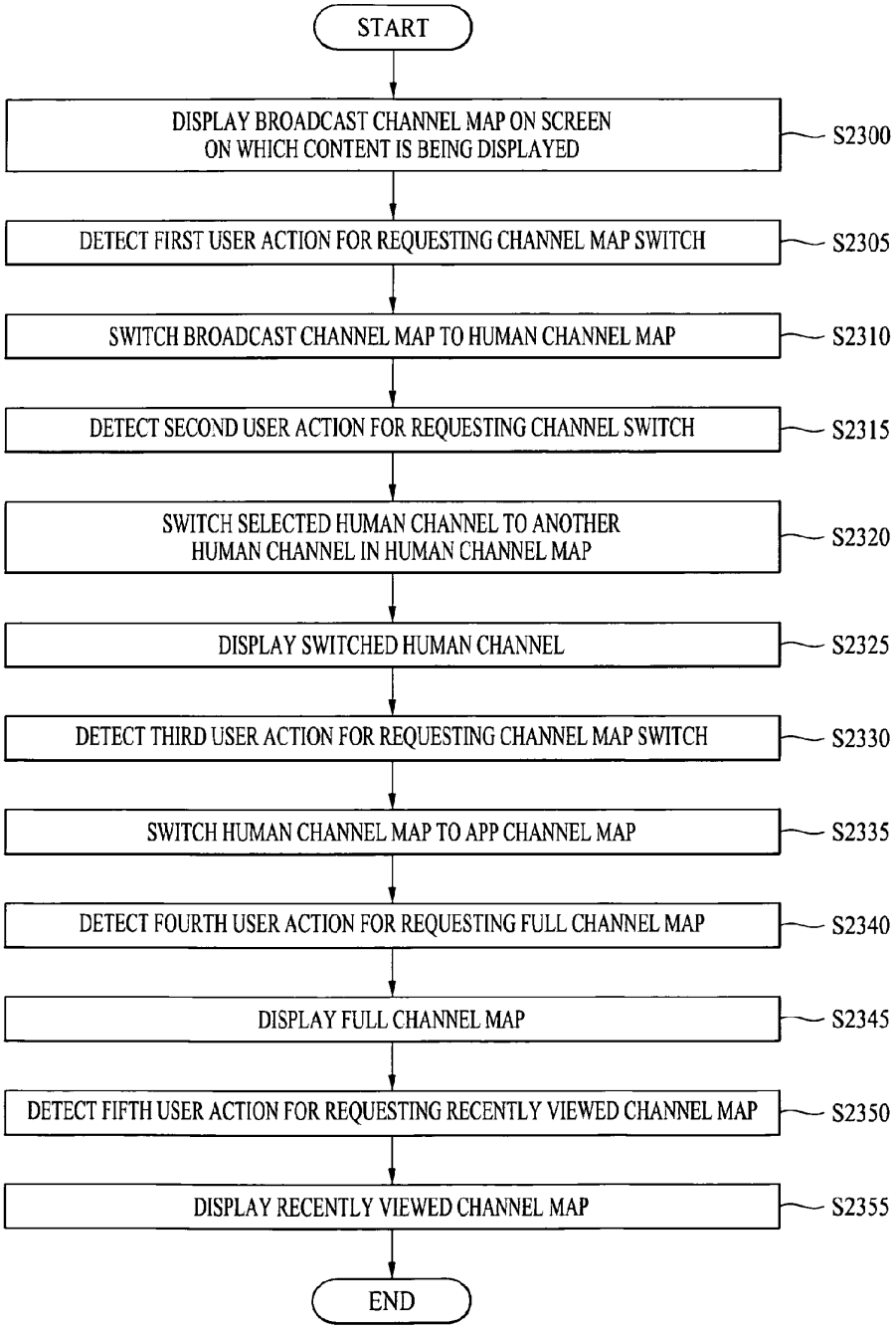

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FIG. 83

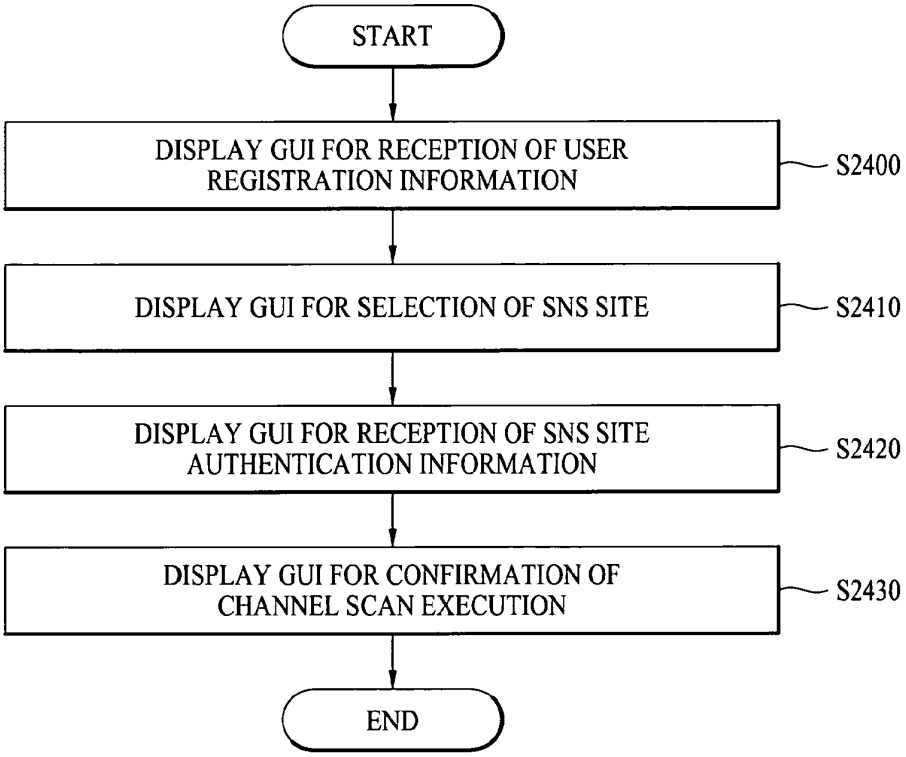

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FIG. 84

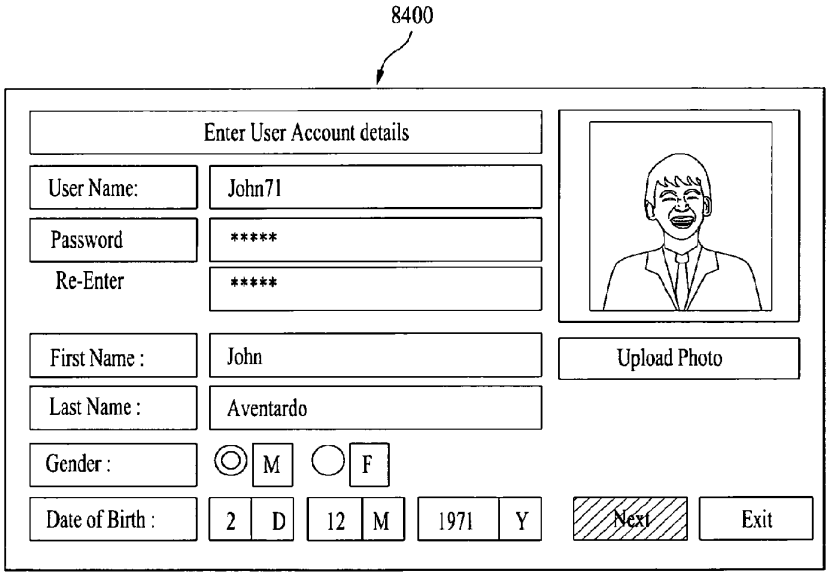

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FIG. 85

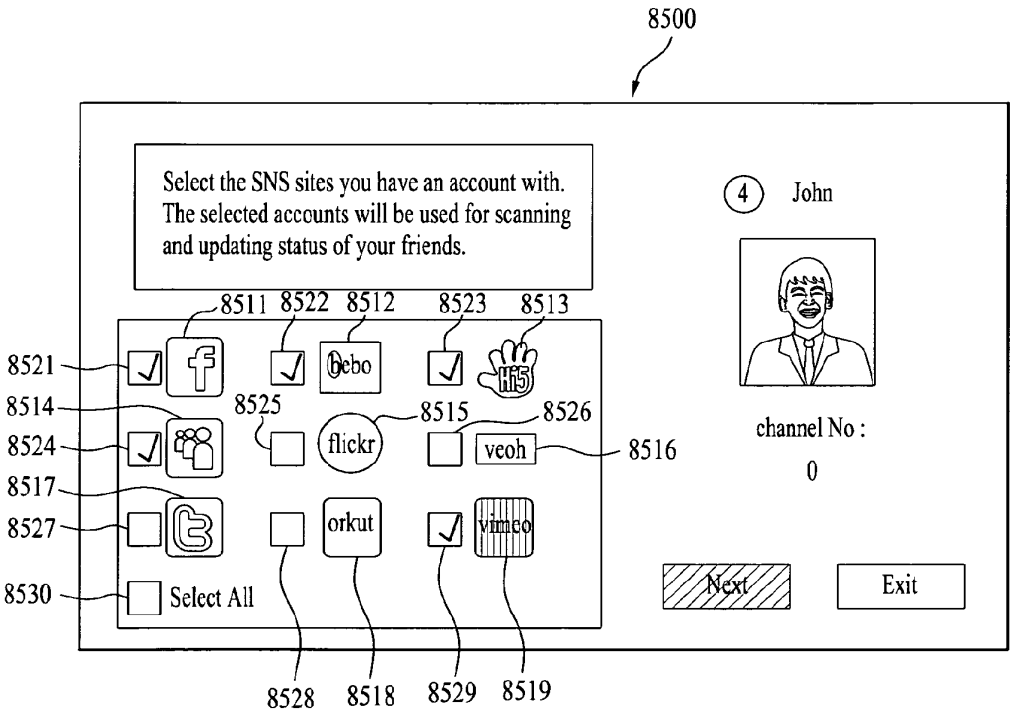
8500
Select the SNS sites you have an account with.
The selected accounts will be used for scanning
and updating status of your friends.
4
John
channel No :
0
8511
8522
8512
8523
8513
8521
8514
8525
8515
8526
8524
8516
8517
8527
8530
Select All
bebo
flickr
veoh
orkut
vimeo
Next
Exit
8528
8518
8529
8519

FIG. 86

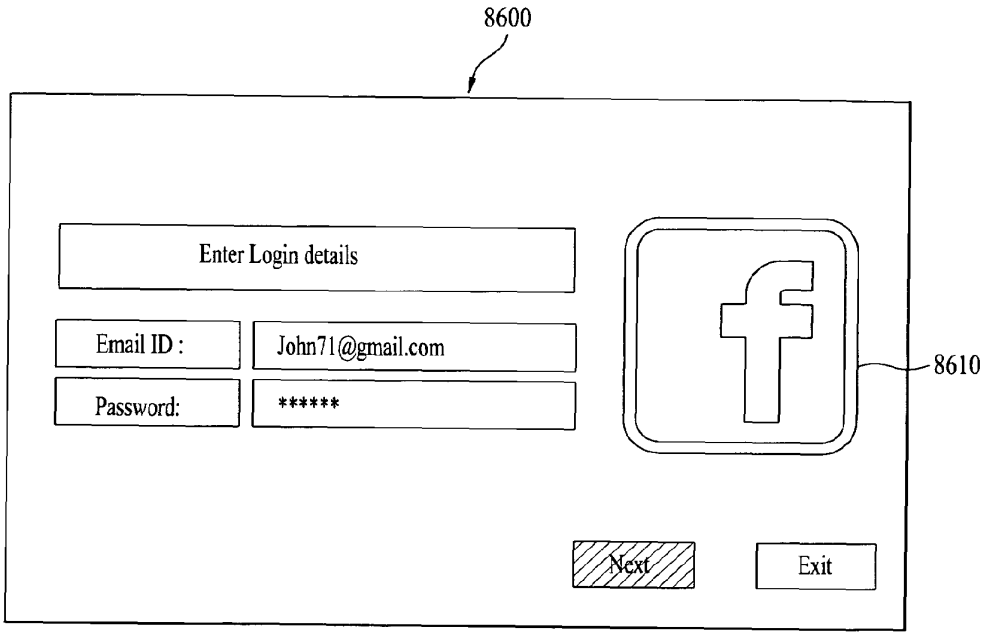

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FIG. 87

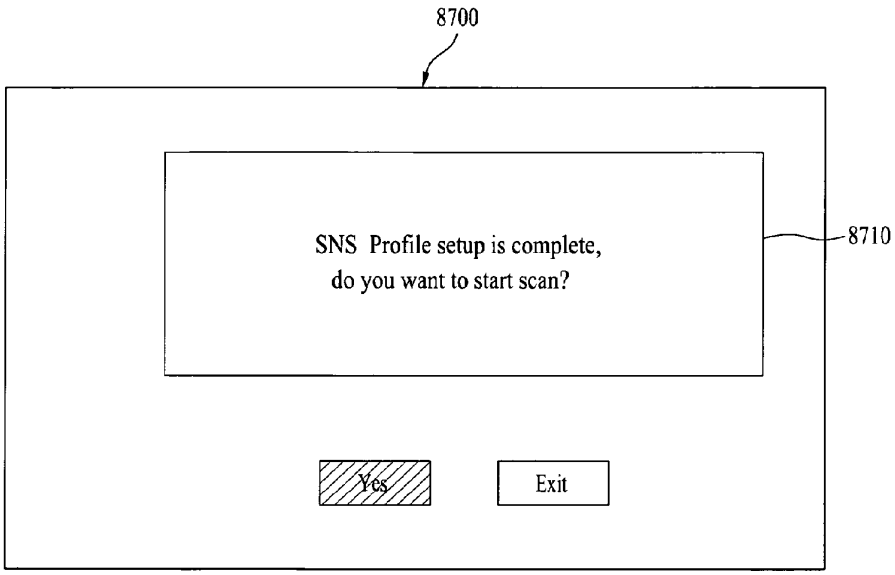
8700
SNS Profile setup is complete,
do you want to start scan?
8710
Yes
Exit

FIG. 88

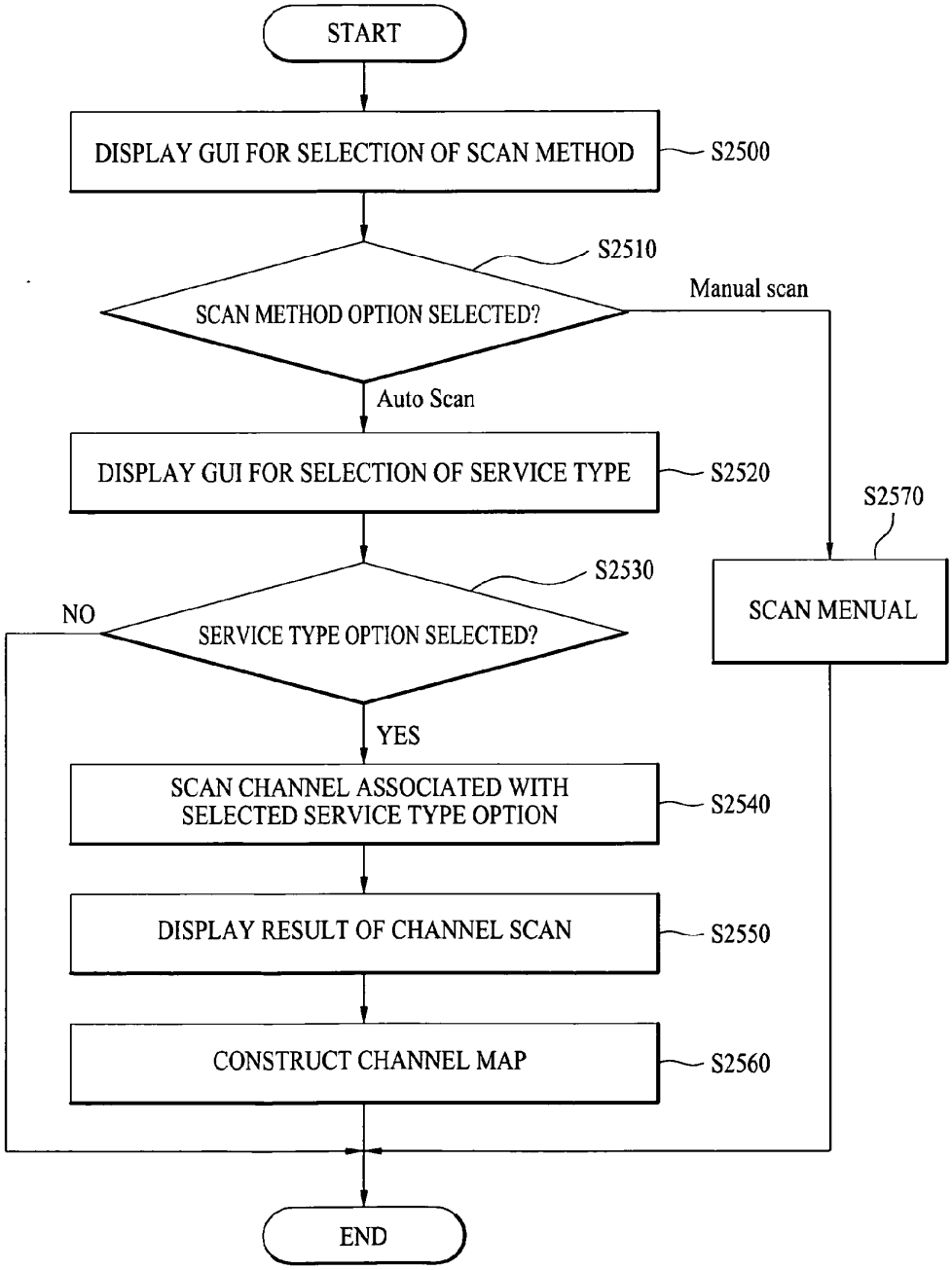

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FIG. 89

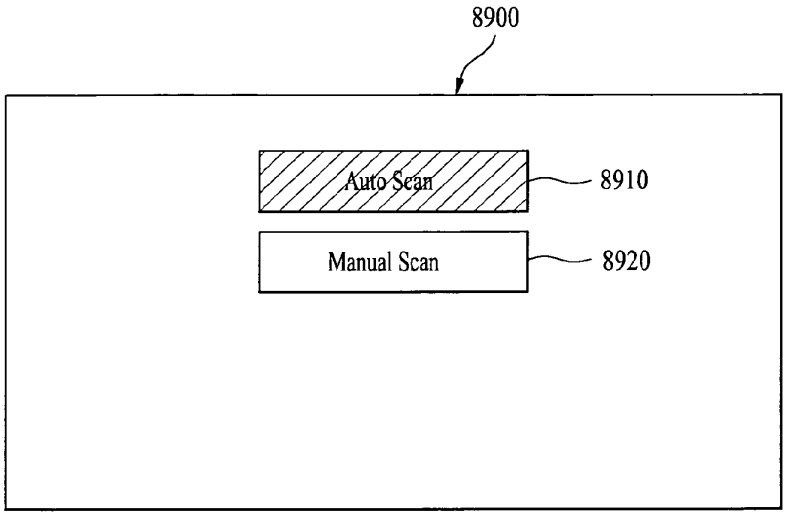

FIG. 90

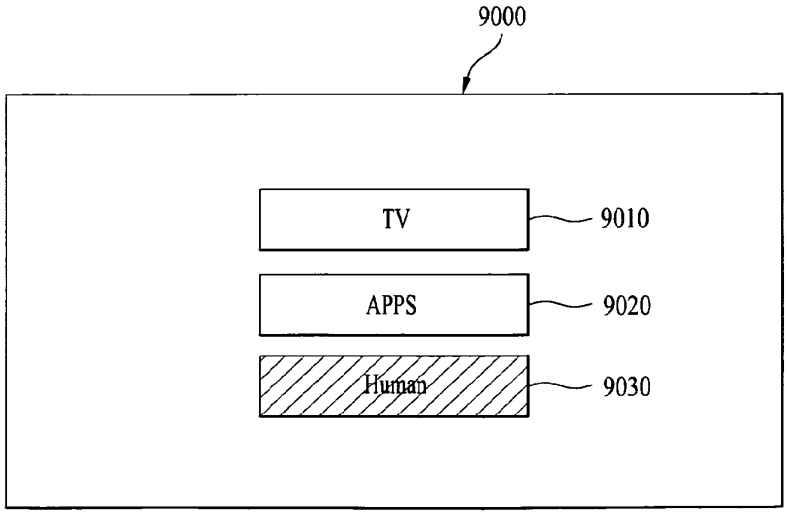

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FIG. 91

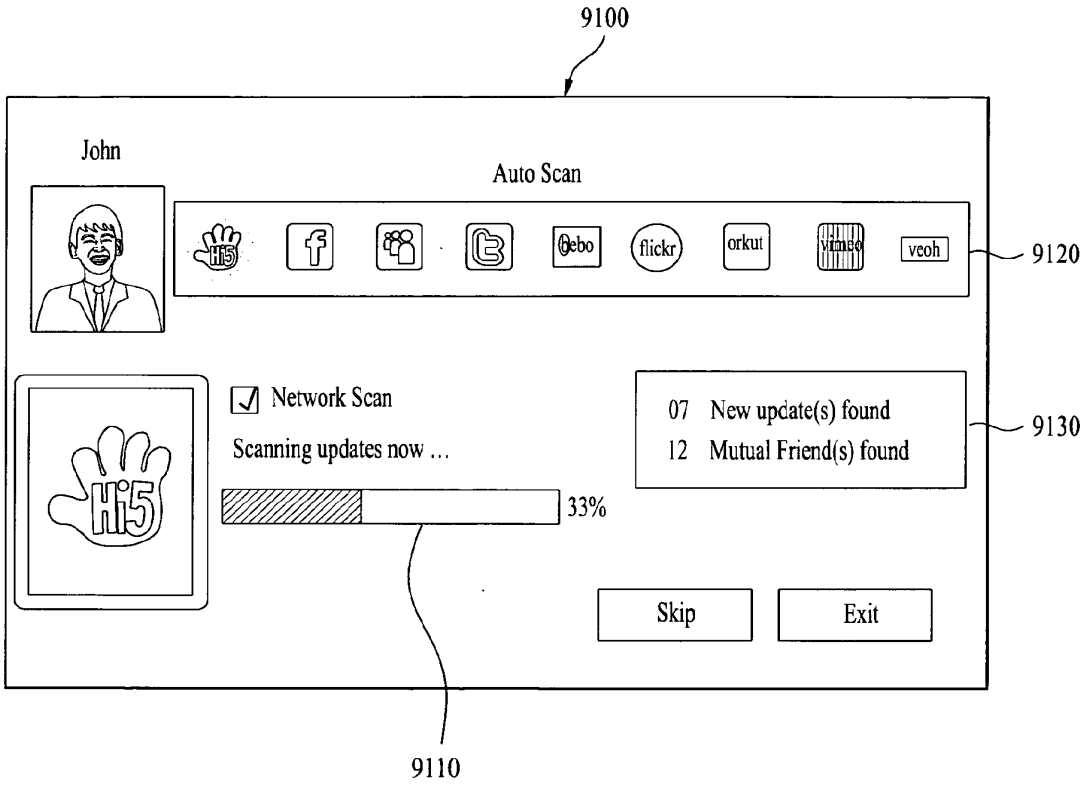
9100
John
Auto Scan
hi5
bebo
flickr
orkut
vimeo
veoh
9120
Network Scan
Scanning updates now ...
33%
07 New update(s) found
12 Mutual Friend(s) found
9130
Skip
Exit
9110

FIG. 92

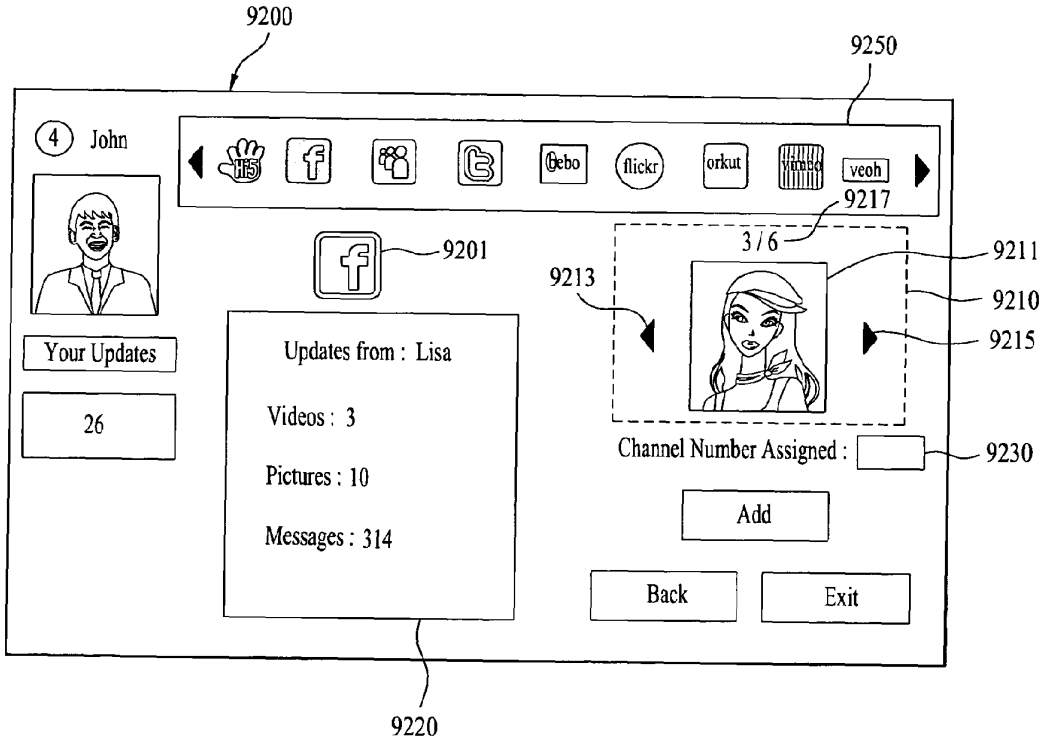

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FIG. 93

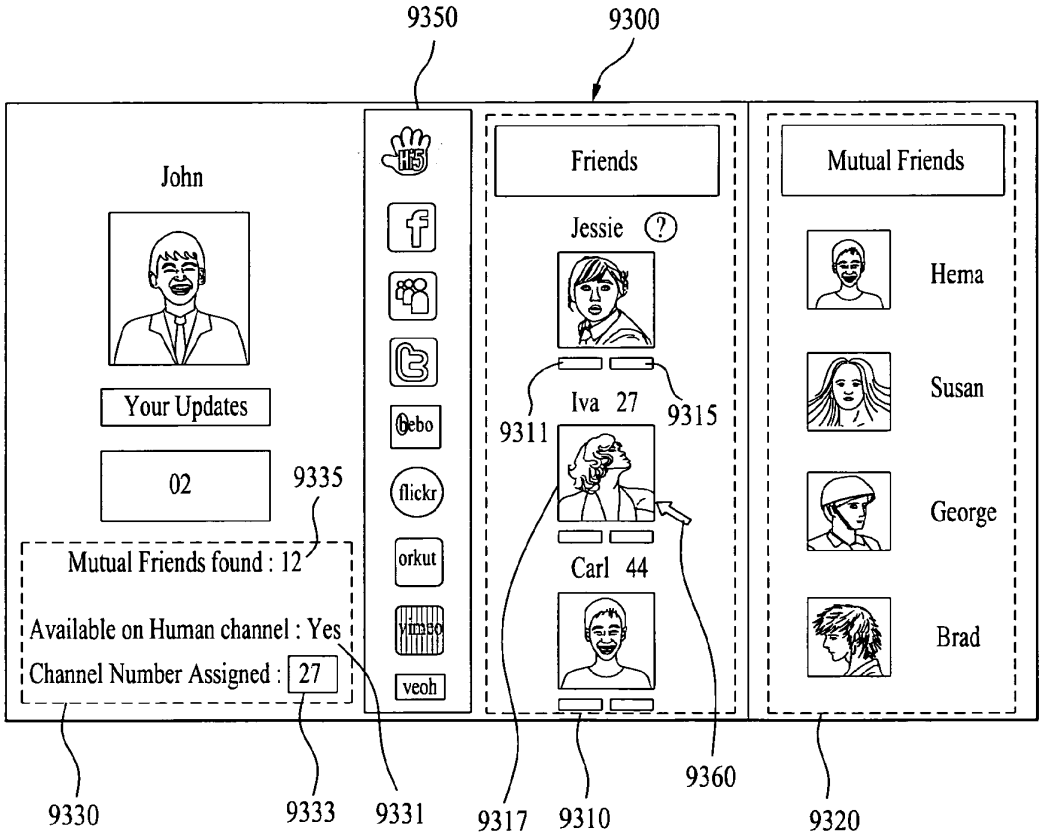

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FIG. 94

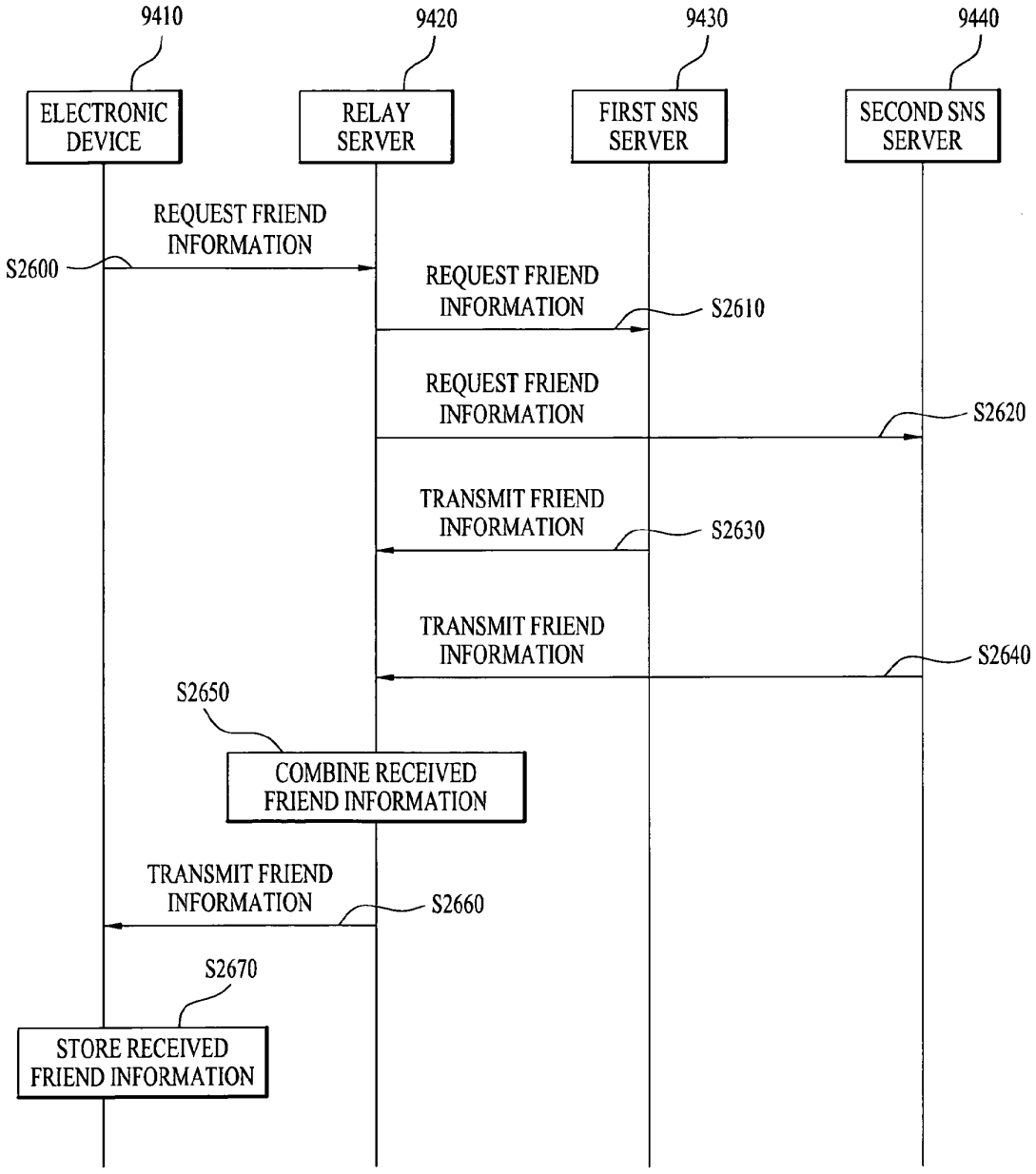

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FIG. 95

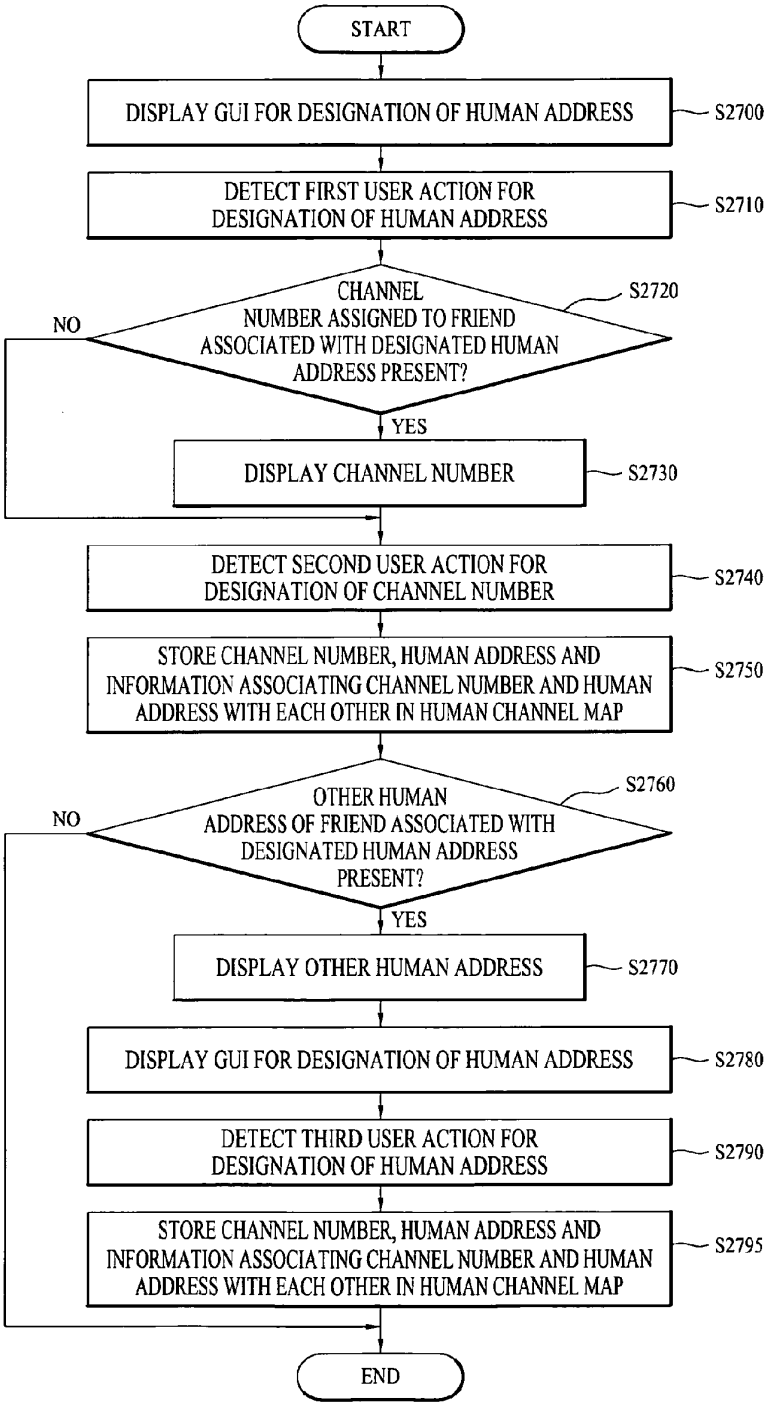

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FIG. 96

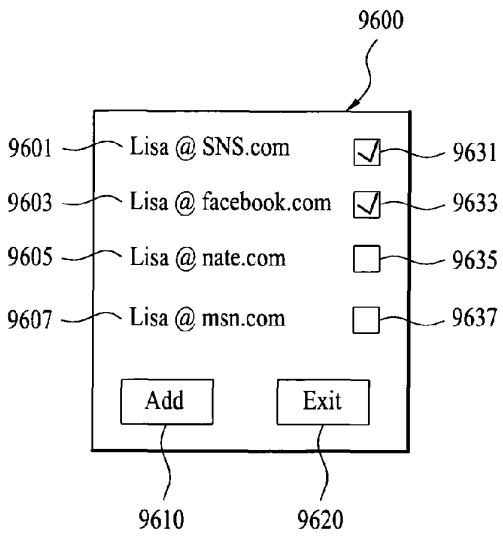

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FIG. 97

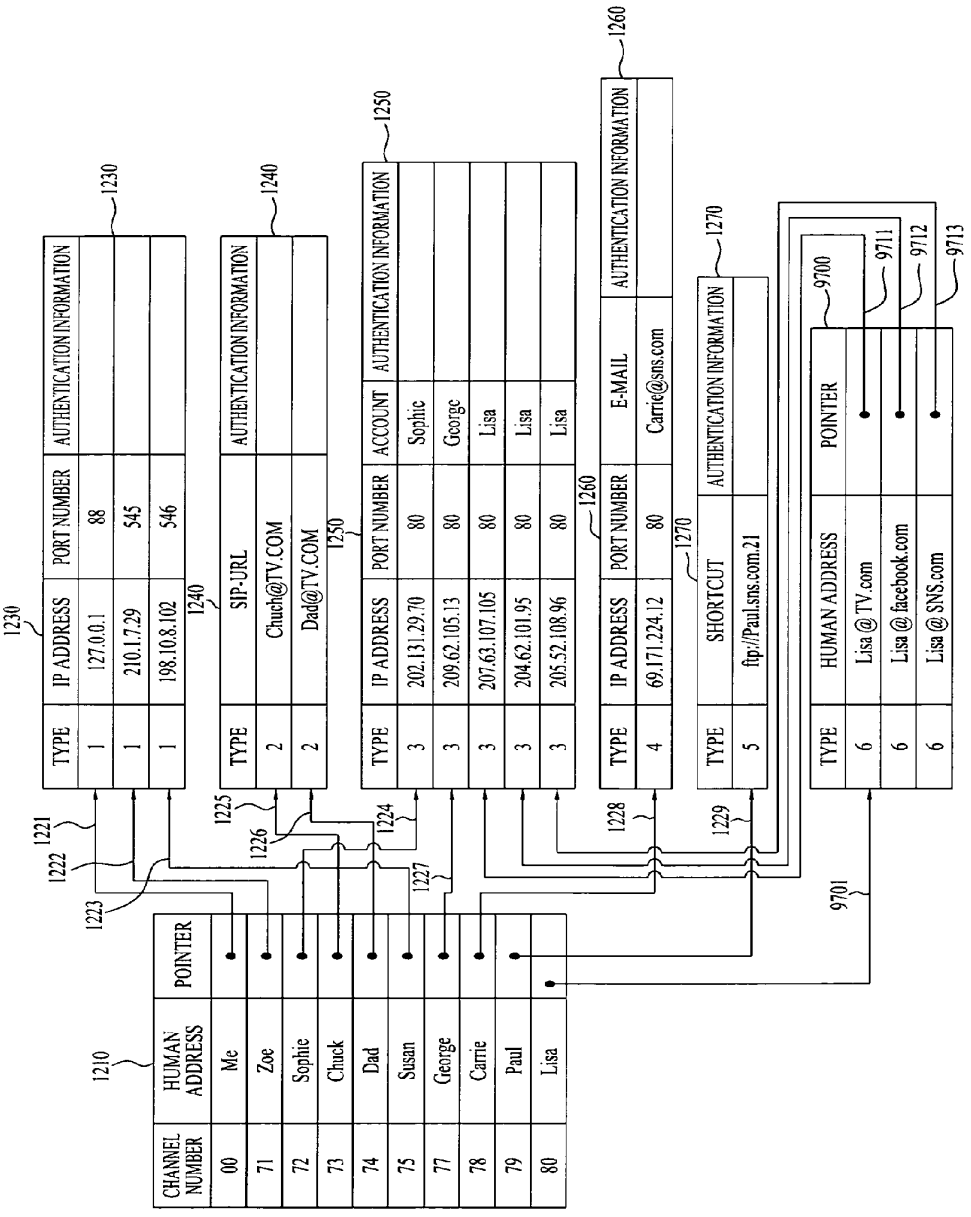

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FIG. 98

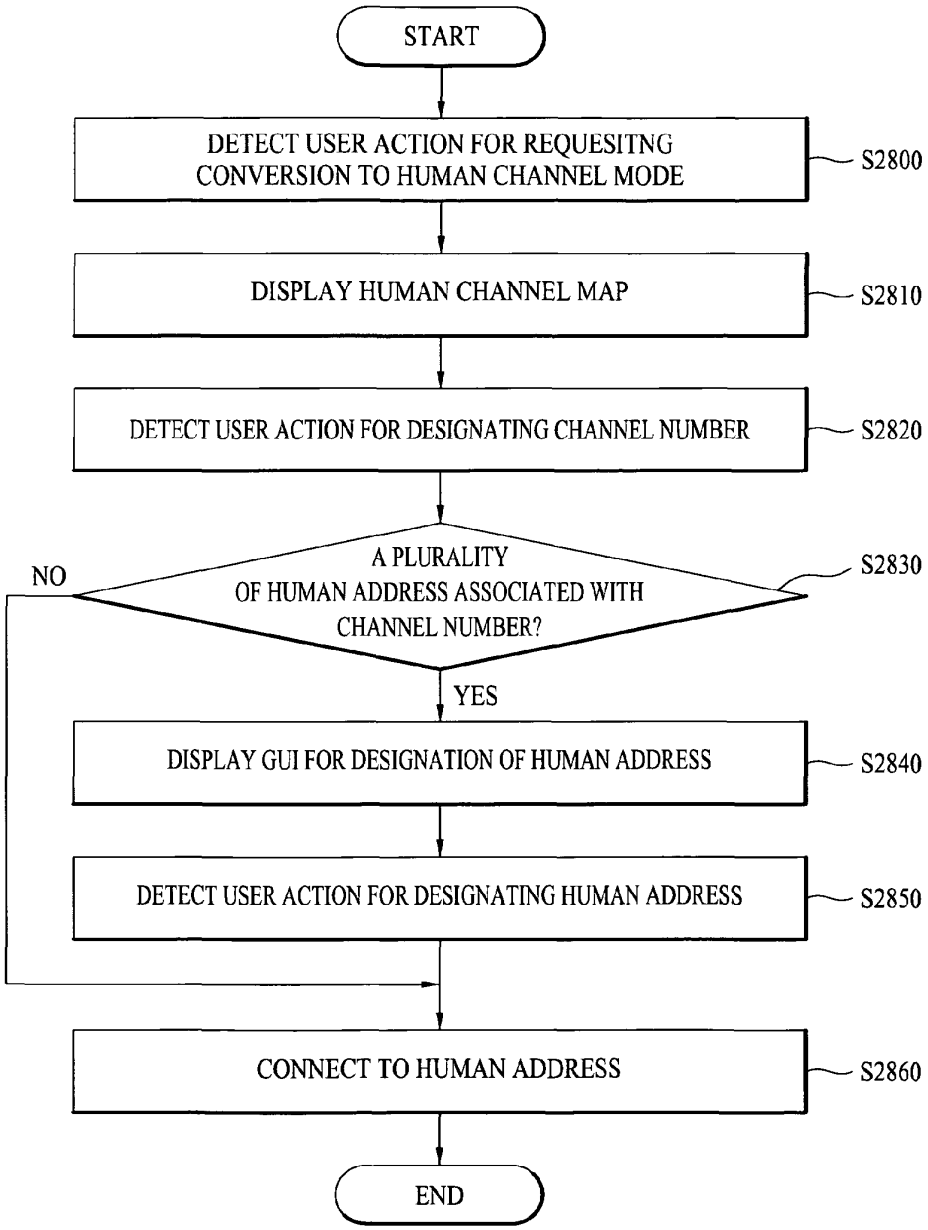

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FIG. 99

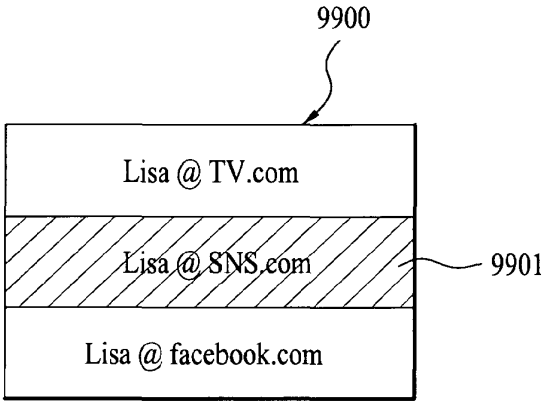

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FIG. 100

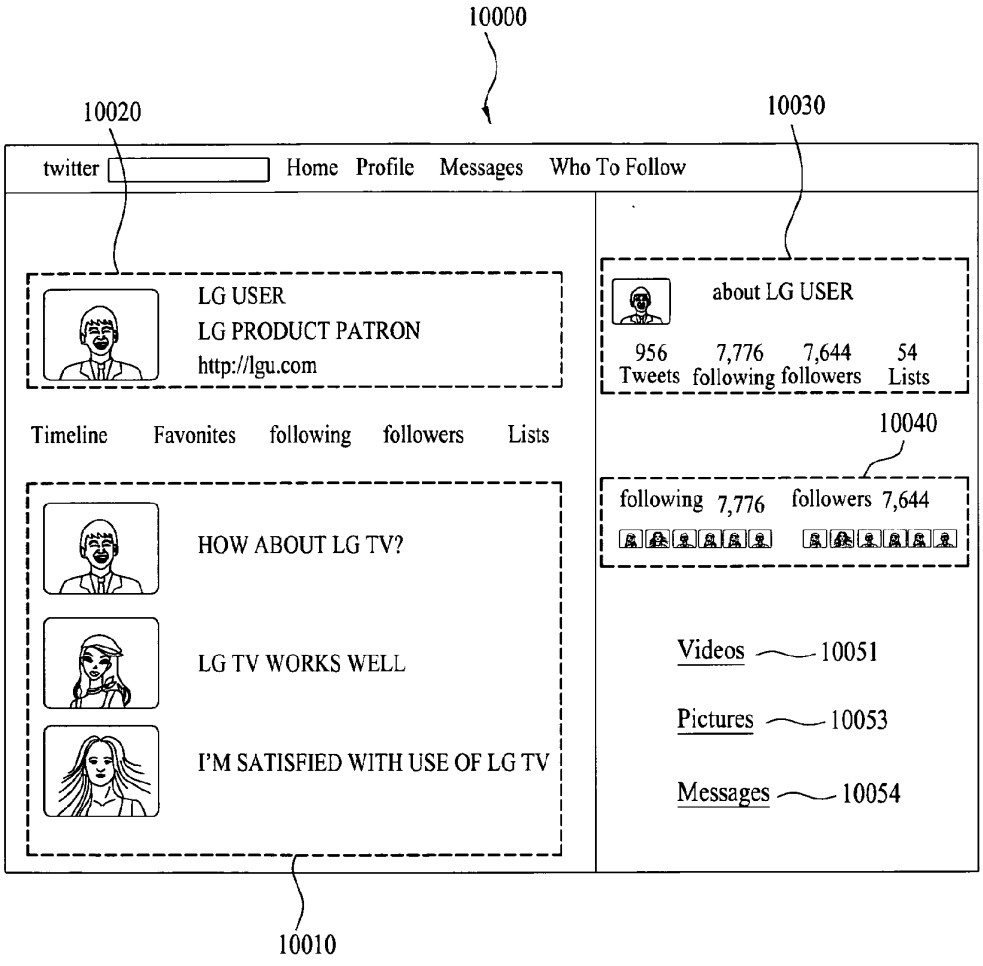
10000
10020
10030
twitter
Home Profile Messages Who To Follow
LG USER
LG PRODUCT PATRON
http://lgu.com
about LG USER
956 Tweets
7,776 following
7,644 followers
54 Lists
Timeline Favonites following followers Lists
10040
following 7,776 followers 7,644
HOW ABOUT LG TV?
LG TV WORKS WELL
I'M SATISFIED WITH USE OF LG TV
Videos 10051
Pictures 10053
Messages 10054
10010

FIG. 101

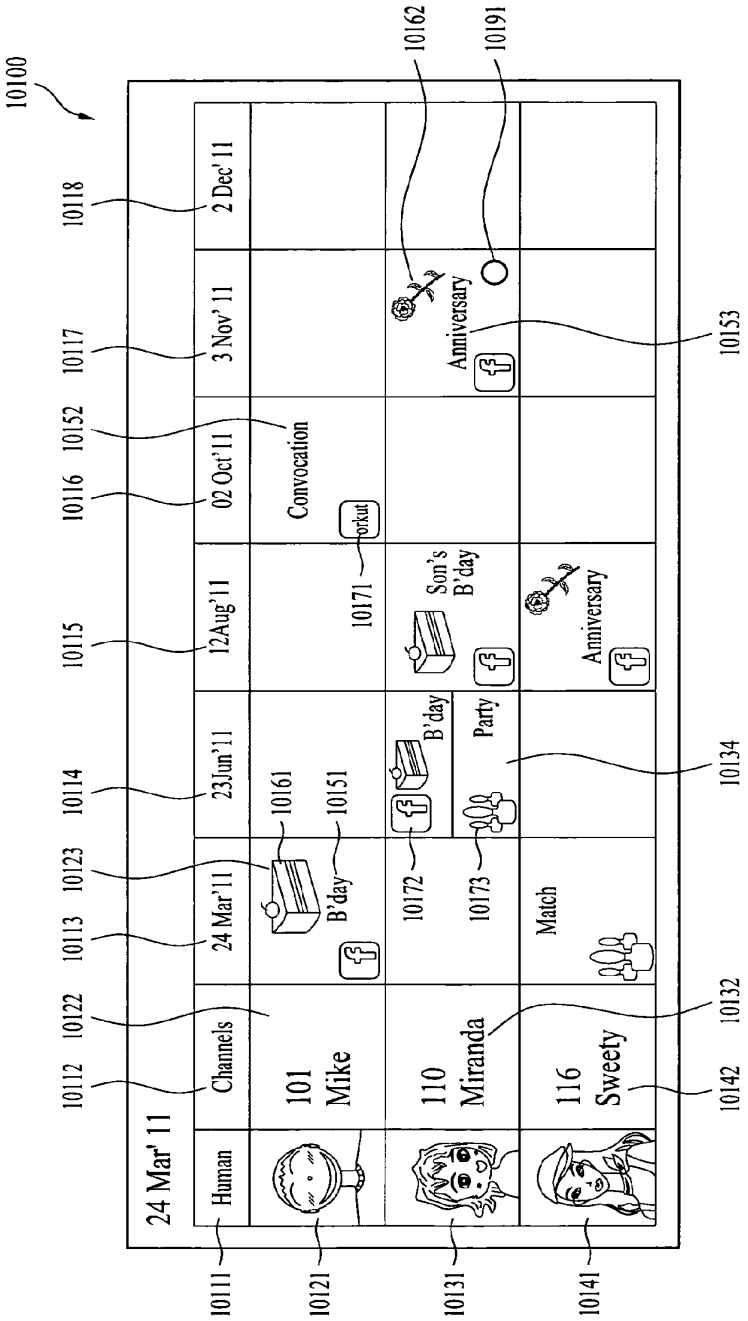

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FIG. 102

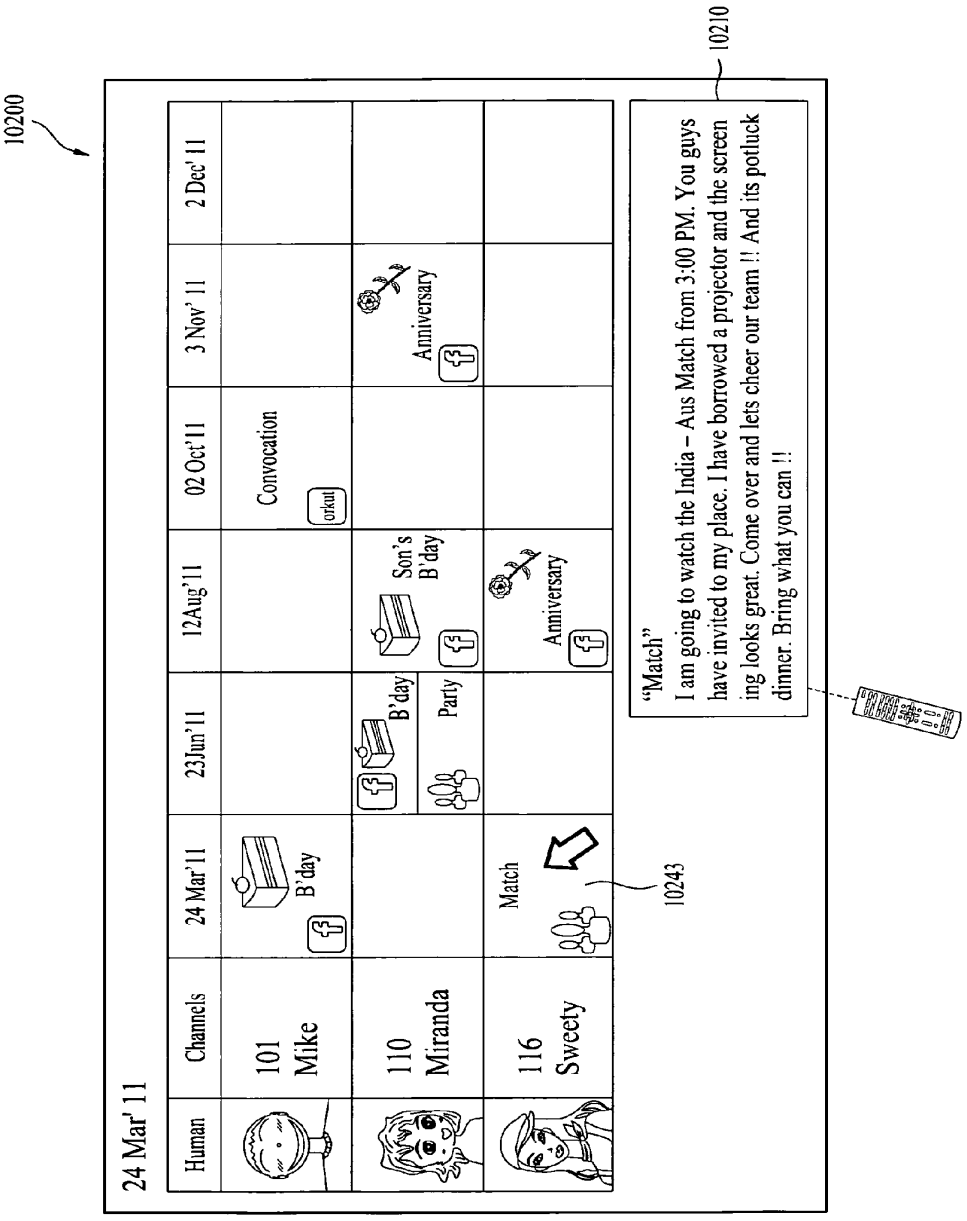
10200
24 Mar' 11
Human
Channels
24 Mar'11
23Jun'11
12Aug'11
02 Oct'11
3 Nov' 11
2 Dec' 11
101 Mike
B'day
Convocation
orkut
110 Miranda
B'day
Party
Son's B'day
Anniversary
116 Sweety
Match
Anniversary
10243
"Match"
I am going to watch the India – Aus Match from 3:00 PM. You guys have invited to my place. I have borrowed a projector and the screen ing looks great. Come over and lets cheer our team !! And its potluck dinner. Bring what you can !!
10210

FIG. 103

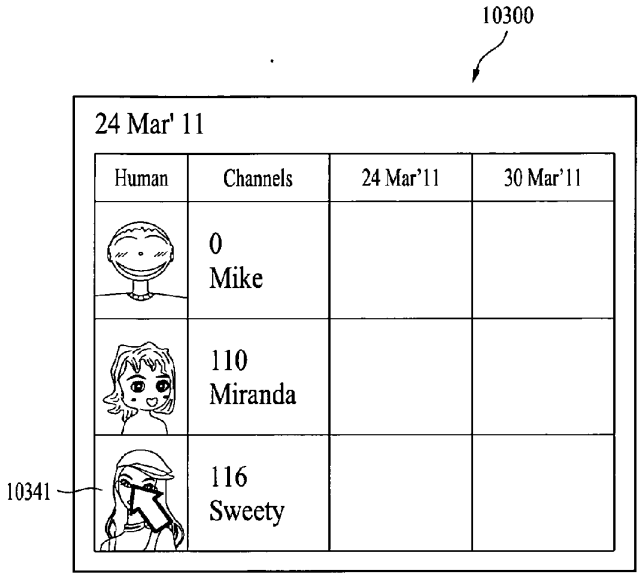
10300
24 Mar' 11
Human
Channels
24 Mar'11
30 Mar'11
0
Mike
110
Miranda
116
Sweety
10341

FIG. 104

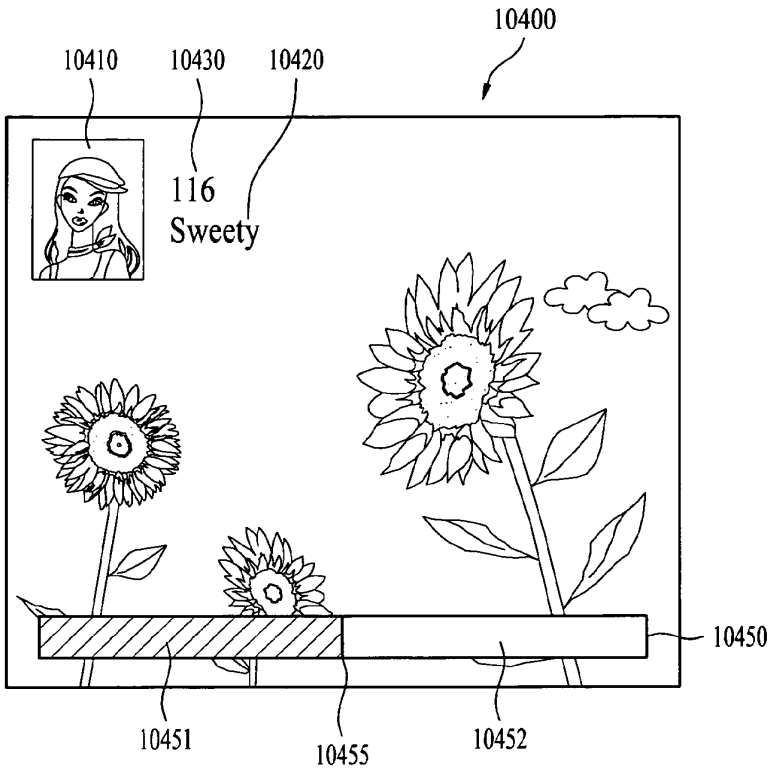

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FIG. 105

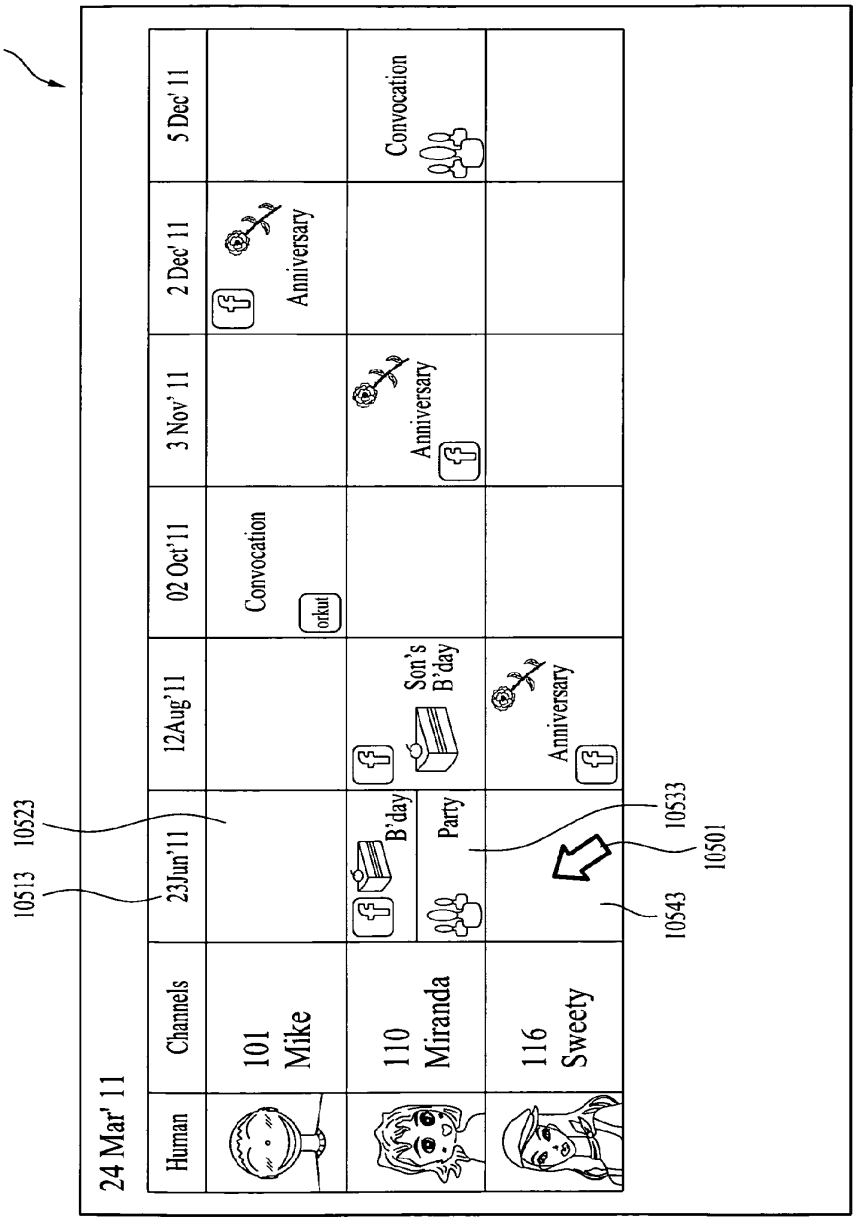

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FIG. 106

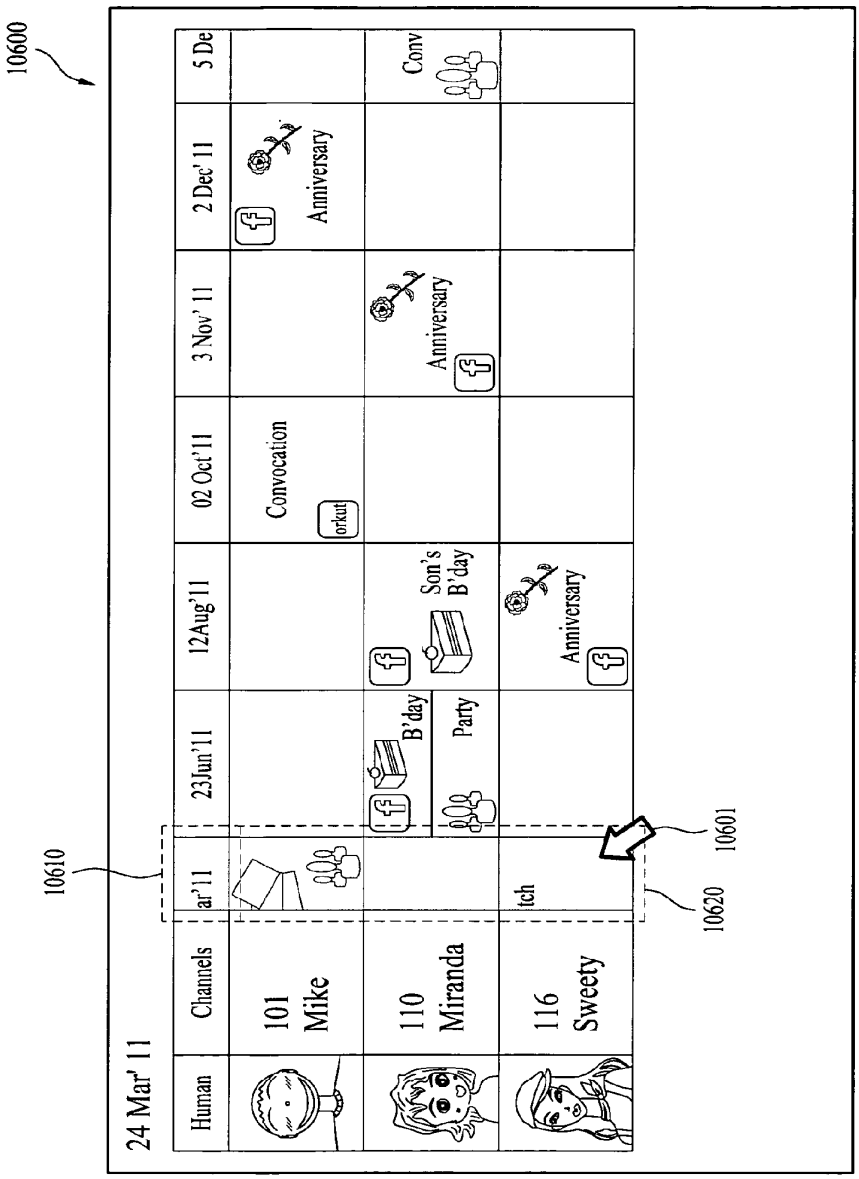

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FIG. 107

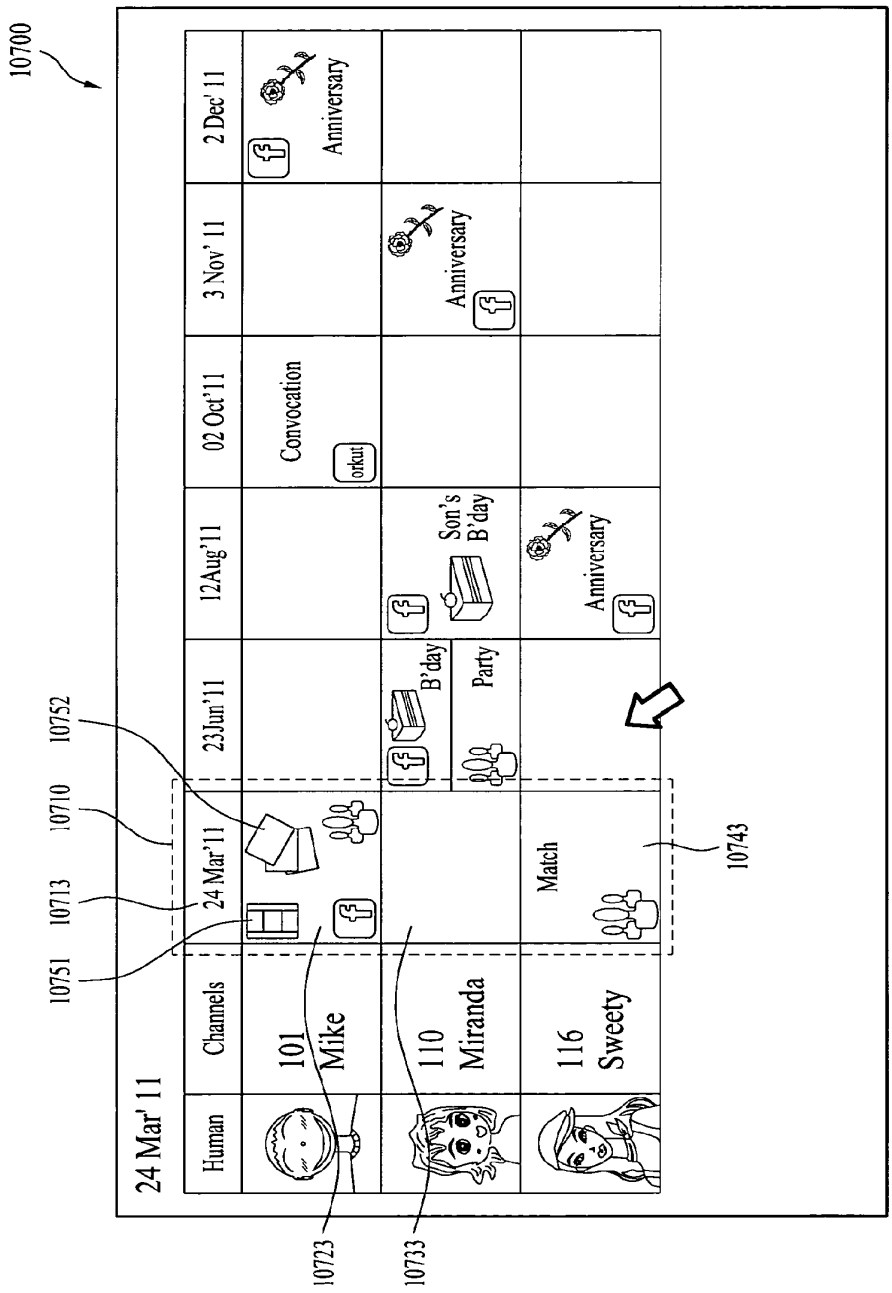

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FIG. 108

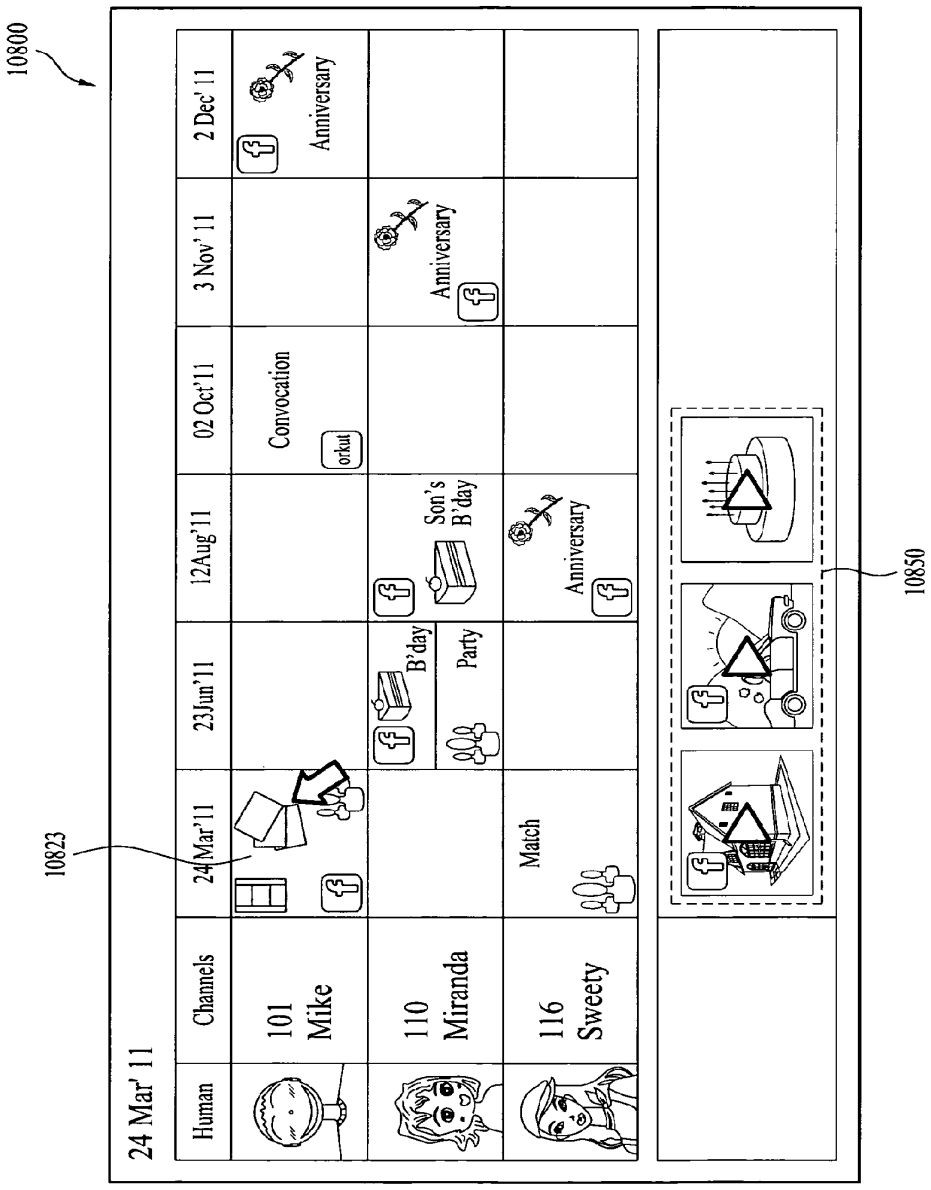

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FIG. 109

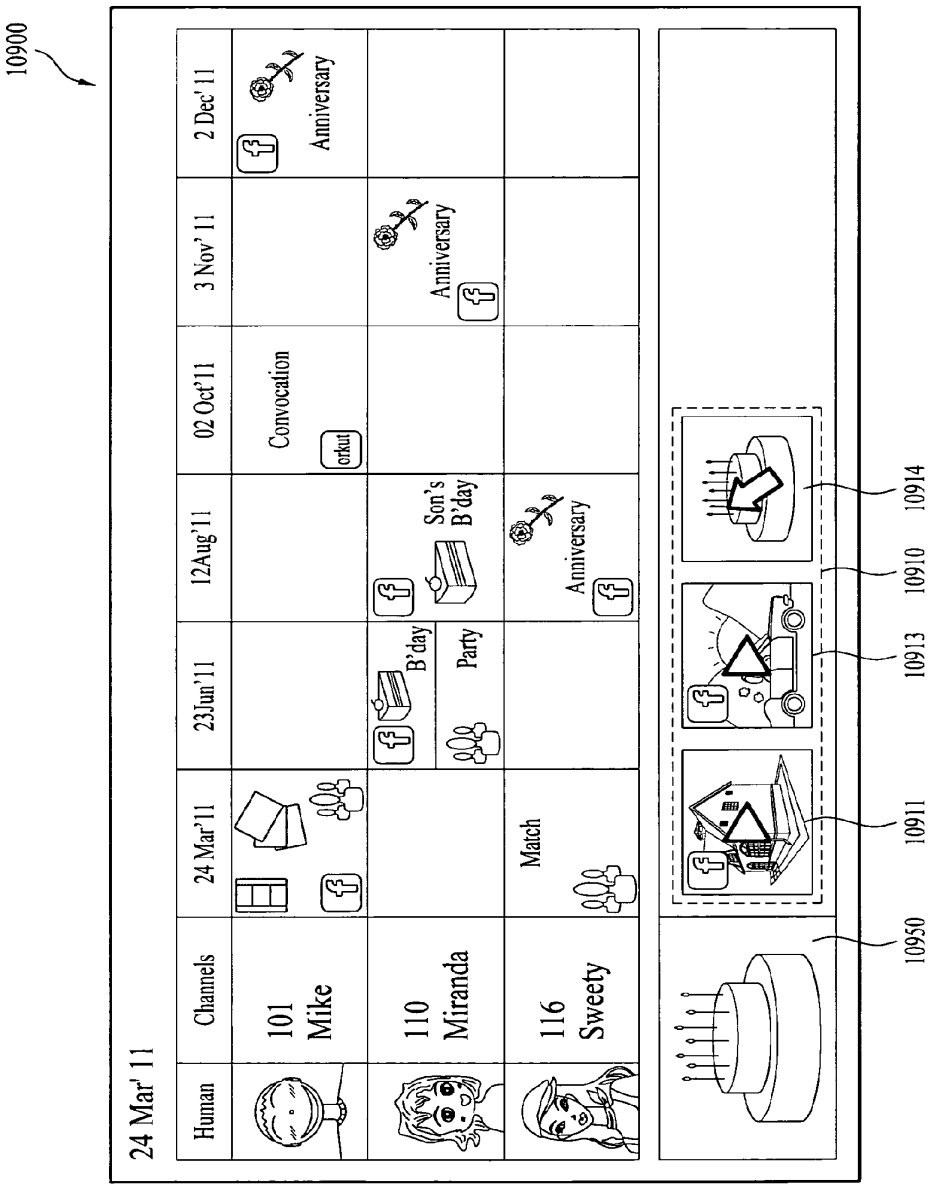

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FIG. 110

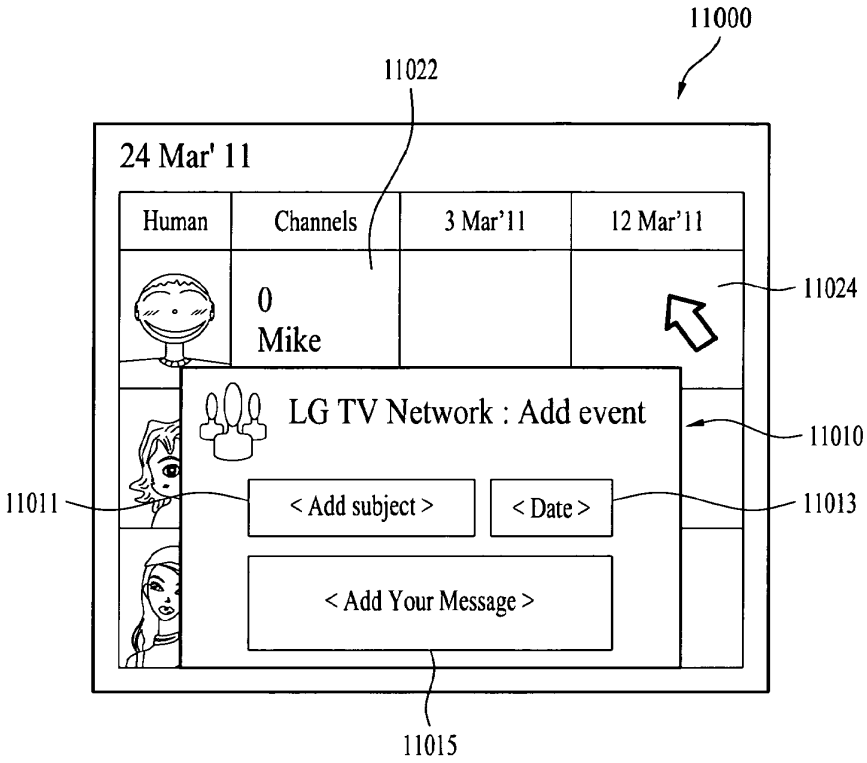

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FIG. 111

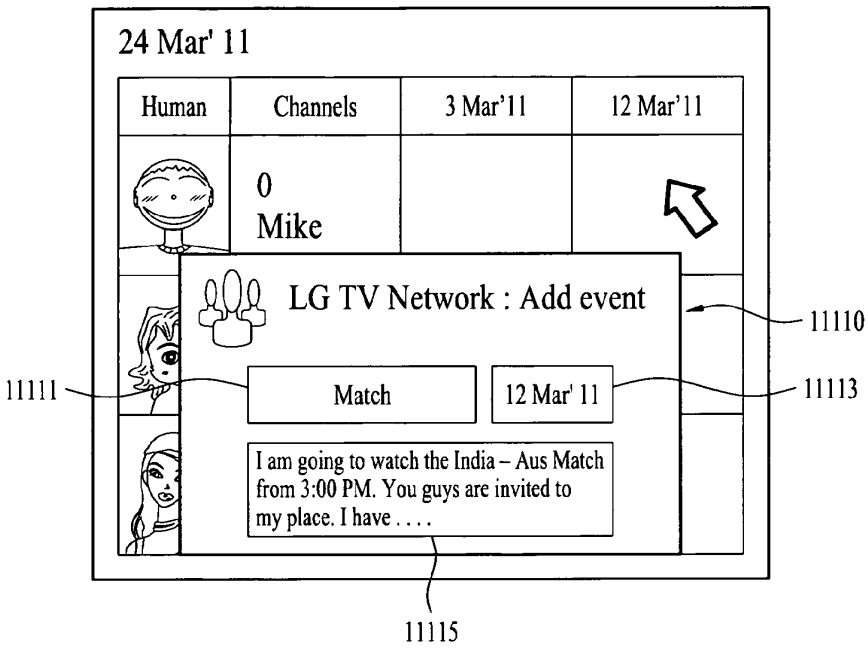

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FIG. 112A

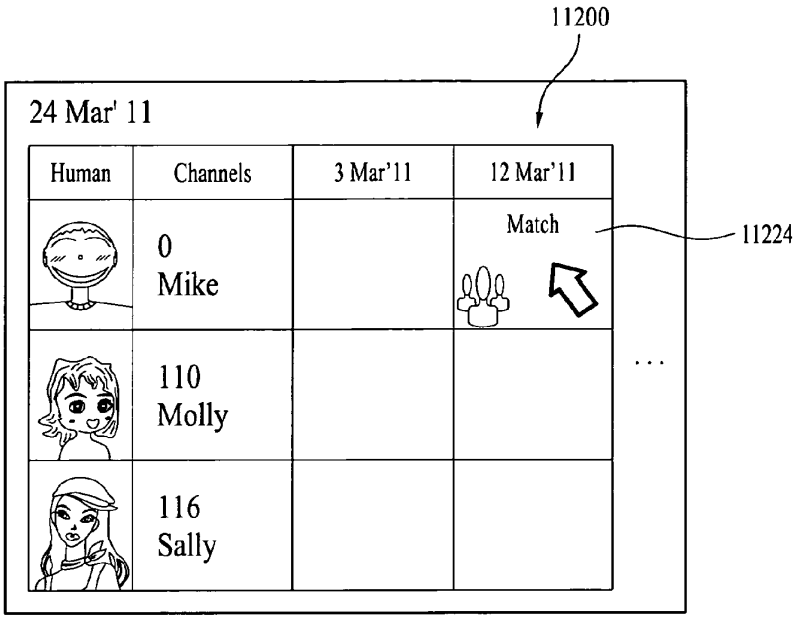

FIG. 112B

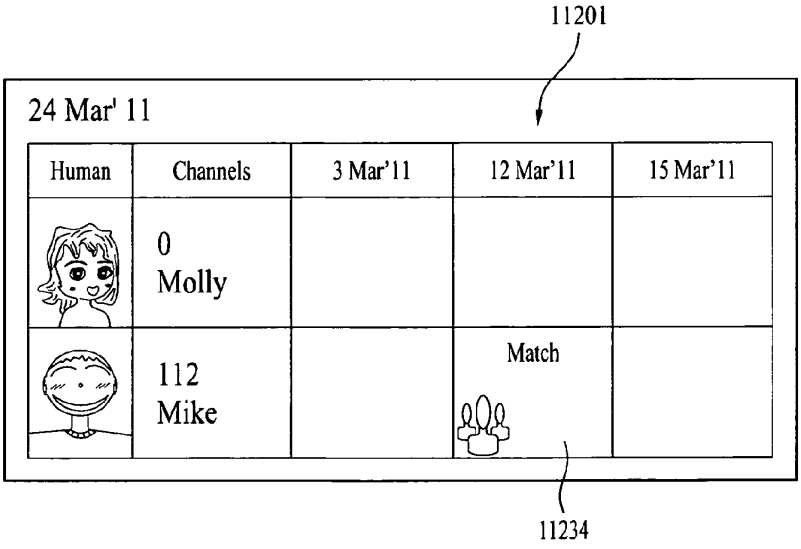

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FIG. 113

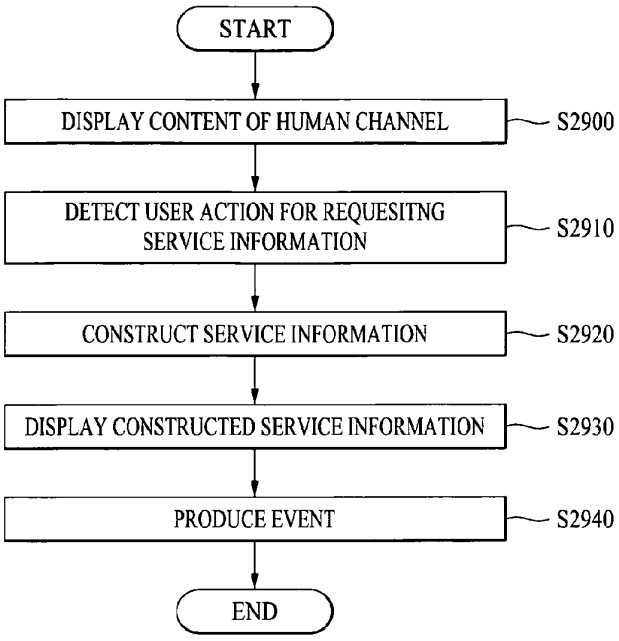

FIG. 114

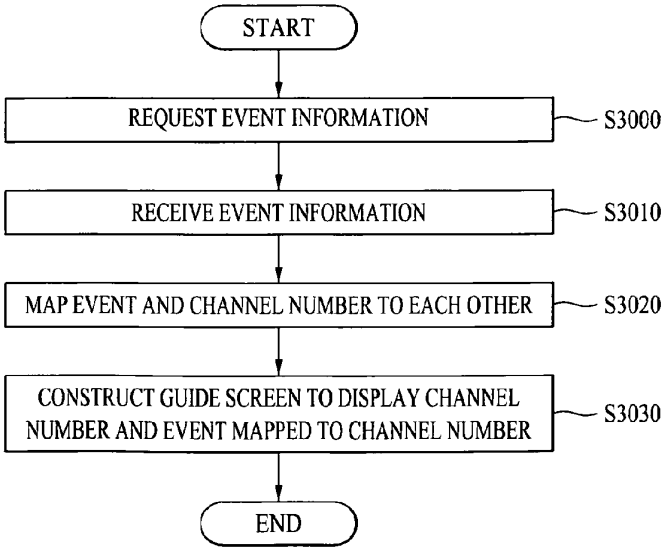

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FIG. 115

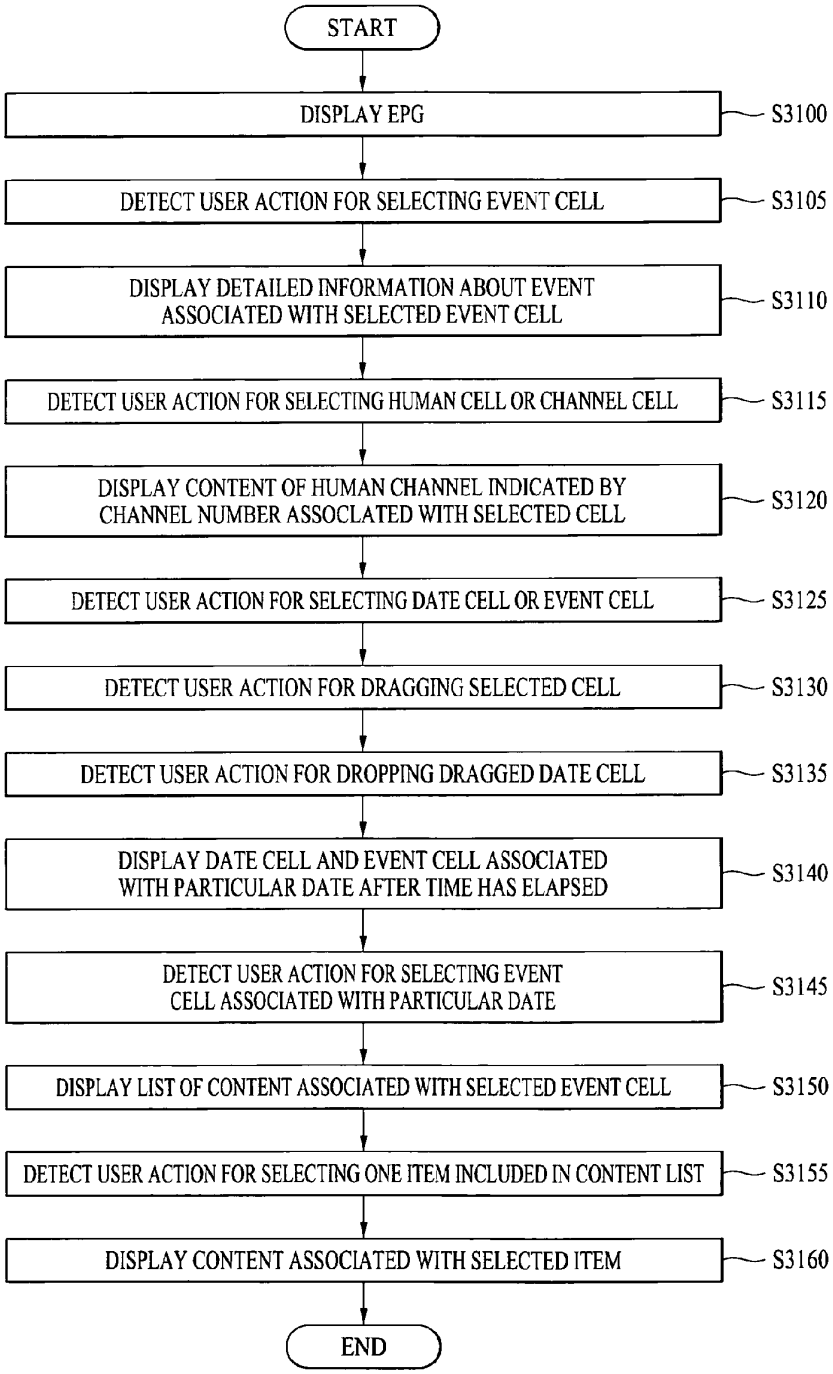

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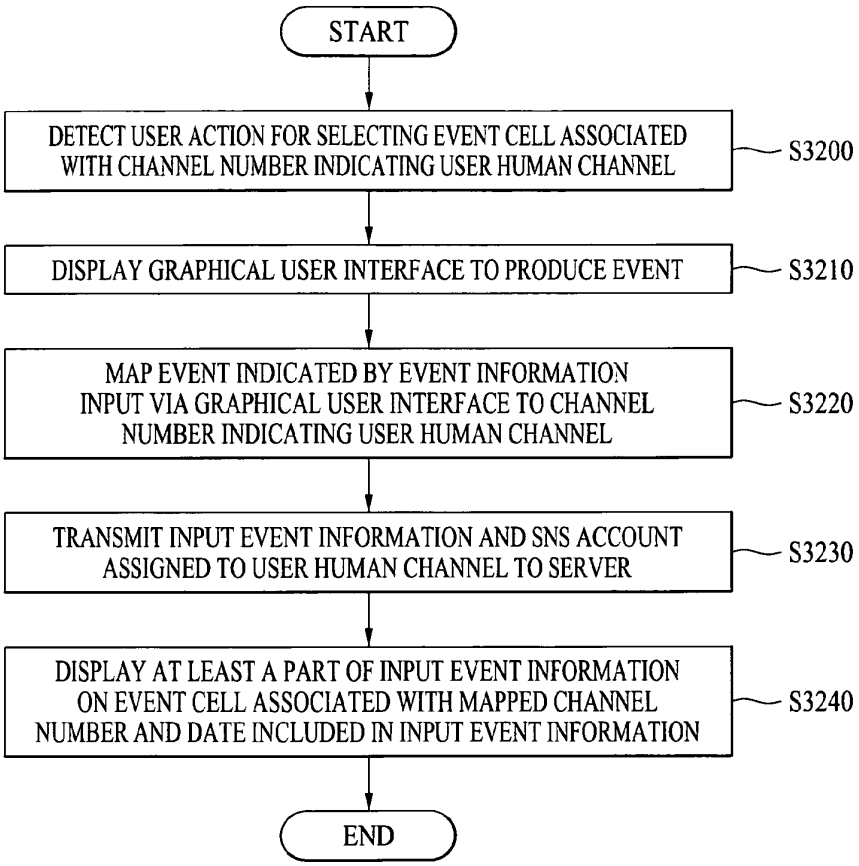
FIG. 116



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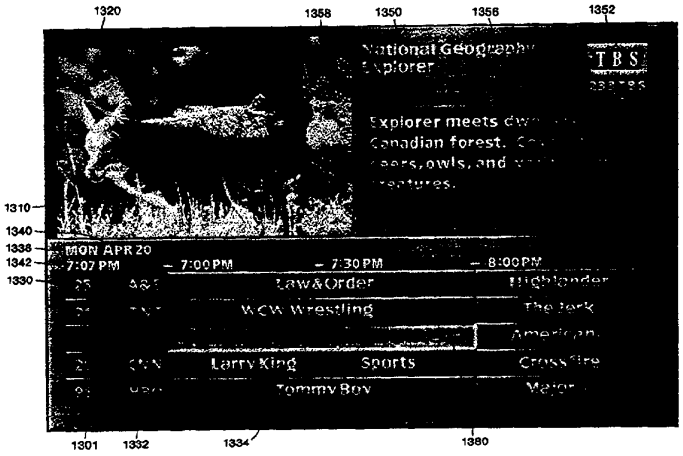
(54) Title: A METHOD AND APPARATUS FOR DISPLAYING AN ELECTRONIC PROGRAM GUIDE



(57) Abstract

A method and apparatus for channel surfing while using an electronic program guide (1301) are provided. A multiple channel broadcasting system is tuned to a first channel to provide a display of a broadcast of a first program on a screen. An electronic program guide (1301) is displayed that identifies a plurality of channels and programming on the channels. A first display information packet (1302) containing a description of the first program is displayed with the electronic program guide. A system pointer is manipulated in response to input by the user to an area of the electronic program guide associated with a second program. The display of the first display information packet (1302) is subsequently replaced with a display of a second display information packet containing a description of the second program. A method for providing a status indication of a tuner and a pointer in a multiple channel broadcasting system are also provided.

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A METHOD AND APPARATUS FOR DISPLAYING AN ELECTRONIC PROGRAM GUIDE

FIELD OF THE INVENTION

The present invention relates to the presentation of channel, program, and broadcast information for a multiple channel television broadcast system.

BACKGROUND OF THE INVENTION

Television broadcasting technology has improved tremendously since its inception. Today, television signals are broadcasted on the airwaves, through cables, and via satellite. The number of stations accessible today has increased to hundreds of stations. To select a program to view, many viewers simply "channel surf" until they find a channel that has a desirable program. Channel surfing refers to the process of using the channel "+" or "-" key to sequentially view each channel. Although some viewers find channel surfing among hundreds of stations enjoyable, most viewers prefer a more direct method for selecting a program to view.

Some prior art television channel selection guides provide a television channel selection guide which displays a listing of the channels typically in numeric order and the titles of the programs broadcasted or to be broadcasted on the channels. A simplified block diagram of such a guide is illustrated in Figure 1. The viewer or user of the system may then select the channel by entering in the channel number or selecting a program. The system responds by removing the guide displayed and tuning to the station selected and displaying the broadcast signals of the station.

This system has a number of drawbacks. First, the guide provides only the title of the program. To get additional information, such as a written description of the program, the user must select an information button which responds by bringing up a second layer of the menu having the program description. Thus, as the number of

stations increase, the efficiency of reviewing programs and program descriptions decreases.

Furthermore, many viewers prefer to preview an actual broadcast on a station before selecting that station for viewing. In the prior art systems, the user has to select each station to view, and subsequently go back to the channel guide in order to view program titles on other channels. While other prior art systems may provide a program listing having a transparent background superimposed over a program broadcast, it is still difficult to view the program broadcast through the program listing.

Moreover, in any television system a user can channel surf by skipping from channel to channel in sequence using the channel "up" or "down" buttons. However, when channel surfing in the prior art systems, the user is unable to take advantage of the channel listing and program description information. While some prior art television channel selection guides allow for channel surfing while the guide is displayed, these systems change the channel as the user moves a selection device or pointer to each new channel. Again this prevents taking full advantage of the broadcast system guide because, while the system guide provides program descriptions, a user might like to view a particular channel while surfing among the program descriptions of other channels.

Another shortcoming of prior art television channel selection guides is that, while providing the current time on the guide display, they do not provide a clear representation of the current time in relation to the channel program listings. Consequently, it is difficult for a user to ascertain the amount of time elapsed since a particular program began.

In the current generation of broadcasting technology, a viewer is provided with many options regarding programs that are available for broadcast. These options include, but are not limited to, on-demand selection of pay-per-view broadcasts, selection of a broadcast for automatic recording, and programming a broadcast system to tune to a preselected station at a designated time. As the number of options

increases, so to does the need for a user-friendly system interface. The prior art channel selection guides do not provide a ready status indication as part of the channel selection guide. In addition, as the channel selection guides become more interactive and provide the viewer with more selections, the lack of status displays for system pointers and tuners can lead to a great deal of viewer frustration.

SUMMARY OF THE INVENTION

A method and apparatus for displaying programming information by translating the display of a broadcast of a program are provided. According to one aspect of the invention, a multiple channel broadcasting system is tuned to a channel to provide a display of a broadcast of a program on a screen. Programming information is displayed that identifies channels in the broadcasting system. When displaying the programming information, the display of the program broadcast is translated to a smaller broadcast window on the screen. The translation comprises two steps. One step superimposes at least one of a series of successively smaller broadcast window outlines over the display of the broadcast on the screen. Another step displays the broadcast in the smaller broadcast window. Therefore, the programming information is displayed along with the program broadcast on the screen such that no portion of the broadcast is covered by the programming information. Thus, a viewer has an unobstructed view of the selected program while simultaneously accessing the channel program selections of the programming information. The programming information includes an electronic program guide, a display information packet, an electronic category guide, and an electronic subcategory guide.

A method and apparatus for channel surfing while using an electronic program guide are provided. According to one aspect of the invention, a multiple channel broadcasting system is tuned to a first channel to provide a display of a broadcast of a first program on a screen. An electronic program guide is displayed that identifies a plurality of channels and programming on the channels. A first

display information packet containing a description of the first program is displayed with the electronic program guide. The broadcast system displays a system pointer. The system pointer is manipulated in response to input by the user to an area of the electronic program guide associated with a second program. The display of the first display information packet is subsequently replaced with a display of a second display information packet containing a description of the second program. The broadcast system remains tuned to the first program while the user views program information for a second program on a second channel.

A method and apparatus for providing a status indication of a tuner and a pointer in a multiple channel broadcasting system are also provided. According to one aspect of the invention, the multiple channel broadcasting system is tuned to a channel to provide a display of a broadcast of a program on a screen. An electronic program guide is generated that identifies a plurality of channels and programming on the channels. A system pointer is supplied that points to a location in the electronic program guide that identifies a channel program in the broadcasting system. An indication is provided to the user as to the status of the broadcasting system tuner and the system pointer. The status is indicated by displaying a program block of a corresponding program on the electronic program guide as appearing to be depressed into the screen when the broadcasting system is tuned to the channel program. The status is indicated by displaying a program block of a corresponding program on the electronic program guide as appearing to be protruding from the screen when the broadcasting system is not tuned to the channel program. The status is indicated by displaying a program block of a corresponding program as highlighted when the system pointer is pointing to the channel program. The status is indicated by displaying a program block of a corresponding program as unhighlighted when the system pointer is not pointing to the channel program.

These and other features, aspects, and advantages of the present invention will be apparent from the accompanying drawings and from the detailed description and appended claims which follow.

BRIEF DESCRIPTION OF THE DRAWINGS

The objects, features, and advantages of the present invention will be apparent to one skilled in the art from the following detailed description in which:

Figure 1 is a simplified illustration of a prior art direct digital satellite system guide display.

Figure 2 is a simple illustration of one embodiment of the present invention.

Figure 3 is a block diagram representation of the elements utilized in the receiver of the television signals.

Figure 4 is a representation of a remote control utilized to tune television stations in accordance with the teachings of the present invention.

Figure 5 is a simplified block diagram of the circuitry utilized in a remote control device.

Figure 6 illustrates the type of data utilized to present the electronic program guide in accordance with the teachings of the present invention.

Figure 7 illustrates the pointers to the data utilized to generate the electronic program guide in accordance with the teachings of the present invention.

Figure 8 illustrates the Master Guide presented to enable the viewer to view programming that is broadcast and is to be broadcast.

Figures 9A, 9B and 9C illustrate one embodiment of the present invention in which a broadcast audio and video is displayed behind the Master Guide.

Figure 10 is an exemplary flowchart illustrative of translating a display to a small window in one embodiment of the present invention.

Figure 11 illustrates a broadcast display in one embodiment of the present invention.

Figure 12 illustrates superimposing successively smaller broadcast window outlines over a broadcast display in the translation of the broadcast window in one embodiment of the present invention.

Figure 13 illustrates the display of an electronic program guide along with a program broadcast on a screen in one embodiment of the present invention.

Figure 14 is an exemplary flowchart that illustrates integrating the translation of a display to a small window with other functions of a broadcast system in one embodiment of the present invention.

Figure 15 illustrates the display of an electronic program guide in one embodiment of the present invention.

Figure 16 is an exemplary flowchart illustrative of the process for optimizing the font size for an available display space in one embodiment of the present invention.

Figure 17 is an exemplary flowchart illustrative of the process for integrating the process of optimization of the font size with other functions of a broadcast system in one embodiment of the present invention.

Figure 18 is an exemplary flowchart illustrative of channel surfing in one embodiment of the present invention.

Figure 19 is an exemplary flowchart illustrative of the process for providing tuner and pointer status display in one embodiment of the present invention.

Figure 20 illustrates the display of an electronic program guide in one embodiment of the present invention.

Figure 21 illustrates the display of an electronic subcategory guide with an electronic program guide in one embodiment of the present invention.

Figure 22 is an exemplary flowchart that illustrates the process for providing an icon to indicate program status in one embodiment of the present invention.

Figure 23 illustrates the display of an electronic program guide having program status icons in one embodiment of the present invention.

Figure 24 is an exemplary flowchart that illustrates a process for providing a time bar with a current time marker in one embodiment of the present invention.

Figure 25 illustrates the display of an electronic program guide having a graphical representation of the current time in relation to the times of channel programming in one embodiment of the present invention.

Figure 26 is an exemplary flowchart that illustrates the process for providing an on-screen menu having differing transparency levels in one embodiment of the present invention.

Figure 27 illustrates the display of an on screen menu having differing transparency levels in one embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

In the method and apparatus of the present invention the broadcast system described is a direct broadcast satellite system. However, it is readily apparent to one skilled in the art that other broadcast systems which have the capability of receiving and displaying a multiplicity of stations may utilize the method and apparatus of the present invention. Furthermore, in the following description, for purposes of explanation, numerous details are set forth, such as menus, flowcharts and system configurations, in order to provide a thorough understanding of the present invention. However, it will be apparent to one skilled in the art that these specific details are not required in order to practice the present invention. In other instances, well known electrical structures and circuits are shown in block diagram form in order not to unnecessarily obscure the present invention.

Figure 2 is a simplified diagram illustrating a Direct Satellite System (DSS). The system has an antenna 3, an integrated receiver/decoder 2 (IRD), a remote controller 5, and a monitor 4. Packets of data are transmitted by a transponder on the satellite. Each transponder transmits data in a time share manner at a predetermined frequency. A tuner 21 of a decoder is tuned in to the frequency of the transponder corresponding to a channel, which is designated by a viewer so that the packets of digital data are received by the decoder.

The antenna 3 receives an encoded data signal sent from a satellite. The received encoded signal is decoded by the IRD. The antenna 3 has a low noise block down converter 3a (LNB). The LNB 3a converts a frequency of a signal sent from the satellite to another frequency. The converted signal is supplied to the IRD 3. The monitor 4 receives a signal from the IRD 3.

Figure 3 is a block diagram of the IRD 3. A radio frequency (RF) signal output from the LNB 3a of the antenna 3 is supplied to a tuner 21 of a front end 20. The output from the tuner 21 is supplied to a quadrature phase shift keying (QPSK) demodulation circuit 22 for demodulation. The output from the QPSK demodulation circuit 22 is supplied to an error correcting circuit 23 for error correction. The data is received in encrypted and encoded (i.e., compressed) form.

The transport IC 24 receives the data stream, consisting of packets of data, from the error correcting circuit 23 and directs portions of the data stream to the appropriate circuit for processing. The digital data stream sent from a satellite includes headers for classifying the different portions of the data in the digital data stream. The transport IC stores the headers in registers and uses the headers to direct the data. The data stream sent from the satellite, includes video data in the format specified by the Motion Pictures Expert Group standard (MPEG), MPEG audio data and electronic programming guide (EPG) data. Data that is identified by its header to be video data is transferred to MPEG video decoder 25. Data that is identified by its header to be audio data is transferred to MPEG audio decoder 26. Similarly, data having a header that identifies the data to be EPG data is transferred to a predetermined area in the data buffer 51 designated to store the EPG.

A conditional access module 33, includes a central processing unit (CPU), a read-only memory (ROM) and a random access memory (RAM). The conditional access module determines whether the user has the authorization to receive certain data, e.g., audio/video for a pay TV station, using the authorization information stored in its memory. Thus, if the conditional access module determines that the user is authorized access, a key to decrypt the incoming data is provided to the transport IC 24, which decrypts the data using the key provided. In one embodiment, a smart card is utilized. This card is inserted into the card reader interface 32 for interface to the transport IC 24. It is readily apparent to one skilled in the art that the

conditional access module is not limited to smart cards and may be configured in other kinds of circuitry.

The MPEG video decoder 25 decodes the video signal received from the transport IC. Dynamic random access memory (DRAM) 25a, connected to the MPEG video decoder 25, is used for buffering and storage of video data during processing by the MPEG video decoder. The decoded digital video signal is supplied to a National Television System Committee (NTSC) encoder 27 and converted to a luminance signal (Y) and a chroma signal (C) which are respectively output through a buffer amplifier 28Y or 28C as an S video signal. A composite video signal is also output through a buffer amplifier 28V.

The MPEG audio decoder 26 decodes the digital audio signal. DRAM 26a, connected to the MPEG audio decoder 26, is used for buffering of data and information during processing by the MPEG audio decoder 26. The decoded digital audio signal is converted into an analog audio signal by D/A converter 30. The left audio signal is output through buffer amplifier 31L and the right audio signal is output through buffer amplifier 31R.

An RF modulator 41 mixes a composite signal output from the NTSC encoder 27 with an analog audio signal output from the D/A converter 30. The RF modulator 41 converts the mixed signal into an RF signal and outputs the RF signal therefrom.

The CPU 29 is the central control mechanism and executes code stored in the ROM 37 to perform certain functions of the system. For example, the CPU processes certain data to control the generation of the program list in accordance with the teachings of the present invention. In addition, the CPU receives and processes the user input, received from the front panel buttons or switches 40 and the photodetector circuit 39 to provide the user functionality and access to the system described herein. In addition, the CPU accesses user settings/preferences for processing of information and configuration

of the system. The user settings are stored in the non-volatile memory, such as electrically erasable programmable read-only memory (EEPROM) 38. In addition, the CPU maintains a list of pointers, stored in static random access memory (SRAM) 36, to the channel information and program information stored in the SRAM 51. Thus, when a user wishes to display a form of the EPG on the screen, the CPU 29, accessing pointers stored in the SRAM 36, communicates to the transport IC 34 to retrieve the data from the data buffer (SRAM) 51 identified by the pointers. The CPU then formulates the format and other digital data which forms the guide or list on the screen and forwards the data representative of the guide/list to the transport IC 34 which forwards the data to the DRAM 25a of the MPEG video decoder 25 for subsequent output to the screen.

Figure 4 shows an example of a remote controller utilized by a user to transmit commands and make program selections in accordance with the teachings of the present invention. **Figure 5** is simplified a block diagram of the remote controller. The remote controller 400 has an infrared originating device 405, a set of operation buttons 410, a CPU 415, a ROM 420 and a RAM 425. The CPU 415 receives a signal sent from an operation button 410 through an input port 430. The signal is processed according to a program stored in the ROM 420. The RAM 425 is used as a working space so as to produce a transmitting code. The transmitting code is sent to the infrared originating device 405 through an output port and converted into an infrared signal. The infrared signal is transmitted to the IRD. The operation buttons 410 include a direction key for designating a pointer direction such as north, south, east and west, an "EPG" key, a "FAVORITE" key, a "SELECT KEY", a "MENU" key, an "EXIT" key, a ten-key numeric keypad and an "ENTER" key. The set of operation buttons 410 enable the user to select programs through the electronic programming guide in accordance with the teachings of the present invention.

Figure 6 is a block diagram illustration of the data stored in a portion of the data buffer RAM 51. As noted above, the RAM 51 stores EPG data including guide data, channel data, and program data. General information is included in the guide data, for example, the current date and time. The transponder list identifies the number of the transponder transmitting a segment. The channel list identifies the channel number of the first channel of a portion of data. The channel data includes data relating to channels, such as the channel number, channel name (i.e., the call sign of a broadcast station), logo ID (i.e., an identification of the channel logo), data ID, which is an identification of a channel number of MPEG video data or MPEG audio data, number of programs, which identifies the number of programs to be transmitted on a channel during a predetermined time frame, and first program offset which identifies the offset from the header to the first channel data in a segment.

The program data includes the program title, start time of the program, time length of the program, program category such as movies, news, sports, etc., program subcategory such as drama, horror, children's movies or baseball, basketball, football for the sports category, the movie rating and program description that provides a detailed description of the program.

Figure 7 illustrates how pointers to the EPG data are sorted for display on a guide on the user's television screen. As noted above, EPG data includes guide data, channel data and program data which are stored in the Data Buffer (RAM) of the IRD (as shown in **Figure 3**). When a viewer selects a channel, the CPU of the system determines the packet containing the channel information and extracts the transponder number from the channel information. The system front end starts tuning in the frequency of the designated transponder so as to receive the data transmitting from that transponder. If a viewer does not select any channel, the last channel is designated.

As noted above, the CPU generates a table of pointers 736 to the EPG stored in the memory. The table 736 is used for changing the order of channels or programs according to the information to be presented in the guide to the user. The table 736 includes an entry for the address pointer to the corresponding channel data and an entry to the corresponding program data.

A table for generating display information is stored in the ROM 37. Certain data from the table is read out from the ROM 37 and stored in DRAM 25a. Preferably the data is stored in compressed form. Therefore, when a character is displayed on a screen, the compressed character array is decoded so as to generate the character to be displayed. The encoder references a dictionary which includes a set of words and frequently used portions of words and numbers corresponding to each word or portion of a word. The encoder encodes each word to each number by using the dictionary. The decoder references the same dictionary as the encoder to perform the decode function. Once decoded, each character of the decoded word includes a character code corresponding to an American Standard Code for Information Interchange (ASCII) code. Nonvolatile memory (e.g., EEPROM 38) has two tables. The first table contains character bitmaps in the different fonts available for each character. The second table identifies the address in the first table at which to extract the character bitmap. The address is determined according to the character code. The bit map image of the character is transmitted to DRAM 25a and subsequently accessed to display the character on the screen.

In one embodiment of the present invention, the channel data is received from a predetermined transponder and the channel number and channel name are stored in DRAM 25a. Additional channel information such as the channel logo is stored in the ROM 36. The ROM 36 preferably includes a table of Logo IDs and the address of Logo Data stored in ROM 36. Therefore, once a Logo ID is

determined, the address of the Logo Data is determined, retrieved and stored in DRAM 25a.

The channel data provides the beginning address of the program data for a particular program. The actual location on the screen at which the program information is displayed is dependent upon the format of the guide. For example, in a time-based system, the location where the program title is displayed is determined by the start time and time length stored in the program data.

Using this information downloaded from the satellite transmission, programming and channel selection information is provided to the viewer. In the system and method of one embodiment of the present invention, this information is provided to the user in an innovative manner in order to enable the viewer to easily determine and select stations or programs to be viewed. For example, **Figure 8** illustrates a Master Guide that provides such information as the channel call sign 810, channel number 815 in the system, the channel logo of the selected station 820, a highlight 825 indicating the location of the system pointer operable by the arrow direction buttons, a program description 830 for the program the system pointer is located at, as well as program time information 835.

This guide is superimposed on the broadcast of channel 840 at which the system pointer is located. Thus, the user not only is provided the television system data showing the television channels, times of programming broadcasts and descriptions of programs, but is also provided the audio and video of one channel, all on the same menu level of the guide. By movement of the pointer 845 (in the present example, by manipulation of the information highlighted), the channel tuned to will change automatically, enabling the user to stay in the menu while still previewing in part the actual channel highlighted on the guide. This process is illustrated by **Figures 9A, 9B, and 9C**. The discussion will now turn to general process flows for an embodiment of the present invention.

It is readily apparent to one skilled in the art that additional functions can be added to the process and functions modified or removed and still be within the spirit and scope of the invention. The system provides an innovative and user friendly access to a wealth of information regarding programming available through the broadcasting system. In the present invention a number of functions are selectable through the remote control device. It is apparent that these functions may be selectable through other devices such as a joystick or other means such as an on screen menu.

Figure 10 is an exemplary flowchart illustrative of translating a display to a small window in one embodiment of the present invention. The resizing process provides innovative feedback to the user while providing the broadcast system time to perform the computations necessary to resize the window. In the present embodiment, the broadcast display is translated to a small window when the user selects to display the electronic program guide. Thus both the broadcast and the electronic program guide are displayed without overlap. It is readily apparent that the window resizing process can be used to resize windows for a variety of purposes.

Referring to **Figure 10**, operation begins at Block 1000, at which a broadcasting system is tuned to a channel to provide a display of a broadcast of a program. The broadcast window corresponds to the entire display. **Figure 11** illustrates a broadcast display 1102 in one embodiment of the present invention. It is readily apparent that the window size need not initially correspond to the entire display but can be some portion of the display. Operation continues at Block 1002, at which a series of successively smaller broadcast window outlines are superimposed over the program display when it is desirable to translate to a smaller window. **Figure 12** illustrates superimposing these successfully smaller broadcast window outlines 1202-1210 over a broadcast display 1201 in the translation of a broadcast window in one embodiment of the present invention. With reference to **Figure 12**,

outline 1202 is displayed first, followed by outlines 1204, 1206, 1208, and 1210, respectively. Preferably, outline 1202 is shorter in length and narrower in width than the screen perimeter 1220, although it is contemplated that the outlines can progress in one dimension. Each of outlines 1204, 1206, 1208, and 1210 is shorter in length and narrower in width than the preceding outline, respectively.

Referring again to **Figure 10**, operation continues at Block 1004, at which the program display is translated to a smaller broadcast window. Preferably the size of the broadcast window is not changed until the size of the smallest superimposed broadcast window outline equals a predetermined smallest broadcast window size. In an alternate embodiment, the size of the broadcast window changes as the size of the outline changes.

Operation continues at Block 1006, at which programming information in the form of an electronic program guide is displayed on the screen with the broadcast on the screen such that no portion of the broadcast is covered by the electronic program guide. In an alternate embodiment, programming information is displayed performed prior to the translation of the program broadcast.

Figure 13 illustrates one embodiment of a display of an electronic program guide 1301 with the program broadcast 1310 on a screen 1320. The electronic program guide 1301 includes the broadcast channel number 1330, the broadcast network identification 1332, the program title 1334, the start and end times for a program 1336, the current day 1338, the current date 1340, and the current time 1342. It is readily apparent that other embodiments of displays of electronic program guides presenting different information may be utilized.

Referring to **Figure 13**, a user is able to readily view not only the broadcast audio and video, but also the electronic program guide of programming and the program description. A display information packet 1302 containing a description of the program broadcast may be

displayed with the electronic program guide 1310. The display information packet 1302 also contains the program title 1350, the broadcast network identification 1352, the broadcast channel number 1354, the start and end times of the program 1356, and the program rating 1358. Alternatively, the user may selectively replace the display of the display information packet 1302 with the display of an electronic category guide. The electronic category guide contains a listing of programming categories.

After viewing the programming selections on the electronic program guide, a viewer may deselect the electronic program guide display. The electronic program guide display is also deselected upon selection of a channel by the user. Upon deselection of the electronic program guide, the broadcast system translates the broadcast of a program displayed in the small window by superimposing a series of successively larger broadcast window outlines over the display. In the present embodiment, the first larger broadcast window is longer in length and wider in width than the small window in which the program is displayed. Each successive outline is longer in length and wider in width than the preceding outline. Following the translation, the video broadcast is redisplayed in an area defined by each successively larger broadcast window outline.

Figure 14 is an exemplary flowchart that illustrates one embodiment of the process for integrating the translation of a display to a small window with other functions of a broadcast system. Operation begins at Block 1402, at which a television screen or display is currently showing a broadcast of a selected station. Operation continues at Block 1404, at which a user may select the electronic program guide for display. The system monitors the states of the buttons on a user's remote control device to determine when the user has depressed a certain button. Implementation of monitoring, e.g., polling, interrupt driven events, are well known in the art and will not be discussed further herein. If the user does not select the

electronic program guide for display operation continues at Block 1402, at which the system continues to display the broadcast and monitors selection by the user of the electronic program guide function. If the user does select the electronic program guide for display at Block 1404, then operation continues at Block 1406, at which a series of successfully smaller broadcast window outlines are displayed.

Operation continues at Block 1408, at which the display of a broadcast is translated to a smaller broadcast window on the display. Operation continues at Block 1410, at which an electronic program guide is displayed in an area adjacent to the smaller broadcast window. An exemplary electronic program guide was previously discussed with reference to **Figure 13**. Operation continues at Block 1412, at which a display information packet is displayed along with the electronic program guide in an area adjacent to the broadcast window on the electronic program guide. The display information packet contains a description of the program that is currently selected. Operation continues at Block 1414, at which a user may select an electronic category guide for display using the buttons on the remote control. If the user selects the display of an electronic category guide, operation continues at Block 1416, at which the display of an electronic category guide replaces the display of the display information packet. The electronic category guide includes a number of programming categories. The broadcast system then identifies programs on channels that correspond to each category contained in the electronic category guide. The programs that correspond to the particular categories of the electronic category guide are then highlighted on the electronic program guide.

If the user does not select the electronic category guide for display, or following the display of the electronic category guide when the user selects the electronic category guide for display, operation continues at Block 1418, at which the user may deselect the display of

the electronic program guide using the buttons on the remote control. If the user does not deselect the electronic program guide at Block 1418, operation continues at Block 1410, at which the broadcast system continues to display the electronic program guide. If the user does deselect the electronic program guide at Block 1418, operation continues at Block 1420, at which a series of successfully larger broadcast window outlines are displayed. Operation continues at Block 1422, at which the electronic program guide is removed from the display. If the electronic category guide was not selected by the user, then the display information packet is also removed from the display at Block 1422. If the electronic category guide was selected by the user, then the electronic category guide is also removed from the display at Block 1422. Operation continues at Block 1424, at which the display of the broadcast is translated to a larger window on the display screen.

As noted earlier and referring again to **Figure 13**, the user may select a display information packet for display along with the electronic program guide. In one embodiment, the display information packet contains a description of the program selected for display. Preferably, the system automatically resizes the text of the display information packet such that all the text appears in the window. **Figure 15** illustrates a display of an electronic program guide in one embodiment of the present invention that is displayed with a display information packet 1502 that contains a greater number of characters than the display information packet 1302 of **Figure 13**. As the area allocated for the display information packet in one embodiment of the broadcasting system is of a constant fixed size, the broadcasting system is configured to adjust the font size of the characters based on the number of characters present for display. Optimization of the font size causes a maximum number of characters to be displayed for a given display area.

Figure 16 is an exemplary flowchart illustrative of the process for optimizing the font size for an available display space in one embodiment of the present invention. Operation begins at Block 1602, at which the broadcast system determines a number of characters to be displayed. Operation continues at Block 1604, at which the broadcast system determines the number of display pixels available for character display. Operation continues at Block 1606, at which the broadcast system adjusts the character font size in order to display all characters in the available number of display pixels. Operation continues at Block 1608, at which the broadcasting system displays the characters in the display information packet.

Figure 17 is an exemplary flowchart illustrative of the process for integrating the process of optimization of the font size in the display information packet with other functions of a broadcast system in one embodiment of the present invention. Operation begins at Block 1702, at which a television screen or display is currently showing a broadcast of a selected station. Operation continues at Block 1704, at which a user may select a display of an electronic program guide. If the user does not select the electronic program guide for display, operation continues at Block 1702, at which the system continues to display the broadcast. If the user does select the display of an electronic program guide operation continues at Block 1706, at which the electronic program guide is displayed. Operation continues at Block 1708, at which a user selects a display information packet for display along with the electronic program guide.

Upon selection of the display information packet for display, operation continues at Block 1710, at which the broadcast system determines the number of pixels available for the display information packet. Operation continues at Block 1712, at which the broadcast system determines the number of characters in the display information packet that are to be displayed. In one embodiment, the maximum number of characters is 256. Operation continues at Block

1714, at which the broadcasting system determines if the number of characters is less than 180. One embodiment of the present invention uses three font sizes for the displaying characters in the display information packet. If the broadcast system determines at Block 1714 that the number of characters is less than 180, then the broadcast system selects the largest of the three font sizes. Following selection of the largest font size, operation continues at Block 1722, at which the broadcast system displays the display information packet using the largest font.

If the broadcast system determines at Block 1714 that the number of characters is not less than 180, then operation continues at Block 1716, at which the broadcasting system determines if the number of characters is greater than 180 and less then 220 characters. If the number of characters is greater than 180 and less than 220 then the broadcast system selects the medium font size. Following selection of the medium font size, operation continues at Block 1722, at which the broadcast system displays the display information packet using the medium sized font.

If the broadcast system determines at Block 1714 that the number of characters is not more than 180 and less than 220, then operation continues at Block 1718, at which the broadcast system determines that the number of characters is more than 220. Operation continues at Block 1720, at which the broadcast system selects the smallest of the three font sizes. Operation continues at Block 1722, at which the broadcast system displays the display information packet using the smallest font size.

Because the number of television broadcasting stations accessible today includes hundreds of stations, many viewers channel surf until they find a channel that has a desirable program. Channel surfing refers to the process of using the channel plus or minus key to sequentially view each channel. While some viewers find channel surfing among hundreds of stations enjoyable, some viewers prefer a

more direct method of program selection. For this reason, an embodiment of the system of the present invention uses two modes, a non-channel surfing mode and a channel surfing mode, from which a user may select channels to view.

The non-channel surfing mode is described with reference to **Figures 9A, 9B, and 9C**. When the user selects the non-channel surfing mode, the broadcast system is first tuned to a channel 233 to provide a broadcast of a program on the screen or display 910. The user then selects a display of an electronic program guide 912 for identifying the channels available on the broadcast system and the programming available on the channels. A display information packet 916 is displayed along with the electronic program guide 912, and the display information packet 916 contains a description of the program to which the broadcast system is currently tuned. Furthermore, a system pointer 918 is displayed on the electronic program guide 912. The system pointer 918 is used to select a program for viewing by the user and, as such, may be manipulated by the user within the area of the electronic program guide 912. In the non-channel surfing mode the broadcast system is tuned to the channel that is pointed to by the system pointer 918. Furthermore, the display information packet 916 displays a program description for the program to which the broadcasting system is tuned. Therefore, when the user manipulates the system pointer to a different channel 229 and 240 in the non-channel surfing mode, the broadcast system tunes to that channel and displays the program 975 and 930 currently being broadcast on that channel, respectively.

In contrast to the non-channel surfing mode, is the channel surfing mode of one embodiment of the present invention. **Figure 18** is an exemplary flowchart illustrative of the process of channel surfing in one embodiment of the present invention. At Block 1802, the broadcast system is tuned to a first channel and a display is generated consisting of a broadcast window, an electronic program guide, a

display information packet, and a system pointer. A first program broadcast is displayed in the broadcast window. Operation continues at Block 1804, at which a display information packet is displayed for the first program broadcast. This display information packet contains a description of the first program broadcast. At Block 1806, the user moves the system pointer to an area of the electronic program guide associated with a second program broadcast. Operation continues at Block 1808, at which the broadcast system replaces the display information packet of the first program with a display information packet of a second program broadcast. The broadcast system remains tuned to the first program broadcast and continues to display the first program broadcast.

In the channel surfing mode the user may manipulate the system pointer to a program or channel in the electronic program guide that is different from the program or channel currently being broadcast. For this reason, it is preferred that the broadcast system provides in the electronic program guide an indication to the user as to the status of the broadcast system tuner and the system pointer. However, the status indication is not required to operate the channel surfing mode in accordance with the teachings of the present invention. **Figure 19** is an exemplary flowchart illustrative of the process for providing tuner and pointer status display in one embodiment of the present invention. An electronic program guide is generated at Block 1902. At Block 1904, a system pointer is supplied for the electronic program guide. Operation continues at Block 1906, at which a status indication is provided of the system tuner and the system pointer.

Each program displayed in the electronic program guide is displayed in a program block or area that is associated with a particular channel and a particular time slot. The status indication is provided by controlling the appearance of the program block in accordance with the location of the system pointer and the channel to which the

system is tuned. In particular, when the broadcast system is tuned to a program, and therefore the broadcast window displays the programming of the channel the system is tuned to, the corresponding program block is displayed on the electronic program guide as appearing to be depressed into the screen. The program blocks of the remaining programs not broadcasted but shown in the electronic program guide appear to be protruding from the screen. Therefore, when the broadcasting system is not tuned to a program the corresponding program block is displayed on the electronic program guide as appearing to be protruding from the screen. The status indication of the system pointer causes a different effect. In particular, when the system pointer is pointing to a program the corresponding program block is displayed as highlighted on the electronic program guide. When the system pointer is not pointing to a program the corresponding program block is displayed as not highlighted on the electronic program guide.

There are four primary combinations of the status indications as used by an embodiment of the broadcast system of the present invention. First, the display of a program block appears depressed into the screen and highlighted to indicate that the broadcast system is tuned to the corresponding program and the system pointer is pointing to the corresponding program. Second, the display of a program block appears depressed into the screen and unhighlighted to indicate that the broadcast system is tuned to the corresponding program while the system pointer is pointing to a different program. Third, the display of a program block appears protruding from the screen and highlighted to indicate that the system pointer is pointing to the corresponding program while the broadcast system is tuned to a different program. Fourth, the display of a program block appears protruding from the screen and unhighlighted to indicate that the broadcast system is not tuned to the corresponding program and the system pointer is not pointing to the corresponding program.

Figure 13 illustrates a tuner and pointer status display in one embodiment of the present invention. The broadcast system of **Figure 13** is tuned to the National Geographic Explorer program on the TBS network as indicated by the corresponding program block 1380 appearing to be depressed into the screen. The system pointer is also pointing to the National Geographic Explorer program as indicated by the highlighting of program block 1380.

Figure 20 illustrates the situation in which a broadcast system is tuned to one channel and the system pointer is pointing somewhere other than to the channel which is tuned. In particular, the broadcast system of **Figure 20** is tuned to the National Geographic Explorer program on the TBS network as indicated by the corresponding program block 2002 appearing to be depressed into the screen. An electronic category guide is selected for display instead of a display information packet. The system pointer is pointing to the "ALL" category box 2004 in the electronic category guide as indicated by the highlighting of the category block 2004.

As shown in **Figure 20**, instead of selecting a display information packet for display at Block 1806 of **Figure 18**, the user may select an electronic category guide 2006 for display with the electronic program guide 2001. The electronic category guide 2006 includes a number of programming categories 2010. The broadcast system then identifies programs on channels that correspond to each category 2010 contained in the electronic category guide 2006. The programs that correspond to the particular categories of the electronic category guide 2006 are then indicated or highlighted on the electronic program guide 2001. The system pointer may be manipulated by the user to an area of the electronic category guide 2006, and system pointer status is indicated. When the system pointer is pointing to a category block the category block is displayed as highlighted on the electronic category guide 2006. The system pointer is pointing to the "ALL" category block

2004 in the electronic category guide 2006 as indicated by the highlighting of category block 2004.

If the user, typically using the broadcast system remote control, selects one of the categories from the electronic category guide, then the display of the electronic category guide is replaced with a display of an electronic subcategory guide. **Figure 21** illustrates the display of an electronic subcategory guide 2102 with an electronic program guide 2104 in one embodiment of the present invention. The selected category 2106 is displayed along with the electronic subcategory guide 2102 and the electronic program guide 2104. The electronic subcategory guide 2102 includes a number of subcategories 2108. The broadcast system identifies programs on channels that correspond to each subcategory contained in the electronic subcategory guide 2102. The programs that correspond to the particular categories of the electronic subcategory guide 2102 are indicated or highlighted on the electronic program guide. The status of the system pointer is shown and changed as the pointer is moved about the display. For example, the system pointer may be manipulated by the user to an area of the electronic subcategory guide 2102. When the system pointer is pointing to a subcategory block the subcategory block is displayed as highlighted on the electronic category guide. In **Figure 21**, he system pointer is pointing to the "ALL" subcategory block 2108 in the electronic subcategory guide 2102 as indicated by the highlighting of subcategory block 2108.

The multiple channel broadcasting system of one embodiment of the present invention provides a user with several options regarding the programs available for broadcast. The multiple channel broadcasting system allows the user to select pay-per-view broadcasts for purchase. In addition, the broadcast system allows the user to select corresponding programs for recording. Furthermore, the multiple channel broadcasting system allows the user to set a broadcasting system timer to automatically tune the broadcasting

system to a program at a particular time. Moreover, the multiple channel broadcasting system allows the user to designate certain programs as favorite programs. Consequently, the multiple channel broadcasting system of one embodiment of the present invention displays icons that provide the user with the status of the programs while viewing the electronic program guide.

Figure 22 is an exemplary flowchart that illustrates the process for providing an icon to indicate program status in one embodiment of the present invention. Operation begins at Block 2202, at which the broadcasting system is tuned to display a program broadcast. Operation continues at Block 2204, at which an electronic program guide is generated. Electronic menus may be displayed along with the electronic program guide. The electronic menus control pay-per-view purchases, selections of programs for recording, setting of the broadcasting system timer, and selection of favorite programs. At Block 2206, graphic images are generated that indicate program status. Operation continues at Block 2208, at which the graphic images are displayed within the electronic program guide. The icons or graphic images may serve as electronic links between the electronic program guide and a corresponding menu of the electronic menus and a display information packet.

Figure 23 illustrates the display of an electronic program guide having program status icons in one embodiment of the present invention. The icon 2302 displayed in program block 2304 to indicate that a pay-per-view broadcast is selected resembles a dollar sign. The icon 2306 displayed in program block 2308 to indicate that a broadcast is selected for recording resembles a videocassette tape. The icon 2310 displayed in program block 2312 to indicate that the broadcast system timer is set to tune the broadcast system to a program at the time of the corresponding program resembles a clock. An icon may be displayed in a program block to indicate that a program is a favorite

program. Icon 2314 in program block 2316 is one possible representation of a favorite program icon.

The multiple channel broadcasting system of one embodiment of the present invention provides a display of the time wherein a user can view the current time in relation to the times of programming and the program blocks. **Figure 24** is an exemplary flowchart that illustrates a process for providing a time bar with the current time marker in one embodiment of the present invention. Operation begins at Block 2402, at which a television screen or display is currently showing a broadcast of a selected station. Operation continues at Block 2404, at which a user may select a display of an electronic program guide. If the user does not select display of an electronic program guide operation continues at Block 2402, at which the broadcasting system continues to display the broadcast of the currently selected station. If the user selects the display of an electronic program guide, operation continues at Block 2406, at which the electronic program guide is displayed by the broadcast system.

Following display of the electronic program guide, operation continues at Block 2408, at which a time bar is displayed that identifies times of programming on the channels in the broadcasting system. Operation continues at Block 2410, at which a graphical representation of the current time is generated. Operation continues at Block 2412, at which the graphical representation of the current time is displayed in proximity to the time bar so as to indicate the current time in relation to the times of programming on the channels of the broadcast system. In one embodiment of the present invention the graphical representation of time is displayed as an inverted triangle on the time bar. The graphical representation of time may include a digital display of the current time. The graphical representation of time may also include an icon with the display of the current time.

Figure 25 illustrates the display of an electronic program guide and a graphical representation of the current time in relation to the

times of channel programming in one embodiment of the present invention. When the user selects the display of an electronic program guide, the electronic program guide 2502 is displayed by the broadcast system. With the electronic program guide, a time bar 2504 is displayed that identifies times of programming 2506 on the channels in the broadcasting system. An embodiment of the present invention generates a graphical representation of the current time 2508. This graphical representation of the current time 2508 is displayed in proximity to the time bar 2504 so as to indicate the current time in relation to the times of programming on the channels of the broadcast system. This graphical representation of the current time 2508 is displayed as an inverted triangle on the time bar and includes a digital display of the current time.

In addition to the electronic program guide discussed herein, an embodiment of the multiple broadcasting system of the present invention provides an on screen menu display that enables the user to operate different functions of the system. **Figure 26** is an exemplary flowchart that illustrates the process for providing an on screen menu having differing transparency levels in one embodiment of the present invention.

In **Figure 26**, operation begins at Block 2602, at which an electronic menu display is generated. The menu display comprises multiple components, multiple alphanumeric characters, and multiple icons that identify different functions of the broadcast system. Operation continues at Block 2604, at which different levels of transparency are applied to the different electronic menu components. The different levels of transparency are applied to the components so that the number of opaque components is minimized and the background is highly transparent. Operation continues at Block 2606, at which the electronic menu is superimposed over the display of a program broadcast. While the opaque components are minimized, the obstruction of the video of the broadcast by the electronic menu

display is minimized. Preferably, the different transparency levels may be selected by the user.

When the user selects an electronic menu for display, then alphanumeric characters and icons are generated that identify different broadcast system functions. The user may select the transparency levels to be applied to the characters and icons of the electronic menu display. If the user does not select the transparency levels to be applied to the characters and icons of the electronic menu, then the multiple channel broadcasting system applies the least transparent level of transparency to the electronic menu icons. Furthermore, the multiple channel broadcasting system applies the least transparent level of transparency to the verbal description of the broadcasting system functions. Moreover, the multiple channel broadcasting system applies the most transparent level of transparency to the numerals of the electronic menu display.

Figure 27 illustrates the display of an on screen menu having differing transparency levels in one embodiment of the present invention. The electronic menu display 2702 comprises multiple components 2711-2719, multiple alphanumeric characters 2720-2722, and multiple icons 2731-2739 that identify different functions of the broadcast system. Different levels of transparency are applied to the different electronic menu components. The different levels of transparency are applied to the components so that the number of opaque components is minimized and the background is highly transparent. Following generation of the electronic menu 2702, the electronic menu 2702 is superimposed over a program broadcast 2750.

The invention has been described in conjunction with the preferred embodiment. Although the present invention has been described with reference to specific exemplary embodiments, it will be evident that various modifications and changes may be made to these embodiments without departing from the broader spirit and scope of the invention as set forth in the claims. Accordingly, the specification

and drawings are to be regarded in an illustrative rather than a restrictive sense.

CLAIMS

What is claimed is:

1. In a multiple channel broadcasting system in which programs are broadcasted for display on a screen, a method for generating an on-screen guide for a user to select channels to view, comprising the steps of:

tuning to a channel to provide a display of a broadcast of a first program on the screen;

displaying an electronic program guide identifying channels and programming in the broadcasting system;

translating the display of a broadcast of the first program to a smaller broadcast window on the screen, said step of translating comprising the steps of superimposing at least one of a series of successively smaller broadcast window outlines over the display of the broadcast on the screen and displaying the broadcast in the smaller broadcast window; and

displaying the electronic program guide along with the broadcast on the screen, such that no portion of the broadcast is covered by the electronic program guide.

2. The method as set forth in claim 1, wherein a display information packet containing a description of the program is displayed with the electronic program guide.

3. The method as set forth in claim 2, wherein an electronic category guide is displayed with the electronic program guide.

4. The method as set forth in claim 1, further comprising the steps of:

displaying a first display information packet containing a description of said first program;

displaying a system pointer;

manipulating said system pointer in response to input by said user to an area of the electronic program guide associated with a second program; and

replacing the display of the first display information packet with a display of a second display information packet containing a description of the second program.

5. The method as set forth in claim 4, further comprising the steps of:

indicating selection of a channel pointed by the pointer;

tuning said broadcast system to said channel if said channel is different from said first channel; and

removing the electronic program guide and display information packet in response to selection of a channel.

6. The method as set forth in claim 4, further comprising a method for generating an on-screen guide in a second mode for a user to select channels to view, comprising the steps of:

tuning to a first channel to provide a broadcast of a first program on the screen;

displaying an electronic program guide identifying a plurality of channels and programming on the channels;

displaying a first display information packet containing a description of said first program;

displaying a system pointer;

manipulating said system pointer in response to input by said user to an area of the electronic program guide associated with a second program; and

tuning said broadcasting system to said second program and displaying a second display information packet containing a description of said second program.

7. The method as set forth in claim 1, further comprising the steps of:

displaying a status indication on said electronic program guide that indicates to said user a status of said broadcasting system tuner;

displaying a status indication on said electronic program guide that indicates to said user a status of said system pointer.

8. The method set forth in claim 7, wherein said step of displaying said status indication of said broadcasting system tuner comprises the steps of:

displaying said channel program on said electronic program guide as appearing to be depressed into said screen when said broadcasting system is tuned to said channel program;

displaying said channel program on said electronic program guide as appearing to be protruding from said screen when said broadcasting system is not tuned to said channel program.

9. The method as set forth in claim 7, wherein said step of displaying said status indication of said system pointer comprises the steps of:

displaying said channel program on said electronic program guide as highlighted when said pointer is pointing to said channel program;

displaying said channel program on said electronic program guide as unhighlighted when said pointer is not pointing to said channel program.

10. The method as set forth in claim 1, further comprising the steps of:

displaying an electronic category guide; and

displaying a system pointer that can be manipulated in response to input by said user to an area of the electronic category guide.

11. The method as set forth in claim 10, wherein the user selects one of the plurality of categories, the selection displaying an electronic subcategory guide comprising the steps of:

displaying said selected category;

displaying a subcategory guide identifying a plurality of subcategories;

identifying programs on channels that correspond to each subcategory of said plurality of subcategories;

highlighting those programs on said program guide that are identified to be the selected subcategory;

wherein all programming can be viewed and the selected subcategory of programs is highlighted for easy viewing by the user.

12. A system comprising:

a processor configured to be coupled to a display device, said processor,

configured to control the system to tune to a first channel in a multiple channel broadcasting system to provide a broadcast of a first program on the display device;

configured to control the system to generate an electronic program guide identifying channels and programming of channels in the broadcasting system;

configured to control the system to translate the display of the broadcast of the first program to a smaller broadcast window on the display device, said translation superimposing at least one of a series of successively smaller broadcast window outlines over the display of the broadcast on the display device; and

configured to control the system to display the electronic program guide along with the broadcast on the display device, such that no portion of the broadcast is covered by the electronic program guide.

13. The system as set forth in claim 12, wherein the processor is further configured to control the system to generate a display information packet containing a description of said first program.

14. The system as set forth in claim 12, wherein the processor is further configured to control the system to generate an electronic category guide containing a plurality of programming categories.

15. The system as set forth in claim 12, wherein the processor is further configured to:

control the system to display a first display information packet containing a description of said first program;

configured to control the system to display a system pointer;

configured to control the system to manipulate said system pointer in response to input by said user to an area of the electronic program guide associated with a second program; and

configured to control the system to replace the display of the first display information packet with a display of a second information packet containing a description of the second program.

16. The system as set forth in claim 15, wherein the processor is further configured to generate an on-screen guide in a second mode for a user to select channels to view said processor configured to:

control the system to display a first display information packet containing a description of said first program;

configured to control the system to display a system pointer;

configured to control the system to manipulate said system pointer in response to input by said user to an area of the electronic program guide associated with a second program; and

configured to control the system to tune said broadcasting system to said second program and displaying a second display information packet containing a description of said second program.

17. The system as set forth in claim 15, wherein the processor is further configured to:

control the system to display a first status indication on said electronic program guide that indicates to said user a status of said broadcasting system tuner;

display a second status indication on said electronic program guide that indicates to said user a status of said system pointer.

18. The system as set forth in claim 12, wherein the processor is further configured to:

control the system to display an electronic category guide; and

configured to control the system to display a system pointer that can be manipulated in response to input by said user to an area of the electronic category guide.

19. The system as set forth in claim 12, wherein said user selects one of a plurality of categories, the processor further configured to display electronic subcategory guide in response to the selection by:

displaying said selected category;

displaying a subcategory guide identifying a plurality of subcategories;

identifying programs on channels that correspond to each subcategory of said plurality of subcategories;

highlighting those programs on said program guide that are identified to be the selected subcategory;

wherein all programming can be viewed and the selected subcategory of programs is highlighted for easy viewing by the user.

20. A system for generating an on-screen guide, comprising:

an electronic program guide displaying on a display device, said electronic program guide configured to operate in a first mode to identify channels and programming in a multiple channel broadcasting system;

a broadcast of a first program displayed on the display device; and

a controller that translates the broadcast from a first size to a smaller second size when the electronic program guide is displayed by superimposing at least one of a series of successively smaller broadcast window outlines over the display of the broadcast on the screen.

21. The system as set forth in claim 20, further comprising a display information packet containing a description of the first program, the

display information packet displayed along with the electronic program guide.

22. The system as set forth in claim 21, wherein said display information packet is selectively replaced by an electronic category guide containing a plurality of programming categories.

23. The system as set forth in claim 20, further comprising:

a display information packet configured to contain a description of said first program;

a system pointer configured to be manipulated in response to input by said user to point to an area associated with a second program in said electronic program guide, said controller further configured to, in response to said manipulation of said pointer, keep said broadcasting system tuned to said first channel thereby allowing said user to view the contents of said area associated with said second program while viewing said broadcast of said first program on said screen.

24. The system as set forth in claim 23, further comprising an electronic category guide, comprising:

a plurality of categories;

an identification of programs on channels that correspond to each category of said plurality of categories;

a highlighting of said programs on said program guide that are identified to be the selected category.

25. The system as set forth in claim 23, further comprising a second mode in which said controller causes the system to tune to said second program and display said second display information packet when the system pointer is manipulated to point to the area associated with the second program.

26. The system as set forth in claim 23, further comprising:

a first status indication displayed on said electronic program guide that indicates to said user a status of said broadcasting system tuner;

a second status indication displayed on said electronic program guide that indicates to said user a status of said system pointer.

27. A computer readable medium containing executable instructions which, when executed in a processing system, causes the system to perform the steps for generating an on-screen guide for a user to select channels in a multiple channel broadcasting system comprising:

tuning to a channel to provide a display of a broadcast of a first program on a display;

generating an electronic program guide identifying channels and programming in the broadcasting system;

translating the display of the broadcast of the first program to a smaller broadcast window on the screen, said step of translating comprising the steps of superimposing at least one of a series of successively smaller broadcast window outlines over the display of the broadcast on the screen and displaying the broadcast in the smaller broadcast window; and

displaying the electronic program guide along with the broadcast on the screen, such that no portion of the broadcast is covered by the electronic program guide.

28. The computer readable medium as set forth in claim 27, further comprising instructions, which when executed, performing the steps of: displaying a system pointer;

manipulating said system pointer in response to input by said user to an area of the electronic program guide associated with a second program; and

replacing the display of the first display information packet with a display of a second display information packet containing a description of the second program.

29. The computer readable medium as set forth in claim 28, said instructions, when executed, further performing the steps of:

indicating selection of a channel pointed by the pointer;

tuning said broadcast system to said channel if said channel is different from said first channel; and

removing the electronic program guide and display information packet in response to selection of a channel.

30. The computer readable medium as set forth in claim 29, further comprising instructions for generating an on–screen guide in a second mode for a user to select channels to view, said instructions, when executed, performing the steps of:

manipulating said system pointer in response to input by said user to an area of the electronic program guide associated with a second program; and

tuning said broadcasting system to said second program and displaying the second display information packet containing a description of said second program.

31. The computer readable medium as set forth in claim 27, said further comprising instruction, which when executed, performing the steps of:

displaying an electronic category guide; and

displaying a system pointer that can be manipulated in response to input by said user to an area of the electronic category guide.

32. The computer readable medium as set forth in claim 31, wherein the instructions for displaying the electronic category guide, when executed, perform the steps of:

displaying a category guide identifying a plurality of categories;

identifying programs on channels that correspond to each category of said plurality of categories;

highlighting those programs on said program guide that are identified to be the selected category;

wherein all programming can be viewed and the selected category of programs is highlighted for easy viewing by the user.

33. The computer readable medium as set forth in claim 32, further comprising instructions, which when executed, and in response to user selection of one of the plurality of categories, performs the steps of:

displaying said selected category;

displaying a subcategory guide identifying a plurality of subcategories;

identifying programs on channels that correspond to each subcategory of said plurality of subcategories;

highlighting those programs on said program guide that are identified to be the selected subcategory;

wherein all programming can be viewed and the selected subcategory of programs is highlighted for easy viewing by the user.

34. The computer readable medium as set forth in claim 27, further comprising instructions, which when executed, perform the steps of:

supplying a system pointer which points to a location in said electronic program guide, said location identifying a channel program in the broadcasting system; and

providing an indication to said user as to the status of the broadcasting system tuner and said system pointer comprising the steps of;

displaying said channel program on said electronic program guide as appearing to be depressed into said screen when said broadcasting system is tuned to said channel program,

displaying said channel program on said electronic program guide as appearing to be protruding from said screen when said broadcasting system is not tuned to said channel program,

displaying said channel program as highlighted when said pointer is pointing to said channel program, and

displaying said channel program as unhighlighted when said pointer is not pointing to said channel program.

35. In a multiple channel broadcasting system which displays a first window containing a broadcast of a program and a second window containing programming information, a method for removing the programming information from a display, comprising the steps of:

translating the broadcast of a program displayed in the first window to a larger window on the display by superimposing at least one of a series of successively larger video window outlines over the screen;

removing the display of said programming information from said display;

displaying said video of a broadcast in the area of the largest video window outline.

36. A system comprising:

a processor configured to be coupled to a display device, said processor,

configured to control the system to tune to a channel in a multiple channel broadcasting system to provide a broadcast of a program on said display device in a first window on the display;

configured to control the system to generate programming information identifying channels in the broadcasting system;

configured to control the system to translate video of the broadcast of a program to a smaller broadcast window on the display device, said translation superimposing at least one of a series of successively smaller broadcast window outlines over the broadcast on the display device;

configured to control the system to display the programming information along with the translated broadcast on the display device.

37. The system as set forth in claim 29, wherein the programming information is removed from the display device, said processor,

configured to control the system to translate video of a broadcast of a program displayed in the smaller broadcast window to a larger broadcast window on the display device by superimposing at least one of a series of successively larger broadcast window outlines over the display device;

configured to control the system to remove the display of the programming information from said display device;

configured to control the system to display the video of the broadcast in the area of the largest broadcast window outline.

38. In a multiple channel broadcasting system in which programs are broadcasted for display on a screen, a method for generating an on-screen guide in a first mode for a user to select channels to view, comprising the steps of:

tuning to a first channel to provide a broadcast of a first program on the screen;

displaying an electronic program guide identifying a plurality of channels and programming on the channels;

displaying a first display information packet containing a description of said first program;

displaying a system pointer;

manipulating said system pointer in response to input by said user to an area of the electronic program guide associated with a second program; and

replacing the display of the first display information packet with a display of a second display information packet containing a description of the second program.

39. The method as set forth in claim 38, further comprising the steps of:

indicating selection of a channel pointed by the pointer;

tuning said broadcast system to said channel if said channel is different from said first channel; and

removing the electronic program guide and display information packet in response to selection of a channel.

40. The method as set forth in claim 38, further comprising a method for generating an on-screen guide in a second mode for a user to select channels to view, comprising the steps of:

tuning to a first channel to provide a broadcast of a first program on the screen;

displaying an electronic program guide identifying a plurality of channels and programming on the channels;

displaying a first display information packet containing a description of said first program;

displaying a system pointer;

manipulating said system pointer in response to input by said user to an area of the electronic program guide associated with a second program; and

tuning said broadcasting system to said second program and displaying a second display information packet containing a description of said second program.

41. The method as set forth in claim 38, further comprising the steps of:

displaying a status indication on said electronic program guide that indicates to said user a status of said broadcasting system tuner;

displaying a status indication on said electronic program guide that indicates to said user a status of said system pointer.

42. The method as set forth in claim 41, wherein said step of displaying said status indication of said broadcasting system tuner comprises the steps of:

displaying said channel program on said electronic program guide as appearing to be depressed into said screen when said broadcasting system is tuned to said channel program;

displaying said channel program on said electronic program guide as appearing to be protruding from said screen when said broadcasting system is not tuned to said channel program.

43. The method as set forth in claim 41, wherein said step of displaying said status indication of said system pointer comprises the steps of:

displaying said channel program on said electronic program guide as highlighted when said pointer is pointing to said channel program;

displaying said channel program on said electronic program guide as unhighlighted when said pointer is not pointing to said channel program.

44. In a multiple channel broadcasting system in which programs are broadcasted for display on a screen, a method for generating an on-screen guide for a user to select channels to view, comprising the steps of:

tuning to a first channel to provide a broadcast of a first program on the screen;

displaying an electronic program guide identifying a plurality of channels and programming on the channels;

displaying an electronic category guide; and

displaying a system pointer that can be manipulated in response to input by said user to an area of the electronic category guide.

45. The method as set forth in claim 44, wherein said step of displaying said electronic category guide comprises the steps of:

displaying a category guide identifying a plurality of categories;

identifying programs on channels that correspond to each category of said plurality of categories;

highlighting those programs on said program guide that are identified to be the selected category;

wherein all programming can be viewed and the selected category of programs is highlighted for easy viewing by the user.

46. The method as set forth in claim 44, further comprising the steps of:

displaying a status indication of said electronic program guide that indicates to said user a status of said broadcasting system tuner;

displaying a status indication on said electronic program guide that indicates to said user a status of said system pointer, displaying a status indication on said electronic category guide that indicates to said user a status of said system pointer, said status indication causing one of a plurality of categories on said electronic category guide to be displayed as highlighted when said pointer is pointing to said category.

47. The method as set forth in claim 44, further comprising the steps of displaying an electronic subcategory guide in response to user selection of one of said plurality of categories, comprising the steps of:

displaying said selected category;

displaying a subcategory guide identifying a plurality of subcategories;

identifying programs on channels that correspond to each subcategory of said plurality of subcategories;

highlighting those programs on said program guide that are identified to be the selected subcategory;

wherein all programming can be viewed and the selected subcategory of programs is highlighted for easy viewing by the user.

48. A computer system comprising:

a processor configured to be coupled to a display device, said processor,

configured to control the system to tune to a first channel to provide a broadcast of a first program on the screen;

configured to control the system to display an electronic program guide identifying a plurality of channels and programming on the channels;

configured to control the system to display a first display information packet containing a description of said first program;

configured to control the system to display a system pointer;

configured to control the system to manipulate said system pointer in response to input by said user to an area of the electronic program guide associated with a second program; and

configured to control the system to replace the display of the first display information packet with a display of a second information packet containing a description of the second program.

49. The computer system as set forth in claim 48, wherein said processor generates an on-screen guide in a second mode for a user to select channels to view, said processor:

configured to control the system to tune to a first channel to provide a broadcast of a first program on the screen;

configured to control the system to display an electronic program guide identifying a plurality of channels and programming on the channels;

configured to control the system to display a first display information packet containing a description of said first program;

configured to control the system to display a system pointer;

configured to control the system to manipulate said system pointer in response to input by said user to an area of the electronic program guide associated with a second program; and

configured to control the system to tune said broadcasting system to said second program and displaying a second display information packet containing a description of said second program.

50. A computer system comprising:

a display device;

a processor coupled to said display device, said processor,

configured to control the system to tune to a first channel to provide a broadcast of a first program on the screen;

configured to control the system to display an electronic program guide identifying a plurality of channels and programming on the channels;

configured to control the system to display an electronic category guide; and

configured to control the system to display a system pointer that can be manipulated in response to input by said user to an area of the electronic category guide.

51. The computer system as set forth in claim 50, wherein said display of said electronic subcategory guide comprises:

displaying said selected category;

displaying a subcategory guide identifying a plurality of subcategories;

identifying programs on channels that correspond to each subcategory of said plurality of subcategories;

highlighting those programs on said program guide that are identified to be the selected subcategory;

wherein all programming can be viewed and the selected subcategory of programs is highlighted for easy viewing by the user.

52. A system for generating an on-screen guide in a first mode for a user to select channels to view, comprising:

a multiple channel broadcasting system configured to be tuned to a first channel to provide a broadcast of a first program on a screen;

an electronic program guide configured to operate in a first mode to identify a plurality of channels and programming on the channels in the broadcasting system;

a display information packet configured to contain a description of said first program;

a system pointer configured to be manipulated in response to input by said user to point to an area associated with a second program in said electronic program guide; and

a controller configured to, in response to said manipulation of said pointer, keep said broadcasting system tuned to said first channel thereby allowing said user to view the contents of said area associated with said second program while viewing said broadcast of said first program on said screen.

53. The system as set forth in claim 52, further comprising the first status indication indicates the status of said broadcasting system tuner by:

displaying said channel program on said electronic program guide as appearing to be depressed into said screen when said broadcasting system is tuned to said channel program;

displaying said channel program on said electronic program guide as appearing to be protruding from said screen when said broadcasting system is not tuned to said channel program; and

a first status indication displayed on said electronic program guide that indicates to said user a status of said broadcasting system tuner;

a second status indication displayed on said electronic program guide that indicates to said user a status of said system pointer, the second status indication indicates the status of said system pointer by:

displaying said channel program on said electronic program guide as highlighted when said pointer is pointing to said channel program;

displaying said channel program on said electronic program guide as unhighlighted when said pointer is not pointing to said channel program.

54. A computer readable medium containing executable instructions which, when executed in a processing system, causes the system to perform the steps for generating an on-screen guide in a first mode for a user to select channels to view in a multiple channel broadcasting system comprising:

tuning to a first channel to provide a broadcast of a first program on the screen;

displaying an electronic program guide identifying a plurality of channels and programming on the channels;

displaying a first display information packet containing a description of said first program;

displaying a system pointer;

manipulating said system pointer in response to input by said user to an area of the electronic program guide associated with a second program; and

replacing the display of the first display information packet with a display of a second display information packet containing a description of the second program.

55. The computer readable medium as set forth in claim 54, wherein generating an on-screen guide in a second mode for a user to select channels to view comprises the steps of:

tuning to the first channel to provide the broadcast of a first program on the screen;

displaying the electronic program guide identifying a plurality of channels and programming on the channels;

displaying the first display information packet containing the description of said first program;

displaying the system pointer;

manipulating said system pointer in response to input by said user to an area of the electronic program guide associated with the second program; and

tuning said broadcasting system to said second program and displaying the second display information packet containing a description of said second program.

56. A computer readable medium containing executable instructions which, when executed in a processing system, causes the system to perform the steps for generating an on-screen guide in a first mode for a user to select channels to view in a multiple channel broadcasting system comprising:

tuning to a first channel to provide a broadcast of a first program on the screen;

displaying an electronic program guide identifying a plurality of channels and programming on the channels;

displaying an electronic category guide; and

displaying a system pointer that can be manipulated in response to input by said user to an area of the electronic category guide.

57. The computer readable medium as set forth in claim 56, wherein said instruction to display said electronic subcategory guide comprises:

displaying said selected category;

displaying a subcategory guide identifying a plurality of subcategories;

identifying programs on channels that correspond to each subcategory of said plurality of subcategories;

highlighting those programs on said program guide that are identified to be the selected subcategory;

wherein all programming can be viewed and the selected subcategory of programs is highlighted for easy viewing by the user.

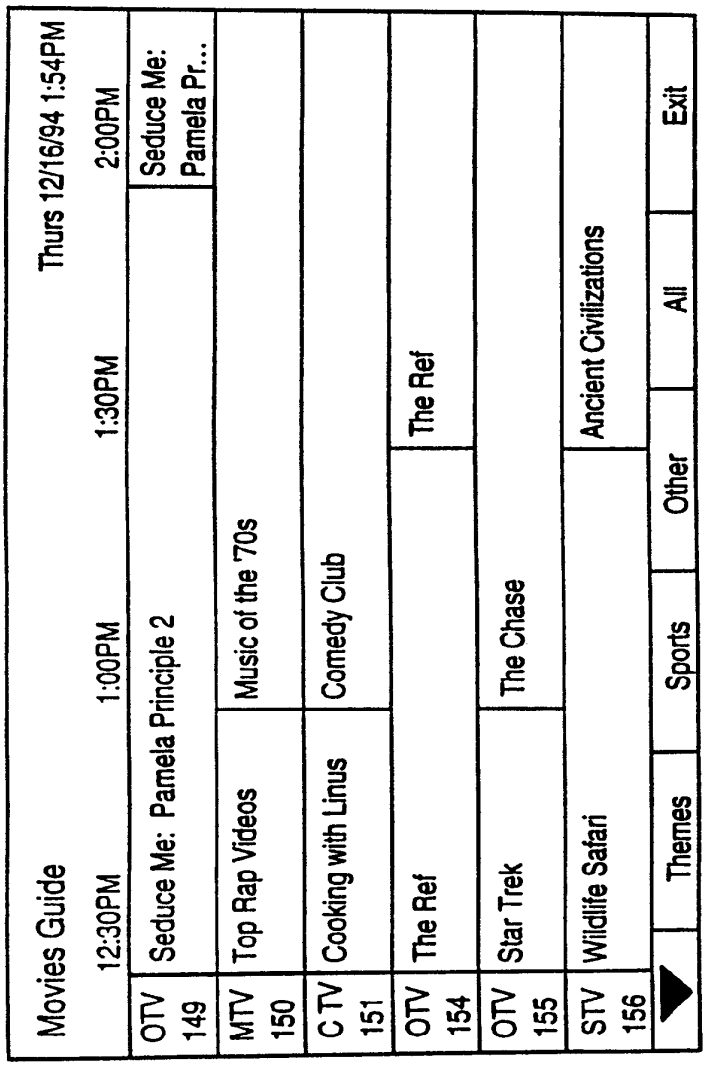

FIG. 1
PRIOR ART

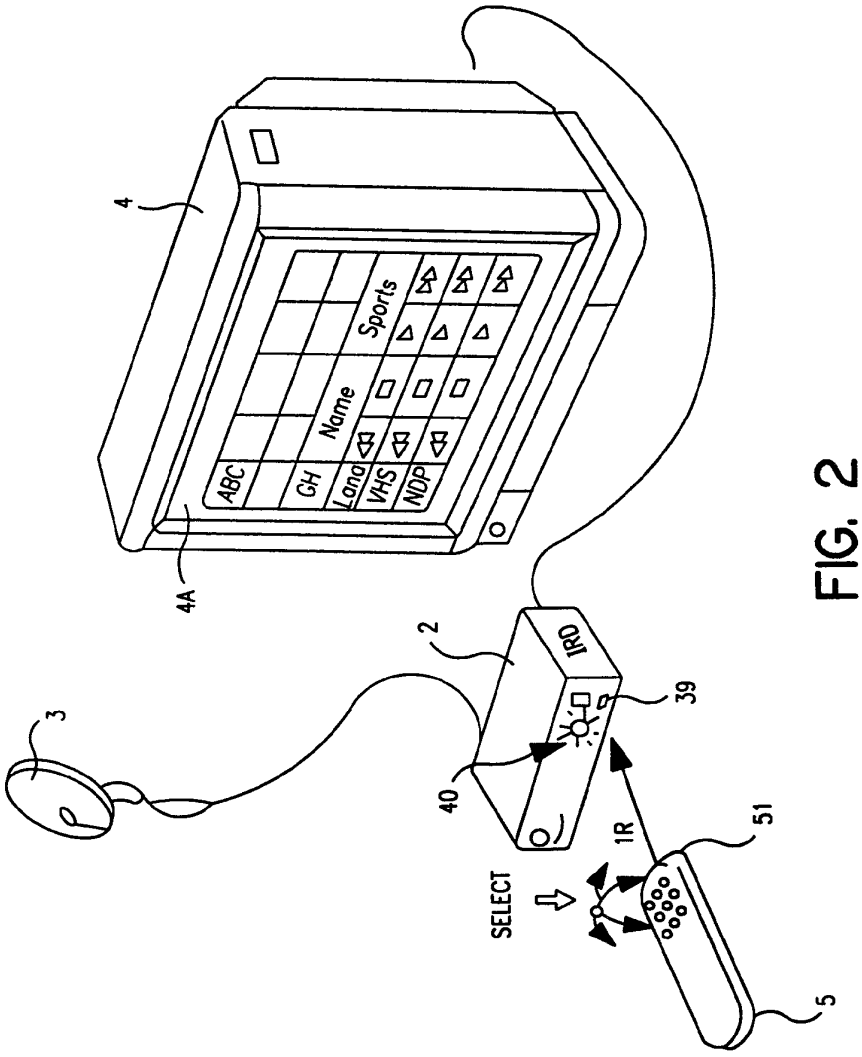

FIG. 2

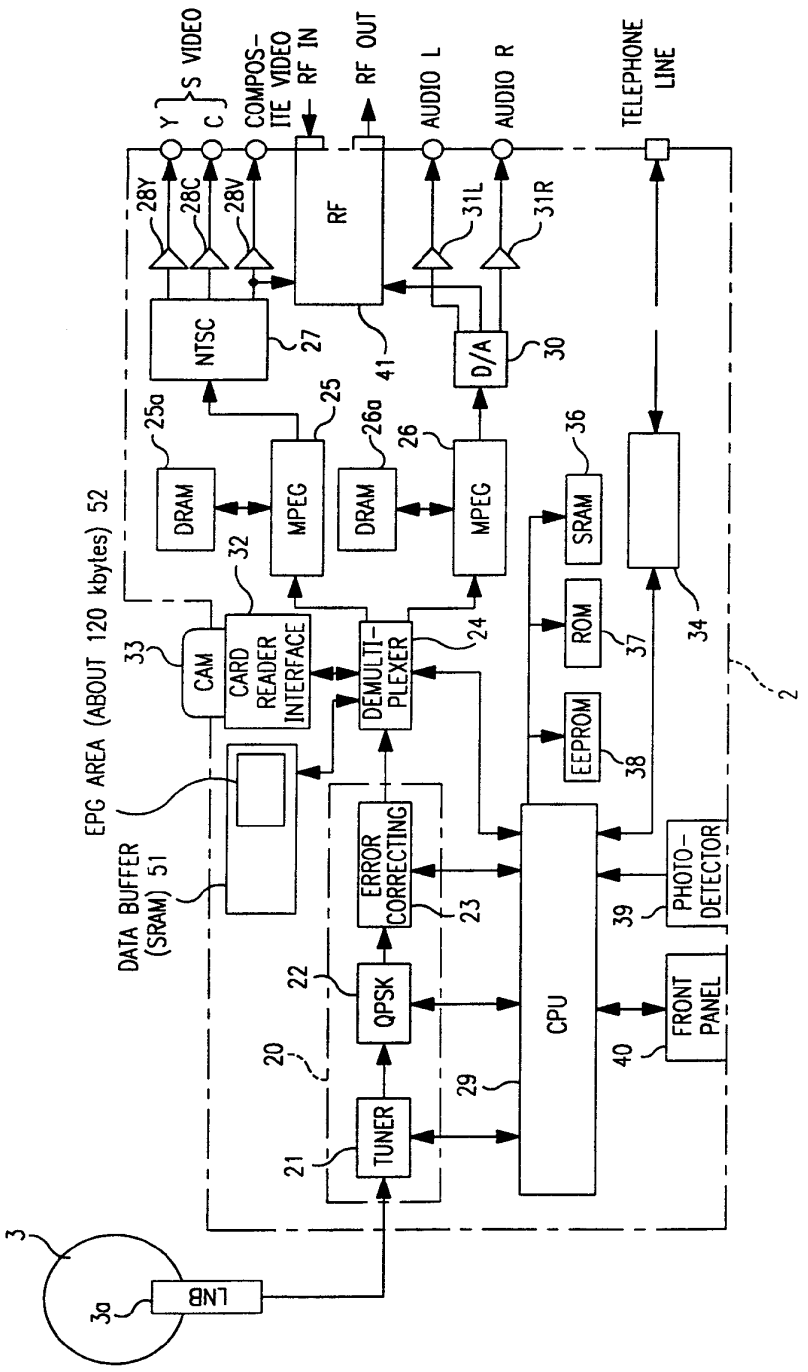
S VIDEO
Y
C
COMPOS-ITE VIDEO
RF IN
RF OUT
AUDIO L
AUDIO R
TELEPHONE LINE
28Y
28C
28V
RF
31L
31R
NTSC
27
41
D/A
30
25a
25
26a
26
36
DRAM
MPEG
DRAM
MPEG
SRAM
32
ROM
37
34
33
CAM
CARD READER INTERFACE
DEMULTI-PLEXER
24
EEPROM
38
EPG AREA (ABOUT 120 kbytes) 52
DATA BUFFER (SRAM) 51
ERROR CORRECTING
23
PHOTO-DETECTOR
39
22
QPSK
CPU
FRONT PANEL
40
20
29
TUNER
21
LNB
3a
3
2

FIG. 3

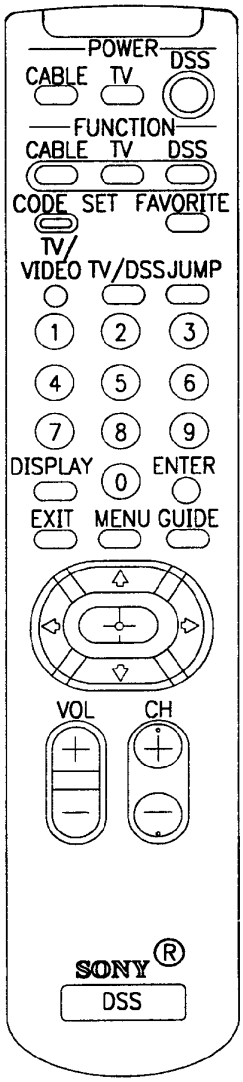
POWER
CABLE
TV
DSS
FUNCTION
CABLE
TV
DSS
CODE SET
FAVORITE
TV/
VIDEO
TV/DSS
JUMP
1
2
3
4
5
6
7
8
9
DISPLAY
0
ENTER
EXIT
MENU
GUIDE
VOL
CH
SONY
DSS

FIG. 4

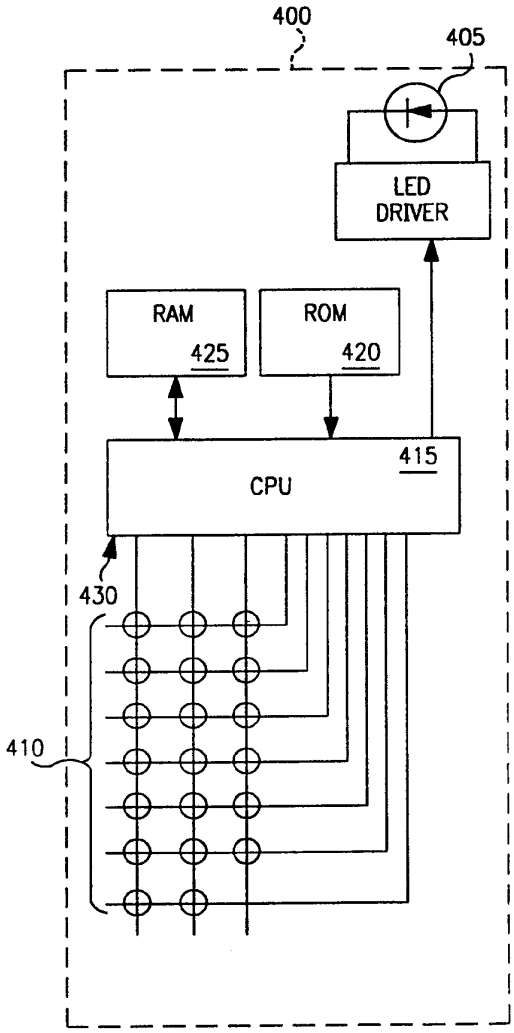

FIG. 5

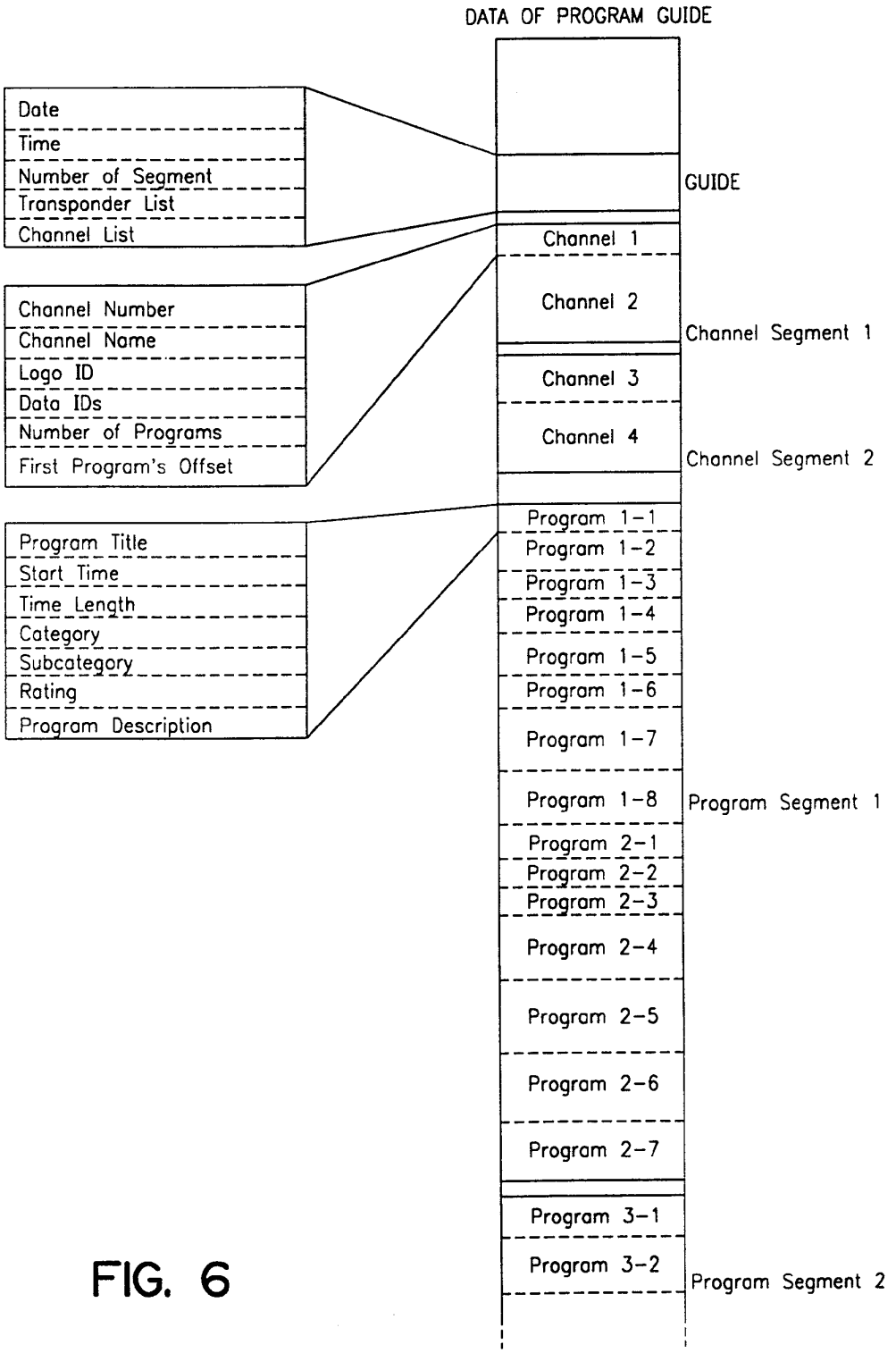

FIG. 6

EX. 1002
LG Electronics, Inc. / Page 1066 of 3394

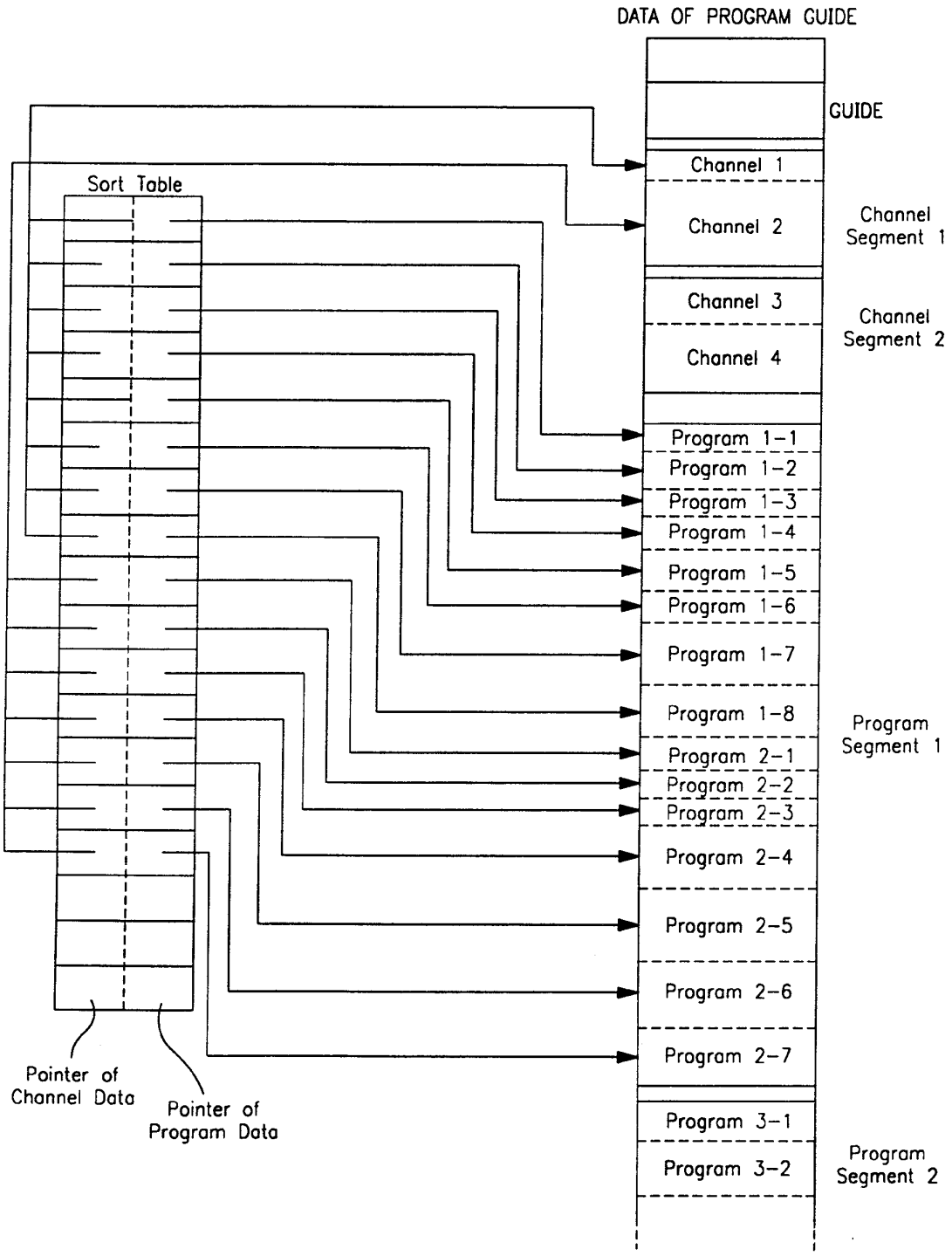
DATA OF PROGRAM GUIDE
GUIDE
Channel 1
Channel 2
Channel Segment 1
Channel 3
Channel 4
Channel Segment 2
Program 1-1
Program 1-2
Program 1-3
Program 1-4
Program 1-5
Program 1-6
Program 1-7
Program 1-8
Program Segment 1
Program 2-1
Program 2-2
Program 2-3
Program 2-4
Program 2-5
Program 2-6
Program 2-7
Program 3-1
Program 3-2
Program Segment 2
Sort Table
Pointer of Channel Data
Pointer of Program Data

FIG. 7

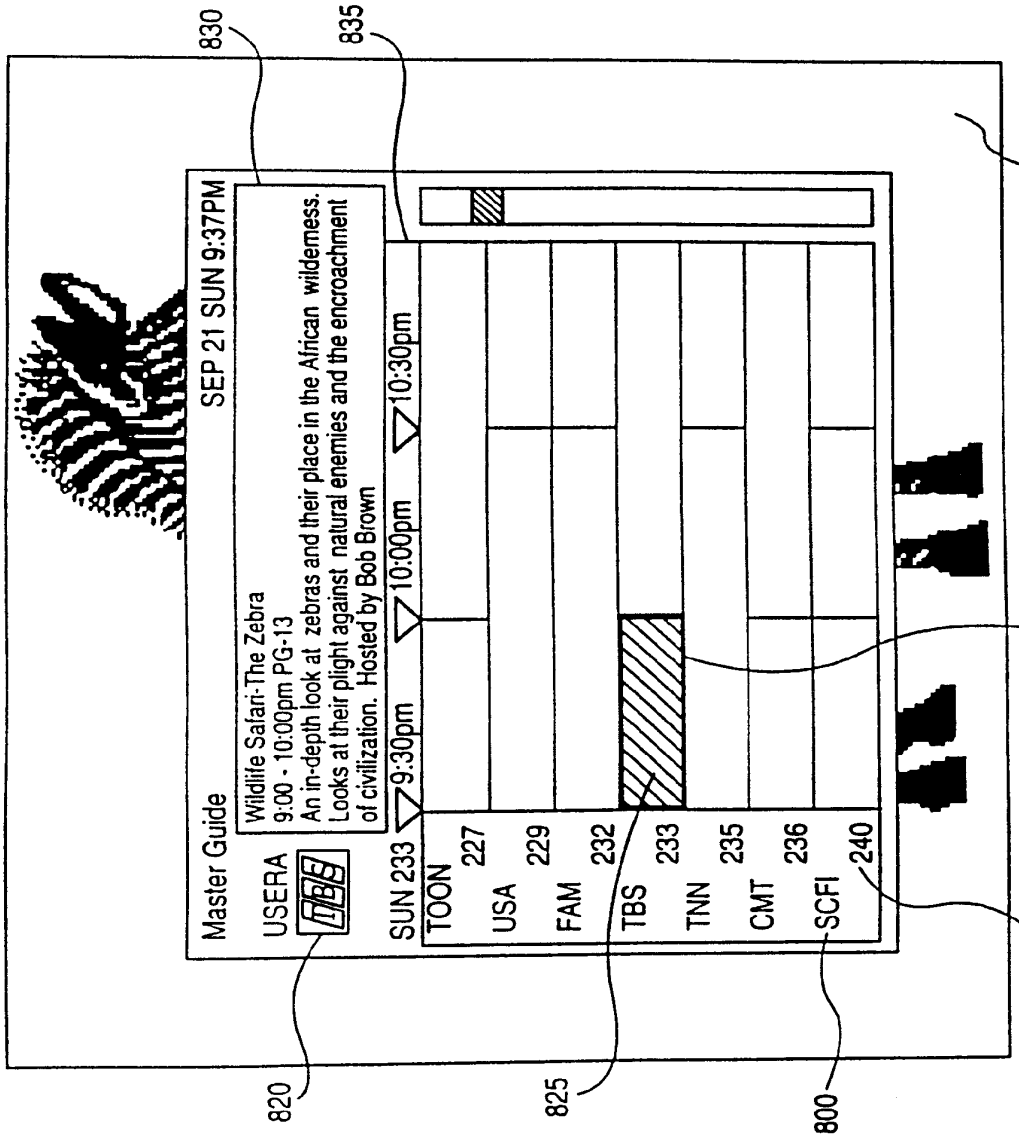

FIG. 8

EX. 1002
LG Electronics, Inc. / Page 1068 of 3394

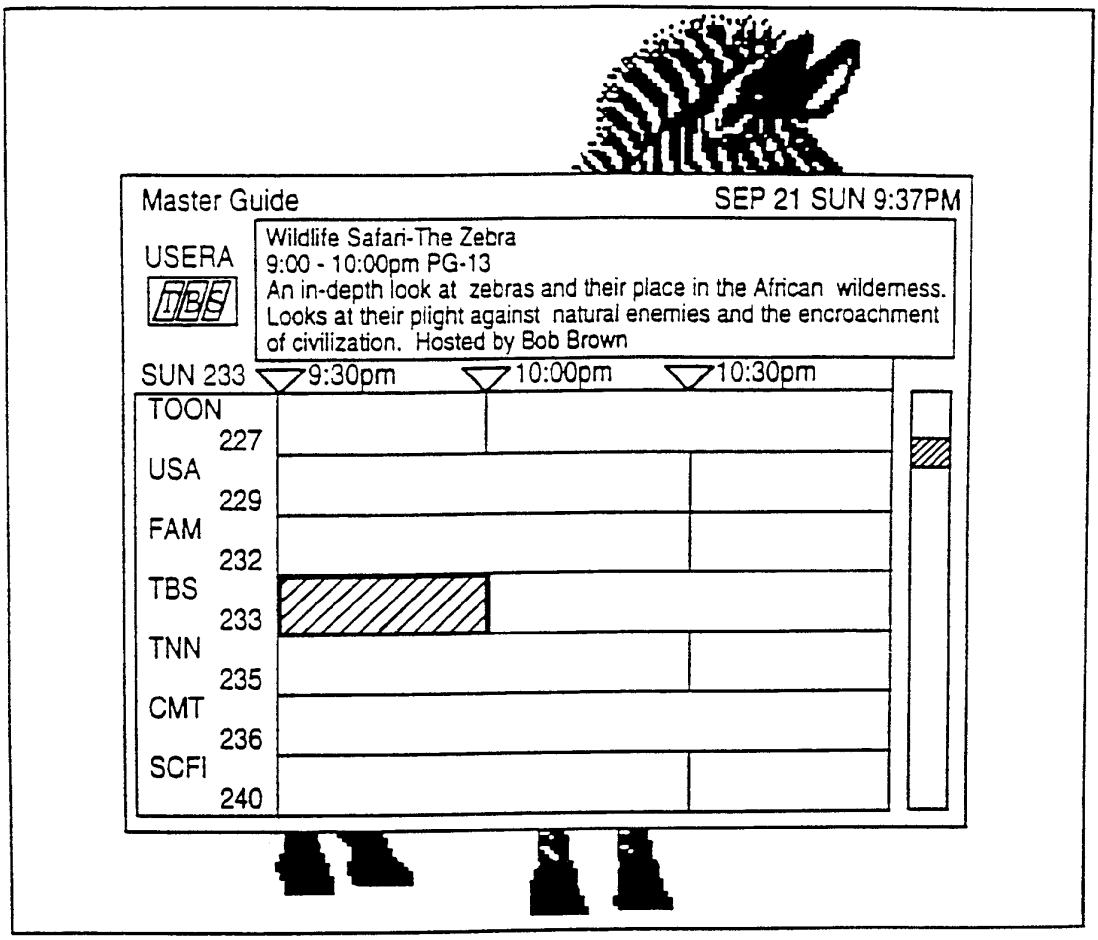

FIG. 9A

EX. 1002
LG Electronics, Inc. / Page 1069 of 3394

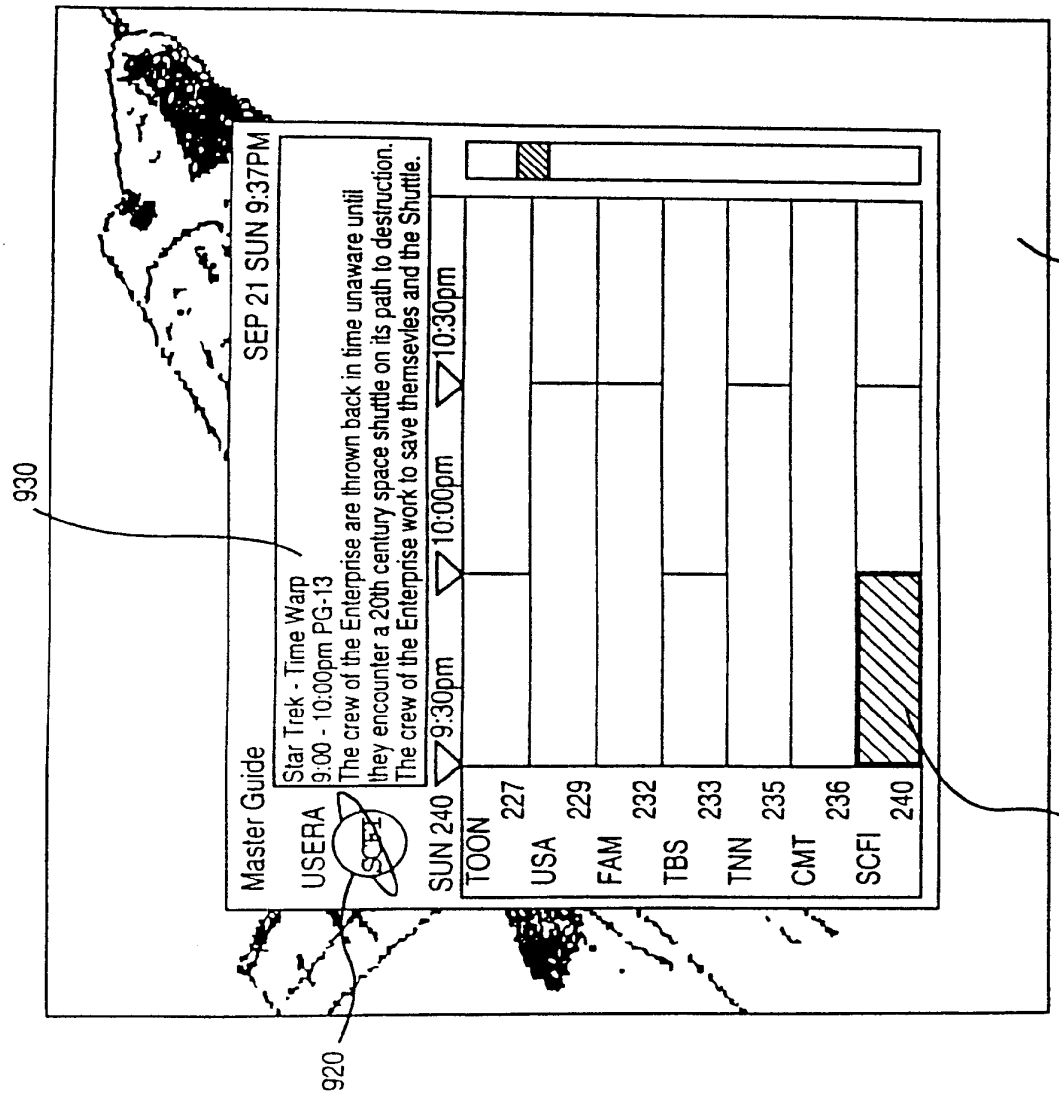
930
Master Guide
SEP 21 SUN 9:37PM
USERA
SCFI
Star Trek - Time Warp
9:00 - 10:00pm PG-13
The crew of the Enterprise are thrown back in time unaware until they encounter a 20th century space shuttle on its path to destruction. The crew of the Enterprise work to save themsevles and the Shuttle.
SUN 240
9:30pm
10:00pm
10:30pm
TOON 227
USA 229
FAM 232
TBS 233
TNN 235
CMT 236
SCFI 240
920
960
965

FIG. 9B

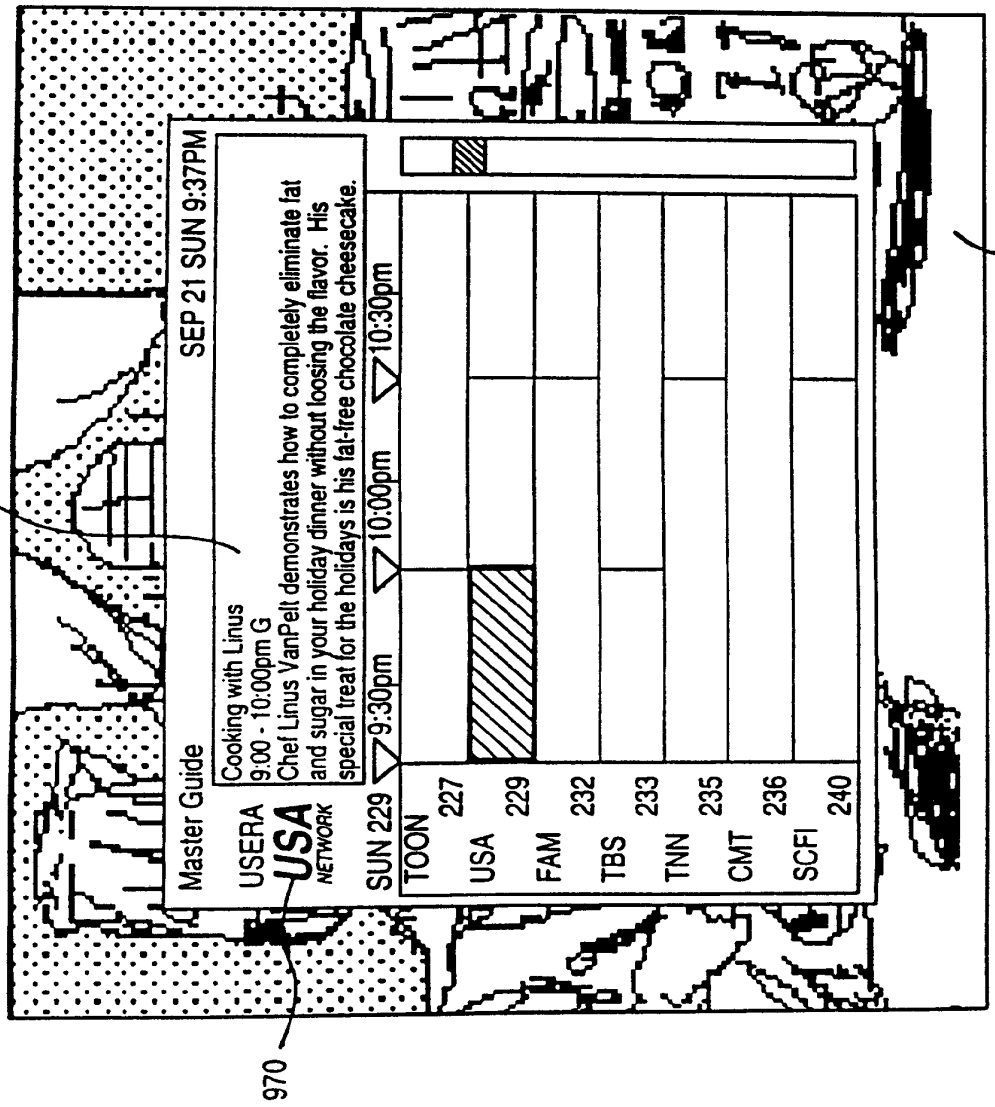
975
970
980
Master Guide
SEP 21 SUN 9:37PM
USERA
USA NETWORK
Cooking with Linus
9:00 - 10:00pm G
Chef Linus VanPelt demonstrates how to completely eliminate fat and sugar in your holiday dinner without loosing the flavor. His special treat for the holidays is his fat-free chocolate cheesecake.
9:30pm
10:00pm
10:30pm
SUN 229
TOON 227
USA 229
FAM 232
TBS 233
TNN 235
CMT 236
SCFI 240

FIG. 9C

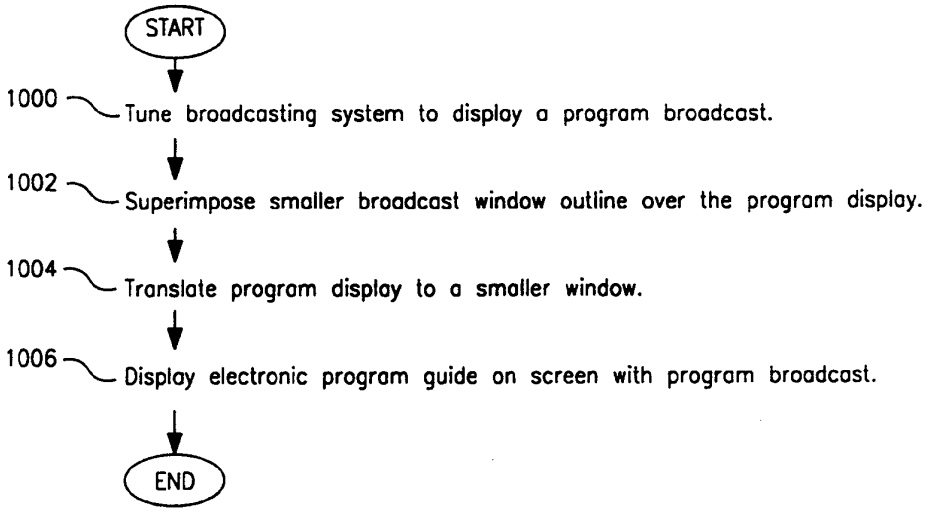
START
1000
Tune broadcasting system to display a program broadcast.
1002
Superimpose smaller broadcast window outline over the program display.
1004
Translate program display to a smaller window.
1006
Display electronic program guide on screen with program broadcast.
END

FIG. 10

FIG. 11

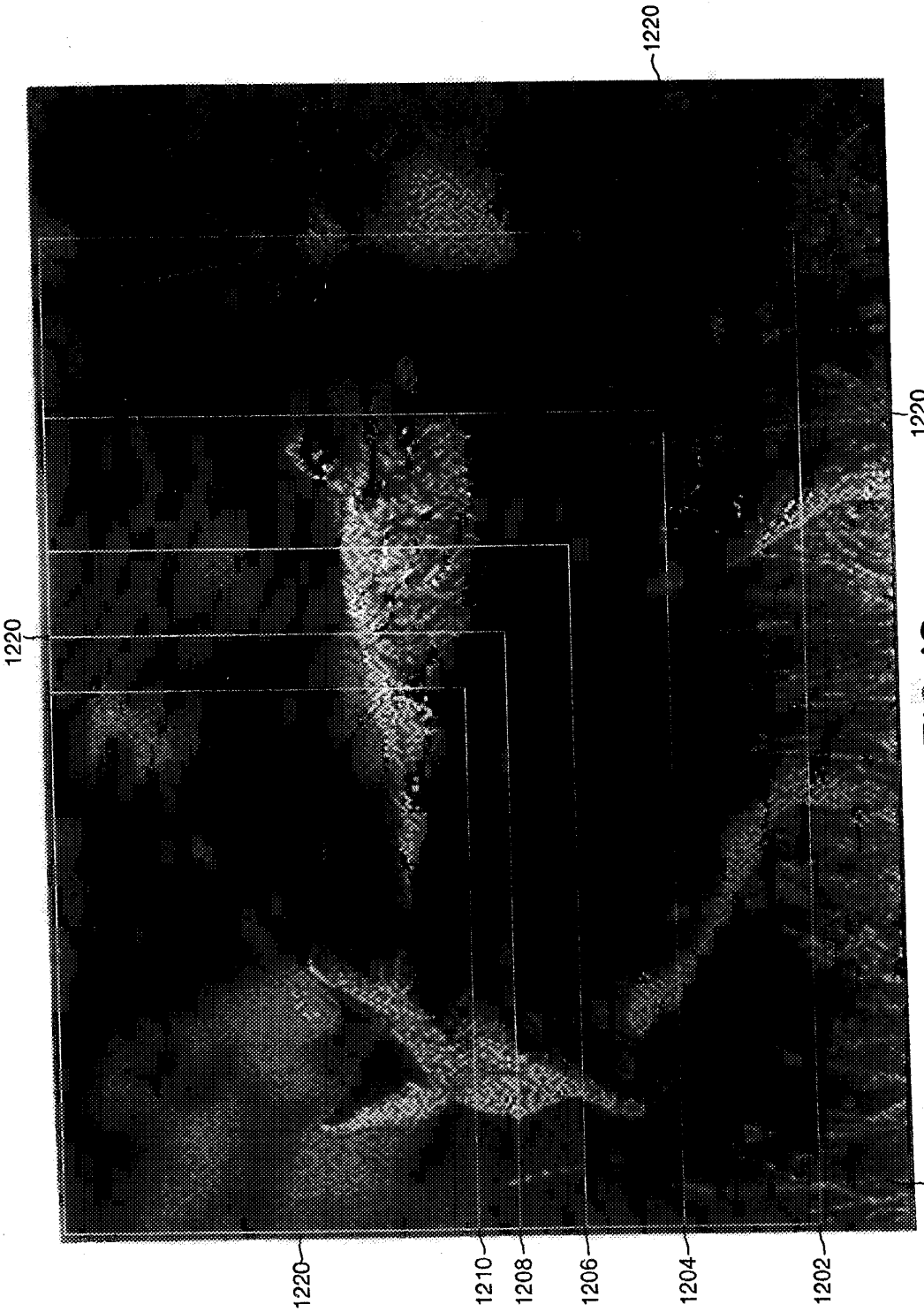

FIG. 12

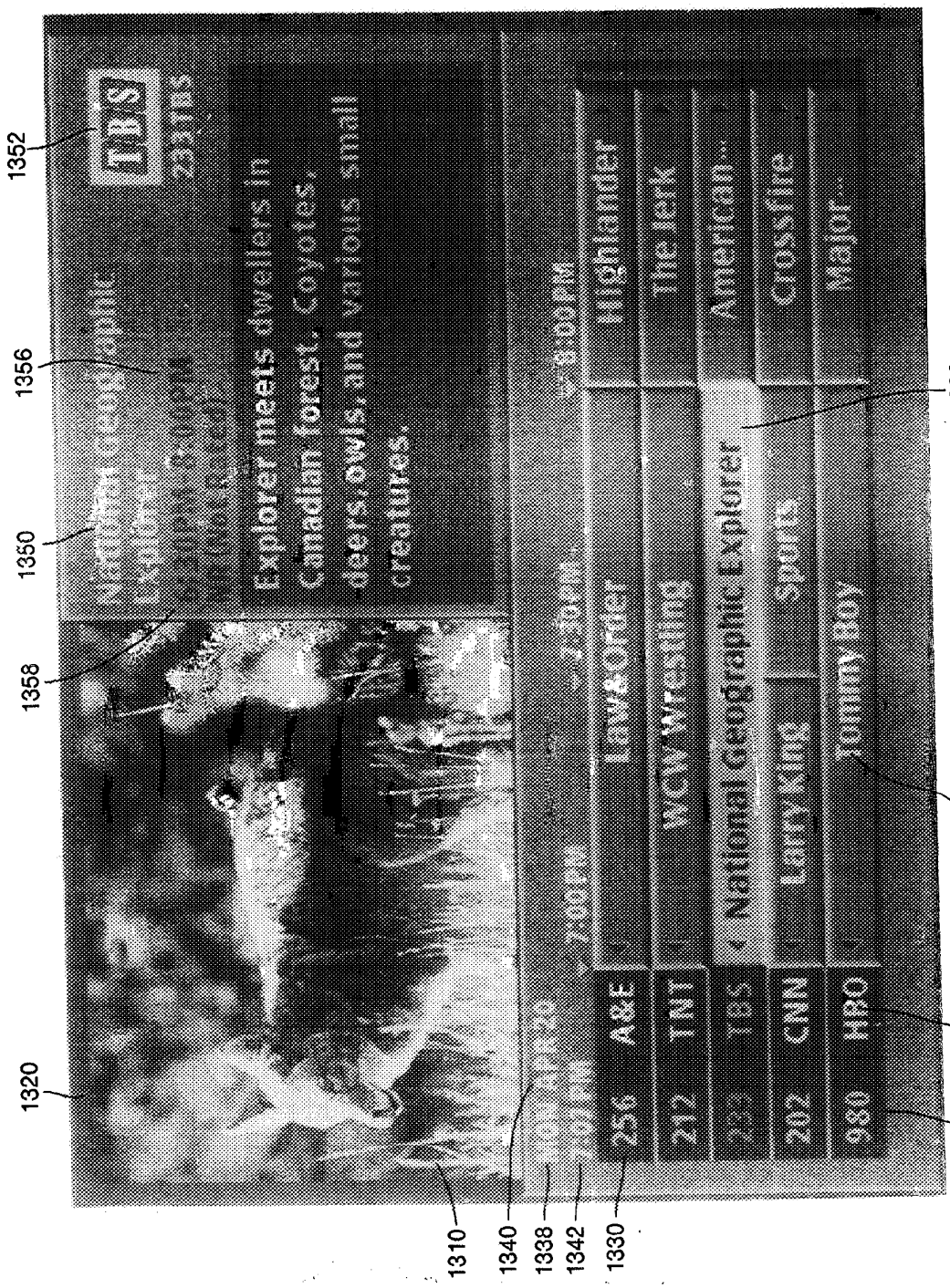
1352
1356
1350
1358
1320
1310
1340
1338
1342
1330
1380
1334
1332
1301
TBS
Explorer meets dwellers in Canadian forest. Coyotes, deers, owls and various small creatures.
8:00PM
Highlander
The Jerk
American...
Crossfire
Major...
A&E
TNT
TBS
CNN
HBO
256
212
223
202
980
Law&Order
WCW Wrestling
National Geographic Explorer
Sports
Tommy Boy

FIG. 13

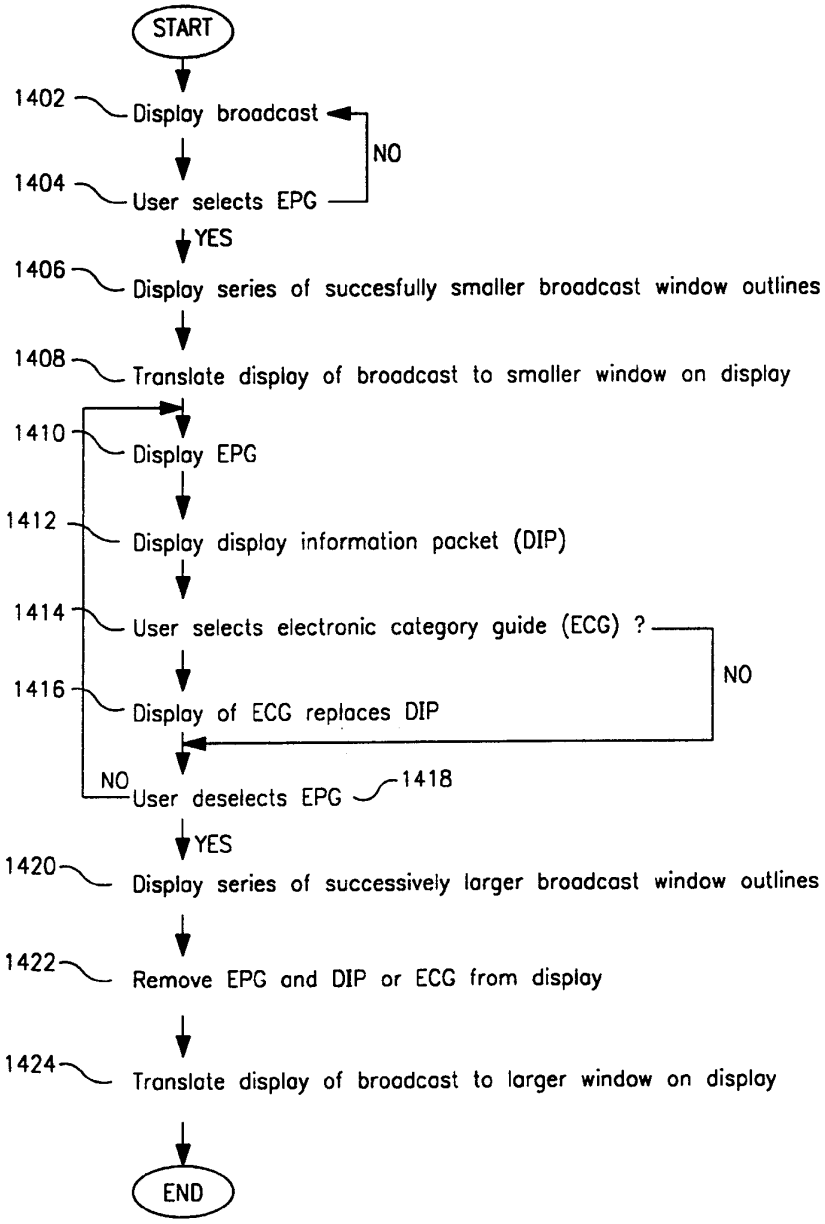
START
1402
Display broadcast
NO
1404
User selects EPG
YES
1406
Display series of succesfully smaller broadcast window outlines
1408
Translate display of broadcast to smaller window on display
1410
Display EPG
1412
Display display information packet (DIP)
1414
User selects electronic category guide (ECG) ?
NO
1416
Display of ECG replaces DIP
NO
User deselects EPG
1418
YES
1420
Display series of successively larger broadcast window outlines
1422
Remove EPG and DIP or ECG from display
1424
Translate display of broadcast to larger window on display
END

FIG. 14

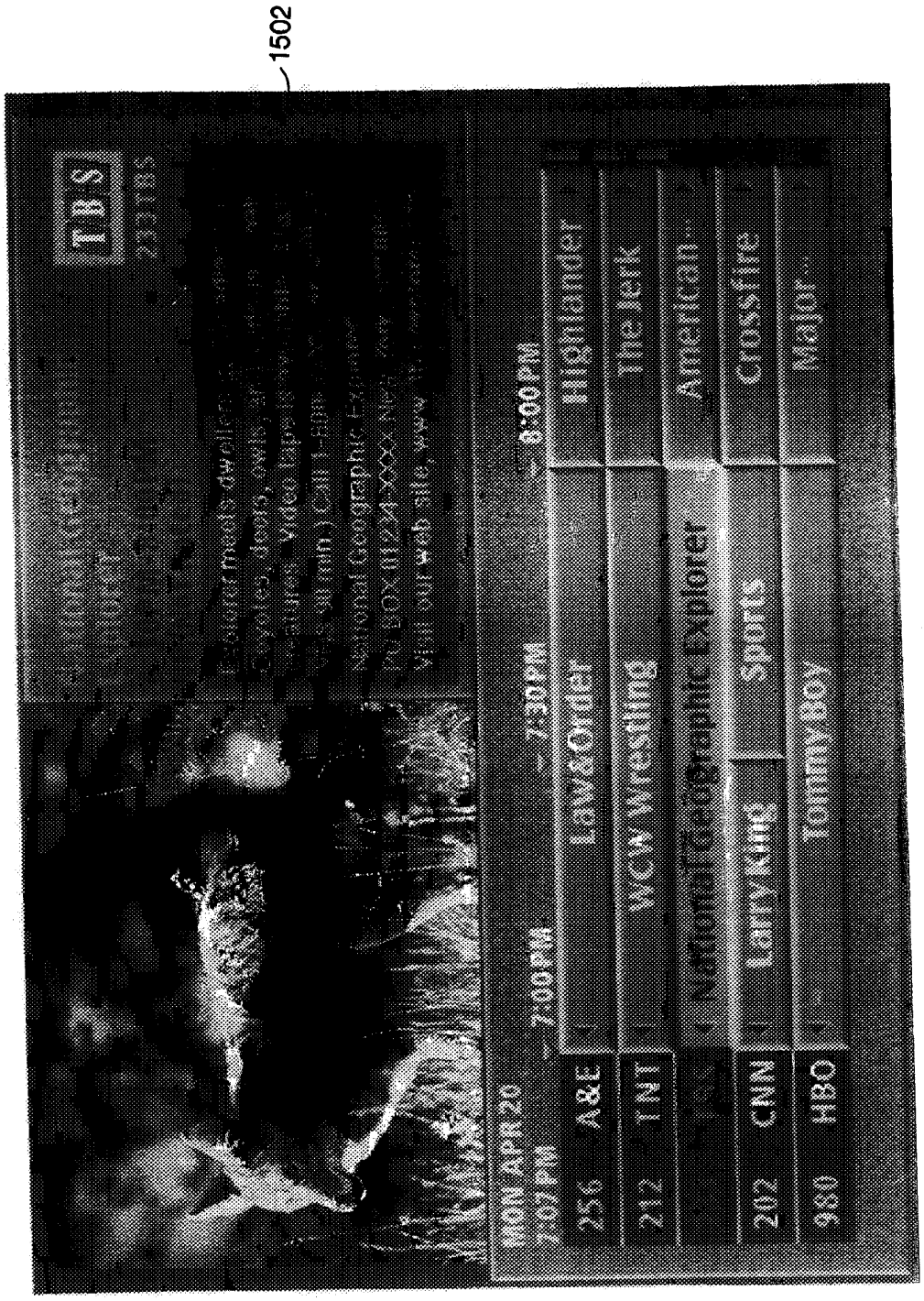
1502
TBS
MON APR 20
7:07 PM
7:00 PM
7:30 PM
8:00 PM
256 A&E
Law&Order
Highlander
212 TNT
WCW Wrestling
The Jerk
National Geographic Explorer
American...
202 CNN
Larry King
Sports
Crossfire
980 HBO
Tommy Boy
Major...

FIG. 15

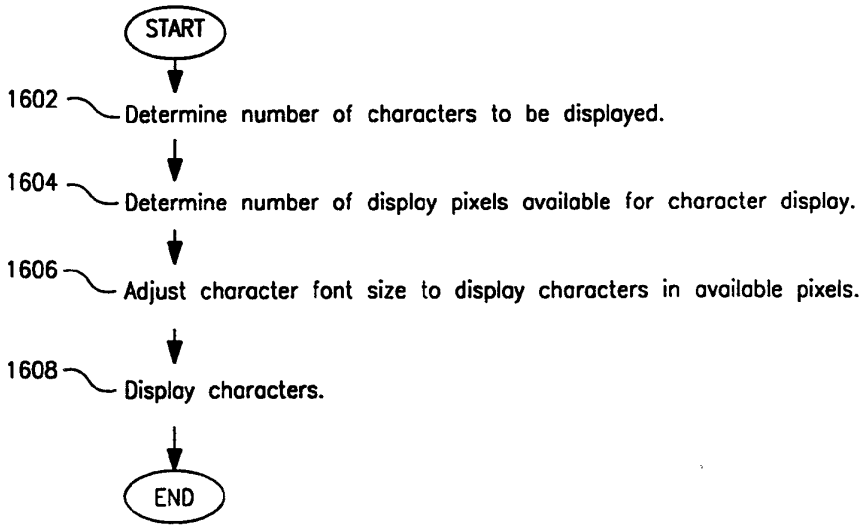
START
1602
Determine number of characters to be displayed.
1604
Determine number of display pixels available for character display.
1606
Adjust character font size to display characters in available pixels.
1608
Display characters.
END

FIG. 16

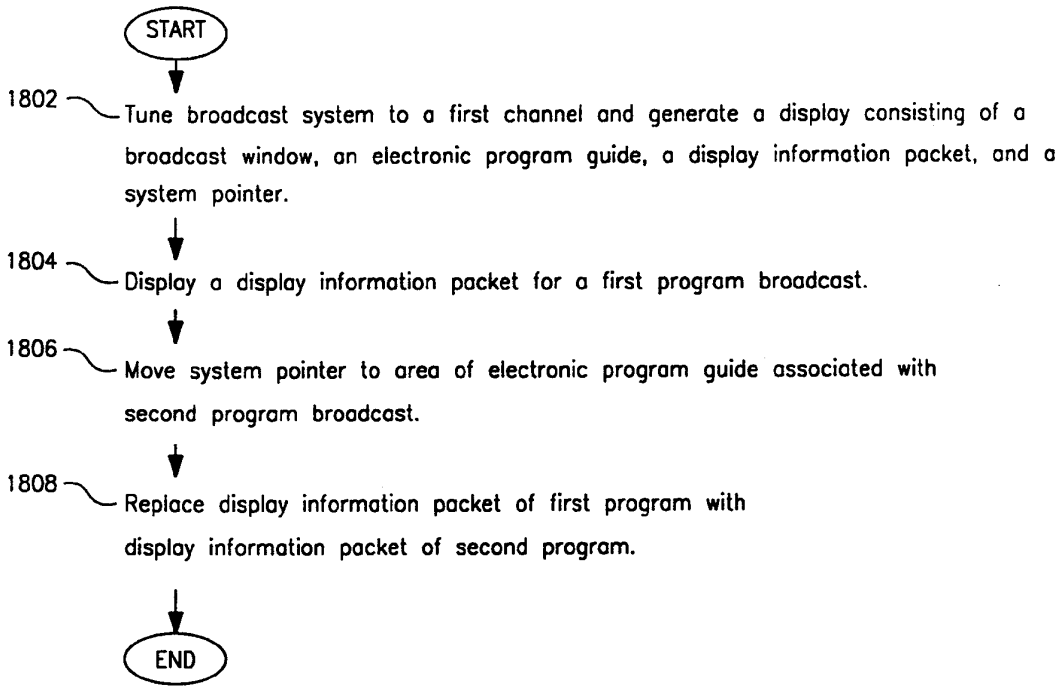
START
1802
Tune broadcast system to a first channel and generate a display consisting of a broadcast window, an electronic program guide, a display information packet, and a system pointer.
1804
Display a display information packet for a first program broadcast.
1806
Move system pointer to area of electronic program guide associated with second program broadcast.
1808
Replace display information packet of first program with display information packet of second program.
END

FIG. 18

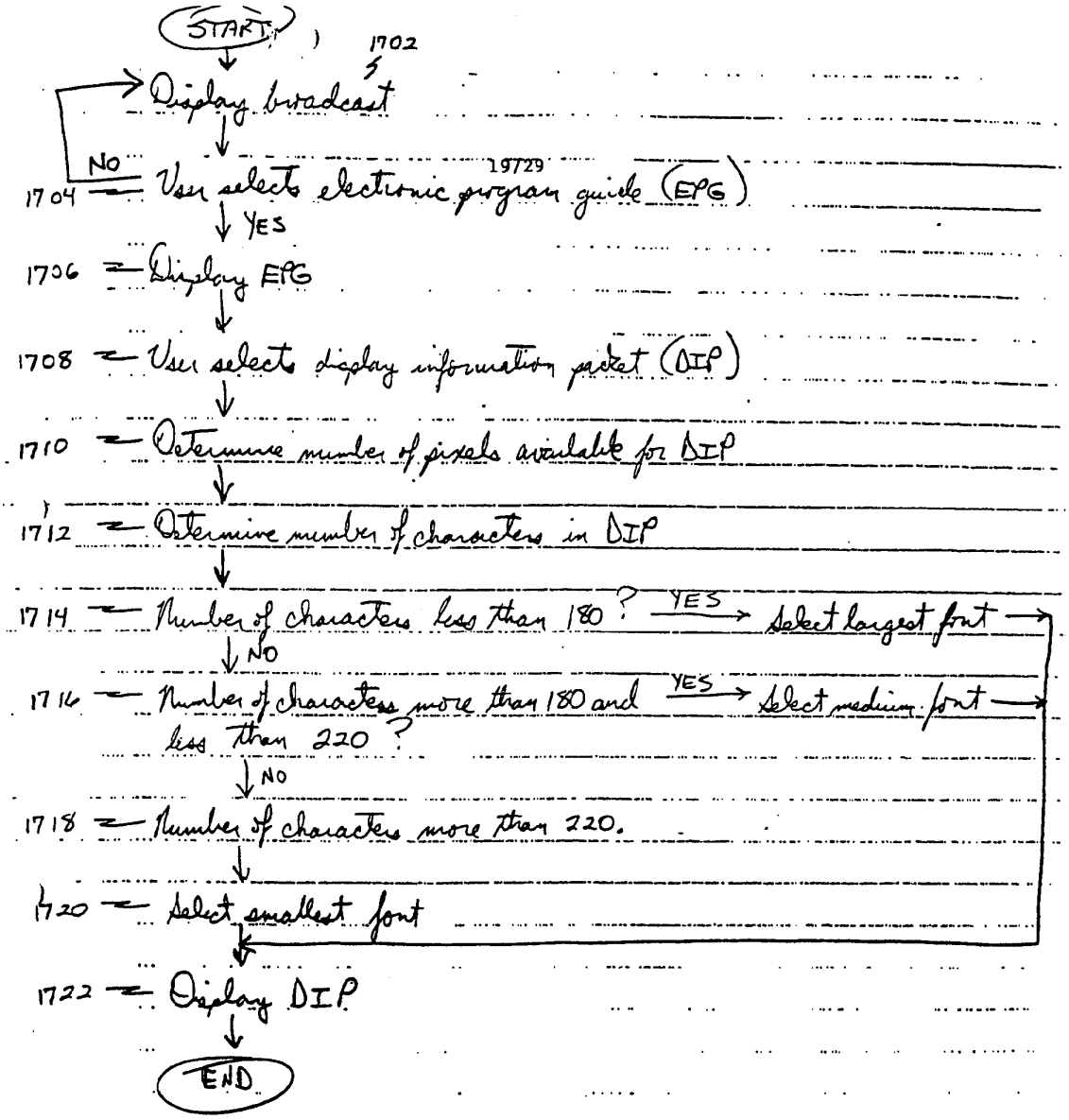
START
1702
Display broadcast
No
19729
1704 User selects electronic program guide (EPG)
YES
1706 Display EPG
1708 User selects display information packet (DIP)
1710 Determine number of pixels available for DIP
1712 Determine number of characters in DIP
1714 Number of characters less than 180?
YES
Select largest font
NO
1716 Number of characters more than 180 and less than 220?
YES
Select medium font
NO
1718 Number of characters more than 220.
1720 Select smallest font
1722 Display DIP
END

FIGURE 17

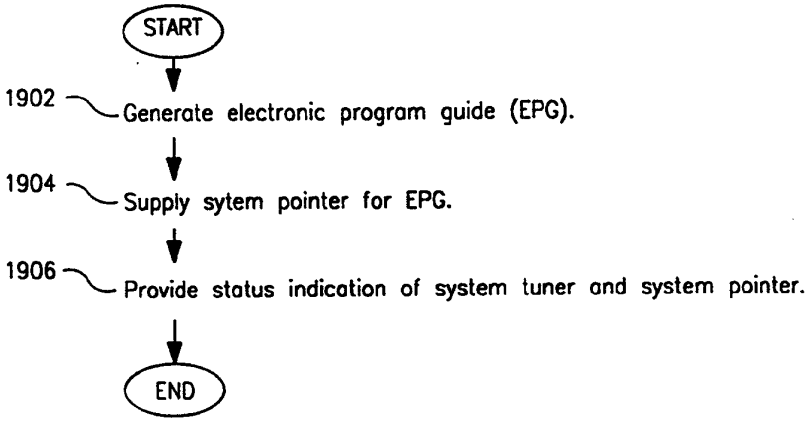
START
1902
Generate electronic program guide (EPG).
1904
Supply sytem pointer for EPG.
1906
Provide status indication of system tuner and system pointer.
END

FIG. 19

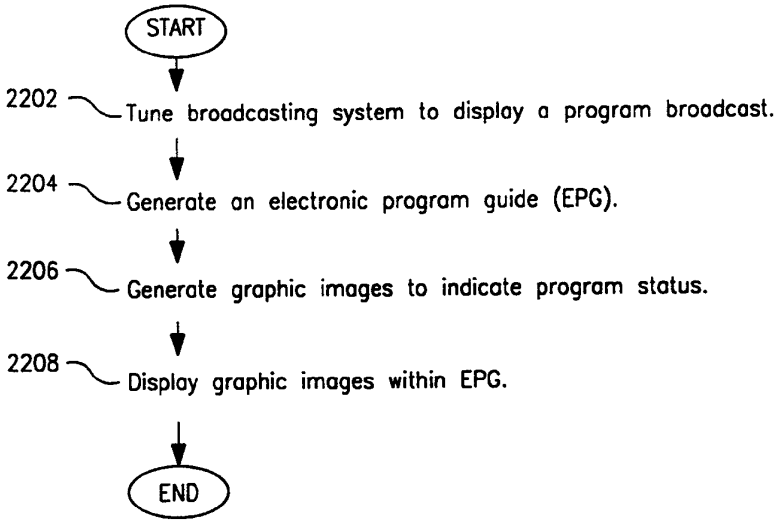
START
2202
Tune broadcasting system to display a program broadcast.
2204
Generate an electronic program guide (EPG).
2206
Generate graphic images to indicate program status.
2208
Display graphic images within EPG.
END

FIG. 22

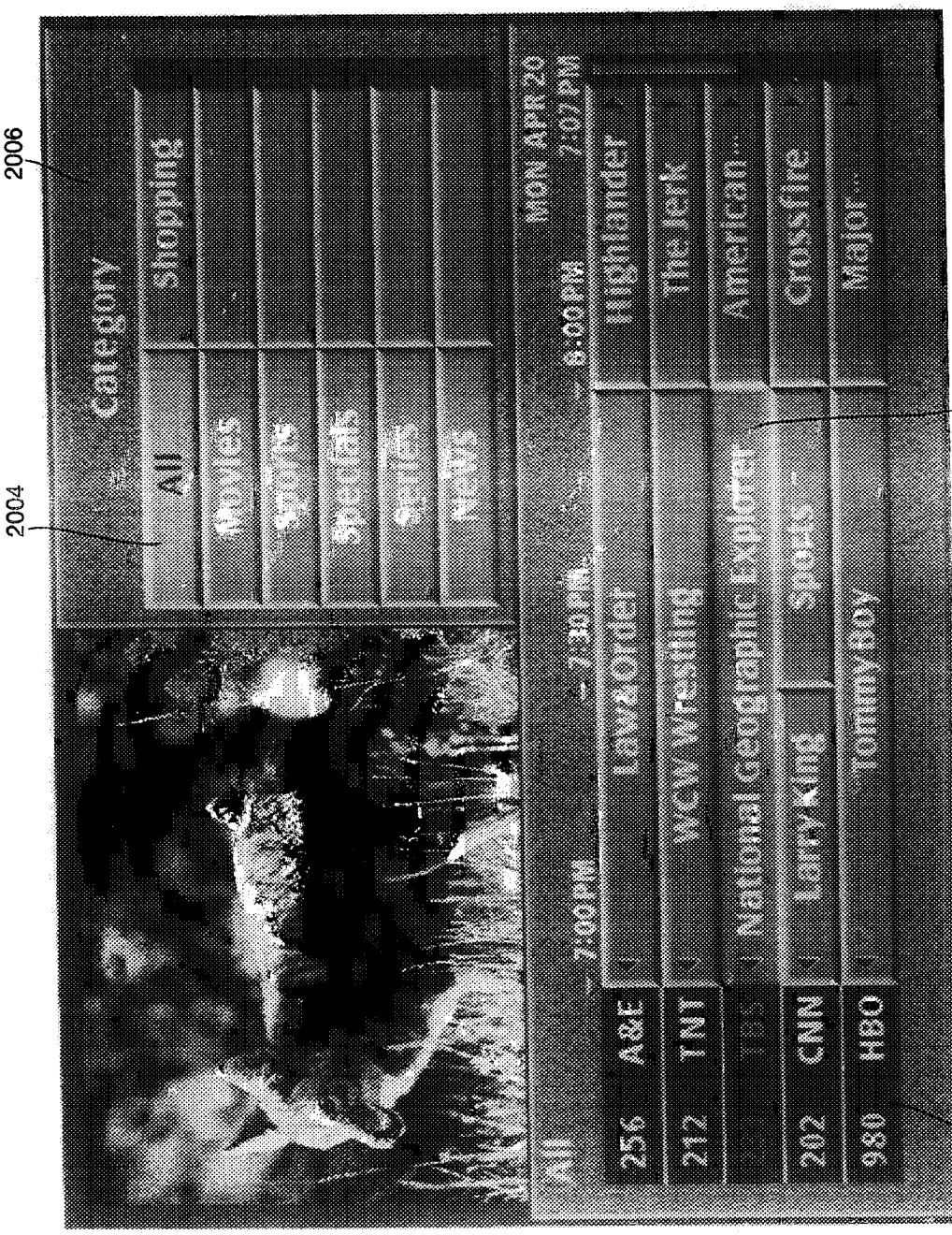
2006
2004
2002
2001
Category
All
Shopping
Movies
Sports
Specials
Series
News
MON APR 20
7:00 PM
7:30 PM
8:00 PM
7:07 PM
All
256 A&E
212 TNT
202 CNN
980 HBO
Law&Order
WCW Wrestling
National Geographic Explorer
Larry King
Sports
Tommy Boy
Highlander
The Jerk
American...
Crossfire
Major...

FIG. 20

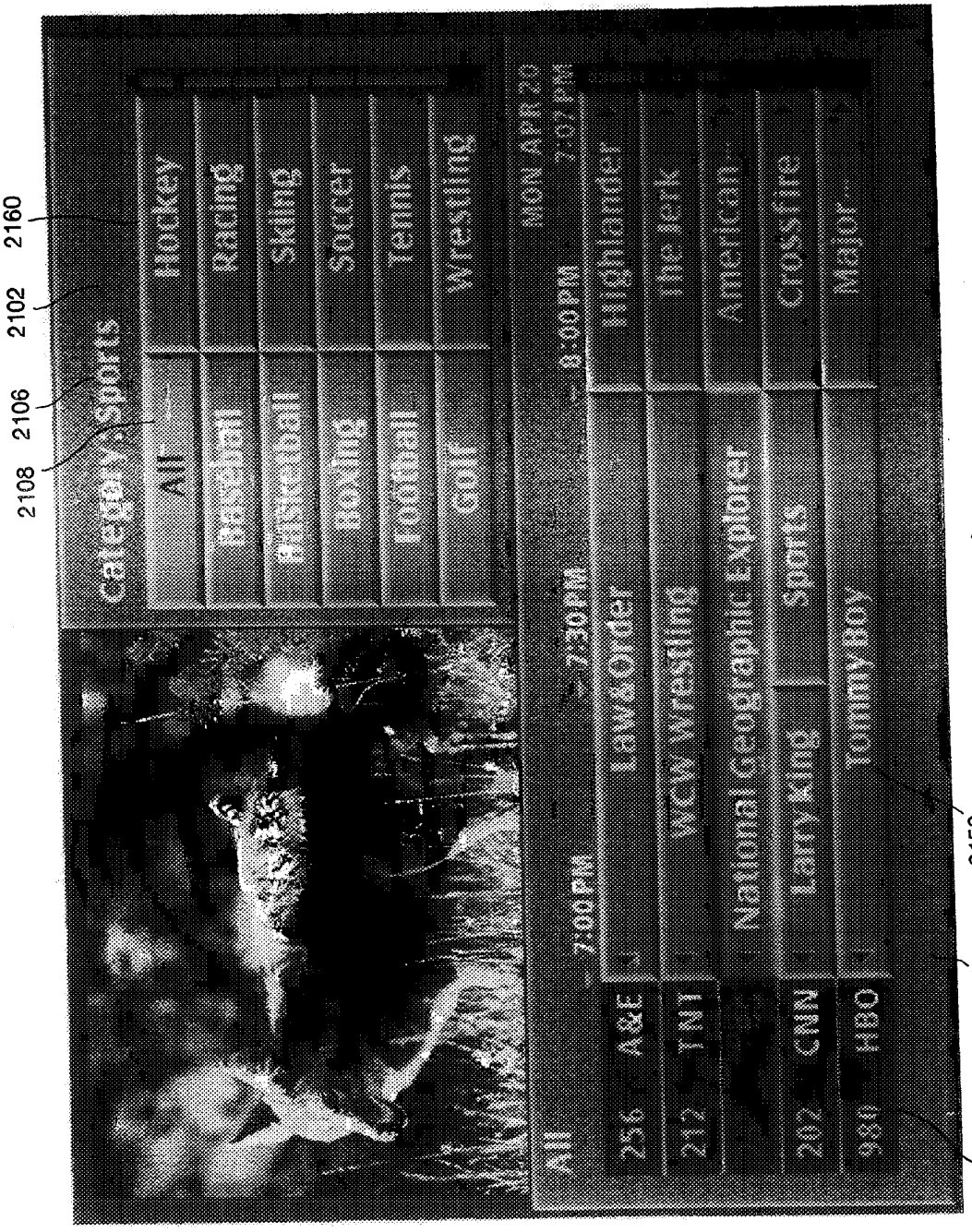
2160
2102
2106
2108
Category: Sports
All
National
Baseball
Boxing
Football
Golf
Hockey
Racing
Skiing
Soccer
Tennis
Wrestling
MON APR 20
7:07 PM
7:00 PM
7:30 PM
8:00 PM
All
256 A&E
212 TNT
202 CNN
930 HBO
Law&Order
WCW Wrestling
National Geographic Explorer
Larry King
Sports
Highlander
The Jerk
American...
Crossfire
Major...
Tommy Boy
2104
2150
2152

FIG. 21

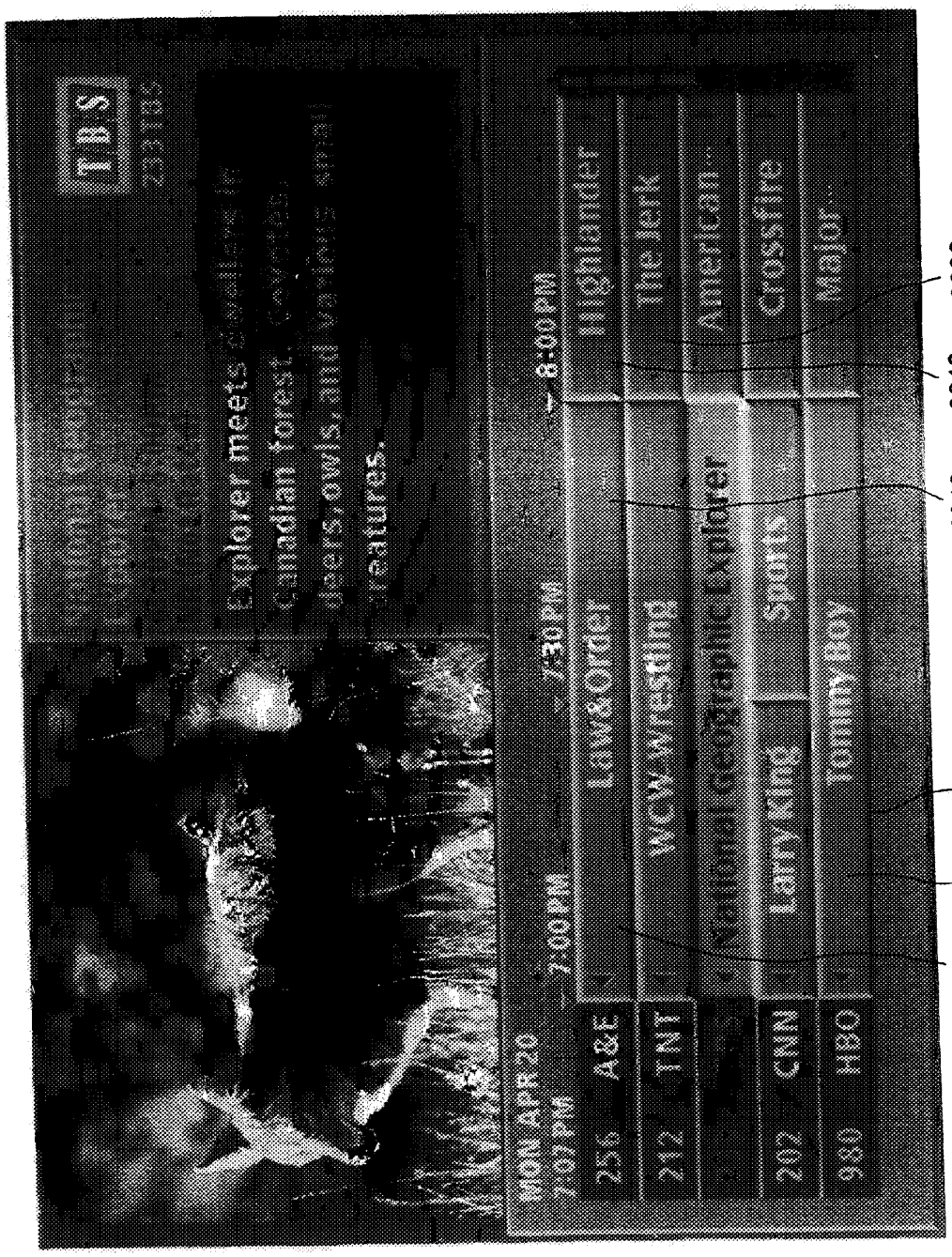
TBS
Explorer meets dwellers in Canadian forest. Coyotes, deers, owls, and various small creatures.
MON APR 20
7:07 PM
7:00 PM
7:30 PM
8:00 PM
256 A&E
212 TNT
202 CNN
980 HBO
Law&Order
WCW Wrestling
National Geographic Explorer
Larry King
Sports
Tommy Boy
Highlander
The Jerk
American...
Crossfire
Major...
2314
2304
2302
2316
2310
2306

FIG. 23

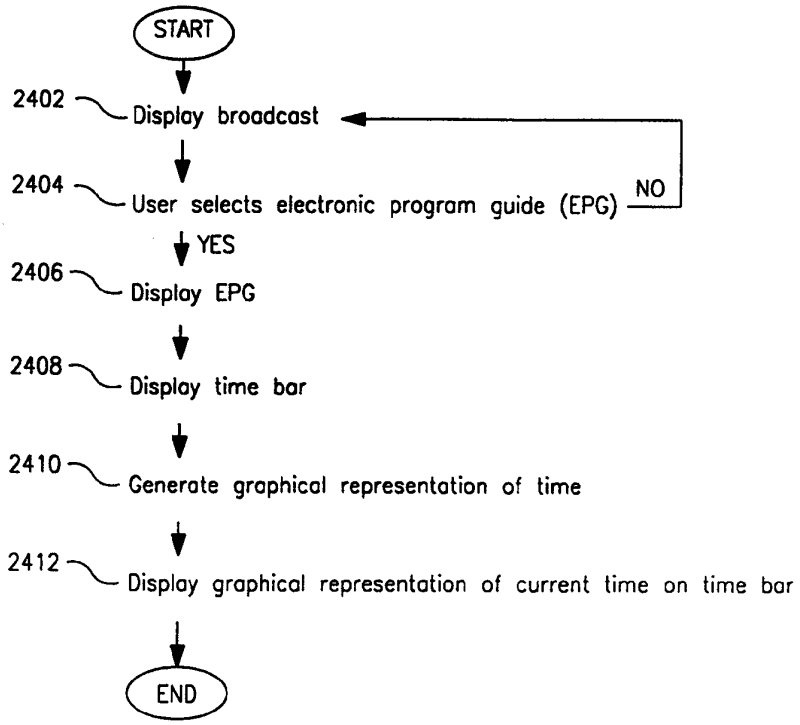
START
2402
Display broadcast
2404
User selects electronic program guide (EPG)
NO
YES
2406
Display EPG
2408
Display time bar
2410
Generate graphical representation of time
2412
Display graphical representation of current time on time bar
END

FIG. 24

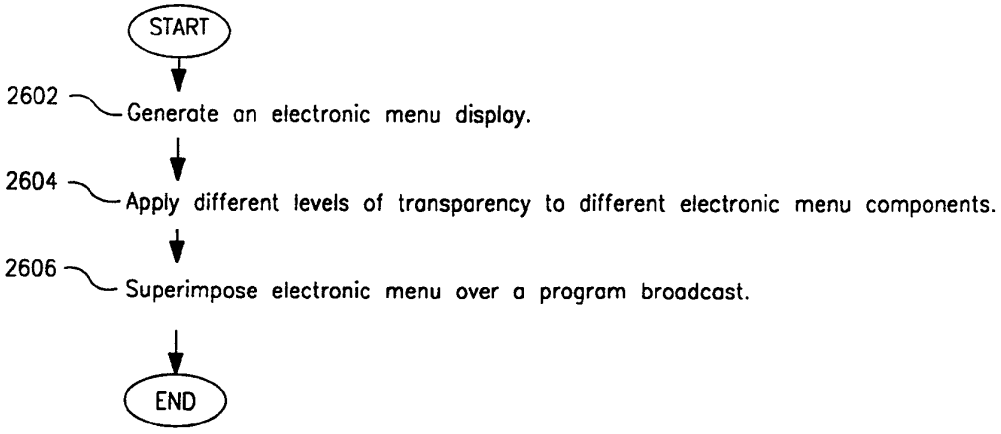
START
2602
Generate an electronic menu display.
2604
Apply different levels of transparency to different electronic menu components.
2606
Superimpose electronic menu over a program broadcast.
END

FIG. 26

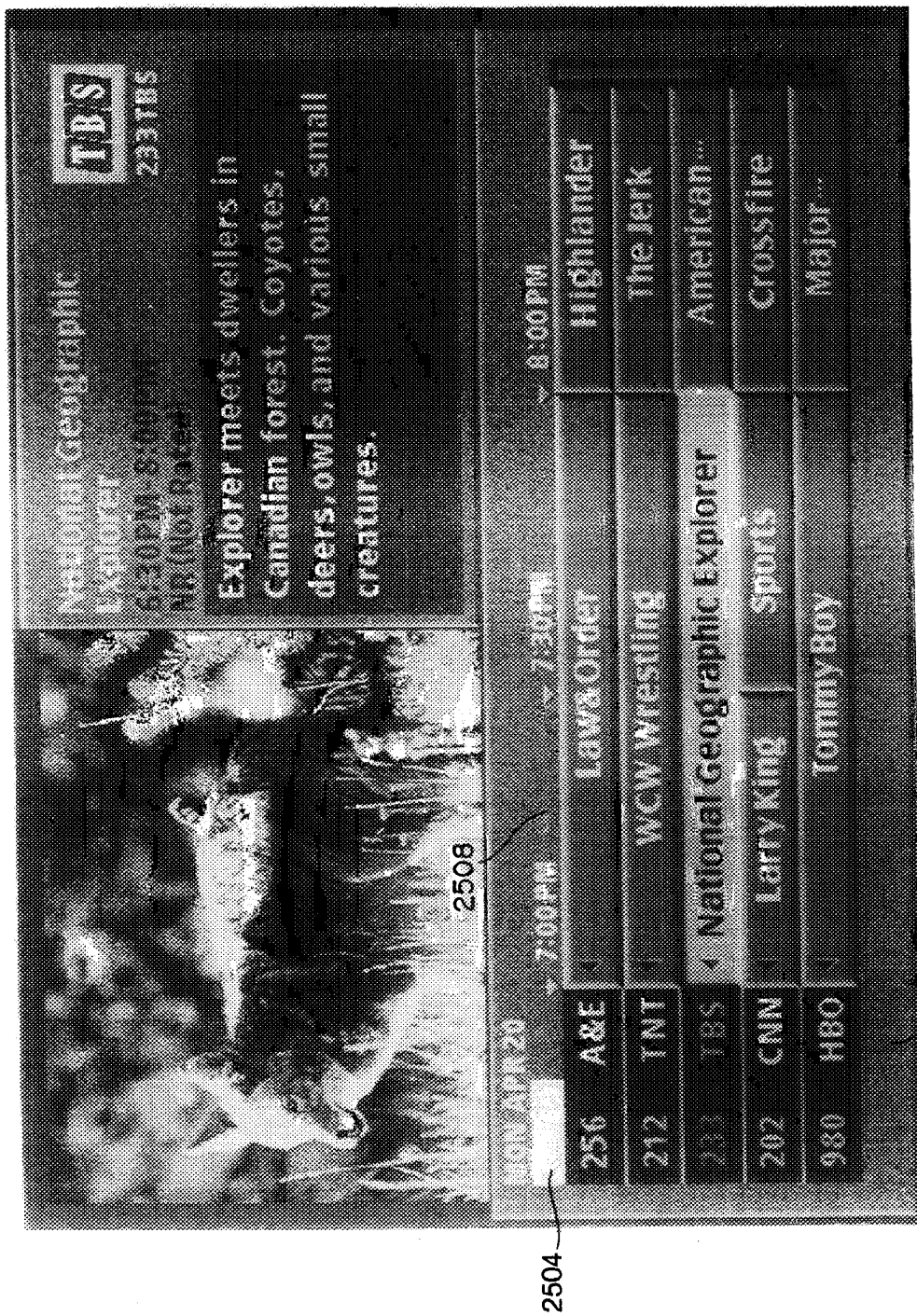
National Geographic Explorer
TBS
233 TBS
Explorer meets dwellers in Canadian forest. Coyotes, deers, owls, and various small creatures.
7:00PM
7:30PM
8:00PM
256 A&E
212 TNT
TBS
202 CNN
980 HBO
Law & Order
WCW Wrestling
National Geographic Explorer
Larry King
Sports
Tommy Boy
Highlander
The Jerk
American...
Crossfire
Major...
2508
2502
2504

FIG. 25

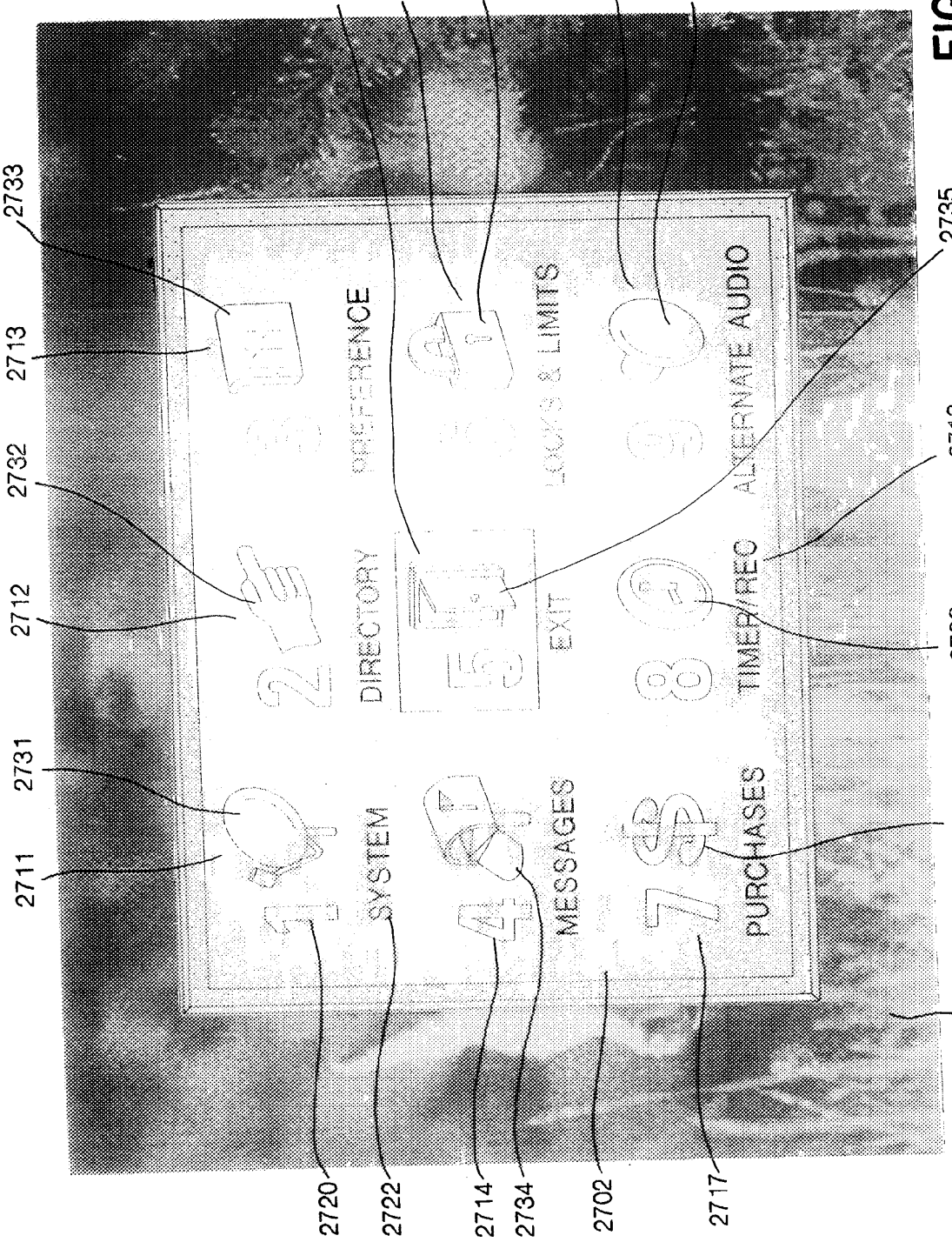
2715
2716
2736
2719
2739
2733
2735
2713
2732
2718
2712
2738
2731
2737
2711
2750
2720
2722
2714
2734
2702
2717
DIRECTORY
EXIT
TIMER/REC
SYSTEM
MESSAGES
PURCHASES

FIG. 27

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/21991

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :H04H 1/02; H04N 5/445, 5/50, 7/08, 7/10
US CL :Please See Extra Sheet.
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : Please See Extra Sheet.

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,585,838 A (LAWLER et al) 17 December 1996, see whole document.	1-57
X	US 5,594,509 A (FLORIN et al) 14 January 1997, see whole document.	1-57
Y	US 5,625,406 A (NEWBERRY et al) 29 April 1997, see whole document.	1-57
Y	US 5,650,826 A (EITZ) 22 July 1997, see whole document.	1-57

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 29 DECEMBER 1998	Date of mailing of the international search report 25 FEB 1999
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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,559,548 A (DAVIS et al) 24 September 1996, see whole document.	10, 11, 14, 18, 19, 24, 31-34, 44-47, 50, 51, 56, 57
Y	US 5,585,866 A (MILLER et al) 17 December 1996, see whole document.	10, 11, 14, 18, 19, 24, 31-34, 44-47, 50, 51, 56, 57
Y	US 5,589,892 A (KNEE et al) 31 December 1996, see whole document.	10, 11, 14, 18, 19, 24, 31-34, 44-47, 50, 51, 56, 57

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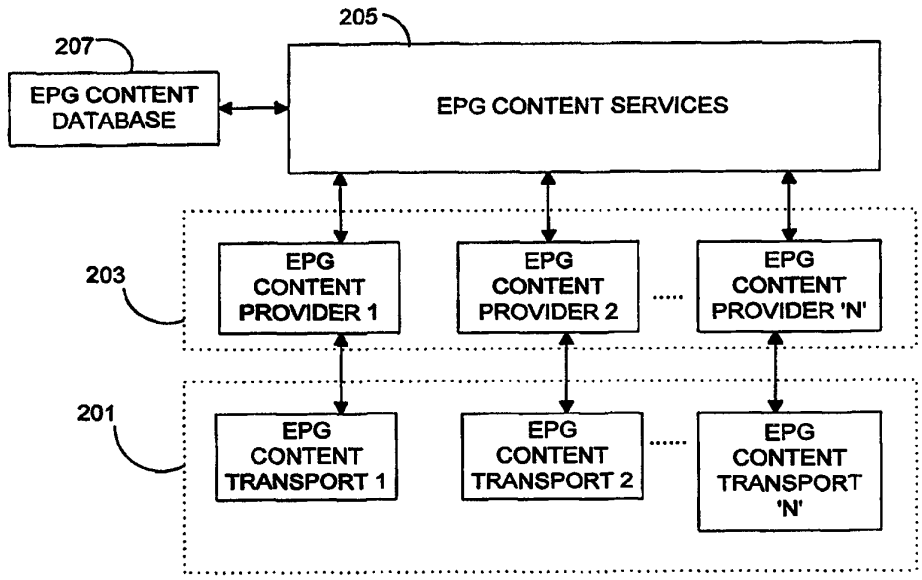

(57) Abstract

An electronic program guide (EPG) system combines different sources of television program guide data supplied by different providers into a unified data store. When different sources provide similar data, the EPG system combines the program guide data from the multiple sources in accordance with criteria such as quality of the data, timeliness of the data, and timeliness of the data provider.

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System for Combining Electronic Program Guide Data

Related Applications

This application is related to the co-assigned and co-filed applications, "Method for managing multiple channel maps from multiple input devices in a multimedia system," "System for time-shifting events in a multi-channel convergence system," "Method and system for associating web sites to television programs," "Individualized parameter control for multiple media sources in a data processing system," "System for scheduled caching of in-band data services," and "Integration of Internet sources into an electronic program database list," all of which are hereby incorporated by reference.

Field of the Invention

The present invention is related to electronic program guides and in particular to retrieving and combining electronic program guide data from more than one provider.

Background of the Invention

One of the current trends in consumer electronics is the convergence of television technology and computer technology. Starting with the inclusion of a simple microprocessor chip in a television set, the convergence of the two technologies has evolved into sophisticated personal computers equipped with television tuners and large VGA monitors. Convergence systems enable the user to perform data processing tasks while simultaneously viewing a broadcast television program. Standard television add-ons, such as VCR's or laser disks, increase the content choices available to the user. The advent of personal satellite receivers has also opened up a vast range of broadcast content.

However, the number of channel choices also requires the user scrutinize many pages of printed schedules and program information to find the programs the user is

interested in watching. One existing approach to managing the great amount of scheduling and program information available is to organize the information in an electronic program guide (EPG). The data for an EPG is downloaded from a particular provider to a microprocessor either in the television or in an attached device. The program guide data is stored in a data store, such as a database, and displayed on the television screen when the user requests. The source of the information differs from provider to provider. For example, StarSight Telecast, Inc. places program guide data in the vertical blanking interval in the broadcast television signal, Direct TV™ and Echostar Communications Corp. use a portion of the MPEG2 (Motion Picture Experts Group) digital satellite data stream, and TV Host and Intel Corp.'s Smart TV® require a dial-up telephone connection. The data stores created from the source information are proprietary to the provider and are incompatible.

Because of the incompatibilities, an EPG user currently must chose a single provider from which to receive program guide data. However, television schedules are often in flux and some providers reflect the changes more quickly than others. Furthermore, the program information given by one provider may be good for one category of program but poor for another category.

Therefore, there is a need for an EPG system that receives program guide data from different sources and resolves conflicts among the data.

Summary of the Invention

An electronic program guide (EPG) system combines data from multiple EPG content providers and organizes the EPG data into an EPG content data store. The EPG system includes an EPG content services function which creates and manages the EPG content data store; a plurality of EPG content transport functions that retrieve the EPG data provided by the EPG content providers from multiple sources and in multiple source-specific formats and a plurality of EPG content provider function which convert the source-specific formatted EPG data into a format compatible with the EPG data store. The EPG content services function also includes a conflict resolution function

which determines what EPG data is of higher quality or more timely when similar data is received from more than one source. In addition, the EPG content services function registers new EPG content providers into the EPG data store. The data structure of the EPG data store is also described, as is a specific arrangement of modules that implement processes necessary for the operation of the EPG system.

Additionally, a system for combining EPG data in multiple formats from a plurality of sources using a content organizer is described. The multiple EPG formats are combined into a single EPG data format. The content organizer includes an EPG content data store created and managed by an EPG content services function, a plurality of EPG content transport functions which retrieves the EPG data from the plurality of sources, and an EPG content provider function which converts the EPG data from the multiple formats to an EPG content data store format for storage in the EPG content data store. A specific arrangement of modules for the content organizer is also described.

Because the EPG system of the present invention retrieves EPG data supplied by multiple EPG content providers through different sources and organizes the EPG data into a single data store, the viewer is not required to select a single provider, be reliant on a single source for the information, or become familiar with multiple EPG systems. Thus, the EPG system gives the viewer more selections, provides more dependability, and makes the EPG data more accessible. Furthermore, because the EPG system resolves conflicts between the data from different providers based on data quality or timeliness, the viewer has access to better and more reliable information.

Brief Description of the Drawings

Figure 1A is a block diagram of hardware components for a convergence system utilizing an electronic program guide (EPG) system.

Figure 1B is a block diagram of a digital processing system shown in Figure 1A.

Figure 1C is a block diagram of a software architecture executing in the digital processing system of Figure 1B.

Figure 2 is a block diagram of four primary modules of one embodiment of an EPG system operating in the software architecture of Figure 1C.

Figure 3 is a block diagram of one embodiment of an EPG content data store in the EPG system of Figure 2.

Figure 4 is a field layout diagram of a provider record in the EPG content data store of Figure 3.

Figure 5 is a field layout diagram of a guide record in the EPG content data store of Figure 3.

Figure 6 is a field layout diagram of a channel record in the EPG content data store of Figure 3.

Figure 7 is a block diagram of the EPG content data store of Figure 3 showing detailed tables associated with an event table.

Figure 8 is a field layout diagram of an event record in the EPG content data store of Figure 7.

Figure 9 is a field layout diagram of an event title record in the EPG content data store of Figure 7.

Figure 10 is a field layout diagram of an event description record in the EPG content data store of Figure 7.

Figure 11 is a field layout diagram of an event extension record in the EPG content data store of Figure 7.

Figure 12 is a field layout diagram of an event start record in the EPG content data store of Figure 7.

Figures 13-15 are operation flow diagrams of the processes of the EPG system of Figure 2.

Description of the Embodiments

In the following detailed description of the embodiments, reference is made to the accompanying drawings which form a part hereof, and in which is shown by way of illustration specific embodiments in which the invention may be practiced. These

embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that structural, logical and electrical changes may be made without departing from the spirit and scope of the present inventions. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present inventions is defined only by the appended claims.

The leading digit(s) of reference numbers appearing in the Figures corresponds to the Figure number, with the exception that the same reference number is used throughout to refer to an identical component which appears in multiple Figures. Signals and connections may be referred to by the same reference number or label, and the actual meaning will be clear from its use in the context of the description.

Electronic Program Guide System Overview

An electronic program guide (EPG) system of the present invention organizes schedule and program information from multiple EPG content providers through differing sources and presents a single, optimized menu to the user based on criteria such as quality of the data, timeliness of the data, and timeliness of the program guide provider. The EPG system is part of a convergence system 100 shown in Figure 1A, such as the Destination personal computer system available from Gateway 2000, Inc. The convergence system 100 incorporates television tuner circuitry into a digital processing system 101, such as a computer which is compatible with standard personal computer systems, and displays television signals and digital output on a large monitor 122 of VGA or better resolution. The EPG system is described in terms of software processes which execute within a microprocessor 186 in the digital processing system 101, as shown in Figure 1B. The processes for the EPG system can be implemented in software, hardware or firmware without departing from the scope of the invention. One embodiment of a software architecture which provides the underlying infrastructure of processing and file input/output operations necessary for the execution of the EPG system is illustrated in Figure 1C. The EPG system operates as part of the system

services 103 and is represented in Figure 1C as EPG data services 109. The software architecture illustrated in Figure 1C is described in detail in co-pending and co-assigned patent application entitled "Architecture for Convergence Systems" filed on the same day as the present application and assigned to the same assignee, which application is hereby incorporated by reference.

In the context of the present application, an "EPG content provider" is a company that supplies program guide data and a company that provides the audio, video and/or data transmitted in a channel is referred to as a "channel content provider." A single company can be both a channel content provider and an EPG content provider. The EPG data may be transmitted either in-band or out-of-band, as known by those of ordinary skill within the art.

In one embodiment, the EPG system 200 comprises four primary modules as illustrated in Figure 2: a plurality of EPG content transport functions 201, a plurality of EPG content provider functions 203, an EPG content services function 205, and an EPG content data store 207. Arranging the tasks performed by the EPG system into different modules will be readily apparent to one skilled in the art upon reading the detailed descriptions below.

The EPG content transport functions 201 move guide data from various sources and into a storage area, such as a hard disk 107, on the digital processing system 101. Each EPG content transport function 201 is specific to the particular source, such as the vertical blanking interval in the broadcast television signal, an MPEG2 data stream transmitted via satellite, a phone line, hard media such as CD-ROM, or some other communications means. The EPG content provider functions 203 convert the guide data from source-specific formats into a format understood by the EPG content services functions 205. Detailed information on a source-specific format necessary to support the conversion can be in the public domain, obtained from standards publications, or licensed from the owner of a proprietary format.

The EPG content services function 205 stores the converted guide data into the EPG content data store 207, resolving conflicts and combining information from the

different EPG content providers according to user preferences as described further below. The EPG content services function 205 also provides an interface for other applications to access the EPG content data base 207 or the EPG content providers through the EPG content provider functions 203.

EPG Content Data store

Figure 3 illustrates data structures in one embodiment of the EPG content data store 207. The data store 207 comprises a provider table 301, a guide table 303, a guide descriptor table 305, a channel table 307, a channel descriptor table 309, a channel region table 311, a channel extension table 313, a service type table 315, a service table 317, and an event table 319. While the EPG content data store 207 is described in terms of tables in a relational database system, one skilled in the art will readily appreciate that the data contained in the data store 207 can be stored in any type of data structure, including flat files or look-up tables, without departing from the scope of the invention. A brief overview of each data structure is given next, with detailed descriptions following.

The provider table 301 describes the EPG content providers that are registered with the EPG content services function. The registration process is described in detail below. Each provider can supply more than one program guide. The guide table 303 identifies which program guides for a provider are managed by the EPG content services function 203. The guide descriptor table 305 provides a description of each guide in the guide table 303 in one or more languages. The channel table 307 identifies which channels are described in a guide. The channel description table 309 provides a description of each channel in the channel table 307 in one or more languages. The channel region table 311 identifies regions (countries, local regions, etc.) in which each channel in the channel table 307 is accessible. The channel extension table 313 identifies any external data associated with a channel in the channel table 307, such as a World Wide Web Internet site or multimedia files stored on media accessible by the convergence system 100. The service type table 315 indicates what type of content,

such as audio, video, or data, is available on each channel in the channel table 307. The services table 317 enumerates which source services, i.e., the communications links for downloading the guide data, are supported by each provider. The event table 319 contains program information for each event on a channel during the time period covered by a program guide that contains the channel.

The provider table 301 comprises a plurality of provider records. One embodiment of a provider record 400 is shown in Figure 4. A provider identifier field 401 contains a unique identifier for each EPG content provider. A provider type field 403 identifies whether the EPG content services function 205 must request an update of the guide data from the EPG content provider, or whether the provider operates autonomously and notifies the EPG content services function 205 when its guide data has changed.

A provider timeliness field 405 indicates how often the provider updates the data it receives from the channel content owner. For example, the provider may supply new guide data every four hours, but the only difference between each update is that the four hours prior to the update time are truncated and the four hours following the update time are included. Schedule or information changes supplied to the EPG content provider by the channel content provider are not reflected in the update. The provider timeliness field 405 for such an EPG content provider would contain a value representing "low" timeliness. For an EPG content provider that changes data in the guide on a daily basis, the provider timeliness field 405 contains a value representing "medium" timeliness. For an EPG content provider that changes data in the guide on an hourly basis, the provider timeliness field 405 contains a value representing "high" timeliness. Other update frequencies, such as more than once a day, can also be designated as being of "high" timeliness.

A provider next-update field 407 contains a time at which the EPG content services function 205 should ask for an update to the guide data. A provider quality field 409 contains values which represent ratings of various content categories with respect to the quality of the descriptions supplied by the provider. For example, one

EPG content provider may provide better movie descriptions while another may provide better sports descriptions. The provider quality field 409 is user-defined.

A service provider name field 411 is a text description of the services made available by the channel content provider, such as audio, video, or data. A content provider name field 413 is a text description of the EPG content provider. A guide provider name field 415 is a text description of the guide provided by the EPG content provider.

The guide table 303 comprises a plurality of guide records, one for each guide supplied by a provider. One embodiment of a guide table record 500 shown in Figure 5.

A guide identifier field 501 contains a unique identifier for each program guide. A provider identifier field 503 identifies the EPG content provider that initialized (and generally owns) the guide. A starting slot field 505 contains a time for the first time slot that is represented in the guide and a starting day field 507 designates the day of the week for the first time slot. If the guide extends beyond one week, the starting day field 507 includes the appropriate week, month, and/or year values. A validity field 509 rates the validity of the data in the guide. If the provider performs some sort of comparison of the data in the guide, the value in the validity field 509 represents a "high" validity rating. If the previous update (as determined by the provider next-update field 407) has not been able to run as scheduled, or if the data in the guide has expired as defined by a lifetime field 511, the value in the validity field 509 represents a "low" validity rating. The lifetime field 511 contains a value indicating the latest date/time before which the provider expects the guide will be updated. A guide width field 513 contains a value which represents the period of time included in the guide, measured in "slots." A slot length field 515 defines the number of seconds represented by a slot, such as 108000 seconds (30 minutes).

The channel table 307 comprises a plurality of channel records. One embodiment of a channel record 600 is shown in Figure 6. The channel table 307 contains a channel record 600 for each channel included in a program guide that is supplied by an EPG content provider.

A guide identifier field 601 designates the guide that contains the channel's information. A provider identifier field 603 refers to the channel content provider responsible for the channel. A display channel number field 605 contains the channel number which is displayed on the monitor. A physical channel number field 607 contains the physical transmission number of the channel on a particular device, such as a satellite receiving station. A short name field 609 holds the channel's call letters while a long name field 611 holds the channel's full name. A conditional access field 613 indicates what level of conditional access is associated with the channel, such as pay-per-view or subscription content. A number-of-streams field 615 contains a value defining the number of audio, video, and data streams associated with the channel. A purchase information field 617 provides data on purchasing the channel, if such purchase is necessary.

Figure 7 illustrates one embodiment of the event table 319 that is associated with each channel stored in the channel table 307. In this embodiment, the provider table 301 is logically connected to one or more channel tables 307. Each channel table 307 is logically connected to one or more event tables 319. The event table 319 comprises a plurality of event records 800 (as shown in Figure 8). Each event record comprises an event identifier field 801, a title field 803, a description field 805, an extension field 807, a start time field 809, and end time field 811, a duration field 813, a category field 815, a subcategory field 817, a closed captioning flag 819, a subtitles flag 821, a taping flag 831, and a plurality of ratings fields 825. For example the ratings fields 825 can contain a TV rating field, an MPAA movie rating field, a content advisory field, a violence rating field, a language rating field, a sexual content rating field, and a V-chip rating field. The number of ratings fields 825 is variable and depends on the number of rating tables provided by the program guide providers. Rating tables are described below.

The event identifier field 801 contains a unique identifier for each event. The title field 803 contains references to one or more event title records 900 in an event title

table 701. Each event title record 900 comprises a language identifier field 901 and a title field 903 that contains text for the title as illustrated in Figure 9.

The description field 805 contains references to one or more event description records 1000 in an event description table 703. In one embodiment shown in Figure 10, an event description record 1000 comprises a language identifier field 1001 and a description field 1003 that contains text for the description.

The extension field 807 contains references to one or more event extension records in an event extension table 705. One embodiment of an event extension record 1100 is shown in Figure 11. Each event extension record 1100 comprises at least one external data field 1101 which identifies a data source associated with a channel, such as a World Wide Web Internet site or a multimedia file.

The start time field 809 contains references to one or more event start records 1200 stored in an event start table 707. As shown in Figure 12, in one embodiment, each event start record 1200 comprises a day field 1201 and a slot field 1203 which together define the beginning of the event. The end time field 811 can contain a value representing the ending time of the program supplied by the guide data provider, a reference to one or more event ending records similar to the event start records 1200, or be blank. If the end time field 811 is blank, the ending time of a program can be calculated from the start time field 809 and the duration field 813 if the duration field contains a value. Alternatively, the ending time of a program can be implied from the start time field 809 for the event immediately following.

The category 815 and subcategory 817 fields contains a category and a subcategory identifier from a category table 709 and a subcategory table 711 respectively. The closed captioning flag 819, subtitles flag 821, and the taping flag 823 indicate when the event contains closed captions, subtitles, or is scheduled for taping by the convergence system 100.

Each of the rating fields 825 in the event record 800 contains a value selected from entries in corresponding tables in the EPG database 207. Using the example tables shown in Figure 7, a TV ratings field contains a TV rating from a TV rating table 713,

an MPAA ratings field contains an MPAA rating from a MPAA rating table 715, a content advisory field contains a content advisory rating from a content advisory rating table 717, a violence rating field contains a violence rating from a violence rating table 719, and a sexual content rating field contains a sexual content rating from the sexual content rating table 721. Additional rating fields and related tables can be added to the event table record 800 and the EPG data store 207 as new rating systems are introduced and supplied by the guide data providers.

EPG System Operation

The operation of the EPG system 200 is shown in Figures 13-15 which illustrate the processes performed by the EPG content services function 205.

Figure 13 illustrates the registration process initiated by the EPG content services function 205 to register a new EPG content provider in the data store 207. The registration process 1300 creates a provider record 400 (step 1301), fills in the appropriate fields (1303), and stores the provider record 400 in the provider table 301 in the EPG data store 207 (1305). If no additional EPG content providers are to be registered (step 1307), the registration function exits; otherwise it loops back to step 1301.

Once the EPG content provider is registered, the EPG content provider function 203 uses the appropriate EPG content transport function 201 to retrieve the guide data from the source. The EPG content provider function 203 then converts the retrieved data from the content provider-specific formats into the appropriate EPG data store record formats which are passed to the EPG content services function 205. The EPG content services function 205 stores the records in the EPG content data store 207 using an update data store process shown in Figure 14. For a newly registered EPG content provider (step 1401), the update data store process 1400 stores a guide record 500 for each guide supplied by the EPG content provider (steps 1403 and 1405) and stores a channel record 600 for each channel contained within each guide supplied (steps 1407 and 1409). If the event record received from the EPG content provider function 203 is

unique (step 1411), the update data store process adds an event record 800 into the data store 207 (step 1413). An event is not unique if there is an existing event record 800 associated with the same channel record 600 and which contains a value in the start time field 809 that overlaps the time slot of the new event. If an event is not unique, a conflict resolution process within the EPG content services function 205 resolves the conflict (step 1415).

The operation of the conflict resolution process is shown in Figure 15. The conflict resolution process 1500 compares data for the existing and new event records (step 1501). In one embodiment, the comparison evaluates event record fields such as the title field 803, the description field 805, the ratings fields 825, and the conditional access field 613 in the associated channel record 600. Alternate embodiments that evaluate different data fields will be apparent to one skilled in the art.

If the data matches exactly (step 1503), the new event record is discarded as a duplicate (step 1505). A mismatch occurs if the data for the existing event does not exactly match the corresponding data for the new event record. Mismatches are handled in several ways.

If the new event has data that the existing event record lacks (step 1507), the new data is merged into the existing event record (step 1509). However when there is conflicting data, the conflict resolution process 1500 selects a conflict resolution algorithm based on the field(s) in conflict, or on the provider of the data, or the source of the data, or a combination thereof (step 1511). The conflict resolution algorithm determines which of the conflicting records is selected as valid.

One embodiment of a conflict resolution algorithm is selected if the title 803, start time 809, end time field 811 (or the calculated or implied ending time as described above), or conditional access 613 fields are different. The selected conflict resolution uses the data from the EPG content provider that has a value representing higher quality timeliness in the timeliness field 405 in its provider record 400. In another embodiment of a conflict resolution algorithm selected when the description fields 805 are different, the event record with a higher quality description text in its description field 805 is

chosen. Higher quality descriptions contain more relevant words (words such as "a," "and," and "if" not considered relevant) and include more proper names, such as those of people or places. In yet another alternate embodiment, a conflict resolution algorithm compares the provider quality fields 409 to determine the event record with the higher quality description.

The conflict resolution process 1500 updates the data store 207 by storing the new event record (step 1515) if the new record is selected by the conflict resolution algorithm. If there has been a change in an event's starting time or ending time (step 1517), the conflict resolution process 1500 requests the event record for each event that follows the modified event from the EPG content provider function 203 that provided the modified event record (step 1519). The conflict resolution process 1500 determines subsequent event records are not needed when the starting and ending times in a subsequent event record in the data store 207 are the same as those provided by the EPG content provider function 203, i.e., the events "re-align" (step 1521).

Conclusion

Because the EPG system of the present invention retrieves EPG data supplied by multiple EPG content providers through different sources and organizes the EPG data into a single data store, the viewer is not required to select a single provider, be reliant on a single source for the information or become familiar with multiple EPG systems. Thus, the EPG system gives the viewer more selections, providing more dependability, and makes the data more accessible. Furthermore, because the EPG system resolves conflicts between the data from different providers based on data quality, the viewer has access to more timely and reliable information.

It is to be understood that the above description is intended to be illustrative, and not restrictive. Many other embodiments will be apparent to those of skill in the art upon reviewing the above description. The scope of the invention should, therefore, be determined with reference to the appended claims, along with the full scope of equivalents to which such claims are entitled.

What is claimed is:

1. A computerized system for combining electronic program guide (EPG) data from multiple EPG content providers, the system comprising:

an EPG content data store;

an EPG content services function operable for creating and managing the EPG content data store;

a plurality of EPG content transport functions operable for retrieving EPG data from a plurality of sources in a plurality of source-specific formats; and

a plurality of EPG content provider functions, each EPG content provider function operable for receiving the EPG data in a source-specific format from an EPG content transport function, converting EPG data from a source-specific format to an EPG content data store format, and delivering the EPG data in the EPG content data store format to the EPG content services function.

2. The computerized system of claim 1, wherein the EPG content services function is further operable for registering each EPG content provider in the EPG content data store.

3. The computerized system of claim 1, wherein the EPG content services function is further operable for resolving conflicts between similar EPG data from the multiple EPG content providers.

4. The computerized system of claim 3, wherein the EPG content services function determines if a conflict exists between the similar EPG data by comparing channel values and start time values contained in the EPG data.

5. The computerized system of claim 3, wherein the EPG content services function resolves a conflict between the similar EPG data by selecting the EPG data containing a value representing higher quality timeliness.

6. The computerized system of claim 3, wherein the EPG content services function resolves a conflict between the similar EPG data by selecting the EPG data containing a description of higher quality.

7. The computerized system of claim 3, wherein the EPG content services function resolves a conflict between the similar EPG data based on the provider of the EPG data.

8. The computerized system of claim 1, wherein at least one of the sources is an in-band source.

9. The computerized system of claim 1, wherein at least one of the sources is an out-of-band source.

10. A method of combining electronic program guide (EPG) data from multiple EPG content providers comprising the steps of:

registering an EPG content provider in an EPG content data store;

retrieving EPG data from a source in a source-specific format;

converting the EPG data from the source-specific format to a format for the EPG content data store;

adding the converted EPG data to the EPG content data store when there is no conflict between the converted EPG data and EPG data existing in the EPG content data store;

resolving conflicts between the converted EPG data and existing EPG data; and

updating the EPG content data store with the converted EPG data when any conflict is resolved in favor of the converted EPG data.

11. The method of claim 10, wherein the step of resolving conflicts comprises:

comparing the converted and existing EPG data; and

resolving the conflict in favor of the EPG data contain a value representing higher quality.

12. A computer-readable medium having computer-executable modules for combining electronic program guide (EPG) data from multiple EPG content providers, the modules comprising:

an EPG content services module for creating and managing an EPG content data store;

an EPG content transport module for retrieving EPG data from a plurality of sources in a plurality of source-specific formats; and

an EPG content provider module for converting EPG data received from the EPG content transport module from the plurality of source-specific formats to an EPG content data store format and for delivering the EPG data in the EPG content data store format to the EPG content services module.

13. The computer-readable medium of claim 12, wherein the EPG content services module further registers each EPG content provider in the EPG content data store.

14. The computer-readable medium of claim 12, wherein the EPG content services module is further operable for resolving conflicts between similar EPG data from the EPG content providers.

15. The computer-readable medium of claim 14, wherein the EPG content services module determines if a conflict exists between the similar EPG data by comparing channel values and start time values contained in the EPG data.

16. The computerized system of claim 14, wherein the EPG content services function resolves a conflict between the similar EPG data by selecting the EPG data containing a value representing higher quality.

17. A digital processing system comprising:

a processor;

communications circuitry communicatively coupled to the processor;

a computer-readable medium communicatively coupled to the central processor; and

an application program executed from the computer-readable medium by the processor, wherein the application program combines electronic program guide (EPG) data from multiple EPG content providers by retrieving the EPG data through the communications circuitry and converting the EPG data from source-specific formats to an EPG content data store format.

18. The digital processing system of claim 17, wherein the communications circuitry comprises tuning circuitry for tuning and receiving broadcast transmissions.

19. The digital processing system of claim 17, wherein the communication circuitry comprises a modem.

20. A computer-readable medium having stored thereon a data structure, comprising:

a first data field containing data representing an electronic program guide (EPG) content provider;

a second data field containing data representing an EPG provided by the EPG content provider identified by the first data field;

a third data field containing data representing a content channel listed in the EPG identified by the second field; and

a fourth data field containing data representing an event delivered in the content channel identified by the third data field.

21. The computer-readable medium of claim 20 further comprising a fifth data field containing data representing a measure of quality of the EPG content provider identified by the first data field.

22. The computer-readable medium of claim 20 further comprising a fifth data field containing data representing a measure of quality of the EPG identified by the second field.

23. The computer-readable medium of claim 20 further comprising a fifth data field containing data representing a rating of the event identified by the fourth data field and further comprising a sixth data field containing a value representing a logical connection to the fifth data field.

24. A computerized system for combining electronic program guide (EPG) data from multiple EPG content providers, the system comprising:

an EPG content data store;

an EPG content services function having means for creating and managing the EPG content data store;

a plurality of EPG content transport functions having means for retrieving EPG data from a plurality of sources in a plurality of source-specific formats; and

a plurality of EPG content provider functions, each EPG content provider function having means for receiving the EPG data in a source-specific format from an EPG content transport function, converting EPG data from a source-specific format to an EPG content data store format, and delivering the EPG data in the EPG content data store format to the EPG content services function.

25. The computerized system of claim 24, wherein the EPG content services function further has means for registering each EPG content provider in the EPG content data store.

26. The computerized system of claim 24, wherein the EPG content services function further has means for resolving conflicts between similar EPG data from the multiple EPG content providers.

27. A system for combining electronic program guide (EPG) data comprising:
a plurality of sources configured to provide the EPG data in multiple formats; and
a content organizer configured to combine the multiple EPG data formats.

28. The system of claim 27, wherein the content organizer is configured to combine the multiple EPG data formats into a single EPG data format.

29. The system of claim 27, wherein the content organizer comprises:
an EPG content data store;
an EPG content services function for creating and managing the EPG content data store;
a plurality of EPG content transport functions for retrieving the EPG data from the plurality of sources; and
an EPG content provider function for receiving the EPG data from the EPG content transport functions, converting EPG data from the multiple formats to an EPG content data store format, and delivering the EPG data in the EPG content data store format to the EPG content services function.

30. The system of claim 29, wherein the EPG content services function registers an EPG content provider in the EPG content data store.

31. The system of claim 29, wherein the EPG content services function resolves conflicts between similar EPG data from the multiple sources.

32. The system of claim 31, wherein the EPG content services function determines if a conflict exists between the similar EPG data by comparing channel values and start time values contained in the EPG data.

33. The system of claim 31, wherein the EPG content services function resolves a conflict between the similar EPG data by selecting the EPG data containing a value representing higher quality timeliness.

34. The system of claim 31, wherein the EPG content services function resolves a conflict between the similar EPG data by selecting the EPG data containing a description of higher quality.

35. The system of claim 31, wherein the EPG content services function resolves a conflict between the similar EPG data based on the source of the EPG data.

36. The system of claim 29, wherein at least one of the sources is an in-band source.

37. The system of claim 29, wherein at least one of the sources is an out-of-band source.

38. A method of combining electronic program guide (EPG) data comprising the steps of:

receiving the EPG data in multiple formats; and

combining the multiple EPG data formats.

39. The method of claim 38, wherein the step of combining the multiple EPG data formats comprises the step of combining the multiple EPG data formats into a single EPG data format.

40. The method of claim 38, wherein the step of combining the multiple EPG data formats comprises the steps of:

converting the EPG data from the multiple formats to a format for the EPG content data store;

adding the converted EPG data to the EPG content data store when there is no conflict between the converted EPG data and EPG data existing in the EPG content data store;

resolving conflicts between the converted EPG data and existing EPG data; and

updating the EPG content data store with the converted EPG data when any conflict is resolved in favor of the converted EPG data.

41. A computer-readable medium having a computer executable module for combining electronic program guide (EPG) data, the module comprising:

a content organizer module to combine multiple EPG data formats from a plurality of sources.

42. The computer-readable medium of claim 41, wherein the content organizer module combines the multiple EPG data formats into a single EPG data format.

43. The computer-readable medium of claim 41, wherein the content organizer module comprises:

an EPG content services module for creating and managing an EPG content data store;

an EPG content transport module for retrieving the EPG data from the plurality of sources; and

an EPG content provider module for converting the EPG data retrieved from the plurality of sources from the multiple formats to an EPG content data store format and for delivering the EPG data in the EPG content data store format to the EPG content services module.

44. A system for combining electronic program guide (EPG) data comprising:
a plurality of source means for providing multiple formats of EPG data; and
a content organizer means for combining the multiple EPG data formats.

45. The system of claim 44, wherein the content organizer means combines the multiple EPG data formats into a single EPG data format.

46. The system of claim 44, wherein the content organizer means comprises:
an EPG content data store;
an EPG content services function having means for creating and managing the EPG content data store;
a plurality of EPG content transport functions having means for retrieving EPG data from the plurality of sources; and
an EPG content provider function having means for receiving the EPG data and converting the EPG data from the multiple formats to an EPG content data store format, and delivering the EPG data in the EPG content data store format to the EPG content services function.

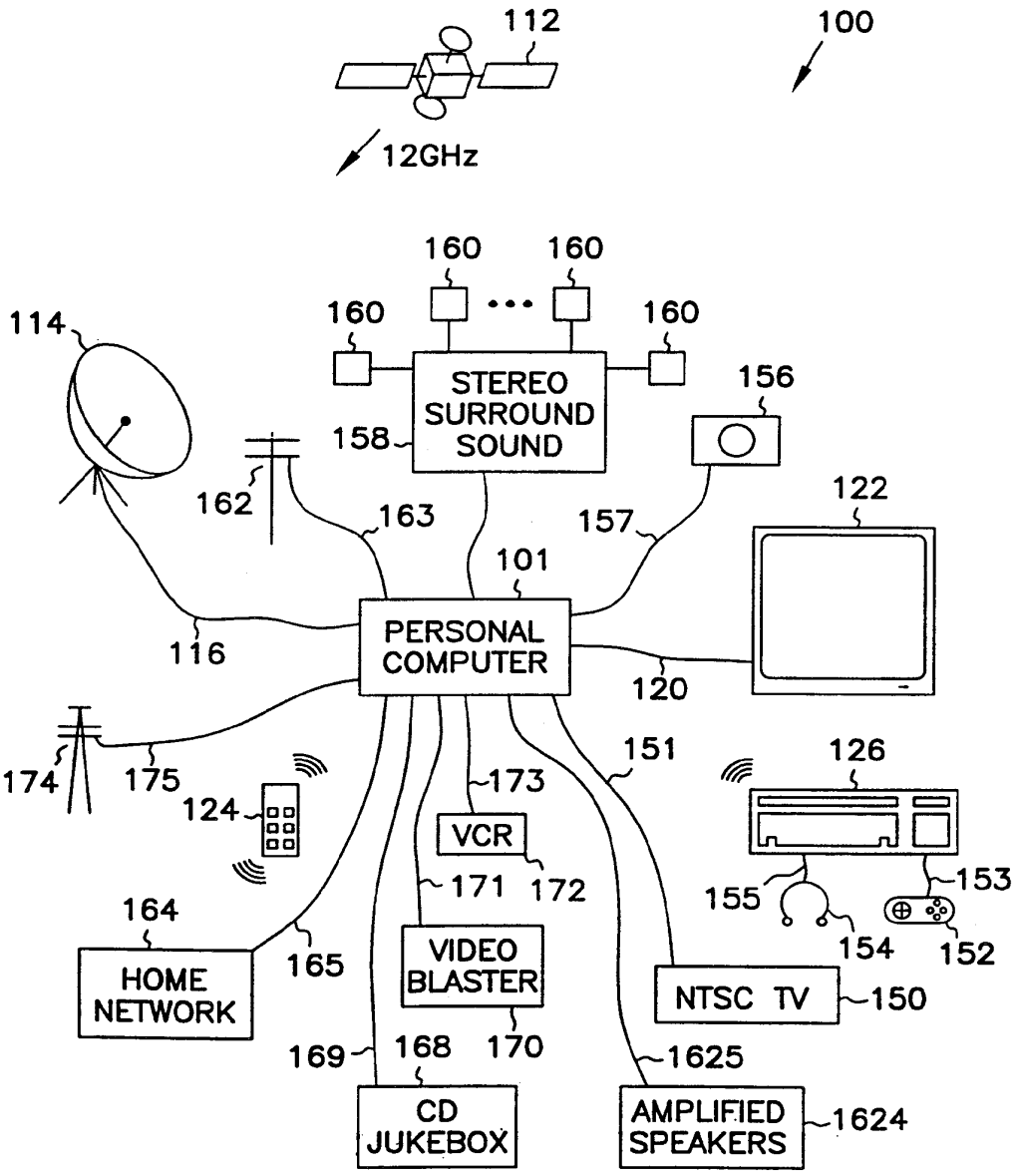

112
100
12GHz
160
160
160
160
114
STEREO SURROUND SOUND
156
158
162
163
157
122
101
PERSONAL COMPUTER
116
120
174
175
124
173
151
126
VCR
171
172
155
153
154
152
164
165
VIDEO BLASTER
NTSC TV
150
169
168
170
1625
CD JUKEBOX
AMPLIFIED SPEAKERS
1624
HOME NETWORK

FIG. 1A

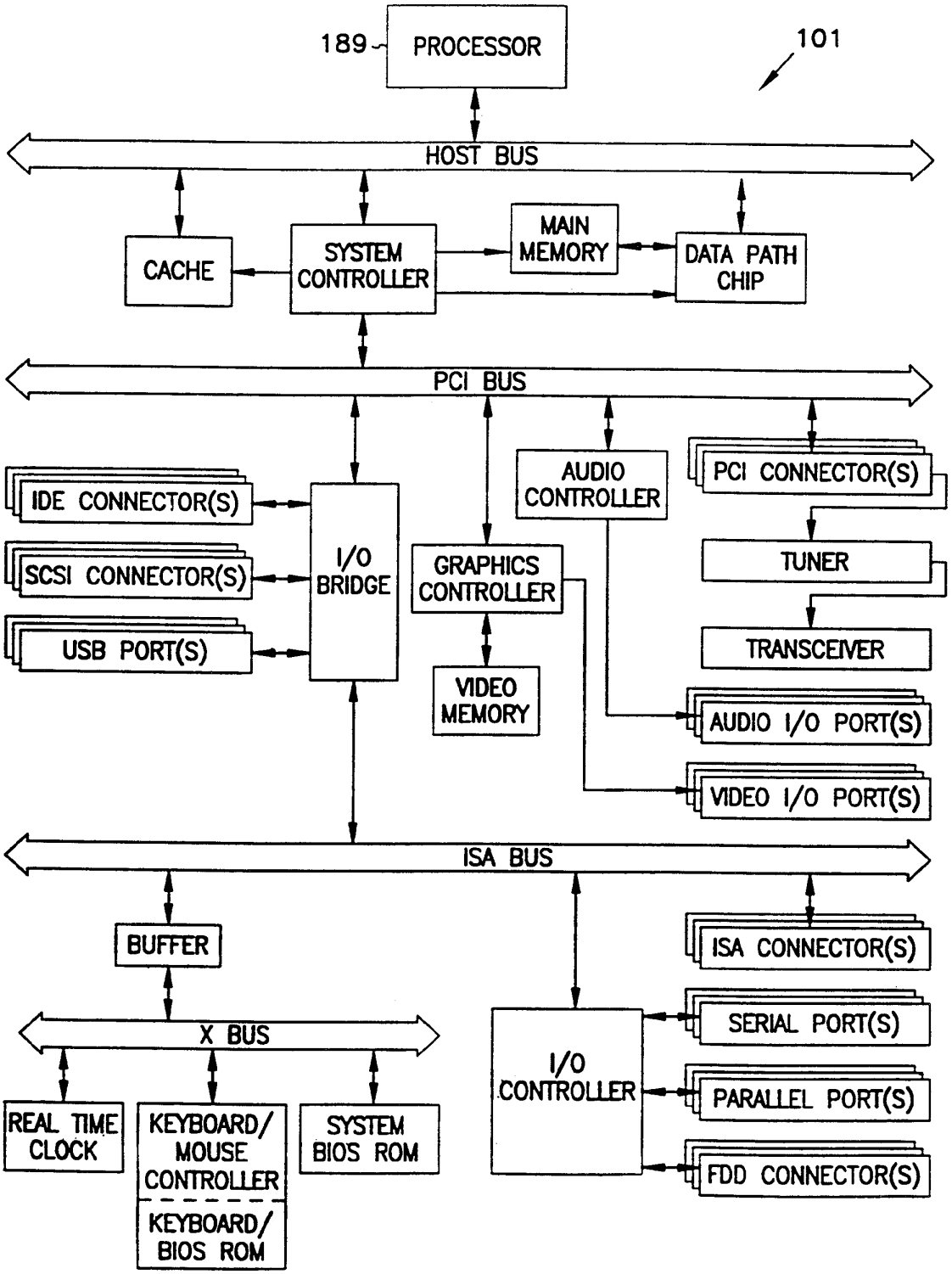

189
PROCESSOR
101
HOST BUS
CACHE
SYSTEM CONTROLLER
MAIN MEMORY
DATA PATH CHIP
PCI BUS
IDE CONNECTOR(S)
SCSI CONNECTOR(S)
USB PORT(S)
I/O BRIDGE
GRAPHICS CONTROLLER
VIDEO MEMORY
AUDIO CONTROLLER
PCI CONNECTOR(S)
TUNER
TRANSCEIVER
AUDIO I/O PORT(S)
VIDEO I/O PORT(S)
ISA BUS
BUFFER
X BUS
REAL TIME CLOCK
KEYBOARD/ MOUSE CONTROLLER
KEYBOARD/ BIOS ROM
SYSTEM BIOS ROM
I/O CONTROLLER
ISA CONNECTOR(S)
SERIAL PORT(S)
PARALLEL PORT(S)
FDD CONNECTOR(S)

FIG. 1B

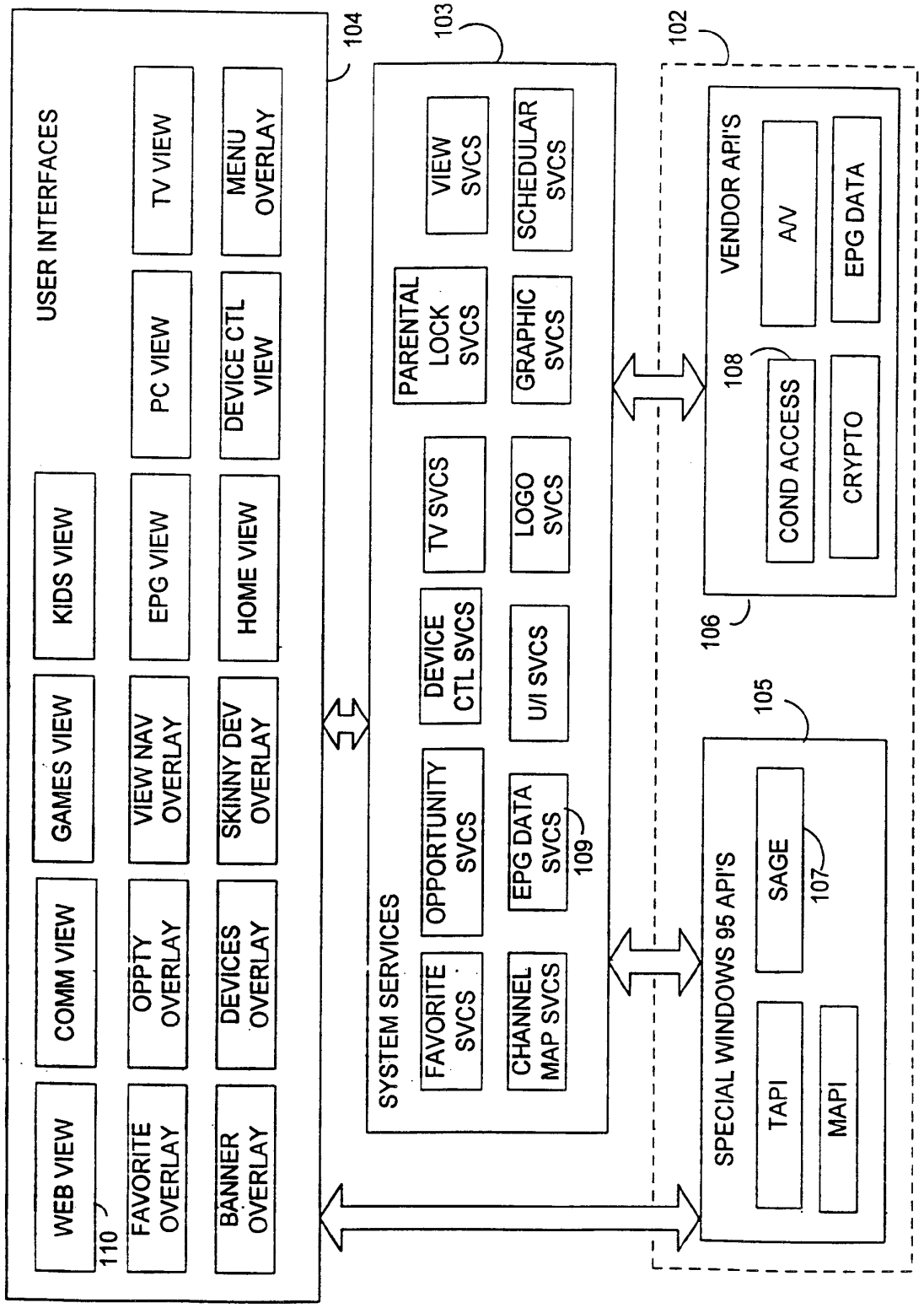

USER INTERFACES
104
WEB VIEW
COMM VIEW
GAMES VIEW
KIDS VIEW
TV VIEW
PC VIEW
DEVICE CTL VIEW
MENU OVERLAY
FAVORITE OVERLAY
OPPTY OVERLAY
VIEW NAV OVERLAY
EPG VIEW
HOME VIEW
BANNER OVERLAY
DEVICES OVERLAY
SKINNY DEV OVERLAY
110
SYSTEM SERVICES
103
FAVORITE SVCS
OPPORTUNITY SVCS
DEVICE CTL SVCS
TV SVCS
PARENTAL LOCK SVCS
VIEW SVCS
SCHEDULAR SVCS
CHANNEL MAP SVCS
EPG DATA SVCS
109
U/I SVCS
LOGO SVCS
GRAPHIC SVCS
102
VENDOR API'S
A/V
EPG DATA
108
COND ACCESS
CRYPTO
106
105
SPECIAL WINDOWS 95 API'S
SAGE
107
TAPI
MAPI

FIG. 1C

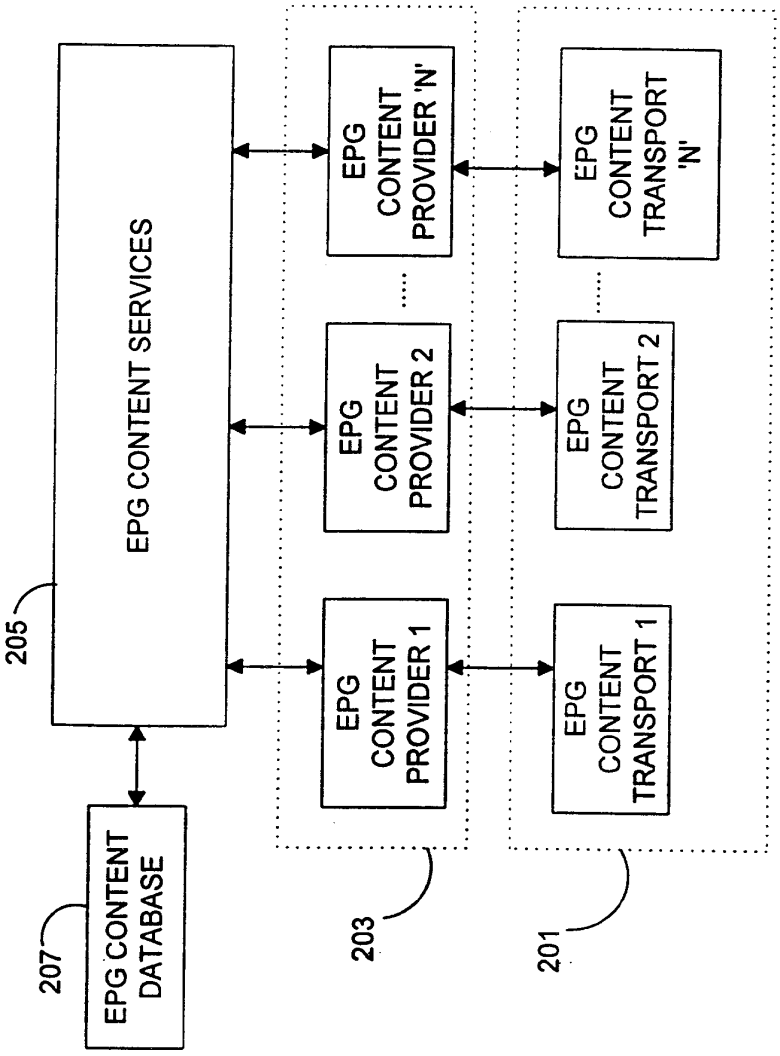

EPG CONTENT SERVICES
205
EPG CONTENT DATABASE
207
EPG CONTENT PROVIDER 1
EPG CONTENT PROVIDER 2
EPG CONTENT PROVIDER 'N'
203
EPG CONTENT TRANSPORT 1
EPG CONTENT TRANSPORT 2
EPG CONTENT TRANSPORT 'N'
201

FIG. 2

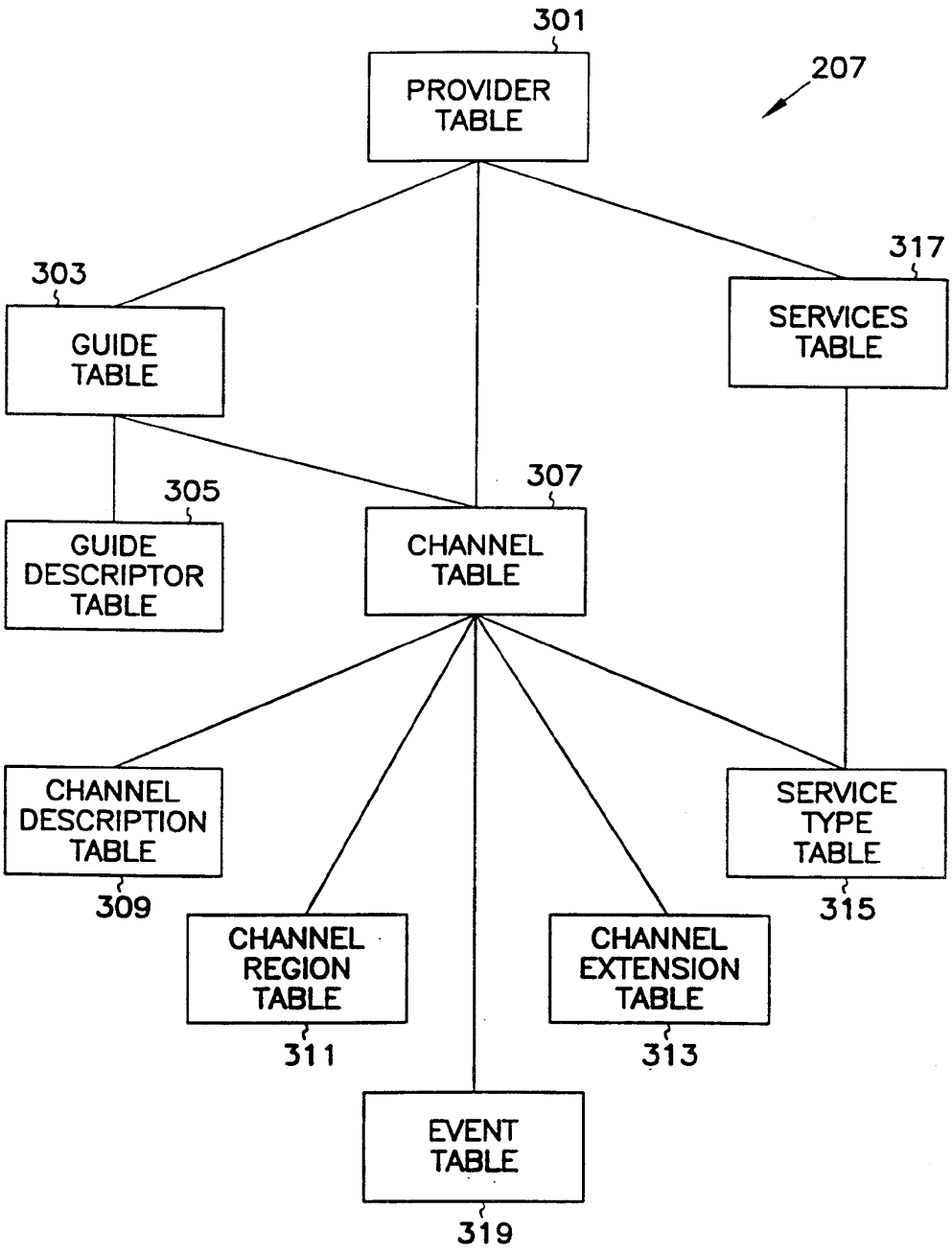

301
PROVIDER TABLE
207
303
GUIDE TABLE
317
SERVICES TABLE
305
GUIDE DESCRIPTOR TABLE
307
CHANNEL TABLE
CHANNEL DESCRIPTION TABLE
309
CHANNEL REGION TABLE
311
CHANNEL EXTENSION TABLE
313
SERVICE TYPE TABLE
315
EVENT TABLE
319

FIG. 3

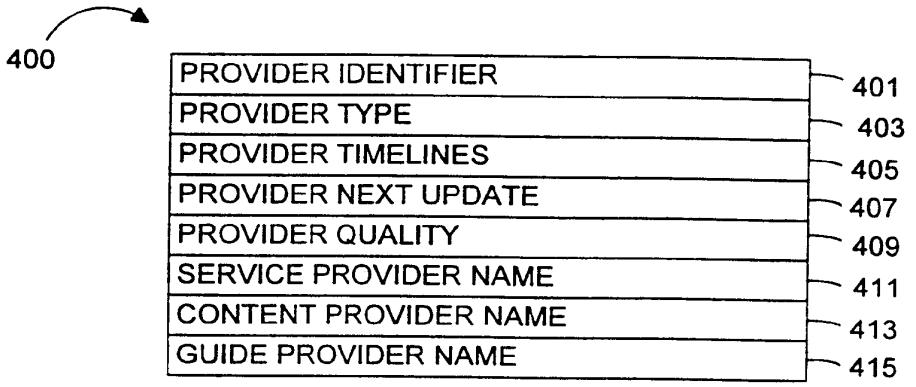

400
PROVIDER IDENTIFIER
PROVIDER TYPE
PROVIDER TIMELINES
PROVIDER NEXT UPDATE
PROVIDER QUALITY
SERVICE PROVIDER NAME
CONTENT PROVIDER NAME
GUIDE PROVIDER NAME
401
403
405
407
409
411
413
415

FIG. 4

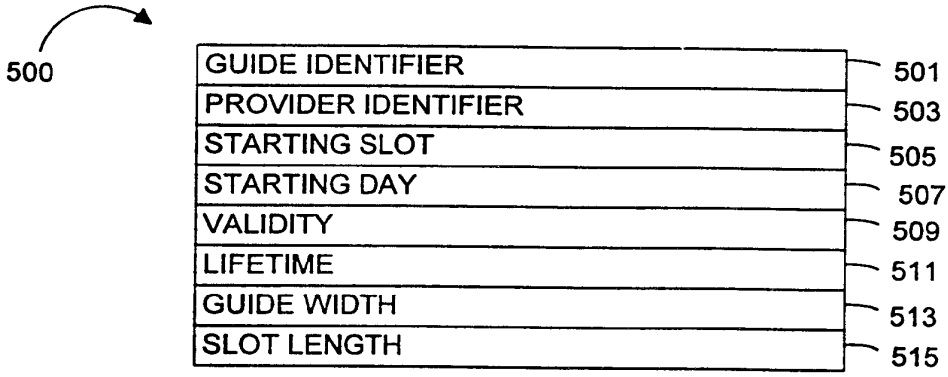

500
GUIDE IDENTIFIER
PROVIDER IDENTIFIER
STARTING SLOT
STARTING DAY
VALIDITY
LIFETIME
GUIDE WIDTH
SLOT LENGTH
501
503
505
507
509
511
513
515

FIG. 5

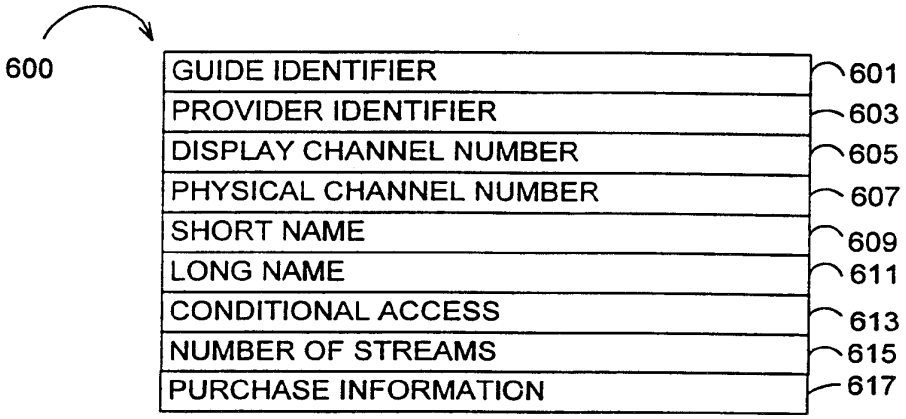

600
GUIDE IDENTIFIER
601
PROVIDER IDENTIFIER
603
DISPLAY CHANNEL NUMBER
605
PHYSICAL CHANNEL NUMBER
607
SHORT NAME
609
LONG NAME
611
CONDITIONAL ACCESS
613
NUMBER OF STREAMS
615
PURCHASE INFORMATION
617

FIG. 6

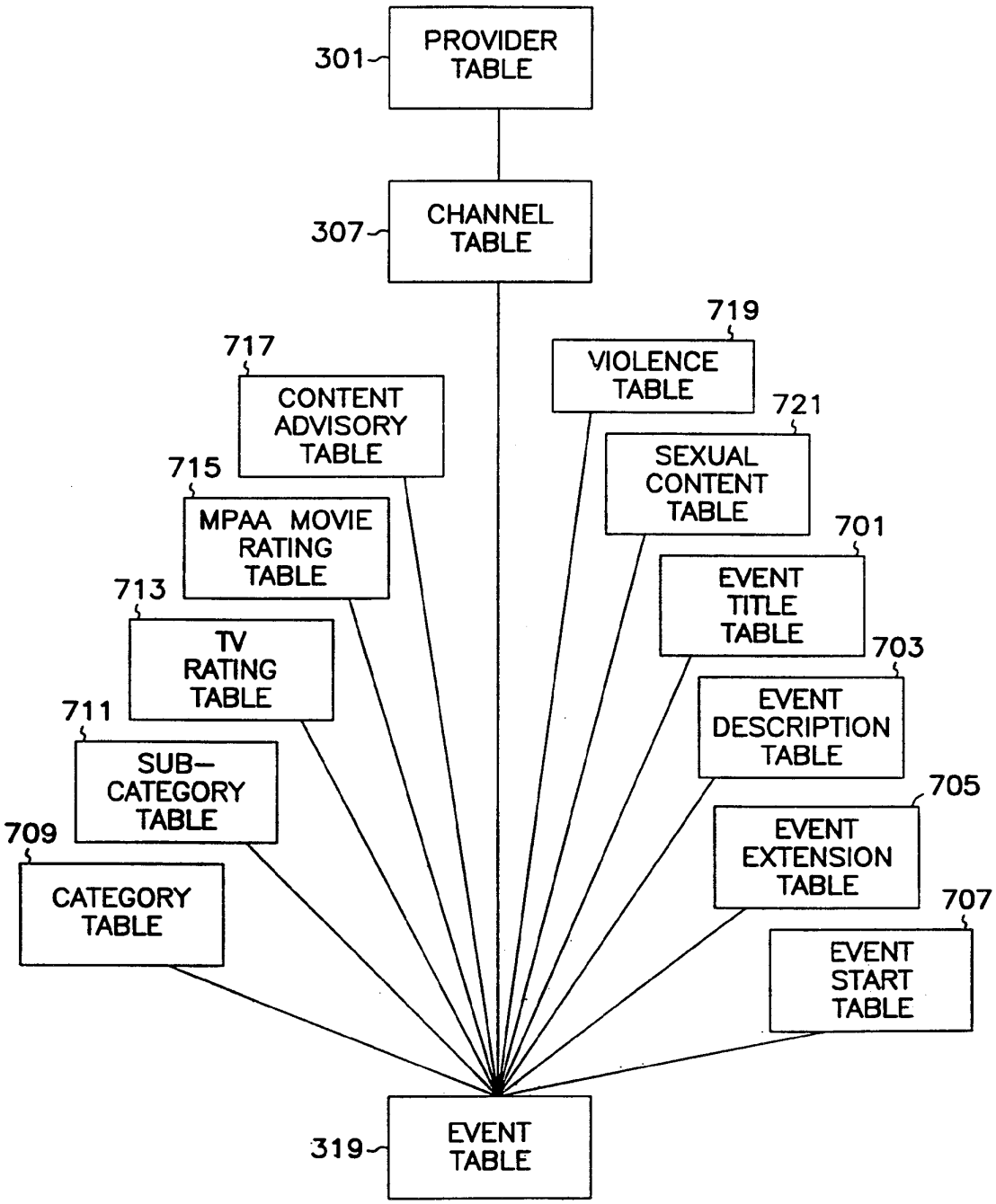

301
PROVIDER TABLE
307
CHANNEL TABLE
719
VIOLENCE TABLE
717
CONTENT ADVISORY TABLE
721
SEXUAL CONTENT TABLE
715
MPAA MOVIE RATING TABLE
701
EVENT TITLE TABLE
713
TV RATING TABLE
703
EVENT DESCRIPTION TABLE
711
SUB-CATEGORY TABLE
705
EVENT EXTENSION TABLE
709
CATEGORY TABLE
707
EVENT START TABLE
319
EVENT TABLE

FIG. 7

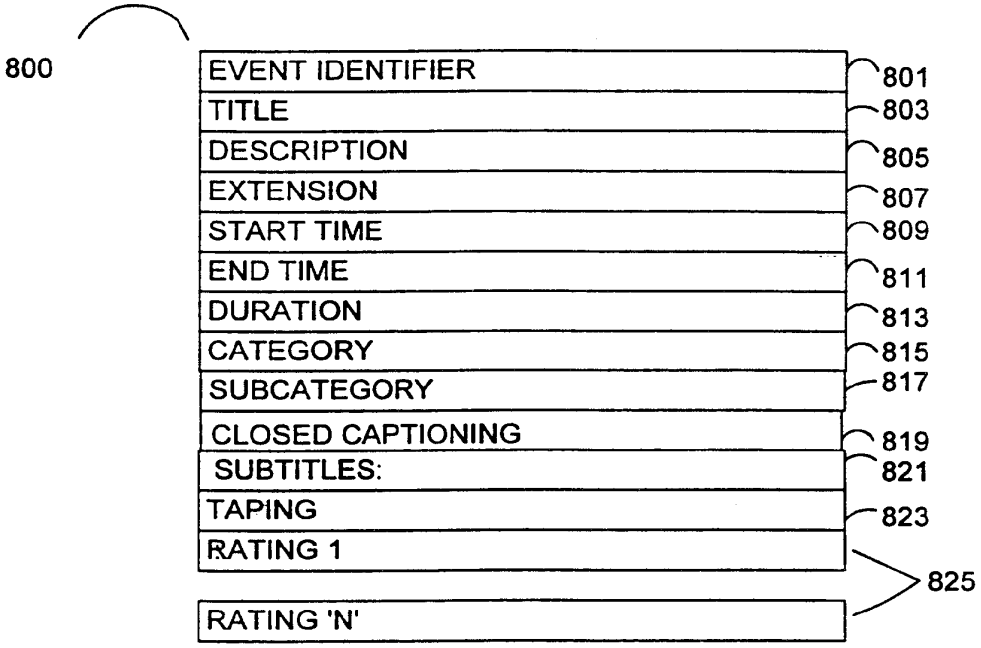

800
EVENT IDENTIFIER
TITLE
DESCRIPTION
EXTENSION
START TIME
END TIME
DURATION
CATEGORY
SUBCATEGORY
CLOSED CAPTIONING
SUBTITLES:
TAPING
RATING 1
RATING 'N'
801
803
805
807
809
811
813
815
817
819
821
823
825

FIG. 8

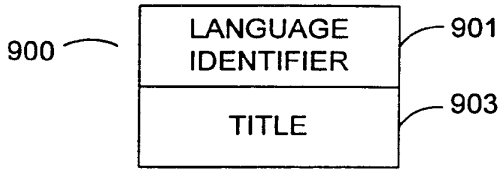


FIG. 9

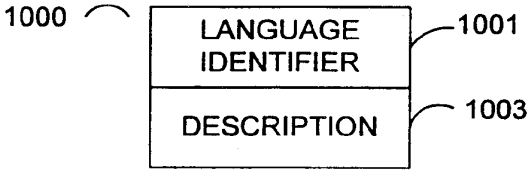


FIG. 10

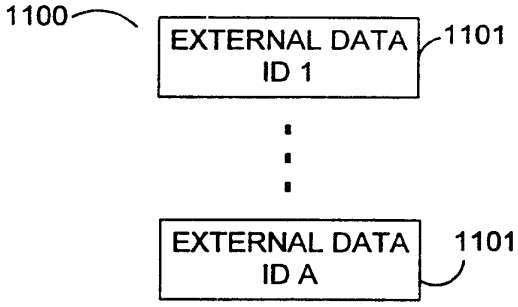


FIG. 11

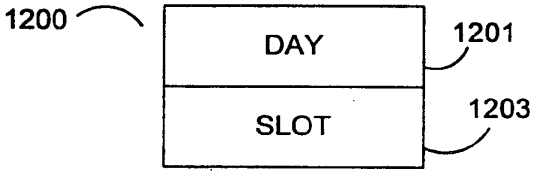


FIG. 12

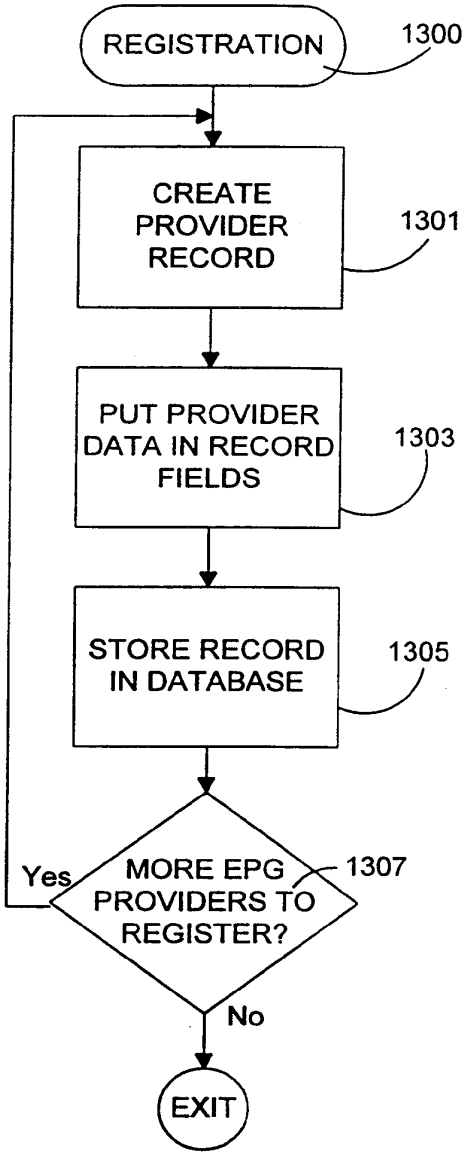

REGISTRATION
1300
CREATE PROVIDER RECORD
1301
PUT PROVIDER DATA IN RECORD FIELDS
1303
STORE RECORD IN DATABASE
1305
MORE EPG PROVIDERS TO REGISTER?
1307
Yes
No
EXIT

FIG. 13

FIG. 14

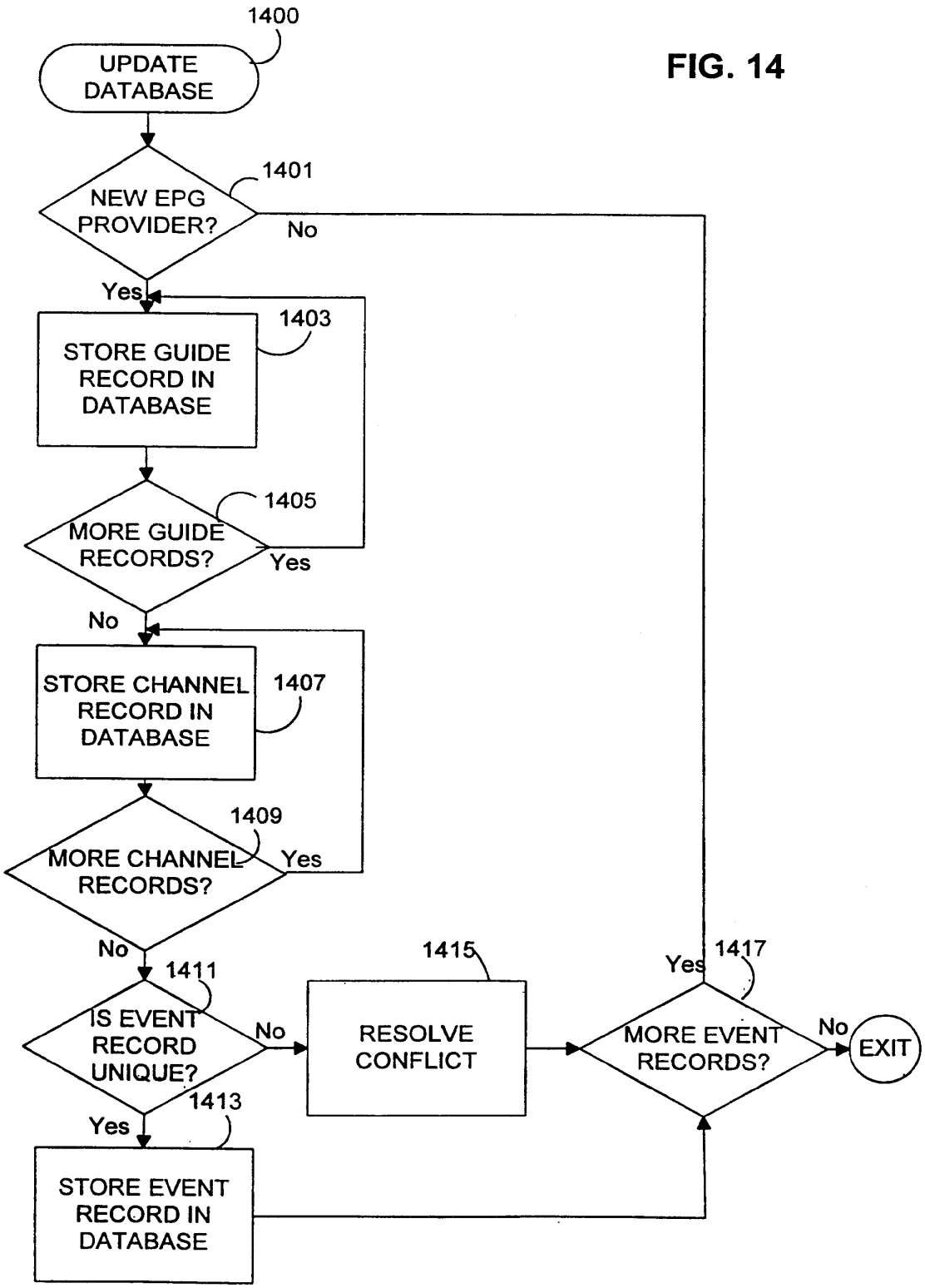
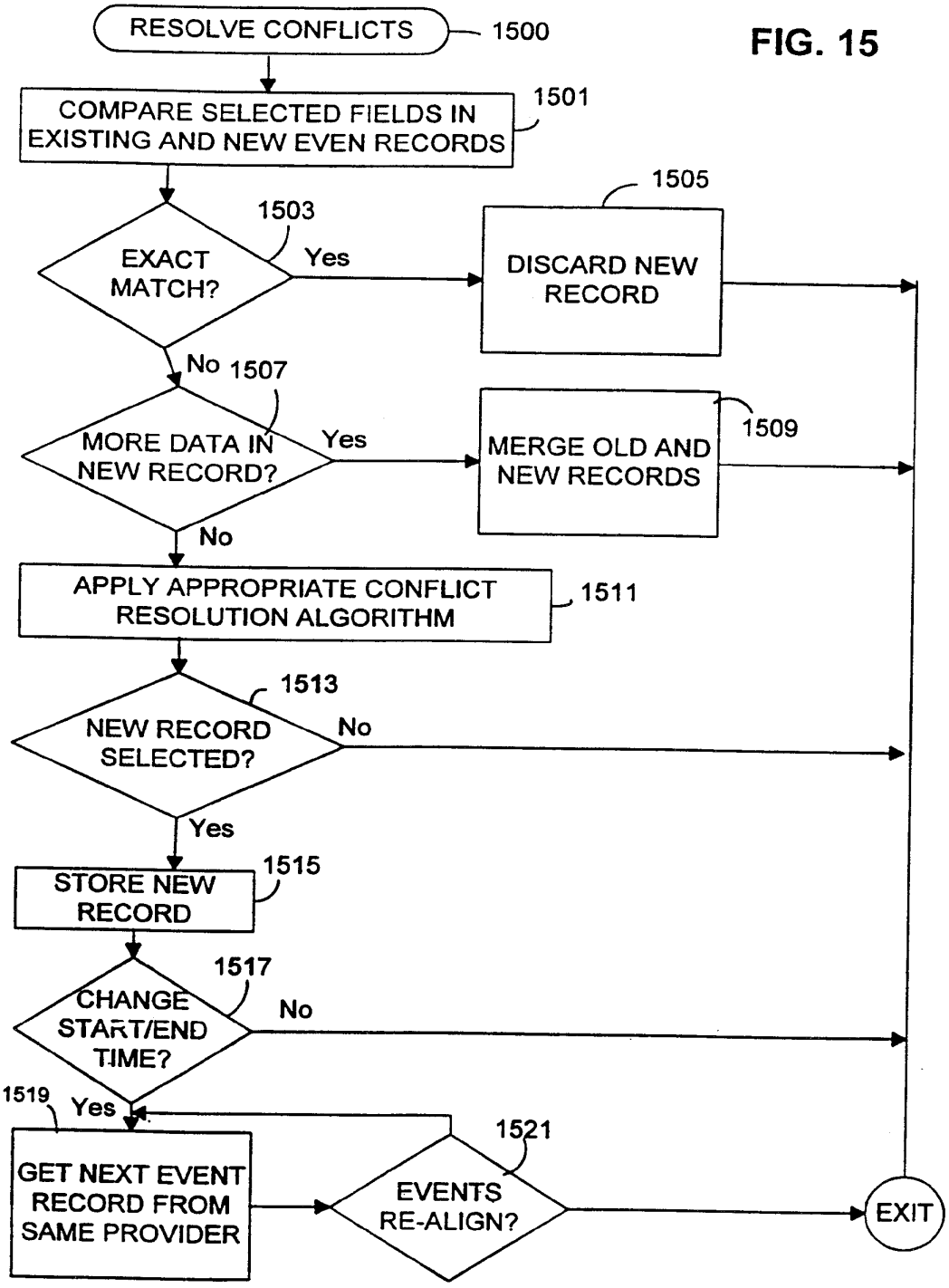

1400
UPDATE DATABASE
1401
NEW EPG PROVIDER?
No
Yes
1403
STORE GUIDE RECORD IN DATABASE
1405
MORE GUIDE RECORDS?
Yes
No
1407
STORE CHANNEL RECORD IN DATABASE
1409
MORE CHANNEL RECORDS?
Yes
No
1411
IS EVENT RECORD UNIQUE?
No
1415
RESOLVE CONFLICT
1417
Yes
MORE EVENT RECORDS?
No
EXIT
1413
Yes
STORE EVENT RECORD IN DATABASE

FIG. 15


RESOLVE CONFLICTS
1500
COMPARE SELECTED FIELDS IN EXISTING AND NEW EVEN RECORDS
1501
EXACT MATCH?
1503
Yes
DISCARD NEW RECORD
1505
No
MORE DATA IN NEW RECORD?
1507
Yes
MERGE OLD AND NEW RECORDS
1509
No
APPLY APPROPRIATE CONFLICT RESOLUTION ALGORITHM
1511
NEW RECORD SELECTED?
1513
No
Yes
STORE NEW RECORD
1515
CHANGE START/END TIME?
1517
No
1519
Yes
GET NEXT EVENT RECORD FROM SAME PROVIDER
EVENTS RE-ALIGN?
1521
EXIT

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 99/00093

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04N7/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 08 275077 A (SONY CORP) 18 October 1996	1,2,8,9, 12,13, 17-20, 24,25, 27-30, 36-39, 41-46
A	& US 5 808 694 A see abstract see column 1, line 1 - column 2, line 24 see column 3, line 27 - column 6, line 17 see column 8, line 20 - column 12, line 5 see column 13, line 35 - column 13, line -/--	3-7,10, 11, 14-16, 21-23, 26, 31-35,40

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 April 1999	22/04/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Hampson, F

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EX. 1002
LG Electronics, Inc. / Page 1128 of 3394

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 99/00093

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
	42 see column 17, line 8 - column 18, line 29 see figures 1-3,7,8,23-25	
X	US 5 576 755 A (DAVIS BRUCE ET AL) 19 November 1996	1,2,8,9, 12,13, 17-20, 24,25, 27-30, 36-39, 41-46
A	see abstract see column 3, line 5 - column 3, line 66 see column 4, line 25 - column 7, line 55 see figure 1	3-7,10, 11, 14-16, 21-23, 26, 31-35,40
X	US 5 666 645 A (GUSTAFSON DAVID W ET AL) 9 September 1997	1-3,8,9, 12,13, 17-19, 24-31, 36-39, 41-46
A	see abstract see column 1, line 45 - column 2, line 25 see column 5, line 15 - column 8, line 45 see figures 1-4	4-7,10, 11, 14-16, 20-23, 32-35,40

1

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

EX. 1002
LG Electronics, Inc. / Page 1129 of 3394

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte..ational Application No
PCT/US 99/00093

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 08275077 A	18-10-1996	US 5808694 A	15-09-1998
US 5576755 A	19-11-1996	AU 700801 B	14-01-1999
		AU 3970795 A	23-05-1996
		BR 9509532 A	30-09-1997
		CA 2203017 A	09-05-1996
		EP 0788713 A	13-08-1997
		JP 10512692 T	02-12-1998
		WO 9613935 A	09-05-1996
US 5666645 A	09-09-1997	AU 5631396 A	18-11-1996
		CA 2219021 A	31-10-1996
		EP 0823176 A	11-02-1998
		WO 9634486 A	31-10-1996

Form PCT/ISA/210 (patent family annex) (July 1992)

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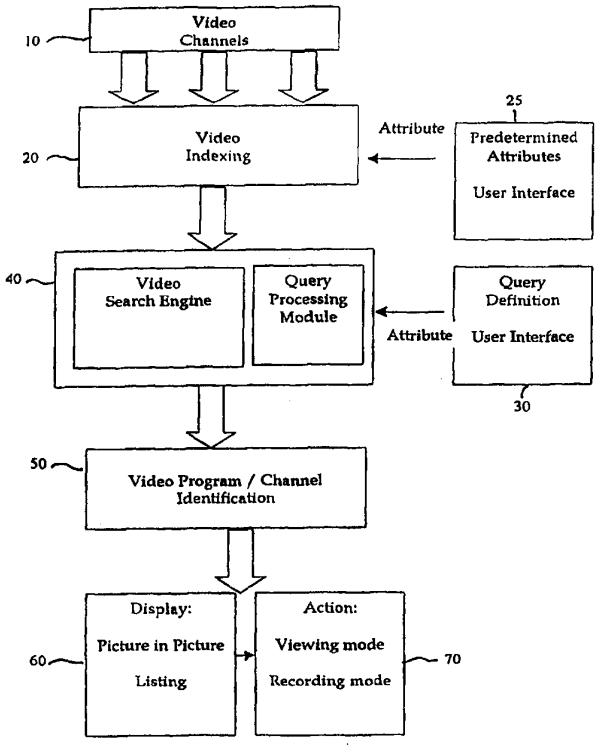
(54) Title: A METHOD OF AUTOMATIC SELECTION OF VIDEO CHANNELS

(57) Abstract

A method of selecting, at a video receiver location, a desired video program channel from a number of program channels (10) transmitting video programs, by: automatically generating, for each program channel, indexing data (115) of at least one predetermined attribute based on the video program content of the respective channel; specifying at least one attribute corresponding to a desired program content, such as a program title or the occurrence of any event within a program; and identifying, from the indexing data, any program channel having a match with respect to the attribute specified. Preferably, the indexing data (115) is generated at a remote location, is encoded and transmitted in a separate indexing channel for all the program channels, and is received and decoded at the receiver location, the attribute corresponding to a desired program being specified at the receiver location.



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A METHOD OF AUTOMATIC SELECTION OF VIDEO CHANNELS

FIELD AND BACKGROUND OF THE INVENTION

The present invention relates to multi-channel video / television systems and, in particular, to a method of providing viewers with automated selection of channels which match viewer's defined search criteria.

The number of video channels available over cable television systems and satellite television systems increases rapidly. Therefore, users need improved methods for selecting video channels that at a given time carry a preferred program and or content. Similar needs occur in video on demand systems, interactive television, and certain internet-television arrangements.

For years, viewers have relied on pre-printed television program listing. There are numerous disadvantages in using an external paper-based information source, which is updated usually once a week.

In recent years, television-based electronic program guides (EPG) have been developed. Program listing are displayed directly on the TV screen and provide better access and ease of updating as compared to pre-printed guides. Typically, the EPG is a scrolling TV program list that is transmitted over a dedicated cable channel. Viewers can tune to the guide channel and view information about programs being then transmitted or to be transmitted in the near future.

Another form of dedicated cable channel contains a split screen display of the other channels. A video combination device generates the display such that several video channels (say 16) are displayed concurrently. When the number of channels is greater than the capacity of a single display screen, several displays are time-toggled to cover the entire set of channels. However, the passive nature of this technique limits its value. Also, one cannot search by title, genre, channel or view listing for programs scheduled a few days ahead.

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Several prior art methods are specifically directed to channel searching.

In some prior art methods, the search capabilities are manual and therefore disturb the viewing habit. Also, manual techniques are very limited in situations of hundreds of video channels.

In other prior art methods, automatic searching is based on pre-encoded textual descriptions of the video content. Such descriptions are subjective and usually very concise. Closed captions, which are encoded into the video signal, contain a transcription of the dialogues but do not relate to any visual information. Additionally, no provision is made for events that are happening in real time such as a sudden or dramatic event that is as "breaking news". Such event is probably not contained in the EPG data.

There exists a need for an improved television channel selection method, which employs automatic searching in video, based on the audio and video content of the television channels. There exists also a need for the method to match the viewer's preferences, specified as a query, with the content attributes of the television channels which are extracted automatically and in real-time from these channels.

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BRIEF SUMMARY OF THE INVENTION

According to one aspect of the present invention, there is provided a method of selecting, at a video receiver location, a desired video program channel from a number of program channels transmitting video programs, comprising: automatically generating for each of the program channels, indexing data of at least one predetermined attribute based on the video program content of the respective channel; specifying at least one attribute corresponding to a desired program content; and identifying, from the indexing data, any program channel having a match with respect to the attribute specified.

According to further features in many of the described preferred embodiments, the indexing data is generated at a remote location, is encoded and transmitted in a separate indexing channel for all the program channels, and is received and decoded at the receiver location; and the at least one attribute corresponding to a desired program is specified at the receiver location.

According to still further features in the described preferred embodiment of the invention, the indexing data is collected from selected key-frames of the respective video program; and is tagged with a channel identification code and with a time tag. In addition, the indexing data from a plurality of channels is multiplexed into a data stream before transmission.

According to still further features in the described invention, the selection of the channel to be viewed may be "event-driven", as an extension of the prior art methods of "program-driven". Thus, the video material is segmented into multiple sets of "events", such as occurrences of people, objects, sounds and other; the occurrence of the events can be detected and presented to the viewer at the receiver location.

Thus, according to another aspect of the invention, there is provided a method for indicating at a video receiver location, the occurrence of a particular event when occurring on any number of program channels transmitting video programs, comprising: automatically generating at a remote location, for each of

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the program channels, indexing data of the respective video programs; encoding and transmitting said indexing data for all the channels; receiving and decoding the indexing data; specifying at the receiver location the particular event when occurring on any of the programmed channels; and identifying, from the indexing data each occurrence of the particular event on any of the program channels.

According to further features with respect to this aspect of the invention, the specified event, when occurring on any of the program channels may be automatically displayed (e.g., as a picture within a picture) on the screen of the video receiver; and / or, may be recorded in a recorder.

According to one embodiment of the invention, the indexing data is transmitted in a separate indexing channel and is received and decoded at the receiver location. In a second described embodiment, the indexing data is used at a central control node for selecting programs to be transmitted to a plurality of viewer stations at a plurality of receiver locations according to the attribute specified at the respective receiver location.

According to another aspect of the present invention, therefore, there is provided a method of selecting, at a plurality of viewer locations, a desired video program from a plurality of video programs transmitted in a plurality of program channels, comprising: automatically indexing, at a remote location, attributes of each of the video programs transmitted in the program channels; transmitting said attributes of each of the video programs in the program channels; receiving, at a central control node, the video programs and the attributes thereof; specifying, at each of the viewer locations, particular attributes of a video program desired to be viewed at the respective viewer location; and utilizing, at the central control node, the attributes specified at the viewer location for identifying the video programs matching the specified attributes.

Thus, the system may include a central control node that receives the indexed data from the indexing channel and transmits programming over a network to multiple viewer stations (e.g. homes). The programming may include

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standard analog video broadcasts (e.g., NTSC, PAL), digitally encoded video broadcasts (e.g. MPEG), or digital information related to computer-executed applications. Each viewer station includes at least one video display set (e.g., a television receiver) and an interactive station controller which is sometimes referred to as a set-top box. The interactive station controller at the viewer station specifies at least one attribute corresponding to a desired program to be viewed. The central control node then identifies from the indexed data received and decoded the channel representing the best match with respect to the content-based attribute specified and transmits the best-match channel to the receiver location.

In one described preferred embodiment, the content that is searched and detected may be stored in a recording device, enabling future viewing and programs/events statistics information gathering. In another described preferred embodiment, the data processor at the remote location generates indexing data that is stored in a web server in the internet.

According to a still further aspect of the present invention, there is provided a method of generating a program schedule of desired video program channels from a number of program channels transmitting video programs of various program contents, comprising: automatically generating, for each of the program channels, indexing data of at least one predetermined attribute based on the content of the programs to be transmitted on the respective channel, and the scheduled transmission time thereof; specifying at least one attribute corresponding to a desired program content; and identifying, from the indexing data, the program channels and the scheduled transmission times thereof, having a match with respect to the specified attribute to thereby produce a program schedule of the program channels.

Further features and advantages of the invention will be apparent from the description below.

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BRIEF DESCRIPTION OF THE DRAWINGS

The invention is herein described, by way of example only, with reference to the accompanying drawings, wherein:

FIG. 1A is a block diagram illustrating an overall system in accordance with the present invention.

FIG. 1B illustrates a video channel selection system based on automatic searching by content according to one aspect of the present invention;

FIG. 2 illustrates a video channel selection system that includes a central control node;

FIGS. 3A and 3B depict a partitioning of a video program into high-resolution segments, or events;

FIG. 4 is a flow diagram of preferred steps for selecting video channel based on automatic searching by content;

FIG. 5 illustrates a video indexing data multiplexing and encoding device according to another aspect of the present invention;

FIG. 6 illustrates an automatic video indexer according to another aspect of the present invention;

FIG. 7 illustrates a search menu for defining a user query from pre-defined attributes of audio and video content;

FIG. 8 illustrates a sequence of video indexing data, which is a low-resolution representation of the respective video images;

FIG. 9 is a flow diagram of preferred steps for searching explosions in video based on visual content only;

FIG. 10 illustrates a data sequence of measurements characteristic of explosions;

FIG. 11 is a flow chart of a web-based television channel selection system based on automatic searching by content; and

FIGS. 12A, 12B and 12C illustrate the system used for producing a personalized program schedule; and

FIG. 13 illustrates the system used for computing topic-oriented video summaries of television channels according to one aspect of the present invention.

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DETAILED DESCRIPTION OF THE PRESENT INVENTION

This invention presents a method of selecting at a video receiver location, a desired video program channel from a number of program channels transmitting video programs. FIG. 1A presents an overview of the main system components. Video channels can be inputted from a variety of sources 10, including live video streams, as well as archived video material. For each of said program channels, indexing data is generated 20, of at least one predetermined attribute 25, based on the video program content of the respective channel. The method entails specifying at least one attribute corresponding to a desired program content 30. The attribute may be a desired program title, or an occurrence of an event within any program at any channel, as will be elaborated on and demonstrated below. While utilizing the indexed data and user input attributes, a search is conducted to detect a match of the program channels and the attribute specified 40. Multiple attributes may be specified, along with a set of relating conjunctions, in which case a match is detected when all attributes are present, and when the associated conjunctions are met. Once a match is detected, the related program and program channel is identified 50. Multiple program channels may be identified as having a match. The match scores may be sorted, in which case the identified program channels are identified as the "best match program channel", "second-best match channel", and so forth. Identified programs are presented to the viewer, e.g., as a picture-in-picture or as a scrolling listing on the main display screen 60. With this information in hand, the viewer may select an option such as the viewing of the identified program content, or the recording of the content 70. Viewer may select these options in an interactive operational mode, or may predetermine selected actions. The variations within the presented method for video channel selection will be discussed as well as possible system embodiments.

Reference is now made to FIG. 1B, which is a block diagram showing a first embodiment of the video channel selection system. For purposes of simplicity and clarity, the system is described with reference to widely available systems and standards, including conventional analog television receivers and

cable-based video networks. It will be appreciated, however, that the particular components of the channel selection system may be implemented with a variety of conventions, standards, or technologies without departing from the underlying concepts of the present invention. The term "video-channel selection system" is used to emphasize the applicability of the invention beyond standard television-based systems. The term "video" is used to describe both an audio-visual content and the image part of that content which consists of a sequence of images.

The system illustrated in FIG. 1B comprises two parts: one at the transmitter side, and the other at the receiver side. Generally, the transmitter side of the system can be located at the service provider's site, and the video indexing channels can be encoded and transmitted along with other channels. The receiver side includes at least one video display set (e.g., a television receiver) and an interactive station controller which is sometimes referred to as a set-top box.

The receiver side of the system can be located in a user's set-top cable converter box or other signal reception or processing device such as a satellite receiver. Alternatively, the components can be mounted in a separate housing or included as a part of the television receiver, VCR, personal computer or multimedia player.

The transmitter side consists of a set of similar processing paths, one for each video channel. Each such path takes a digital video bit-stream 110, such as an MPEG2 stream, and decodes the stream in a decoder unit 111, into a sequence of video images. The video feed for each channel may be a live program or a recording on tape. The programming may include standard analog video broadcasts (e.g., NTSC, PAL), digitally encoded video broadcasts (e.g. MPEG), or digital information related to computer-executed applications. Regardless of input format, the bit-stream is converted into a sequence of images and the associated sound track in order to enable indexing on a wide range of video attributes.

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When the input for a specific television channel consists of a video signal 113, a video digitizer module 114 converts that signal into a digital representation of the sequence of images and the associated sound track in a format suitable for processing by the video indexer modules 115. The decoded or digitized video signals are encoded for transmission in the video indexer modules 115. The operation of each video indexer module 115 is described in detail in FIG. 6. In that described embodiment video indexing is based on key-frames (a subset of the original video frames), which are used as a representation for these original video frames. Video content is captured at frame rate of 25 frames or 30 frames per second (PAL or NTSC formats, respectively). Since the visual information content in video changes at slower rates, only a fraction of the video frames is retained, and the indexing data for content-attributes are automatically computed for these frames only. Although video-indexing data is related to key-frames, additional frames may be needed when computing this data. A specific example is in the case of motion where frames adjacent to each key-frames are analyzed to extracted motion attributes.

The key-frames and video indexing data of a number of selected channels are time multiplexed in multiplexer 116 (FIG. 1B) into at least one video index channel which is later processed to aid the user in television channel selection. The sparse nature of key-frames, coupled with the concise nature of video indexing data, allows multiplexing such frames and indexing data from multiple channels into a unified video index channel. All key-frames and associated indexing data are tagged with a channel identification code as well as a time-tag, so that channel-specific indexing data can be de-multiplexed and reconstructed at the receiver's side.

Video indexing data is preferably prepared at the transmitter side for the following reasons: The computational capacity of the set-top box or television receiver is limited; the indexing is done in a user-independent manner; and the bandwidth does not allow transmitting multiple channels to the receiver for indexing. Note that the "transmitter side" can be any central location, such as a cable head-end, as will be discussed below.

Since key-frames and indexing data depend on the content of each channel, multiplexer 116 is designed to handle several situations that may occur. One such situation is the occurrence of two or more key-frames at the same time. In such a situation key-frames are either dropped or re-encoded in a more concise manner.

FIG. 1B shows also a functional block diagram of the remote control handset 120 and set-top box controller 130 at the receiver side. The remote control handset 120 comprises: a query profile selection signal generator 121 that generates query profile selection signals in response to depression of suitable buttons: an automatic searching signal generator 122, and a regular channel changing signal generator 123 which generates channel changing signals in response to depression of the channel changing buttons.

The set-top box controller 130 at the receiver side further includes an indexing data decoder 131 in communication with the cable-company and connected to a video search engine 132 within controller 130. The latter further includes a channel selector 133 controlling a secondary channel receiver 134 within controller 130 in communication with the cable company. Controller 130 further includes a primary channel receiver 135, and a user interface 136.

FIG. 2 is a block diagram showing an alternate to the video channel selection system of FIG. 1B. In FIG. 2, the transmitter 200 and the receivers 210 are separated by a central control node 220, that includes a receiver 221, a server 222, a video search engine 223, and a transmitter 224. The receiver 221 receives the programs and indexed material from the transmitter 200. The server 221 stores the indexed material received from the transmitter 200, searches this material for specified attributes in the video search engine 223, and transmits programming over a network to the multiple viewer stations 210 (e.g. homes) via cable or wireless.

Each viewer station 210 includes a receiver 211, at least one video display set 212 (e.g., a television receiver), and an interactive station controller 213, e.g., that sometimes referred to as a set-top box. The server 222 in the central

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control node 220 matches the indexed video material to a pre-allocated set of users. The users' preferences and search criteria are available at the server 211 by a user-controlled remote server within controller 213, and/or by automatic extraction of viewer preferences based on viewing-history profiles effected by the controller 213. The interactive station controllers 213 at the viewer stations also enable the viewers to specify at least one attribute corresponding to a desired program to be viewed. The central control node 220 then identifies, from the indexed data received and decoded, the channel representing the best match with respect to the content-based attribute specified by each user and transmits the best-match channel program to the receiver location of the respective viewer.

In the two embodiments described (FIG. 1B and FIG. 2), the channel selection (identification) process takes place in the set-top box (130) and the server in the central-control node (220), respectively. These units have access to the attributes coming from the receiver end, as well as the indexed data generated from the video channels. These units are then responsible for detecting any matches and identifying the respective channels, sorted by their match; specifically, identifying the channel representing the best match, and the channel of the next-best match. The two embodiments described represent two possible system architectures. In the one case, the indexed data is generated at a remote location, and transmitted to the receiver location, at which place the program identification is pursued. In the second case, the indexed data is generated at a remote location, transmitted to a centralized location (a central-control node), at which place the program identification is pursued and conveyed further to receiver locations. It should be noted that additional embodiments are possible, such as the generation of the indexing data locally at the server location; the detection of a match and identification of selected programs at a server location, which may be physically located with the video channel providers; and variations thereof.

An example is in news production houses that generate the video material, have indexing data generated in house, provide video material to

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editorial rooms based on predefined attributes, or user-specified attributes – all within a localized architecture.

With the present invention, video material, both pre-recorded programs as well as live material (e.g. live footage coming in a news program), are automatically indexed for content. Channel selection is thus enabled based on live material as well as predefined program categories. Multiple channels are indexed simultaneously.

The term "content" refers to all visual and auditory information that is extracted and indexed automatically from the video streams, in addition to any manual annotation available (e.g. the program title, program category etc). Moreover, video content relates to the partitioning of video streams into segments that correspond with video "attributes". Attributes may represent video program *titles*, as known in prior art, in which case the corresponding video segments are full–length video program segments. In this invention, attributes may also represent the occurrence of "events" *within a program segment*, thus partitioning the program into higher-resolution segments of content. Hereon, the terms *attributes* and *events* are used interchangibly.

FIG. 3-A depicts a partitioning of a video program segment 300 into "event" segments. Examples of attributes and events include: object (e.g., people) events 310-313, sport-events (e.g., "goals" 320, 321), and news events (e.g., "breaking-news" events 330). Examples of other events that may be specified by a user include: action-movie events (e.g., explosions), sound events (e.g., President Clinton's voice), spoken-word events (e.g., words about politics or the economy), and text-events (e.g., segments that have material regarding a certain location and that location is present as overlayed text on top of the video segment). Events are detected and indexed across several video channels simultaneously, as shown in FIG. 3-B. The time axis is segmented into events as they occur ("event-driven"). Each event, indicated as a short line segment, is linked to the related channel /video source.

With this definition of content, the selection of the channel to be viewed may be "event-driven", as an extension of the prior art methods of

"program-driven". Thus, the system enables searching video channels for attributes/events in addition to searching for full-length programs. Occurrences of the specified events are detected and presented to the viewer at the receiver location.

The user can predefine a table of attributes of interest. Alternatively, a viewer's preference list of search attributes, or a program viewing profile, may be learned from the user's viewing history.

An example of a user's attribute table, or a program and event list, is the following:

Category/Attributes	Programs/Events
News	CNN, NBC, ABC
Sports	NBA
News	"breaking news"
Sports	"Goal"
People	"Sharon Stone", "Clinton"
Words	"economy", "disaster"

The user may select a category of interest, such as news or sports; within each category, the user may define programs of interest such as CNN, NBC news. The user may choose attributes of interest, such as people or keywords, and particular events of interest, such as the appearance of "Sharon Stone" and "Clinton", or any words spoken about the "economy".

Combinations are possible within the selection criteria. The user may combine program categories with attribute events, such as selecting to see Pres. Clinton only on selected news programs (e.g. CNN); the user may add time constraints, such as selecting to be notified of events occurring during all evening news channels.

FIG. 4 is a flow diagram of preferred steps for selecting a television channel or any video channel based on automatic searching by content.

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In step 410, video streams are received from multiple video channels. In step 420, key-frames are selected from each video channel, based on the video content in a manner that represents the content of the video in a concise and efficient way; based on the key-frames, additional indexing data, which are attributes related to the content of the video, are computed. In step 430, key-frames and indexing data from all indexed channels are encoded and combined into a much smaller number of indexing streams or files.

Steps 440 to 480 constitute a particular sequence for channel selection by the viewer according to the present invention. In step 440, the viewer receives a particular primary video signal to the television receiver or set-top box controller; the primary signal is usually displayed on the main video display. In step 450, key frames and video-indexing data generated as described above are transmitted to the set-top box controller; alternatively, the video-indexing data is transmitted to the server at a central node location as described above with reference to FIG. 2. In step, 460 a video query is defined by manipulating an on-screen menu; alternatively, such a query can be defined by the user in a more flexible or pre-programmed manner in the user's personal computer and downloaded to the receiver or set-top box controller or server at the central control node 210 of FIG. 2. Alternatively, viewer's preference list of search attributes is updated based on viewer's query history or viewing profile, and used for current search.

In step 470, the search results, (e.g., in the form of key-frames) from video channels other than the primary channel that match the video query, are displayed on a secondary display (such as a picture-in-picture (PIP) arrangement). Alternatively, results may be presented as a listing. The user can, as shown by step 480, select interactively either to switch the primary channel, or to record a video channel, according to the search results.

A functional description of a mutiplexing device for video indexing data for use as multiplexer 116, FIG. 1B, is illustrated in FIG. 5. Video indexing data 510 enters the video index multiplexer from a plurality of channels and is encoded by the indexing data encoder 520 for each channel. The parallel to

serial converter 530 serializes the encoded indexing data streams from the plurality of channels. The serial index data stream enters a FIFO buffer 540 and exits to an arbitration logic 550 designed to handle co-occurrence of key-frames in more than one channel. Then, the encoded indexing data goes through a bit rate controller 560 to produce the output time-multiplexed video indexing data.

The serialization of a number of data channels, the arbitration of key-frames, and the control of the data-rate, can be implemented by a number of prior art methods from the field of communications that are not specific to the present invention.

FIG. 6 describes an automatic video indexer that may be for video indexer 115 in FIG. 1B to select key-frames and to generate indexing data.

The audio-video data stream is first processed by a key-frame selection module 610 to produce a content summary. A number of prior-art methods for selecting key-frames are known. Most of them are based on detecting video shot transitions and selecting a frame from each shot (generally the first one) as a key-frame. In the presence of motion, more key-frames have to be selected to represent the content of video including the temporal variation. Co-pending Application No. PCT/IL99/00169 by the same assignee as the present application, describes a preferred method of selecting key-frames. In most types of video content, it is sufficient to select only a few percentage points of the original video frames to get a good representation.

While the summary, which consists of the video key-frames, can be used as a concise descriptor of the video content, more indexing information should be extracted to allow for efficient automatic searching. This is due to the following reasons:

- The key-frames contain raw image data, while video searching is done based on image attributes.
- Some attributes, such as image motion information, cannot be extracted accurately from key-frames alone.

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- Practical limitations on the computing power inside set-top boxes require that video search engines inside such boxes will operate on concise indexing data.

Video indexing data is automatically computed from the video image sequence by video image indexing engines 620. Such engines may include a face detection engine 621, a motion indexing engine 622, a video text recognition engine 623, and / or a color indexing engine 624.

Audio indexing data is automatically computed from the audio track by audio indexing engines 630. Such engines may include: segmentation to silence, speech, music and effects 631; feature extraction for audio classification 632; and recognition of pre-programmed effects 633.

Prior art methods are known and may be used for implementing each of the above mentioned indexing engines 620 - 633.

Sometimes video streams carry video meta-data such as closed captions, and possibly encoded textual information such as annotations. Meta-data decoder 640 extracts this meta-data which is added to content-based indexing data. Manual annotations can also be added by annotation editor 650. In a live feed situation, the volume of such descriptions is limited due to time constraints. However, they provide additional information about the video content.

All video indexing data is time-stamped according to a global clock.

FIG. 7 illustrates a search menu 700 overlaid on the television display by a graphic generator that mixes the graphic video signal with the receiver video signal. The search menu consists of a set of content-based attributes such as visual attributes 710, audio attributes 720, topic-related attributes 730, and special attributes 740 such as breaking news or explosions. The search menu also includes a simple query language 750 that allows selecting "AND", "OR" and "NOT" control functions, for generating and displaying, in a display region 760, such queries as:

VISUAL = People AND AUDIO = Laughter

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Such a search menu is simple to operate and requires only a minimal user-interface. However, the indexing data transmitted to the viewer can support a wide range of video queries. For that purpose, a computer-based interface can be used to define a set of queries on the viewer's personal computer and to download the set of queries to the set-top box. Once downloaded, these queries can be selected by the remote controller handset 120 (FIG. 1B). In other TV-PC combinations, the query definition is supported more easily.

As mentioned above, the method for computing attribute-specific indexing data and for querying these attributes can be implemented by methods known in the art. For illustrative purposes, a simple example is described below teaching how to search for explosions based on the video image track.

The search is implemented, as described in FIG. 9, by a combination of indexing and searching. Indexing 910 consists of decimating the key-frame sequence that is computing a low-resolution version of the images. Low-resolution color representations support a wide variety of color-based queries.

FIG. 8 shows a low-resolution frame sequence obtained by decimating the key-frame sequence.

Searching for explosions in the indexing data is performed by computing the "fire magnitude" 920 at each frame. The fire magnitude value is computed by summing a quantity inversely related to the color distance from a pre-specified fire color value, over all pixels in the low-resolution image as shown by blocks 930 and 940 in FIG. 9. FIG. 10 shows the fire magnitude for the sequence of FIG. 8. The concise one-dimensional fire-magnitude sequence is processed by a derivative and threshold logic 950 to decide on a candidate explosion event.

The present invention can be implemented in additional embodiments other than those described above in which the multi-channel video indexing data are transmitted to the set-top box controller (FIG. 1B), or to a central control node (FIG. 2) that conducts the searching.

Thus, the automatic television channel selection may be implemented over the Internet as illustrated in FIG. 11, wherein a set of video channels are indexed by content by the combination of a digital video decoder 1110 and a video indexer 1120 for each of the indexed channels. The index data is stored in a web server 1130 on the Internet 1131. The web server uses an Internet TCP/IP protocol to make the indexing data available to users at the PC and TV combinations 1140, 1150, 1160 and 1170.

Because of the growing overlap between the TV, the personal computer and the Internet, more configurations now support data integration between these elements. Several such configurations are illustrated in FIG. 11. These include: the configuration 1140 of TV viewing on a personal computer 1141 that has at least one TV tuner 1142 but is also connected to the Internet; the configuration 1150 of Internet-capable set-top boxes 1151 with a video- search engine 1152, and at least one TV tuner; the configuration 1160 of a computer connected directly to the television receiver, and the configuration 1170 of a personal computer only. Streaming video via an Internet connection, such as a broadband connection, is a replacement for a television signal connection.

Video streaming over the net is becoming more and more a reality, for example in "broadcast.com". Users of such sites are presented with listings of broadcast (video) material from multiple broadcast (video) channels. Video may be viewed and downloaded. With the present invention, users of such sites will be able to benefit from "event-driven" information, with program content provided by content-providers sorted according to viewer's preference lists, and all other additional characteristics that are described herein. In figure 11, the broadcast content is streamed via an Internet broadband connection. The user can select a user profile, formulate a query or provide a username for selection of previously defined search criteria. In a preferred embodiment, search results in the form of a listing of the currently available channels that meet the user-defined criteria, or a thumbnail presentation of the content of these channels in the form of updating key-frames can be put by the web-server as an HTML page and sent to the user.

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By clicking on at least one list item or one channel key-frame window, the selected video stream is buffered and played on the user terminal.

The identification of a channel meeting user-defined criteria is a process of finding a match between attributes in user-input query, or predefined attribute listing, and the indexed data. In case of multiple attributes and conjunctions, a match score may be given in reference to the number of attributes and conjunctions met (for example, the number of elements present). Alternatively, an all-or-nothing scheme may be used, in which a match is defined when all attributes and conjunctions are met, otherwise no match. Multiple matches correspond to multiple channels. Prioritizing between the channels may be introduced by utilizing the relative match scores; alternatively, viewer may set relative weights to the set of user-defined attributes; alternatively, video programs may be prioritized utilizing a viewer program preference table and history profile.

Once a video channel is automatically identified as containing the category and attribute of interest, the information may be conveyed to the viewer at the receiver location in several ways. In one embodiment the program (or a keyframe program representation) may be displayed in a secondary video display window as a picture-in-picture (PIP). A variety of PIP settings are known in the art. These may include partitioning of the main video display window into several smaller windows surrounding the main display, or a secondary display window as a small window top right, and others. In another embodiment, program identification is displayed as a listing on part of the display window. Program identification may include the program title (e.g. "CNN"), any defining attributes ("breaking news" segment) and any additional information desired (e.g., in a pay-per-view channel: "selecting this channel will cost X per hour"). In yet another embodiment, a signal may be used (such as a blinking signal or a sound signal) to notify of an event.

Following a channel identification event, the user at the receiver location may select via the controller 213, FIG. 2, one of several action items, including a viewing option and a recording option. In the viewing option, the user may select to switch over to a full-screen view of the selected channel. In

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the recording option, the user may select to record the content. The viewer may choose to select amongst these options interactively, following the notification of an event; alternatively, the viewer may decide on a fixed setting (e.g. record all events occurring during the 6-8pm time slot). For example, while a viewer is watching the sports channel, the viewer is notified in a picture-in-picture setting that there is a "breaking news" segment in the CNN channel whereupon the viewer may decide to select the CNN channel for viewing; alternatively, the "breaking news" may be automatically recorded.

A variety of techniques exist in the prior art that enable channel selection based on specific programs or categories, as selected by the viewer. Interactive television systems establish a database of viewer preferences based on particular characteristics previously delivered to the viewer. The system compares the viewer preference list to the video programming available at the selected time, and identifies the video programming which has the greatest degree of correlation. The main goal is to generate a personalized channel guide based on program preferences and times personalized for the individual viewer. An example of such a guide is shown in the following table:

	8:00-8:30	8:30-9:00	9:00-9:30	9:30-10:00
Sports	Soccer Game		NBA	
Drama	Gone with the Wind			
News	CNN	NBC	ABC	

In the present invention, an "event-driven" electronic program guide (EPG) can be generated. A block diagram for generating the event-driven EPG listing is shown in FIG 12-A. Video indexing data 1210 (generated based on a

set of predefined attributes) and user-specified attributes 1211,1212 are processed by a video search engine 1213, and the resultant program/events schedule is displayed in a listing 1214. The listing may be a scrolling listing, allowing the viewer to follow in real time, the video content from a number of channels, such that the content matches specific topics of interest. The listing may also entail future scheduled programs and events, in which case the listing entails programs and events, channel identification and time segments (such as the beginning and the end time of the segment of interest). Schedules of events that are non real-time are generated for any video material available that is non real-time material. An example of an event-based EPG real-time scrolling listing is shown in FIG. 12-B. At each time in which there is one or more identified matches, the identified events are listed along with the corresponding video channel identifications. The continuous scrolling listing of the events may be presented on a small portion of the main display screen, or as a buffered secondary screen. The viewer may be interested in future scheduling. A variety of scheduling screens are available to the viewer, as shown in FIG. 12-C. The display screens include a display that is channel based (for each channel, time schedule and attributes are listed), or a display that is time schedule based (time segment is listed, together with the attribute/event and corresponding program identification).

The event-driven electronic program guide may be generated as a personalized guide, personalized to the particular viewer attributes 1212. The event-driven electronic program guide may be generated as a global listing, containing all attributes, as chosen by the respective video channel providers, or predefined in the centralized control server, or as combined across multiple user preferences, 1211.

Referring to the two embodiments of FIG. 1B and FIG. 2, the indexing data for each of the program channels could be generated in the video indexing modules 115 or in the central control node 220, respectively. The video search engine and channel selection units, at the set-top box 130, alternatively, the server at the central control node 220, identify from the indexing data the

program channels to transmit programs, and the scheduled transmission times thereof, having a match with respect to the specified one or more attributes, to thereby produce a program schedule. The personalized attributes may be input via the remote control handset 121 or user interface in the set-top box 136, or alternatively, the controller 213 at each viewer station 210 could be used for specifying one or more attributes corresponding to desired program content data. The global set of attributes by which a schedule is generated, may be derived at the server 222 in the central control node 220. The global set can be extracted from a set of attributes as chosen by the video content providers, or by collecting attributes from a set of viewers, or by utilizing a history profiling of the viewers, or via some combination logic of the personalized attributes lists.

Generating a viewing history profile for a viewer may include storing a viewer preference database of programs viewer selects or receives, as known in prior art. In this invention, attributes and events are incorporated in the profiling. The handset 120 in FIG. 1B, or the controller 213 in FIG. 2 at the receiver location, may generate and store a viewing-history profile of the programs viewed and the attributes requested at the respective receiver location. Such history profile may be utilized for prioritizing the programs identified, e.g., in the server 222 of the central control node 220 having the attributes specified by the respective user at the receiver location.

In recent years, smart TV, or "time-shifted" TV have been developed which, via recording systems that use hard-drives and computer chips, record and store television programming so that people can watch whatever they want, whenever they wish. With such recording devices, the viewer at home may choose between viewing a selected channel and recording it. The present invention may also be used in such systems to record content-based events from a plurality of channels according to designated events or events based on history-profile preferences.

A yet additional application of the invention is to generate a report of program and event statistics. A professional user may be interested to gather appearance statistics for a particular logo of interest or a particular clip, for

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example. In this scenario. the event of interest is the logo (clip). This event is automatically indexed in the transmitter side and the indexed channel is received by the receiver (FIG. 1B) or by the server at the central control node (FIG. 2). Any indexed event is recorded in the recording device (as known in prior art). At the end of a specified time period (e.g., several hours, one day, night shows etc), statistics may be gathered. Examples are: number of occurrences per channel, overall time allocated in all segments, and so forth.

FIG. 13 is a flow diagram illustrating a method for generating topic-oriented video summaries (block 1310). In this method, video key-frames and video indexing data are processed by a video search engine 1311, and the query results are arranged in a storyboard, multi-frame display 1312. This display allows the viewer to follow. in real time, the video content from a number of channels, such that the content matches specific topics of interest.

The topic summary engine 1310 is similar in implementation to the channel selection method taught by the present invention and includes a query processing module 1313 communicating with a query definition user interface 1314. However, the purpose of the system in FIG. 13 is to allow topic-oriented multi-channel browsing rather than to select a specific channel.

The present invention can thus be applied to various arrangements where the user of viewer can select between multiple video or multimedia programs. Such arrangements include broadcasting, webcasting and other internet-television implementations, telecasting, video on demand, near video on demand, and interactive television.

While the invention has been described with respect to certain preferred embodiments, it will be appreciated that these are set forth merely for purposes of example, and that many other variations, modifications and applications of the invention may be made.

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What is Claimed is:

1. A method of selecting, at a video receiver location, a desired video program channel from a number of program channels transmitting video programs, comprising:

automatically generating, for each of said program channels, indexing data of at least one predetermined attribute based on the video program content of the respective channel;

specifying at least one attribute corresponding to a desired program content;

and identifying, from said indexing data, any program channel having a match with respect to the attribute specified.

2. The method according to claim 1, wherein said indexing data is generated at a remote location, is encoded and transmitted in a separate indexing channel for all said program channels, and is received and decoded at said receiver location; and wherein said at least one attribute corresponding to a desired program is specified at said receiver location.

3. The method according to claim 2, wherein said indexing data from a plurality of channels is multiplexed into a data stream before transmission.

4. The method according to claim 1, wherein said indexing data is generated from selected key-frames of the respective video program.

5. The method according to claim 1, wherein said indexing data is tagged with a channel identification code and with a time tag.

6. The method according to claim 1, wherein said generated indexing data includes both image and audio attributes.

7. The method according to claim 1, wherein one program channel is identified having the best match with respect to the attribute specified, and at least one additional program channel is identified having the next-best match with respect to the specified attribute.

8. The method according to claim 1, wherein, in order to assist specifying at said receiver location said at least one attribute corresponding to a

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desired program content, there is displayed, at said receiver location, a search menu setting forth a plurality of different attributes selectable by the user.

9. The method according to claim 8, wherein there are also displayed "AND", "OR" and "NOT" control functions also selectable by the user.

10. The method according to claim 1, wherein at least one of said attributes is the occurrence of an explosion in the video program, said indexing data including characteristic data indicative of fire-like color distribution in selected frames of the respective video program.

11. The method according to claim 1, wherein the generated indexing data is stored in a web server in the internet.

12. The method according to claim 1, wherein the program channel best matching the specified attribute is displayed as a picture within a picture on the screen of the video receiver.

13. The method according to claim 1, wherein the identification of the program channel matching the specified attribute is displayed on the screen of the video receiver.

14. The method according to claim 1, wherein the program channel matching the specified attribute is recorded.

15. The method according to claim 1, wherein a viewer at the receiver location preselects, via a user interface, whether a program channel identified as having a match with a specified attribute is to be recorded or to be immediately displayed on a video receiver at the receiver location.

16. The method according to claim 1, wherein said at least one predetermined attribute is used for generating a program guide setting forth a program schedule of channels to contain a video program content based on said at least one predetermined attribute.

17. The method according to claim 1, wherein said at least one specified attribute includes a particular event desired to be identified if occurring on any of said program channels.

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18. The method according to claim 1, wherein said indexing data is transmitted in an indexing channel and is received and decoded at said receiver location.

19. The method according to claim 1, wherein said indexing data is used at a central control node for selecting programs to be transmitted to a plurality of viewer stations at a plurality of receiver locations according to the attribute specified at the respective receiver locations.

20. The method according claim 19, wherein said indexing data is transmitted in an indexing channel to said central control node.

21. The method according to claim 19, wherein said central control node also uses said indexing data together with a history-profile of at least some of said viewer stations, for listing the programs to be transmitted to the respective viewer stations.

22. The method according to claim 1, wherein the video receiver location generates and stores a history-profile of programs viewed at said video receiver location, and utilizes said history-profile for prioritizing the identified programs having the attribute specified.

23. The method according to claim 1, wherein the video receiver location or the server at a central control node, generates a statistical report of occurrences of said specified attribute.

24. The method according to claim 1, wherein the specified attribute relates to a particular topic of interest, and said video receiver location or the server at the central control node, generates a summary of occurrences of said topic of interest in the video channels.

25. A method for indicating at a video receiver location, the occurrence of a particular event when occurring on any of a number of program channels transmitting video programs, comprising:

automatically generating at a remote location, for each of said program channels, indexing data of the respective video programs;

encoding and transmitting said indexing data for all said channels;

receiving and decoding said indexing data;

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specifying at said receiver location said particular event; and

identifying from said indexing data each occurrence of the particular event on any of the program channels.

26. The method according to claim 25, wherein said indexing data is transmitted in a separate indexing channel and is received and decoded at said receiver location.

27. The method according to claim 25, wherein said indexing data is used at a central control node for selecting programs to be transmitted to a plurality of viewer stations at a plurality of receiver locations according to the attribute specified at the respective receiver location.

28. A method of selecting, at a plurality of viewer locations, a desired video program from a plurality of video programs transmitted in a plurality of program channels, comprising:

automatically indexing, at a remote location, attributes of each of said video programs transmitted in said program channels;

transmitting said attributes of each of said video programs in said program channels;

receiving, at a central control node, the video programs and the attributes thereof;

specifying, at each of said viewer locations, particular attributes of a video program desired to be viewed at the respective viewer location; and

utilizing, at said central control node, said attributes specified at said viewer location for identifying the video programs matching said specified attributes.

29. The method according to claim 28, wherein said attributes of each of said video programs in said program channels are transmitted in a separate indexing channel.

30. The method according to claim 29, wherein said central control node also uses said attributes transmitted in said indexing channel, together with a history-profile of at least some of said viewer stations, for listing the programs to be transmitted to the respective viewer station.

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31. A method of generating a program schedule of desired video program channels from a number of program channels transmitting video programs of various program contents, comprising:

automatically generating, for each of said program channels, indexing data of at least one predetermined attribute based on the content of the programs to be transmitted on the respective channel, and the scheduled transmission time thereof;

specifying at least one attribute corresponding to a desired program content;

and identifying, from said indexing data, the program channels and the scheduled transmission times thereof, having a match with respect to the specified attribute to thereby produce a program schedule of said program channels.

32. The method according to claim 31, wherein said indexing data is generated at a remote location, and is encoded and transmitted in a separate indexing channel for all said program channels.

33. The method according to claim 31, wherein said indexing data is received, decoded, and utilized at a receiver location for identifying the program channels to transmit programs having a match with respect to the specified attribute, and the scheduled transmission times thereof.

34. The method according to claim 31, wherein said indexing data is received, decoded, and utilized at a central control node for identifying the program channels to transmit programs having a match with respect to the specified attribute, and the scheduled transmission times thereof.

35. The method according to claim 31, wherein a plurality of attributes are specified each corresponding to a desired program content, and each program having a match with a specified attribute is identified and included, together with its scheduled transmission time, in said program schedule.

36. The method according to claim 1, wherein said video receiver is a computer connected to the Internet.

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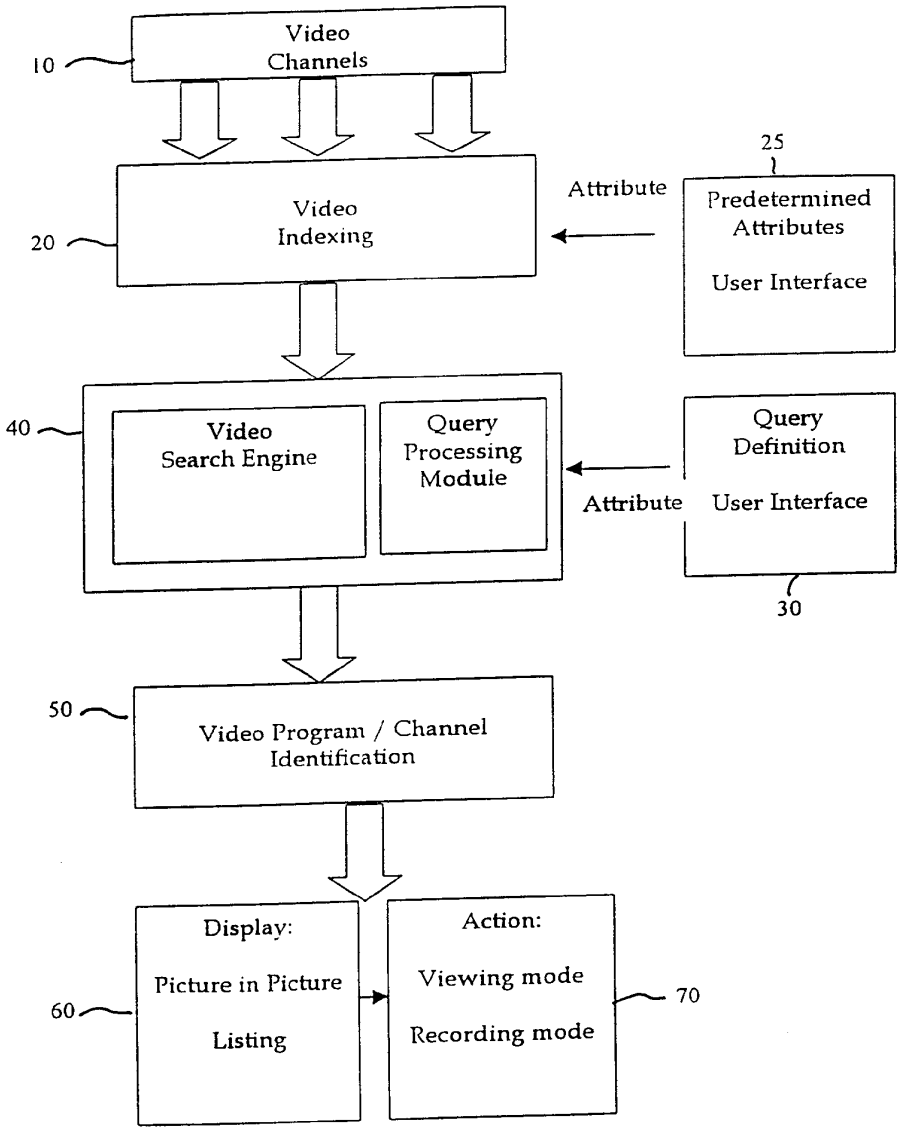

FIG 1-A

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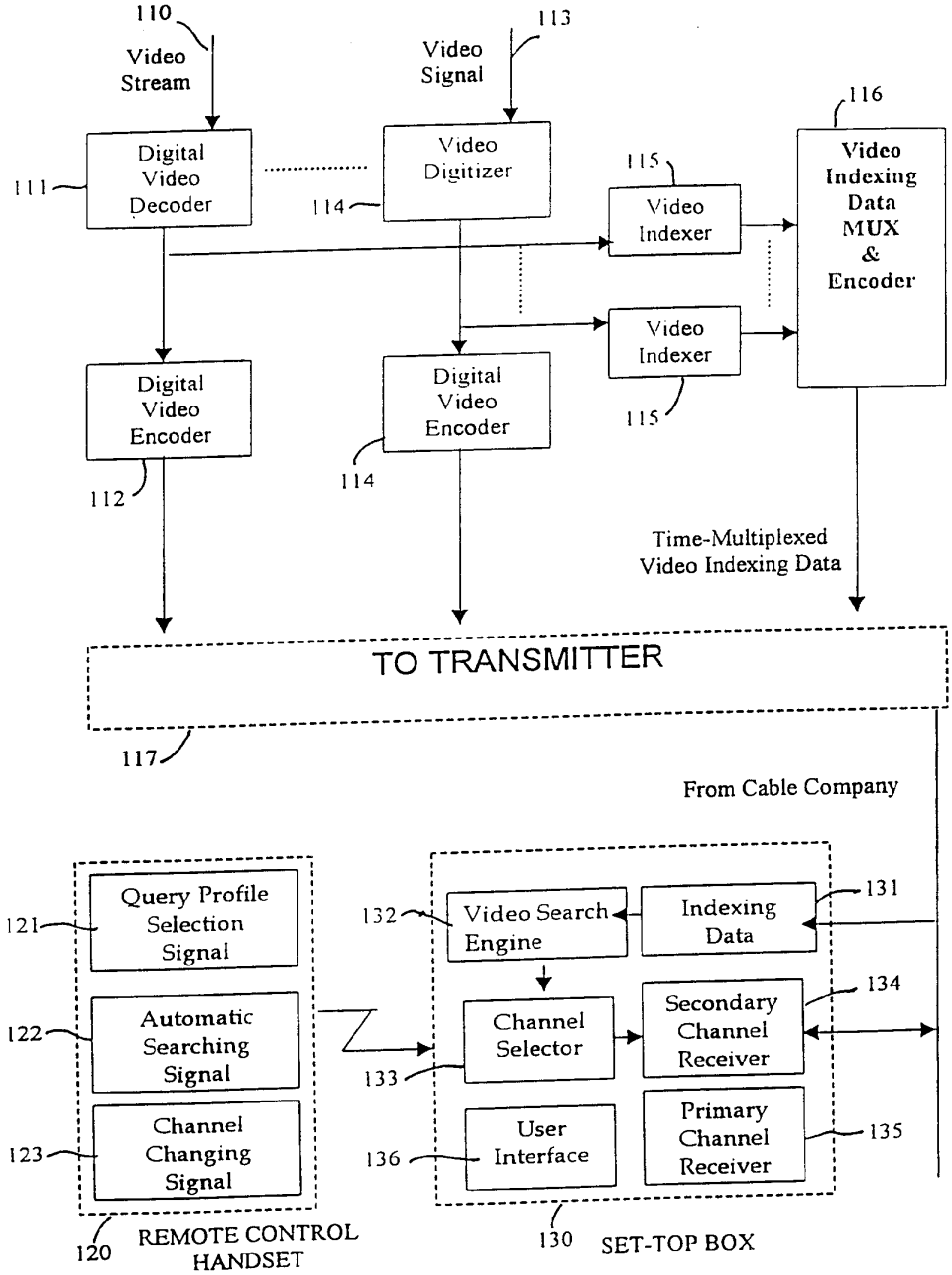
110
Video Stream
113
Video Signal
116
Digital Video Decoder
111
Video Digitizer
114
115
Video Indexer
Video Indexing Data MUX & Encoder
Video Indexer
115
Digital Video Encoder
112
Digital Video Encoder
114
Time-Multiplexed Video Indexing Data
TO TRANSMITTER
117
From Cable Company
Query Profile Selection Signal
121
Automatic Searching Signal
122
Channel Changing Signal
123
REMOTE CONTROL HANDSET
120
132
Video Search Engine
Indexing Data
131
Channel Selector
133
Secondary Channel Receiver
134
User Interface
136
Primary Channel Receiver
135
130
SET-TOP BOX

FIG 1-B

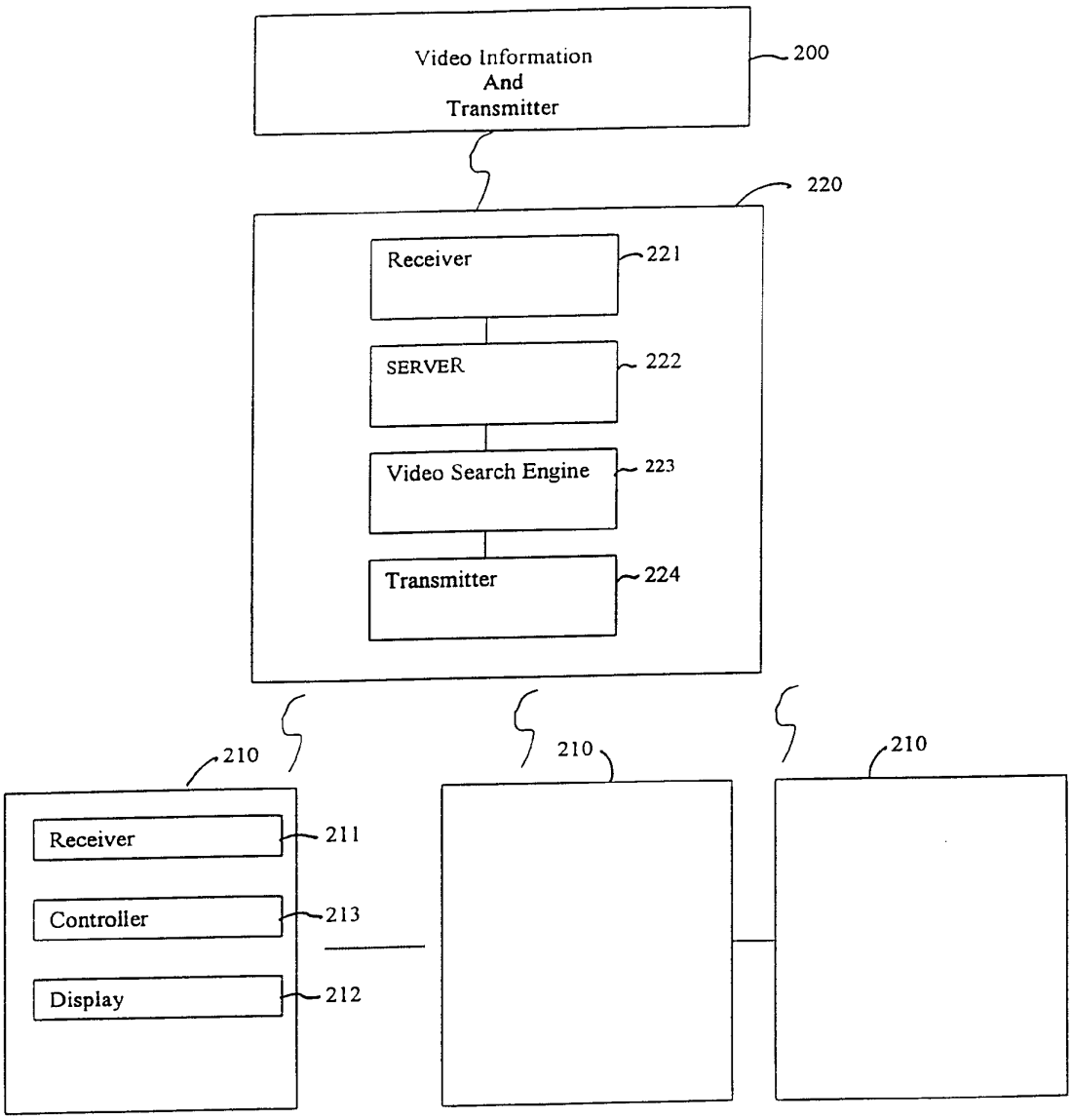
Video Information
And
Transmitter
200
220
Receiver
221
SERVER
222
Video Search Engine
223
Transmitter
224
210
210
210
Receiver
211
Controller
213
Display
212

FIG 2

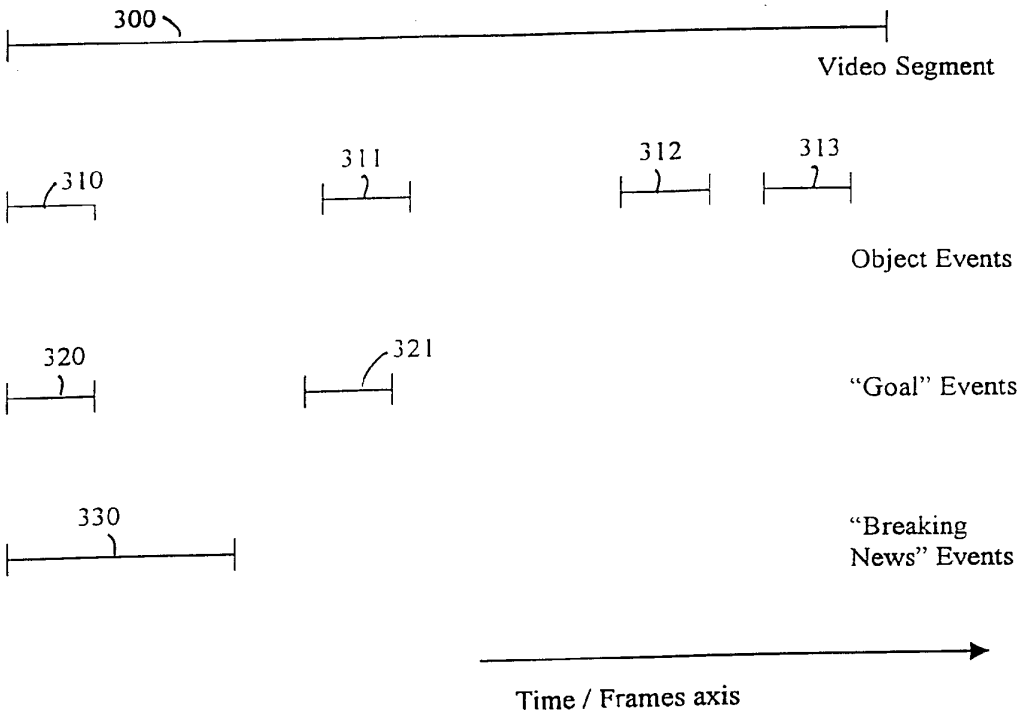
300
Video Segment
310
311
312
313
Object Events
320
321
"Goal" Events
330
"Breaking News" Events
Time / Frames axis

FIG 3-A

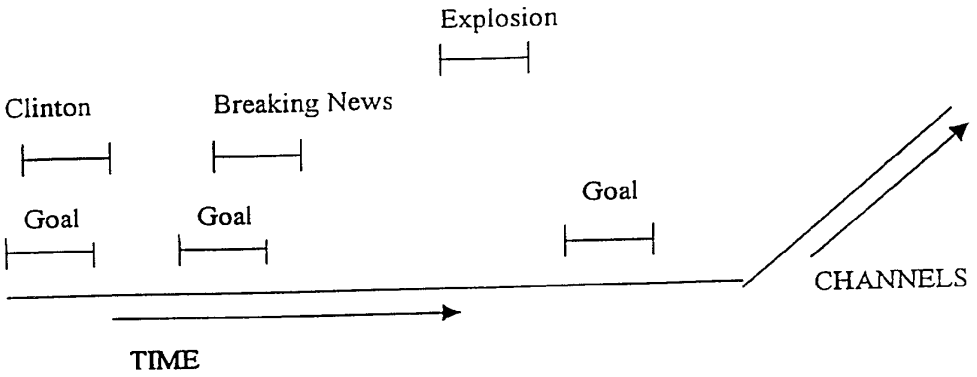
Explosion
Clinton
Breaking News
Goal
Goal
Goal
CHANNELS
TIME

FIG 3-B

5/14

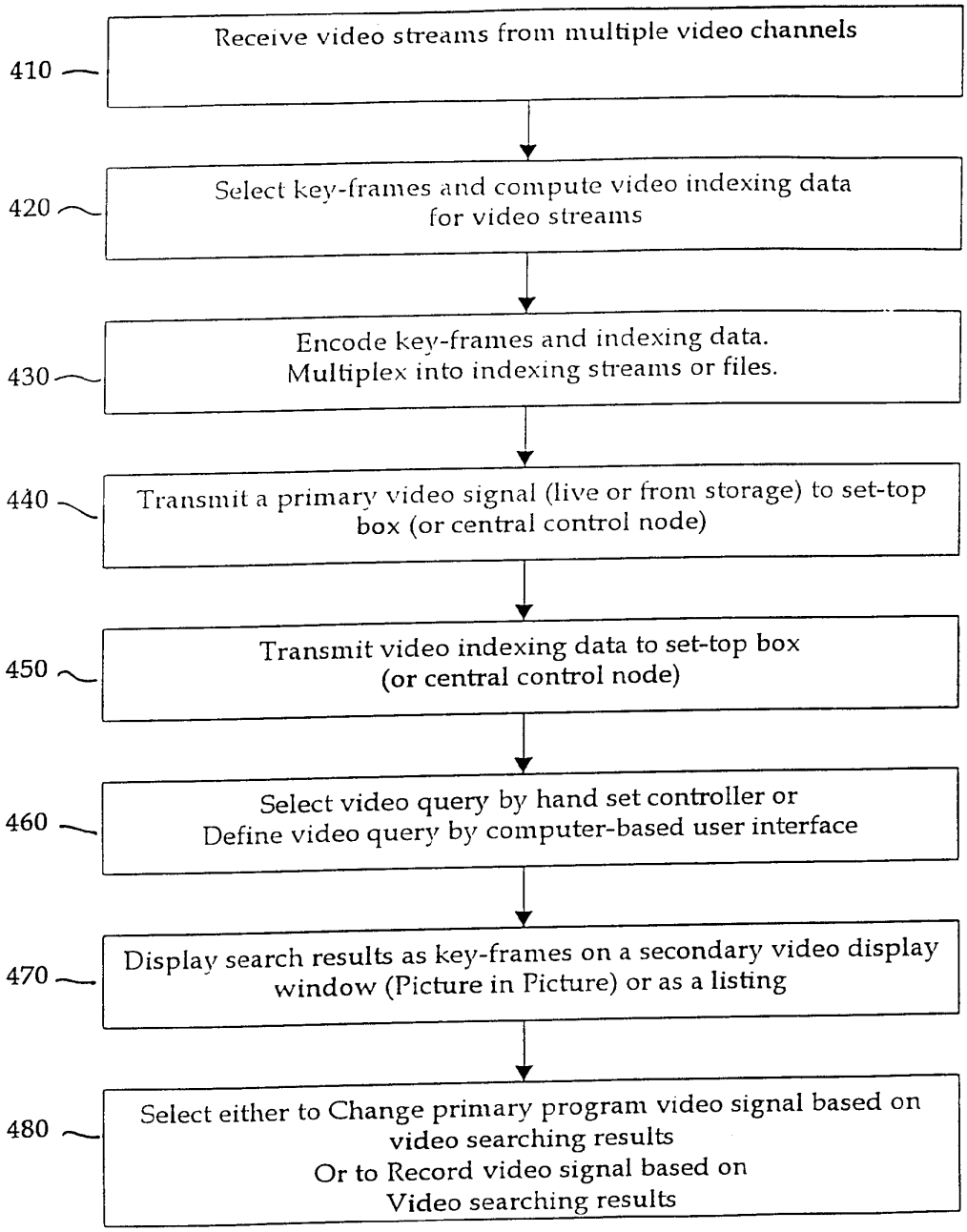

FIG 4

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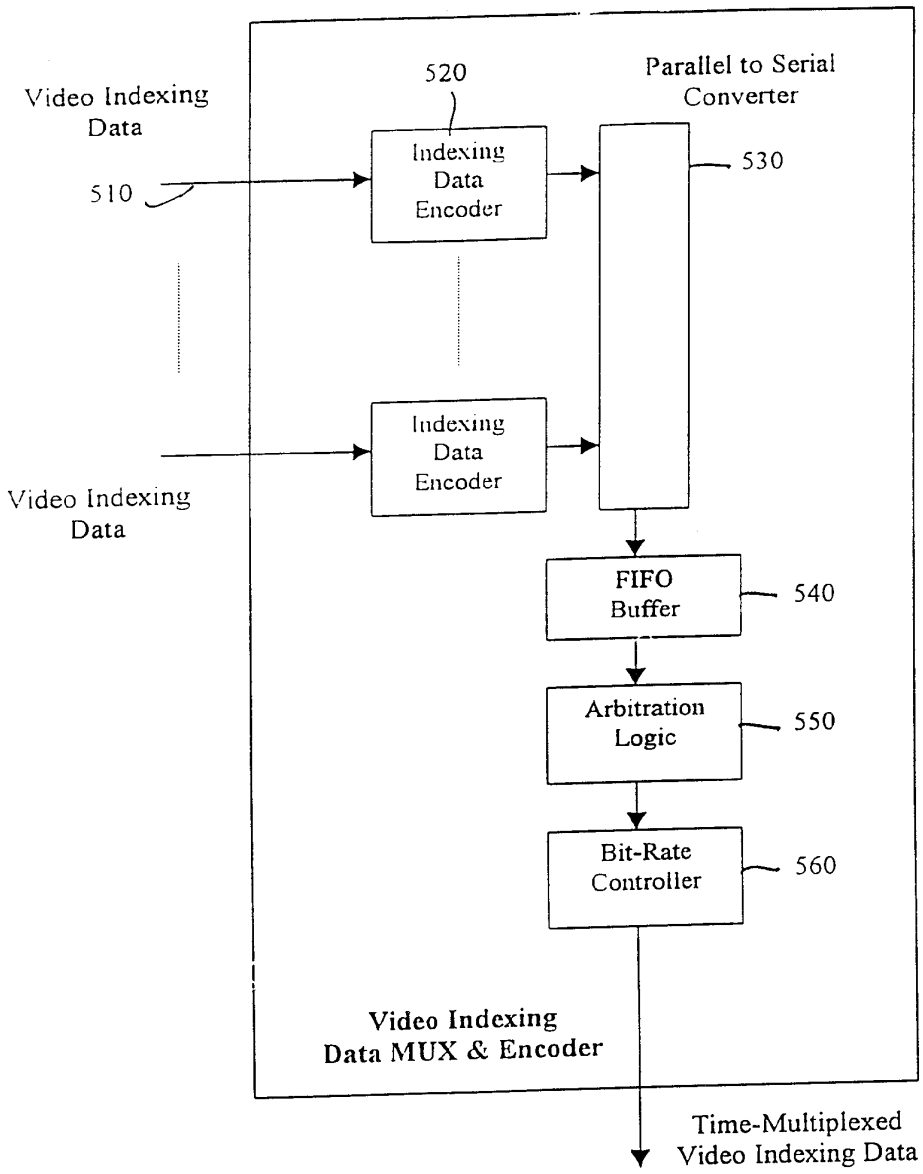
Video Indexing Data
510
520
Indexing Data Encoder
Parallel to Serial Converter
530
Indexing Data Encoder
Video Indexing Data
FIFO Buffer
540
Arbitration Logic
550
Bit-Rate Controller
560
Video Indexing Data MUX & Encoder
Time-Multiplexed Video Indexing Data

FIG 5

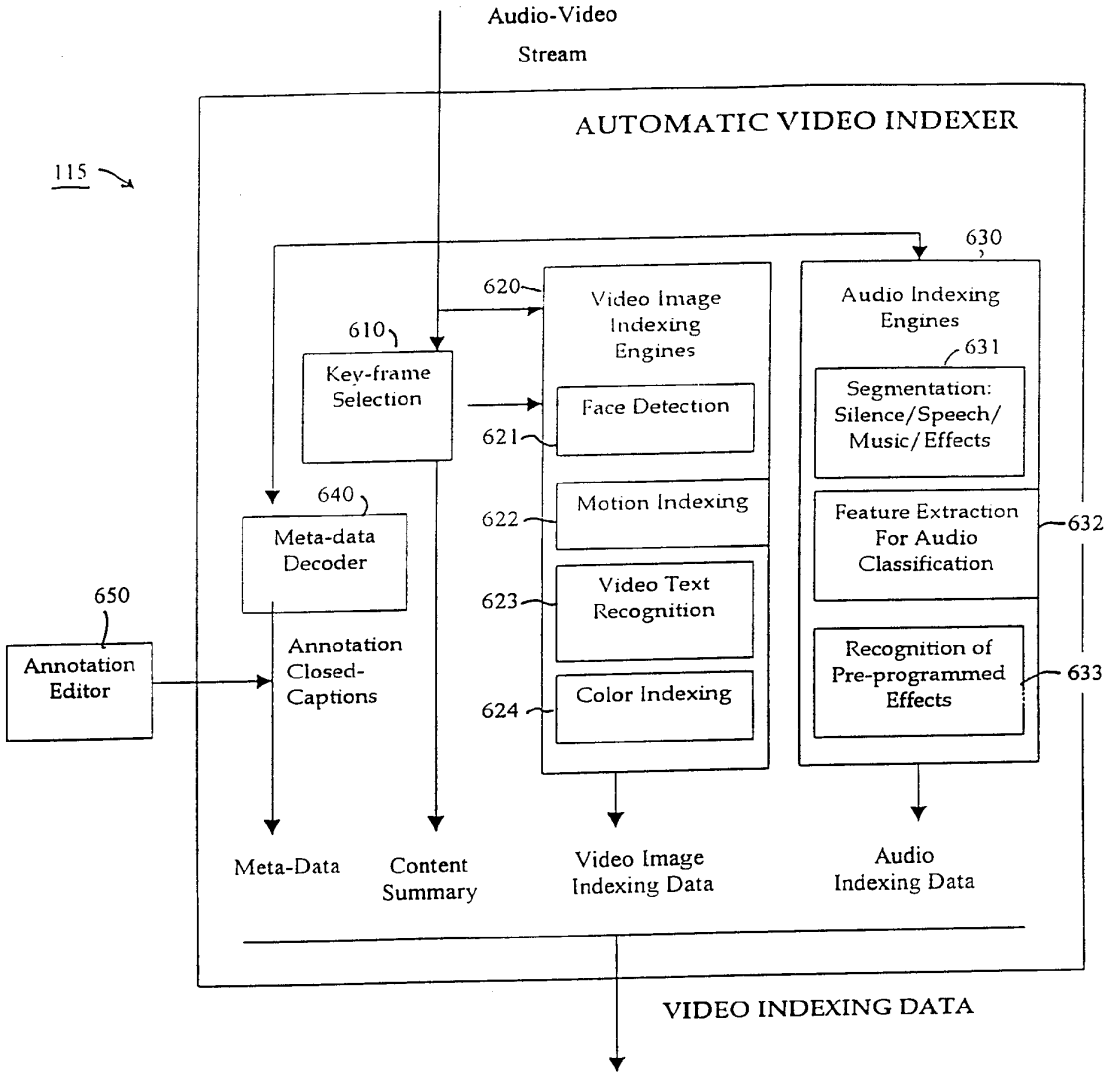
Audio-Video
Stream
AUTOMATIC VIDEO INDEXER
115
630
620
Video Image
Indexing
Engines
Audio Indexing
Engines
631
610
Key-frame
Selection
Face Detection
621
Segmentation:
Silence/Speech/
Music/Effects
640
Meta-data
Decoder
622
Motion Indexing
Feature Extraction
For Audio
Classification
632
650
Annotation
Editor
623
Video Text
Recognition
Annotation
Closed-
Captions
Recognition of
Pre-programmed
Effects
633
624
Color Indexing
Meta-Data
Content
Summary
Video Image
Indexing Data
Audio
Indexing Data
VIDEO INDEXING DATA

FIG 6

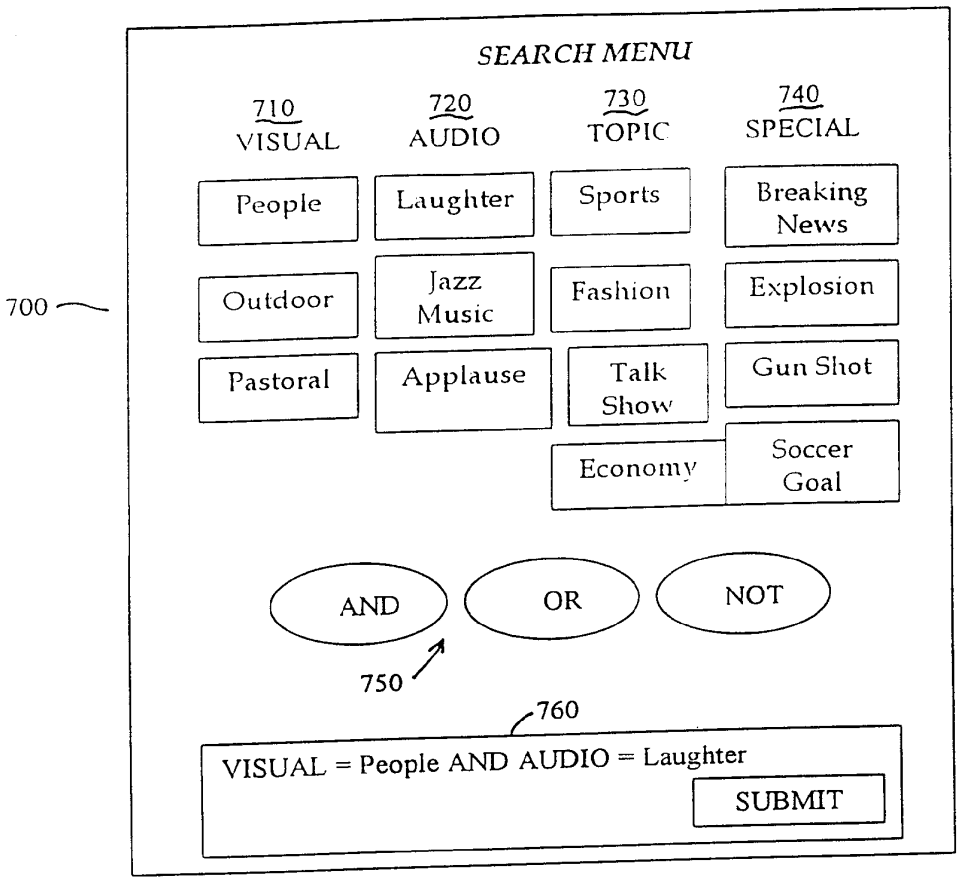
SEARCH MENU
710 VISUAL
720 AUDIO
730 TOPIC
740 SPECIAL
People
Laughter
Sports
Breaking News
Outdoor
Jazz Music
Fashion
Explosion
Pastoral
Applause
Talk Show
Gun Shot
Economy
Soccer Goal
700
AND
OR
NOT
750
760
VISUAL = People AND AUDIO = Laughter
SUBMIT

FIG 7

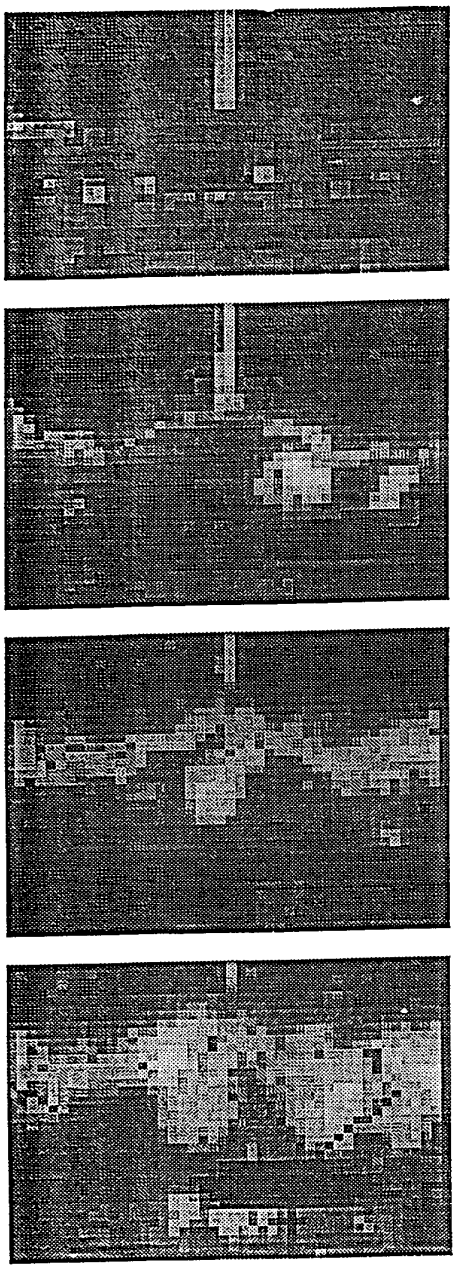

FIG 8

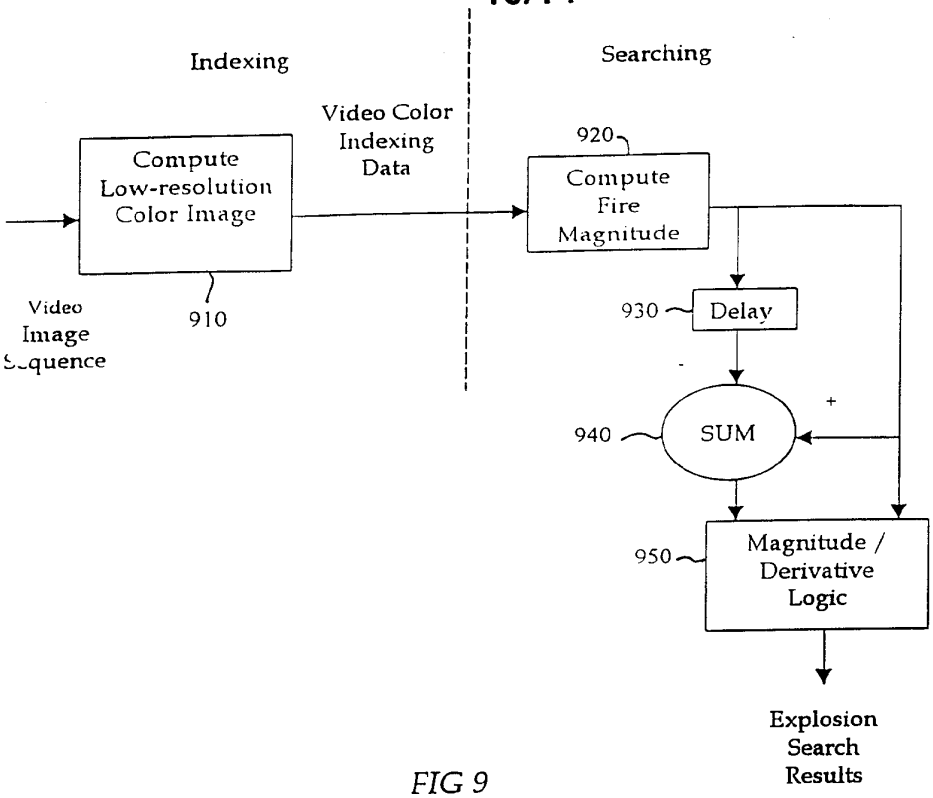
Indexing
Searching
Video Color Indexing Data
Compute Low-resolution Color Image
910
Video Image Sequence
920
Compute Fire Magnitude
930
Delay
940
SUM
+
950
Magnitude / Derivative Logic
Explosion Search Results

FIG 9

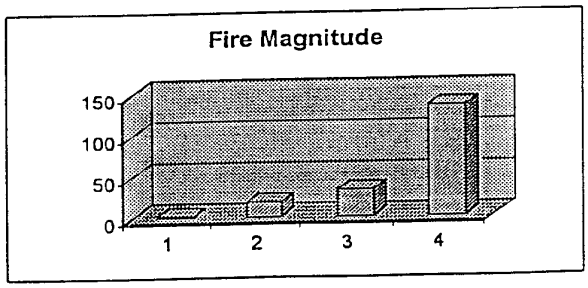
Fire Magnitude
150
100
50
0
1
2
3
4

FIG 10

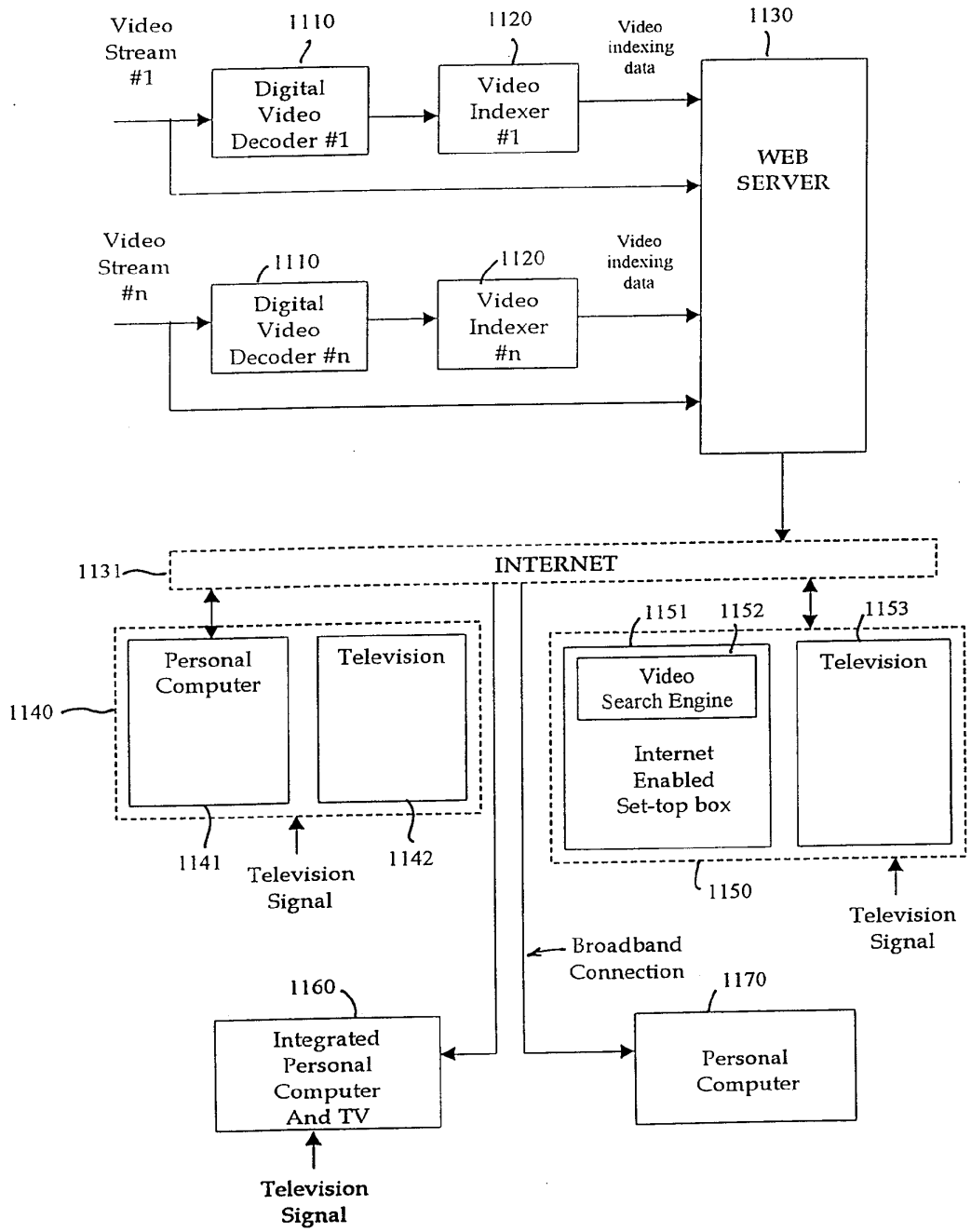
Video Stream #1
1110
Digital Video Decoder #1
1120
Video Indexer #1
Video indexing data
1130
WEB SERVER
Video Stream #n
1110
Digital Video Decoder #n
1120
Video Indexer #n
Video indexing data
1131
INTERNET
1140
Personal Computer
Television
1141
Television Signal
1142
1151
1152
1153
Video Search Engine
Internet Enabled Set-top box
Television
1150
Television Signal
Broadband Connection
1160
Integrated Personal Computer And TV
Television Signal
1170
Personal Computer

FIG 11

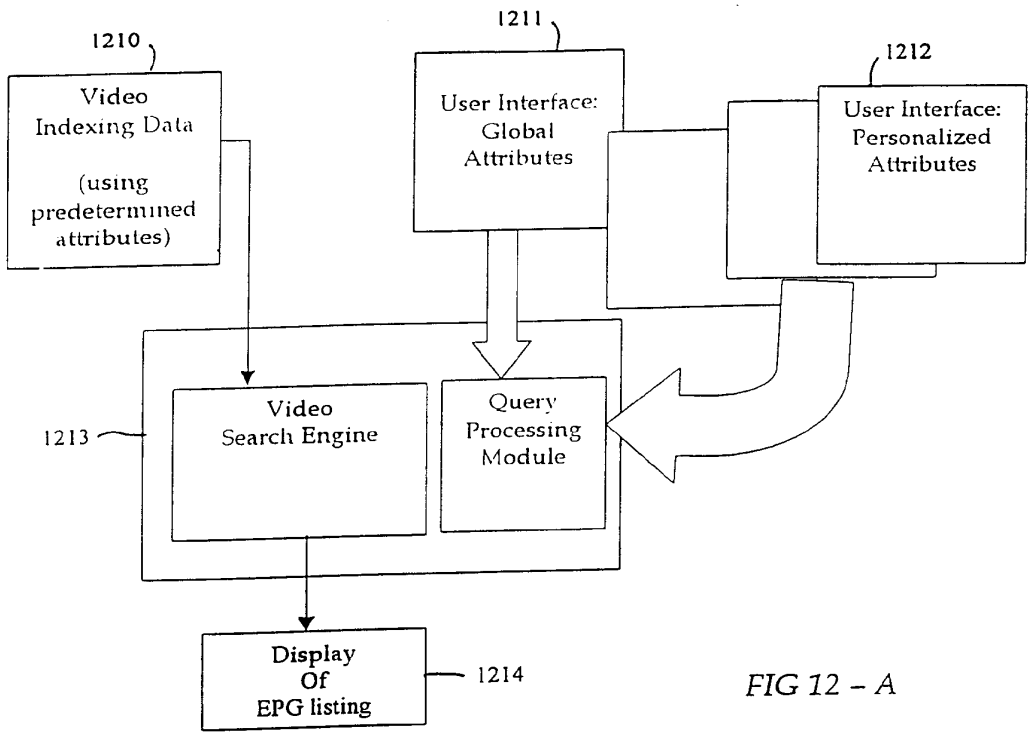

FIG 12 – A

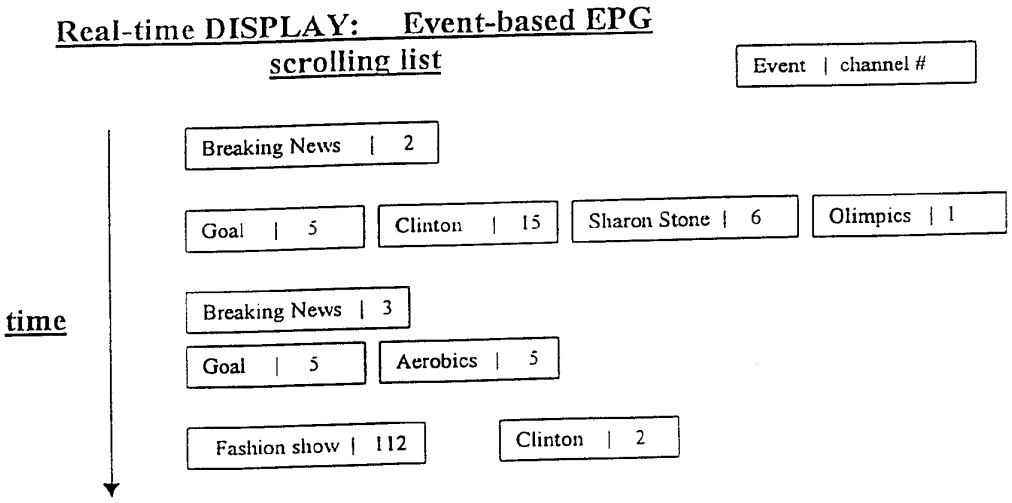

FIG 12 – B

DISPLAY: Channel 5

DATE	TIME	EVENT
4 /17/99	[10:10 - 10:30]	Clinton speech
4 /18/99	[9:25 - 9:40]	Fashion show
4 /20/99	[12:00 - 12:10]	Sharon Stone
4 /20/99	[14:20 - 14:25]	Explosion event

DISPLAY: TIME [10pm-12pm]
DATE April 20

Time segment	Event	Channel #
10:10-10:30	Clinton speech	5
10:30-10:35	Stelone & Shooting	6
11:00 – 11:10	Explosion event	13
11:15 – 11:20	Goal Event	220

FIG 12 – C

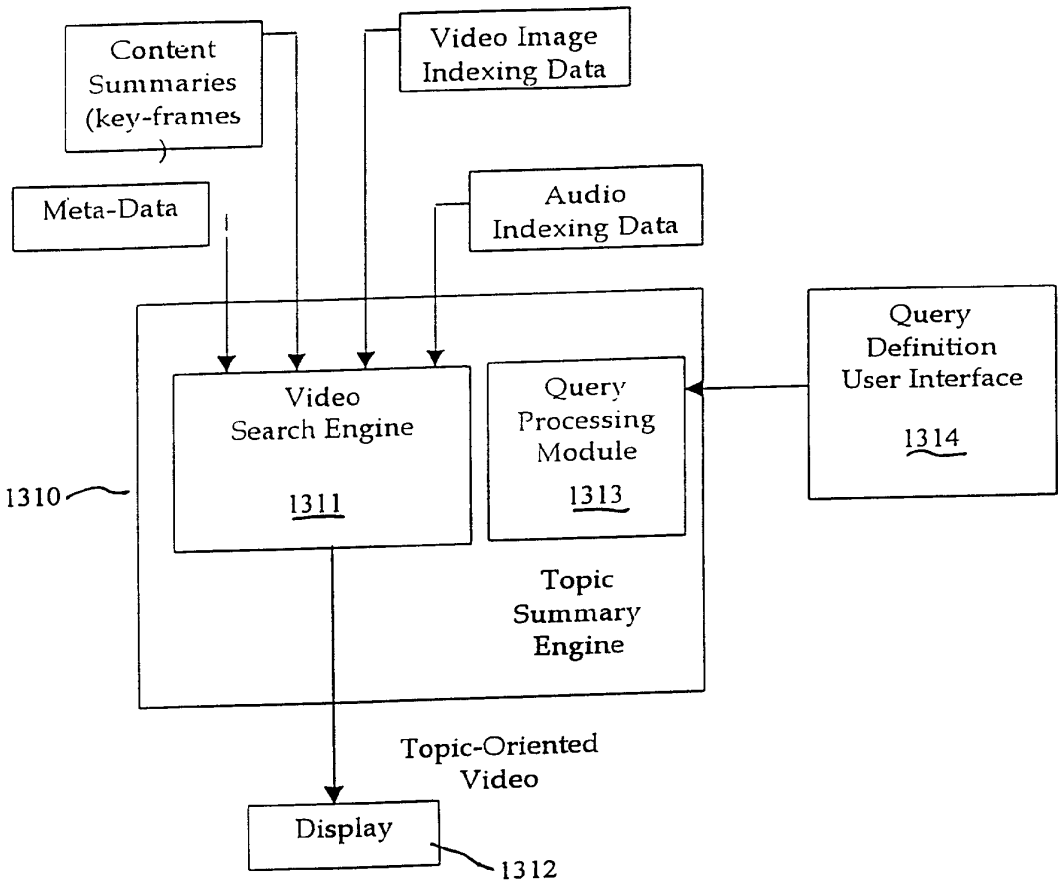
Content Summaries (key-frames)
Video Image Indexing Data
Meta-Data
Audio Indexing Data
Query Definition User Interface
1314
Video Search Engine
1311
Query Processing Module
1313
1310
Topic Summary Engine
Topic-Oriented Video
Display
1312

FIG 13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL99/00393

A. CLASSIFICATION OF SUBJECT MATTER
IPC(6) :H04N 7/10
US CL :345/327
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/327; 348/1, 10, 12, 13; 455/5.1, 6.2, 6.3, 4.2

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WEST: AUTOMATICALLY GENERATING, CHANNEL, ATTRIBUTE, INDEXING, MULTICHANNEL, ENCODER, DECODER, EPG , RECEIVING, TRANSMITTING

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y,P	US 5,867,205 A (HARRISON) 02 FEBRUARY 1999, col. 5, line 66 - col. 6, line 5.	1,2,11,14, 16-21, 25-29, 31-34
Y,P	US 5,872,588 A (ARAS et al) 16 FEBRUARY 1999, col. 3, lines 7-27.	1,2,11,14, 16-21, 25-29, 31-34
A,P	US 5,801,747 A (BEDARD) 01 SEPTEMBER 1998, ABSTRACT.	1-36
A,P	US 5,880,768 A (LEMMONS et al) 09 MARCH 1999, ABSTRACT.	1-36

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
02 NOVEMBER 1999

Date of mailing of the international search report
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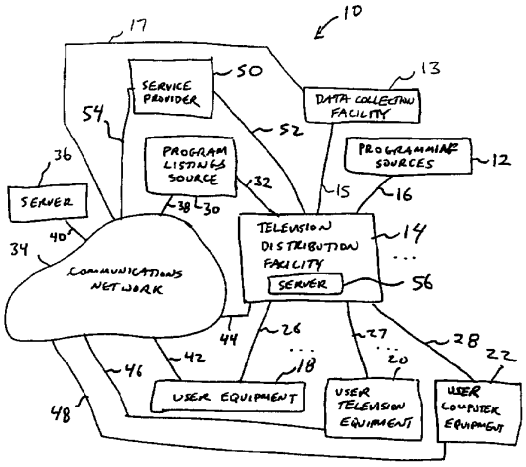
(54) Title: INTERACTIVE TELEVISION SYSTEMS WITH DATA COLLECTION



(57) Abstract: A system is provided based on user equipment such as a set-top box or computer on which an interactive television application may be implemented. Information may be collected on the television viewing activities of a user and the user's interactions with the interactive television application. The interactive television application may be an interactive television program guide. The collected information may be transmitted to a data collection facility using e-mail protocols, using the communications capabilities of a web browser, using a stand-alone FTP application, or using the communications capabilities of an operating system installed on the user equipment.

WO 01/06784 A2

INTERACTIVE TELEVISION SYSTEMS WITH DATA COLLECTION

Background of the Invention

This invention relates to television systems, and more particularly, to interactive television systems such as interactive television program guide systems in which data is collected on user activities.

Interactive television program guides are typically implemented on set-top boxes connected to televisions. Such program guides may be used to present screens of interactive television program listings to users.

Program guides may also be used to control which television channels the set-top box tunes to when a user is watching television. For example, a program guide may tune to different television channels in response to channel-changing commands from the user's remote control. Users may also select programs from the program guide for recording or viewing. Additional information may be obtained for a program by selecting the displayed listing for that program with a highlight region. Reminders may be set for programs.

The user's interactions with the program guide and the television programs that the user watches are indicative of the user's interests. These activities may be monitored. The information that is collected on the viewer's interests may be used for marketing purposes. For example, information that is collected on the viewer's interests may be used to target program guide advertisements to the user as described in Knudson et al. U.S. patent application Serial No. 09/034,939, filed March 4, 1998, which is hereby incorporated by reference herein in its entirety. Viewer monitoring is described, for example, in Thomas et al. U.S. patent application Serial No. 09/139,798, filed August 25, 1998, which is hereby incorporated by reference herein in its entirety.

It is an object of the present invention to provide arrangements for collecting information on the viewing habits and other activities of the user.

Summary of the Invention

A system is provided that gathers information on a user's television viewing activities and interactions with an interactive television program guide or other interactive television application.

The user's activities may be monitored by an interactive television program guide or other application. The monitoring software may maintain, for example, information on which channels the user watches, the duration that each channel is watched, and information on which household members are in the room while the television is being viewed. Information may also be collected on the user's interactions with the

interactive television program guide or other interactive television application. For example, information may be collected on which interactive buttons the user selects, which screens the user views, etc.

The user information that is collected may be transmitted to a data collection facility for analysis. Analysis may reveal that certain television programs are more popular than others, that certain program guide screens are more popular than others, etc. Analysis may also reveal the particular interests of a viewer and may reveal data trends. Correlations may be observed between certain viewer interactions with the program guide and certain viewer activities.

The user may participate in a monitoring scheme that requires the user to periodically submit information to a data collection facility for analysis. If desired, user information may be collected and transmitted to the data collection facility automatically and without user intervention.

User data may be transmitted to the data collection facility using e-mail, using the communications capabilities of the user's browser application (e.g., the forms capabilities of such browsers), using communications capabilities associated with the operating system on the user's equipment, using a stand-alone FTP application, etc.

Further features of the invention, its nature and various advantages will be more apparent from the accompanying drawings and the following detailed description of the preferred embodiments.

Brief Description of the Drawings

FIG. 1 is a diagram of an illustrative interactive television system with data collection capabilities in accordance with the present invention.

FIG. 2 is a diagram of illustrative user television equipment in accordance with the present invention.

FIG. 3 is a diagram of additional illustrative user television equipment in accordance with the present invention.

FIG. 4 is a diagram of an illustrative remote control in accordance with the present invention.

FIG. 5 is a diagram of illustrative user computer equipment in accordance with the present invention.

FIG. 6 is a generalized diagram of illustrative user equipment in accordance with the present invention.

FIG. 7 shows an illustrative menu screen in accordance with the present invention.

FIG. 8 shows an illustrative program guide screen in accordance with the present invention.

FIG. 9 is a flow chart of illustrative steps involved in gathering user information and automatically reporting such information to a data collection facility in accordance with the present invention.

FIG. 10 is a flow chart of illustrative steps involved in gathering user information and reporting such information to a data collection facility when authorized by the user in accordance with the present invention.

FIG. 11 shows an illustrative e-mail message that may be presented to the user to allow the user to authorize transmission of a user report to a data collection facility in accordance with the present invention.

FIG. 12 is a flow chart of illustrative steps involved in providing the e-mail message of FIG. 11 in accordance with the present invention.

FIG. 13 shows an illustrative program guide screen containing an interactive prompt that allows a user to decide whether or not to submit a user report in accordance with the present invention.

FIG. 14 shows an illustrative program guide settings screen that may be provided in accordance with the present invention.

FIG. 15 shows an illustrative personalization settings screen that may be provided by a program guide in accordance with the present invention.

Detailed Description of the Preferred Embodiments

An illustrative interactive television system 10 in accordance with the present invention is shown in FIG. 1. Television programming and digital music may be provided from programming sources 12 to television distribution facilities such as television distribution facility 14 using communications path 16. Programming sources 12 may be any suitable sources of television and music programming, such as television and music production studios, etc.

Television distribution facility 14 may be a cable system headend, a satellite television distribution facility, a television broadcast facility,

or any other suitable facility for distributing television and music programming to users. There are typically numerous television distribution facilities 14 in system 10, but only one is shown in FIG. 1 to avoid overcomplicating the drawings.

Communications path 16 may be a satellite path, a fiber-optic path, a cable path, or any other suitable wired or wireless communications paths or combinations of such paths.

Television distribution facility 14 may be connected to various user equipment devices 18. Such user equipment 18 may, for example, be located in the homes of users. User equipment 18 may include user television equipment 20 or user computer equipment 22.

The user equipment may receive television and music programming and other information from television distribution facility 14 over communications paths such as communications paths 26, 27, and 28. The user equipment may also transmit signals to television distribution facility 14 over paths 26, 27, and 28. Paths 26, 27, and 28 may be cables or other wired connections, free-space connections (e.g., for broadcast or other wireless signals), satellite links, etc.

Program listings source 30 may be used to provide the user with television program schedule information such as scheduled broadcast times, titles, channels, ratings information (e.g., parental ratings and critic's ratings), detailed title descriptions, genre or category information (e.g., sports, news, movies, etc.), information on actors and actresses, running times, etc.

Program listings source 30 may provide program schedule information to television distribution facility 14 over communications path 32 for distribution to the associated user equipment over paths 26, 27, and 28. Communications path 32 may be any suitable communications path such as a satellite communications path or other wireless path, a fiber-optic or other wired communications path, a combination of such paths, etc.

User equipment devices such as user television equipment and personal computers may use the program schedule information to display program listings and information on digital music for the user. An interactive television program guide application or other suitable application may be used to display such information on the user's display.

An on-line program guide may be provided by a server connected to communications network 34 such as server 36. Server 36 may receive program schedule information from program listings source 30 via communications path 38, communications network 34, and communications path 40. Paths 38 and 40 may be satellite paths, fiber-optic paths, wired paths, etc. Communications network 34 may be any suitable communications network, such as the Internet, the public switched telephone network, a packet-based network, etc.

User equipment 18 may access the on-line program guide via communications path 42, which may be any suitable communications path such as a wired path, a cable path, fiber-optic path, satellite path, a combination of such paths, or any other suitable path.

User equipment 18 may also access the on-line program guide via communications path 26, television distribution facility 14, and communications path 44. For example, a cable modem or the like may be used by user equipment 18 to communicate with television distribution facility 14. Television distribution facility 14 may communicate with communications network 34 over any suitable path 44, such as a wired path, a cable path, fiber-optic path, satellite path, a combination of such paths, etc.

User equipment such as user television equipment 20 and user computer equipment 22 may access the on-line program guide using similar arrangements. User television equipment 20 may access the on-line program guide using communications path 46 or using path 27, television distribution facility 14, and path 44. User computer equipment 22 may access the on-line program guide using communications path 48 or using path 28, television distribution facility 14, and path 44. Paths 46 and 48 may be any suitable paths, such as wired paths, cable paths, fiber-optic paths, satellite paths, a combination of such paths, etc.

Interactive television applications other than program guide applications may use service providers such as service provider 50. For example, a home shopping service may be supported by a service provider such as service provider 50 that has sales representatives, order fulfillment facilities, account maintenance facilities, and other equipment for supporting interactive home shopping features. A home shopping application that is implemented using the user equipment may be used to access the service provider to

provide these features to the user. The user equipment may access service provider 50 via television distribution facility 14 and communications path 52 or via communications network 34 and communications path 54. Communications paths such as paths 52 and 54 may be any suitable paths, such as wired paths, cable paths, fiber-optic paths, satellite paths, a combination of such paths, etc.

Another example of an interactive television application is a home banking application. A home banking service may be supported using personnel at facilities such as service provider 50. An interactive home banking application that is implemented using the user equipment may access the home banking service via television distribution facility 14 and communications path 52 or via communications network 34 and communications path 54.

If desired, an interactive television application such as a video-on-demand application may be supported using server 56. Videos may be stored on server 56 and provided to the user equipment when requested by users.

If desired, applications such as the interactive television program guide application, a home shopping application, a home banking application, a video-on-demand application, and other applications (e.g., applications related to e-mail and chat or other communications functions, etc.) may be provided as separate applications that are accessed through a navigation shell application (i.e., a menu application with menu options corresponding to the applications). The features of such applications may be combined. For

example, video-on-demand, home shopping, and communications functions may be incorporated into the program guide.

Moreover, the interactive television program guide application, the home banking application, and the home shopping application, the video-on-demand application, the communications application, and the navigation shell application, are only a few illustrative examples of the types of interactive television applications that may be supported by system 10. Other suitable applications that may be supported include, news services, Internet services, interactive wagering services (e.g., for wagering on horse races and the like), communications services (e.g., e-mail, chat, etc.), and any other suitable interactive applications.

These applications may be implemented locally on the user equipment. The applications may also be implemented using a client-server architecture in which the user equipment serves as a client processor and a server such as server 56 at television distribution facility 14 or other suitable location acts as a server processor. Other distributed architectures may also be used if desired. Regardless of the particular arrangement used to implement interactive television features related to program guides, home shopping, home banking, video-on-demand, Internet, communications, etc., the software that supports these features may be referred to as an application.

As the user interacts with the application and as the user watches television on the user equipment, information may be gathered on the user's

activities. For example, information may be gathered regarding which television channels the user tunes to and the times at which the user watches each television channel. Because the programs that are being aired at any given time may be determined from program schedule data, gathering information on the television channels that the user tunes to and the times at which these channels are tuned to allows the viewing habits of the user to be monitored. Information may also be gathered on which selectable on-screen interactive television application options the user selects when interacting with interactive television applications. This may reveal, for example, information on the advertisements that the user responds to, information on the user's favorite genres of television programming, information on other user interests (e.g., sports, news, etc.).

The information that is collected on the user's activities may be reported back to a suitable data collection facility for processing. For example, the information may be collected at user equipment 18 and reported back to computer equipment at data collection facility 13 via communications path 26, television distribution facility 14, and communications path 15 or via communications path 42, communications network 34 (e.g., the Internet), and communications path 17. Communications paths 15 and 17 may be fiber-optic paths, cable or other wired paths, wireless paths, or any other suitable communications paths.

If desired, the data collection facility may be located at television distribution facility 14. Data may, for example, be collected using a server such as server 56. User data may also be collected at a

server connected to the Internet or other communications network. For example, information on the user's activities may be collected using a server such as server 36. These examples are merely illustrative. User information may be collected using any suitable facility.

Moreover, user information may be collected regardless of the type of architecture used to provide television programming and interactive television services to the user. For example, if a client-server arrangement is used to provide program guide services to the user, information that has been gathered on the user at the server may be provided to the data collection facility using a communications path between the server and the data collection facility. Such a path may, for example, involve a communications network such as communications network 34.

Illustrative user television equipment 20 that is based on a set-top box arrangement is shown in FIG. 2. Input/output 60 may be connected to communications paths such as paths 27 and 46. Television programming and other information may be received using input/output 58. Commands and requests and other information from the user may also be transmitted over input/output 58.

Set-top box 60 may be any suitable analog or digital set-top box. Set-top box 60 may contain an analog tuner for tuning to a desired analog television channel. Set-top box 60 may also contain digital decoding circuitry for receiving digital television and music channels. Both analog and digital channels may be handled together if desired. Set-top box 60 also

contains a processor (e.g., a microcontroller or microprocessor or the like) that is used to execute software applications. Set-top box 60 may contain memory such as random-access memory for use when executing applications. Nonvolatile memory may also be used (e.g., to launch a boot-up routine and other instructions). Hard disk storage may be used to back up data and to otherwise support larger databases than may be supported using random-access memory approaches.

Set-top box 60 may have infrared (IR) or other communications circuitry for communicating with a remote control. Set-top box 60 may also have dedicated buttons and a front-panel display. The front-panel display may, for example, be used to display the current channel to which the set-top box is tuned.

Set-top box 60 may also have communications circuitry such as a cable modem for cable communications over a cable, an integrated services digital network (ISDN) modem for ISDN communications, a digital subscriber line (DSL) modem for DSL communications, a telephone modem for communications over telephone lines, paging communications circuitry for paging communications (e.g., wireless radio-frequency transmissions using paging frequencies), cellular telephone communications circuitry (e.g., for digital cellular telephone data communications), and other equipment for communications using other approaches. Such communications may involve the Internet or any other suitable communications networks or paths.

A videocassette recorder 62 or other suitable recording device may be connected to set-top box 60.

This allows videos from set-top box 60 to be recorded. For example, if set-top box 60 is tuned to a given television channel, the video signal for that television channel may be passed to videocassette recorder 62 for recording on a videocassette. If desired, videocassette recorder functions such as start, stop, record, etc. may be controlled by set-top box 60. For example, set-top box 60 may control videocassette recorder 62 using infrared commands directed toward the remote control inputs of videocassette recorder 62.

The output of videocassette recorder 62 may be provided to television 64 for display to the user. If videocassette recorder 62 is not being used, the video signals from set-top box 58 may be provided directly to television 64. If desired, any suitable monitor may be used to display the video.

Another illustrative arrangement for user television equipment 20 is shown in FIG. 3. In the example of FIG. 3, user television equipment 20 includes a digital video recorder 66 (e.g., a personal video recorder (PVR)) and a television 68. Input/output 70 may be connected to communications paths such as paths 27 and 46. Television programming and other information may be received using input/output 70. Commands and requests and other information from the user may be transmitted over input/output 70.

Digital video recorder 66 may be similar to a standard set-top box, except that a hard disk or other suitable storage medium may be used for video storage

in lieu of videocassettes. The hard disk may be internal to digital video recorder 66.

Digital video recorder 66 may contain an analog tuner for tuning to a desired analog television channel. Digital video recorder 66 may also contain digital decoding circuitry for receiving digital television and music channels. If desired, digital video recorder 66 may contain circuitry for handling both analog and digital channels. Digital video recorder 66 also contains a processor (e.g., a microcontroller or microprocessor or the like) that is used to execute software applications. Digital video recorder 66 may contain memory such as random-access memory for use when executing applications. Nonvolatile memory may also be used to store a boot-up routine or other instructions. The hard disk and other storage in digital video recorder 66 may be used to support databases (e.g., program guide databases or interactive television application databases).

Digital video recorder 66 may have IR communications circuitry or other suitable communications circuitry for communicating with a remote control. Digital video recorder 66 may also have dedicated buttons and a front-panel display. The front-panel display may, for example, be used to display the current channel to which the digital video recorder is tuned.

Digital video recorder 66 may also have communications circuitry such as a cable modem, an integrated services digital network (ISDN) modem, a digital subscriber line (DSL) modem, a telephone modem, etc. for communications with other equipment. Such

communications may involve the Internet or any other suitable communications networks or paths.

If desired, digital video recorder 66 of FIG. 3 or set-top box 60 of FIG. 2 may be a satellite receiver or other equipment that has wireless communications circuitry for receiving satellite signals.

Television programming may be recorded on the hard disk of digital video recorder 66. Digital video recorder 66 may record new video while previously recorded video is being played back on television 68. This allows users to press a pause button during normal television viewing. When the pause button is pressed, the current television program is stored on the hard disk of digital video recorder 66. When the user presses play, the recorded video may be played back. This arrangement allows the user to seamlessly pause and resume television viewing.

The set-top box arrangement of FIG. 2 and the digital video recorder set-top box arrangement of FIG. 3 are merely illustrative. Other arrangements may be used if desired. For example, user television equipment may be based on a WebTV box, a personal computer television (PC/TV), or any other suitable television equipment arrangement. If desired, the functions of components such as set-top box 60, digital video recorder 66, a WebTV box, or PC/TV or the like may be integrated into a televison or personal computer or other suitable device.

An illustrative remote control 72 for operating user television equipment 20 is shown in FIG. 4. Remote control 72 may have keys 74 such as channel

up and down keys, a power on/off key, numeric keys, a favorites key (e.g., for setting favorites in a program guide application or other interactive television application), an info key (for requesting that additional information on a selection be displayed), etc. Arrow keys 76 may be used to position an on-screen cursor or highlight region on options of interest. Highlighted options may be selected using OK key 78. Menu key 80 may be used to direct an interactive television application (e.g., a program guide application, a nav shell application, or any other suitable application) to display a menu of available options.

Help key 82 may be used to invoke help functions such as context-sensitive on-screen help, etc.

Illustrative user computer equipment 22 is shown in FIG. 5. In the arrangement of FIG. 5, personal computer 84 may be controlled by the user using keyboard 86 or other suitable user input device, such as a trackball, mouse, touch pad, touch screen, voice recognition system, etc. Television programming and interactive television application content may be displayed on monitor 88. Television programming and other information may be received from paths 28 and 48 (FIG. 1) using input/output 90. The user may also send commands and other information to remote services over input/output line 90.

Personal computer unit 84 may contain a television tuner card for decoding analog and digital television channels. The television tuner card may contain an analog tuner for tuning to a given analog

channel and digital decoding circuitry for filtering out a desired digital television or music channel from a packetized digital data stream.

The user computer equipment arrangement of FIG. 5 is merely illustrative. Any suitable computer equipment arrangement may be used if desired.

Moreover, the user television equipment and user computer equipment arrangements described above are merely illustrative. A more generalized embodiment of illustrative user equipment is shown in FIG. 6.

As shown in FIG. 6, control circuitry 92 is connected to input/output 94. Input/output 94 may be connected to communications paths such as paths 26, 27, 28, 42, 46, and 48 of FIG. 1. Television and music programming may be received via input/output 94 (e.g., from programming sources 12 and television distribution facility 14). Program scheduled information for an interactive television program guide may also be received via input/output 94. Input/output 94 may also be used to receive information for other interactive television applications. The user may use control circuitry 92 to send commands, requests, and other suitable information using input/output 94.

Information that is collected locally on the user such as information on the user's television viewing habits and information on the user's interactions with interactive television applications such as an interactive television program guide application may be sent to a data collection facility via input/output 94. Any suitable technique may be used to transmit the information that is collected about the user. For example, information may be

transmitted using a cable return path in a cable system, using fiber-optic links, using a dial up modem connection (e.g., over a telephone link, a DSL or ISDN link, etc.), using a wireless link (e.g., using a cellular or paging frequency), using combinations of such paths, etc. Information that is collected at a server (e.g., a server used to support a client-server program guide) may be passed from the server to the data collection facility using paths such as these or any other suitable paths.

Control circuitry 94 may be based on any suitable processor such as a microprocessor, microcontroller, etc. Memory or other suitable storage devices may be provided as part of control circuitry 94. Tuning circuitry such as an analog tuner, an MPEG-2 decoder or other digital tuning circuitry, or any other suitable tuning circuits or combinations of such circuits may also be included as part of circuitry 92. The tuning circuitry may be used to tune the user equipment to a particular television or music channel. The state of the tuning circuitry may be monitored by an interactive television application such as an interactive television program guide or may be monitored by a monitoring application, or by monitoring functions embedded in any other suitable application. Monitoring may also involved gathering information on the time of day, whether the user equipment is on or off, the status of various button presses, or any other function or hardware state of the user equipment. The information that is monitored may be stored in storage in control circuitry 92 (e.g., on a hard disk or on random-access memory, etc.).

Television programming and on-screen options and information may be displayed on display 100. Display 100 may be a monitor, a television, or any other suitable equipment for displaying visual images. Speakers 102 may be provided as part of a television or may be stand-alone units. Digital music and the audio component of videos displayed on display 100 may be played through speakers 102.

A user may control the control circuitry using user input interface 96. The user input interface may be any suitable user interface, such as a mouse, trackball, keypad, keyboard, touch screen, touch pad, or any other suitable user input interface. A microphone 98 and video camera 104 may be used to supply audio and video information to control circuitry 92.

A user of user equipment 18 (e.g., a user of user television equipment or a user of user computer equipment, or a user of any other suitable user equipment device) may invoke an interactive television menu by pressing menu button 80 (FIG. 4). An illustrative interactive television navigation shell or menu 106 is shown in FIG. 7. Remote control 72 (FIG. 4) may be used to position highlight region 108 on top of options 110, 112, 114, 116, 118, and 120. If the user selects option 110, a screen of program listings may be displayed. Option 112 may be used to invoke a home shopping application. Option 114 may be selected to display options related to video-on-demand services. If the user selects option 116, the user may be presented with an opportunity to access home banking functions. Selecting Internet option 118 may launch a

web browser or the like. Option 120 may be used to access a settings screen that allows the user to adjust various settings. If desired, the user may use such a menu option to access a program guide settings screen with which the user may adjust program guide settings.

An illustrative program guide screen 122 that may be displayed for the user is shown in FIG. 8. Program guide screen 122 may be displayed, for example, when the user selects program listings option 108 of FIG. 7 or when the user selects a suitable option from within an interactive television program guide application. Program guide screen 122 may contain a grid or list of program listings 124. Program listings 124 may include program titles, channels, scheduled broadcast times, and any other suitable program schedule information. Advertisements may be displayed if desired.

A highlight region such as highlight region 126 may be used to select a desired program listing. If the user presses an OK key when a program listing for a current program is highlighted, the program guide may tune to the channel for that program. If the user presses an OK key when a program listing for a future program is highlighted, the program guide may provide the user with an opportunity to set a reminder for that program. Other functions that the program guide may provide include the ability to set favorite channels and establish other preferences and settings. For example, the user may select a particular channel for the program guide to automatically tune to when the user equipment is powered on. The user may also select favorite programs, favorite channels, etc. The program

guide may provide the user with the ability to establish parental control settings, the ability to search for programming of interest, and the ability to view program descriptions, advertisements, text, graphics, and video, etc. The use of any of these functions by the user may be monitored. Moreover, these are merely illustrative examples of program guide functions that may be provided by an interactive television program application. Any other suitable program guide functions may be provided if desired. The program guide may be invoked from an option such as option 110 of FIG. 7, by pressing a dedicated guide button on a remote control, by selecting any other suitable button or on-screen option, etc.

The user's response to any interactive content in the interactive program guide may be monitored. For example, the user's response to interactive advertisements that are presented by the program guide may be monitored.

Illustrative steps involved in monitoring the user are shown in FIG. 9. At step 128, the program guide or other application may monitor the user's interactions with the program guide or other interactive television application and may monitor other user activities (e.g., which television programs the user is watching, etc.). The television program guide or other interactive television application or a monitoring application or the like may be used to collect information on the user's activities. Information on the televison programs that the user is watching may be gathered by comparing information on the channels and times at which the user is watching

television with information on the programs scheduled to be broadcast at those times on those channels. This comparison may be performed locally (e.g., at user equipment 18) prior to or during monitoring or may be performed remotely (e.g., a the data collection facility after monitoring or at a server or other computer during monitoring). These are merely illustrative examples. Any suitable monitoring techniques may be used if desired. The information that is collected on the television viewing habits of the user and the user's interactions with the interactive program guide or other interactive television application may be gathered using the interactive television program guide or other interactive television application or may be gathered using a monitoring application or any other suitable application.

At step 130, the program guide or other application may automatically transmit the collected user information to the data collection facility (e.g., a data collection facility such as data collection facility 13 of FIG. 1). The user data may be transmitted using an e-mail protocol such as the standard Post Office Protocol (POP) or Simple Mail Transport Protocol (SMPT). The program guide or interactive television application or other monitoring application or the like may access e-mail communications functions such as these through an existing e-mail application or other application or the like that is installed on user equipment 18. Accordingly, with an e-mail transport arrangement a proprietary communications protocol need not be