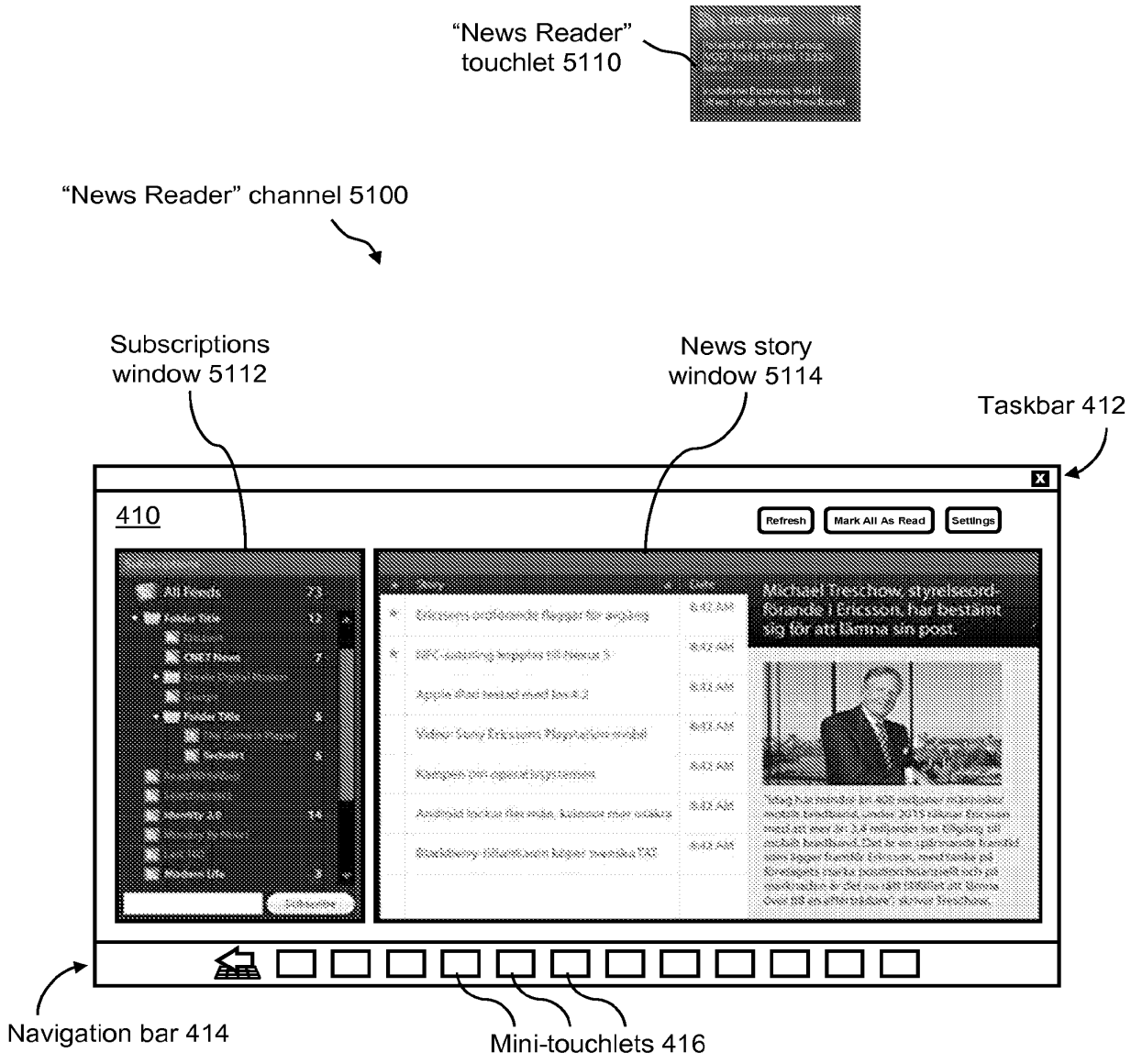
"News Reader" touchlet 5110
"News Reader" channel 5100
Subscriptions window 5112
News story window 5114
Taskbar 412
410
Refresh
Mark All As Read
Settings
Navigation bar 414
Mini-touchlets 416

FIG. 51

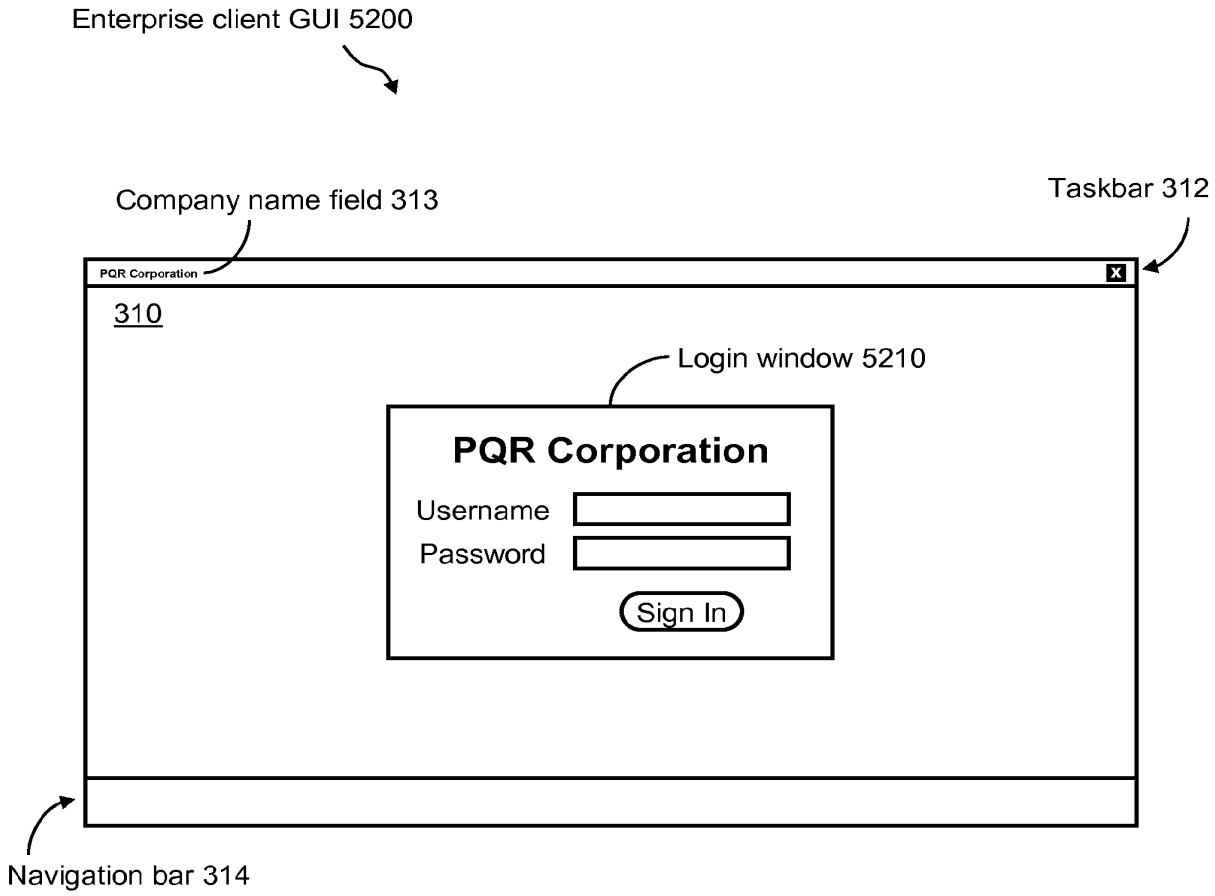
Enterprise client GUI 5200
Company name field 313
Taskbar 312
PQR Corporation
310
Login window 5210
PQR Corporation
Username
Password
Sign In
Navigation bar 314

FIG. 52

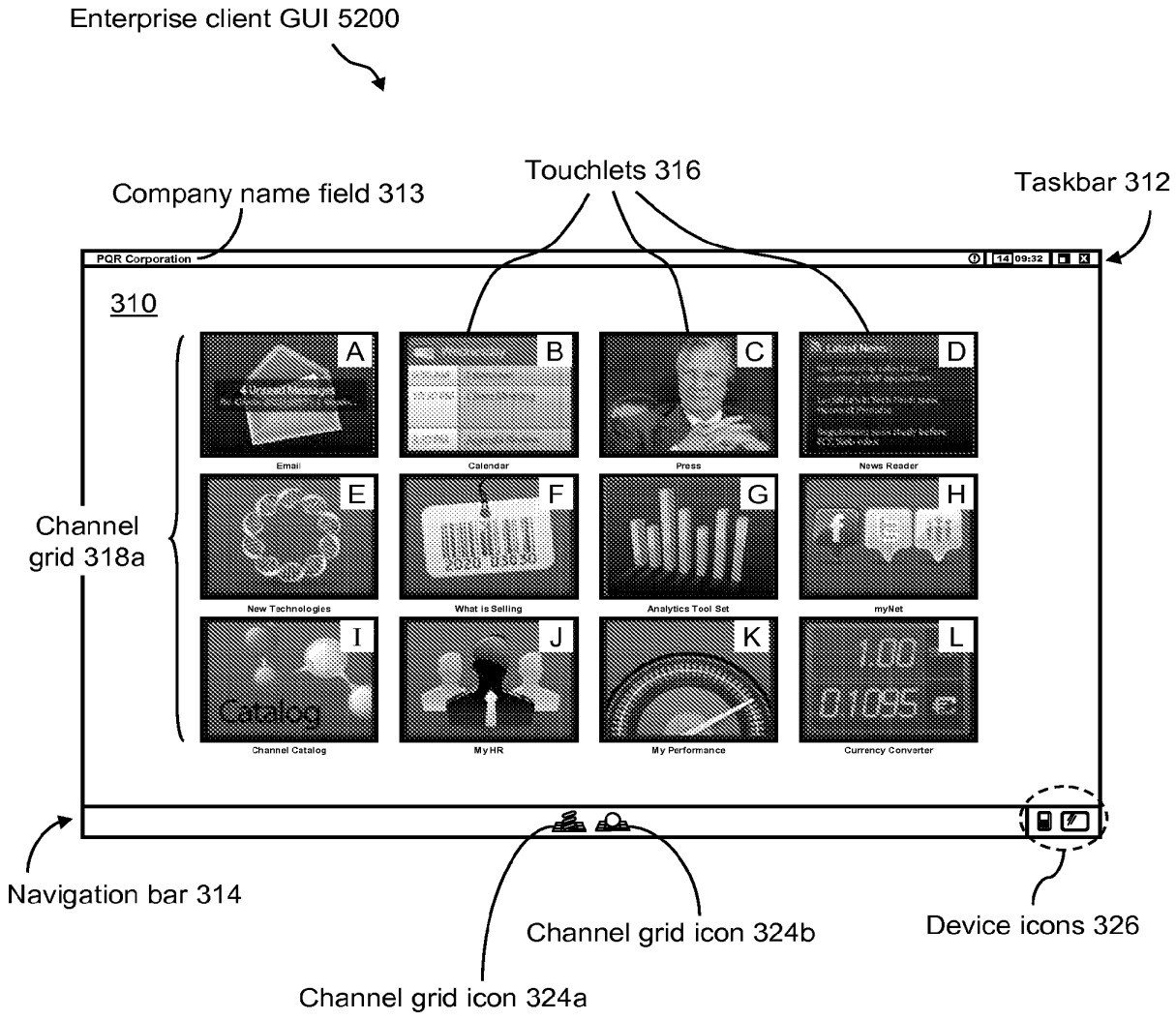
Enterprise client GUI 5200
Company name field 313
Touchlets 316
Taskbar 312
PQR Corporation
14 09:32
310
A
B
C
D
Email
Calendar
Press
News Reader
E
F
G
H
New Technologies
What is Selling
Analytics Tool Set
myNet
I
J
K
L
Catalog
Channel Catalog
MyHR
My Performance
Currency Converter
Channel grid 318a
Navigation bar 314
Channel grid icon 324b
Channel grid icon 324a
Device icons 326

FIG. 53

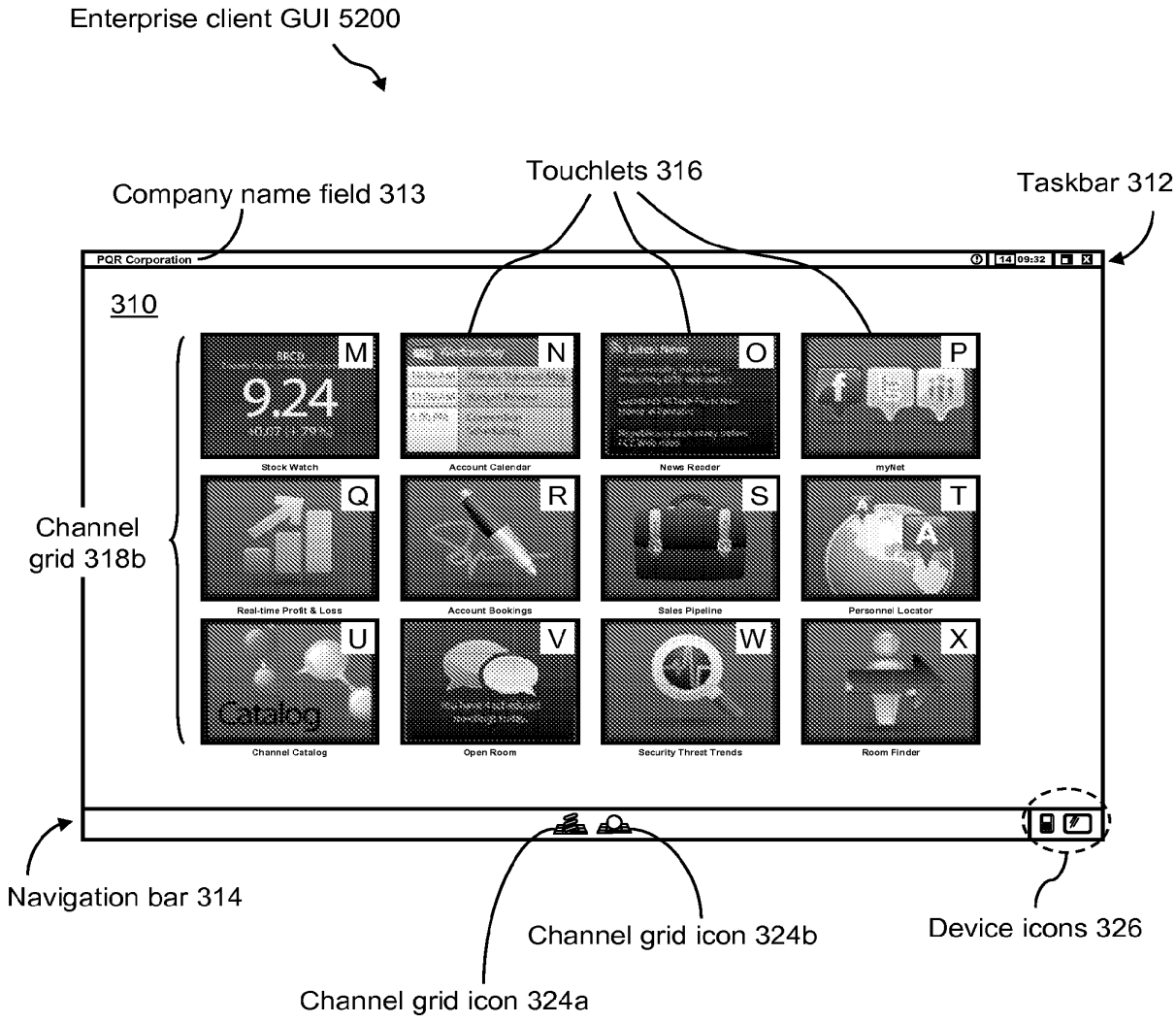
Enterprise client GUI 5200
Company name field 313
Touchlets 316
Taskbar 312
PQR Corporation
14 09:32
310
M
N
O
P
Stock Watch
Account Calendar
News Reader
myNet
Q
R
S
T
Real-time Profit & Loss
Account Bookings
Sales Pipeline
Personnel Locator
U
V
W
X
Catalog
Channel Catalog
Open Room
Security Threat Trends
Room Finder
Channel grid 318b
Navigation bar 314
Channel grid icon 324b
Channel grid icon 324a
Device icons 326

*FIG. 54*

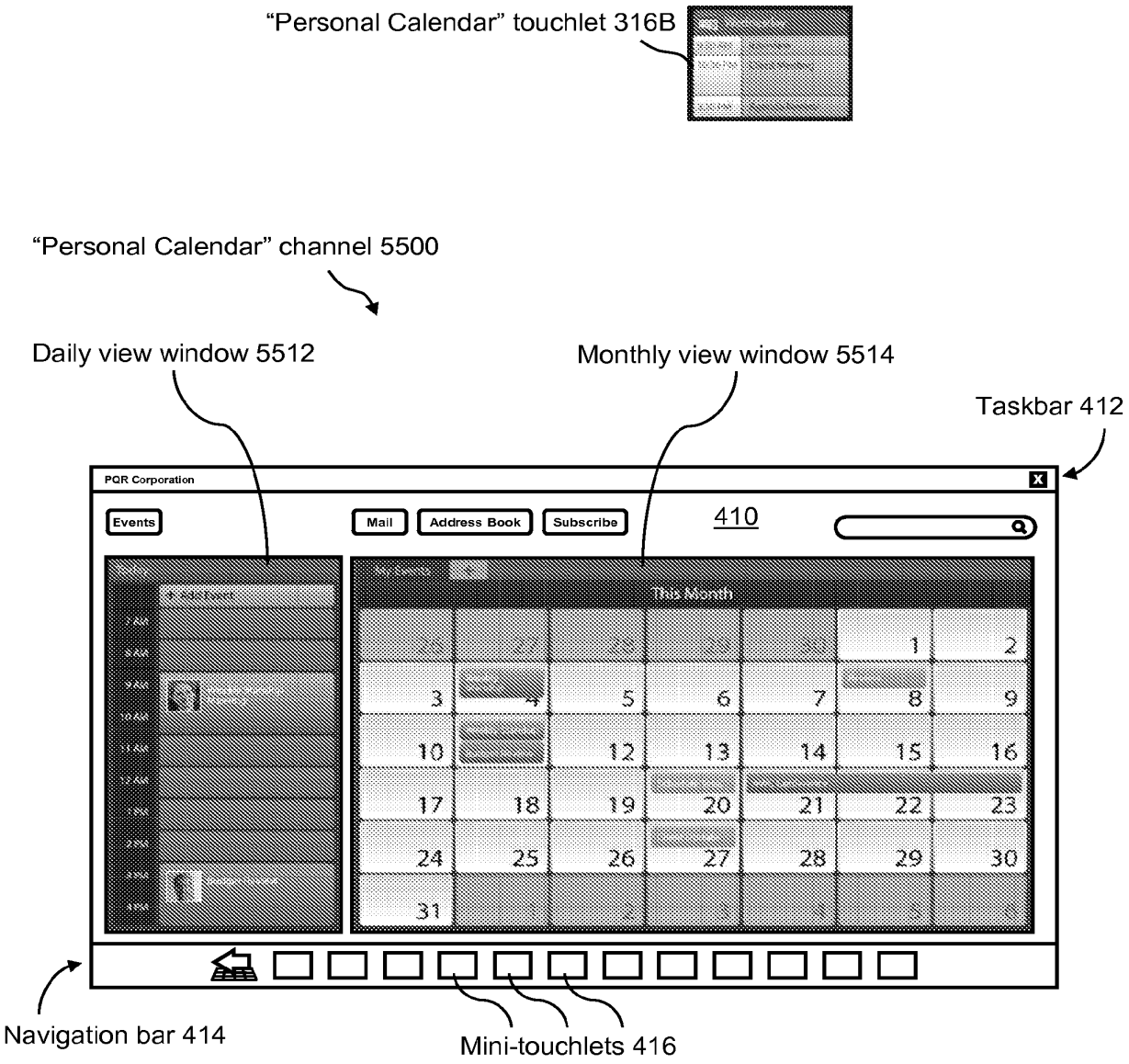
"Personal Calendar" touchlet 316B
"Personal Calendar" channel 5500
Daily view window 5512
Monthly view window 5514
Taskbar 412
PQR Corporation
Events
Mail
Address Book
Subscribe
410
This Month
Navigation bar 414
Mini-touchlets 416

FIG. 55

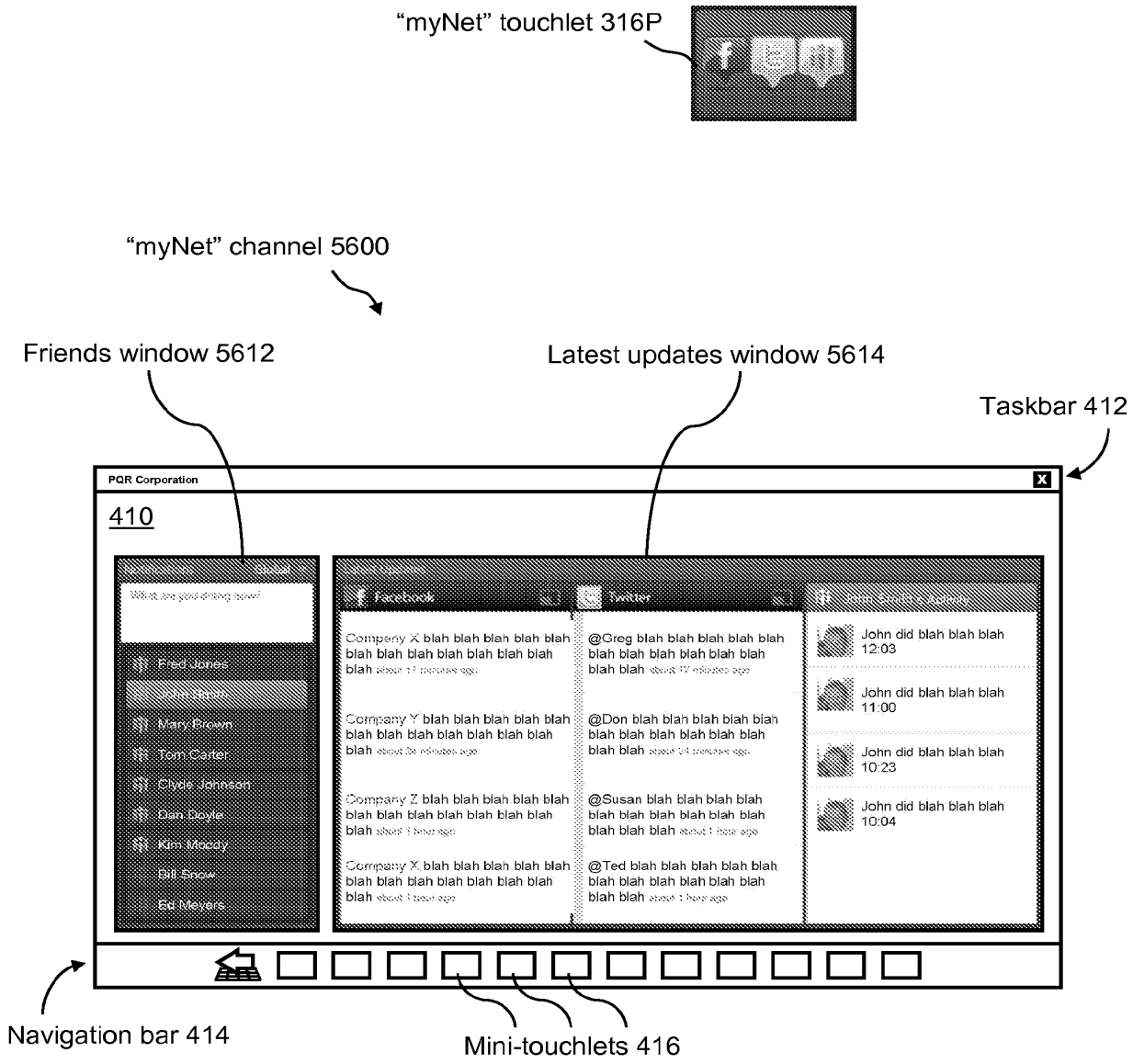
"myNet" touchlet 316P
"myNet" channel 5600
Friends window 5612
Latest updates window 5614
Taskbar 412
PQR Corporation
410
Fred Jones
Mary Brown
Tom Carter
Clyde Johnson
Dan Doyle
Kim Moody
Bill Snow
Ed Meyers
Facebook
Twitter
Company X blah blah blah blah blah blah blah blah blah blah blah blah blah blah
Company Y blah blah blah blah blah blah blah blah blah blah blah blah blah blah
Company Z blah blah blah blah blah blah blah blah blah blah blah blah blah blah
Company X blah blah blah blah blah blah blah blah blah blah blah blah blah blah
@Greg blah blah blah blah blah blah blah blah blah blah blah blah blah blah
@Don blah blah blah blah blah blah blah blah blah blah blah blah blah blah
@Susan blah blah blah blah blah blah blah blah blah blah blah blah blah blah
@Ted blah blah blah blah blah blah blah blah blah blah blah blah blah blah
John did blah blah blah 12:03
John did blah blah blah 11:00
John did blah blah blah 10:23
John did blah blah blah 10:04
Navigation bar 414
Mini-touchlets 416

*FIG. 56*

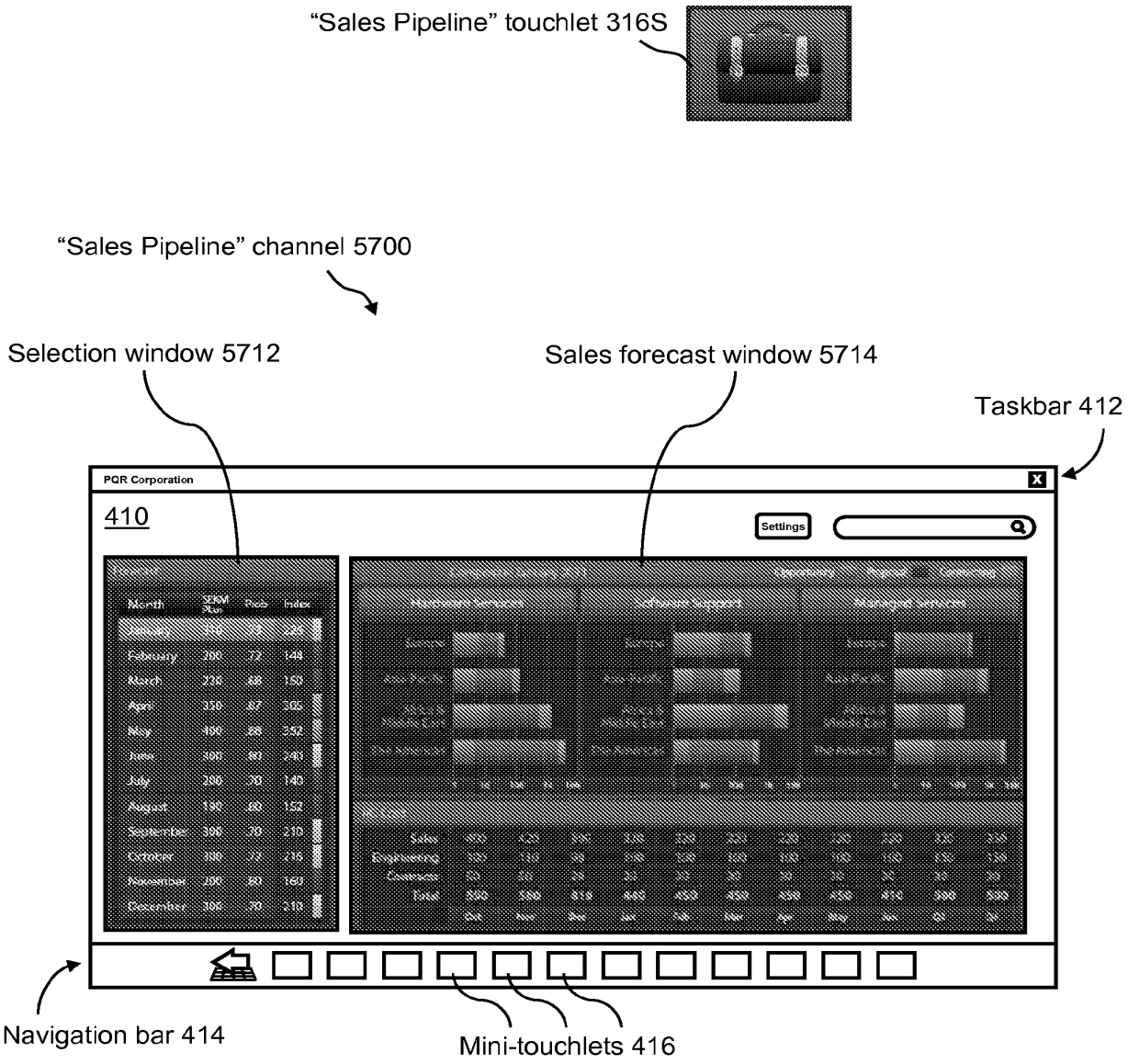
"Sales Pipeline" touchlet 316S
"Sales Pipeline" channel 5700
Selection window 5712
Sales forecast window 5714
Taskbar 412
PQR Corporation
410
Settings
Navigation bar 414
Mini-touchlets 416

FIG. 57

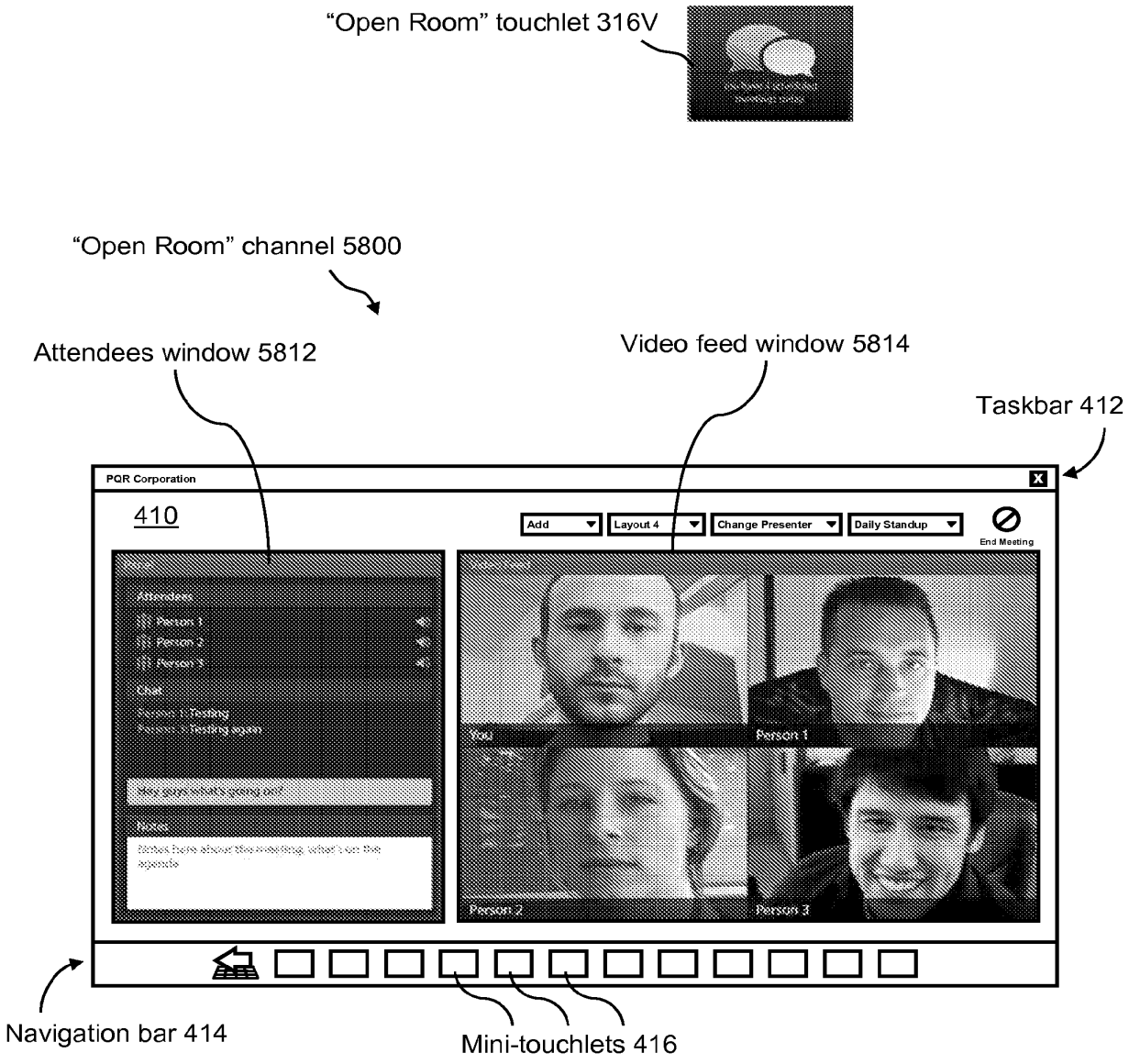
"Open Room" touchlet 316V
"Open Room" channel 5800
Attendees window 5812
Video feed window 5814
Taskbar 412
PQR Corporation
410
Add
Layout 4
Change Presenter
Daily Standup
End Meeting
Attendees
Person 1
Person 2
Person 3
Chat
Hey guys what's going on?
Notes
You
Person 1
Person 2
Person 3
Navigation bar 414
Mini-touchlets 416

FIG. 58

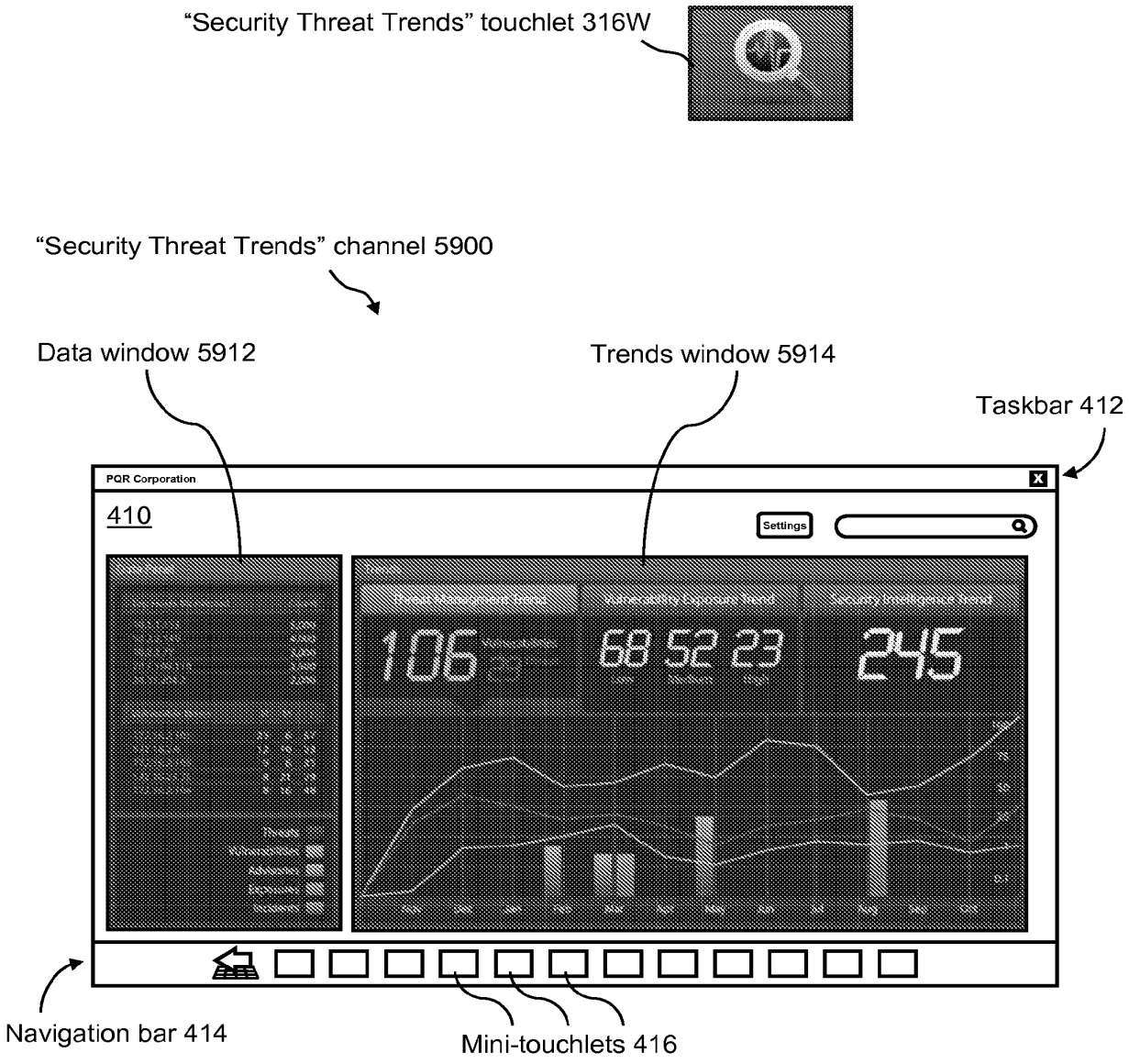
"Security Threat Trends" touchlet 316W
"Security Threat Trends" channel 5900
Data window 5912
Trends window 5914
Taskbar 412
PQR Corporation
410
Settings
106
68 52 23
245
Navigation bar 414
Mini-touchlets 416

FIG. 59

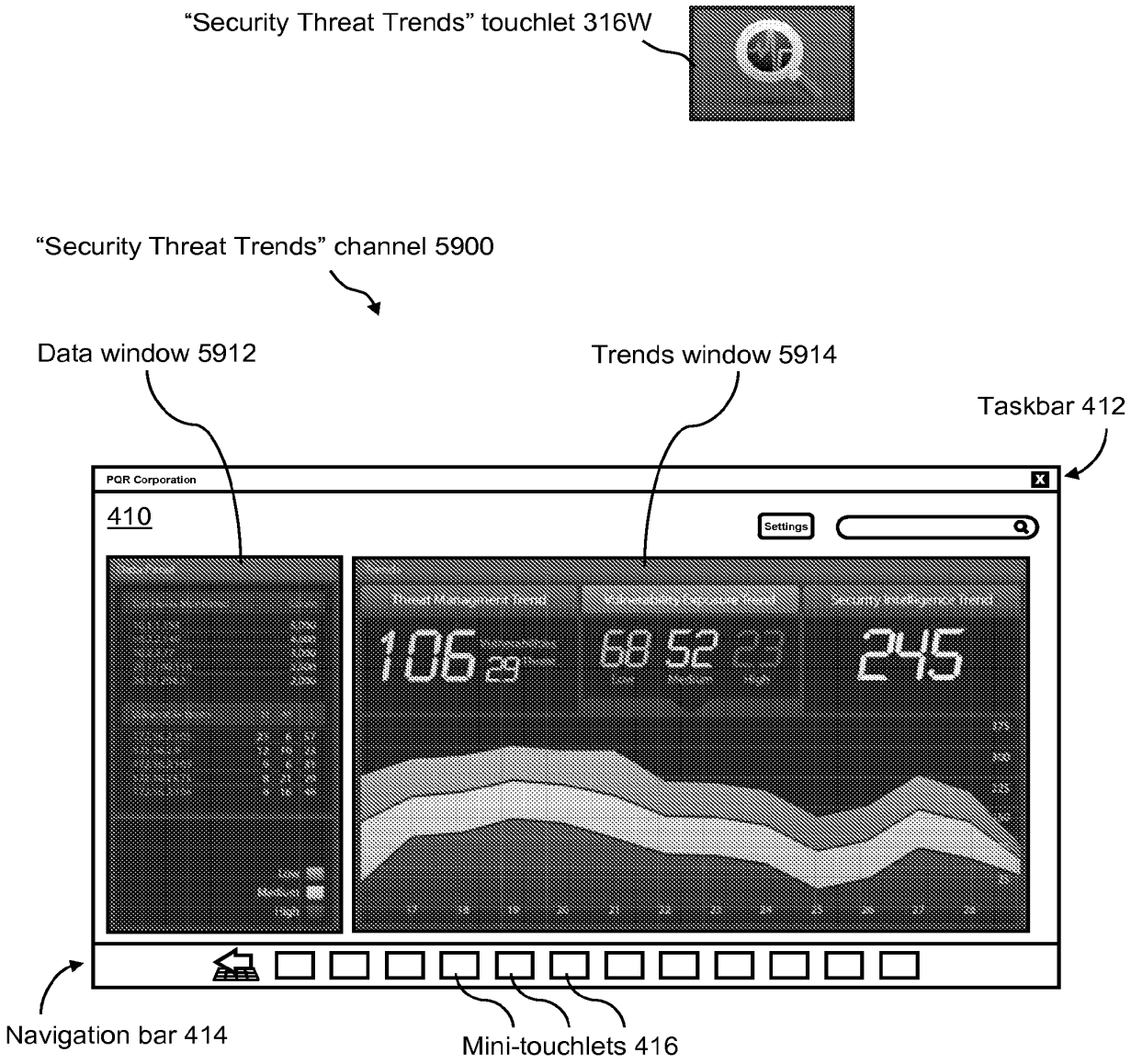
"Security Threat Trends" touchlet 316W
"Security Threat Trends" channel 5900
Data window 5912
Trends window 5914
Taskbar 412
PQR Corporation
410
Settings
106
68 52
245
Navigation bar 414
Mini-touchlets 416

FIG. 60

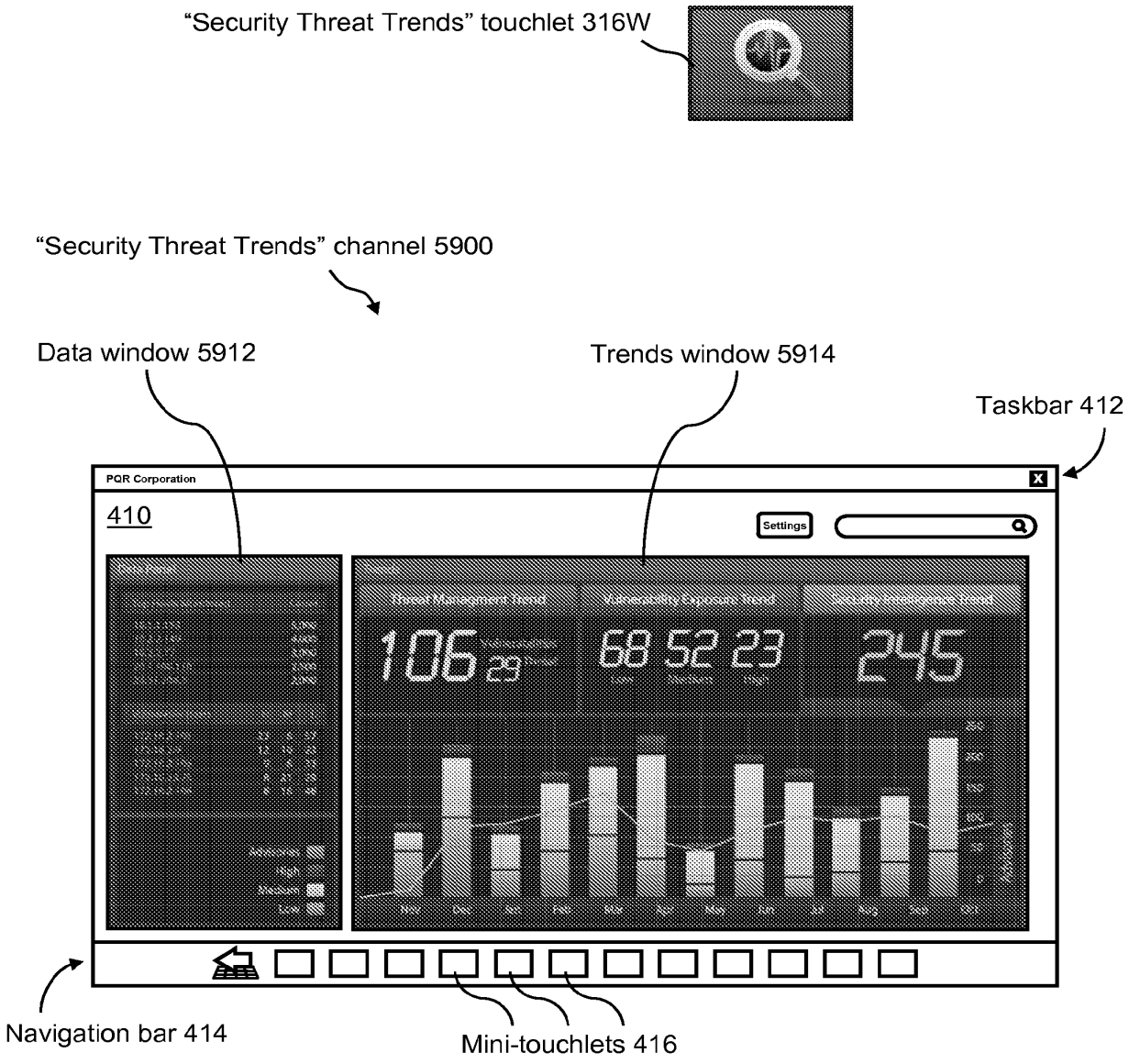
"Security Threat Trends" touchlet 316W
"Security Threat Trends" channel 5900
Data window 5912
Trends window 5914
Taskbar 412
PQR Corporation
410
Settings
106
68 52 23
245
Navigation bar 414
Mini-touchlets 416

FIG. 61

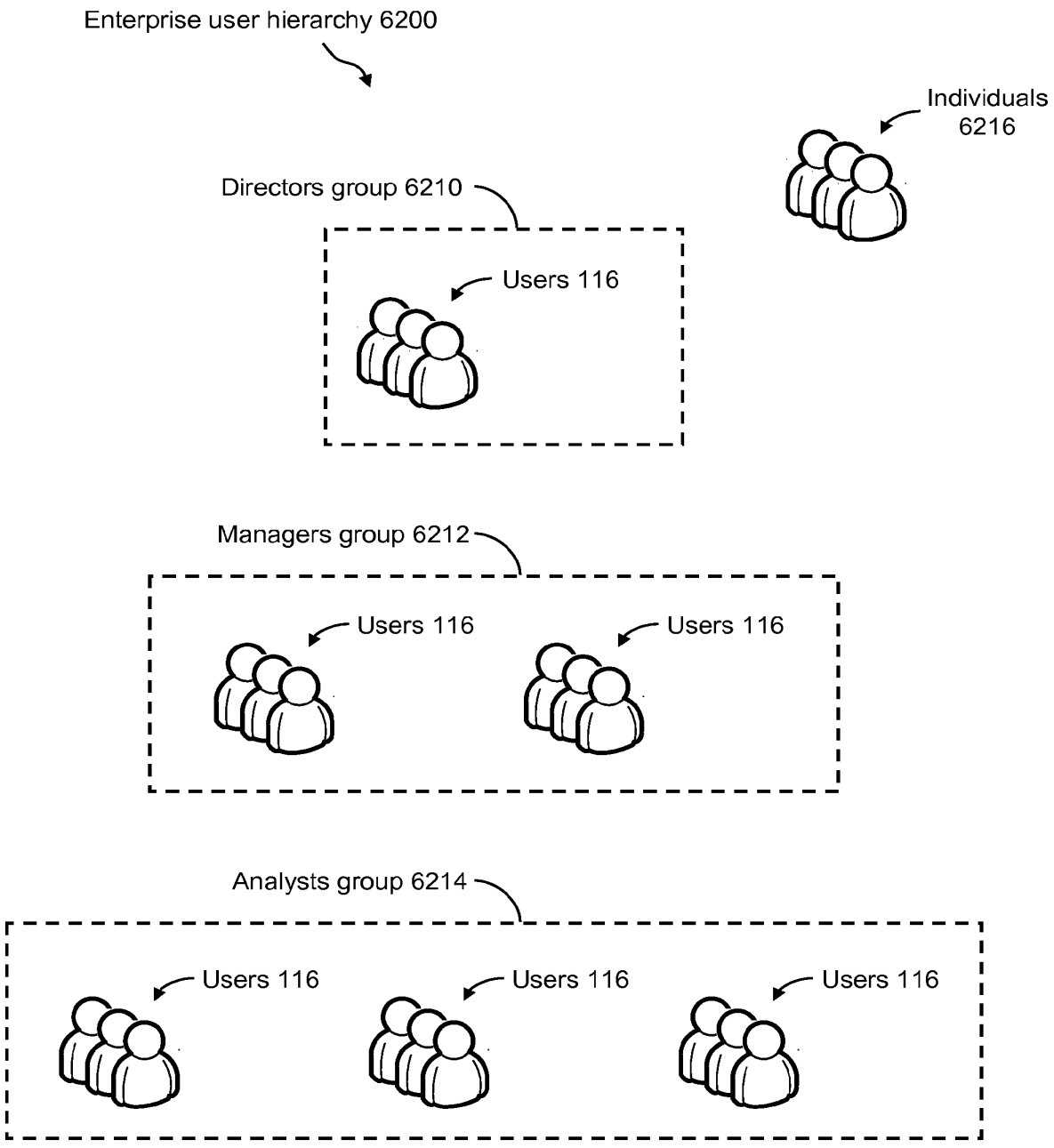
Enterprise user hierarchy 6200
Individuals 6216
Directors group 6210
Users 116
Managers group 6212
Users 116
Users 116
Analysts group 6214
Users 116
Users 116
Users 116

FIG. 62

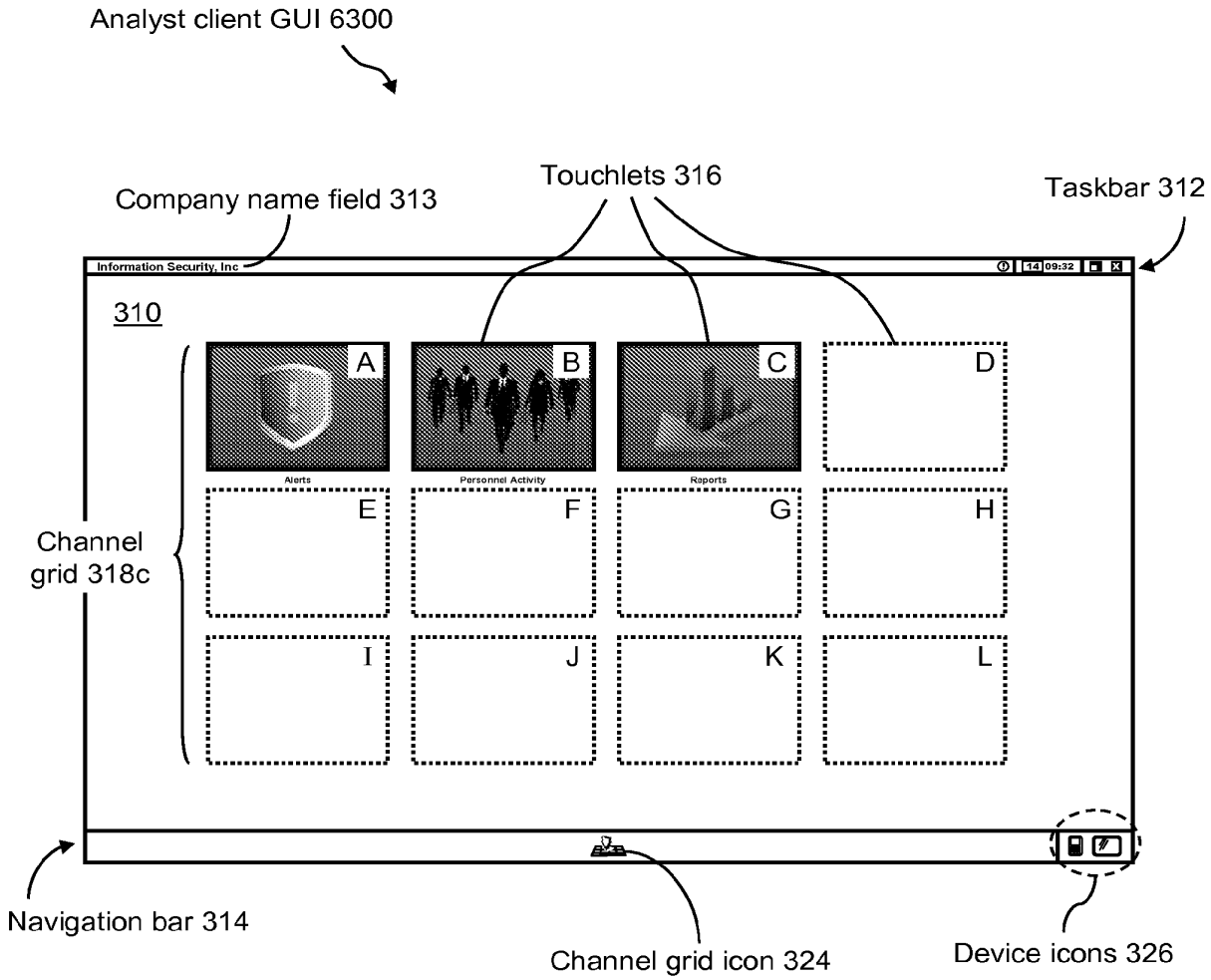
Analyst client GUI 6300
Company name field 313
Touchlets 316
Taskbar 312
Information Security, Inc
14 09:32
310
A
B
C
D
Alerts
Personnel Activity
Reports
E
F
G
H
I
J
K
L
Channel grid 318c
Navigation bar 314
Channel grid icon 324
Device icons 326

FIG. 63

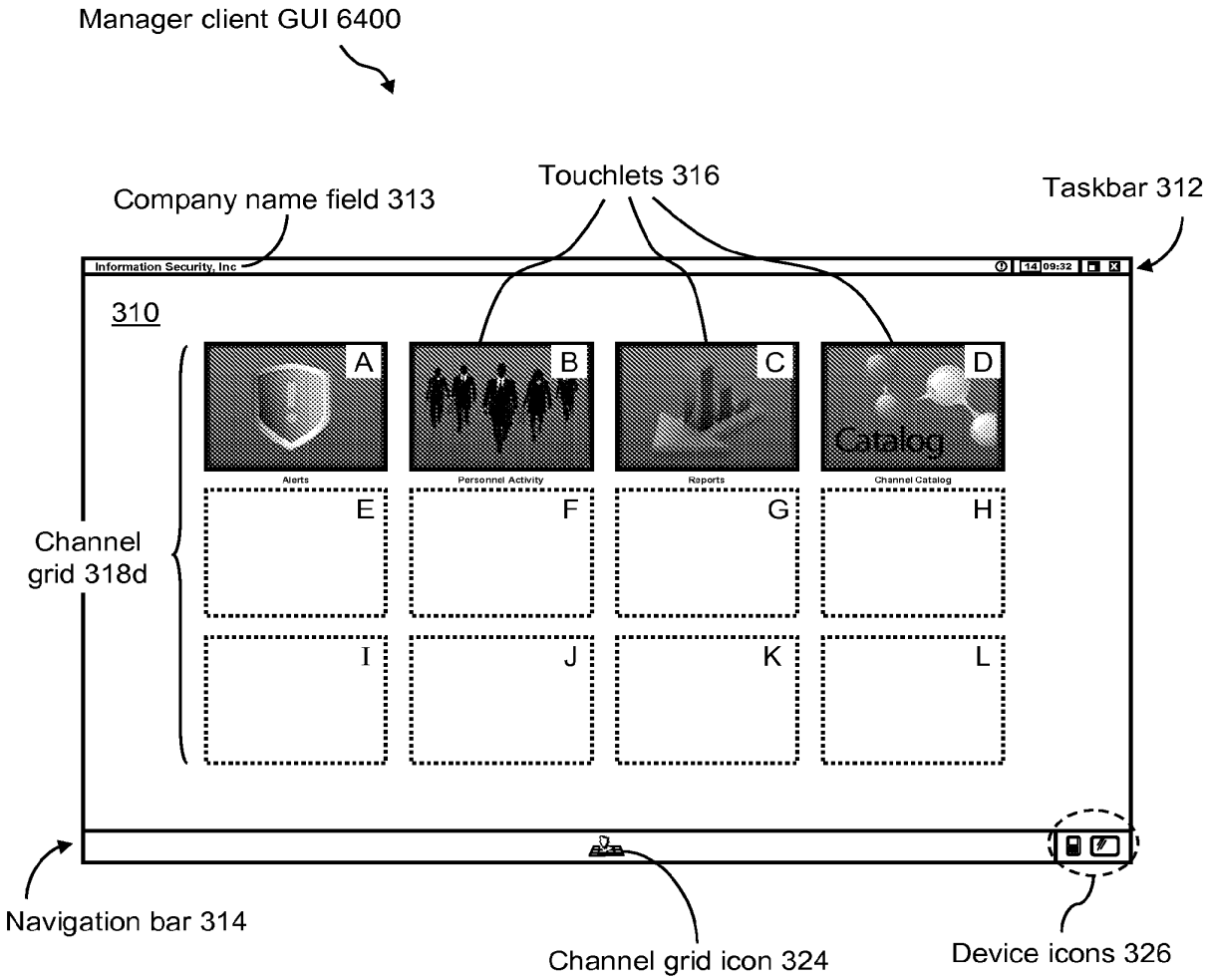
Manager client GUI 6400
Company name field 313
Touchlets 316
Taskbar 312
Information Security, Inc
14 09:32
310
A
B
C
D
Catalog
Alerts
Personnel Activity
Reports
Channel Catalog
E
F
G
H
I
J
K
L
Channel grid 318d
Navigation bar 314
Channel grid icon 324
Device icons 326

FIG. 64

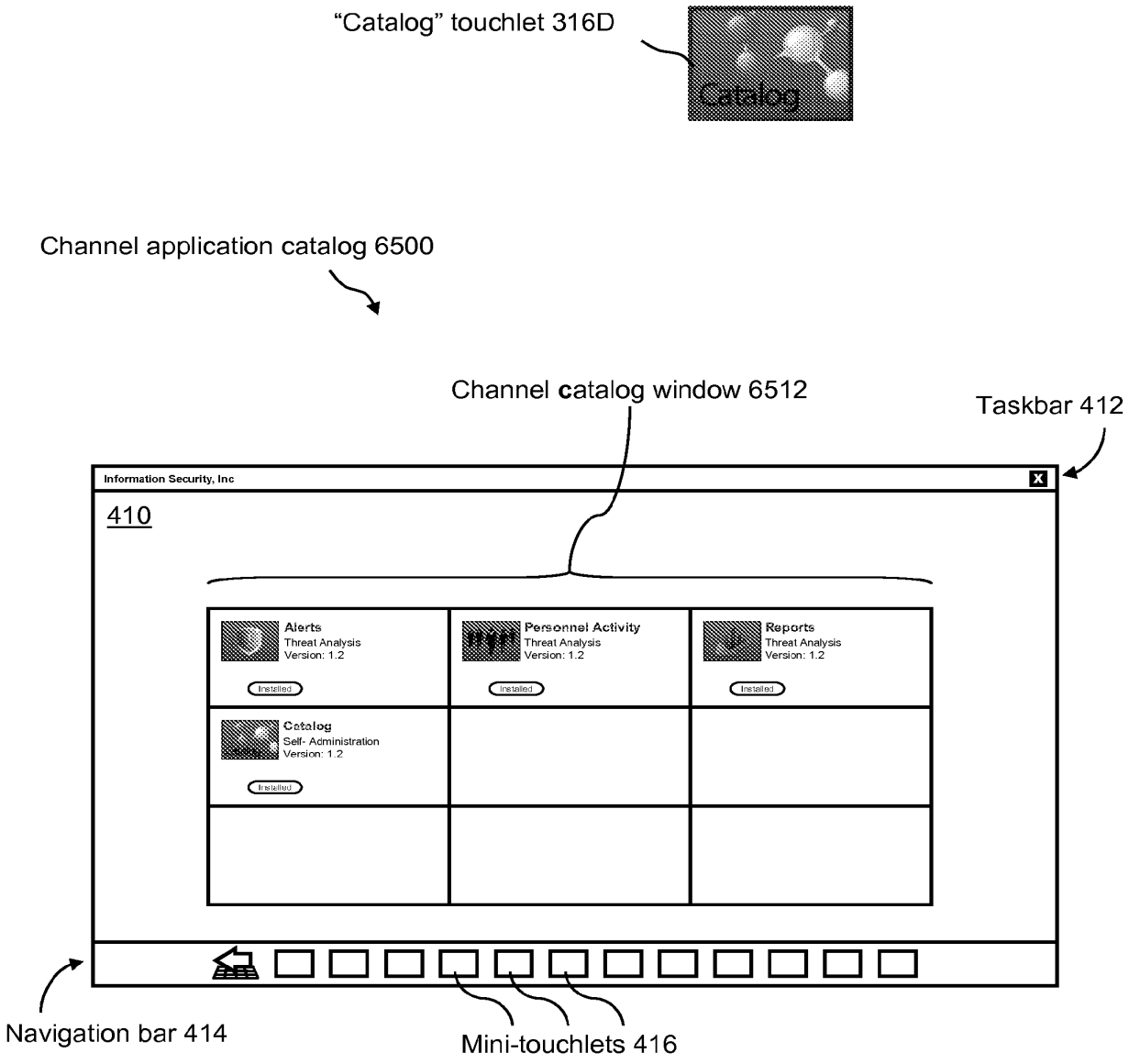
"Catalog" touchlet 316D
Catalog
Channel application catalog 6500
Channel catalog window 6512
Taskbar 412
Information Security, Inc
410
Alerts
Threat Analysis
Version: 1.2
Installed
Personnel Activity
Threat Analysis
Version: 1.2
Installed
Reports
Threat Analysis
Version: 1.2
Installed
Catalog
Self- Administration
Version: 1.2
Installed
Navigation bar 414
Mini-touchlets 416

FIG. 65

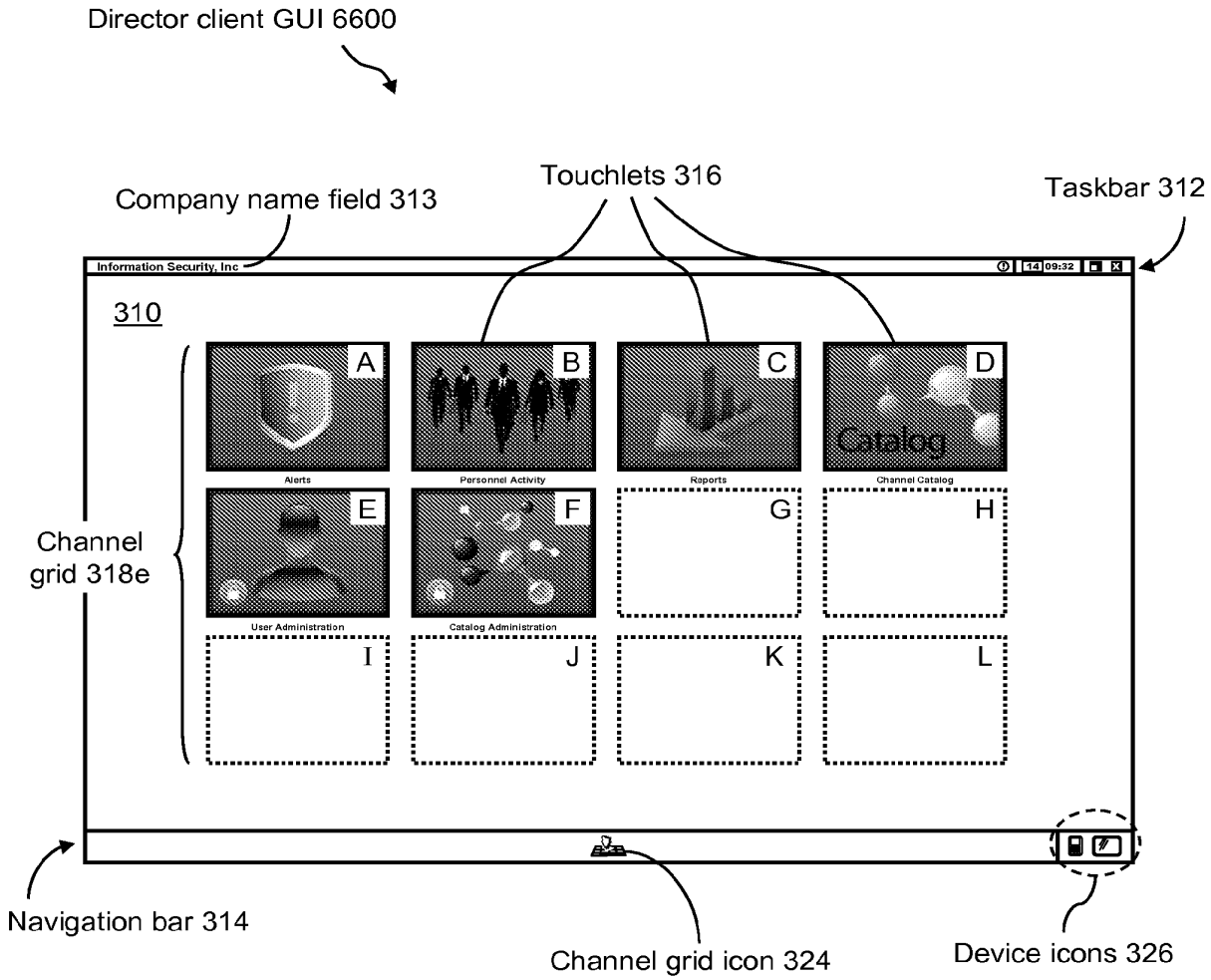
Director client GUI 6600
Company name field 313
Touchlets 316
Taskbar 312
Information Security, Inc
14 09:32
310
A
B
C
D
Catalog
Alerts
Personnel Activity
Reports
Channel Catalog
E
F
G
H
User Administration
Catalog Administration
I
J
K
L
Channel grid 318e
Navigation bar 314
Channel grid icon 324
Device icons 326

FIG. 66

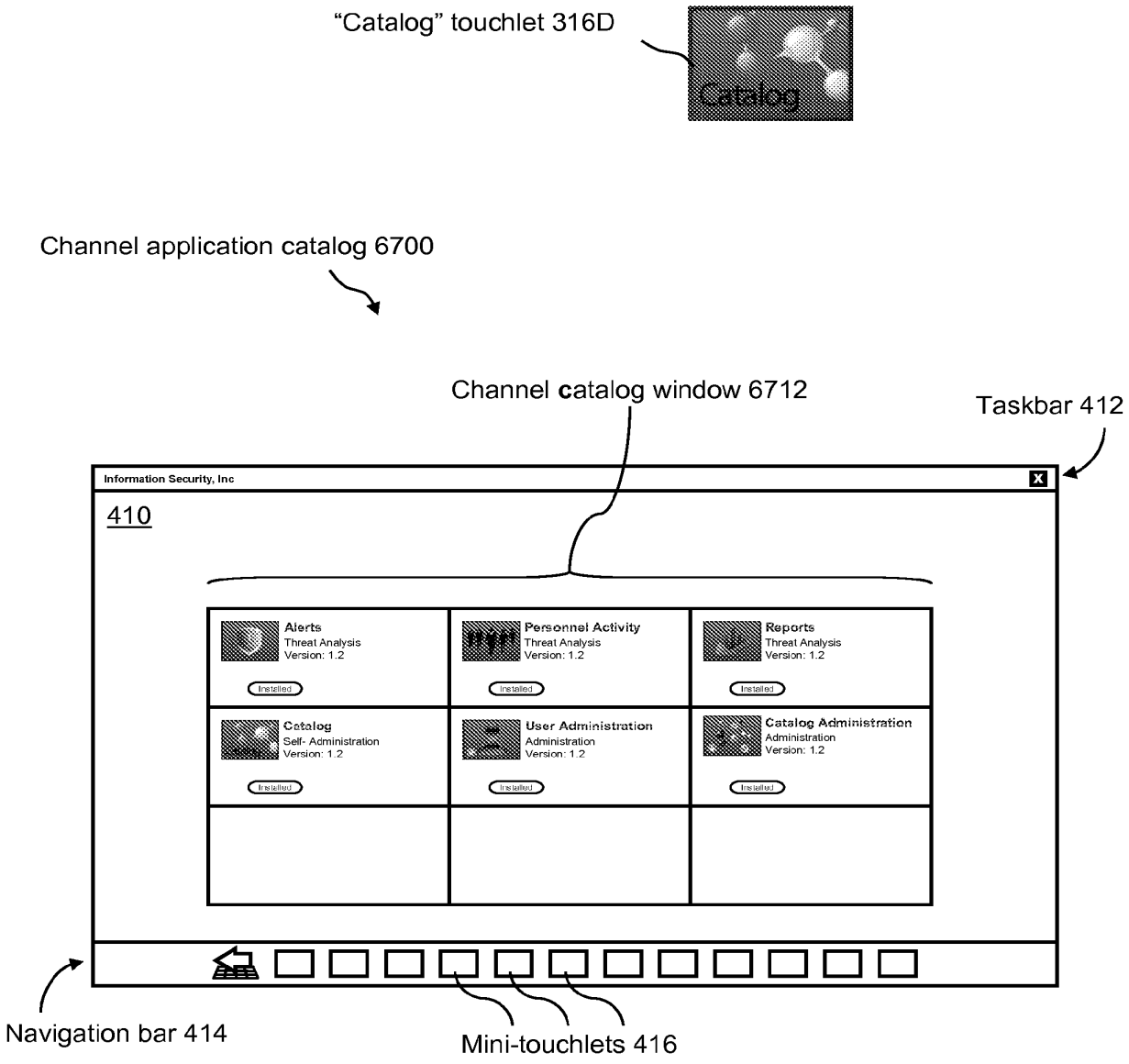
"Catalog" touchlet 316D
Catalog
Channel application catalog 6700
Channel catalog window 6712
Taskbar 412
Information Security, Inc
410
Alerts
Threat Analysis
Version: 1.2
Installed
Personnel Activity
Threat Analysis
Version: 1.2
Installed
Reports
Threat Analysis
Version: 1.2
Installed
Catalog
Self- Administration
Version: 1.2
Installed
User Administration
Administration
Version: 1.2
Installed
Catalog Administration
Administration
Version: 1.2
Installed
Navigation bar 414
Mini-touchlets 416

*FIG. 67*

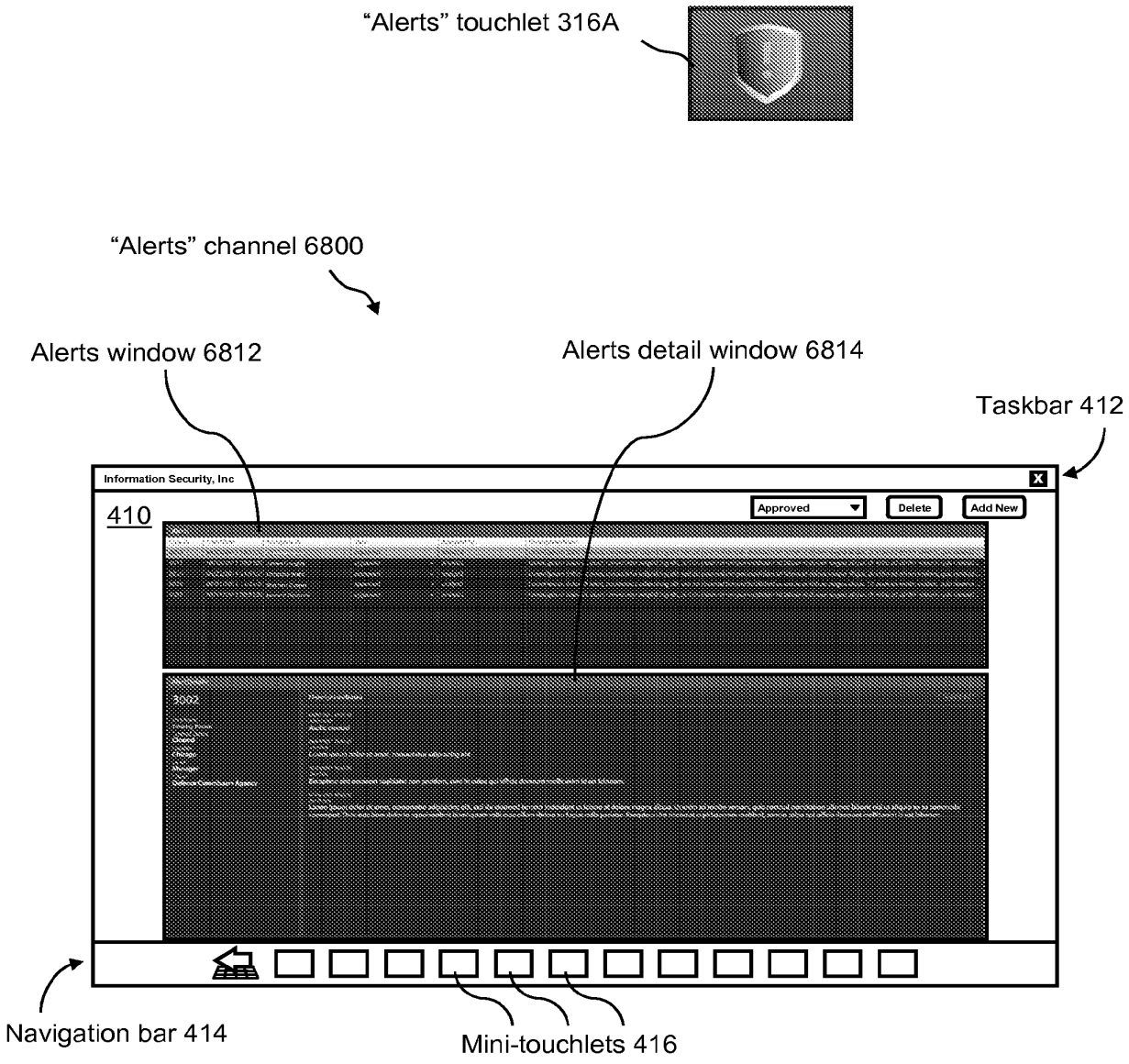
"Alerts" touchlet 316A
"Alerts" channel 6800
Alerts window 6812
Alerts detail window 6814
Taskbar 412
Information Security, Inc
410
Approved
Delete
Add New
Navigation bar 414
Mini-touchlets 416

FIG. 68

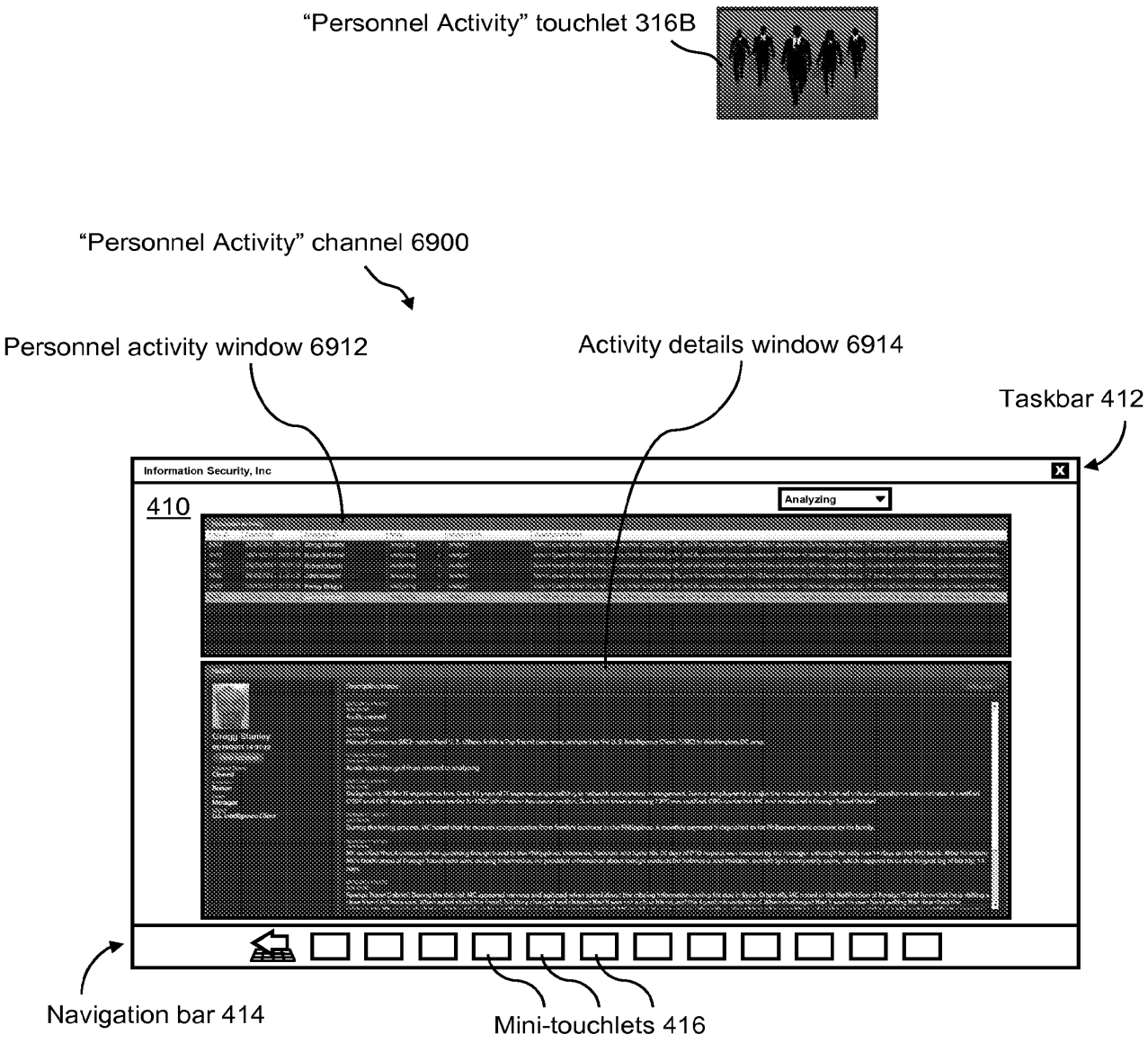
"Personnel Activity" touchlet 316B
"Personnel Activity" channel 6900
Personnel activity window 6912
Activity details window 6914
Taskbar 412
Information Security, Inc
410
Analyzing
Navigation bar 414
Mini-touchlets 416

FIG. 69

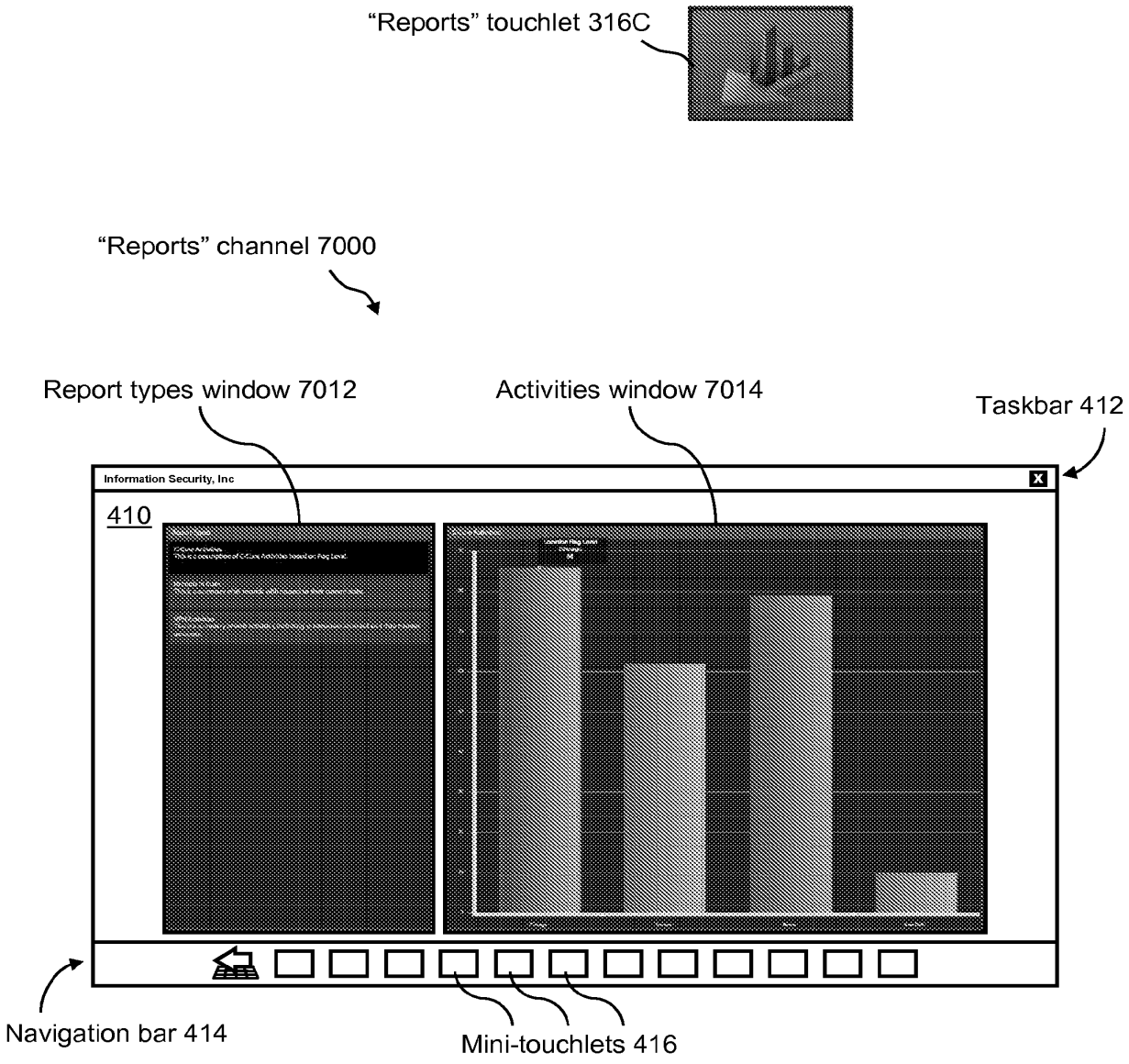
"Reports" touchlet 316C
"Reports" channel 7000
Report types window 7012
Activities window 7014
Taskbar 412
Information Security, Inc
410
Navigation bar 414
Mini-touchlets 416

FIG. 70

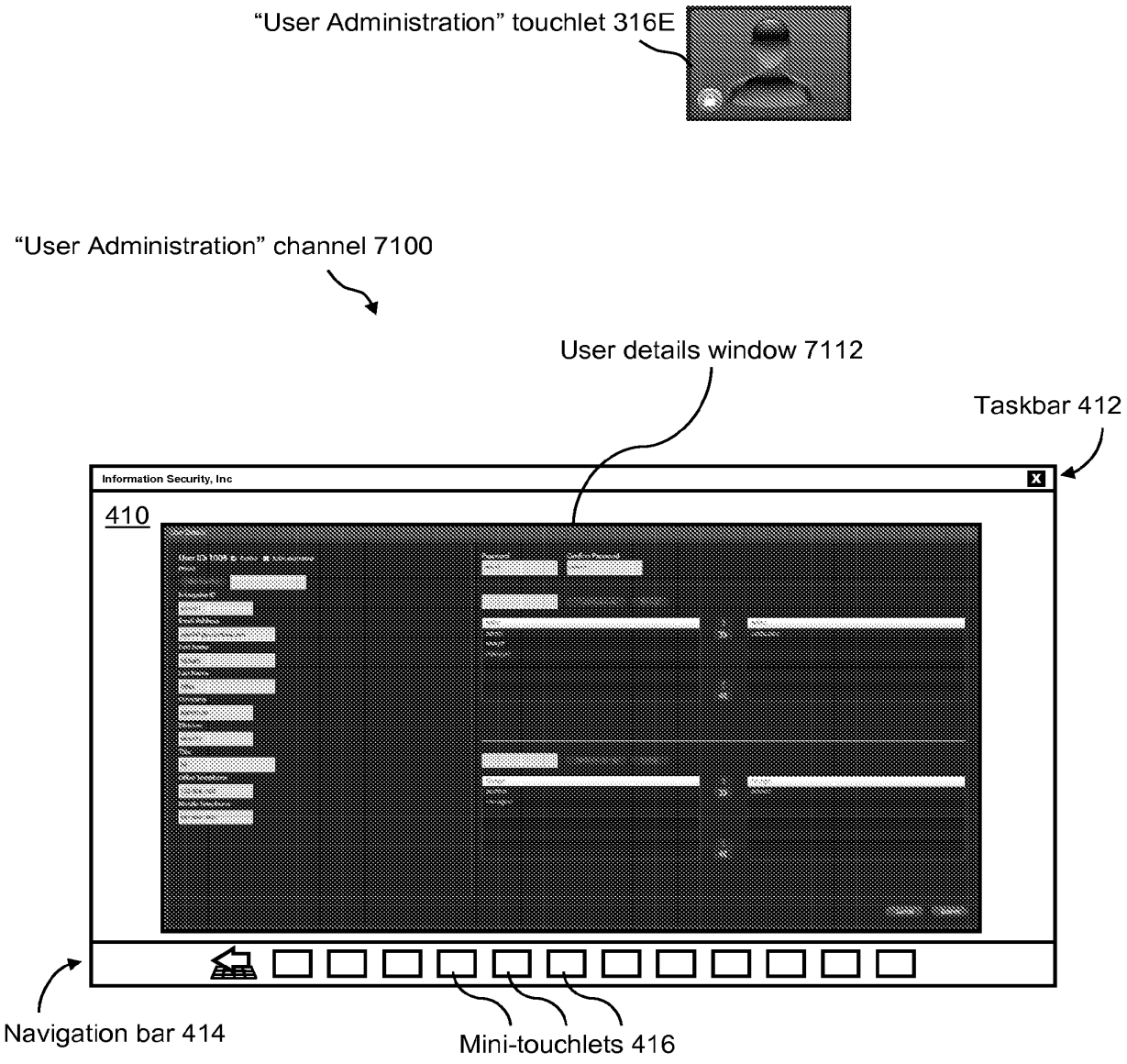
"User Administration" touchlet 316E
"User Administration" channel 7100
User details window 7112
Taskbar 412
Information Security, Inc
410
Navigation bar 414
Mini-touchlets 416

FIG. 71

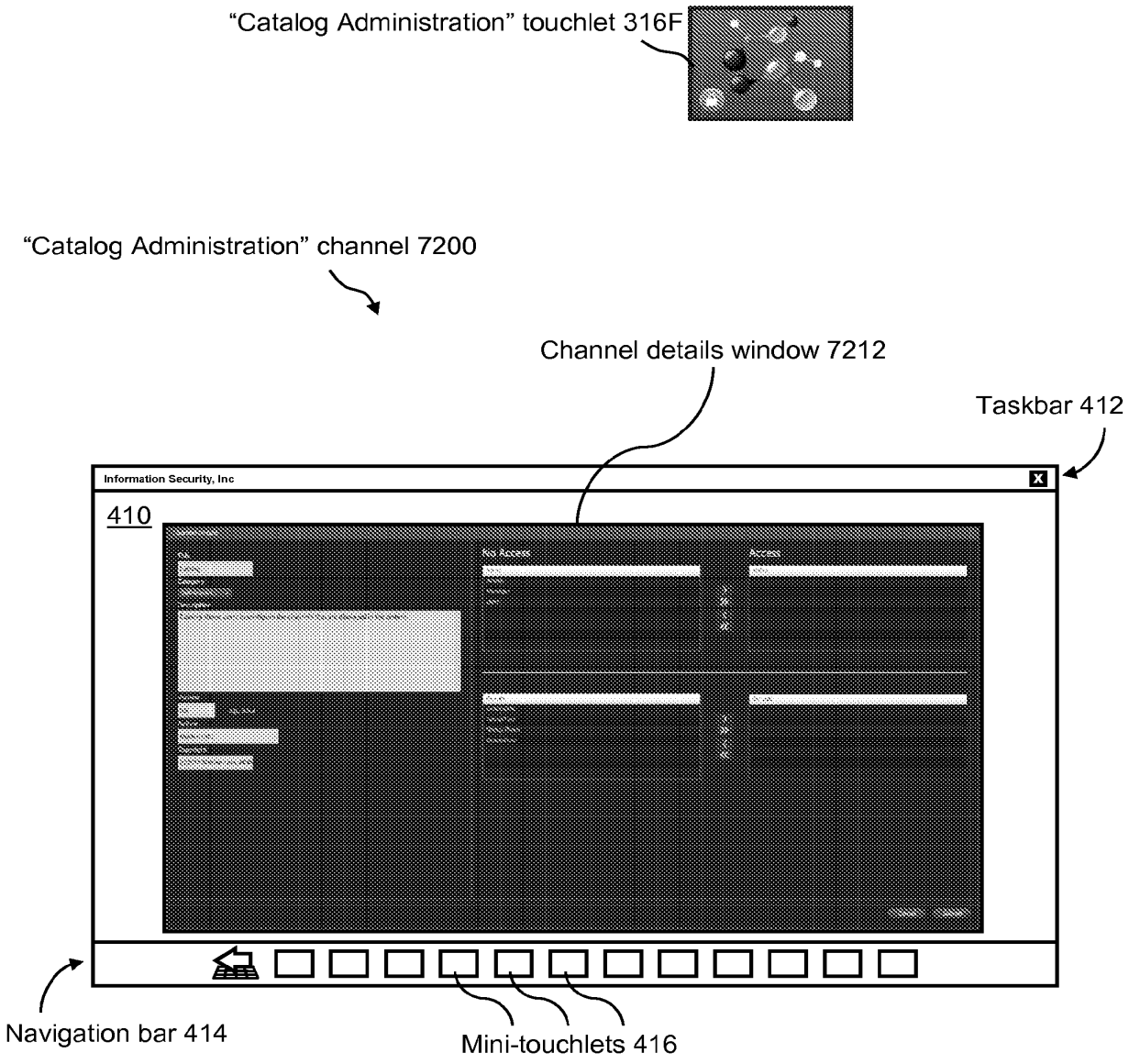
"Catalog Administration" touchlet 316F
"Catalog Administration" channel 7200
Channel details window 7212
Taskbar 412
Information Security, Inc
410
Navigation bar 414
Mini-touchlets 416

FIG. 72

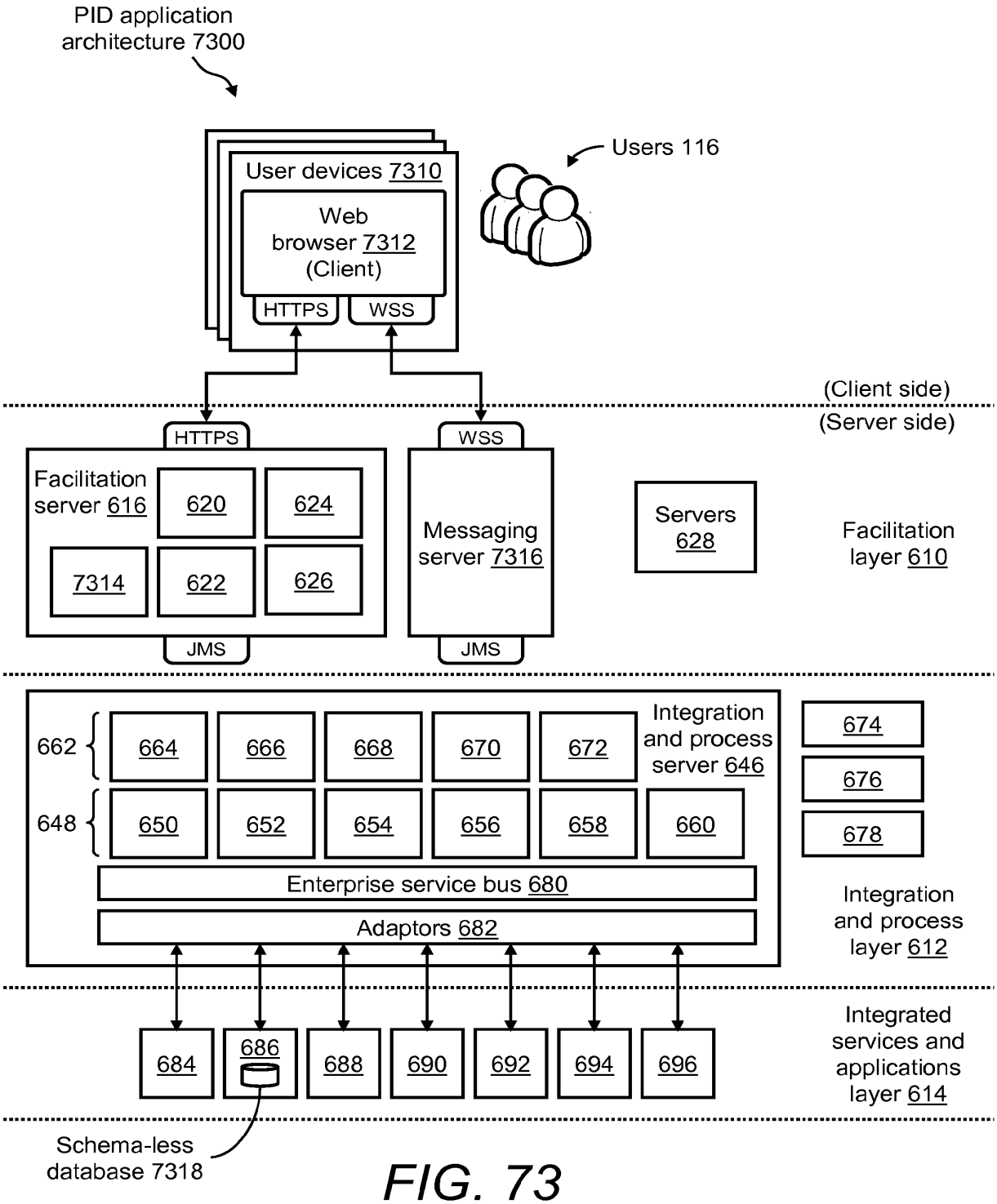
PID application architecture 7300
User devices 7310
Web browser 7312 (Client)
HTTPS
WSS
Users 116
(Client side)
(Server side)
HTTPS
WSS
Facilitation server 616
620
624
7314
622
626
JMS
Messaging server 7316
JMS
Servers 628
Facilitation layer 610
662
664
666
668
670
672
Integration and process server 646
674
676
678
648
650
652
654
656
658
660
Enterprise service bus 680
Adaptors 682
Integration and process layer 612
684
686
688
690
692
694
696
Integrated services and applications layer 614
Schema-less database 7318

FIG. 73

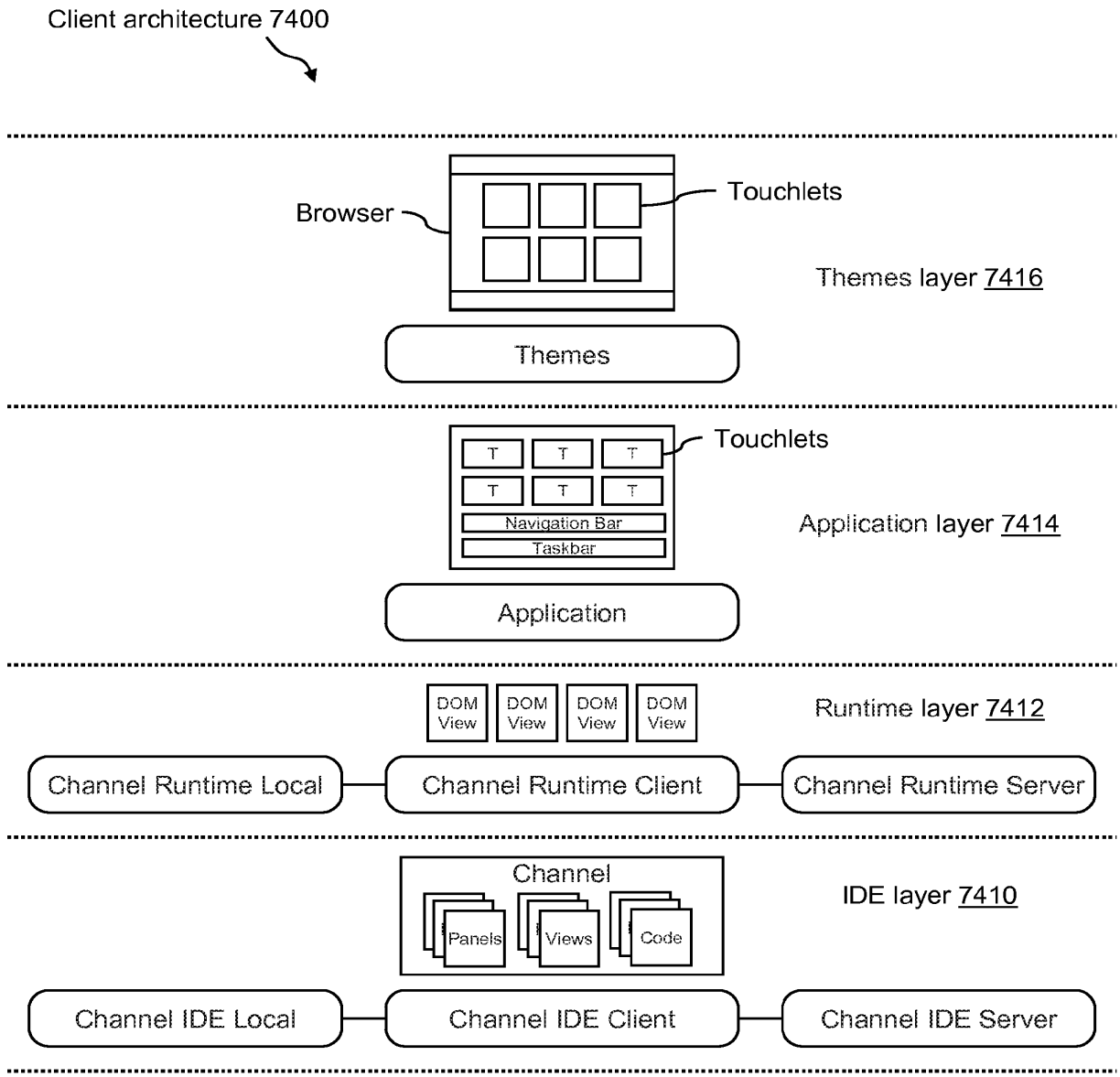
Client architecture 7400
Browser
Touchlets
Themes layer 7416
Themes
Touchlets
T
Navigation Bar
Taskbar
Application layer 7414
Application
DOM View
Runtime layer 7412
Channel Runtime Local
Channel Runtime Client
Channel Runtime Server
Channel
Panels
Views
Code
IDE layer 7410
Channel IDE Local
Channel IDE Client
Channel IDE Server

FIG. 74

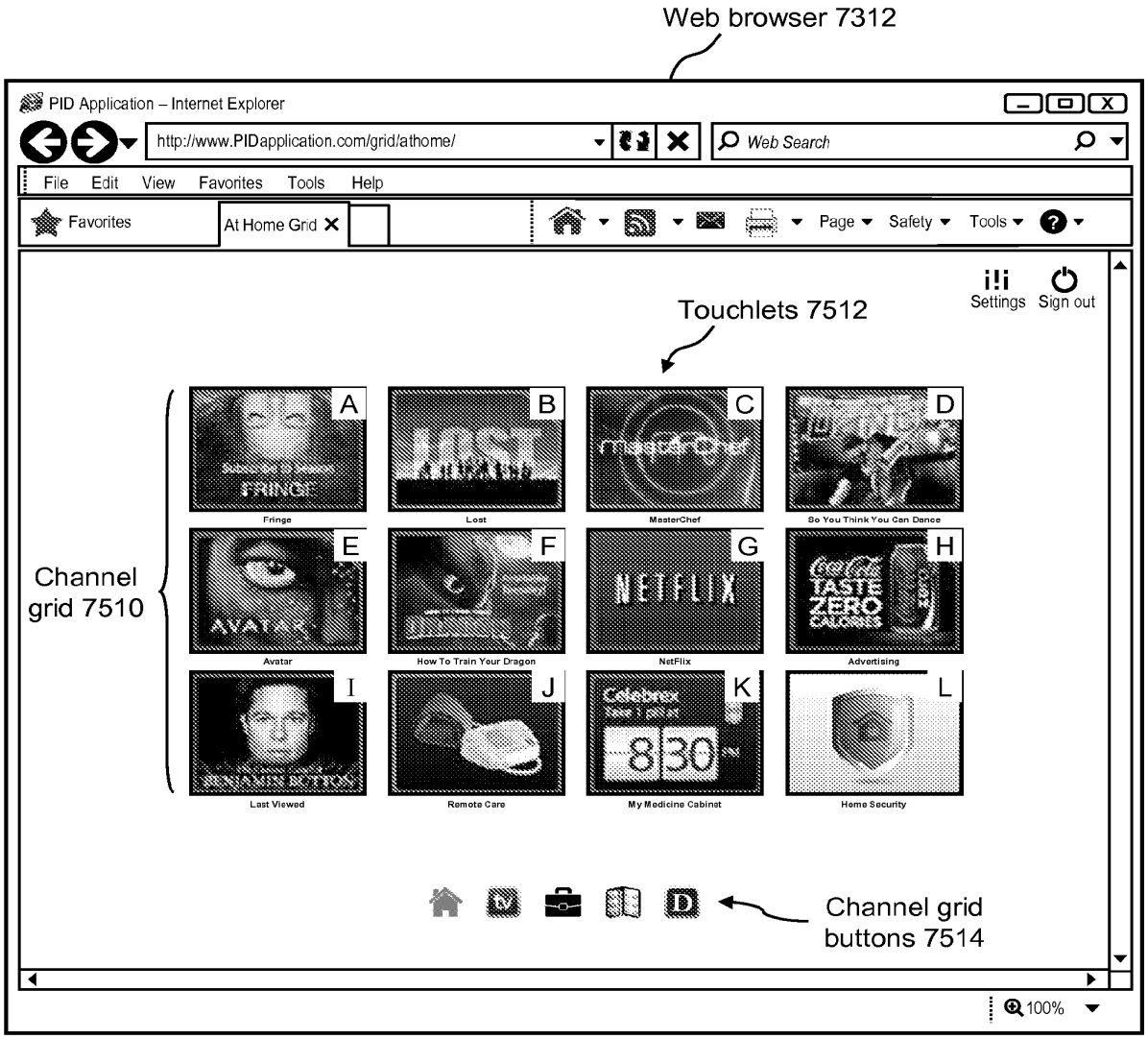
Web browser 7312
PID Application – Internet Explorer
http://www.PIDapplication.com/grid/athome/
Web Search
File Edit View Favorites Tools Help
Favorites
At Home Grid
Page Safety Tools
Settings
Sign out
Touchlets 7512
Channel grid 7510
A
Fringe
B
Lost
C
MasterChef
D
So You Think You Can Dance
E
Avatar
F
How To Train Your Dragon
G
NetFlix
H
Advertising
I
Last Viewed
J
Remote Care
K
My Medicine Cabinet
L
Home Security
Channel grid buttons 7514
100%

FIG. 75

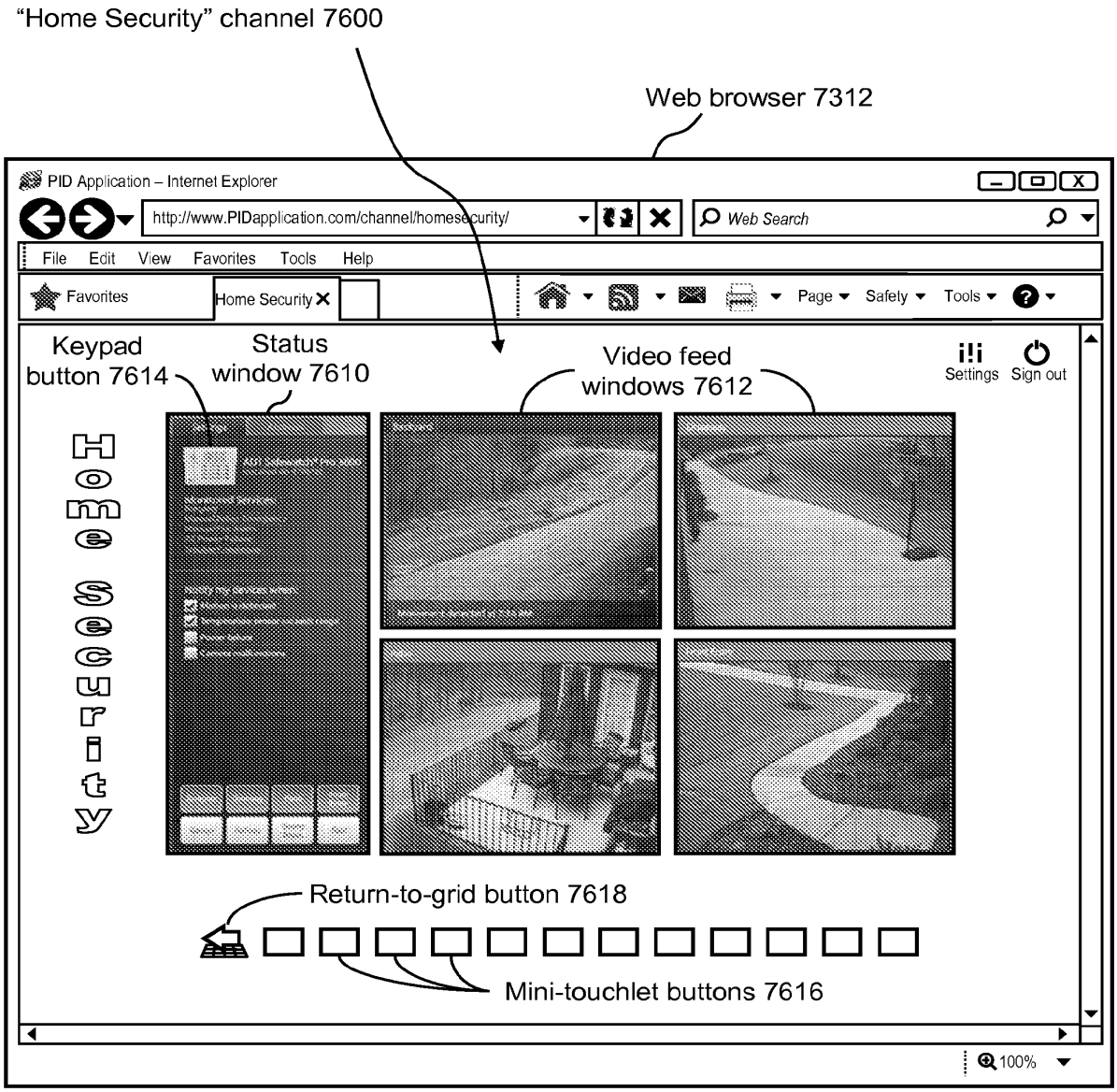
"Home Security" channel 7600
Web browser 7312
PID Application – Internet Explorer
http://www.PIDapplication.com/channel/homesecurity/
Web Search
File Edit View Favorites Tools Help
Favorites
Home Security
Page Safety Tools
Keypad button 7614
Status window 7610
Video feed windows 7612
Settings
Sign out
Home Security
Return-to-grid button 7618
Mini-touchlet buttons 7616
100%

FIG. 76

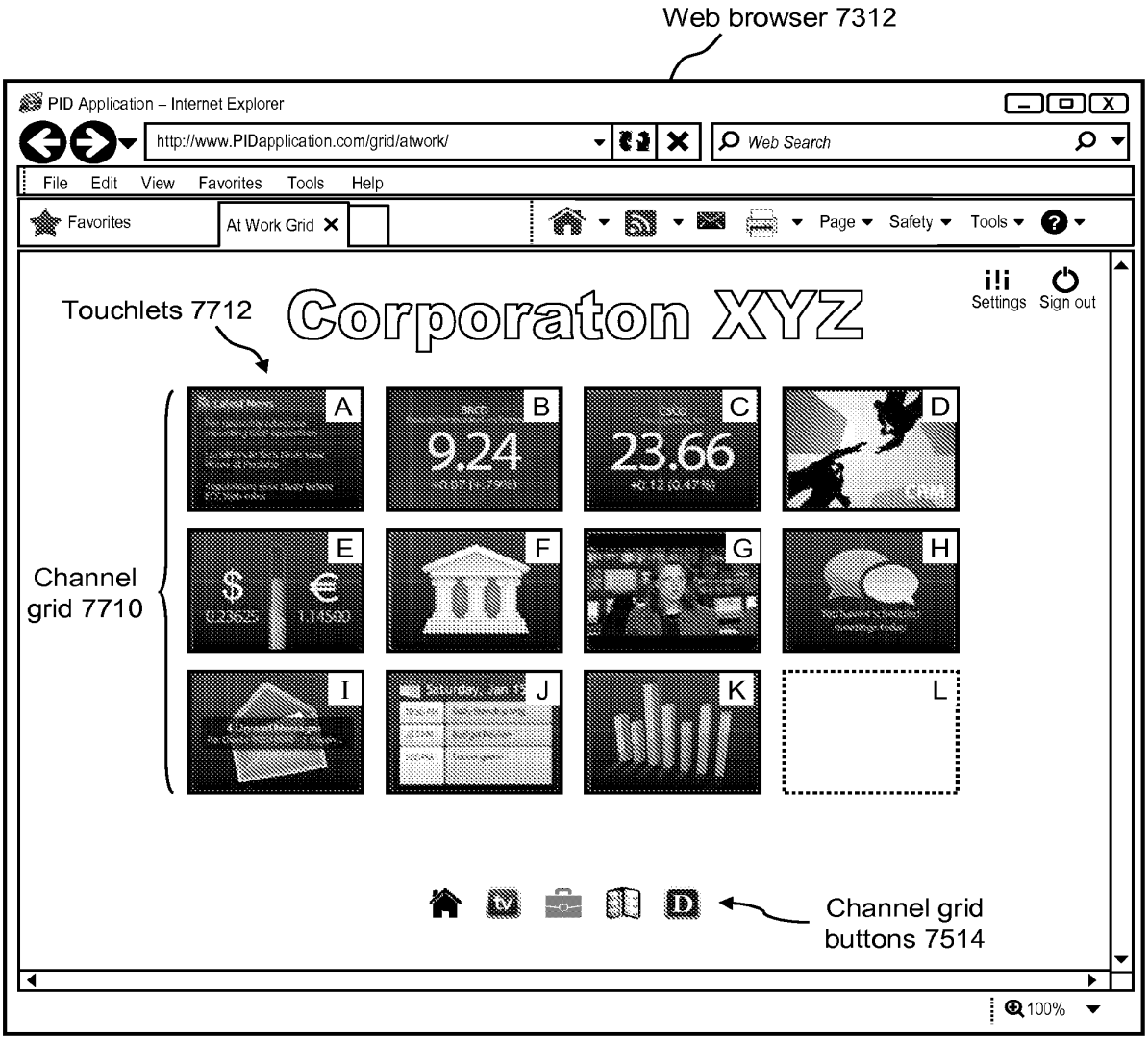
Web browser 7312
PID Application – Internet Explorer
http://www.PIDapplication.com/grid/atwork/
Web Search
File Edit View Favorites Tools Help
Favorites
At Work Grid
Page Safety Tools
Settings
Sign out
Touchlets 7712
Corporaton XYZ
Channel grid 7710
A
B
9.24
C
23.66
D
E
F
G
H
I
J
K
L
Channel grid buttons 7514
100%

FIG. 77

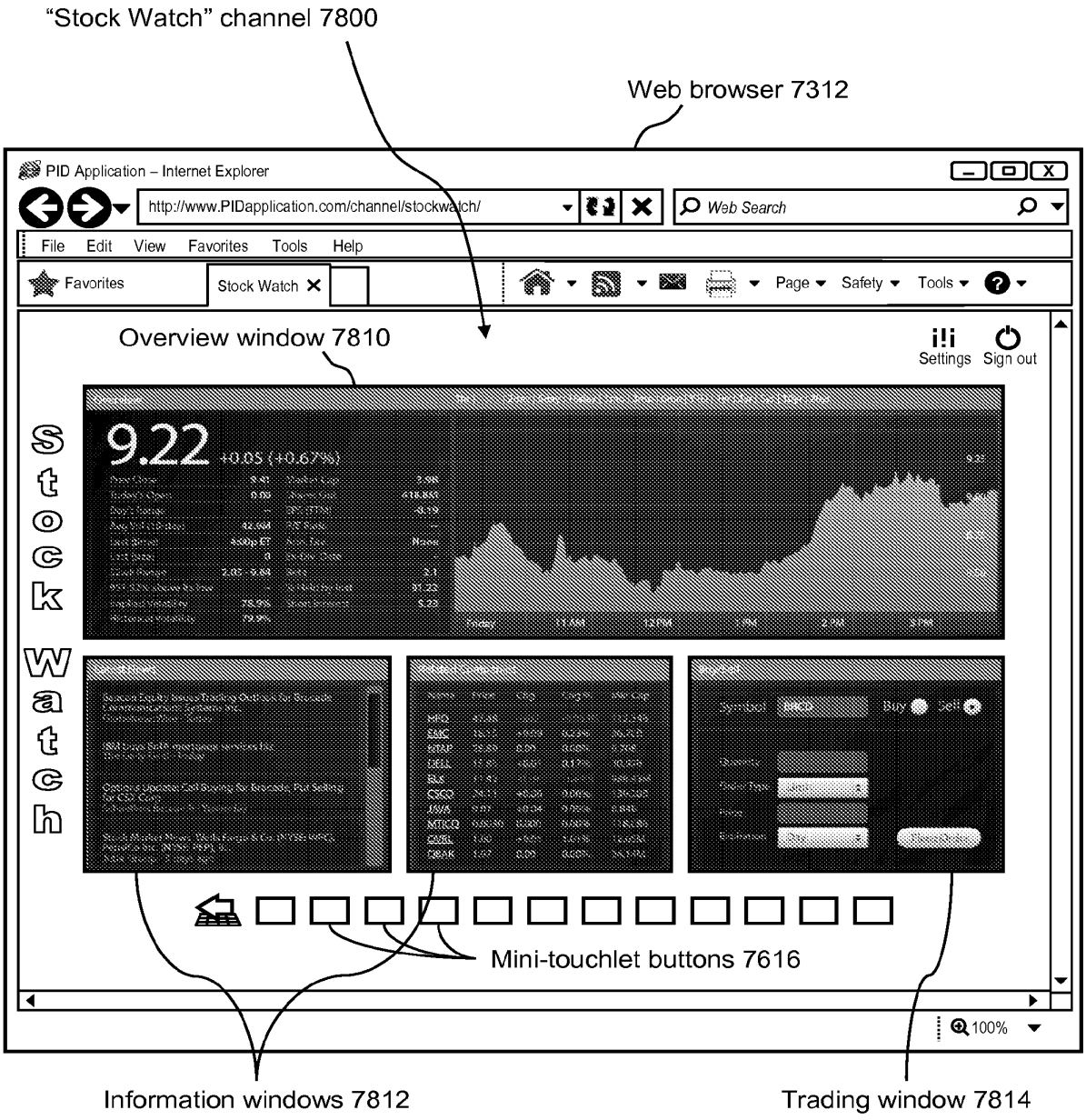
"Stock Watch" channel 7800
Web browser 7312
PID Application – Internet Explorer
http://www.PIDapplication.com/channel/stockwatch/
Web Search
File Edit View Favorites Tools Help
Favorites
Stock Watch
Page Safety Tools
Overview window 7810
Settings
Sign out
Stock Watch
9.22 +0.05 (+0.67%)
Mini-touchlet buttons 7616
100%
Information windows 7812
Trading window 7814

FIG. 78

**INTERNATIONAL SEARCH REPORT**

International application No.
PCT/US2012/022406

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H04H 6/32 (2012.01)
USPC - 725/14
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(8) - H04H 6/32, H04N 7/16, H04N 17/00 (2012.01)
USPC - 725/9, 725/14, 725/25

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)
MicroPatent, Google Patents, and ACM

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| Y | US 2005/0114881 A1 (PHILYAW et al) 26 May 2005 (26.05.2005) entire document | 1-20 |
| Y | US 2010/0254370 A1 (JANA et al) 07 October 2010 (07.10.2010) entire document | 1-20 |
| Y | US 2010/0281107 A1 (FALLOWS et al) 04 November 2010 (04.11.2010) entire document | 2-3 |
| Y | US 2010/0031334 A1 (SHAIKH) 04 February 2010 (04.02.2010) entire document | 18 |
| A | US 2009/0025025 A1 (VLECK et al) 22 January 2009 (22.01.2009) entire document | 1-20 |

☐ Further documents are listed in the continuation of Box C. ☐

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"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
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"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 |
|---|---|
| 30 April 2012 | 10 MAY 2012 |
| Name and mailing address of the ISA/US<br>Mail Stop PCT, Attn: ISA/US, Commissioner for Patents<br>P.O. Box 1450, Alexandria, Virginia 22313-1450<br>Facsimile No. 571-273-3201 | Authorized officer:<br>Blaine R. Copenheaver<br>PCT Helpdesk: 571-272-4300<br>PCT OSP: 571-272-7774 |

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To: Tadd F. Wilson
Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, Colorado 80202
United States of America

**PCT**

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

| | |
|---|---|
| | Date of mailing *(day/month/year)* 16 APR 2014 |
| Applicant's or agent's file reference 6583-426-PCT | **FOR FURTHER ACTION** See paragraphs 1 and 4 below |
| International application No. PCT/US13/55494 | International filing date *(day/month/year)* 18 August 2013 (18.08.2013) |
| Applicant Flextronics AP, LLC | |

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   **Filing of amendments and statement under Article 19:**
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   **When?** The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   **Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   **For more detailed instructions,** see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

   For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

| | |
|---|---|
| Name and mailing address of the ISA/<br>Mail Stop PCT, Attn: ISA/US<br>Commissioner for Patents<br>P.O. Box 1450, Alexandria, Virginia 22313-1450<br>Facsimile No. 571-273-3201 | Authorized officer<br>Shane Thomas<br>PCT Helpdesk: 571-272-4300<br>Telephone No. PCT OSP: 571-272-7774 |

Form PCT/ISA/220 (July 2010)

PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| Applicant's or agent's file reference<br>6583-426-PCT | **FOR FURTHER ACTION** | see Form PCT/ISA/220<br>as well as, where applicable, item 5 below. |
|---|---|---|
| International application No.<br>PCT/US13/55494 | International filing date *(day/month/year)*<br>18 August 2013 (18.08.2013) | (Earliest) Priority Date *(day/month/year)*<br>17 August 2012 (17.08.2012) |
| Applicant<br>Flextronics AP, LLC | | |

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

   b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

   c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☒ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

   ☐ the text is approved as submitted by the applicant.

   ☒ the text has been established by this Authority to read as follows:

PROVIDING USER INTERFACES IN AN INTELLIGENT TELEVISION

5. With regard to the **abstract**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

   a. the figure of the **drawings** to be published with the abstract is Figure No. 1a

   ☐ as suggested by the applicant.

   ☒ as selected by this Authority, because the applicant failed to suggest a figure.

   ☐ as selected by this Authority, because this figure better characterizes the invention.

   b. ☐ none of the figures is to be published with the abstract.

## INTERNATIONAL SEARCH REPORT

International application No.
PCT/US13/55494

**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

Group I: Claims 1-2; Group II: Claims 3-4; Group II: Claims 5-6; Group IV: Claims 7-8; Group V: Claims 9-10; Group VI: Claims 11-12; Group VII: Claims 13-14

-***-Please see Supplemental Page-***-

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1 and 2

**Remark on Protest**

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/US13/55494

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 3/0482 (2014.01)
USPC - 715/851
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(8) Classification(s): G06F 3/01, 3/048, 3/0482 (2014.01)
USPC Classification(s): 715/738, 851, 854; 348/14.03

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)
MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C,B, DE-A, DE-T, DE-U, GB-A, FR-A); ProQuest; IEEE; Google/Google Scholar

Keywords: intelligent, smart, hybrid, tv, television, reverse, back, navigation, user interface, second user interface, media, content

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | US 2012/0174039 A1 (RHOADS, J. et al.) 05 July 2012; claims 5, 6, 22, paragraphs [0006], [0026], [0028], [0049]. | 1-2 |
| A | US 2012/0173979 A1 (LEE, K.) 05 July 2012; the entire document. | 1-2 |
| A | US 2011/0131506 A1 (CALISSENDORFF, E.) 02 June 2011; the entire document. | 1-2 |

☐ Further documents are listed in the continuation of Box C. ☐

* 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 application or patent but 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 | Date of mailing of the international search report |
|---|---|
| 24 March 2014 (24.03.2014) | 16 APR 2014 |
| Name and mailing address of the ISA/US<br>Mail Stop PCT, Attn: ISA/US, Commissioner for Patents<br>P.O. Box 1450, Alexandria, Virginia 22313-1450<br>Facsimile No. 571-273-3201 | Authorized officer:<br>Shane Thomas<br>PCT Helpdesk: 571-272-4300<br>PCT OSP: 571-272-7774 |

Form PCT/ISA/210 (second sheet) (July 2009)

-***-Continued from Box No. III - Observations where unity of invention is lacking-***-

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fee must be paid.

Group I: Claims 1-2 are directed toward a method for providing a user interface in an intelligent television.
Group II: Claims 3-4 are directed toward a method for providing a user interface in an intelligent television.
Group III: Claims 5-6 are directed toward a method for providing a user interface in an intelligent television.
Group IV: Claims 7-8 are directed toward a method for providing a user interface in an intelligent television.
Group V: Claims 9-10 are directed toward a method for providing a user interface in an intelligent television.
Group VI: Claims 11-12 are directed toward a method for providing one of two types of user interfaces in an intelligent television.
Group VII: Claims 13-14 are directed toward a method for providing a user interface in an intelligent television.

The inventions listed as Groups I-VII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The special technical features of Group I include a first series of user interfaces; receiving a back selection to reverse a navigation, which are not present in Groups II-VII.

The special technical features of Group II include a first navigation bar; a second navigation bar; rendering a horizontal navigation bar; and rendering a different user interface for the second navigation bar, which are not present in Groups I and III-VII.

The special technical features of Group III include a notification for a user; dismissing the notification; and providing a missing notification icon in the user interface, which are not present in Groups I-II and IV-VII.

The special technical features of Group IV include the user interface including at least two regions; and providing an action based on a location within one of the least two regions, which are not present in Groups I-III and V-VII.

The special technical features of Group V include determining a selection characteristic; determining a content characteristic; and based on the selection characteristic and the content characteristic, affecting change in the user interface, which are not present in Groups I-IV and VI-VII.

The special technical features of Group VI include determining a type of user interface selection; a first type of selection; and a second type of selection, which are not present in Groups I-V and VII.

The special technical features of Group VII include receiving a selection for an unrelated search that does not apply to the first content; and providing a search panel above a portion of the content to search for a second content, which are not present in Groups I-VI.

The common technical feature shared by Groups I-VII is a method and system for providing a user interface in an intelligent television, the method and system comprising: receiving, by a processor of the intelligent television, a selection associated with content in the intelligent television; presenting a second user interface different than a first user interface. However, this common feature is previously disclosed by US 2012/0210239 A1 (Kim). Kim discloses a method and system for providing a user interface in an intelligent television (a first GUI (user interface) displayed on a screen of a Smart TV; paragraphs [0121] and [0247]), the method and system comprising: receiving, by a processor (paragraph [0177]) of the intelligent television, a selection associated with content in the intelligent television (first user action (selection); paragraph [0249]); presenting a second user interface different than a first user interface (second GUI; paragraph [0249]).

Since the common technical feature is previously disclosed by the Kim reference, this common feature is not special and so Groups I-VII lack unity.

# PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: Tadd F. Wilson
Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, Colorado 80202
United States of America

# PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

| Date of mailing *(day/month/year)* | 16 APR 2014 |
|---|---|

| Applicant's or agent's file reference | FOR FURTHER ACTION |
|---|---|
| 6583-426-PCT | See paragraph 2 below |

| International application No. | International filing date *(day/month/year)* | Priority date *(day/month/year)* |
|---|---|---|
| PCT/US13/55494 | 18 August 2013 (18.08.2013) | 17 August 2012 (17.08.2012) |

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 3/0482 (2014.01)
USPC - 715/851

Applicant Flextronics AP, LLC

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

| Name and mailing address of the ISA/US | Date of completion of this opinion | Authorized officer: |
|---|---|---|
| Mail Stop PCT, Attn: ISA/US<br>Commissioner for Patents<br>P.O. Box 1450, Alexandria, Virginia 22313-1450<br>Facsimile No. 571-273-3201 | 24 March 2014 (24.03.2014) | Shane Thomas<br>PCT Helpdesk: 571-272-4300<br>PCT OSP: 571-272-7774 |

Form PCT/ISA/237 (cover sheet) (July 2011)

**WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US13/55494

**Box No. I Basis of this opinion**

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

**WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US13/55494

**Box No. IV Lack of unity of invention**

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the appicable time limit:

   ☐ paid additional fees

   ☐ paid additional fees under protest and, where applicable, the protest fee

   ☐ paid additional fees under protest but the applicable protest fee was not paid

   ☒ not paid additional fees

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

   ☐ complied with

   ☒ not complied with for the following reasons:

Group I: Claims 1-2; Group II: Claims 3-4; Group II: Claims 5-6; Group IV: Claims 7-8; Group V: Claims 9-10; Group VI: Claims 11-12; Group VII: Claims 13-14

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fee must be paid.

Group I: Claims 1-2 are directed toward a method for providing a user interface in an intelligent television.
Group II: Claims 3-4 are directed toward a method for providing a user interface in an intelligent television.
Group III: Claims 5-6 are directed toward a method for providing a user interface in an intelligent television.
Group IV: Claims 7-8 are directed toward a method for providing a user interface in an intelligent television.
Group V: Claims 9-10 are directed toward a method for providing a user interface in an intelligent television.
Group VI: Claims 11-12 are directed toward a method for providing one of two types of user interfaces in an intelligent television.
Group VII: Claims 13-14 are directed toward a method for providing a user interface in an intelligent television.

The inventions listed as Groups I-VII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The special technical features of Group I include a first series of user interfaces; receiving a back selection to reverse a navigation, which are not present in Groups II-VII. The special technical features of Group II include a first navigation bar; a second navigation bar; rendering a horizontal navigation bar; and rendering a different user interface for the second navigation bar, which are not present in Groups I and III-VII. The special technical features of Group III include a notification for a user; dismissing the notification; and providing a missing notification icon in the user interface, which are not present in Groups I-II and IV-VII. The special technical features of Group IV include the user interface including at least two regions; and providing an action based on a location within one of the least two regions, which are not present in Groups I-III and V-VII. The special technical features of Group V include determining a selection characteristic; determining a content characteristic; and based on the selection characteristic and the content characteristic, affecting change in the user interface, which are not present in Groups I-IV and VI-VII. The special technical features of Group VI include determining a type of user interface selection; a first type of selection; and a second type of selection, which are not present in Groups I-V and VII. The special technical features of Group VII include receiving a selection for an unrelated search that does not apply to the first content; and providing a search panel above a portion of the content to search for a second content, which are not present in Groups I-VI.

The common technical feature shared by Groups I-VII is a method and system for providing a user interface in an intelligent television, the method and system comprising: receiving, by a processor of the intelligent television, a selection associated with content in the intelligent television; presenting a second user interface different than a first user interface. However, this common feature is previously disclosed by US 2012/0210239 A1 (Kim). Kim discloses a method and system for providing a user interface in an intelligent television (a first GUI (user interface) displayed on a screen of a Smart TV; paragraphs [0121] and [0247]), the method and system comprising: receiving, by a processor (paragraph [0177]) of the intelligent television, a selection associated with content in the intelligent television (first user action (selection); paragraph [0249]); presenting a second user interface different than a first user interface (second GUI; paragraph [0249]).

Since the common technical feature is previously disclosed by the Kim reference, this common feature is not special and so Groups I-VII lack unity.

4. Consequently, this opinion has been established in respect of the following parts of the international application:

   ☐ all parts

   ☒ the parts relating to claims Nos. 1 and 2

**WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US13/55494

**Box No. V** **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

| | | | |
|---|---|---|---|
| Novelty (N) | Claims | None | YES |
| | Claims | 1-2 | NO |
| Inventive step (IS) | Claims | None | YES |
| | Claims | 1-2 | NO |
| Industrial applicability (IA) | Claims | 1-2 | YES |
| | Claims | None | NO |

2. Citations and explanations:

Claims 1-2 lack novelty under PCT Article 33(2) as being anticipated by US 2012/0174039 A1 to Rhoads et al. (hereinafter "Rhoads").

As to claim 1, Rhoads discloses a method for providing a user interface in an intelligent television, the method comprising: receiving, by a processor of the intelligent television, a selection associated with content in the intelligent television (receiving by the control circuitry of a smart TV comprising a microprocessor (receiving, by a processor of the intelligent television) a user selection of a media identifier from multiple media identifiers by the smart TV (a selection associated with content in the intelligent television), paragraphs [0006], [0026], [0049]); in response to the selection, presenting the user interface associated with the content, wherein the user interface is associated with a first series of user interfaces (In response to the user's indication (in response to the selection), the media guidance application may provide a display screen with media guidance data (presenting the user interface associated with the content); an options region may allow the user to access different types of content, media guidance application displays, and/or media guidance application features (wherein the user interface is associated with a first series of user interfaces), paragraph [0028]); receiving a back selection to reverse a navigation through the first series of user interfaces (the navigation indicator may allow a user to navigate back (receiving a back selection to reverse a navigation) through a hierarchical structure of media identifiers to the location of the media asset (through the first series of user interfaces), paragraph [0023]); and presenting a second user interface, wherein the second user interface is in a second series of user interfaces (a second navigation indicator is displayed (and presenting a second user interface) that represents a path navigating through the hierarchy of the interactive media guidance application to the second media asset (wherein the second user interface is in a second series of user interfaces), claims 5, 6), and wherein the first series of user interfaces is different from the second series of user interfaces (wherein the first navigation indicator comprises a first navigation cue that identifies which media identifier to select from a first portion of the plurality of media identifiers (wherein the first series of user interfaces) second navigation cue that identifies which media identifier to select from a second portion of the plurality of media identifier (is different from a second series of user interfaces), claim 22).

As to claim 2, Rhoads discloses an intelligent television system comprising: a memory operable to store social media data (memory storage may be used to store various types of content including social media content (a memory operable to store social media data), paragraphs [0025], [0051]); a processor in communication with the memory (a processor with an application stored in memory (a processor in communication with the memory), paragraph [0049]), the processor operable to: execute a user interface application (the processor executes instruction for the media guidance application (executes a user interface application), paragraph [0049]), the user interface application operable receive, by a processor of the intelligent television, a selection associated with content in the intelligent television (the media guidance application (the user interface application) receives by the control circuitry of a smart TV comprising a microprocessor (operable to receive, by a processor of the intelligent television) a user selection of a media identifier from multiple media identifiers by the smart TV (a selection associated with content in the intelligent television), paragraphs [0006], [0026], [0049]); in response to the selection, present the user interface associated with the content, wherein the user interface is associated with a first series of user interfaces (In response to the user's indication (in response to the selection), the media guidance application may provide a display screen with media guidance data (present the user interface associated with the content); an options region may allow the user to access different types of content, media guidance application displays, and/or media guidance application features (wherein the user interface is associated with a first series of user interfaces), paragraph [0028]); receive a back selection to reverse a navigation through the first series of user interfaces (the navigation indicator may allow a user to navigate back (receive a back selection to reverse a navigation) through a hierarchical structure of media identifiers to the location of the media asset (through the first series of user interfaces), paragraph [0023]); and present a second user interface, wherein the second user interface is in a second series of user interfaces (a second navigation indicator is displayed (and present a second user interface) that represents a path navigating through the hierarchy of the interactive media guidance application to the second media asset (wherein the second user interface is in a second series of user interfaces), claims 5, 6), and wherein the first series of user interfaces is different from the second series of user interfaces (wherein the first navigation indicator comprises a first navigation cue that identifies which media identifier to select from a first portion of the plurality of media identifiers (wherein the first series of user interfaces) second navigation cue that identifies which media identifier to select from a second portion of the plurality of media identifier (is different from a second series of user interfaces), claim 22).

Claims 1-2 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

# PATENT COOPERATION TREATY

RECEIVED
APR 21 2014
SHERIDAN ROSS P.C.
DOCKETING DEPT.

From the INTERNATIONAL SEARCHING AUTHORITY

To: TADD F. WISON
SHERIDAN ROSS P.C.
1560 BROADWAY
SUITE 1200
DENVER, CO 80202

**PCT**

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

| | |
|---|---|
| | Date of mailing *(day/month/year)* 17 APR 2014 |
| Applicant's or agent's file reference 6583-434-PCT | **FOR FURTHER ACTION** See paragraphs 1 and 4 below |
| International application No. PCT/US2013/055342 | International filing date *(day/month/year)* 16 August 2013 |
| Applicant FLEXTRONICS AP, LLC | |

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   **Filing of amendments and statement under Article 19:**
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   **When?** The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   **Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   **For more detailed instructions**, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

   For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

| | |
|---|---|
| Name and mailing address of the ISA/<br>Mail Stop PCT, Attn: ISA/US<br>Commissioner for Patents<br>P.O. Box 1450, Alexandria, Virginia 22313-1450<br>Facsimile No. 571-273-3201 | Authorized officer<br>Blaine R. Copenheaver<br>PCT Helpdesk: 571-272-4300<br>Telephone No. PCT OSP: 571-272-7774 |

Form PCT/ISA/220 (July 2010)

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| Applicant's or agent's file reference<br>6583-434-PCT | **FOR FURTHER ACTION** | see Form PCT/ISA/220<br>as well as, where applicable, item 5 below. |
|---|---|---|
| International application No.<br>PCT/US2013/055342 | International filing date *(day/month/year)*<br>16 August 2013 | (Earliest) Priority Date *(day/month/year)*<br>17 August 2012 |
| Applicant<br>FLEXTRONICS AP, LLC | | |

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

   b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

   c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☒ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

   a. the figure of the **drawings** to be published with the abstract is Figure No. 14

   ☒ as suggested by the applicant.

   ☐ as selected by this Authority, because the applicant failed to suggest a figure.

   ☐ as selected by this Authority, because this figure better characterizes the invention.

   b. ☐ none of the figures is to be published with the abstract.

## INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/055342

**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:
See Extra Sheet.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-2

**Remark on Protest**

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/055342

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H04N 5/445 (2014.01)
USPC - 725/56
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(8) - G06F 3/033; H04N 5/445; 21/262; H04H 6/32 (2014.01)
USPC -345/156, 682; 725/56

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
CPC - G06F 3/033; H04N 5/445; 21/262; H04H 6/32 (2014.01)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Google, Orbit, Google Patents

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | US 2012/0144416 A1 (WETZER et al) 07 June 2012 (07.06.2012) entire document | 1, 2 |
| A | US 2012/0154449 A1 (RAMAGEM et al) 21 June 2012 (21.06.2012) entire document | 1, 2 |
| A | WO 2012/103121 A1 (WETZER et al) 02 August 2012 (02.08.2012) entire document | 1, 2 |
| A | US 2011/0246495 A1 (MALLINSON) 06 October 2011 (06.10.2011) entire document | 1, 2 |

☐ Further documents are listed in the continuation of Box C. ☐

* 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 application or patent but 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 | Date of mailing of the international search report |
|---|---|
| 09 April 2014 | 17 APR 2014 |
| Name and mailing address of the ISA/US<br>Mail Stop PCT, Attn: ISA/US, Commissioner for Patents<br>P.O. Box 1450, Alexandria, Virginia 22313-1450<br>Facsimile No. 571-273-3201 | Authorized officer:<br>Blaine R. Copenheaver<br>PCT Helpdesk: 571-272-4300<br>PCT OSP: 571-272-7774 |

Form PCT/ISA/210 (second sheet) (July 2009)

**INTERNATIONAL SEARCH REPORT**
Information on patent family members

International application No.
PCT/US2013/055342

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claims 1-2, drawn to a method for providing an indication of a linkage to a poster of social media, an intelligent television, comprising: providing a first visual indicia for a first posting and a second visual indicia for a second posting wherein the first and second visual indicia are different and indicate the linkage between a first poster of the first posting or a second poster of the second posting.
Group II, claims 3-4, drawn to a method for providing a rooting section for an intelligent television, comprising: based on a received selection of sporting content, providing a first visual representation of one or more of the social media postings associated with a first team affiliation and providing a second visual representation of one or more of the social media postings associated with a second team affiliation.
Group III, claims 5-6, drawn to a method for providing social media on an intelligent television, comprising: identifying a user of the intelligent television and registering the user with one or more social media sites, and providing social media posting associated with the user on an user interface of the intelligent television.
Group IV, claims 7-8, drawn to a method for providing social media information on an intelligent television, comprising: determining the availability of social media for the selected programming and providing a visual representation of one or more of the social media postings associated with selected programming.
Group V, claims 9-10, drawn to a method for providing social media information on an intelligent television, comprising: receiving a second selection to change a volume of social media, and changing an amount of social media presented in response to the second selection.
Group VI, claims 11-12, drawn to a method for providing social media information on an intelligent television, the comprising: the intelligent television discovering a device also connected to the network, connecting the device to the intelligent television, a user pushes a social media message from the device, and displaying the social media message on the intelligent television.
Group VII, claims 13-14, drawn to a method for providing media on an intelligent television, comprising: retrieving available media from one or more social media sources and from one or more local sources and presenting together media from both one or more social media sources and one or more local sources.
Group VIII, claims 15-16, drawn to a method for providing social media on an intelligent television, comprising: receiving a programming change input and providing determining the type of programming changing input one of two or more user interfaces that include a presentation of social media information.
Group IX, claims 17-18, drawn to a method for providing social media on an intelligent television, comprising: pausing the media playback on the intelligent television while the media continues to be presented in real-time and during the pause, receiving one or more social media postings associated with the media, and storing the one or more social media postings in a time sequence correlated to the media presentation.
Group X, claims 19-20, drawn to a method for providing social media on an intelligent television, comprising: receiving a selection of a control device on a remote control associated with an intelligent television and determining whether the selection is a first type or a second type, and providing a first user interface at the bottom of a display of the intelligent television wherein the first user interface provides at least one social media posting if the selection is a first type, and providing a second user interface at the top of the display of the intelligent television, wherein the second user interface provides information associated with content being presented in the display if the selection is a second type.
Group XI, claims 21-22, drawn to a method for publishing social media by an intelligent television, the comprising: receiving a selection of a control device associated with the intelligent television and automatically publishing information about the content to a social media site based on the selection.
Group XII, claim 23-24, drawn to a method for providing social media on an intelligent television, comprising: determining a state associated with a social media posting and providing a user interface for the social media application, having the social media posting displayed based on the state.

The inventions listed as Groups I-XII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the special technical feature of the Group I invention: providing a first visual indicia for a first posting and a second visual indicia for a second posting wherein the first and second visual indicia are different and indicate the linkage between a first poster of the first posting or a second poster of the second posting as claimed therein is not present in the invention of Groups II-XII. The special technical feature of the Group II invention: based on a received selection of sporting content, providing a first visual representation of one or more of the social media postings associated with a first team affiliation and providing a second visual representation of one or more of the social media postings associated with a second team affiliation as claimed therein is not present in the invention of Groups I, III-XII. The special technical feature of the Group III invention: identifying a user of the intelligent television and registering the user with one or more social media sites, and providing social media posting associated with the user on an user interface of the intelligent television as claimed therein is not present in the invention of Groups I, II, IV-XII. The special technical feature of the Group IV invention: determining the availability of social media for the selected programming and providing a visual representation of one or more of the social media postings associated with selected programming as claimed therein is not present in the invention of Groups I, II, III or V-XII. The special technical feature of the Group V invention: receiving a second selection to change a volume of social media, and changing an amount of social media presented in response to the second selection as claimed therein is not present in the invention of Groups I-IV, VI-XII. The special technical feature of the Group VI invention: the intelligent television discovering a device also connected to the network, connecting the device to the intelligent television, a user pushes a social media message from the device, and displaying the social media message on the intelligent television as claimed therein is not present in the invention of Groups I-V, VII-XII. The special technical feature of the Group VII invention: retrieving available media from one or more social media sources and from one or more local sources and presenting together media from both one or more social media sources and one or more local sources as claimed therein is not present in the invention of Groups I-VI or VIII-XII. The special technical feature of the Group VIII invention: receiving a programming change input and providing determining the type of programming changing input one of two or more user interfaces that include a presentation of social media information as claimed therein is not present in the invention of Groups I-VII or IX-XII.

[See Continuation on Next Extra Sheet]

The special technical feature of the Group IX invention: pausing the media playback on the intelligent television while the media continues to be presented in real-time and during the pause, receiving one or more social media postings associated with the media, and storing the one or more social media postings in a time sequence correlated to the media presentation as claimed therein is not present in the invention of Groups I-VIII or X-XII. The special technical feature of the Group X invention: receiving a selection of a control device on a remote control associated with an intelligent television and determining whether the selection is a first type or a second type, and providing a first user interface at the bottom of a display of the intelligent television wherein the first user interface provides at least one social media posting if the selection is a first type, and providing a second user interface at the top of the display of the intelligent television, wherein the second user interface provides information associated with content being presented in the display if the selection is a second type as claimed therein is not present in the invention of Groups I-IX or XI-XII. The special technical feature of the Group XI invention: receiving a selection of a control device associated with the intelligent television and automatically publishing information about the content to a social media site based on the selection as claimed therein is not present in the invention of Groups I-X or XII. The special technical feature of the Group XII invention: determining a state associated with a social media posting and providing a user interface for the social media application, having the social media posting displayed based on the state as claimed therein is not present in the invention of Groups I-XI.

Groups I- XII lack unity of invention because even though the inventions of these groups require the technical feature of visual representation of social media posting on an intelligent TV, this technical feature is not a special technical feature as it does not make a contribution over the prior art in view of US 2012/0154449 A1 (RAMAGEM et al) 21 June 2012 (21.06.2012).

US 2012/0154449 A1 to RAMAGEM et al discloses a visual whiteboard as an application or component for operation on a smart TV (para. 0007) and social networking techniques, devices, systems and software which can be used in conjunction with social networks associated with a television (para 0002) and teaches visual representation of social media posting on an intelligent TV (content identifiers or other group information can be posted to the visual whiteboard by the authorized users for subsequent display on the corresponding smart [intelligent] TV, para 0007; receiving media items from various media sources and service providers, para 0021; mechanism for direct sharing of information via the social graph ...finding a funny cat video posted on a large site like Digg, para 0038; that a content identifier (hyperlink to a video), and various notes posted to the visual whiteboard by authorized group members, para 0055; see also para 0030, 0031 for using the visual whiteboard operating on an intelligent TV and enabling an active user engaging in various aspects of social networking on the intelligent TV, including searching for updates from social networks [that implies receiving and visual representation of social postings on the intelligent TV).

Since none of the special technical features of the Group I-XII inventions are found in more than one of the inventions, unity of invention is lacking.

# PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: TADD F. WISON
SHERIDAN ROSS P.C.
1560 BROADWAY
SUITE 1200
DENVER, CO 80202

# PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

| | |
|---|---|
| Date of mailing *(day/month/year)* | 17 APR 2014 |
| Applicant's or agent's file reference<br>6583-434-PCT | **FOR FURTHER ACTION**<br>See paragraph 2 below |

| International application No. | International filing date *(day/month/year)* | Priority date *(day/month/year)* |
|---|---|---|
| PCT/US2013/055342 | 16 August 2013 | 17 August 2012 |

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H04N 5/445 (2014.01)
USPC - 725/56

Applicant FLEXTRONICS AP, LLC

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

| Name and mailing address of the ISA/US | Date of completion of this opinion | Authorized officer: |
|---|---|---|
| Mail Stop PCT, Attn: ISA/US<br>Commissioner for Patents<br>P.O. Box 1450, Alexandria, Virginia 22313-1450<br>Facsimile No. 571-273-3201 | 09 April 2014 | Blaine R. Copenheaver<br>PCT Helpdesk: 571-272-4300<br>PCT OSP: 571-272-7774 |

Form PCT/ISA/237 (cover sheet) (July 2011)

**WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2013/055342

**Box No. I Basis of this opinion**

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

   ☐ on paper

   ☐ in electronic form

   b. (time)

   ☐ in the international application as filed

   ☐ together with the international application in electronic form

   ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/055342

**Box No. IV Lack of unity of invention**

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the appicable time limit:

   ☐ paid additional fees

   ☐ paid additional fees under protest and, where applicable, the protest fee

   ☐ paid additional fees under protest but the applicable protest fee was not paid

   ☒ not paid additional fees

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

   ☐ complied with

   ☒ not complied with for the following reasons:

See Supplemental Box

4. Consequently, this opinion has been established in respect of the following parts of the international application:

   ☐ all parts

   ☒ the parts relating to claims Nos. 1-2

Form PCT/ISA/237 (Box No. IV) (July 2011)

**WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2013/055342

**Box No. V** **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

| | | | |
|---|---|---|---|
| Novelty (N) | Claims | None | YES |
| | Claims | 1, 2 | NO |
| Inventive step (IS) | Claims | None | YES |
| | Claims | 1, 2 | NO |
| Industrial applicability (IA) | Claims | 1, 2 | YES |
| | Claims | None | NO |

2. Citations and explanations:

Claims 1-2 lack novelty under PCT Article 33(2) as being anticipated by Wetzer et al., hereinafter referred to as Wetzer.

Regarding claims 1, 2, Wetzer discloses a method for providing an indication of a linkage to a poster of social media [claim 1] (further fig.29 F shows a gettogether session interface wherein participants who accept the invitation join a session, that allows participants to chat with each other through the text chat interface, further the interface shows messages 2927 between users, wherein a message from a first user is displayed with the name of that user i.e. "Jennifer Coulter" [first visual indicia indicate the linkage between a first poster of the first posting] and a message from a second user is displayed with the name of that user i.e. "Mark Daniels", para 0209, 0210), the method comprising, and an intelligent television (user device 118 (e.g., an intelligent TV) is a user platform operated by a user to facilitate display of and interaction with secure user-centric information, Fig 1, para 0050, 0059) system [claim 2] comprising: a memory operable to store social media data; a processor in communication with the memory, the processor operable to (user devices 118 serve as a platform operated by a user 116 to facilitate display and interaction, the user devices 118 of user 116 includes a portable device/tablet and an intelligent television, mobile device, para 0059; fig.22 shows an alert notification appears in the display of the tablet device 1310, indicating that a friend is also watching Fringe [an intelligent television used to view social media notifications is interpreted as stores social media data with a processor in communication to a memory], para 0014, 0195): receiving, by a processor of an intelligent television (user device 118 (e.g., an intelligent TV) is a user platform operated by a user to facilitate display of and interaction with secure user-centric information, Fig 1, para 0050, 0059), two or more social media postings (user devices 118 serve as a platform operated by a user 116 to facilitate display and interaction, the user devices 118 of user 116 includes a portable device/tablet and an intelligent television, mobile device, para 0059; fig.29A shows a user 116 watching a show on TV 1340 using a tablet device 1310, further fig.29C shows an interface where a user invites other users/participants who are contacts of the user 116, para 0202, 0203; further fig.29 F shows a gettogether session interface wherein participants who accept the invitation join a session, that allows participants to chat with each other through the text chat interface, further the interface shows messages 2927 between users "Jennifer Coulter" and "Mark Daniels" [two or more social media postings] , para 0209, 0210); execute a user interface application in communication with the social media application, the user interface application operable to [claim 2] (further fig.29 F shows a gettogether session interface wherein participants who accept the invitation join a session, that allows participants to chat with each other through the text chat interface, further the interface shows messages 2927 between users "Jennifer Coulter" and "Mark Daniels" [two or more social media postings] , para 0209, 0210): providing a visual representation of the social media postings (further fig.29 F shows a gettogether session interface wherein participants who accept the invitation join a session, that allows participants to chat with each other through the text chat interface, further the interface shows messages 2927 between users "Jennifer Coulter" and "Mark Daniels" [providing a visual representation of two or more social media postings] , para 0209, 0210); in the visual representation, providing a first visual indicia for a first posting and a second visual indicia for a second posting (further fig.29 F shows a gettogether session interface wherein participants who accept the invitation join a session, that allows participants to chat with each other through the text chat interface, further the interface shows messages 2927 between users, wherein a message from a first user is displayed with the name of that user i.e. "Jennifer Coulter" [first visual indicia for a first posting] and a message from a second user is displayed with the name of that user i.e. "Mark Daniels" [second visual indicia for a second posting], para 0209, 0210); and wherein the first and second visual indicia are different and indicate the linkage between a first poster of the first posting or a second poster of the second posting (further fig.29 F shows a gettogether session interface wherein participants who accept the invitation join a session, that allows participants to chat with each other through the text chat interface, further the interface shows messages 2927 between users, wherein a message from a first user is displayed with the name of that user i.e. "Jennifer Coulter" [first visual indicia indicate the linkage between a first poster of the first posting] and a message from a second user is displayed with the name of that user i.e. "Mark Daniels" [second visual indicia different from first visual indicia], the chat session messages between the users provides the users to communicate with each other by sending texts, pictures and videos, para 0209, 0210).

Claims 1-2 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/055342

**Supplemental Box**

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claims 1-2, drawn to a method for providing an indication of a linkage to a poster of social media, an intelligent television comprising: providing a first visual indicia for a first posting and a second visual indicia for a second posting wherein the first and second visual indicia are different and indicate the linkage between a first poster of the first posting or a second poster of the second posting.
Group II, claims 3-4, drawn to a method for providing a rooting section for an intelligent television, comprising: based on a received selection of sporting content, providing a first visual representation of one or more of the social media postings associated with a first team affiliation and providing a second visual representation of one or more of the social media postings associated with a second team affiliation.
Group III, claims 5-6, drawn to a method for providing social media on an intelligent television, comprising: identifying a user of the intelligent television and registering the user with one or more social media sites, and providing social media posting associated with the user on an user interface of the intelligent television.
Group IV, claims 7-8, drawn to a method for providing social media information on an intelligent television, comprising: determining the availability of social media for the selected programming and providing a visual representation of one or more of the social media postings associated with selected programming.
Group V, claims 9-10, drawn to a method for providing social media information on an intelligent television, comprising: receiving a second selection to change a volume of social media, and changing an amount of social media presented in response to the second selection.
Group VI, claims 11-12, drawn to a method for providing social media information on an intelligent television, the comprising: the intelligent television discovering a device also connected to the network, connecting the device to the intelligent television, a user pushes a social media message from the device, and displaying the social media message on the intelligent television.
Group VII, claims 13-14, drawn to a method for providing media on an intelligent television, comprising: retrieving available media from one or more social media sources and from one or more local sources and presenting together media from both one or more social media sources and one or more local sources.
Group VIII, claims 15-16, drawn to a method for providing social media on an intelligent television, comprising: receiving a programming change input and providing determining the type of programming changing input one of two or more user interfaces that include a presentation of social media information.
Group IX, claims 17-18, drawn to a method for providing social media on an intelligent television, comprising: pausing the media playback on the intelligent television while the media continues to be presented in real-time and during the pause, receiving one or more social media postings associated with the media, and storing the one or more social media postings in a time sequence correlated to the media presentation.
Group X, claims 19-20, drawn to a method for providing social media on an intelligent television, comprising: receiving a selection of a control device on a remote control associated with an intelligent television and determining whether the selection is a first type or a second type, and providing a first user interface at the bottom of a display of the intelligent television wherein the first user interface provides at least one social media posting if the selection is a first type, and providing a second user interface at the top of the display of the intelligent television, wherein the second user interface provides information associated with content being presented in the display if the selection is a second type.
Group XI, claims 21-22, drawn to a method for publishing social media by an intelligent television, the comprising: receiving a selection of a control device associated with the intelligent television and automatically publishing information about the content to a social media site based on the selection.
Group XII, claim 23-24, drawn to a method for providing social media on an intelligent television, comprising: determining a state associated with a social media posting and providing a user interface for the social media application, having the social media posting displayed based on the state.

The inventions listed as Groups I-XII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the special technical feature of the Group I invention: providing a first visual indicia for a first posting and a second visual indicia for a second posting wherein the first and second visual indicia are different and indicate the linkage between a first poster of the first posting or a second poster of the second posting as claimed therein is not present in the invention of Groups II-XII. The special technical feature of the Group II invention: based on a received selection of sporting content, providing a first visual representation of one or more of the social media postings associated with a first team affiliation and providing a second visual representation of one or more of the social media postings associated with a second team affiliation as claimed therein is not present in the invention of Groups I, III-XII. The special technical feature of the Group III invention: identifying a user of the intelligent television and registering the user with one or more social media sites, and providing social media posting associated with the user on an user interface of the intelligent television as claimed therein is not present in the invention of Groups I, II, IV-XII. The special technical feature of the Group IV invention: determining the availability of social media for the selected programming and providing a visual representation of one or more of the social media postings associated with selected programming as claimed therein is not present in the invention of Groups I, II, III or V-XII. The special technical feature of the Group V invention: receiving a second selection to change a volume of social media, and changing an amount of social media presented in response to the second selection as claimed therein is not present in the invention of Groups I-IV, VI-XII. The special technical feature of the Group VI invention: the intelligent television discovering a device also connected to the network, connecting the device to the intelligent television, a user pushes a social media message from the device, and displaying the social media message on the intelligent television as claimed therein is not present in the invention of Groups I-V, VII-XII. The special technical feature of the Group VII invention: retrieving available media from one or more social media sources and from one or more local sources and presenting together media from both one or more social media sources and one or more local sources as claimed therein is not present in the invention of Groups I-VI or VIII-XII. The special technical feature of the Group VIII invention: receiving a programming change input and providing determining the type of programming changing input one of two or more user interfaces that include a presentation of social media information as claimed therein is not present in the invention of Groups I-VII or IX-XII.

[See Continuation on Next Extra Sheet]

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/055342

**Supplemental Box**

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

The special technical feature of the Group IX invention: pausing the media playback on the intelligent television while the media continues to be presented in real-time and during the pause, receiving one or more social media postings associated with the media, and storing the one or more social media postings in a time sequence correlated to the media presentation as claimed therein is not present in the invention of Groups I-VIII or X-XII. The special technical feature of the Group X invention: receiving a selection of a control device on a remote control associated with an intelligent television and determining whether the selection is a first type or a second type, and providing a first user interface at the bottom of a display of the intelligent television wherein the first user interface provides at least one social media posting if the selection is a first type, and providing a second user interface at the top of the display of the intelligent television, wherein the second user interface provides information associated with content being presented in the display if the selection is a second type as claimed therein is not present in the invention of Groups I-IX or XI-XII. The special technical feature of the Group XI invention: receiving a selection of a control device associated with the intelligent television and automatically publishing information about the content to a social media site based on the selection as claimed therein is not present in the invention of Groups I-X or XII. The special technical feature of the Group XII invention: determining a state associated with a social media posting and providing a user interface for the social media application, having the social media posting displayed based on the state as claimed therein is not present in the invention of Groups I-XI.

Groups I- XII lack unity of invention because even though the inventions of these groups require the technical feature of visual representation of social media posting on an intelligent TV, this technical feature is not a special technical feature as it does not make a contribution over the prior art in view of US 2012/0154449 A1 (RAMAGEM et al) 21 June 2012 (21.06.2012).

US 2012/0154449 A1 to RAMAGEM et al discloses a visual whiteboard as an application or component for operation on a smart TV (para. 0007) and social networking techniques, devices, systems and software which can be used in conjunction with social networks associated with a television (para 0002) and teaches visual representation of social media posting on an intelligent TV (content identifiers or other group information can be posted to the visual whiteboard by the authorized users for subsequent display on the corresponding smart [intelligent] TV, para 0007; receiving media items from various media sources and service providers, para 0021; mechanism for direct sharing of information via the social graph ...finding a funny cat video posted on a large site like Digg, para 0038; that a content identifier (hyperlink to a video), and various notes posted to the visual whiteboard by authorized group members, para 0055; see also para 0030, 0031 for using the visual whiteboard operating on an intelligent TV and enabling an active user engaging in various aspects of social networking on the intelligent TV, including searching for updates from social networks [that implies receiving and visual representation of social postings on the intelligent TV).

Since none of the special technical features of the Group I-XII inventions are found in more than one of the inventions, unity of invention is lacking.

Amy

# PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: Kendria E. Pearson
Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, Colorado 80202
United States of America

# PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

| | |
|---|---|
| Applicant's or agent's file reference<br>6583-464-PCT | Date of mailing *(day/month/year)* 10 MAR 2014<br>**FOR FURTHER ACTION** See paragraphs 1 and 4 below |
| International application No.<br>PCT/US13/55592 | International filing date *(day/month/year)* 19 August 2013 (19.08.2013) |
| Applicant Flextronics AP, LLC | |

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   **Filing of amendments and statement under Article 19:**
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   **When?** The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   **Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   **For more detailed instructions**, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

   For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

| | |
|---|---|
| Name and mailing address of the ISA/<br>Mail Stop PCT, Attn: ISA/US<br>Commissioner for Patents<br>P.O. Box 1450, Alexandria, Virginia 22313-1450<br>Facsimile No. 571-273-3201 | Authorized officer<br>Shane Thomas<br>PCT Helpdesk: 571-272-4300<br>Telephone No. PCT OSP: 571-272-7774 |

Form PCT/ISA/220 (July 2010)

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| Applicant's or agent's file reference<br>6583-464-PCT | **FOR FURTHER ACTION** | see Form PCT/ISA/220<br>as well as, where applicable, item 5 below. |
|---|---|---|
| International application No.<br>PCT/US13/55592 | International filing date *(day/month/year)*<br>19 August 2013 (19.08.2013) | (Earliest) Priority Date *(day/month/year)*<br>17 August 2012 (17.08.2012) |
| Applicant<br>Flextronics AP, LLC | | |

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

USER INTERFACE FOR AN INTELLIGENT TELEVISION

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 14

☐ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☒ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/US13/55592

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 3/0481 (2014.01)
USPC - 715/848
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(8) Classification(s): H04N 21/47; G06F 3/01, 3/0481 (2014.01)
USPC Classification(s): 725/811, 838, 848

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)
MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C,B, DE-A, DE-T, DE-U, GB-A, FR-A); ProQuest; IEEE; Google/Google Scholar

Keywords: GUI, Fibonacci, Timeline, Grid, Thumbnail, Smart TV, Favorite, Icon, Select

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X<br>---<br>Y | US 2011/0131506 A1, (CALLISENDORFF, E.), 02 June 2011; figures 5a-5d, paragraphs [0025], [0032], [0047], [0077], [0091], [0110], [0112], [0113], [0120] | 1<br>---<br>2-20 |
| Y | US 2011/0252446 A1, (JEONG, Y. et al.), 13 October 2011; Claim 20, figures [0020], [0145], [0163], [0444] | 2-5, 13-14, 17-20 |
| Y | US 2010/0241962 A1, (PETERSON, T. et al.), 23 September 2010; figure 7, paragraphs [0011], [0037], [0039], [0060] | 3-5, 12-16, 18 |
| Y | US 2005/0091596 A1, (ANTHONY, C. et al.), 28 April 2005; paragraphs [0042], [0043], [0044], [0046], [0047], [0063] | 6-11, 15, 19 |

☐ Further documents are listed in the continuation of Box C. ☐

* 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 application or patent but 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 | Date of mailing of the international search report |
|---|---|
| 05 February 2014 (05.02.2014) | 10 MAR 2014 |

| Name and mailing address of the ISA/US | Authorized officer: |
|---|---|
| Mail Stop PCT, Attn: ISA/US, Commissioner for Patents<br>P.O. Box 1450, Alexandria, Virginia 22313-1450<br>Facsimile No. 571-273-3201 | Shane Thomas<br>PCT Helpdesk: 571-272-4300<br>PCT OSP: 571-272-7774 |

# PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: Kendria E. Pearson
Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, Colorado 80202
United States of America

# PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

| | |
|---|---|
| Date of mailing *(day/month/year)* | 10 MAR 2014 |
| Applicant's or agent's file reference<br>6583-464-PCT | **FOR FURTHER ACTION**<br>See paragraph 2 below |

| International application No. | International filing date *(day/month/year)* | Priority date *(day/month/year)* |
|---|---|---|
| PCT/US13/55592 | 19 August 2013 (19.08.2013) | 17 August 2012 (17.08.2012) |

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 3/0481 (2014.01)
USPC - 715/848

Applicant Flextronics AP, LLC

1. This opinion contains indications relating to the following items:

- [X] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [X] Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [ ] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Fom PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

| Name and mailing address of the ISA/US | Date of completion of this opinion | Authorized officer: |
|---|---|---|
| Mail Stop PCT, Attn: ISA/US<br>Commissioner for Patents<br>P.O. Box 1450, Alexandria, Virginia 22313-1450<br>Facsimile No. 571-273-3201 | 05 February 2014 (05.02.2014) | Shane Thomas<br>PCT Helpdesk: 571-272-4300<br>PCT OSP: 571-272-7774 |

Form PCT/ISA/237 (cover sheet) (July 2011)

**WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US13/55592

**Box No. I Basis of this opinion**

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

**WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US13/55592

**Box No. V** **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

| | | | |
|---|---|---|---|
| Novelty (N) | Claims | 2-20 | YES |
| | Claims | 1 | NO |
| Inventive step (IS) | Claims | None | YES |
| | Claims | 1-20 | NO |
| Industrial applicability (IA) | Claims | 1-20 | YES |
| | Claims | None | NO |

2. Citations and explanations:

Claims 1 lacks novelty under PCT Article 33(2) as being anticipated by US 2011/0131506 A1 (Calissendorff).

As to claim1, Calissendorff discloses a method for providing multiple types of user interfaces in an intelligent television (a method to dynamically adapt a user interface to the available context in a smart TV (method for providing multiple types of user interfaces in an intelligent television), paragraph [0025], [0120]), the method comprising: receiving a selection for the user interface (the presentation model locates the command associated with the action (receiving a selection for the user interface), paragraph [0077]), wherein the user interface provides content (the presentation model uses the available content to generate the interface for the user (wherein the user interface provides content), paragraph [0091]); determining a type of content to provide (content is determined by which available items fulfill the criteria of a presentation group (determining a type of content to provide), paragraph [0047]); determining a type of user interface based on the type of content to provide, wherein a first type of content corresponds to a first user interface (available content with the known context is used to generate the user interface (determining a type of user interface based on the type of content to provide, wherein the first type of content corresponds to a first user interface), paragraph [0072]), a second type of content corresponds to a second user interface (when a change in context is detected, the available content is used to generate a new user interface (a second type of content corresponds to a second user interface), paragraphs [0110], [0112]), and a third type of content corresponds to a third user interface (when the user moves into a different context B or C, the interface will update to the new context (and a third type of content corresponds to a third user interface), figures 5a-5d, paragraph [0058]); providing the first user interface for the first type of content (presenting the user interface of content (providing the first user interface for the first type of content), paragraph [0073]); providing the second user interface for the second type of content (presenting the user interface of the new content (providing the second user interface for the second type of content), paragraph [0113]); and providing the third user interface for the third type of content (the presentation model ensures that each item is presented (providing the third user interface for the third type of content), paragraph [0032]).

Claims 2, 17 and 20 lack an inventive step under PCT Article 33(3) as being obvious over Calissendorff in view of US 2011/0252466 A1 to Jeong et al. (hereinafter "Jeong").

As to claim 2, Calissendorff discloses the method as defined in claim 1. However, Calissendorff fails to disclose a method wherein the first type of content is for a selection main screen with a limited amount of content. Jeong discloses a method wherein the first type of content is for a selection main screen with a limited amount of content (the home screen (selection main screen) may further include an application menu with at least one application that can be executed (wherein the first type of content is for a selection main screen with a limited amount of content), paragraph [0145]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the method of Calissendorff to include wherein the first type of content is for a selection main screen with a limited amount of content, as taught by Jeong, for the benefit of presenting a main screen that is simple to navigate.

-***-Continued Within the Next Supplemental Box-***-

**Supplemental Box**

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
-***-Continued from Box V: Citations and Explanations-***-

As to claim 17, Calissendorff discloses a method comprising: receive a selection for the user interface (the presentation model locates the command associated with the action (receive a selection for the user interface), paragraph [0077]), wherein the user interface provides content (the presentation model uses the available content to generate the interface for the user (wherein the user interface provides content), paragraph [0091]); determine a type of content to provide (content is determined by which available items fulfill the criteria of a presentation group (determine a type of content to provide), paragraph [0047]); determine a type of user interface based on the type of content to provide, wherein a first type of content corresponds to a first user interface (available content with the known context is used to generate the user interface (determine a type of user interface based on the type of content to provide, wherein the first type of content corresponds to a first user interface), paragraph [0072]), a second type of content corresponds to a second user interface (when a change in context is detected, the available content is used to generate a new user interface (a second type of content corresponds to a second user interface), paragraphs [0110], [0112]), and a third type of content corresponds to a third user interface (when the user moves into a different context B or C, the interface will update to the new context (and a third type of content corresponds to a third user interface), figures 5a-5d, paragraph [0058]); provide the first user interface for the first type of content (presenting the user interface of content (provide the first user interface for the first type of content), paragraph [0073]); provide the second user interface for the second type of content (presenting the user interface of the new content (provide the second user interface for the second type of content), paragraph [0113]); provide the third user interface for the third type of content (the presentation model ensures that each item is presented (provide the third user interface for the third type of content), paragraph [0032]). However, Calissendorff fails to disclose a method comprising: computer readable medium having stored thereon processor executable instructions that cause a computing system to execute a method, the instructions comprising: instructions to. Jeong discloses a method comprising: computer readable medium having stored thereon processor executable instructions that cause a computing system to execute a method, the instructions comprising: instructions to (a non-transitory computer readable medium including instructions configured to perform the display method (computer readable medium having stored thereon processor executable instructions that cause a computing system to execute a method, the instructions comprising: instructions to), claim 20). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the method of Calissendorff to include computer readable medium having stored thereon processor executable instructions that cause a computing system to execute a method, the instructions comprising: instructions to, as taught by Jeong, for the benefit of executing instructions to perform the method.

As to claim 20, Calissendorff and Jeong disclose the computer readable medium as defined in claim 17. Calissendorff further discloses the computer readable medium wherein the third type of content is for a collection of content, and wherein the third user interface is for a linear view (the presentation group (wherein the third type of content is for a collection of content) is in a linear view (wherein the third user interface is for a linear view), figure 3d).

Claims 12 and 16 lack an inventive step under PCT Article 33(3) as being obvious over Calissendorff in view of US 2010/0241962 A1 to Peterson et al. (hereinafter "Peterson").

As to claim 12, Calissendorff discloses an intelligent television system comprising (smart TV controller (intelligent television system), paragraph [0114]): execute a statistics subservice (the presentation model includes services to present content to users based on user preferences (execute a statistics subservice), paragraph [0033]); execute an user interface application (dynamically adapt a user interface to the available context (execute an user interface application), paragraph [0120]): receive a selection for the user interface (the presentation model locates the command associated with the action (receive a selection for the user interface), paragraph [0077]), wherein the user interface provides content (the presentation model uses the available content to generate the interface for the user (wherein the user interface provides content), paragraph [0091]); determine a type of content to provide (content is determined by which available items fulfill the criteria of a presentation group (determine a type of content to provide), paragraph [0047]); determine a type of user interface based on the type of content to provide, wherein a first type of content corresponds to a first user interface (available content with the known context is used to generate the user interface (determine a type of user interface based on the type of content to provide, wherein the first type of content corresponds to a first user interface), paragraph [0072]), a second type of content corresponds to a second user interface (when a change in context is detected, the available content is used to generate a new user interface (a second type of content corresponds to a second user interface), paragraphs [0110], [0112]), and a third type of content corresponds to a third user interface (when the user moves into a different context B or C, the interface will update to the new context (and a third type of content corresponds to a third user interface), figures 5a-5d, paragraph [0058]); provide the first user interface for the first type of content (presenting the user interface of content (provide the first user interface for the first type of content), paragraph [0073]); provide the second user interface for the second type of content (presenting the user interface of the new content (provide the second user interface for the second type of content), paragraph [0113]); and provide the third user interface for the third type of content (the presentation model ensures that each item is presented (provide the third user interface for the third type of content), paragraph [0032]). However, Calissendorff fails to disclose a system comprising: a memory operable to store social media data; a processor in communication with the memory, the processor operable to execute a statistics subservice operable to: execute an user interface application operable to. Peterson discloses a system comprising: a memory operable to store social media data (memory can store supplemental content such as social network data (a memory operable to store social media data), paragraphs [0037], [0039]); a processor in communication with the memory, the processor operable to: execute an user interface application operable to (one or more processors with a memory element (a processor in communication with the memory), the processor executes the media delivery system (execute an user interface application operable to), figure 7, paragraph [0060]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the system of Calissendorff to include a memory operable to store social media data; a processor in communication with the memory, the processor operable to execute a statistics subservice operable to: execute an user interface application operable to, as taught by Peterson, for the benefit of using stored social media data to perform metrics for organizing content display.

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As to claim 16, Calissendorff and Peterson disclose the intelligent television system as defined in claim 12. Calissendorff further discloses a system wherein the third type of content is for a collection of content, and wherein the third user interface is for a linear view (the presentation group (wherein the third type of content is for a collection of content) is in a linear view (wherein the third user interface is for a linear view), figure 3d).

Claims 3-5 and 18 lack an inventive step under PCT Article 33(3) as being obvious over Calissendorff in view of Jeong, and further in view of US 2010/0241962 A1 to Peterson et al. (hereinafter "Peterson").

As to claim 3, Calissendorff and Jeong disclose the method as defined in claim 2. However, Calissendorff fails to disclose a method wherein the first user interface is for at least one of a grid view, a Fibonacci view, and a cluster view. Peterson discloses a method wherein the first user interface is for at least one of a grid view, a Fibonacci view, and a cluster view (the means of displaying can be presented as a Fibonacci spiral (wherein the first user interface is a Fibonacci view), paragraph [0043]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the method of Calissendorff to include wherein the first user interface is for at least one of a grid view, a Fibonacci view, and a cluster view, as taught by Peterson, for the benefit of presenting a Fibonacci view giving the user more selectable options.

As to claim 4, the combination of Calissendorff, Jeong, and Peterson disclose the method as defined in claim 3. However, Calissendorff fails to disclose a method wherein the Fibonacci view provides selectable content thumbnails arranged in a Fibonacci spiral. Peterson discloses a method wherein the Fibonacci view provides selectable content thumbnails arranged in a Fibonacci spiral (content thumbnails can be presented in a Fibonacci spiral (the Fibonacci view provides selectable content thumbnails arranged in a Fibonacci spiral), paragraph [0011]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the method of Calissendorff to include wherein the Fibonacci view provides selectable content thumbnails arranged in a Fibonacci spiral, as taught by Peterson, for the benefit of presenting a Fibonacci view giving the user more selectable options.

As to claim 5, the combination of Calissendorff, Jeong, and Peterson disclose the method as defined in claim 4. However, Calissendorff fails to disclose a method wherein the thumbnails are arranged in the Fibonacci spiral based on a characteristic of the content associated with the thumbnail, and wherein the characteristic is one or more of an amount of content, a most viewed statistic, a newest statistic, or a most favorite statistic. Peterson discloses a method wherein the thumbnails are arranged in a Fibonacci spiral (thumbnails can be presented in a Fibonacci spiral (wherein thumbnails are arranged in a Fibonacci spiral), paragraph [0011]). Further, Jeong discloses a method wherein the arrangement is based on a characteristic of the content associated with the thumbnail (the application menu of thumbnails may be arranged based on characteristics (wherein the arrangement is based on a characteristic of the content associated with the thumbnail), paragraphs [0163], [0444]), and wherein the characteristic is a most favorite statistic (thumbnails may be arranged by applications most frequently used by the user (wherein the characteristic is a most favorite statistic), paragraph [0444]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the method of Calissendorff to include wherein the thumbnails are arranged in a Fibonacci spiral, as taught by Peterson, for the benefit of giving the user more selectable options. Further, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the method of Calissendorff to include wherein the characteristic is a most favorite statistic, as taught by Jeong, for the benefit of presenting thumbnails in a preferred order.

As to claim 18, Calissendorff and Jeong disclose the computer readable medium as defined in claim 17. However, Calissendorff fails to disclose a computer readable medium wherein first type of content is for a selection main screen with a limited amount of content, and wherein the first user interface is for at least one of a grid view, a Fibonacci view, and a cluster view. Jeong discloses a computer readable medium wherein first type of content is for a selection main screen with a limited amount of content (the home screen (selection main screen) may further include an application menu with at least one application that can be executed (wherein the first type of content is for a selection main screen with a limited amount of content), paragraph [0145]). Further, Peterson discloses a computer readable medium wherein the first user interface is for at least one of a grid view, a Fibonacci view, and a cluster view (the means of displaying can be presented as a Fibonacci spiral (wherein the first user interface is a Fibonacci view), paragraph [0043]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the system of Calissendorff to include wherein first type of content is for a selection main screen with a limited amount of content, as taught by Jeong, for the benefit of presenting a main screen that is simple for the user to navigate. Further, It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the system of Calissendorff to include wherein the first user interface is for at least one of a grid view, a Fibonacci view, and a cluster view, as taught by Peterson, for the benefit of using a Fibonacci view to present more selectable options to the user.

Claims 6-11 lack an inventive step under PCT Article 33(3) as being obvious over Calissendorff in view of US 2005/0091596 A1 to Anthony et al. (hereinafter "Anthony").

As to claim 6, Calissendorff discloses the method as defined in claim 1. However, Calissendorff fails to disclose a method wherein the second type of content is for content associated with time. Anthony discloses a method wherein the second type of content is for content associated with time (the area displayed to the user is enough in detail for the user to discern the timeline content (wherein the second type of content is for content associated with time), paragraph [0063]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the method of Calissendorff to include wherein the second type of content is for content associated with time, as taught by Anthony, for the benefit of using a time parameter for organizing content.

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As to claim 7, Calissendorff and Anthony disclose the method as defined in claim 6. However, Calissendorff fails to disclose a method wherein the second user interface is a timeline view. Anthony discloses a method wherein the second user interface is a timeline view (a dynamic timeline view allows a user to view a set of items arranged chronologically (is a timeline view) and presented in a GUI environment (wherein the second user interface), paragraph [0043]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the method of Calissendorff to include wherein the second user interface is a timeline view, as taught by Anthony, for the benefit of presenting the content in a timeline view to a user.

As to claim 8, Calissendorff and Anthony disclose the method as defined in claim 7. However, Calissendorff fails to disclose a method wherein the timeline view provides selectable content thumbnails arranged in timeline from oldest content at a first side of the timeline view to newest content at a second side of the timeline view. Anthony discloses a method wherein the timeline view provides selectable content thumbnails arranged in timeline from oldest content at a first side of the timeline view to newest content at a second side of the timeline view (the timeline view provides thumbnail icons that will open when the user double clicks (wherein the timeline view provides selectable content thumbnails) arranged in a chronological manner (arranged in timeline from oldest content at a first side of the timeline view to newest content at a second side of the timeline view), paragraphs [0044], [0046], [0047]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the method of Calissendorff to include wherein the timeline view provides selectable content thumbnails arranged in timeline from oldest content at a first side of the timeline view to newest content at a second side of the timeline view, as taught by Anthony, for the benefit of presenting a chronological view of content to a user.

As to claim 9, Calissendorff and Anthony disclose the method as defined in claim 8. However, Calissendorff fails to disclose a method wherein the timeline view includes a demarcation to indicate a change in date to which the content is associated. Anthony discloses a method wherein the timeline view includes a demarcation to indicate a change in date to which the content is associated (items may be grouped in chronological order (the timeline view includes a demarcation) in a logical timeline that may include various time intervals (to indicated a change in date to which the content is associated), paragraph [0042]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the method of Calissendorff to include wherein the timeline view includes a demarcation to indicate a change in date to which the content is associated, as taught by Anthony, for the benefit of showing a user interface that clearly indicates a date change of a timeline view.

As to claim 10, Calissendorff discloses the method as defined in claim 1. However, Calissendorff fails to disclose a method wherein the third type of content is for a collection of content. Anthony discloses a method wherein the third type of content is for a collection of content (items may be stored in logical groupings such as virtual folders or stacks (wherein the third type of content is for a collection of content), paragraph [0047]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the method of Calissendorff to include wherein the third type of content is for a collection of content, as taught by Anthony, for the benefit of grouping content for easier viewing for the user.

As to claim 11, Calissendorff and Anthony disclose the method as defined in claim 10. Calisendorff further discloses a method wherein the third user interface is for a linear view (the presentation group is in a linear view (wherein the third user interface is for a linear view), figure 3d). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the method of Calissendorff to include wherein the third user interface is for a linear view, as taught by Anthony, for the benefit of presenting a linear view in a user interface.

Claims 13-14 lack an inventive step under PCT Article 33(3) as being obvious over Calissendorff in view of Peterson, and further in view of Jeong.

As to claim 13, Calissendorff and Peterson disclose the intelligent television system as defined in claim 12. However, Calissendorff fails to disclose a system wherein first type of content is for a selection main screen with a limited amount of content, and wherein the first user interface is for at least one of a grid view, a Fibonacci view, and a cluster view. Jeong discloses a system wherein first type of content is for a selection main screen with a limited amount of content (the home screen (selection main screen) may further include an application menu with at least one application that can be executed (wherein the first type of content is for a selection main screen with a limited amount of content), paragraph [0145]). Further, Peterson discloses a system wherein the first user interface is for at least one of a grid view, a Fibonacci view, and a cluster view (the means of displaying can be presented as a Fibonacci spiral (wherein the first user interface is a Fibonacci view), paragraph [0043]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the system of Calissendorff to include wherein first type of content is for a selection main screen with a limited amount of content, as taught by Jeong, for the benefit of presenting a main screen that is simple for the user to navigate. Further, It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the system of Calissendorff to include wherein the first user interface is for at least one of a grid view, a Fibonacci view, and a cluster view, as taught by Peterson, for the benefit of using a Fibonacci view to present more selectable options to the user.

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As to claim 14, the combination of Calissendorff, Jeong, and Peterson disclose the intelligent television system as defined in claim 13. However, Calissendorff fails to disclose a system wherein the first user interface is a Fibonacci view, wherein the Fibonacci view provides selectable content thumbnails arranged in a Fibonacci spiral, wherein the thumbnails are arranged in the Fibonacci spiral based on a characteristic of the content associated with the thumbnail, and wherein the characteristic is one or more of an amount of content, a most viewed statistic, a newest statistic, or a most favorite statistic. Peterson discloses a system wherein the first user interface is a Fibonacci view (content can be presented in a Fibonacci spiral (wherein the first user interface is a Fibonacci view), paragraph [0011]), wherein the Fibonacci view provides selectable content thumbnails arranged in a Fibonacci spiral (content (thumbnails can be presented in a Fibonacci spiral (the Fibonacci view provides selectable content thumbnails arranged in a Fibonacci spiral), paragraph [0011]), wherein the thumbnails are arranged in the Fibonacci spiral (thumbnails can be presented in a Fibonacci spiral (wherein the thumbnails are arranged in a Fibonacci spiral), paragraph [0011]). Further, Jeong discloses a system wherein the arrangement is based on a characteristic of the content associated with the thumbnail (the application menu of thumbnails may be arranged based on characteristics (wherein the arrangement is based on a characteristic of the content associated with the thumbnail (paragraphs [0163], [0444]), and wherein the characteristic is a most favorite statistic (thumbnails may be arranged by applications most frequently used by the user (wherein the characteristic is a most favorite statistic), paragraph [0444]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the system of Calissendorff to include wherein the first user interface is a Fibonacci view, wherein the Fibonacci view provides selectable content thumbnails arranged in a Fibonacci spiral, wherein the thumbnails are arranged in the Fibonacci spiral, as taught by Peterson, for the benefit of presenting thumbnails using a Fibonacci spiral to the user. Further, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the system of Calissendorff to include system wherein the arrangement is based on a characteristic of the content associated with the thumbnail, and wherein the characteristic is a most favorite statistic as taught by Jeong, for the benefit of presenting thumbnails to a user based on favorites.

Claim 15 lacks an inventive step under PCT Article 33(3) as being obvious over Calissendorff in view of Peterson, and further in view of Anthony.

As to claim 15, Calissendorff and Peterson disclose the intelligent television system as defined in claim 12. However, Calissendorff fails to disclose a system wherein the second type of content is for content associated with time, wherein the second user interface is a timeline view, wherein the timeline view provides selectable content thumbnails arranged in timeline from oldest content at a first side of the timeline view to newest content at a second side of the timeline view, and wherein the timeline view includes a demarcation to indicate a change in date to which the content is associated. Anthony discloses a system wherein the second type of content is for content associated with time (the area displayed to the user is enough in detail for the user to discern the timeline content (wherein the second type of content is for content associated with time), paragraph [0063]), wherein the second user interface is a timeline view (a dynamic timeline view allows a user to view a set of items arranged chronologically (is a timeline view) and presented in a GUI environment (wherein the second user interface), paragraph [0043]), wherein the timeline view provides selectable content thumbnails arranged in timeline from oldest content at a first side of the timeline view to newest content at a second side of the timeline view (the timeline view provides thumbnail icons that will open when the user double clicks (wherein the timeline view provides selectable content thumbnails) arranged in a chronological manner (arranged in timeline from oldest content at a first side of the timeline view to newest content at a second side of the timeline view), paragraphs [0044], [0046], [0047]), and wherein the timeline view includes a demarcation to indicate a change in date to which the content is associated (items may be grouped in chronological order (the timeline view includes a demarcation) in a logical timeline that may include various time intervals (to indicated a change in date to which the content is associated), paragraph [0042]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the system of Calisssendorff to include wherein the second type of content is for content associated with time, wherein the second user interface is a timeline view, wherein the timeline view provides selectable content thumbnails arranged in timeline from oldest content at a first side of the timeline view to newest content at a second side of the timeline view, and wherein the timeline view includes a demarcation to indicate a change in date to which the content is associated, as taught by Anthony, for the benefit of organizing the display of content in a timeline view.

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Claim 19 lacks an inventive step under PCT Article 33(3) as being obvious over Calissendorff in view of Jeong, and further in view of Anthony.

As to claim 19, Calissendorff and Jeong disclose the computer readable medium as defined in claim 17. However, Calissendorff fails to disclose the computer readable medium wherein the second type of content is for content associated with time, wherein the second user interface is a timeline view, wherein the timeline view provides selectable content thumbnails arranged in timeline from oldest content at a first side of the timeline view to newest content at a second side of the timeline view, and wherein the timeline view includes a demarcation to indicate a change in date to which the content is associated. Anthony discloses a computer readable medium (computer readable medium, claim 21) wherein the second type of content is for content associated with time (the area displayed to the user is enough in detail for the user to discern the timeline content (wherein the second type of content is for content associated with time), paragraph [0063]), wherein the second user interface is a timeline view (a dynamic timeline view allows a user to view a set of items arranged chronologically (is a timeline view) and presented in a GUI environment (wherein the second user interface), paragraph [0043]), wherein the timeline view provides selectable content thumbnails arranged in timeline from oldest content at a first side of the timeline view to newest content at a second side of the timeline view the timeline view provides thumbnail icons that will open when the user double clicks (wherein the timeline view provides selectable content thumbnails) arranged in a chronological manner (arranged in timeline from oldest content at a first side of the timeline view to newest content at a second side of the timeline view), paragraphs [0044], [0046], [0047]), and wherein the timeline view includes a demarcation to indicate a change in date to which the content is associated (items may be grouped in chronological order (the timeline view includes a demarcation) in a logical timeline that may include various time intervals (to indicated a change in date to which the content is associated), paragraph [0042]). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the computer readable medium of Calissendorff to include wherein the second type of content is for content associated with time, wherein the second user interface is a timeline view, wherein the timeline view provides selectable content thumbnails arranged in timeline from oldest content at a first side of the timeline view to newest content at a second side of the timeline view, and wherein the timeline view includes a demarcation to indicate a change in date to which the content is associated, as taught by Anthony, for the benefit of performing the timeline view operations using computer readable medium.

Claims 1-20 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

# Electronic Acknowledgement Receipt

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| **Confirmation Number:** | 7370 |
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| **First Named Inventor/Applicant Name:** | Sanjiv Sirpal |
| **Customer Number:** | 111285 |
| **Filer:** | Douglas W. Swartz/Robert Roe-Pachirat |
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## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
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| **Warnings:** | | | | | |
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| 24 | Non Patent Literature | 6583-498_OA_05-06-2014.pdf | 401800<br>842b992e85d8ecf6084412670fcd2c96de49fbd7 | no | 12 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 25 | Non Patent Literature | 6583-499_OA_04-30-2014.pdf | 357652<br>24c196b3fbdead07de140cc45ea1fee1d327d2a6 | no | 11 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 26 | Non Patent Literature | 6583-500_OA_05-27-2014.pdf | 414649<br>69622a4b0aa546852115e60280ef598eee13fa20 | no | 12 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 27 | Non Patent Literature | 6583-501_OA_06-25-2014.pdf | 284651<br>85a879461322ac3178eb37328a449afac371e972 | no | 9 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 28 | Non Patent Literature | 6583-511_OA_06-25-2014.pdf | 386960<br>1dbcc9147ff873c7849b329c4b680d061b91df42 | no | 13 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 29 | Non Patent Literature | 6583-520_OA_07-09-2014.pdf | 630160<br>42b06f756020de23b17fc48eb7a4201ccddc881a | no | 19 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 30 | Non Patent Literature | 6583-526_OA_07-15-2014.pdf | 307584<br>7a57a9fa2db383092656ae539a054fd7099bf01f | no | 9 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 28520003 | | |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**<u>New Applications Under 35 U.S.C. 111</u>**
**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**<u>National Stage of an International Application under 35 U.S.C. 371</u>**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**<u>New International Application Filed with the USPTO as a Receiving Office</u>**
**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | |
|---|---|---|
| In Re the Application of: | ) | Group Art Unit: 2421 |
| Sanjiv Sirpal | ) | Confirmation No.: 7370 |
| Serial No.: 13/968,665 | ) | Examiner: James R Marandi |
| Filed: August 16, 2013 | ) | SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT |
| Atty. File No.: 6583-488 | ) | |
| Entitled: "Panel User Interface for an Intelligent Television" | ) | *Electronically Submitted* |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

The references cited on attached Form PTO/SB08 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.

☒ Copies of the cited U.S. patents/patent application publications are not enclosed in accordance with 37 C.F.R. § 1.98(a).

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. _____ filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☐ To the best of applicants' belief, the pertinence of the foreign-language references is believed to be summarized in the attached English abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☐ Examiner's attention is drawn to the following related applications:

Serial No. _____ filed _____ (Attorney Ref. No. _____)

Serial No. _____ filed _____ (Attorney Ref. No. _____)

☐ Other:_____

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in the art would refer to or recognize the pertinence of any reference without the benefit of hindsight, nor should an inference be drawn as to the pertinence



**EX. 1002**
**LG Electronics, Inc. / Page 467 of 3394**

of the references based on the order in which they are presented. Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

## FEES

| | |
|---|---|
| ☒ | **37 CFR 1.97(b)**: No fee is believed due in connection with this submission, because the information disclosure statement submitted herewith is satisfied by one of the following conditions ("X" indicates satisfaction):<br>☐ Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or<br>☐ Within three months of the date of entry of the national stage as set forth in § 1.491 in an international application, or<br>☒ Before the mailing date of a first Office Action on the merits, or<br>☐ Before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114.<br>Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970. |
| ☐ | **37 CFR 1.97(c)**: The information disclosure statement transmitted herewith is being filed after all the above conditions (37 CFR 1.97(b)), but before the mailing date of any one of the following conditions:<br>(1) a final action under 37 C.F.R. 1.113, or<br>(2) a notice of allowance under 37 C.F.R. 1.311, or<br>(3) an action that otherwise closes prosecution in the application.<br>This Information Disclosure Statement is accompanied by:<br>☐ A Certification (below) as specified by 37 C.F.R. 1.97(e). Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.<br>OR<br>☐ Please charge Deposit Account 19-1970 in the amount of $180.00 for the fee set forth in 37 C.F.R. 1.17(p) for submission of an information disclosure statement. Please credit any overpayment or charge any underpayment to Deposit Account 19-1970. |
| ☐ | **37 CFR 1.97(d)**: This Information Disclosure Statement is being submitted after the period specified in 37 CFR 1.97(c).<br>☐ This information Disclosure Statement includes a Certification (below) as specified by 37 C.F.R. 1.97(e)<br>AND<br>☐ Applicants hereby requests consideration of the reference(s) disclosed herein. Please charge Deposit Account 19-1970 in the amount of $180.00 under 37 C.F.R. 1.17(p). Please credit any overpayment or charge any underpayment to Deposit Account 19-1970. Election to pay the fee should not be taken as an indication that applicant(s) cannot execute a certification. |



EX. 1002
LG Electronics, Inc. / Page 468 of 3394

**Certification (37 C.F.R. 1.97(e))**
(Applicable only if checked)

☐ The undersigned certifies that:

☐ Each item of information contained in the Information Disclosure Statement submitted herewith was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).

☐ A copy of the communication from the foreign patent office is enclosed.

OR

☐ No item of information contained in the Information Disclosure Statement submitted herewith was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in the Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

SHERIDAN ROSS P.C.

By: /Douglas W. Swartz/
Douglas W. Swartz
Registration No. 37,739
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: July 29, 2014



EX. 1002
LG Electronics, Inc. / Page 469 of 3394

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NUMBER | FILING or 371(c) DATE | GRP ART UNIT | FIL FEE REC'D | ATTY.DOCKET.NO | TOT CLAIMS | IND CLAIMS |
|---|---|---|---|---|---|---|
| 13/968,665 | 08/16/2013 | 2421 | 1740 | 6583-488 | 20 | 3 |

**CONFIRMATION NO. 7370**

**CORRECTED FILING RECEIPT**

111285
Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, CO 80202

Date Mailed: 07/16/2014

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

**Inventor(s)**

Sanjiv Sirpal, Oakville, CANADA;
Mohammed Selim, Oakville, CANADA;
Saulo Correia Dourado, Oakville, CANADA;
Alexander de Paz, Burlington, CANADA;

**Applicant(s)**

Flextronics AP, LLC, San Jose, CA

**Assignment For Published Patent Application**

Flextronics AP, LLC, San Jose, CA

**Power of Attorney:** The patent practitioners associated with Customer Number 111285

**Domestic Priority data as claimed by applicant**

This appln claims benefit of 61/684,672 08/17/2012
and claims benefit of 61/702,650 09/18/2012
and claims benefit of 61/697,710 09/06/2012
and claims benefit of 61/700,182 09/12/2012
and claims benefit of 61/736,692 12/13/2012
and claims benefit of 61/798,821 03/15/2013
and claims benefit of 61/804,942 03/25/2013
and claims benefit of 61/804,998 03/25/2013
and claims benefit of 61/804,971 03/25/2013
and claims benefit of 61/804,990 03/25/2013
and claims benefit of 61/805,003 03/25/2013
and claims benefit of 61/805,053 03/25/2013
and claims benefit of 61/805,030 03/25/2013
and claims benefit of 61/805,027 03/25/2013

and claims benefit of 61/805,042 03/25/2013
and claims benefit of 61/805,038 03/25/2013

**Foreign Applications** for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
*Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.*

**If Required, Foreign Filing License Granted:** 09/04/2013

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/968,665**

**Projected Publication Date:** Not Applicable

**Non-Publication Request:** No

**Early Publication Request:** No

**Title**

PANEL USER INTERFACE FOR AN INTELLIGENT TELEVISION

**Preliminary Class**

725

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** Yes

## PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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## Title 35, United States Code, Section 184

## Title 37, Code of Federal Regulations, 5.11 & 5.15

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The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

**NOT GRANTED**

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

---

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | |
|---|---|
| In Re the Application of: | Group Art Unit: 2421 |
| SIRPAL et al. | Confirmation No.: 7370 |
| Serial No.: 13/968,665 | Examiner: MARANDI, James R. |
| Filed: August 16, 2013 | |
| Atty. File No.: 6583-488 | |
| Entitled: "PANEL USER INTERFACE FOR AN INTELLIGENT TELEVISION" | ***Submitted Via EFS-Web*** |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**STATEMENT FOR TRANSITIONAL APPLICATION AND SUBMISSION OF REPLACEMENT APPLICATION DATA SHEET**

Dear Sir/Madam:

Pursuant to 37 C.F.R. 1.55 or 1.78, applicant states that this application claims priority to or the benefit of an application filed prior to March 16, 2013, but may contain, or may have contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. Thus, submitted herewith is a replacement Application Data Sheet that includes a modified Statement under 37 C.F.R. 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications.

Although Applicant believes that no fees are due in connection with this filing, please charge any fees deemed necessary to Deposit Account No. 19-1970.

Respectfully submitted,
SHERIDAN ROSS P.C.

By: /Tadd F. Wilson/
Tadd F. Wilson
Registration No. 54544
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: July 11, 2014

PTO/AIA/14 (03-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | 6583-488 |
|---|---|---|
| | Application Number | 13/968,665 |
| Title of Invention | PANEL USER INTERFACE FOR AN INTELLIGENT TELEVISION | |

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

## Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

## Inventor Information:

**Inventor 1** Remove

**Legal Name**

| Prefix | Given Name | Middle Name | Family Name | Suffix |
|---|---|---|---|---|
| | Sanjiv | | Sirpal | |

**Residence Information (Select One)** ○ US Residency ◉ Non US Residency ○ Active US Military Service

| City | Oakville | Country of Residence | CA |
|---|---|---|---|

**Mailing Address of Inventor:**

| | | | |
|---|---|---|---|
| **Address 1** | 3264 Stocksbridge Avenue | | |
| **Address 2** | | | |
| **City** | Oakville | **State/Province** | ON |
| **Postal Code** | L6M 0E3 | **Country** | CA |

**Inventor 2** Remove

**Legal Name**

| Prefix | Given Name | Middle Name | Family Name | Suffix |
|---|---|---|---|---|
| | Mohammed | | Selim | |

**Residence Information (Select One)** ○ US Residency ◉ Non US Residency ○ Active US Military Service

| City | Oakville | Country of Residence | CA |
|---|---|---|---|

**Mailing Address of Inventor:**

| | | | |
|---|---|---|---|
| **Address 1** | 2488 Oakhaven Drive | | |
| **Address 2** | | | |
| **City** | Oakville | **State/Province** | ON |
| **Postal Code** | L6M 4B9 | **Country** | CA |

**Inventor 3** Remove

**Legal Name**

PTO/AIA/14 (03-13)
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| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | 6583-488 |
|---|---|---|
| | Application Number | |
| Title of Invention | PANEL USER INTERFACE FOR AN INTELLIGENT TELEVISION | |

| Prefix | Given Name | Middle Name | Family Name | Suffix |
|---|---|---|---|---|
| | Saulo | Correia | Dourado | |

**Residence Information (Select One)** ○ US Residency ◉ Non US Residency ○ Active US Military Service

| City | Oakville | Country of Residence [i] | CA |
|---|---|---|---|

**Mailing Address of Inventor:**

| | | | |
|---|---|---|---|
| **Address 1** | 2420 Ravinebrook Crescent | | |
| **Address 2** | | | |
| **City** | Oakville | **State/Province** | ON |
| **Postal Code** | L6H 6Y2 | **Country** [i] | CA |

**Inventor 4** Remove

**Legal Name**

| Prefix | Given Name | Middle Name | Family Name | Suffix |
|---|---|---|---|---|
| | Alexander | | de Paz | |

**Residence Information (Select One)** ○ US Residency ◉ Non US Residency ○ Active US Military Service

| City | Burlington | Country of Residence [i] | CA |
|---|---|---|---|

**Mailing Address of Inventor:**

| | | | |
|---|---|---|---|
| **Address 1** | 5444 Valleyhigh Drive | | |
| **Address 2** | | | |
| **City** | Burlington | **State/Province** | ON |
| **Postal Code** | L7L 6Z6 | **Country** [i] | CA |

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

## Correspondence Information:

**Enter either Customer Number or complete the Correspondence Information section below.**
**For further information see 37 CFR 1.33(a).**

☐ **An Address is being provided for the correspondence Information of this application.**

| | | | |
|---|---|---|---|
| **Customer Number** | 111285 | | |
| **Email Address** | flexpatents@sheridanross.com | Add Email | Remove Email |

PTO/AIA/14 (03-13)
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| **Application Data Sheet 37 CFR 1.76** | Attorney Docket Number | 6583-488 |
|---|---|---|
| | Application Number | |
| Title of Invention | PANEL USER INTERFACE FOR AN INTELLIGENT TELEVISION | |

## Application Information:

| | | | |
|---|---|---|---|
| **Title of the Invention** | PANEL USER INTERFACE FOR AN INTELLIGENT TELEVISION | | |
| **Attorney Docket Number** | 6583-488 | **Small Entity Status Claimed** ☐ | |
| **Application Type** | Nonprovisional | | |
| **Subject Matter** | Utility | | |
| **Total Number of Drawing Sheets (if any)** | 40 | **Suggested Figure for Publication (if any)** | 20A |

## Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

## Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

| | | | |
|---|---|---|---|
| Please Select One: | ◉ Customer Number | ○ US Patent Practitioner | ○ Limited Recognition (37 CFR 11.9) |
| Customer Number | 111285 | | |

## Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

| | | | |
|---|---|---|---|
| Prior Application Status | Pending | Remove | |
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
| | non provisional of | 61/684672 | 2012-08-17 |
| Prior Application Status | Pending | Remove | |
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
| | non provisional of | 61/702650 | 2012-09-18 |
| Prior Application Status | Pending | Remove | |
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
| | non provisional of | 61/697710 | 2012-09-06 |

PTO/AIA/14 (03-13)
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| **Application Data Sheet 37 CFR 1.76** | Attorney Docket Number | 6583-488 |
|---|---|---|
| | Application Number | |
| Title of Invention | PANEL USER INTERFACE FOR AN INTELLIGENT TELEVISION | |

| Prior Application Status | Pending | | Remove |
|---|---|---|---|
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
| | non provisional of | 61/700182 | 2012-09-12 |
| Prior Application Status | Pending | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
| | non provisional of | 61/736692 | 2012-12-13 |
| Prior Application Status | Pending | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
| | non provisional of | 61/798821 | 2013-03-15 |
| Prior Application Status | Pending | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
| | non provisional of | 61/804942 | 2013-03-25 |
| Prior Application Status | Pending | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
| | non provisional of | 61/804998 | 2013-03-25 |
| Prior Application Status | Pending | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
| | non provisional of | 61/804971 | 2013-03-25 |
| Prior Application Status | Pending | | Remove |
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| Prior Application Status | Pending | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
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| Prior Application Status | Pending | | Remove |
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| | non provisional of | 61/805027 | 2013-03-25 |
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| | non provisional of | 61/805042 | 2013-03-25 |

| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | 6583-488 |
|---|---|---|
| | Application Number | |
| Title of Invention | PANEL USER INTERFACE FOR AN INTELLIGENT TELEVISION | |

| Prior Application Status | Pending | Remove | |
|---|---|---|---|
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
| | non provisional of | 61/805038 | 2013-03-25 |

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

## Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

| | | | Remove |
|---|---|---|---|
| Application Number | Country[i] | Filing Date (YYYY-MM-DD) | Access Code[i] (if applicable) |
| | | | |

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

## Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☒ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

## Authorization to Permit Access:

☐ Authorization to Permit Access to the Instant Application by the Participating Offices

PTO/AIA/14 (03-13)
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| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | 6583-488 |
|---|---|---|
| | Application Number | |
| Title of Invention | PANEL USER INTERFACE FOR AN INTELLIGENT TELEVISION | |

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date o f filing this Authorization.

## Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

**Applicant 1**

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

| | | |
|---|---|---|
| ◉ Assignee | ○ Legal Representative under 35 U.S.C. 117 | ○ Joint Inventor |
| ○ Person to whom the inventor is obligated to assign. | ○ Person who shows sufficient proprietary interest | |

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☒

| Organization Name | Flextronics AP, LLC |
|---|---|

**Mailing Address Information For Applicant:**

| | | | |
|---|---|---|---|
| **Address 1** | 6201 America Center Drive | | |
| Address 2 | | | |
| **City** | San Jose | **State/Province** | CA |
| **Country** | US | Postal Code | ~~95134~~ 95002 |
| Phone Number | | Fax Number | |

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| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | 6583-488 |
|---|---|---|
| | Application Number | |
| Title of Invention | PANEL USER INTERFACE FOR AN INTELLIGENT TELEVISION | |

| Email Address | |
|---|---|

Additional Applicant Data may be generated within this form by selecting the Add button.

## Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

**Assignee 1**

Complete this section only if non-applicant assignee information is desired to be included on the patent application publication in accordance with 37 CFR 1.215(b). Do not include in this section an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest), as the patent application publication will include the name of the applicant(s).

If the Assignee is an Organization check here. ☐

| Prefix | **Given Name** | Middle Name | **Family Name** | Suffix |
|---|---|---|---|---|
| | | | | |

**Mailing Address Information For Non-Applicant Assignee:**

| **Address 1** | |
|---|---|
| Address 2 | |

| **City** | | **State/Province** | |
|---|---|---|---|
| **Country** | | Postal Code | |
| Phone Number | | Fax Number | |
| Email Address | | | |

Additional Assignee Data may be generated within this form by selecting the Add button.

## Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.

| **Signature** | /Tadd F. Wilson/ | | | Date (YYYY-MM-DD) | 2014-07-11 |
|---|---|---|---|---|---|
| First Name | Tadd F. | Last Name | Wilson | Registration Number | 54544 |

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| **Application Data Sheet 37 CFR 1.76** | Attorney Docket Number | 6583-488 |
|---|---|---|
| | Application Number | |
| Title of Invention | PANEL USER INTERFACE FOR AN INTELLIGENT TELEVISION | |

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Co o p eration Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 19562680 |
| **Application Number:** | 13968665 |
| **International Application Number:** | |
| **Confirmation Number:** | 7370 |
| **Title of Invention:** | PANEL USER INTERFACE FOR AN INTELLIGENT TELEVISION |
| **First Named Inventor/Applicant Name:** | Sanjiv Sirpal |
| **Customer Number:** | 111285 |
| **Filer:** | Tadd Fjelp Wilson/Amy Duarte |
| **Filer Authorized By:** | Tadd Fjelp Wilson |
| **Attorney Docket Number:** | 6583-488 |
| **Receipt Date:** | 11-JUL-2014 |
| **Filing Date:** | 16-AUG-2013 |
| **Time Stamp:** | 19:31:00 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
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| Submitted with Payment | no |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Make/Rescind AIA (First Inventor to File) 1.55/1.78 Stmnt | Statement_for_Transitional_Application.pdf | 95436<br>53c220ee51f152d0029cb02bb10310b87cd36b7b | no | 1 |

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| **Warnings:** | |
| **Information:** | |

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| 2 | Application Data Sheet | Replacement_ADS.pdf | 1484553<br>2ca64bbb1d17ce66e339022e4bc7335746cd4eab | no | 9 |

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| **Warnings:** | |
| **Information:** | |
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**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**
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| Substitute for form 1449/PTO | | | | Complete if Known | |
|---|---|---|---|---|---|
| **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** | | | | Application Number | 13/968,665 |
| | | | | Filing Date | August 16, 2013 |
| | | | | First Named Inventor | Sanjiv Sirpal |
| *(Use as many sheets as necessary)* | | | | Art Unit | 2421 |
| | | | | Examiner Name | James R Marandi |
| Sheet | 1 | of | 11 | Attorney Docket Number | 6583-488 |

| U.S. PATENT DOCUMENTS | | | | | |
|---|---|---|---|---|---|
| Examiner Initials* | Cite No.[1] | Document Number Number-kind Code[2] (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear |
| | 1 | 4284849 | 08/18/1981 | Anderson et al. | |
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| Examiner Signature | | Date Considered | |
|---|---|---|---|

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

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| **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** | | | | Application Number | 13/968,665 |
| | | | | Filing Date | August 16, 2013 |
| | | | | First Named Inventor | Sanjiv Sirpal |
| *(Use as many sheets as necessary)* | | | | Art Unit | 2421 |
| | | | | Examiner Name | James R Marandi |
| Sheet | 2 | of | 11 | Attorney Docket Number | 6583-488 |

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| Examiner Signature | | Date Considered | |
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|---|---|---|---|---|---|
| **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** | | | | Application Number | 13/968,665 |
| | | | | Filing Date | August 16, 2013 |
| | | | | First Named Inventor | Sanjiv Sirpal |
| *(Use as many sheets as necessary)* | | | | Art Unit | 2421 |
| | | | | Examiner Name | James R Marandi |
| Sheet | 3 | of | 11 | Attorney Docket Number | 6583-488 |

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| **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** | | | | Application Number | 13/968,665 |
| | | | | Filing Date | August 16, 2013 |
| | | | | First Named Inventor | Sanjiv Sirpal |
| *(Use as many sheets as necessary)* | | | | Art Unit | 2421 |
| | | | | Examiner Name | James R Marandi |
| Sheet | 4 | of | 11 | Attorney Docket Number | 6583-488 |

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| ***(Use as many sheets as necessary)*** | | | | Art Unit | 2421 |
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| | | | | First Named Inventor | Sanjiv Sirpal |
| *(Use as many sheets as necessary)* | | | | Art Unit | 2421 |
| | | | | Examiner Name | James R Marandi |
| Sheet | 8 | of | 11 | Attorney Docket Number | 6583-488 |

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## Set-top box with scene mode and its control method

No documents available for this priority number.

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**Classification:** **- international:** ***H04N5/00; H04N7/173***
**- cooperative:**

**Application number:** CN2005133554 20050309

**Priority number (s):** CN2005133554 20050309

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## Abstract of CN1832534 (A)

This invention discloses a set-top box with a situational mode and its control method including: a receiving unit capable of receiving information of channels-the EPG signals, a storing unit storing situational mode information set by a user and channel program information, an input receiving unit for receiving user operation orders and a control unit for controlling the TV to play the situational mode, in which, the set-top box enters into the personal situational mode state selected by the user after initial operation, this time, all operations are against the person situation mode, the user can add and delete its channel list liked and the set-top box enters into the personal situation mode play state, the selected channels are all ones the user likes so the user can watch the programs conveniently.

Last updated: 11.12.2013 Worldwide Database 5.8.15.10; 92p



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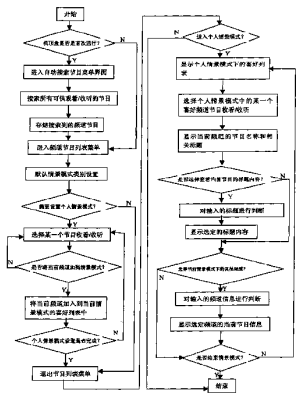
权利要求书 3 页 说明书 5 页 附图 4 页

[54] 发明名称

# 一种具有情景模式的机顶盒及其控制方法

[57] 摘要

本发明公开了一种具有情景模式的机顶盒及其控制方法，其技术方案包括：能够接收频道节目信息信号即 EPG 信号的接收单元、存储用户个人设置的情景模式信息和频道节目信息的存储单元、用于用户操作命令接收的输入接收单元和控制电视机进行情景模式播放的控制单元。 机顶盒经过初始化运行后进入用户选择的个人情景模式设置状态，此时所有的操作都针对该个人情景模式进行，用户可以很方便地对喜好频道列表进行添加、删除操作；设置完毕或者跳过上述设置状态后，机顶盒自动进入个人情景模式播放状态，其中的可选择频道都是用户预先设置好的喜好频道，用户可以很方便地浏览、观看上述频道节目。



1、一种具有情景模式的机顶盒，包括：能够接收频道节目信息信号即 EPG 信号的接收单元、存储频道节目信息的存储单元、用于用户操作命令接收的输入接收单元，以及控制单元，其特征是：所述的存储单元能够存放用户个人设置的情景模式信息，所述的控制单元通过以下步骤实现电视节目的情景模式播放：

（a）控制单元判断机顶盒是否是首次运行，若是则控制单元自动搜索并存储可供观看、收听的频道节目信息，搜索完毕进入频道节目列表菜单；若否，则直接进入频道节目列表菜单；

（b）默认情景模式类别设置，控制单元根据输入接收单元的指令进行默认情景模式类别设置，并将其作为当前默认的情景模式；

（c）控制单元通过播放单元提示用户是否进行个人情景模式设置，若是则进入下一步骤，若否则直接进入（e）步骤；

（d）个人情景模式设置；

（e）控制单元通过播放单元提示用户是否进入个人情景模式，若是则进下一步骤，若否则直接进入（g）步骤；

（f）个人情景模式播放；

（g）机顶盒结束本次运行。

2、根据权利要求 1 所述的具有情景模式的机顶盒，其特征是：所述的（d）步骤具体通过如下 3 个小步骤实现：

（a）控制单元等待输入接收单元的指令，选择电视频道节目；

（b）控制单元通过播放单元提示用户是否将当前频道添加到个人情景模式的喜好列表中来，若是则添加，若否则返回（a）步骤；

（c）控制单元通过播放单元询问用户个人情景模式设置是否完成，如是则退出节目列表菜单并结束本次设置，如否则返回（a）步骤。

3、根据权利要求 1 或者 2 所述的具有情景模式的机顶盒，其特征是：所述的（f）步骤具体通过如下 4 个小步骤实现：

（a）控制单元控制显示单元显示个人情景模式下的喜好列表；

（b）控制单元等待用户选择具体频道节目；

（c）控制单元控制控制显示单元显示当前频道的节目名称和相关标题；

（d）控制单元根据输入接收单元的操作命令控制播放单元播放当前情景模式下的其他频道信息或者当前节目的其他标题内容。

4、根据权利要求 3 所述的具有情景模式的机顶盒，其特征是：所述的情景模式信息包括至少下述之一：

（a）表示用户喜好的情景模式的标识信息；

（b）个人情景模式中所包含每一个频道的频道名称、序号信息；



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（c）个人情景模式中所包含每一个频道播放时所需要的频道信息。

5、根据权利要求4所述的具有情景模式的机顶盒，其特征是：所述的喜好列表包括：

（a）当前所处的情景模式的标识说明；

（b）可供选择的几种情景模式的名称；

（c）至少一个可以被选择的频道和这些频道对应的节目指南信息；

（d）显示一些操作命令的提示，使用户可以通过输入单元向控制单元发出信号，包括至少下述之一：

切换到其他频道节目提示：控制播放单元播放其他可收看的频道；

显示其他频道名称提示：控制显示目前没有被显示在屏幕上的其他频道名称；

显示/隐藏节目指南提示：控制显示单元显示或者隐藏节目指南信息。

6、根据权利要求5所述的具有情景模式的机顶盒，其特征是：所述的喜好列表包括频道列表和节目指南信息列表，二者在显示单元屏幕上纵向排列且彼此相关的频道和节目指南信息在显示单元屏幕横向上对齐排布；所述的频道名称、序号和频道信息的显示只覆盖显示单元屏幕的一部分。

7、一种具有情景模式的机顶盒的控制方法，包括如下步骤：

（a）接收单元接收频道节目信息信号即EPG信号；

（b）控制单元控制存储单元存储频道节目信息；

（c）控制单元控制显示单元显示频道节目信息，并控制播放单元播放广播电视节目信号，其特征是：所述的存储单元能够存放用户个人设置的情景模式信息，所述的控制单元通过以下步骤实现电视节目的情景模式播放：

（a）控制单元判断机顶盒是否是首次运行，若是则控制单元自动搜索并存储可供观看、收听的频道节目信息，搜索完毕进入频道节目列表菜单；若否，则直接进入频道节目列表菜单；

（b）默认情景模式类别设置，控制单元根据输入接收单元的指令进行默认情景模式类别设置，并将其作为当前默认的情景模式；

（c）控制单元通过播放单元提示用户是否进行个人情景模式设置，若是则进入下一步骤，若否则直接进入（e）步骤；

（d）个人情景模式设置；

（e）控制单元通过播放单元提示用户是否进入个人情景模式，若是则进下一步骤，若否则直接进入（g）步骤；

（f）个人情景模式播放；

（g）机顶盒结束本次运行。



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8、根据权利要求7所述的具有情景模式的机顶盒的控制方法，其特征是：所述的（d）步骤具体通过如下3个小步骤实现：

（a）控制单元等待输入接收单元的指令，选择电视频道节目；

（b）控制单元通过播放单元提示用户是否将当前频道添加到个人情景模式的喜好列表中来，若是则添加，若否则返回（a）步骤；

（c）控制单元通过播放单元询问用户个人情景模式设置是否完成，如是则退出节目列表菜单并结束本次设置，如否则返回（a）步骤。

9、根据权利要求7或者8所述的具有情景模式的机顶盒的控制方法，其特征是：所述的（f）步骤具体通过如下4个小步骤实现：

（a）控制单元控制显示单元显示个人情景模式下的喜好列表；

（b）控制单元等待用户选择具体频道节目；

（c）控制单元控制控制显示单元显示当前频道的节目名称和相关标题；

（d）控制单元根据输入接收单元的操作命令控制播放单元播放当前情景模式下的其他频道信息或者当前节目的其他标题内容。

10、根据权利要求9所述的具有情景模式的机顶盒的控制方法，其特征是：所述的情景模式信息包括至少下述之一：

（a）表示用户喜好的情景模式的标识信息；

（b）个人情景模式中所包含每一个频道的频道名称、序号信息；

（c）个人情景模式中所包含每一个频道播放时所需要的频道信息。

11、根据权利要求10所述的具有情景模式的机顶盒的控制方法，其特征是：所述的喜好列表包括：

（a）当前所处的情景模式的标识说明；

（b）可供选择的几种情景模式的名称；

（c）至少一个可以被选择的频道和这些频道对应的节目指南信息；

（d）显示一些操作命令的提示，使用户可以通过输入单元向控制单元发出信号，包括至少下述之一：

切换到其他频道节目提示：控制播放单元播放其他可收看的频道；

显示其他频道名称提示：控制显示目前没有被显示在屏幕上的其他频道名称；

显示/隐藏节目指南提示：控制显示单元显示或者隐藏节目指南信息。

12、根据权利要求11所述的具有情景模式的机顶盒的控制方法，其特征是：所述的喜好列表包括频道列表和节目指南信息列表，二者在显示单元屏幕上纵向排列且彼此相关的频道和节目指南信息在显示单元屏幕横向上对齐排布；所述的频道名称、序号和频道信息的显示只覆盖显示单元屏幕的一部分。



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# 一种具有情景模式的机顶盒及其控制方法

## 技术领域

本发明涉及一种收看电视节目并设定个人情景模式的设备和方法，更具体的说，涉及一种接收频道节目信息信号并能设置情景模式播放的机顶盒及其控制方法。

## 背景技术

在过去的模拟电视时代，只有很少的电视节目可供观看，因此，观众没有选择想要观看的电视节目的困难。然而，现在已经进入数字电视时代，节目的数量剧增，用户可以选择的节目也越来越多，由于电视机往往在家庭中使用，而每个家庭成员所喜好的频道类型各有不同，譬如，新闻类、体育类、文艺类、影视类、综合类等等，那么，如何在所有的这些频道当中快速、便捷的找到自己感兴趣的频道就成为了一个问题。例如，观众总是要不断的浏览所有频道的节目，甚至包括一些观众并不喜欢的频道，以便找到自己喜爱的频道，这样的操作必然浪费观众大量不必要的时间。

为了解决上述问题，使用具有喜好频道设定的机顶盒已经被开发出来。如图1和2所示，当用户从频道表选择了一个之后，如图1所示一上层菜单被显示在屏幕上，以便使用户查看所有可供选择的频道的列表。当用户选定一个频道并且想要把它添加到自己的喜好频道列表中时，如图 2 所示的下层菜单被显示在屏幕上，询问用户要添加至哪一个喜好频道表中，此时用户将这个频道加入到自己的喜好频道表中。这样就完成了一次添加，同时，用户的这次操作被机顶盒记录并存储下来。重复上述的步骤就能够将所有自己感兴趣的频道全部添加至自己的喜好频道表。每当用户想要观看自己的喜好的频道时，必须重新选择自己的喜好列表，再次选择自己想要看的频道名称。

可见，当可供收看的频道的数量很大的时候，对于用户来说不断地在喜好列表和全部频道列表之间进行切换将变的很麻烦。

## 发明内容

本发明所要解决的技术问题是，提供一种能够方便、快捷地进行用户喜好频道设置和喜好频道电视节目播放的具有情景模式的机顶盒及其控制方法。

为解决上述技术问题，本发明包括：能够接收频道节目信息信号即 EPG 信号的接收单元、存储频道节目信息的存储单元、用于用户操作命令接收的输入接收单元，以及控制单元，其中，所述的存储单元能够存放用户个人设置的情景模式信息，所述的控制单元通过以下步骤实现电视节目的情景模式播放：



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（a）控制单元判断机顶盒是否是首次运行，若是则控制单元自动搜索并存储可供观看、收听的频道节目信息，搜索完毕进入频道节目列表菜单；若否，则直接进入频道节目列表菜单；

（b）默认情景模式类别设置，控制单元根据输入接收单元的指令进行默认情景模式类别设置，并将其作为当前默认的情景模式；

（c）控制单元通过播放单元提示用户是否进行个人情景模式设置，若是则进入下一步骤，若否则直接进入（e）步骤；

（d）个人情景模式设置；

（e）控制单元通过播放单元提示用户是否进入个人情景模式，若是则进下一步骤，若否则直接进入（g）步骤；

（f）个人情景模式播放；

（g）机顶盒结束本次运行。

作为本发明的改进，所述的（d）步骤具体通过如下 3 个小步骤实现：

（a）控制单元等待输入接收单元的指令，选择电视频道节目；

（b）控制单元通过播放单元提示用户是否将当前频道添加到个人情景模式的喜好列表中来，若是则添加，若否则返回（a）步骤；

（c）控制单元通过播放单元询问用户个人情景模式设置是否完成，如是则退出节目列表菜单并结束本次设置，如否则返回（a）步骤。

作为本发明的改进，所述的（f）步骤具体通过如下 4 个小步骤实现：

（a）控制单元控制显示单元显示个人情景模式下的喜好列表；

（b）控制单元等待用户选择具体频道节目；

（c）控制单元控制控制显示单元显示当前频道的节目名称和相关标题；

（d）控制单元根据输入接收单元的操作命令控制播放单元播放当前情景模式下的其他频道信息或者当前节目的其他标题内容。

作为本发明进一步的改进，所述的情景模式信息包括至少下述之一：

（a）表示用户喜好的情景模式的标识信息；

（b）个人情景模式中所包含每一个频道的频道名称、序号信息；

（c）个人情景模式中所包含每一个频道播放时所需要的频道信息。

作为本发明更进一步的改进，所述的喜好列表包括：

（a）当前所处的情景模式的标识说明；

（b）可供选择的几种情景模式的名称；

（c）至少一个可以被选择的频道和这些频道对应的节目指南信息；

（d）显示一些操作命令的提示，使用户可以通过输入单元向控制单元发出信号，包括至少下述之一：



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切换到其他频道节目提示：控制播放单元播放其他可收看的频道；

显示其他频道名称提示：控制显示目前没有被显示在屏幕上的其他频道名称；

显示/隐藏节目指南提示：控制显示单元显示或者隐藏节目指南信息。

作为本发明再进一步的改进，所述的喜好列表包括频道列表和节目指南信息列表，二者在显示单元屏幕上纵向排列且彼此相关的频道和节目指南信息在显示单元屏幕横向上对齐排布；所述的频道名称、序号和频道信息的显示只覆盖显示单元屏幕的一部分。

通过实施本发明，机顶盒运行经过必要的初始化，即搜索、储存能够观看、收听的电视节目后就提示用户是否进入个人情景模式，一旦用户做出选择后，所有的操作都将用户设置的个人情景模式作为默认的当前情景模式。用户在观看各频道电视节目的过程中可以很方便地添加、删除喜好频道列表。若用户此时不想重新设置个人情景模式，则机顶盒自动进入用户预先设置的个人的情景模式，其中的可选择频道都是用户预先设置的喜好频道，用户可以很方便的浏览、观看其中的各个频道，而不需要在全部频道列表与喜好频道列表间反复切换。

## 说明书附图

下面结合附图和具体实施方式，对本发明做进一步详细的说明。其中：

图 1 为全部频道列表传统显示模式示意图；

图 2 为喜好频道列表传统显示模式示意图；

图 3 为本发明所涉机顶盒的工作结构示意图；

图 4 为本发明所涉机顶盒控制单元工作流程示意图；

图 5 为本发明所涉喜好频道列表显示模式示意图；

图 6 为选定具体频道后频道信息显示模式示意图。

## 具体实施方式

如图 3 所示，本发明包括：能够接收频道节目信息信号即 EPG 信号的接收单元、存储频道节目信息的存储单元、用于用户操作命令接收的输入接收单元，以及控制单元，其中所述的存储单元能够存放用户个人设置的情景模式信息。其中，输入单元可以是安装在机顶盒上的操作面板，也可以是具有多个操作按钮的遥控器。

如图 4 所示，所述的控制单元通过以下步骤实现电视节目的情景模式播放：

(a) 控制单元判断机顶盒是否是首次运行，若是则控制单元自动搜索并存储可供观看、收听的频道节目信息，搜索完毕进入频道节目列表菜单；若否，则直接进入频道节目列表菜单；



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（b）默认情景模式类别设置，控制单元根据输入接收单元的指令进行默认情景模式类别设置，并将其作为当前默认的情景模式；

（c）控制单元通过播放单元提示用户是否进行个人情景模式设置，若是则进入下一步骤，若否则直接进入（e）步骤；

（d）个人情景模式设置；

（e）控制单元通过播放单元提示用户是否进入个人情景模式，若是则进下一步骤，若否则直接进入（g）步骤；

（f）个人情景模式播放；

（g）机顶盒结束本次运行。

其中，所述的（d）步骤具体通过如下 3 个小步骤实现：

（a）控制单元等待输入接收单元的指令，选择电视频道节目；

（b）控制单元通过播放单元提示用户是否将当前频道添加到个人情景模式的喜好列表中来，若是则添加，若否则返回（a）步骤；

（c）控制单元通过播放单元询问用户个人情景模式设置是否完成，如是则退出节目列表菜单并结束本次设置，如否则返回（a）步骤。

其中，所述的（f）步骤具体通过如下 4 个小步骤实现：

（a）控制单元控制显示单元显示个人情景模式下的喜好列表；

（b）控制单元等待用户选择具体频道节目；

（c）控制单元控制控制显示单元显示当前频道的节目名称和相关标题；

（d）控制单元根据输入接收单元的操作命令控制播放单元播放当前情景模式下的其他频道信息或者当前节目的其他标题内容。

具体可设置上/下键或者左/右键实现（d）步骤的操作，对于其他频道的选择具体还可以设置数字键直接输入的方式进行选择确定。通过实施本发明，当用户控制输入单元例如遥控器查看节目指南信息时，所查找到的也只是自己情景模式的喜好频道，而没有显示自己没有添加进情景模式的频道。如果用户使用遥控器查看自己情景模式下所有的频道，用户只需要按下相应按键例如遥控器上的喜好键，此时屏幕上显示的是该情景模式下所有喜好频道列表。

如图 5 所示，所述的情景模式信息包括至少下述之一：

（a）表示用户喜好的情景模式的标识信息；

（b）个人情景模式中所包含每一个频道的频道名称、序号信息；

（c）个人情景模式中所包含每一个频道播放时所需要的频道信息。

如图 6 所示，所述的喜好列表包括：

（a）当前所处的情景模式的标识说明；

（b）可供选择的几种情景模式的名称；



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（c）至少一个可以被选择的频道和这些频道对应的节目指南信息；

（d）显示一些操作命令的提示，使用户可以通过输入单元向控制单元发出信号，包括至少下述之一：

切换到其他频道节目提示：控制播放单元播放其他可收看的频道；

显示其他频道名称提示：控制显示目前没有被显示在屏幕上的其他频道名称；

显示/隐藏节目指南提示：控制显示单元显示或者隐藏节目指南信息。

其中，所述的喜好列表包括频道列表和节目指南信息列表，二者在显示单元屏幕上纵向排列且彼此相关的频道和节目指南信息在显示单元屏幕横向上对齐排布；所述的频道名称、序号和频道信息的显示只覆盖显示单元屏幕的一部分。



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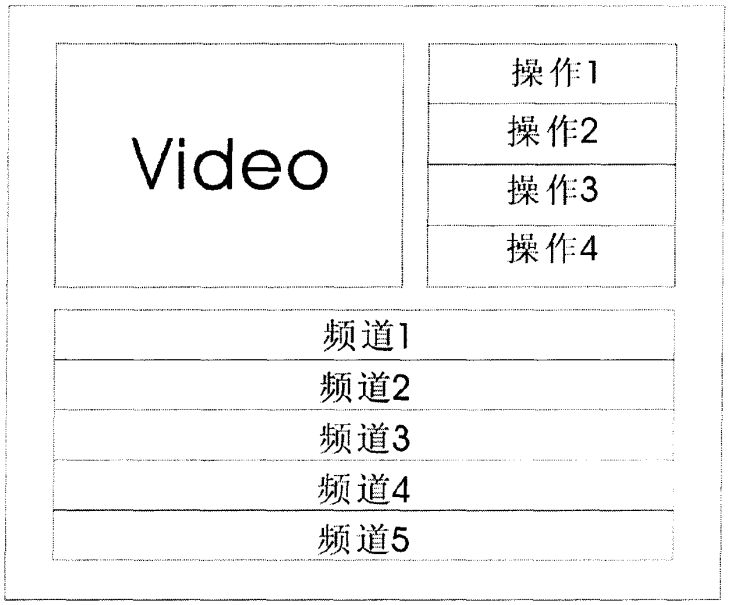


图 1

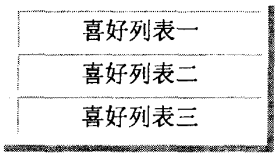


图 2



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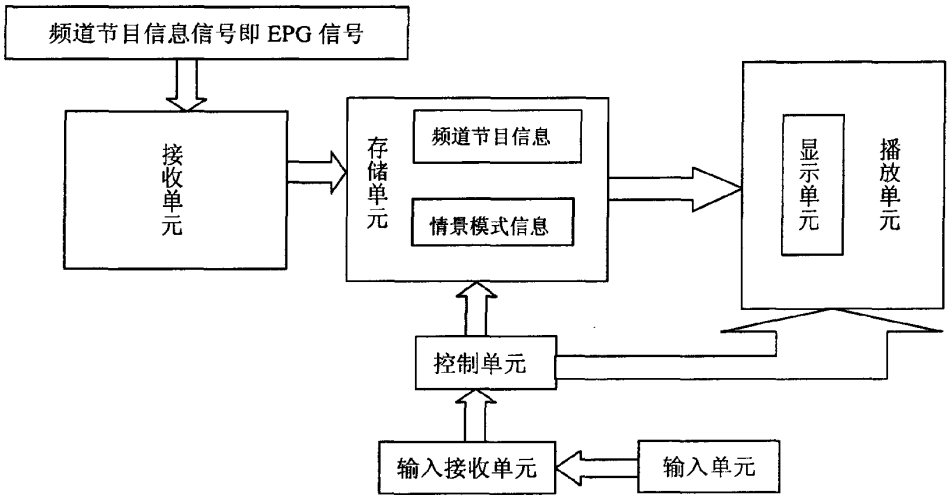


图 3



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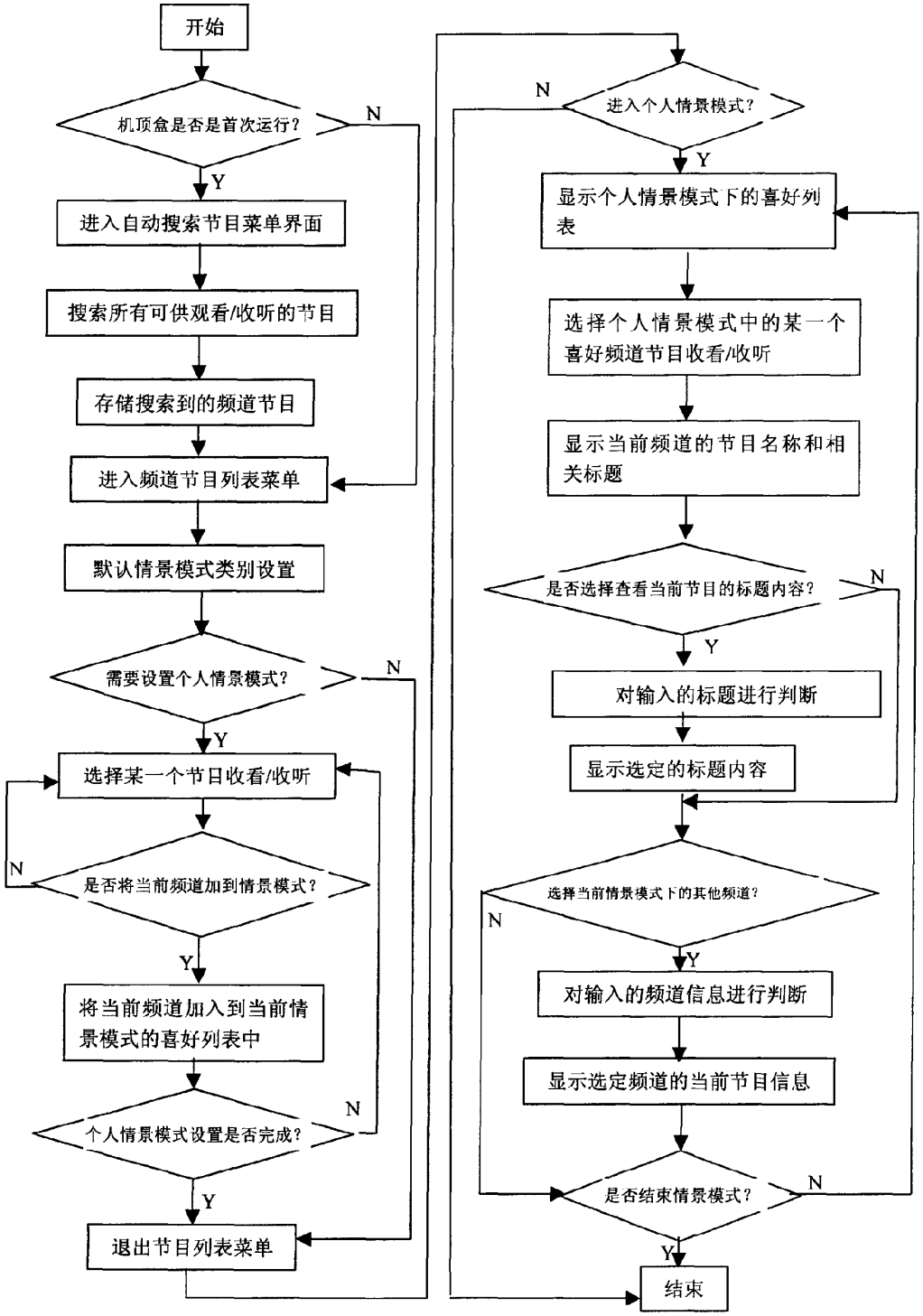


图 4



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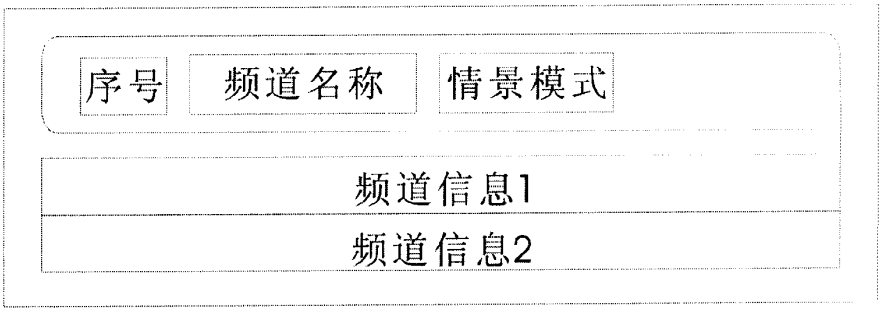


图 5

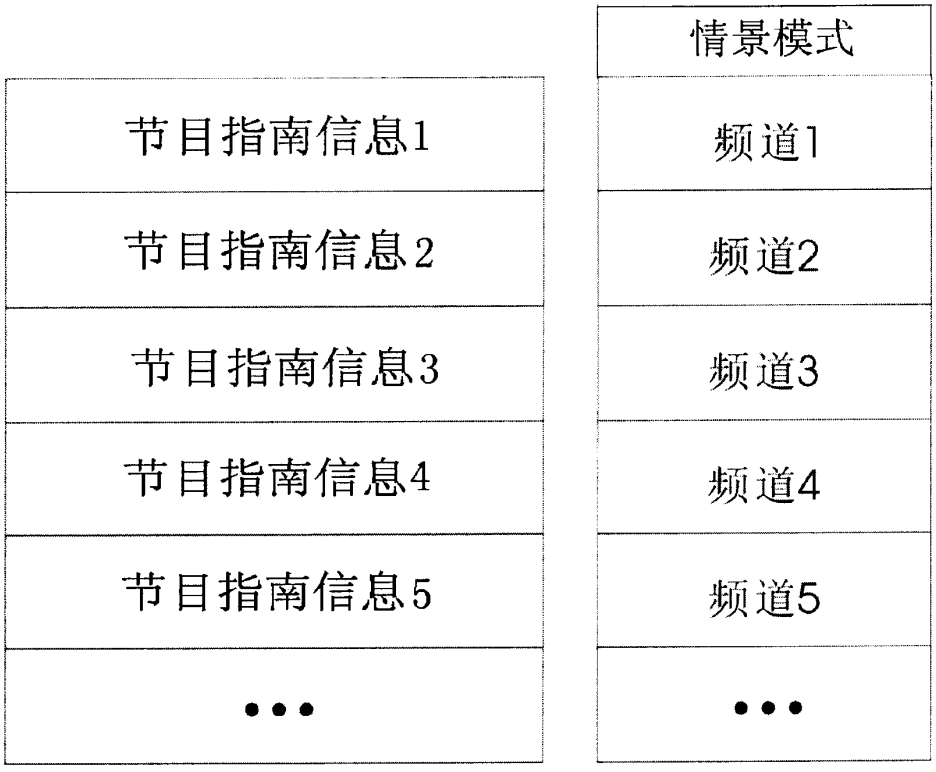


图 6



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Espacenet

# Bibliographic data: CN101472102 (A) — 2009-07-01

## Automatic prompting method for television program transmission and television set

No documents available for this priority number.

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**Applicant(s):** KONKA GROUP CO LTD [CN] ± (KONKA GROUP CO., LTD)

**Classification:** **- international:** ***H04N5/445***
**- cooperative:**

**Application number:** CN20071125516 20071225

**Priority number(s):** CN20071125516 20071225

## Abstract of CN101472102 (A)

The invention relates to a television program broadcasting automatic reminder method. The method comprises the following steps: A, the user coded information of a current user is acquired, the corresponding watching record of the current user stored in the television is found according to the coded information, and the information of the favorite programs of the user is generated according to the watching record; B, the program information in the television program guidebook is analyzed according to the relevant information of the favorite programs of the user, and the programs that the user is possibly interested in are found out; C, the programs that the user is possibly interested in are stored in a program broadcasting reminder list; and D, the television program prompting information is output within a time before the programs according to the program broadcasting reminder list. By implementing the invention, the television can automatically remind the user to watch the favorite programs, and the tedious program broadcasting reminder is not required to be manually set by the user, therefore, the use is simpler and more convenient.

Last updated: 11.12.2013 Worldwide Database 5.8.15.10; 92p



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[19] 中华人民共和国国家知识产权局

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*H04N 5/00* (2006.01)

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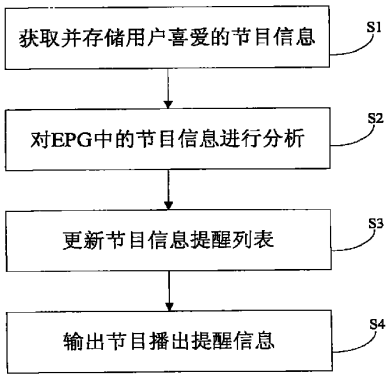
代理人 高占元
权利要求书 4 页 说明书 9 页 附图 5 页

[54] 发明名称

# 一种电视节目播出自动提醒方法及电视机

[57] 摘要

本发明涉及一种电视节目播出自动提醒方法，包括步骤：A. 获取当前用户的用户编码信息，根据该编码信息找到对应的电视机内存储的当前用户的收视记录，根据该收视记录生成用户喜爱节目的信息；B. 根据用户喜爱节目的相关信息对电子节目指南中的节目信息进行分析，找出用户可能感兴趣的节目；C. 将用户可能感兴趣的节目存储到节目播出提醒列表；D. 根据节目播出提醒列表，在节目开始前一段时间内输出电视节目提示信息。 实施本发明，电视机能够自动提醒用户收看自己喜爱的节目，不需要用户手动设置繁琐的节目播出提醒，使用更简单、方便。



1、一种电视节目播出自动提醒方法，包括步骤：

A、获取当前用户的用户编码信息，根据该编码信息找到对应的电视机内存储的当前用户的收视记录，根据该收视记录生成用户喜爱节目的信息；

B、根据用户喜爱节目的相关信息对电子节目指南中的节目信息进行分析，找出用户可能感兴趣的节目；

C、将用户可能感兴趣的节目存储到节目播出提醒列表；

D、根据节目播出提醒列表，在节目开始前一段时间内输出电视节目提示信息。

2、根据权利要求 1 所述的电视节目自动提醒方法，其特征在于，所述步骤 A 包括子步骤：

A1、通过无线射频识别技术读取当前用户无线射频识别标签中的用户编码信息；

A2、根据编码信息在电视机的数据库中找到当前用户的收视记录；

A3、根据所述收视记录获取收看频率最高的节目类型并存储为用户喜爱节目的节目类型；

A4、根据所述收视记录获取收看频率最高的节目名称并存储为用户喜爱节目的节目名称；

A5、根据所述收视记录获取出现频率最高的节目内容关键字并存储为用户喜爱节目的节目内容关键字。

3、根据权利要求 1 所述的电视节目自动提醒方法，其特征在于，所述用户喜爱节目的信息包括节目类型、节目名称和节目内容关键字，所述步骤 B 包括步骤：

B1、电子节目指南更新时，获取其中每个节目的节目类型、节目名称和节目内容介绍；

B2、顺序判断每个节目是否有两项或两项以上符合用户喜爱节目的节目类型、节目名称和节目内容关键字，若是，则该节目是用户可能感兴趣的节目，



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执行步骤C。

4、根据权利要求1所述的电视节目自动提醒方法，其特征在于，步骤D包括子步骤：

D1、检索节目播出提醒列表；

D2、找出提醒列表中是否有即将播出的节目记录；

D3、将该节目存入一个临时列表；

D4、将该节目从节目播出提醒列表中删除；

D5、根据临时列表中的记录输出电视节目提示信息。

5、根据权利要求3所述的电视节目自动提醒方法，其特征在于，所述节目播出提醒列表中，节目按播出的时间先后顺序排序。

6、一种电视节目自动提醒的电视机，其特征在于，包括用户喜爱节目信息自动获取模块、电子节目指南信息分析模块、节目提醒列表模块和节目播出提醒模块；

所述用户喜爱节目信息自动获取模块，用于通过无线射频识别技术读取用户的无线射频识别标签中的用户编码信息，根据编码信息读取电视机内存储的该用户的收视记录，根据该收视记录自动生成用户喜爱节目信息，该信息包括节目类型、节目名称和节目内容关键字，并将该信息传输到电子节目指南信息分析模块；

所述电子节目指南信息分析模块用于根据用户喜爱节目的分析电子节目指南中的节目的节目类型、节目名称和节目内容，找出在当前电子节目指南中用户可能喜欢的节目信息，并将该信息传输至节目提醒列表模块；

所述节目提醒列表模块用于根据电子节目指南信息分析模块传输来的信息生成节目提醒列表；

所述节目播出提醒模块用于根据节目提醒列表显示即将播出的节目的提醒信息。

7、根据权利要求6所述的电视节目自动提醒的电视机，其特征在于，所述用户喜爱节目信息自动获取模块包括用户编码获取子模块、收视记录存储子模块、收视记录查找子模块、节目类型子模块、节目名称子模块、节目内容关



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键字子模块；

所述用户编码获取子模块用于利用无线射频识别技术从用户的电子标签中获取当前用户的编码信息；

所述收视记录存储子模块用于存储用户一定时间内的收视信息；

所述收视记录查找子模块用于根据当前用户的编码信息在收视记录存储子模块中查找到用户的收视记录信息；

所述节目类型子模块用于根据用户的收视记录信息中用户收看频率最高的节目的节目类型生成用户喜爱节目的节目类型；

所述节目名称子模块用于根据用户的收视记录信息中用户收看频率最高的节目的节目名称生成用户喜爱节目的节目名称；

所述节目内容关键字子模块用于根据用户的收视记录信息中用户收看频率最高的节目的节目内容关键字生成用户喜爱节目的节目内容关键字。

8、根据权利要求 7 所述的电视节目自动提醒的电视机，其特征在于，所述电子节目指南信息分析模块包括节目信息获取子模块、用户喜爱节目判断子模块；

所述节目信息获取子模块用于在电子节目指南更新时，自动获取其中每个节目的节目类型、节目名称和节目内容介绍；

所述用户喜爱节目判断子模块用于判断每个节目是否有两项或两项以上符合用户喜爱节目的节目类型、节目名称和节目内容关键字，若是，则判断该节目是用户可能喜爱的节目。

9、根据权利要求 8 所述的电视节目自动提醒的电视机，其特征在于，所述节目播出提醒模块包括节目播出提醒列表检索子模块、即将播出节目子模块、临时列表子模块、节目删除子模块、节目播出提示输出子模块；

节目播出提醒列表检索子模块用于检索节目播出提醒列表；

即将播出节目子模块用于从提醒列表中找出即将播出的节目；

临时列表子模块用于存储即将播出的节目；

节目删除子模块用于将已存入临时列表的节目从节目播出提醒列表中删除；



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节目播出提示输出子模块用于据临时列表中的记录输出电视节目提示信息。

10、根据权利要求9所述的电视节目自动提醒的电视机，其特征在于，所述节目播出提醒列表中，节目按播出的时间先后顺序排序。



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# 一种电视节目播出自动提醒方法及电视机

## 技术领域

本发明涉及电视机领域，更具体地说，涉及一种电视节目播出自动提醒方法及电视机。

## 背景技术

已有的电视节目提醒系统，一般需要由用户事先设置对某一些或某一类电视节目的喜好，电视机根据用户的设置对电子节目指南（Electronic Program Guide，简称 EPG）进行分析，找出下一时段用户感兴趣的节目，然后在节目播出之前提醒用户收看节目。

已有的电视节目播出提醒系统虽然大大方便了用户使用电视，但是需要用户进行手工设置，不够智能化。特别在用户对多个节目或多类节目感兴趣时，设置相当繁琐。

## 发明内容

本发明要解决的技术问题在于，针对现有技术的上述手工设置节目播出提醒不够方便的缺陷，提供一种电视节目播出自动提醒方法及电视机。

本发明解决其技术问题所采用的技术方案是：构造一种电视节目播出自动提醒方法，包括步骤：

A、获取当前用户的用户编码信息，根据该编码信息找到对应的电视机内存储的当前用户的收视记录，根据该收视记录生成用户喜爱节目的信息；

B、根据用户喜爱节目的相关信息对电子节目指南中的节目信息进行分析，找出用户可能感兴趣的节目；

C、将用户可能感兴趣的节目存储到节目播出提醒列表；

D、根据节目播出提醒列表，在节目开始前一段时间内输出电视节目提示



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信息。

在本发明所述的电视节目自动提醒方法中，所述步骤A包括子步骤：

A1、通过无线射频识别技术读取当前用户无线射频识别标签中的用户编码信息；

A2、根据编码信息在电视机的数据库中找到当前用户的收视记录；

A3、根据所述收视记录获取收看频率最高的节目类型并存储为用户喜爱节目的节目类型；

A4、根据所述收视记录获取收看频率最高的节目名称并存储为用户喜爱节目的节目名称；

A5、根据所述收视记录获取出现频率最高的节目内容关键字并存储为用户喜爱节目的节目内容关键字。

在本发明所述的电视节目自动提醒方法中，所述用户喜爱节目的信息包括节目类型、节目名称和节目内容关键字，所述步骤B包括步骤：

B1、电子节目指南更新时，获取其中每个节目的节目类型、节目名称和节目内容介绍；

B2、顺序判断每个节目是否有两项或两项以上符合用户喜爱节目的节目类型、节目名称和节目内容关键字，若是，则该节目是用户可能感兴趣的节目，执行步骤C。

在本发明所述的电视节目自动提醒方法中，步骤D包括子步骤：

D1、检索节目播出提醒列表；

D2、找出提醒列表中是否有即将播出的节目记录；

D3、将该节目存入一个临时列表；

D4、将该节目从节目播出提醒列表中删除；

D5、根据临时列表中的记录输出电视节目提示信息。

在本发明所述的电视节目自动提醒方法中，所述节目播出提醒列表中，节目按播出的时间先后顺序排序。

本发明还提供一种电视节目自动提醒的电视机，包括用户喜爱节目信息自动获取模块、电子节目指南信息分析模块、节目提醒列表模块和节目播出提醒



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模块；

所述用户喜爱节目信息自动获取模块，用于通过无线射频识别技术读取用户的无线射频识别标签中的用户编码信息，根据编码信息读取电视机内存储的该用户的收视记录，根据该收视记录自动生成用户喜爱节目信息，该信息包括节目类型、节目名称和节目内容关键字，并将该信息传输到电子节目指南信息分析模块；

所述电子节目指南信息分析模块用于根据用户喜爱节目的分析电子节目指南中的节目的节目类型、节目名称和节目内容，找出在当前电子节目指南中用户可能喜欢的节目信息，并将该信息传输至节目提醒列表模块；

所述节目提醒列表模块用于根据电子节目指南信息分析模块传输来的信息生成节目提醒列表；

所述节目播出提醒模块用于根据节目提醒列表显示即将播出的节目的提醒信息。

在本发明所述的电视节目自动提醒的电视机中，所述用户喜爱节目信息自动获取模块包括用户编码获取子模块、收视记录存储子模块、收视记录查找子模块、节目类型子模块、节目名称子模块、节目内容关键字子模块；

所述用户编码获取子模块用于利用无线射频识别技术从用户的电子标签中获取当前用户的编码信息；

所述收视记录存储子模块用于存储用户一定时间内的收视信息；

所述收视记录查找子模块用于根据当前用户的编码信息在收视记录存储子模块中查找到用户的收视记录信息；

所述节目类型子模块用于根据用户的收视记录信息中用户收看频率最高的节目的节目类型生成用户喜爱节目的节目类型；

所述节目名称子模块用于根据用户的收视记录信息中用户收看频率最高的节目的节目名称生成用户喜爱节目的节目名称；

所述节目内容关键字子模块用于根据用户的收视记录信息中用户收看频率最高的节目的节目内容关键字生成用户喜爱节目的节目内容关键字。

在本发明所述的电视节目自动提醒的电视机中，所述电子节目指南信息分



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析模块包括节目信息获取子模块、用户喜爱节目判断子模块；

所述节目信息获取子模块用于在电子节目指南更新时，自动获取其中每个节目的节目类型、节目名称和节目内容介绍；

所述用户喜爱节目判断子模块用于判断每个节目是否有两项或两项以上符合用户喜爱节目的节目类型、节目名称和节目内容关键字，若是，则判断该节目是用户可能喜爱的节目。

在本发明所述的电视节目自动提醒的电视机中，所述节目播出提醒模块包括节目播出提醒列表检索子模块、即将播出节目子模块、临时列表子模块、节目删除子模块、节目播出提示输出子模块；

节目播出提醒列表检索子模块用于检索节目播出提醒列表；

即将播出节目子模块用于从提醒列表中找出即将播出的节目；

临时列表子模块用于存储即将播出的节目；

节目删除子模块用于将已存入临时列表的节目从节目播出提醒列表中删除；

节目播出提示输出子模块用于据临时列表中的记录输出电视节目提示信息。

在本发明所述的电视节目自动提醒的电视机中，所述节目播出提醒列表中，节目按播出的时间先后顺序排序。

实施本发明的一种电视节目播出自动提醒方法及电视机，具有以下有益效果：电视机能够自动提醒用户收看自己喜爱的节目，不需要用户手动设置繁琐的节目播出提醒，使用更简单、方便。

## 附图说明

下面将结合附图及实施例对本发明作进一步说明，附图中：

图 1 是本发明电视节目播出自动提醒的电视机的结构图；

图 2 是本发明电视节目播出自动提醒方法的流程图；

图 3 是本发明电视节目播出自动提醒方法的最佳实施例流程图；

图 4 是本发明电视节目播出自动提醒方法的最佳实施例中步骤 S11 的子步



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骤流程图；

图 5 是本发明电视节目播出自动提醒方法的最佳实施例中步骤 S13 的子步骤流程图；

图 6 是本发明电视节目播出自动提醒方法的最佳实施例中步骤 S15 的子步骤流程图。

具体实施方式

如图 1 所示，在本发明的电视节目自动提醒电视机中，包括四个模块：用户喜爱节目信息自动获取模块 1、EPG 信息分析模块 2、节目提醒列表模块 3 以及节目播出提醒模块 4。

用户喜爱节目信息自动获取模块 1 用于通过无线射频识别技术读取用户的无线射频识别标签中的用户编码信息，根据编码信息读取电视机内存储的该用户的收视记录，根据该收视记录自动生成用户喜爱节目信息，该信息包括节目类型、节目名称和节目内容关键字，并将该信息传输到 EPG 信息分析模块 2。

用户喜爱节目信息自动获取模块 1 包括用户编码获取子模块 11、收视记录存储子模块 12、收视记录查找子模块 13、节目类型子模块 14、节目名称子模块 15 和节目内容关键字子模块 16。

用户编码获取子模块 11 用于利用无线射频识别技术从用户的电子标签中获取当前用户的编码信息。无线射频识别（Radio Frequency Identification，简称 RFID）技术是一种非接触式的自动识别技术，它通过射频信号自动识别目标对象并获取相关数据，识别工作无须人工干预。RFID 系统包括存储有约定格式的电子数据的电子标签(Tag)、能读取标签中数据的阅读器(Reader)。在实际应用中，电子标签附着在待识别物体上，阅读器可无接触地读取并识别电子标签中所保存的电子数据，从而达到自动识别物体的目的。用户在收看电视时持有自己的电子标签，电子标签中存储有用户的基本信息，可包括用户编码、姓名、性别和年龄等，其中，用户编码唯一。电视机主要通过其中的用户编码信息对用户进行识别。

收视记录存储子模块 12 用于存储该电视的用户在一定时间内的收视信



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息。每个用户的信息单独存储。只保存一定时间内的收视记录，一般是近一个月内的收视记录，这样能更准确的判断用户最近时间段的收视喜好。

收视记录查找子模块 13 用于根据当前用户的编码信息在收视记录存储子模块 12 中查找到该用户对应的收视记录信息。

节目类型子模块 14 用于根据用户的收视记录信息中用户收看频率最高的节目的节目类型生成用户喜爱节目的节目类型。

节目名称子模块 15 用于根据用户的收视记录信息中用户收看频率最高的节目的节目名称生成用户喜爱节目的节目名称。

节目内容关键字子模块 16 用于根据用户的收视记录信息中用户收看频率最高的节目的节目内容关键字生成用户喜爱节目的节目内容关键字。

EPG 信息分析模块 2 用于根据用户喜爱节目的分析电子节目指南中的节目的节目类型、节目名称和节目内容，找出在当前电子节目指南中用户可能喜欢的节目信息，并将该信息传输至节目提醒列表模块 3。在用户开机、EPG 更新或 EPG 改变时，系统获取新的 EPG 信息。EPG 信息分析模块 2 根据用户喜爱节目信息模块 14 中的用户喜爱节目的相关信息对新 EPG 中每个节目的节目类型、节目名称和节目内容进行分析，如果有两项或两项以上符合用户喜爱节目的相关信息，就标记该节目为用户可能感兴趣的节目，并把该节目及其相关信息传输至节目提醒列表模块 3。

EPG 信息分析模块 2 包括节目信息获取子模块 21 和用户喜爱节目判断子模块 22。

节目信息获取子模块 21 用于在电子节目指南更新时，自动获取其中每个节目的节目类型、节目名称和节目内容介绍。

用户喜爱节目判断子模块 22 用于判断每个节目是否有两项或两项以上符合用户喜爱节目的节目类型、节目名称和节目内容关键字，若是，则判断该节目是用户可能喜爱的节目。

节目提醒列表模块 3 根据从 EPG 信息分析模块 2 传输来的信息，按照节目播出时间先后排序生成新的节目提醒列表节目并存储。

节目播出提醒模块 4 根据节目提醒列表输出提醒信息，提醒用户收看电视



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节目。每隔一段时间，节目播出提醒模块 4 就自动获取一次当前时间，然后对节目提醒列表进行检索。找出提醒列表中将播出的节目记录，并将该节目记录存入一个临时列表，并删除节目提醒列表中的相应记录。提醒列表检索完毕后，根据临时列表中的记录，在屏幕上显示节目的播出提醒信息。提醒信息一般显示在屏幕的边角位置，不影响用户观看当前节目。

节目播出提醒模块包括节目播出提醒列表检索子模块 41、即将播出节目子模块 42、临时列表子模块 43、节目删除子模块 44、节目播出提示输出子模块 45。

节目播出提醒列表检索子模块 41 用于检索节目播出提醒列表。

即将播出节目子模块 42 用于从提醒列表中找出即将播出的节目。

临时列表子模块 43 用于将即将播出的节目存储到临时列表。

节目删除子模块 44 用于将已存入临时列表的节目从节目播出提醒列表中删除。及时删除已提醒过的节目。

节目播出提示输出子模块 45 用于据临时列表中的记录输出电视节目提示信息。

如图 2 所示，在本发明的电视节目播出自动提醒方法中，包括步骤：

步骤 S1：获取并存储用户喜爱的节目信息。获取依据是用户收看节目的时间和频率。

步骤 S2：根据用户喜爱的节目信息对 EPG 中的节目信息进行分析，找出用户可能感兴趣的电视节目。

步骤 S3：将用户可能感兴趣的电视节目更新到节目播出提醒列表。

步骤 S4：根据节目播出提醒列表，在节目播出前一段时间内，输出节目播出提醒信息，并在电视机屏幕上显示。

显示该播出提醒信息只是提醒用户收看节目，在用户执行换台操作后才收看新的电视节目，否则仍收看原来播出的电视节目。

如图 3 所示，在本发明的电视节目播出自动提醒方法的优选实施例中，包



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括步骤：

步骤 S11：获取用户喜爱节目的相关信息，并存储。

步骤 S12：判断是否开机，或 EPG 是否更新，或 EPG 是否发生变化，若是，则执行步骤 S13，若否，则执行步骤 S18。

步骤 S13：根据用户喜爱节目的相关信息对新的 EPG 中的节目信息进行分析，得到当前 EPG 中可能是用户喜爱的节目信息。

步骤 S14：根据可能是用户喜爱的节目生成或更新节目提醒列表，并存储新的节目提醒列表。该节目提醒列表按节目播放时间先后排序。

步骤 S15：根据新的节目提醒列表显示节目播出提醒信息。

步骤 S16：判断用户是否换台，若是，则执行步骤 S17，若否，则执行步骤步骤 S18。

步骤 S17：执行换台操作，收看新的节目。

步骤 S18：继续收看原来的节目。

如图 4 所示，其中步骤 S11 包括子步骤：

步骤 S111：在用户多次使用电视的过程中，获取用户收看电视的记录，并存储。

步骤 S112：对数据库中用户收视数据进行分析。

步骤 S113：找出收看频率最高的节目类型并存储。

步骤 S114：找出收看频率最高的节目名称并存储。

步骤 S115：找出出现频率最高的节目内容关键字并存储。

步骤 S116：根据上面的节目类型、节目名称和节目内容关键字生成用户喜爱节目的相关信息并存储。

如图 5 所示，其中步骤 S13 包括子步骤：

步骤 S1301：获取新的 EPG 信息。

步骤 S1302：对新的 EPG 中的节目进行检索。该检索可以以 EPG 中的节目播出时间先后为序。



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步骤S1303：判断当前节目是否含有用户喜爱节目的节目内容关键字，若是，则执行步骤S1304，若否，则执行步骤S1305。

步骤S1304：对该节目作标记。

步骤S1305：判断当前节目是否与用户喜爱节目的名称相同，若是，则执行步骤S1306，若否，则执行步骤S1307。

步骤S1306：对该节目作标记。

步骤S1307：判断当前节目是否与用户喜爱的节目类型相同，若是，则执行步骤S1308，若否，则执行步骤S1309。

步骤S1308：对该节目作标记。

步骤 S1309：判断是否当前节目的被标记次数≥2，若是，则执行步骤S1310，若否，则执行步骤S1311。

步骤S1310：该节目可能是用户喜爱的节目。

步骤S1311：判断当前EPG是否已检索完毕，若是，则执行步骤S1312，若否，则执行步骤S1302。

步骤S1312：输出当前EPG中用户可能喜爱的节目。

如图6所示，其中步骤S15包括子步骤：

步骤S151：获取当前系统时间。

步骤S152：检索节目提醒列表。

步骤S153：判断是否有即将播出的节目，若是，则执行步骤S154，若否，则执行步骤S151。

步骤S154：将该节目存入临时列表。

步骤S155：从提醒列表中删除该节目。

步骤S156：判断提醒列表是否检索完毕，若是，则执行步骤S157，若否，则执行步骤S152。

步骤S157：根据临时列表中的记录显示节目播出提醒信息。



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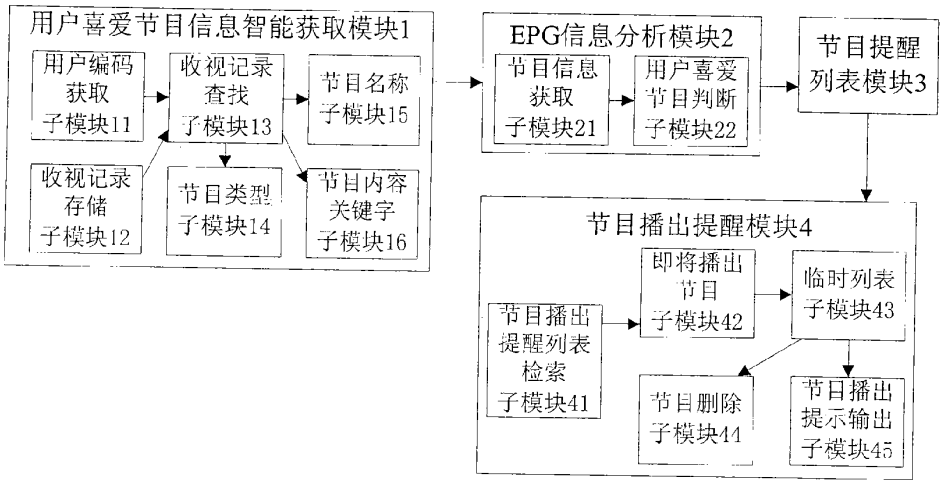


图 1

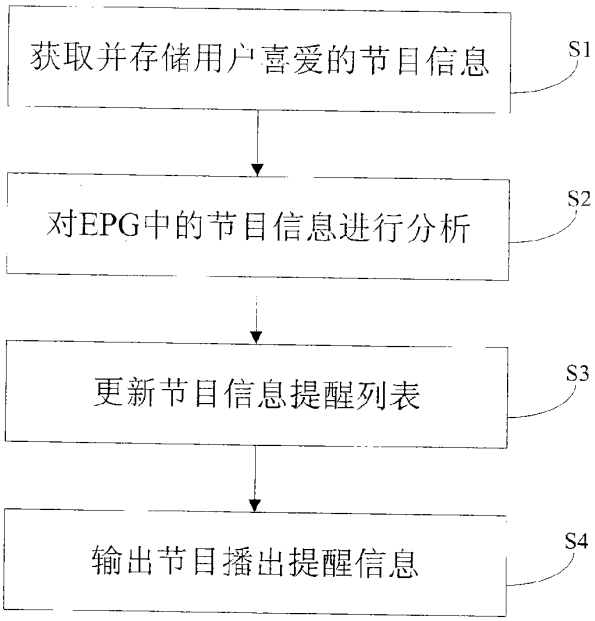


图 2



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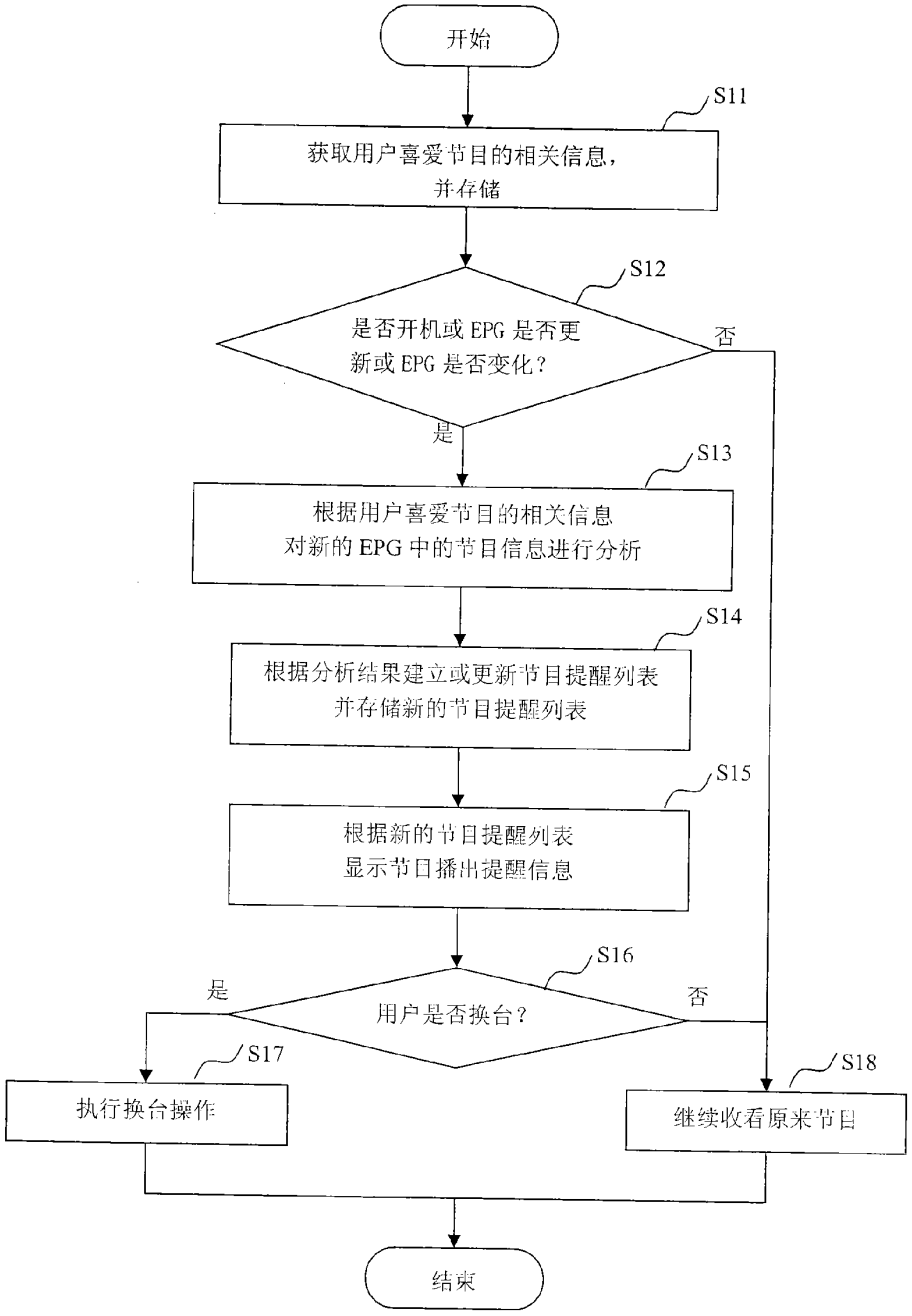


图 3



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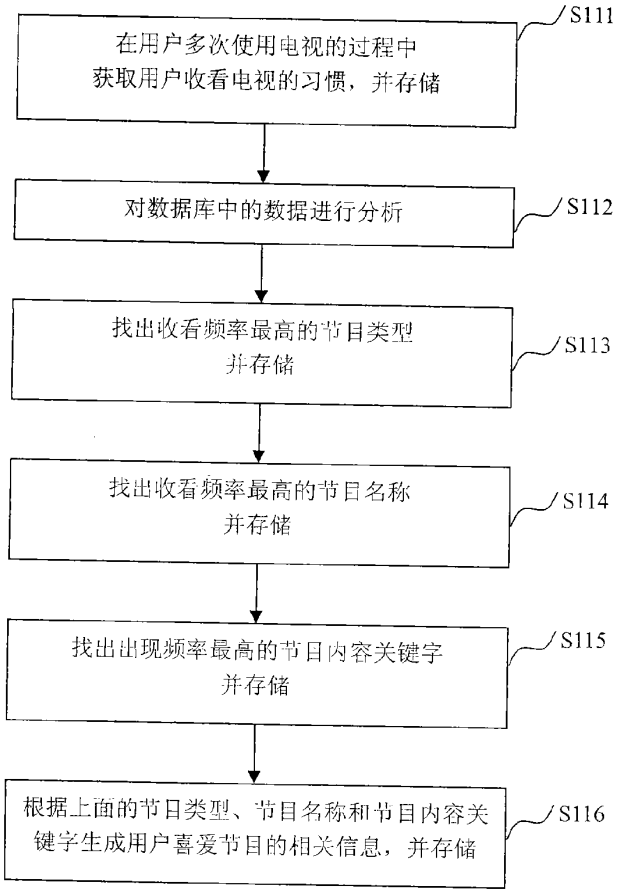


图 4



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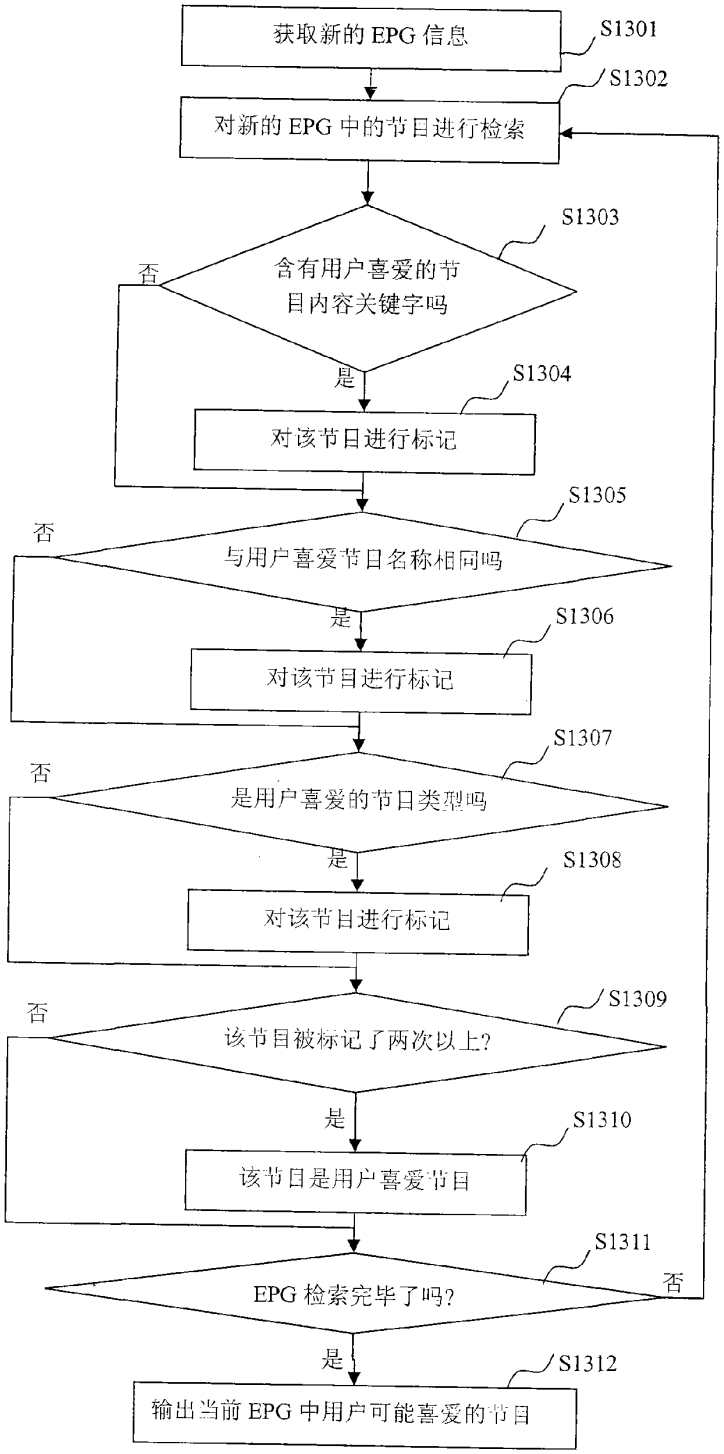


图 5



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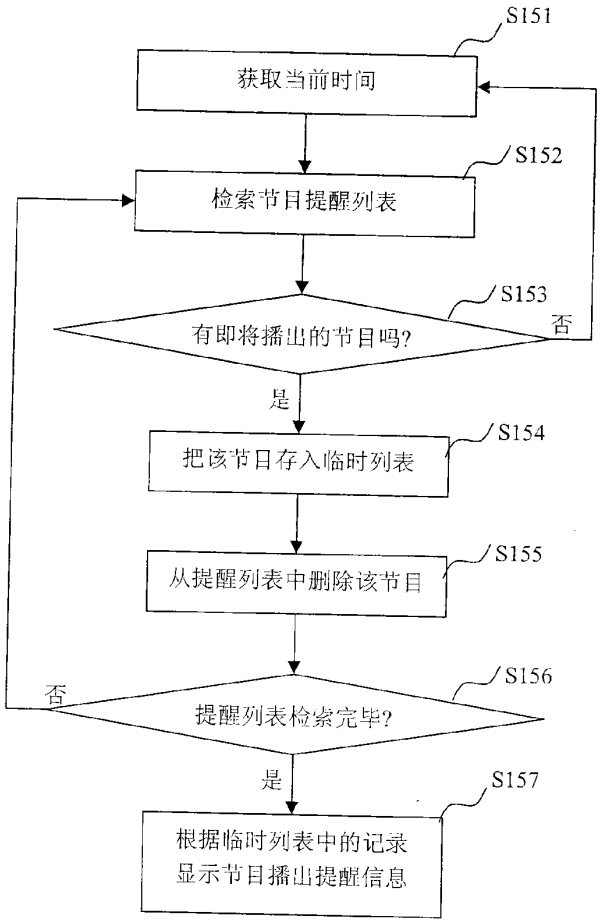


图 6



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Espacenet

# Bibliographic data: CN101540850 (A) — 2009-09-23

## System and method for selecting television programs

No documents available for this priority number.

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**Classification:** - international:***H04N5/445; H04N5/46; H04N7/16***
- cooperative: **H04N21/4345; H04N21/436; H04N21/4622; H04N21/4821; H04N5/44513; H04N5/50; H04N7/163**

**Application number:** CN2008166107 20080318

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**Also published as:** WO2009117009 (A1) US2011010738 (A1) EP2253133 (A1) EP2253133 (A4)

## Abstract of CN101540850 (A)

The invention discloses a system for selecting television programs, which comprises a processor and a display, wherein the processor can acquire video data from various sources and generate a selection interface of screen display content on the display, and the selection interface of the screen display content provided with a graphic label respectively corresponds to each source type of the video data. The technical proposal of the invention solves the operating problems for users caused by different forms of television interfaces, and is convenient for the users to use the system.

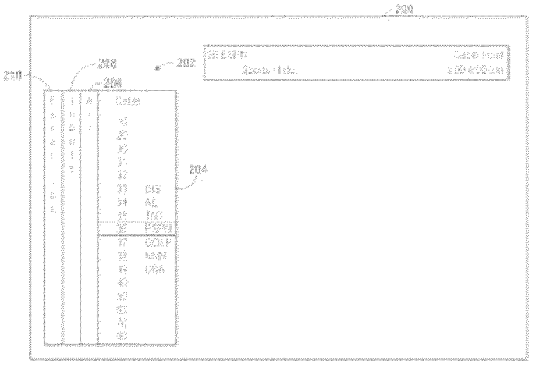

FIG. 2



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Last updated: 11.12.2013 Worldwide Database 5.8.15.10; 92p



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代理人 逯长明

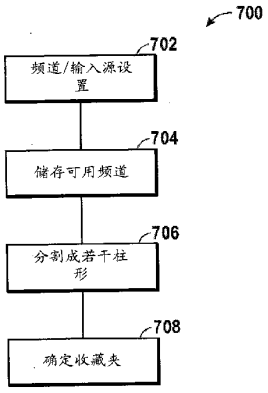
权利要求书 2 页 说明书 7 页 附图 4 页

[54] 发明名称

电视节目的选择系统和方法

[57] 摘要

本发明公开了一种电视节目的选择系统，该电视节目的选择系统包括一处理器以及一显示器，该处理器可从多种类型来源处获得视频数据，并在该显示器上产生一屏幕显示内容选择界面，该屏幕显示内容选择界面对应该视频数据的每一来源类型分别设有一图形标签。 本发明的技术方案解决了不同形式的电视界面为用户带来的操作问题，方便了用户的使用。



1. 一种电视节目的选择系统，所述电视节目的选择系统包括一处理器以及一显示器，其特征在于，所述处理器可从多种类型来源处获得视频数据，并在所述显示器上产生一屏幕显示内容选择界面，所述屏幕显示内容选择界面对应所述视频数据的每一来源类型分别设有一图形标签。

2. 如权利要求 1 所述的电视节目的选择系统，其特征在于，所述多种类型来源中包括一无线电视频道源。

3. 如权利要求 1 所述的电视节目的选择系统，其特征在于，所述多种类型来源中包括一有线电视频道源。

4. 如权利要求 1 所述的电视节目的选择系统，其特征在于，所述多种类型来源中包括一计算机接口。

5. 如权利要求 1 所述的电视节目的选择系统，其特征在于，所述多种类型来源中包括若干外围设备、一天线及一电缆。

6. 如权利要求 1 所述的电视节目的选择系统，其特征在于，所述屏幕显示内容选择界面包括一图形标签以对应用户选中的频道。

7. 如权利要求 1 所述的电视节目的选择系统，其特征在于，所述图形标签之一显示一列可选频道，所述可选频道包括模拟频道和数字频道。

8. 如权利要求 7 所述的电视节目的选择系统，其特征在于，每一可选频道均用一种与其类型相对应的字体显示。

9. 如权利要求 8 所述的电视节目的选择系统，其特征在于，所述模拟频道用红色字体显示。

10. 如权利要求 7 所述的电视节目的选择系统，其特征在于，所述可选频道包括若干输入源。

11. 如权利要求 1 所述的电视节目的选择系统，其特征在于，所述图形标签之一显示一列可选输入源，所述可选输入源包括一计算机接口。



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12. 如权利要求 1 所述的电视节目的选择系统，其特征在于，当所述显示器未显示任何菜单时，通过操作一控制器的一控制部可激活所述屏幕显示内容选择界面。

13. 如权利要求 1 所述的电视节目的选择系统，其特征在于，所述电视节目的选择系统包括一电视机、一机顶盒或一计算机系统。

14. 一种电视节目的选择方法，其特征在于，所述方法包括以下步骤：

从若干类型来源处获得视频数据；

显示一屏幕显示内容选择界面，所述屏幕显示内容选择界面对应所述视频数据的每一类型来源分别设有一图形标签。

15. 如权利要求 14 所述的电视机操作方法，其特征在于，所述方法还包括：在所述图形标签中的一被激活的标签中显示一列可选项目。

16. 如权利要求 15 所述的电视机操作方法，其特征在于，所述一列可选项目中的每一项都用一种与其来源类型相对应的字体显示。

17. 如权利要求 14 所述的电视机操作方法，其特征在于，所述方法还包括：将一被激活标签显示于其它未被激活标签的顶部。

18. 如权利要求 14 所述的电视机操作方法，其特征在于，所述方法还包括：在没有显示菜单时，接收来自控制器的一向上切换指令后激活所述屏幕显示内容选择界面。

19. 如权利要求 14 所述的电视机操作方法，其特征在于，所述方法还包括：根据用户的输入来设定一收藏夹。



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# 电视节目的选择系统和方法

## 技术领域

本发明涉及一种电视应用技术，尤指一种电视节目的选择系统和方法。

## 背景技术

现在，电视机可以为用户提供多种媒体内容，例如，数字电视机可提供数字电视频道、模拟电视频道、无线电视频道、有线电视频道和来自其它设备（例如 DVD 播放机、CD 播放机、硬碟机及存储卡）的输入。电视机也可以显示或提供来自非传统电视媒体的内容，例如从硬碟机及家庭网络获取的数字图片和计算机文件。

虽然有很多不同来源提供了多种媒体内容，但是现有的电视机通常只能显示其中的一部分，实际上，很多电视机仅能显示来自一个特定来源的媒体内容，因此，用户只能在其提供的媒体内容中进行选择。现有的媒体选择技术包括：通过数字键输入频道序号、用浏览键对频道进行上/下切换，或者在图形菜单中通过软按键进行选择。

传统的电视机系统会根据不同类型的媒体提供不同形式的界面，换句话说，电视机针对每种媒体类型都会提供一种特有的媒体选择方式，例如从 DVD 播放机、有线电视及硬碟机中进行内容选择的过程都各不相同。在收看有线电视时，用户需要使用节目加减键对节目进行选择，而观看数字图片时用户则需要用方向键在数字图片的菜单中滚动操作。这些导航形式的差异会给用户的媒体选则过程带来极大不便。

## 发明内容



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本发明所要解决的技术问题在于提供一种电视应用技术，尤指一种电视节目的选择系统和方法。

本发明是这样实现的，一种电视节目的选择系统，该电视节目的选择系统包括一处理器以及一显示器，该处理器可从多种类型来源处获得视频数据，并在该显示器上产生一屏幕显示内容选择界面，该屏幕显示内容选择界面对应该视频数据的每一来源类型分别设有一图形标签。

本发明的技术方案解决了不同形式的电视界面为用户带来的操作问题，方便了用户的使用。

## 附图说明

图 1 是本发明电视节目的选择系统的较佳实施方式的模块图。

图 2 是本发明较佳实施方式中包括一标签式菜单的显示器屏幕的示意图。

图 3 是本发明较佳实施方式中包括一标签式菜单的显示器屏幕的示意图。

图 4 是本发明较佳实施方式中包括一标签式菜单的显示器屏幕的示意图。

图 5 是本发明较佳实施方式中包括一标签式菜单的显示器屏幕的示意图。

图 6 是本发明另一实施方式中包括一标签式菜单的显示器屏幕的示意图。

图 7 是本发明电视节目的选择方法的较佳实施方式的流程图。

## 具体实施方式

为了使本发明的目的、技术方案及优点更加清楚明白，以下结合附图及实施例，对本发明进行进一步详细说明。应当理解，此处所描述的具体实施例仅仅用以解释本发明，并不用于限定本发明。

请参阅图 1，为本发明电视节目的选择系统的较佳实施方式的模块图，所述电视节目的选择系统（例如电视机、机顶盒、或计算机系统）的标号为 100，



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其包括若干如图 1 中功能模块所示的子系统。图 1 所示的功能模块可包括硬件部分（包括电路）、软件部分（包括存储于计算机可读介质中的计算机编码）或者软硬结合部分。

所述电视节目的选择系统 100 包括至少一接收器 102（例如有线电视接口、外围设备接口或天线）、一调谐器 104、一处理器 106、一存储器 108、一显示器 110、一控制器 112（例如遥控器）以及各种外围设备输入接口 114、116 和 118。所述存储器 108 包括一计算机可读介质以保存计算机编码，所述计算机编码使所述处理器 106 执行本发明提供的方法。例如，所述存储器 108 和处理器 106 可组成一控制系统以提供一屏幕显示选择界面。

本发明提供了一种可在电视机上对多种不同类型的媒体显示相同类型菜单的系统和方法，尤其涉及一种标签式菜单系统，以重叠的图形显示若干候选标签。在本发明的较佳实施方式中，所述标签式菜单系统包括一用户界面（UI），所述用户界面分别用重叠柱形或标签表示可用的输入源、媒体类型和频道，以便于快速精确的进行选择。所述用户界面或屏幕显示选择界面被称为标签式内容来源选择系统（TCSSS），其每一标签都具有相似的外形，用户可通过选择标签来选择对应的数据输入类型，此外，用户还可以设定一自定义标签，以一个标签囊括多种不同类型的媒体内容。

在此需要说明的是，通过使用设有滚珠、操纵杆或动态指示器的遥控器可使所述标签式菜单系统的导航更加便利，也可以使用普通的遥控器进行操作。从遥控器发出的一“内容”指令即可启动电视机中的标签式内容来源选择系统。例如在本发明的较佳实施方式中，当没有处于激活状态的菜单被认为是所述“内容”指令时，所述控制器 112（例如一遥控器）的方向键的节目向上切换操作即可启动电视机中的标签式内容来源选择系统。在本发明的另一实施方式中，所述控制器 112 上设有一特殊的按键以启动所述“内容”指令。



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所述标签式内容来源选择系统在所述显示器 110 上显示若干重叠图形(例如柱形或标签)。请参阅图 2，为所述显示器 110 的屏幕 200 的示意图，所述屏幕 200 包括一位于显示器边缘的菜单 202，所述菜单 202 包括四个重叠的柱形。位于顶层的图形（显示于其它所有图形之上的一个图形）是被激活的，而其它图形未被激活，例如图 2 所示的菜单 202 包括一第一柱形 204，所述第一柱形 204 被激活并代表有线电视节目可选。所述菜单 202 中未被激活的图形包括一激活时代表无线电视节目的第二柱形 206、一激活时代表输入源的第三柱形 208 以及一激活时代表收藏夹的第四柱形 210。如图 2 所示，所述未被激活的图形大部分会被隐藏，仅保留一用于识别其内容的标签。

所述标签式内容来源选择系统的每一图形都会在选中后被激活，被激活后即被置顶，该图形对应的内容或选项随即可选。例如在图 2 中，用户通过操作所述控制器的控制部（例如所述控制器 112 的操纵杆或方向键）即可控制一指针掠过所述柱形 206、208 或 210 的标签，从所述第一柱形 204 导航到其它柱形。在本发明的较佳实施方式中，用户可以通过从所述第一柱形 204 向左移动一选择器来激活所述第二柱形 206。如图 3 所示，所述第二柱形 206 被选中后将显示一屏幕 300 ，在所述屏幕 300 中所述第二柱形 206 位于顶部，且其内容可选。此外，通过向右移动所述选择器或使所述选择器离开未被激活的柱形，即可退出所述标签式内容来源选择系统。

所述标签式内容来源选择系统启动后，用户可在被激活的柱形列出的节目中进行浏览以选择需要的节目。例如在本发明的较佳实施方式中，用户可通过发送一上移或下移指令在活跃的柱形中将一亮条移到某个频道，可以是逐条浏览也可以是快速浏览，向一个方向按住遥控器一段时间即可加快浏览速度。此外，为了便于选择，在被激活的柱形中被选中的频道及该频道附近的频道以最小化形式显示，其它较远的频道设计成线条形式，例如一条横线可以代表 10 个天线频道或 100 个有线频道。



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当某个柱形处于激活状态，其对应的内容即可通过移动亮条来选中和激活。如图 3 所示，所述柱形 206 被激活，显示可供选择的无线电视频道，亮条在 302 频道上。通过输入一“输入”指令（例如按动遥控器的一特定按键）可选中亮条所在的频道，电视机在某频道被选中和激活后启动该频道的调谐处理以显示其对应的媒体内容。

当某个柱形处于激活状态，一信息条 304 也处于激活状态。所述信息条 304 显示所述亮条所在频道的详细信息，例如显示 302 频道的频道序号、频道名称、本地会员、字幕情况、屏幕高宽比、音频选项以及输入来源，所述信息条 304 也显示 302 频道的节目编排信息，例如开始时间、等级以及节目摘要等。这些资料可以从服务指南、有线卡或数据流中获取，以帮助用户决定是否选择该频道。

请参阅图 4，所述标签式内容来源选择系统的第三柱形 208 处于激活状态以显示可供选择的输入源，包括前置 A/V 402（来自电视机前置 A/V 接口的输入）、输入 404（与电视机输入接口连接的任何媒体来源）、VCR 406（来自录像机的输入）、DVD 408（来自 DVD 播放器的输入）、SAT/CABLE 410（来自卫星或电缆的输入）、HDMI 410（来自高清晰多媒体接口的输入）以及 SVGA 412（来自计算机的输入）。如图 4 所示，所述亮条在 DVD408 上，所述信息条 414 显示有关 DVD 408 的信息。

请参阅图 5，所述标签式内容来源选择系统的第四柱形 210 处于激活状态并显示收藏夹中的可选频道，所述第四柱形 210 可由用户自己定义，以录入任何媒体来源及频道，使用户在一个菜单或柱形中就可以方便的在喜欢的媒体来源及频道之间进行切换。

本发明各实施方式分别包括各种不同种类的标签或柱形。请参阅图 6，在本发明的另一实施方式中，所述标签式内容来源选择系统还包括一菜单 602 以表示一家庭网络处于激活状态。在电视机与一网络（例如家庭计算机网络）



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连接后，所述家庭网络 604 可被使用。通过所述家庭网络 604 可使用所述网络提供的内容，例如照片、视频、音频以及所述网络上的计算机内存储的其它内容，并可用字体颜色进行区分，例如白色字体代表视频内容 606、绿色字体代表音频内容 608 以及红色字体代表照片 610。

请参阅图 7，为本发明较佳实施方式的方法流程图，该方法在图中以标号 700 指示，图中该方法 700 包括的步骤只是为了说明本发明的较佳实施例，在不同的实施方式中可相应的对某些步骤进行增加或删减。

所述方法 700 首先执行一全部频道/输入源设置步骤 702，该步骤在电视机首次开机过程中执行，例如在电视机组装完成后，电视机首次开机即执行所述步骤 702，此后在每次添加频道后即重复执行所述步骤 702。所述步骤 702 包括模拟电视、数字电视、无线电视、有线电视及其它输入源的扫描步骤，和输入源的选项标识（例如 DVD 或 VCR）步骤。

如图 7 所示，在步骤 704 中，一旦可用的频道和输入源被所述步骤 702 识别，其相关信息将作为选项标识被储存于一存储器中，提供给标签式内容来源选择系统以进行节目选择，所述存储器包括闪存及暂态存储器。在步骤 706 中，所述选项标识根据频道类型被分割成若干带标签的柱形（例如无线电视、有线电视及输入源）。所述无线电视和有线电视的柱形可以同时包括模拟和数字频道，这些频道以背景、字体、字体颜色或其它方式进行区别，以便于用户识别。

步骤 708，确认喜欢的频道以收入如所述第四柱形 210 所示的收藏夹。喜欢的频道可以通过很多不同方法进行确认，例如通过用户直接指定某些频道（例如有线电视频道或其它设备的输入），或者自动指定被用户选中次数较多的频道，在本发明中仅用到以上各种方法所获得的结果。所述喜欢的频道包括被指定的频道及被指定的输入源，它们组成一独立的柱形以便于访问。收藏夹中的频道在它们出现的柱形中将以特殊的风格进行显示，例如在有线电



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视节目柱形（第一柱形 204）中，模拟电视频道选项以标准字体显示、数字电视频道选项以粗体显示，同时普通频道为黑色而喜欢的频道为黄色。

以上所述仅为本发明的较佳实施例而已，并不用以限制本发明，凡在本发明的精神和原则之内所作的任何修改、等同替换和改进等，均应包含在本发明的保护范围之内。



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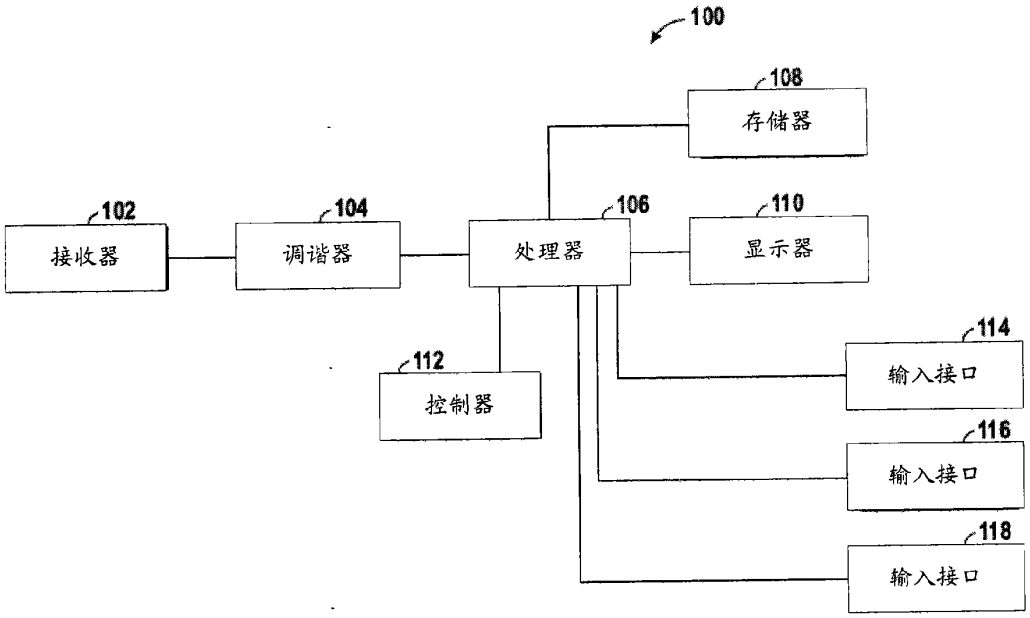


图 1

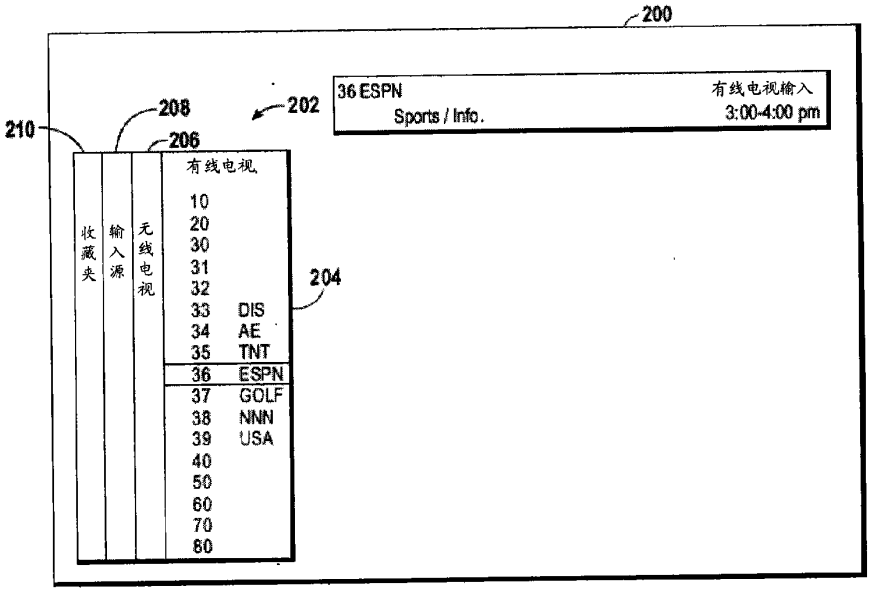


图 2



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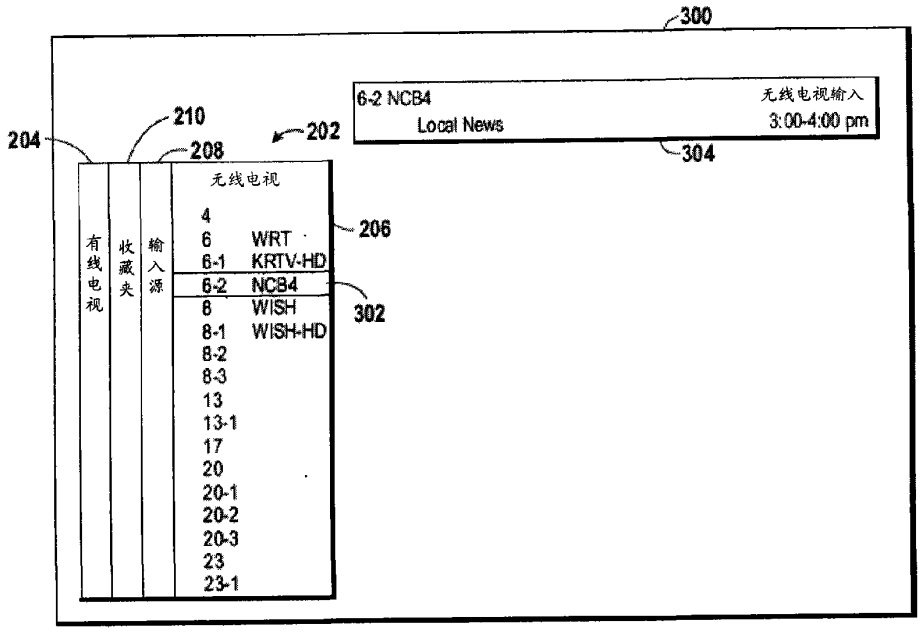


图 3

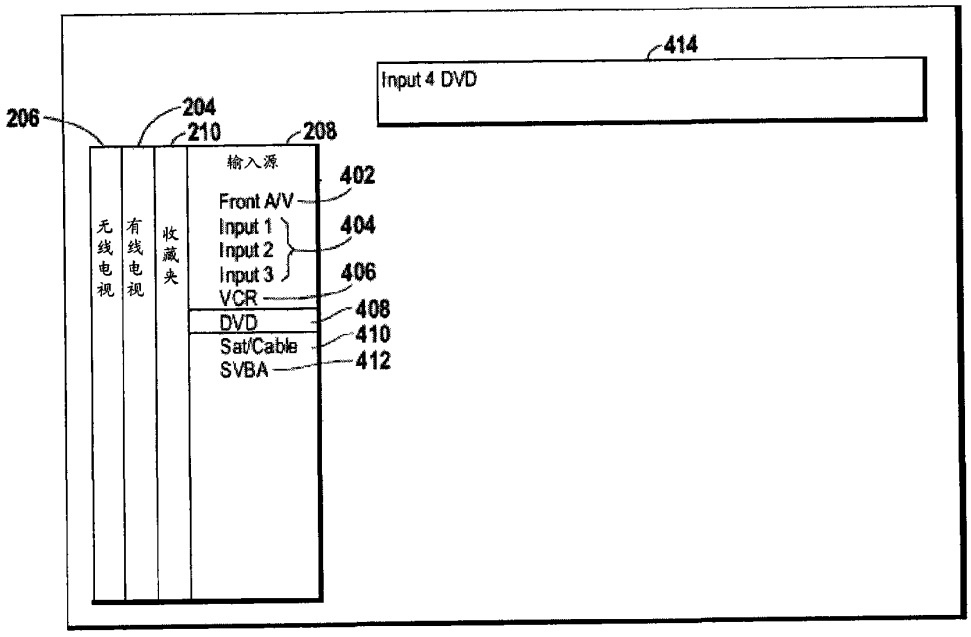


图 4



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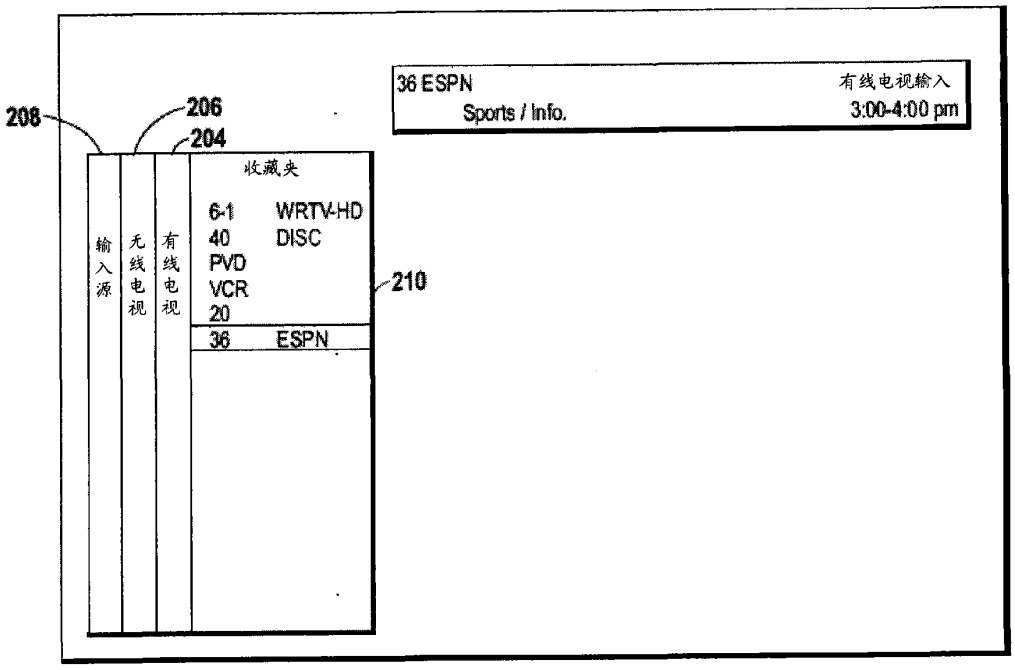


图 5

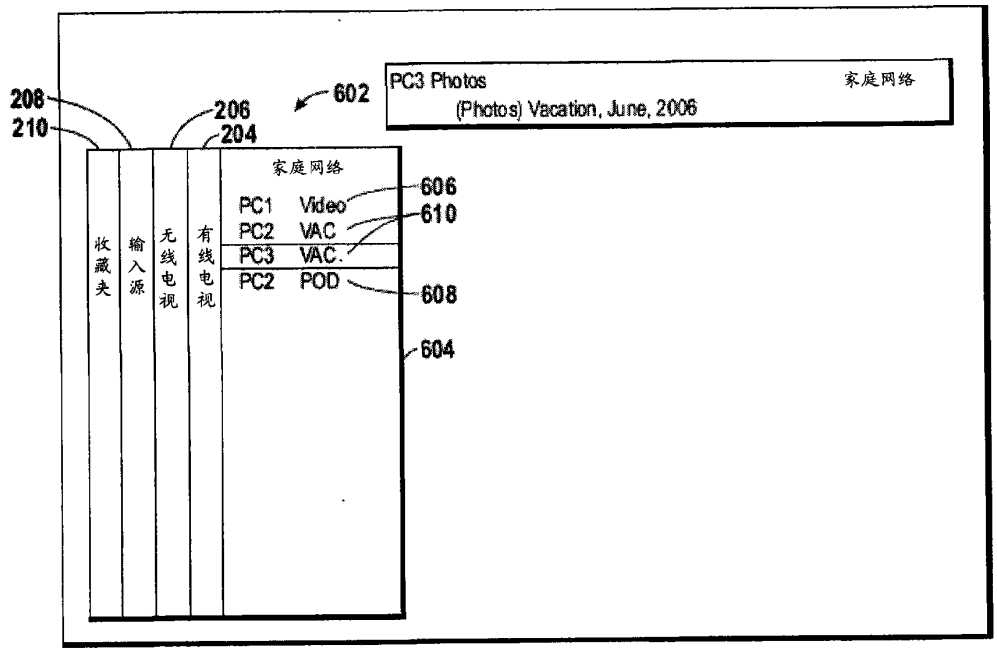


图 6



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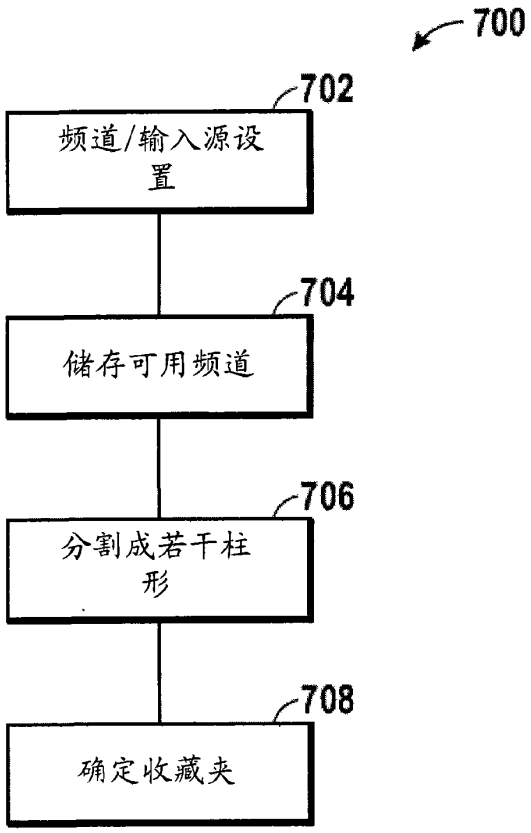


图 7



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## Method for dynamically displaying auxiliary data

No documents available for this priority number.

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**Classification:** - international:***H04N5/445; H04N7/08***
- cooperative: **H04N21/47214**; **H04N21/4882**; **H04N5/44543**; H04N21/485

**Application number:** CN2008192329 20080422

**Priority number(s):** CN2008192329 20080422

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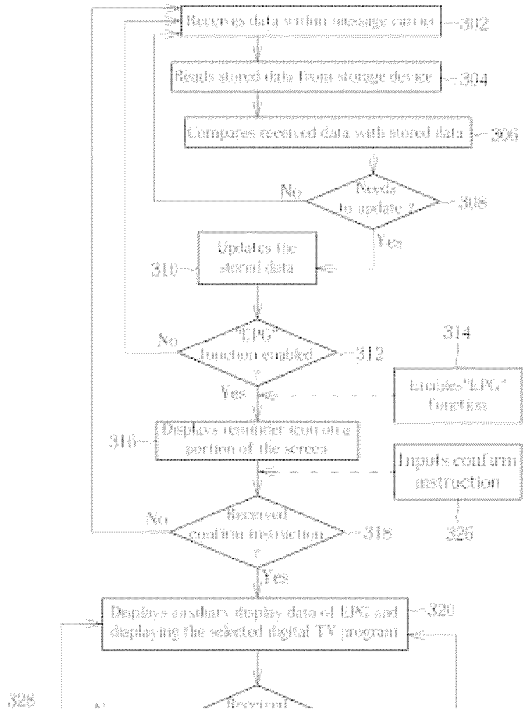
## Abstract of CN101567992 (A)

The invention discloses a method for dynamically displaying auxiliary data on an image, comprising the following steps: receiving an information carrier wave, and storing the information of the information carrier wave in a storage device; comparing the receiving information of the information carrier wave with storing information inside the storage device, and storing the receiving information into the storage device to update the storing information when the receiving information is different from the storing information; judging if the auxiliary data corresponding to a changing part can be displayed, and playing the auxiliary data on the image after the updated storing information is regulated when the auxiliary data can be displayed.



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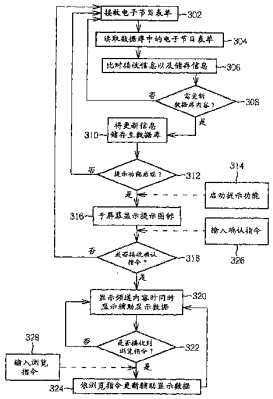
权利要求书 2 页 说明书 12 页 附图 13 页

[54] 发明名称

# 动态显示辅助数据的方法

[57] 摘要

本发明是揭露一种在画面上动态显示辅助数据的方法。 该方法包含有：接收消息载波，并储存该消息载波上的信息于储存装置中；比对该消息载波的接收信息及该储存装置中的储存信息，当该接收信息不同于该储存信息时，将该接收信息储存至该储存装置中以更新该储存信息；以及判断是否致能显示对应变动部分的该辅助数据，当该辅助数据显示时，是根据更新后的该储存信息做调整操作后播放该辅助数据于该画面上。



1. 一种在画面上动态显示辅助数据的方法，包含有：

(a)接收消息载波，并储存该消息载波上的信息于储存装置中；

(b)比对该消息载波的接收信息及该储存装置中的储存信息，当该接收信息不同于该储存信息时，将该接收信息储存至该储存装置中以更新该储存信息；以及

(c)判断是否致能显示对应变动部分的该辅助数据，当该辅助数据显示时，是根据更新后的该储存信息做调整操作后播放该辅助数据于该画面上。

2. 根据权利要求 1 所述的方法，其中步骤(c)是于对应电子节目表单的辅助显示功能被致能以及该电子节目表单的内容产生异动时，判断要致能显示对应该变动部分的该辅助数据；以及该调整操作包含有：

(d)依据产生异动的节目的相关信息来设定该辅助数据，并整合该辅助数据与主要显示数据来产生调整后的主要显示数据，以使该辅助数据可通过该调整后的主要显示数据的播放而播放于该画面上。

3. 根据权利要求 2 所述的方法，其中该调整操作还包含有：

依据提示图标来设定该辅助数据，整合该辅助数据与该主要显示数据以产生该调整后的主要显示数据，以使对应该提示图标的该辅助数据可通过该调整后的主要显示数据的播放而播放于该画面上；

判断是否接收到对应该提示图标的确认指令；以及

当接收到该确认指令时，执行步骤(d)。

4. 根据权利要求 2 所述的方法，其中该调整操作还包含有：

判断是否接收到浏览指令；以及

当接收到该浏览指令时，依据该浏览指令于该电子节目表单中所选取的节目的相关信息来设定该辅助数据，整合该辅助数据与该主要显示数据以产生该调整后的主要显示数据，以使该辅助数据可通过该调整后的主要显示数据的播放而播放于该画面上。

5. 根据权利要求 1 所述的方法，其中步骤(c)是当对应使用者偏好节目的辅助显示功能被致能时，判断对应该辅助数据的该显示条件是符合；以及该调整操作是依据该使用者偏好节目的相关信息来设定该辅助数据，整合该辅助数据与主要显示数据以产生调整后的主要显示数据，以使对应该使用者



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偏好节目的相关信息的该辅助数据可通过该调整后的主要显示数据的播放而播放于该画面上。

6. 根据权利要求 5 所述的方法，其中该使用者偏好节目的相关信息包含有依使用者所设定达到预定时间后将播放该使用者偏好节目的时间倒数信息。

7. 根据权利要求 1 所述的方法，其中步骤(c)是当对应需预录节目的辅助显示功能被致能时，判断对应该辅助数据的该显示条件是符合；以及该调整操作是依据该需预录节目的相关信息来设定该辅助数据，整合该辅助数据与主要显示数据以产生调整后的主要显示数据，以使对应该需预录节目的相关信息的该辅助数据可通过该调整后的主要显示数据的播放而播放于该画面上。

8. 根据权利要求 1 所述的方法，其中步骤(c)是当对应付费凭证状态的辅助显示功能被致能时，判断对应该辅助数据的该显示条件是符合；以及该调整操作是依据该付费凭证状态的相关信息来设定该辅助数据，整合该辅助数据与主要显示数据以产生调整后的主要显示数据，以使对应该付费凭证状态的相关信息的该辅助数据可通过该调整后的主要显示数据的播放而播放于该画面上。

9. 根据权利要求 1 所述的方法，其还包含有：

自该消息载波接收在线交易的相关信息；

其中步骤(c)是当对应该在线交易的辅助显示功能被致能时，判断对应该辅助数据的该显示条件是符合；以及

该调整操作是依据该在线交易的相关信息来设定该辅助数据，整合该辅助数据与主要显示数据以产生调整后的主要显示数据，以使对应该在线交易的相关信息的该辅助数据可通过该调整后的主要显示数据的播放而播放于该画面上。



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# 动态显示辅助数据的方法

## 技术领域

本发明是有关于视频显示机制，尤指在电子装置(例如数字电视)上动态显示辅助数据的方法。

## 背景技术

随着科技进步，采用数字电视广播系统的数字电视装置也随着越来越普及。相较于传统采用NTSC(National Television Standard Committee)系统的模拟电视广播(Analog Television Broadcasting)系统，数字电视广播系统将电视频号由“模拟信号”转换为“数字信号”的电视系统，而数字电视广播系统(Digital Television Broadcasting)主要包含有三套技术标准，分别为美规ATSC(Advanced Television Systems Committee)、及欧规DVB-T(Digital Video Broadcasting-Terrestrial)、日本ISDB-T(Terrestrial Integrated Services Digital Broadcasting)，然而除了以上三种技术标准之外，随着地域的不同，尚有许多其它的不同标准，举例来说，中华人民共和国目前亦自订了数字电视规范。不管使用那一种数字电视规范，均需要使用数字电视接收器(其应用在一般产品数字电视盒中)来接收数字电视频号。

然而，现今使用者在观赏数字电视频道以及/或其它娱乐电子装置时，并没有一个简易、实时的辅助数据显示功能，在不影响使用者观赏播放中的频道节目的前提下，提供简易的查询/浏览除了频道节目之外其余相关信息。

举例来说，一般数字电视节目提供者可利用数字电视频号来提供相关的电子节目表单(Electronic Program Guide，EPG)予使用者参阅查询。电子节目表单会完整地显示各个频道的播放时段以及其播放节目类别，倘若使用者正在欣赏一数字频道节目时，当欲查询后续时段该频道或其它频道即将播映的频道节目时，必须按下遥控器的电子节目表单按键以跳出表格式的电子节目表单画面。传统电子节目表单的全屏幕显示方式虽然详细地显示了包含有：日期、时间、频道号码、频道名称、节目名称以及节目将播放的时段等信息，但是这种全屏幕显示的电子节目表单不仅显得庞杂，而且需耗费时间来浏览



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节目信息，更迫使使用者必须中断目前正观赏的节目内容以查询电子节目表单。除此之外，随着数字电视系统的普及，数字电视频道数目亦随之迅速增加，传统浏览方式显然相当不便利/不人性化。

发明内容

有鉴于此，本发明的目的之一即为设计可动态显示辅助数据的方式，在使用者选定/启动所需的提醒功能(reminding function)之后，通过简短篇幅的消息条列方式提供使用者于观赏频道节目的同时也可接收其所需的个人化提醒信息，以解前述问题。此外，本发明亦可应用于数字电视装置外的其它电子装置，例如具有显示屏幕的MP3随身听装置。

根据本发明的一实施例，其包含有一种在画面上动态显示辅助数据的方法。该方法包含有以下步骤：接收消息载波，并储存该消息载波上的信息于储存装置中；比对该消息载波的接收信息及该储存装置中的储存信息，当该接收信息不同于该储存信息时，将该接收信息储存至该储存装置中以更新该储存信息；以及判断是否致能显示对应变动部分的该辅助数据，当该辅助数据显示时，是根据更新后的该储存信息做调整操作后播放该辅助数据于该画面上。

相较于先前技术，本发明动态显示辅助显示信息的方法通过简易消息显示接口于屏幕(屏幕显示器)上简便地将辅助显示信息提供给使用者阅览。使用者先通过在提示功能选单(reminder menu)中来依照其需求设定，接着，经由简易消息显示接口、提示功能选单与自动搜寻管理的结合，因此使用者于欣赏数字电视时便可享受轻松、简易并人性化的操作机制以阅览辅助信息。

附图说明

图1所示为本发明应用于电子装置(例如数字电视装置)的提示功能选单的一实施例的示意图。

图2为更新电子节目表单信息的流程图。

图3为本发明动态显示电子节目表单辅助数据的一实施例的流程图。

图4为启动辅助显示功能/提示功能时所显示的提示图标的示意图。

图5为于屏幕上显示电子节目表单的辅助显示消息的示意图。

图6为使用者利用简易消息显示接口浏览不同时段节目的示意图。



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图 7 为使用者利用简易消息显示接口浏览不同频道节目的示意图。

图 8 为本发明动态显示使用者偏好节目(我的最爱)的辅助数据的一实施例的流程图。

图 9 为在一时间点时所显示的我的最爱(使用者偏好节目)的相关辅助显示消息的示意图。

图 10 为在另一时间点所显示的我的最爱(使用者偏好节目)的相关辅助显示消息的示意图。

图 11 为本发明动态显示个人视频录像的提示辅助数据的一实施例的流程图。

图 12 为于录像操作开始启动时在屏幕上显示的提示辅助数据的示意图。

图 13 为于录像过程中在屏幕上显示个人视频录像的提示辅助数据的示意图。

[主要元件标号说明]

100 提示功能选单

200～222、302～328、802～824、1102～1136 步骤

具体实施方式

为求将叙述简单化，在接下来的叙述中本发明所提及的数字电视广播系统系简称为数字电视系统。此外，本篇所述的电子装置是指使用数字电视广播系统的数字电视装置(包含有数字电视盒)。然而，如本领域技术人员所周知，本发明并不限定于采用数字电视广播系统的数字电视装置，亦可应用于其它具有显示功能/播放功能的电子装置，且以本发明所揭露的技术来动态显示辅助数据的相关设计变化均属本发明的范畴。

请参阅图 1，图 1 所示为本发明应用于电子装置(例如数字电视装置)的提示功能选单(reminder menu)100 的一实施例的示意图。如图 1 所示，提示功能选单 100 中可包含有多种提醒功能设定选项，如电子节目表单(EPG)选项、自动关机设定(Sleep Timer)选项、用来设定使用者偏好节目的我的最爱(My Favorite)选项、可显示付费凭证状态的共通接口(Common Interface, CI)选项、个人视频录制(Personal Video Recorder, PVR)选项等等…。

当使用者启动数字电视盒(机顶盒)并播放数字频道节目时，此数字电视装置(机顶盒)会于消息载波(如多媒体载波)中随时取得电子节目表单的相关



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信息(如频道、日期、时间、节目名称等等)，并将其储存于储存装置(如存储器装置或数据库)作为储存信息。在本实施例中，此储存装置可以是易失性存储器，例如动态随机存取存储器(Dynamic Random Access Memory, DRAM)，而用以提示功能选单的设定则储存于非易失性存储器，例如闪存(flash memory)，然而，这仅作为范例说明之用，并不为本发明的限定条件。

数字电视装置(机顶盒)会定期地接收电子节目表单的相关信息，并将所接收到的接收信息(亦即电子表单信息)与目前的储存信息(亦即储存于数据库内的信息)作比对，而当所接收的相关信息相较于数据库中的信息有出现变动/更新的部分时，系统便会执行调整操作将更新储存装置内的储存信息(例如:将需要变更/更新的部分写入至数据库中)。

请参阅图 2，图 2 为更新电子节目表单信息的流程图。本流程包含有以下步骤:

步骤 200: 电子节目表单更新流程开始。

步骤 202: 数字电视装置(机顶盒)开始接收消息载波上的信息(如电子节目表单)。

步骤 204: 从储存装置(数据库)读取储存于其中的储存信息(亦即电子节目表单)。

步骤 206: 比对接收信息以及储存信息(亦即比对所接收的电子节目表单与储存于数据库内的电子节目表单的信息是否相同)。

步骤 208: 是否需更新数据库中电子节目表单的节目名称? 若是，则执行步骤 214; 否则，则执行步骤 210。

步骤 210: 将对应到节目名称的旗标(Flag)设为零。

步骤 212: 是否需更新数据库中电子节目表单的节目播放时间? 若是，则执行步骤 218; 否则，则执行步骤 220。

步骤 214: 将对应到节目名称的旗标(Flag)设为一。

步骤 216: 将数据库中电子节目表单的信息更新。

步骤 218: 将对应到节目时间的旗标(Flag)设为一。

步骤 220: 将对应到节目时间的旗标(Flag)设为零。

步骤 222: 本次电子节目表单更新流程结束。

本发明利用了上述电子节目表单更新的流程，以便利地于画面(如屏幕的画面)提供使用者简易显示/浏览电子节目表单以及其它提示功能选单中相关



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的提醒功能，例如使用者偏好节目(亦即我的最爱)、个人视频录制(用以设定节目录像)等等…。

请参阅图 3，图 3 所示为本发明动态显示电子节目表单辅助数据的一实施例的流程图。请注意到，倘若实质上可达到相同的结果，并不一定需要遵照图 3 所示的流程中的步骤顺序来依序进行。本流程包含有以下步骤：

步骤 302：数字电视装置(机顶盒 410)接收消息载波上的信息(如电子节目表单)。

步骤 304：由储存装置(如数据库)读取储存于其中的储存信息(电子节目表单)。

步骤 306：比对接收信息以及储存信息(亦即比对所接收的电子节目表单与储存于数据库内的电子节目表单的信息是否相同)。

步骤 308：是否需更新数据库中的储存信息(储存装置中的电子节目表单)？若是，则执行步骤 310；否则，则回到步骤 302。

步骤 310：更新该储存信息(如将更新的电子节目表单信息储存至数据库中)。

步骤 312：数字电视装置(机顶盒 410)判断提示功能选单 100 中的电子节目表单选项是否启动？若是，则执行步骤 316；否则，回到步骤 302。

步骤 316：于数字电视装置(机顶盒 410)的屏幕 400 画面的一部分画面位置显示提示图标(在本实施例中为星号)，此时屏幕 400 是同时播放频道节目内容(如图 4 所示，图 4 为根据本发明的一实施例于屏幕 400 上显示辅助数据的示意图，其中该屏幕 400 是耦接至数字机顶盒 410。在后续的揭露中，机顶盒 410 为具有 PVR(个人视频录制)功能的机顶盒，然而在其它实施例中，亦可采用不具有个人视频录制功能的机顶盒，此相关设计变化亦属于本发明的范畴之中。)。

步骤 318：检测是否接收到使用者输出的确认指令以确认显示简便的电子节目表单信息？若是，则执行步骤 320；否则，则执行步骤 302。

步骤 320：在数字电视装置(亦即机顶盒 410)播放数字频道内容时同时于屏幕 400 其画面的部分显示相关的电子节目表单辅助数据，此辅助显示信息是以一行消息显示列的方式显示在屏幕 400 其画面的一部分画面位置(如图 5 所示)。

步骤 322：检测是否接收到使用者输出的浏览指令(例如经由方向键所输



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入的指令)以浏览电子节目表单信息？若是，则执行步骤 324；否则，执行步骤 320。

步骤 324：依据浏览指令于电子节目表单中所选取的节目的相关信息来更新该辅助数据，接着，执行步骤 320 以进行显示。

如前面所述，图 3 的详细实施方法是可利用图 2 的步骤推论而得，故本领域技术人员应可经由图 2 所示的流程了解步骤 302～步骤 310，故于此不另赘述。在步骤 312 中，当电子装置(机顶盒 410)判定了电子节目表单的提示功能启动(亦即使用者将图 1 所示的提示功能选单 100 中的电子节目表单选项设定为“启动”)时，即可根据使用者的操作来将电子节目表单以简短消息显示列的方式显示在屏幕 400 的(画面)上。于本发明的一实作方式中，此消息条列的显示方式可以用跑马灯的方式显示之。且该辅助信息的调整操作是于数字电视装置(机顶盒 410)判断使用者已经启动了显示电子节目表单的提示功能之后(例如于步骤 314 中，数字电视装置(机顶盒 410)在接收到使用者所输入的启动电子节目表单的提示功能的指令，请注意，步骤 314 的启动提示功能的操作可在任何时间点执行)，会先在屏幕 400 上显示提示图标，此时，若使用者想要阅览辅助信息，即可通过按下相对应的提示热键以输出确认指令给数字电视装置(机顶盒 410)(步骤 326)。在接收到确认指令后，简易消息显示接口即会把步骤 214 以及步骤 218 中旗标设定为“1”的数据项(亦即节目名称出现变动及/或节目时间出现变动的电子节目)显示在屏幕 400 的一部分显示位置(例如屏幕 400 其画面中底部位置)。如图 5 所示，此辅助数据包含有频道号码、频道名称、变动的电子节目的播放时间以及相关的更新部分，请注意，辅助数据的内容可根据设计需求而定，亦可由使用者来自行决定。

除此之外，使用者亦可使用这种简易消息显示接口来显示/浏览电子节目表单，通过在电视遥控器(未显示于图中)按下相对应的按键即可于一画面(位于屏幕 400)上浏览同频道其前后不同时段的节目表单，以及浏览不同频道于同一时段的节目信息。也就是说，当使用者经由电视遥控器输入确认指令至数字电视装置(机顶盒 410)(步骤 328)，则数字电视装置(机顶盒 410)便依据浏览指令于电子节目表单中所选取的单一节目的相关信息来更新并显示辅助数据于屏幕 400 的画面上(步骤 324、320)。

请注意，使用前述的简易消息显示接口来浏览电子节目表单的功能(步骤 320、322、324、328)亦可独立执行，亦即本发明并不限定将此功能整合于图



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3 所示的动态显示电子节目表单辅助数据的操作中，举例来说，于另一实施例中，无论电子节目表单的内容是否有更新，使用者亦可使用这种简易消息显示接口来显示/浏览电子节目表单(步骤 320、322、324、328)，此设计变化亦属本发明的范畴。

举例来说，原本如图 5 所示，简易消息显示接口在屏幕 400 上显示了第 99 频道的 ABC 电视台晚间九点至十点播放的节目名称为“Pro_ABC”。在使用者按下电视遥控器的相对应于浏览不同时段的功能热键后(在本实施例中为：向左、向右热键)，简易信号显示接口即会将同频道下一时段即将播放的节目数据显示在显示屏幕 400 的部分画面位置(如图 6 所示)，此时耦接至数字电视装置(在本实施例中为机顶盒 410)的显示屏幕 400 除了继续播放数字频道的节目(主要显示数据)之外，在屏幕 400 下方边框显示的辅助显示消息为第 99 频道的 ABC 电视台于晚间 10：00～11：00 时播放的节目名称为“Pro_TTV”。

此外，使用者亦可于屏幕 400 上读取邻近的其它频道于同一时段将播映的节目相关信息。请同时对照图 6 以及图 7，图 7 为使用者利用简易消息显示接口于屏幕 400 浏览不同频道节目的示意图。使用者可经由按下电视遥控器的相对应于浏览不同频道的功能热键(在本实施例中为：向上、向下热键)，来控制简易信号显示接口将邻近频道于同一时段即将播放的节目数据显示在显示屏幕 400(画面)的部分画面位置以供使用者浏览(如图 7 所示)。此时，数字电视装置(机顶盒 410)的显示屏幕 400(亦即其画面部分)除了继续正常播放数字频道的节目(主要显示数据)之外，在屏幕 400 其画面下方边框显示的辅助显示消息为第 98 频道的 BBC 电视台于晚间 10：00～11：00 时播放的节目名称为 Pro_CATV。当然，使用者可通过电视遥控器的向上/向下热键继续浏览其它频道于此时段(10：00～11：00)播映的节目相关信息。

通过本发明提供的动态显示辅助数据的方法，使用者可一边欣赏数字电视频道播映的节目内容(显示于画面的大部分显示区域中)，一边浏览其它频道/其它时间播映的电视节目信息(显示于屏幕 400 其画面的一部分显示区域中)，故不需中断现正欣赏的频道节目来读取全屏幕显示的电子节目表单。

在本实施例中，使用了提示图标(例如图 4 所示的星号)来提示使用者此时有辅助数据可供浏览，此外，辅助数据的内容是以跑马灯的方式显示在屏幕 400 的部分画面位置(例如靠近画面边缘的位置)，然而这仅为说明之用。换言之，提示图标的样式、形状、大小、辅助数据显示的位置以及方式皆不



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为本发明的限制条件，亦即在其它实施例中，使用其它图样/文字显示方式以及显示位置以达到同样辅助信息显示效果的方式皆隶属本发明的范畴。

请参阅图 8，图 8 为本发明动态显示使用者偏好节目(我的最爱)的辅助数据的一实施例的流程图。请注意到，倘若实质上可达到相同的结果，并不一定需要遵照图 8 所示的流程中的步骤顺序来依序进行。本流程包含有以下步骤：

步骤 802：数字电视装置(机顶盒 410)接收消息载波上的信息(如电子节目表单)。

步骤 804：由储存装置(如数据库)读取储存于其中的储存信息(电子节目表单)。

步骤 806：比对接收信息以及储存信息(亦即比对所接收的电子节目表单与储存于数据库内的电子节目表单的信息是否相同)。

步骤 808：我的最爱中所设定的节目的相关节目数据(节目名称及/或节目时段)是否需更新？若是，则执行步骤 810；否则，则执行步骤 812。

步骤 810：将我的最爱中需更新节目数据的节目的相对应电子节目表单信息储存至数据库中。

步骤 812：判断我的最爱所设定的节目中是否有任一使用者偏好节目即将播放(亦即播放时间与目前时间的时间差小于临界范围)？若是，则启动时间倒数功能来开始计数使用者偏好节目即将播映的时间，亦即当节目播放时间的临界范围设为十分钟时，在节目即将播映的前十分钟将启动时间倒数计时操作并执行步骤 814；否则，回到步骤 802。

步骤 814：数字电视装置(机顶盒 410)判断提示功能选单 100 中的我的最爱(使用者偏好节目)的提示功能是否启动？若是，则执行步骤 816；否则，则执行步骤 802。

步骤 816：耦接于于数字电视装置(机顶盒 410)的屏幕 400 的画面的一部分画面位置显示提示图标(在本实施例中为星号)，此时屏幕 400 是同时播放频道节目内容(请参照图 4)。

步骤 818：检测是否接收到使用者输出的确认指令以确认显示我的最爱(使用者偏好节目)的时间倒数提示？若是，则执行步骤 820；否则，则回到步骤 802。

步骤 820：在数字电视装置(机顶盒 410)播放数字频道内容时，同时于屏



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幕 400 画面的部分显示我的最爱(使用者偏好节目)即将播映的相关辅助数据(例如上述的时间倒数信息)，此辅助显示信息是以一行消息显示列的方式显示在屏幕 400 画面的一部分画面位置(如图 9、图 10 所示)。

请同时对照图 9 以及图 10，图 9 以及图 10 分别为数字电视装置(机顶盒 410)的屏幕 400 显示部分于不同时间点显示我的最爱(使用者偏好节目)的相关辅助显示消息的示意图。在使用者启动了显示我的最爱(亦即使用者偏好节目)的提示功能之后(例如于步骤 822 中，数字电视装置(机顶盒 410)接收到使用者所输入的启动我的最爱(使用者偏好节目)的提示功能的指令，亦即图 1 所示的提示功能选单 100 中我的最爱选项设定为“启动”，请注意，步骤 822 的启动提示功能的操作可在任何时间点执行)，当屏幕 400 上显示的提示图标出现时，使用者通过按下相对应的提示热键以输出确认信号给数字电视装置(机顶盒 410)(步骤 824)。在接收到确认信号后，于屏幕 400 播放正常频道内容的同时，简易消息显示接口即会在显示屏幕 400 的部分画面位置以消息显示列的方式告知使用者还剩余多少时间，使用者所设定每一使用者偏好节目即将要开始播映。

由于使用本发明动态显示辅助数据来提供我的最爱提示信息的方法与前述电子节目表单的辅助数据的显示方法大致上相同，故详细运作请参照前述的揭露内容，在此为了简明之便就不加以赘述。同样地，此实施例使用了提示图标(例如星号)来提示使用者此时有辅助数据可供浏览，且辅助数据是以跑马灯的方式显示在显示屏幕 400 的一部分位置(例如靠近画面边缘的位置)，然而这仅作为范例说明之用，换言之，诸如提示图标的样式、形状、大小、辅助数据显示的位置以及方式皆不为本发明的限制条件。

除此之外，对于可同时欣赏播映的电视节目以及进行录像的数字电视装置(此时机顶盒 410 需为具有个人视频录制(PVR)功能的数字机顶盒)而言，使用者亦可使用前述提及的简易消息显示接口来结合自动搜寻管理接口以及提示功能选单的设定操作，因此，在欲录像的节目的播放时间将至的时候，通过辅助数据的显示来让使用者可实时地启动/操作节目预录功能。使用者亦可经由简易消息显示画面及电视遥控器的操作来启动及/或停止录像，详细运作将于下详述。

请参阅图 11，图 11 为本发明动态显示个人视频录像的提示辅助数据的一实施例的流程图。请注意到，倘若实质上可达到相同的结果，并不一定需



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要遵照图 11 所示的流程中的步骤顺序来依序进行。本流程包含有以下步骤：

步骤 1102：数字电视装置(机顶盒 410)接收消息载波上的信息(如电子节目表单)。

步骤 1104：由储存装置(如数据库)读取储存于其中的储存信息(电子节目表单)。

步骤 1106：比对接收信息以及储存信息(亦即比对所接收的电子节目表单与储存于数据库内的电子节目表单的信息是否相同)。

步骤 1108：个人视频录像中所设定的需预录节目的相关节目数据(节目名称及/或节目时段)是否需更新？若是，则执行步骤 1110；否则，则执行步骤 1112。

步骤 1110：将个人视频录像中需更新节目数据的需预录节目的相对应电子节目表单信息储存至数据库中。

步骤 1112：判断个人视频录像中所设定的需预录节目中是否有任一需预录节目即将要开始播放(亦即播放时间与目前时间的时间差小于临界范围)？若是，则执行步骤 1114；否则，回到步骤 1102。

步骤 1114：数字电视装置(机顶盒 410)判断提示功能选单 100 中个人视频录像的提示功能是否启动?若是(例如于步骤 1134 中，数字电视装置(机顶盒 410)接收到使用者所输入的启动个人视频录像的提示功能的指令，请注意，步骤 1134 的启动提示功能的操作实际上可在任何时间点执行)，则执行步骤 1116；否则，回到步骤 1102。

步骤 1116：于数字电视装置(机顶盒 410)的屏幕 400 画面的一部分画面位置显示提示图标(在本实施例中为星号)，此时屏幕 400 是同时播放频道节目内容。

步骤 1118：检测是否接收到使用者输出的确认指令以确认显示个人视频录像的提示信息？若是(例如于步骤 1136 中，使用者通过按下相对应的提示热键以输出确认信号给数字电视装置(机顶盒 410))，则执行步骤 1120；否则，则回到步骤 1102。

步骤 1120：在数字电视装置(机顶盒 410)播放数字频道内容时，同时于屏幕 400 画面的部分显示即将播映的需预录节目的相关辅助数据(例如显示文字消息以提醒使用者有需预录节目即将于 1 分钟后播映)，此辅助显示信息是以一行消息显示列的方式显示在屏幕 400 画面的一部分画面位置。



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步骤 1122：确认是否执行录像功能？若是，则执行步骤 1124；否则，回到步骤 1102。

步骤 1124：当目前时间等于该需预录节目的播放时间时，启动该需预录节目的录像操作。

步骤 1126：于使用者欣赏频道节目的同时，经由简易消息显示接口在使用者欣赏频道节目(亦即主要显示数据)的同时，于数字电视装置(机顶盒 410)的屏幕 400 画面的一部分画面位置显示录像状态，例如当录像操作一开始启动时，告知使用者录像功能已经启动(请参照图 12)，或者于录像过程中告知使用者已进行的录像时间长度及/或正在录像中的节目名称(请参照图 13)。

步骤 1128：数字电视装置(机顶盒 410)判断是否要关闭录像操作？当数字电视装置(机顶盒 410)接收到使用者输出的关闭录像指令、该需预录节目已录完或者是使用者将目前所观赏的频道切换至该需预录节目的频道，则停止录像并回到步骤 1102；否则，则回到步骤 1124 继续录像。

现今技术中，一般数字电视装置可提供两个以上的频道调谐器(tuner)而可同时接收两个频道的信息，让使用者在以在观赏一个频道节目时同步对另一频道的节目进行录像。由于使用本发明动态显示辅助数据来提供个人视频录像提示信息的方法与前述实施例所揭露的辅助数据的显示方法大致上相同，故详细运作请参照前述的揭露内容，在此为了简明之便就不加以赘述。

总结来说，在前述的揭露中，数字电视装置是接收消息载波中的信息以作为接收信息，并将其与储存装置(例如数据库)内的储存信息作比对，当储存信息与接收信息不相符时，将所接收的信息更新储存至储存装置之中。当使用者于电子表单内依据使用者的喜好致能(启动)所需显示辅助信息的功能之后，数字电视装置即根据使用者所设定功能选项对储存装置内的储存信息动态地与使用者进行人机接口的互动，以依使用者的喜好来执行调整操作于画面(屏幕 400 装置)上动态地显示使用者欲浏览的辅助信息消息，提供使用者在不中断目前节目观赏的同时，可简单并人性化地随时取得所欲接收的辅助信息。

请注意，本发明所提供的动态显示辅助数据的功能亦可应用于电子装置的自动关机操作以及数字电视装置的付费凭证状态上，举例来说，当对应自动关机操作的辅助显示功能被致能以及启动该自动关机操作的剩余时间达到预定值时，通过本发明所揭露的动态显示辅助数据的方法以将自动关机操作



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的辅助信息显示于屏幕 400 画面上，以及当对应付费凭证状态的辅助显示功能被致能时，通过本发明所揭露的动态显示辅助数据的方法以将付费凭证状态的辅助信息显示于屏幕 400 的画面上。由于本领域技术人员于阅读完上述有关图 3、8、11 的流程说明之后应可轻易地了解将自动关机操作或付费凭证状态的辅助信息显示于屏幕 400 画面上的机制，故于此便不另赘述。

除了以上所述的功能之外，本发明动态显示辅助数据功能亦可应用在在线购物(例如电视购物)上。举例来说，通过与电视购物台的合作(例如通过有线数字电视(DVB-C)系统)，使用者的下单操作及/或下单成功的确认消息亦可经由其它装置的协助以辅助数据的方式显示于显示屏幕 400 上，也就是说，经数字电视广播业者与本发明所提供的动态辅助数据显示方法相互结合，亦可通过简易消息显示接口于显示屏幕 400 上显示一些特定用户的个人化提示信息(例如使用者完成交易的购物信息)。

本发明所提供的动态显示数据的方法除了可应用于通过电视载波接收主要显示数据的数字电视装置之外，诸如 MP3 随身听、个人计算机、电动游戏机等等任何需要便利简易的辅助数据的电子装置亦可应用本发明所揭露的动态显示辅助数据的方法，如此一来，在不影响使用者原本执行/操作的状态下，提供使用者个人化、人性化且便利的使用环境，而这些相关设计变化皆遵循本发明的精神，且属于本发明的范畴。

总而言之，本发明动态显示辅助数据的方法是周期性地判断对应辅助数据的显示条件是否符合(例如步骤 308、312、318、322；步骤 812、814、818；以及步骤 1112、1114、1118)，以便适时地将辅助信息告知使用者来达到提示/提醒的功能，此外，当符合显示条件时，本发明动态显示辅助数据的方法会整合辅助数据与主要显示数据(例如电视节目内容或其它类型的视频数据)以产生调整后的主要显示数据并播放该调整后的主要显示数据，其中该调整后的主要显示数据包含有该辅助数据，举例来说，主要显示数据中的一部分数据被辅助数据所取代而产生调整后的主要显示数据，因此，当依据调整后的主要显示数据来进行显示时，于实际输出的画面中，辅助数据等效是覆盖(overlay)于主要显示数据之上，换言之，画面中的一部分显示区域会用来显示该辅助数据，例如使用跑马灯或文字消息条的方式呈现。

以上所述仅为本发明的较佳实施例，凡依本发明权利要求范围所做的均等变化与修饰，皆应属本发明的涵盖范围。



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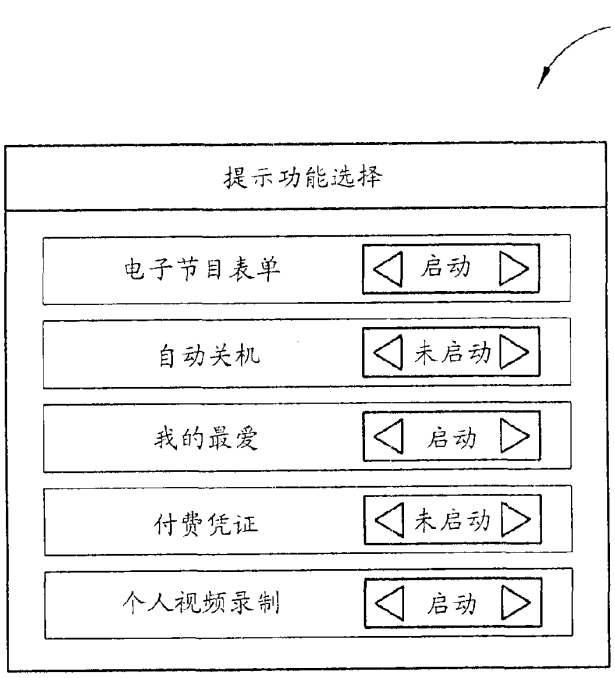


图 1



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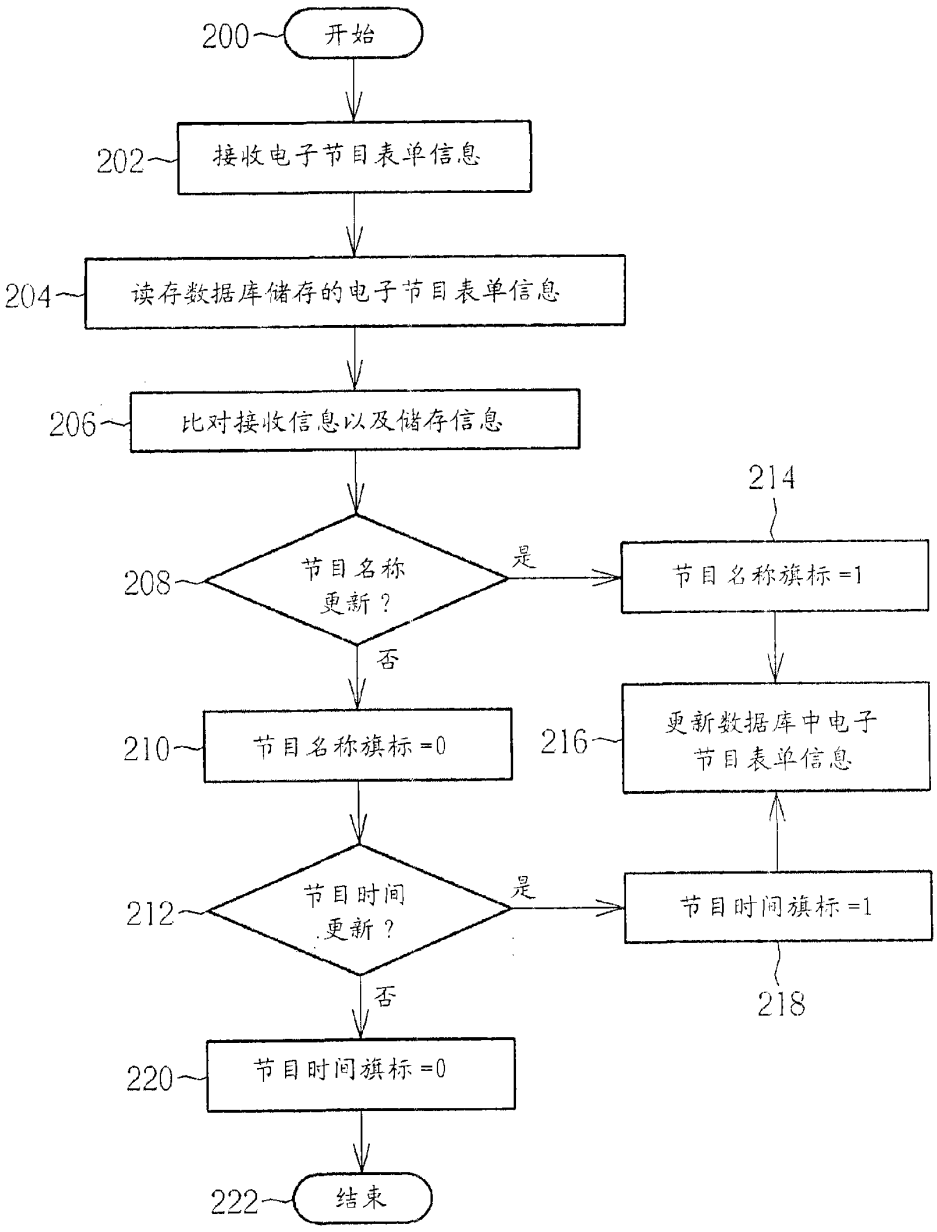


图 2



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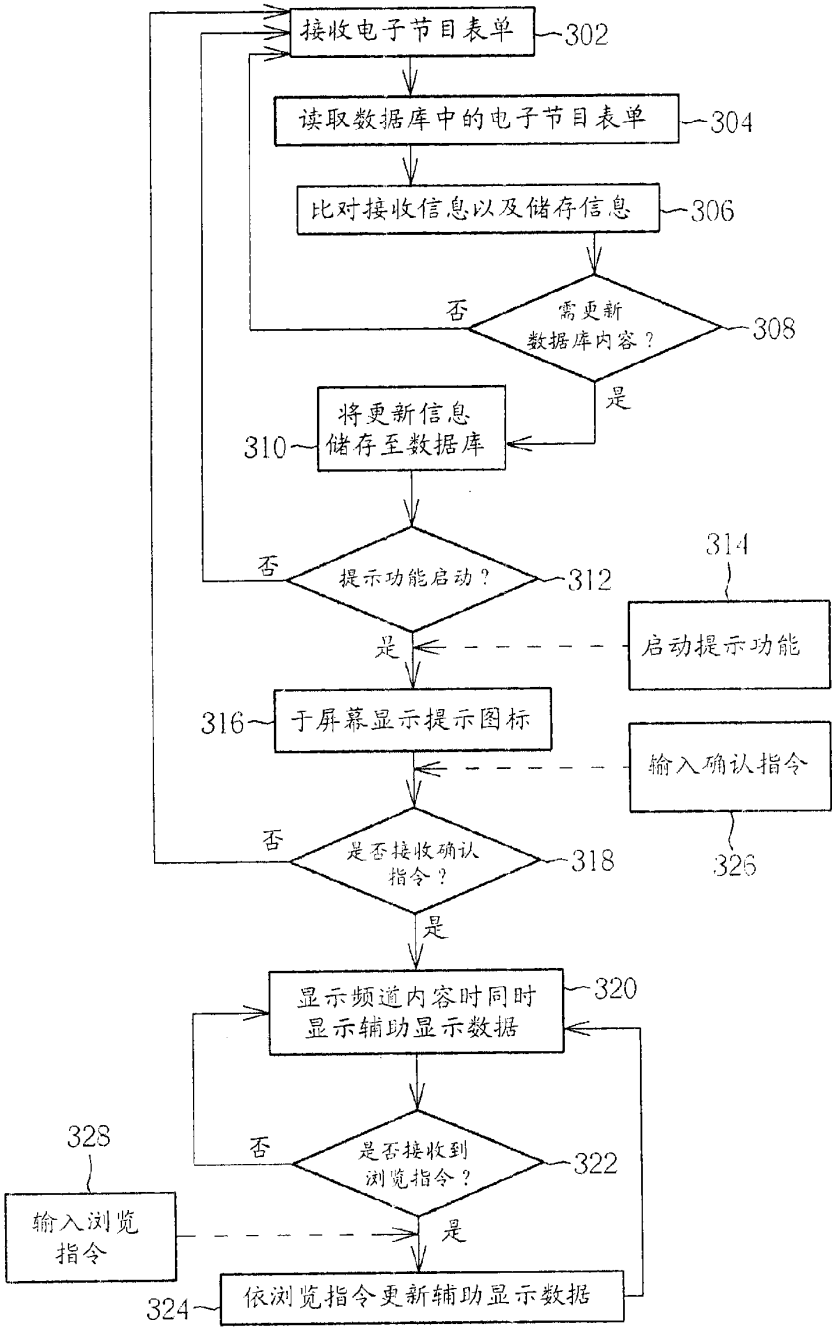


图 3



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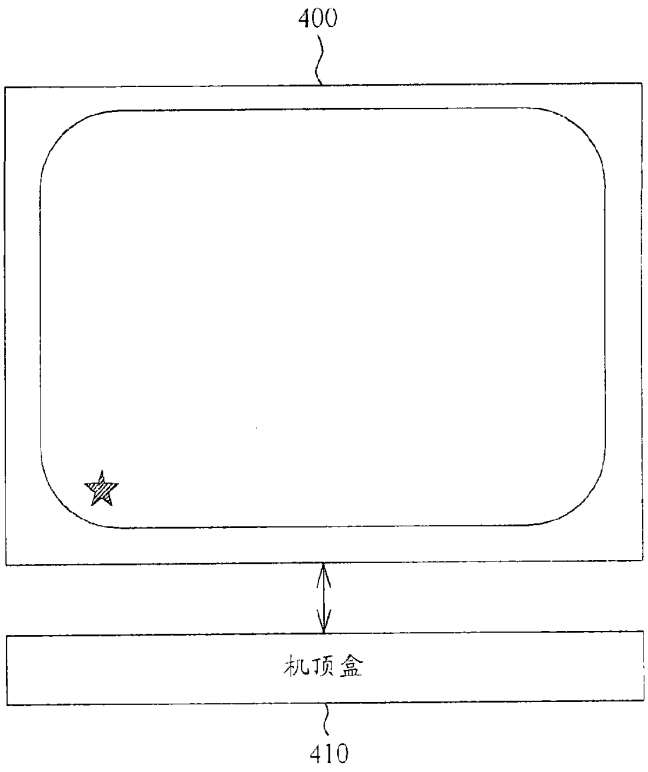


图 4



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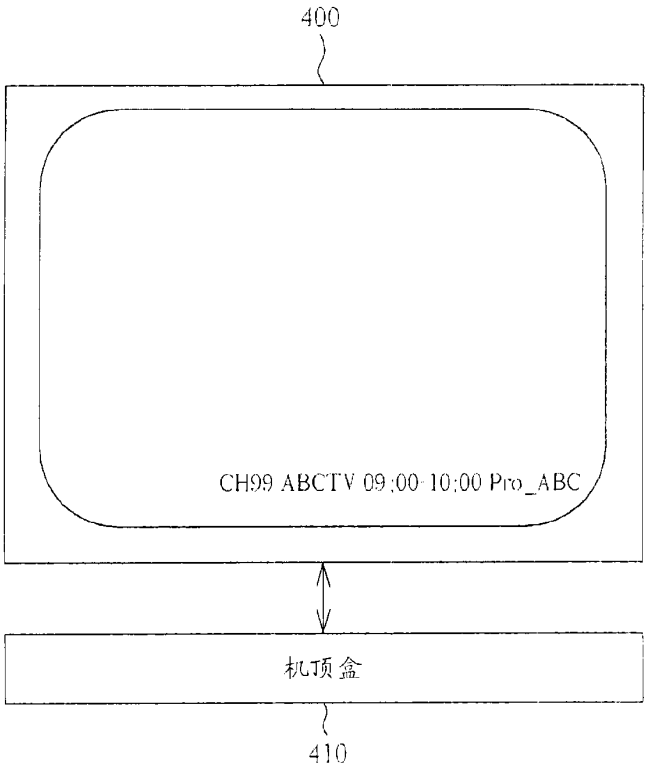


图 5



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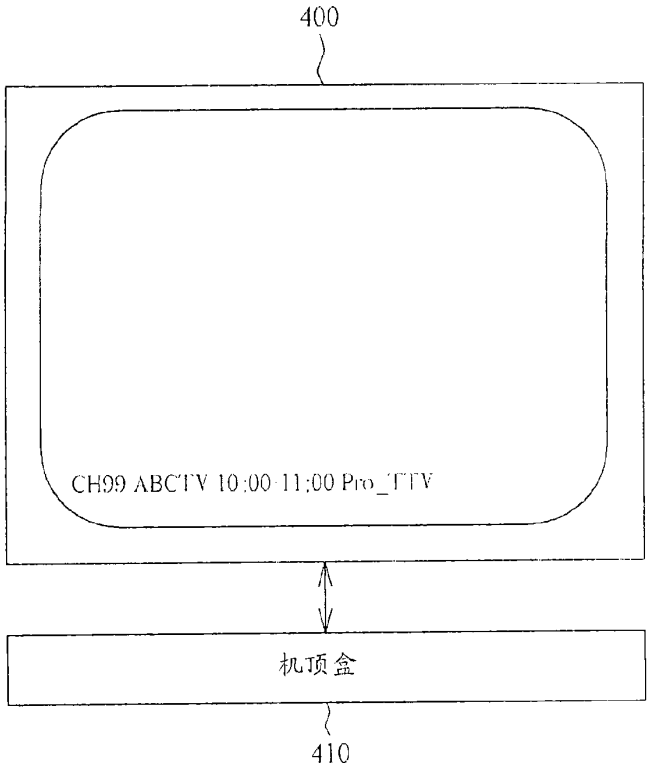


图 6



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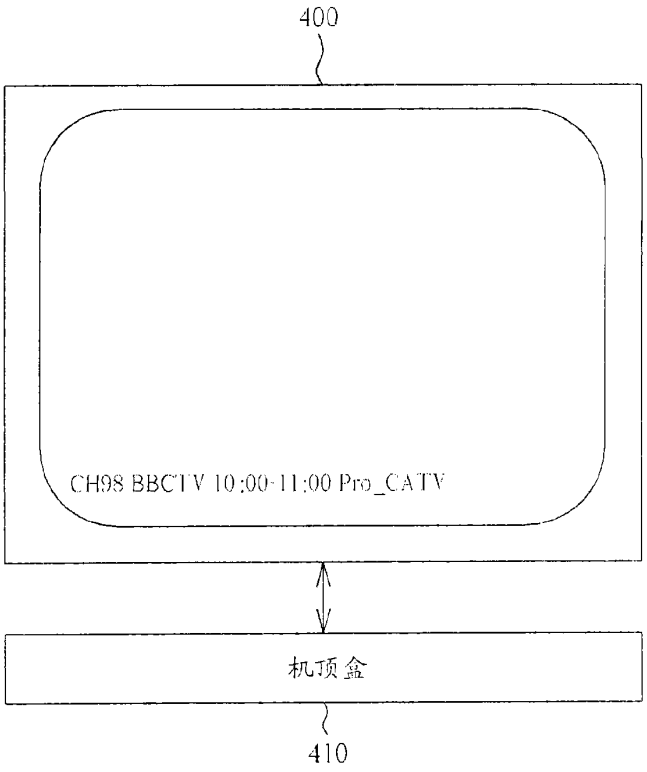


图 7



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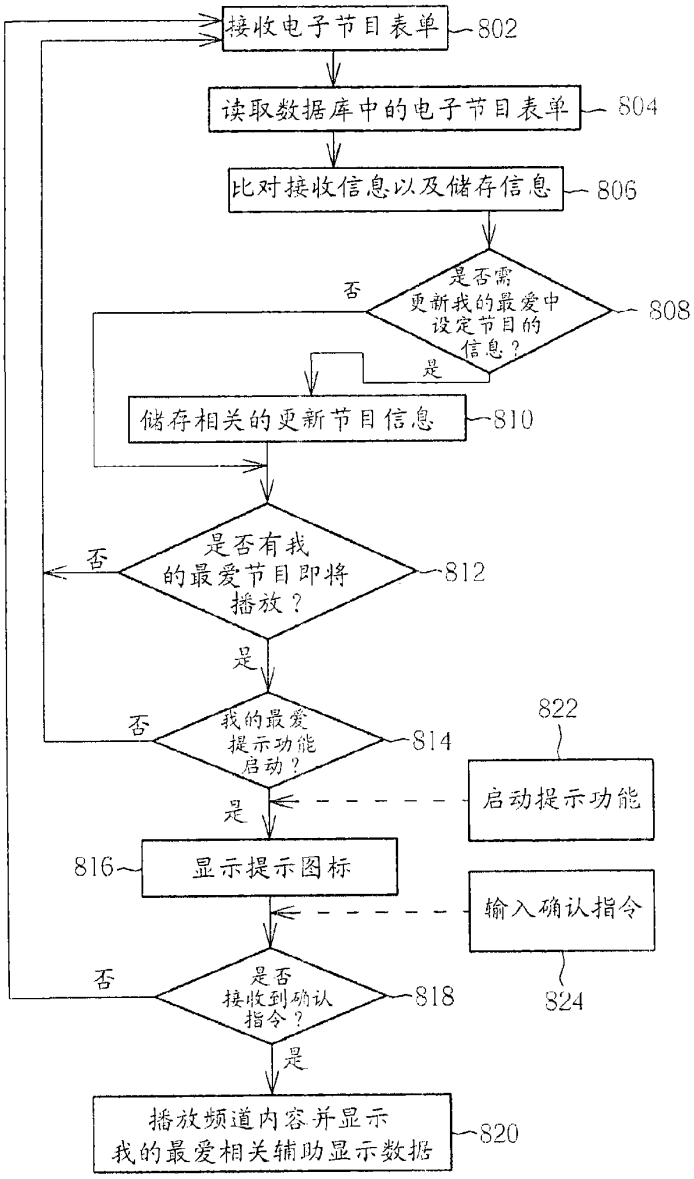


图 8



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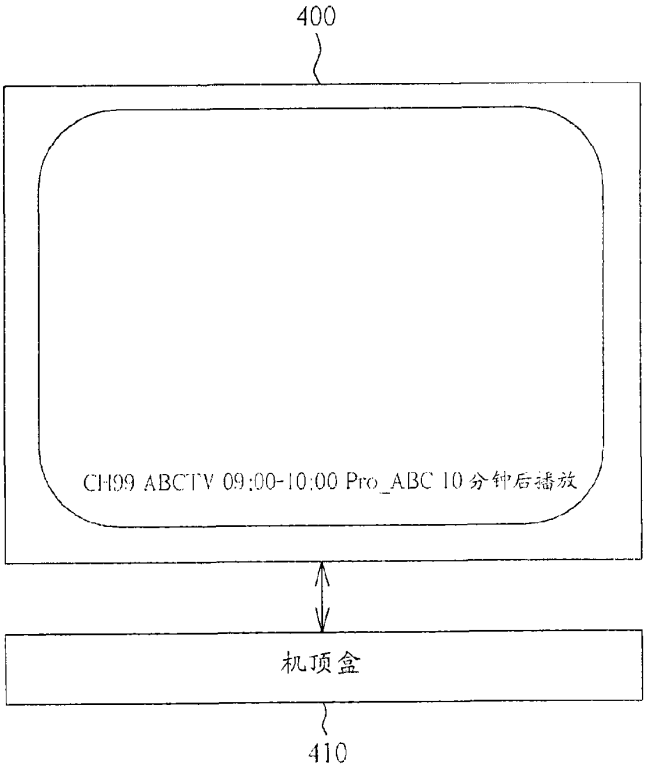


图 9



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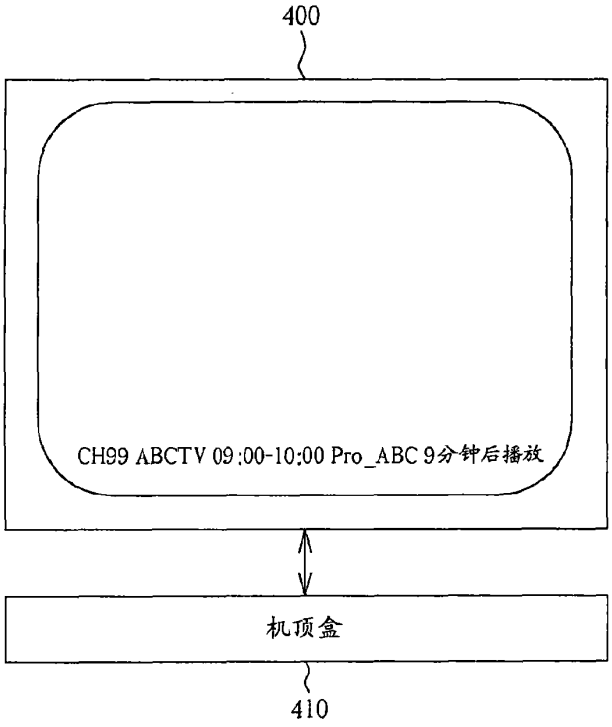


图 10



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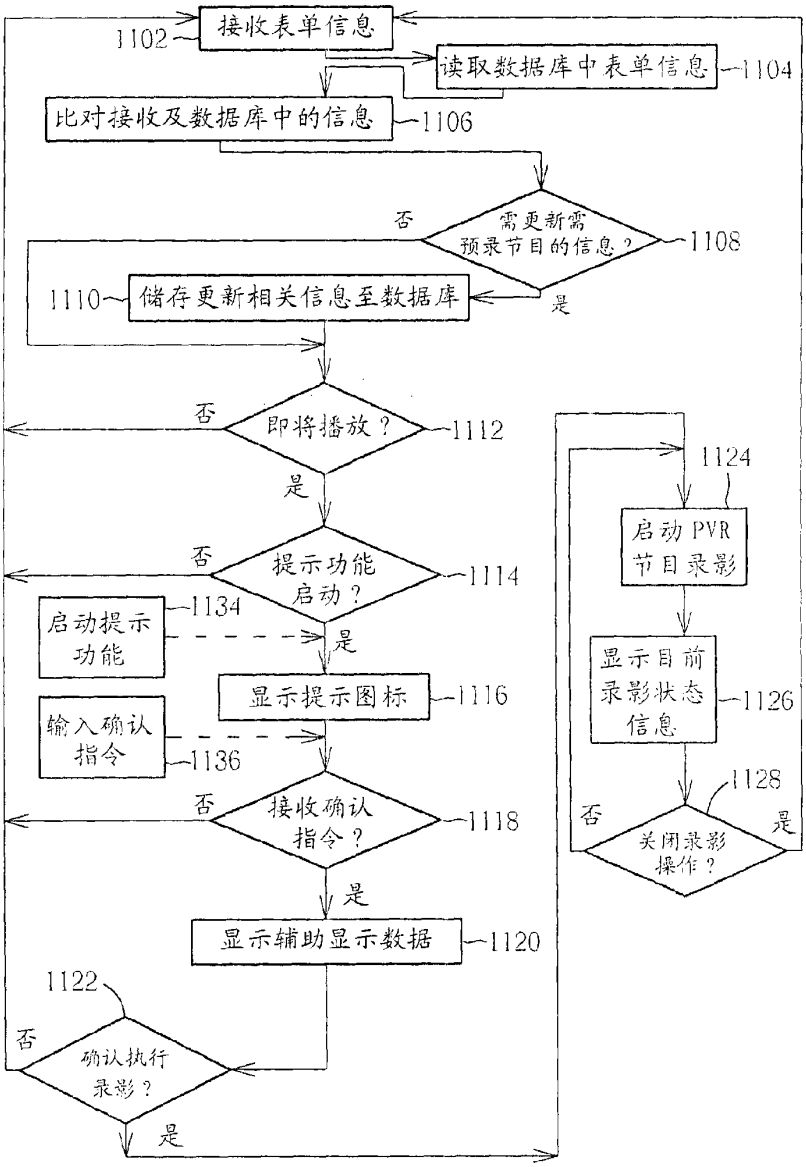


图 11



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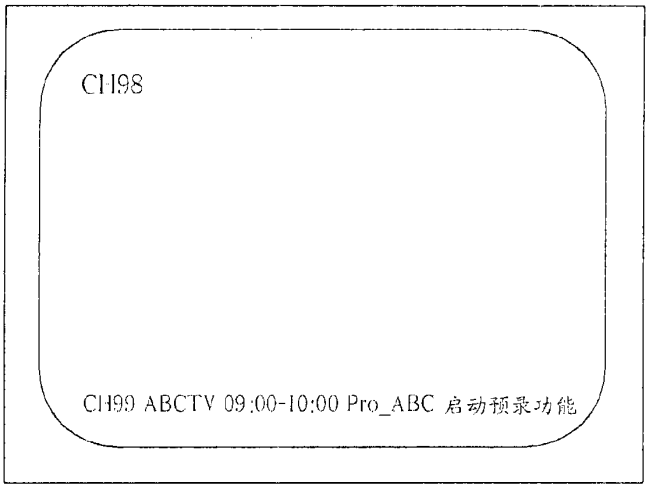


图 12



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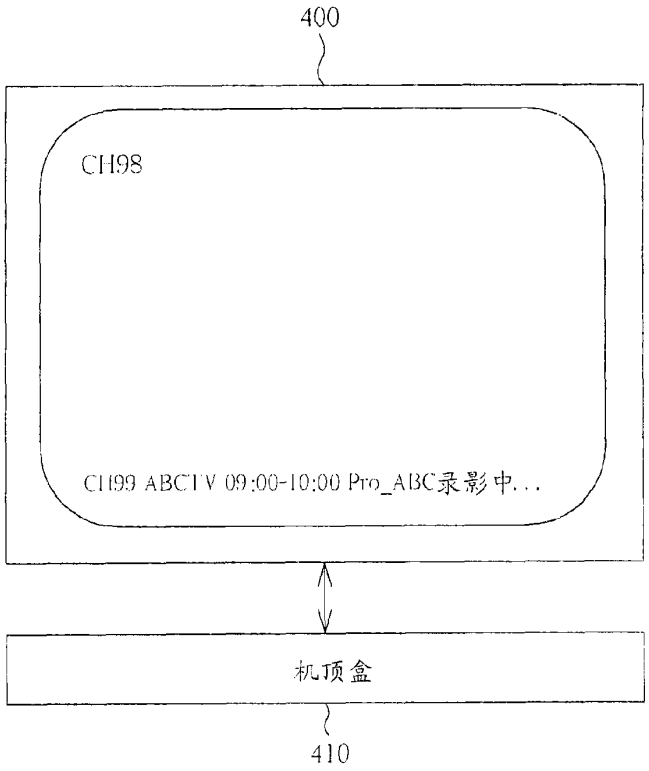


图 13



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Espacenet

# Bibliographic data: CN201937743 (U) — 2011-08-17

## Display device for simulated remote controller interfaces

No documents available for this priority number.

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**Applicant(s):** SVA TECHNOLOGIES CO LTD ± (SVA TECHNOLOGIES, CO., LTD)

**Classification:** **- international:** ***H04N21/40; H04N5/44; H04N5/445***
**- cooperative:**

**Application number:** CN20102694527U 20101231

**Priority number(s):** CN20102694527U 20101231

## Abstract of CN201937743 (U)

The utility model relates to a display device for simulated remote controller interfaces, which comprises a signal receiving module, a processing module and a display module. The signal receiving module is used for receiving key operating instruction of a remote controller and transmitting the key operating instruction to the processing module. When receiving the key operating instruction, the processing module calls corresponding simulated interface data and outputs the simulated interface data to the display module. The display module displays a simulated remote controller interface in a local area of a display according to the simulated interface data, and positions and arrangement of keys of the simulated remote controller interface are identical to those of the remote controller. A user can intuitively operate the remote controller according to prompting information by the aid of the simulated remote controller interface, and does not need to lower the head to observe the positions of keys of the remote controller or memorize the positions of the keys of the remote controller.

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(12)实用新型专利

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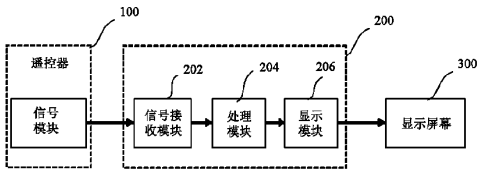
(54)实用新型名称

遥控器模拟界面的显示装置

(57)摘要

本实用新型涉及遥控器模拟界面的显示装置，包括信号接收模块、处理模块和显示模块。信号接收模块用以接收来自一遥控器的按键操作指令，并传输给处理模块。当处理模块接收到该按键操作指令时，调用对应一模拟界面数据，并输出给显示模块。显示模块根据该模拟界面数据，在一显示屏的局部区域显示一遥控器模拟界面，该遥控器模拟界面的按键位置和布局与该遥控器相同。通过该遥控器模拟界面，用户可直观的依据提示进行操作，从而不必低头观察遥控器按键位置或者记忆遥控器按键位置。

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1. 一种遥控器模拟界面的显示装置，其特征在于包括：

信号接收模块，用以接收来自一遥控器的按键操作指令，并传输一处理模块；

处理模块，当接收到该按键操作指令时，调用对应一模拟界面数据，并输出给一显示模块；以及

显示模块，根据该模拟界面数据，在一显示屏的局部区域显示一遥控器模拟界面，该遥控器模拟界面的按键位置和布局与该遥控器相同。

2. 如权利要求 1 所述的遥控器模拟界面的显示装置，其特征在于，该处理模块具有一场景识别器，用以识别当前遥控器的功能场景，该处理模块根据该功能场景调用对应的模拟界面数据。

3. 如权利要求 1 所述的遥控器模拟界面的显示装置，其特征在于，该遥控器模拟界面的每一模拟按键具有启用和闲置两种状态，该处理模块具有一按键状态器，以记录模拟按键的状态，其中当按键被按下时，该处理模块将对应的模拟按键转换到启用状态，而该显示模块对处于启用状态的按键进行高亮显示。

4. 如权利要求 1 所述的遥控器模拟界面的显示装置，其特征在于，该处理模块具有一定时器，用以对遥控器闲置时间进行计时，当该闲置时间超过一设定值时，该处理模块通知该显示模块停止显示该遥控器模拟界面。

5. 如权利要求 1 所述的遥控器模拟界面的显示装置，其特征在于，该遥控器模拟界面的显示装置是集成于一机顶盒中。

6. 如权利要求 1 所述的遥控器模拟界面的显示装置，其特征在于，该遥控器模拟界面的显示装置是集成于一电视机中。



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# 遥控器模拟界面的显示装置

## 技术领域

[0001] 本实用新型涉及电视机，尤其是涉及在电视机上显示遥控器模拟界面的装置。

## 背景技术

[0002] 随着电视机、机顶盒产品的不断推陈出新，智能化已经成为了此类电子产品的发展方向。这也使得看电视这一简单的娱乐方式变得复杂。与此同时，基于数字电视平台的应用不断扩展，已经融合了互联网、多媒体播放和互动娱乐等多种应用。这对遥控器的功能提出了更高的要求，除了选台、音量调节、参数设置等十分基本的操作外，使用智能终端可能会涉及视 / 音频播放、网页浏览、文字输入、游戏等等更多功能，遥控器发射出的指令也更为复杂。

[0003] 相对于越来越多功能的智能电视机、机顶盒，遥控的操作方式最好能够变得更加简单，让每个人拿到电子产品，不需要阅读说明书，就可以进行准确的操作。提示界面就是一种很好的解决方法。通过在屏幕上显示操作说明，提示用户如何进行操作。然而，现有的提示一般有两种，一是弹出图形窗口，用户需要记忆操作提示，返回界面后再进行操作，增加了遥控操作的难度；二是屏幕某处以文字提示条显示，这样不需要用户记忆，但是不够直观，用户仍然需要在遥控器上寻找相对应的按键。

## 实用新型内容

[0004] 本实用新型的一个目的是提供一种遥控器模拟界面的显示装置，以方便使用者的操作。

[0005] 本实用新型所提出的一种遥控器模拟界面的显示装置，包括信号接收模块、处理模块和显示模块。信号接收模块用以接收来自一遥控器的按键操作指令，并传输给处理模块。当处理模块接收到该按键操作指令时，调用对应一模拟界面数据，并输出给显示模块。显示模块根据该模拟界面数据，在一显示屏的局部区域显示一遥控器模拟界面，该遥控器模拟界面的按键位置和布局与该遥控器相同。

[0006] 在上述的遥控器模拟界面的显示装置中，该处理模块具有一场景识别器，用以识别当前遥控器的功能场景，该处理模块根据该功能场景调用对应的模拟界面数据。

[0007] 在上述的遥控器模拟界面的显示装置中，该遥控器模拟界面的每一模拟按键具有启用和闲置两种状态，该处理模块具有一按键状态器，以记录模拟按键的状态，其中当按键被按下时，该处理模块将对应的模拟按键转换到启用状态，而该显示模块对处于启用状态的按键进行高亮显示。

[0008] 在上述的遥控器模拟界面的显示装置中，该处理模块具有一定时器，用以对遥控器闲置时间进行计时，当该闲置时间超过一设定值时，该处理模块通知该显示模块停止显示该遥控器模拟界面。

[0009] 在上述的遥控器模拟界面的显示装置中，该遥控器模拟界面的显示装置可以是集成于一机顶盒中。



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[0010] 在上述的遥控器模拟界面的显示装置中，该遥控器模拟界面的显示装置可以是集成于一电视机中。

[0011] 本实用新型由于采用以上技术方案，在电视机屏幕上显示合理尺寸的遥控器模拟界面，使之与现有技术相比，用户不需要记忆遥控器按键的位置，也不需要低头观看遥控器按键，即可顺畅的进行操作。

## 附图说明

[0012] 为让本实用新型的上述目的、特征和优点能更明显易懂，以下结合附图对本实用新型的具体实施方式作详细说明，其中：

[0013] 图 1 示出根据本实用新型一实施例的电视机界面。

[0014] 图 2 示出根据本实用新型一实施例的遥控器模拟界面。

[0015] 图 3 示出根据本实用新型一实施例的遥控器按键反馈示意图。

[0016] 图 4 示出本实用新型一实施例的遥控器模拟界面显示装置的方块图。

## 具体实施方式

[0017] 本实用新型的下述实施例描述一种遥控器模拟界面的显示装置，它可在用户触发遥控器使用时，在电视机屏幕的部分区域呈现遥控器模拟界面，该界面的大小适合用户从遥控位置观看。从而，用户可根据遥控器模拟界面的提示，完成所需的操作。

[0018] 在图 4 中示出了包含遥控器 100、遥控器模拟界面显示装置 200 以及显示屏幕 300 的系统。遥控器 100 上布置有按键，当用户按压按键时，从遥控器 200 的信号模块 102 发出操作指令给遥控器模拟界面显示装置 200。遥控器模拟界面显示装置 200 内部设有信号接收模块 202、处理模块 204 和显示模块 206。信号接收模块 202 的输出端连接处理模块 204，处理模块 204 的输出端连接显示模块 206。显示模块 206 的输出端连接显示屏幕 300。显示屏幕 300 是电视机的屏幕。

[0019] 在本实用新型的一实施例中，遥控器模拟界面显示装置 200 是集成在机顶盒中。机顶盒是电视机之外的设备，它连接电视机与外部信号源，可以将压缩的数字信号转成电视内容，并在电视机的显示屏幕 300 上显示出来。

[0020] 在本实用新型的另一实施例中，遥控器模拟界面显示装置 200 是集成在电视机中。电视机内部将处理完成的内容显示在显示屏幕 300 上。

[0021] 在又一实施例中，遥控器模拟界面显示装置 200 是集成在高清播放器中。

[0022] 下面继续参照图 1-3 和图 4 来描述本实用新型的实施例。首先参照图 1 所示，右侧是一个遥控器 100，其正面布置有键盘。该键盘以手机键盘为基础，针对电视机 / 机顶盒操作的特点，进行按键改良，以符合用户体验。键盘大致上包括数字键、方向键和功能键三部分。可以理解，本实用新型并不限定于这一特定的按键布置。在左侧的显示屏幕 300 上，示出一个包含了视频画面 304 的显示界面。

[0023] 参照图 4 所示，当用户在遥控器 100 上按下按键时，遥控器将按键信号转换为可识别的编码信号，经信号模块 102 发射出去。遥控器模拟界面显示装置 200 的信号接收模块 202 会接收到这一信号，并传输给处理模块 204。处理模块 204 在内部进行处理，调用遥控器模拟界面数据，然后传输给显示模块 206，显示模块 206 将遥控器模拟界面显示于屏幕 300



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上。

[0024] 在图 2 示出的显示界面 302 的局部区域中，出现了遥控器模拟界面 306。遥控器模拟界面 306 是根据遥控器 100 设计，界面上的按键位置和布局与遥控器可以完全相同。用户可在遥控器模拟界面 306 的提示下，不观察遥控器 100 即可完成操作，也就是所谓的盲操作。因此用户的注意力可不必再遥控器本体和屏幕之间切换。

[0025] 在一实施例中，可以比例缩小视频画面 304，使其全部内容仍能显示给观者。在另一实施例中，视频画面 304 保持不变，而是部分内容被遥控器模拟界面 306 遮蔽。在这一例子中，遥控器模拟界面 306 可以显示成半透明状。

[0026] 由于观看电视时，用户离屏幕距离较远，因此，遥控器模拟界面 306 的尺寸一方面应当以保证用户能够清楚看到遥控器模拟界面 306 上的图标或文字提示为宜。另一方面，遥控器模拟界面 306 占显示界面 302 的比例不宜过大，以影响视频画面的观看效果。在当今电视机屏幕大尺寸的趋势下，可以容易的找到这两个设计目标的平衡点。

[0027] 在本实用新型的实施例中，针对某一特定的功能场景，遥控器模拟界面 306 的按键上会显示当下按键的操作，让用户可以在直观的提示下进行遥控。举例来说，在某些场景下，遥控器模拟界面 306 的数字键上显示的是数字 0-9 和 *，# 键，供输入频道号和进行文字输入，如图 2 所示。在另一些场景下，遥控器模拟界面 306 的数字键上显示的是多媒体操作键，例如播放、停止、快进、快退等。为此，为每一功能场景配置一套遥控器模拟界面数据。不同功能场景下的界面数据，其按键位置和布局相同，但是按键功能可以不同，相应的，显示在按键上的文字、数字、图标等也可以不同。处理模块 204 内具有一场景识别器，用以识别当前遥控器的功能场景，处理模块 204 再根据功能场景调用对应的模拟界面数据。

[0028] 在本实用新型的较佳实施例中，在遥控器模拟界面 306 上提供对用户在遥控器上进行任何按键操作的反馈。如图 3 所示，当用户在遥控器 100 上按下数字键 9 时，在遥控器模拟界面 306 高亮数字键 9，以作为对用户操作的反馈。

[0029] 为实现遥控器模拟界面 306 上按键被操作时的高亮显示，遥控器按键键值与模拟遥控器的按键一一对应，模拟按键都有闲置 / 使用两种状态显示。处理模块 204 内部设有一按键状态器，以记录模拟按键的状态。其中当遥控器的实体按键被按下时，处理模块 204 将对应的模拟按键转换到启用状态，而显示模块 206 对处于启用状态的按键进行高亮显示。在若干秒后，显示模块 206 恢复启用闲置状态显示。

[0030] 处理模块 204 内部还设有一定时器，用以对遥控器闲置状态进行计时。也就是说，当遥控器模拟界面显示装置 200 未接收到遥控器的操作指令时，计时开始，当这一计时超过一设定值（如 10 秒）时，处理模块 204 通知显示模块 206 停止显示遥控器模拟界面 306。由此，显示界面 302 由图 3 所示状态恢复到图 1 所示状态。

[0031] 本实用新型的遥控器模拟界面显示装置，通过在电视机界面的局部区域显示模拟遥控器画面，使得用户可以直观地根据提示进行操作，而且不需要记忆按键。用户不需要低头看遥控器，就可知道自己按的是什么键。模拟遥控器的人机界面，最大限度降低遥控操作的难度，同时可以帮助一些人，尤其是老人和儿童克服对于新型智能产品的不适应和恐惧感。

[0032] 虽然本实用新型已以较佳实施例揭示如上，然其并非用以限定本实用新型，任何本领域技术人员，在不脱离本实用新型的精神和范围内，当可作些许的修改和完善，因此本



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实用新型的保护范围当以权利要求书所界定的为准。



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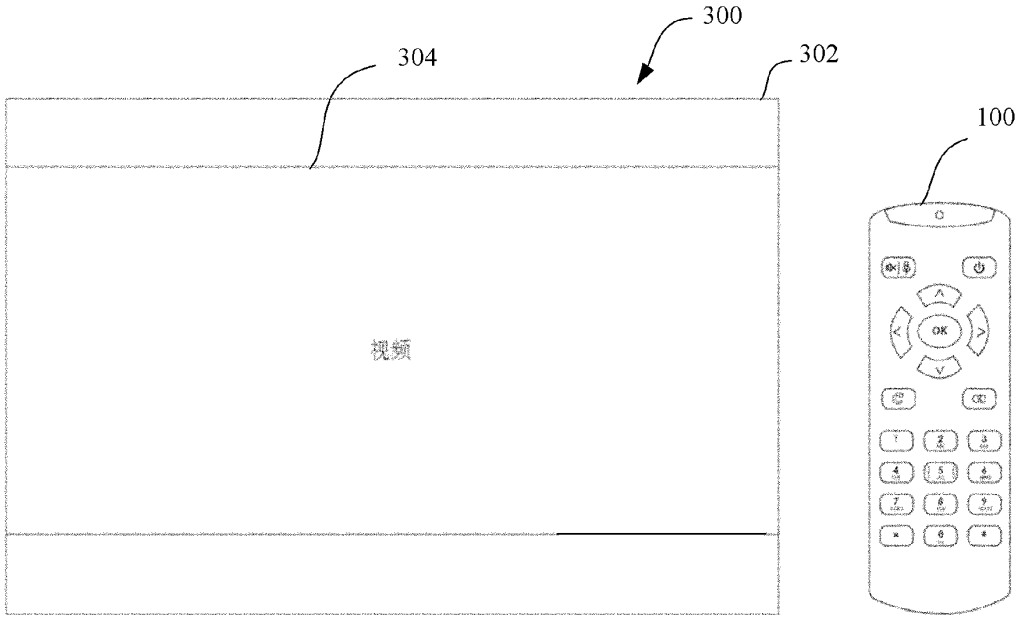


图 1

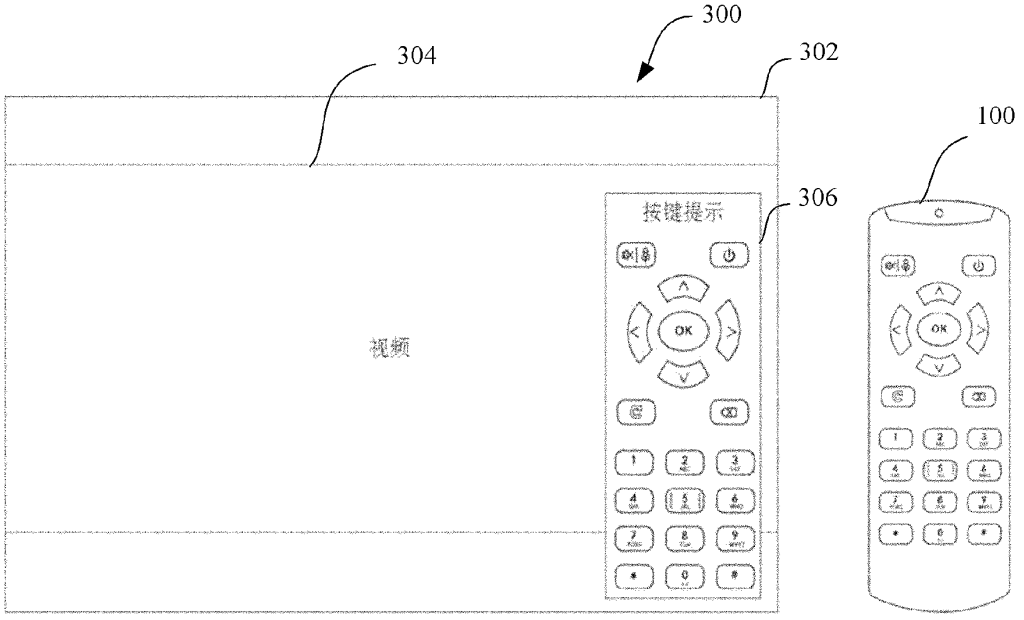


图 2



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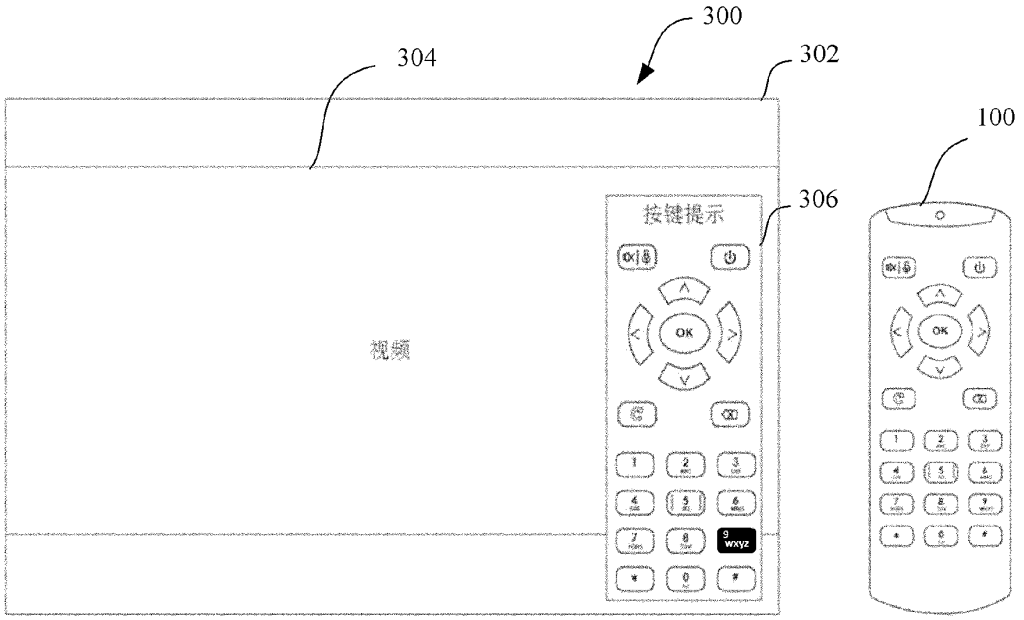


图 3

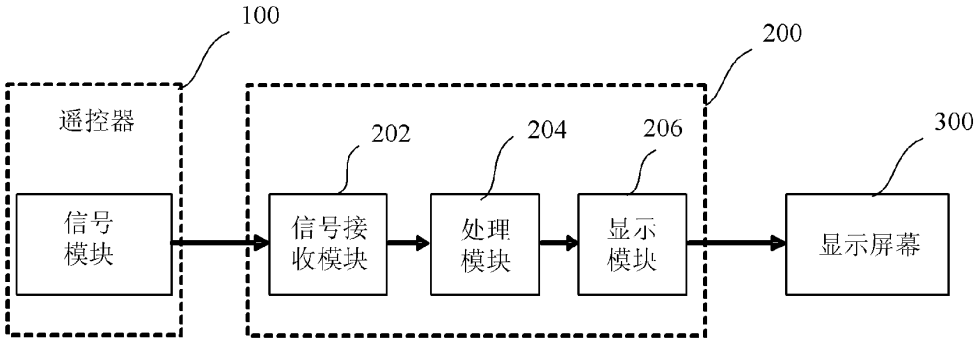


图 4



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## (54) Use of erasable non-volatile memory for storage of changing information

(57) Non-volatile write-once memory (106, 108, 110) is used for storage of variable data. In an example embodiment, segmented flash memory is used, in which individual segments can be erased. At least two segments are used. When a segment is nearly full (222), or when the segment is corrupted (224), the latest values are written to a new segment (226). During initialization, all variables of interest are written into RAM with default values (204). The flash segment being used is read sequentially from oldest entry to newest entry, and values from flash memory are used to overwrite values (or pointers to values) in RAM (216). RAM then contains (or points to) the most recent value for every variable. When a new segment is written, the new segment is written using the values from RAM (236). The method provides for identification of the latest (current) value for each stored item of information, provides for adding new types of data and deleting old types of data, provides for action when a memory segment is full, and provides for recovery from power-failure.

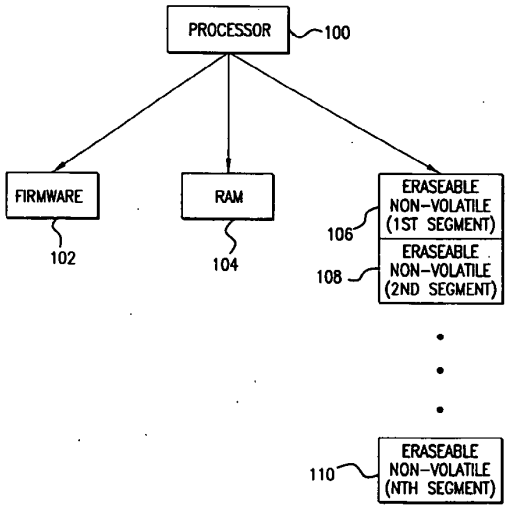


FIG.1

EP 1 031 929 A2

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## Description

### FIELD OF INVENTION

**[0001]** This invention relates generally to computer processor based systems, and more specifically to non-volatile storage of changing information.

### BACKGROUND OF THE INVENTION

**[0002]** Computer systems commonly store data in random access memory (RAM). Memory locations in RAM can be rapidly overwritten. RAM is typically volatile, meaning that all information is lost when power is removed. Historically, non-changing software (called firmware) for computer processor based systems was often stored in non-volatile, non-erasable, read-only memory (ROM). If the software needed to be changed, ROMs were replaced. More recently, various programmable or erasable non-volatile memory technologies have been developed. Typically, erasable non-volatile memory devices do not have to be removed for firmware updates. Examples include programmable read only memory (PROM), and electrically erasable programmable read only memory (EEPROM), also called flash memory. Flash memory chips may be electronically erased, and each erased memory location can be written once. To change the contents of a memory location, the entire chip (or in some versions, a large segment or block of the chip) must be erased, and the contents must then be rewritten.

**[0003]** Some information changes over time and needs to be saved in non-volatile memory. For example, an electromechanical computer peripheral system may need to track the number of hours the unit has been powered on, for preventive maintenance. A common approach is to update the power-on data every hour. The power-on information must be saved in non-volatile memory. One common approach is to save such data in low power static RAM, with a battery to retain power to the static RAM when system power is off. This approach is relatively expensive, and reliability depends on the integrity of the battery charge and the power switch over circuitry.

**[0004]** There is an ongoing need for non-volatile storage of changing data.

### SUMMARY OF THE INVENTION

**[0005]** Non-volatile, write-once memory is used for storage of variable data. In an example embodiment, segmented flash memory is used, in which individual segments can be erased. At least two segments are used. When a segment is nearly full, or when the segment is corrupted, the latest values are written to a new segment. During initialization, all variables of interest are written into RAM with default values. The flash segment being used is read sequentially from oldest entry to newest entry, and values from flash memory are used to overwrite values (or pointers to values) in RAM. RAM then contains (or points to) the most recent value for every variable. When a new segment is written, the new segment is written using the values from RAM. The method provides for identification of the latest (current) value for each stored item of information, provides for adding new types of data and deleting old types of data, provides for action when a memory segment is full, and provides for recovery from power-failure.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0006]** Figure 1 is a block diagram of a processor based system in accordance with the invention.

**[0007]** Figure 2A is a first part of a flow chart of a method in accordance with the invention, illustrating setting initial conditions.

**[0008]** Figure 2B is a second part of flow chart of a method in accordance with the invention, illustrating copying of data from non-volatile memory to RAM.

**[0009]** Figure 2C is a flow chart continuation of figure 2B, illustrating switching segments.

**[0010]** Figure 2D is flow chart providing additional detail for block 226 of figure 2C.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

**[0011]** Figure 1 is a block diagram of a processor based system in accordance with the invention. A processor 100 is controlled by firmware 102, which may be in ROM. The system also uses volatile RAM 104. In addition, the system uses non-volatile memory (106, 108, and 110). In a specific example embodiment of the invention, segmented (or blocked) flash memory is used, in which each location can be written only once, but an entire segment or block can be erased. That is, the smallest portion that can be erased is segment 106, or segment 108, or segment 110. Other types of erasable, non-volatile, write-once memory may be equally suitable. In the following discussion, the expression "the erased value" means whatever value is stored in a memory location in a non-volatile segment after erasure. In a

specific example embodiment, when non-volatile segments are erased, each memory location is set to FFFF hex.

**[0012]** Use of erasable, write-once, segmented memory for storage of changing parameters requires a solution to the following problems:

Identification of the latest (current) value for each stored item of information;
Provision for adding new types of data, and deleting old types of data;
Provision for action when a memory segment is full;
Provision for power-failure, to ensure that no data is lost if power is lost during transfer of data from one memory segment to another or during writing of data.

The invention solves each of the above problems and provides additional features as discussed below.

**[0013]** In the example embodiment, for convenience of memory management, each item of information to be stored is packaged in a data structure called a parameter, where a parameter comprises identification of the data, length of the data, and the actual data. In the example embodiment, each parameter includes a parameter ID. The parameter ID identifies the item of information, and specifies the length of the item of information. The identified data immediately follows the parameter ID in memory. In the specific example embodiment, the parameter ID is one 16-bit word, and the two most significant bits of the parameter ID specify one of three ID classes as follows:

00 16-bit data field;
01 32-bit data field;
10 Variable length data field (next word specifies length).

**[0014]** In a specific example application of the invention, the invention is used in a mass-memory drive mechanism having a removable storage medium. Examples of data of interest for storing in non-volatile memory include drive serial number (determined at manufacturing time), date of manufacture, the number of hours the drive has been powered-on, the number of times a medium has been loaded into the drive (load count), and the amount of data read or written over the life of the drive (read counter). These types of data are useful for maintenance and for preventive maintenance. After the drive has been used for a while, the segment of non-volatile memory being used to store the relevant parameters may appear as in the following example:

| |
|---|
| Parameter ID for drive serial number, variable length data field. |
| Length of data field for drive serial number (3 words). |
| Data (first 16 bits of drive serial number). |
| Data (second 16 bits of drive serial number). |
| Data (third 16 bits of drive serial number). |
| Parameter ID for date of manufacture, 16-bit data field. |
| Data (date of manufacture). |
| Parameter ID for power-on hours, 16-bit data field |
| Data (power-on-hours/10) |
| Parameter ID for load count, 32-bit data field |
| Data (first 16 bits of load count data) |
| Data (second 16 bits of load count data) |
| Parameter ID for read count, 32-bit data field |
| Data (first 16 bits of read count data) |
| Data (second 16 bits of read count data) |
| Parameter ID for load count, 32-bit data field |
| Data (first 16 bits of load count data) |
| Data (second 16 bits of load count data) |
| Parameter ID for read count, 32-bit data field |
| Data (first 16 bits of read count data) |
| Data (second 16 bits of read count data) |
| Unwritten location (erased value) |
| Unwritten location (erased value) |
| Unwritten location (erased value) |

**[0015]** In the above example, the load-count and read-count parameters have been updated with newer information since they were first written to the non-volatile memory segment. In the example embodiment, the parameters to be stored are coded into the firmware. During initialization, the firmware creates an entry in volatile RAM for every parameter of interest and assigns a default value to each parameter. The firmware then reads the non-volatile memory segment from the beginning, reading the value for each parameter and overwriting the value in RAM. If a subsequent value of any parameter is found, the previous value in RAM is replaced. By performing this progressive walk through the non-volatile memory segment, the final resulting information in RAM is the most recent value for every parameter. In the specific example embodiment, the erased value of FFFF hex is not valid for a parameter ID, so that when the initialization firmware encounters a value of FFFF where a parameter ID is expected, the firmware knows that it has reached the end of the recorded information.

**[0016]** Preferably, the firmware reserves known locations in RAM for each parameter. The firmware then can reference a fixed known location for each data item, as would normally be done by a variable reference in compiled code. In addition, this provides quick read access to a parameter because there is no need for a reference look-up to find the current location of each parameter. However, if saving space in RAM is preferable, a pointer to the most recent location in non-volatile memory may be stored in RAM. Access is then slower, but this may be acceptable for infrequently changing parameters or parameters that have a large length that would consume significant amounts of RAM. The data structure in volatile RAM may be identical to the data structure in non-volatile memory, or the data structure in RAM may be different. The only requirement is that the firmware must know the RAM location for every parameter of interest. This could be done by direct compiled reference, or an embodiment of a lookup/hash table.

**[0017]** As updated parameter values are appended in the non-volatile memory segment, the segment will eventually fill. In the example embodiment of the invention, when one segment is full (or when a predetermined threshold is reached, or when a segment becomes corrupted due to power failure during a parameter update operation), the most recent values for the parameters, as stored in RAM, are copied to an unused non-volatile memory segment. The previously used segment may then be erased. The system may reserve two segments for changing parameters, and alternate between the two segments. Alternatively, the system may use other segment selection algorithms, the only requirement being that one unused segment must be available to copy into from volatile RAM.

**[0018]** After walking consecutively through the non-volatile memory segment, each parameter in volatile RAM has its latest value (either the default value or its latest value from the non-volatile memory). Each time a parameter is updated, or each time a new segment is written, the parameter with its latest value is written into non-volatile memory. Similarly, if a parameter is deleted in a new version of the firmware, the firmware does not assign a RAM location for the deleted parameter, and the parameter is not copied from non-volatile memory to volatile RAM. When a new non-volatile segment is written, the deleted parameter is not written to the new non-volatile segment. As a result, if the firmware is updated, and new parameters are added or deleted, they are automatically added to the parameters or deleted from the parameters in non-volatile memory.

**[0019]** The original segment is not erased until a new segment is written. If power is lost during writing of a new segment, the new segment may be left in a corrupt state. Accordingly, if two segments contain parameter data during initialization, the system must have a method for determining which of two segments is valid and current. Likewise, if power is lost while a value is being written into non-volatile memory, the segment may be left in a corrupt state. A method in accordance with the invention provides for recovery from power loss during writing of a parameter into non-volatile memory, and provides for recovery from power loss during writing of a new segment, as illustrated in figures 2A-2D.

**[0020]** Figures 2A - 2D are flow charts of a method of using erasable non-volatile memory to store changing data in accordance with the invention. Figure 2A illustrates setup of initial conditions, which may occur during manufacturing or may occur the first time the system is started. At step 200, two segments are designated for use in non-volatile storage of changing data. A first segment will be used until filled, and then the second segment will be used. Two segments may be dedicated to non-volatile storage of changing data (with the system switching back and forth between the two), or other algorithms may be used to identify at least two segments that may be used. Both segments should be initially erased. At step 202, a sequence number is written into the first word of the first segment to be used. As will be discussed further below, each time a new segment is used, the sequence number is incremented and written as the first word of the new segment.

**[0021]** Figure 2B illustrates part of an initialization process for the processor, which is executed when system power is applied, or after a hard reset. At step 204, the firmware designates RAM locations for every parameter of interest, and writes a default value in RAM for each parameter having a value in RAM (for some variable length parameters, RAM may contain a pointer to a location in non-volatile memory). At step 206, the first word of each of the designated segments is read, and test 208 determines whether exactly one segment contains a sequence number (whether only one segment has a value in the first word that is not equal to the erased value). If the first word of both segments is the erased value (test 210), then an error condition has occurred (step 212). If both segments contain a sequence number (the first word of each segment is not the erased value), then power may have been lost during writing of one of the segments. At step 214, the segment with the lowest sequence number is selected, which assumes that the segment having the lowest sequence number still has valid data, and assumes that the other segment is corrupted. At step 216, parameters are sequentially read from the segment currently being used, and values in RAM are over-written.

**[0022]** In figure 2C, at decision 218, if the segment that is not being used is not erased (the first word is not the erased value), then it is assumed that the segment was being written earlier, and power was lost during writing. Accordingly, the segment is erased (step 220), and the process of switching segments is started again (step 226). At decision 222, if a segment is almost full, then the process of switching segments is started (step 226). The test at decision 222 may be a predetermined threshold, such as a percentage of the segment has been used, or it may simply be determined that there is no room to store another parameter.

**[0023]** When parameters are stored in non-volatile memory, the value is stored first, and then the parameter ID is stored. As a result, if power is lost while a parameter is being stored, then the location for the parameter ID will have the erased value, and there will be data other than the erased value stored beyond the location of the parameter ID. At test 224, locations beyond the first erased value are checked to see if they are also equal to the erased value. If not, power may have been lost during writing of the last parameter. If there are locations beyond the first erased value that are not equal to the erased value, then the segment is corrupted. That is, without a segment ID, there is no way to determine the expected length or validity of the data. Therefore, a new segment is written (step 226), with last known values for all parameters.

**[0024]** Figure 2D is an expansion of step 226 (figure 2C), in which segments are switched. At step 228, the sequence number is incremented. At step 230, the new sequence number is written into the first word of the new segment. At step 232, a write pointer is set to point to the second word of the segment. In the specific example embodiment, the erasable non-volatile memory being used can be placed into either a read mode, or a write mode, but not both at the same time. If variable length parameters are not copied into RAM, reading variable length data from non-volatile memory and then writing variable length data back into a new segment would require switching the memory back and forth between a read mode and a write mode. Accordingly, at step 234, all parameters that are not normally copied in RAM are then copied to RAM. At step 236, all parameters in RAM are copied into the new segment. At step 238, the write

pointer is positioned to write a new parameter value. After step 238, it is safe to erase the old segment, and this is done at step 240.

**[0025]** It is possible that sequence numbers may wrap from FFFF hex to 0000 hex. FFFF is an invalid sequence number since it is the erased value. Therefore, FFFF and 0000 are special cases that must be checked when incrementing and writing the sequence number (figure 2D, steps 228 and 230) and when selecting the oldest of two segments (figure 2B, step 214).

**[0026]** Still another consideration is whether all of a segment is useable. During manufacturing test, it may be determined that one or more memory locations in non-volatile memory are defective. Alternatively, during the lifetime of the product, one or more memory locations within a segment may fail. A partially working segment may still be useable. One can simply write until a defective location is reached, or one can start writing beyond the last defective location, or one can map around the defective location(s). One parameter that is stored in non-volatile memory may be a map of known defective locations for specific segments. Writing to a segment, reading from a segment, and the decision as to when to switch segments, must all then take into account the parameter that identifies defective locations. For an example of defect handling for flash memory, see U.S. Patent Number 5,200,959.

**[0027]** The foregoing description of the present invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed, and other modifications and variations may be possible in light of the above teachings. The embodiment was chosen and described in order to best explain the principles of the invention and its practical application to thereby enable others skilled in the art to best utilize the invention in various embodiments and various modifications as are suited to the particular use contemplated. It is intended that the appended claims be construed to include other alternative embodiments of the invention except insofar as limited by the prior art.

## Claims

1. A method for saving data in a non-volatile memory (106, 108, 110) that is erasable but not over-writable, the method comprising the following steps:

   (a) defining (204) a location in volatile memory for the data;
   (b) when the data changes, overwriting the data in the volatile memory and writing a new version of the data in a first erasable portion of the non-volatile memory;
   (c) determining (222) whether the first portion of the non-volatile memory is almost full; and
   (d) when it is determined that the first portion of the non-volatile memory is almost full, copying (234) the data from the volatile memory to a second erasable portion of the non-volatile memory.

2. The method of claim 1, further comprising the following steps after step (a):

   (a1) assigning (204) a default value to the data in volatile memory;
   (a2) reading (216) the data from the non-volatile memory; and
   (a3) overwriting (216) the value in volatile memory with the value read from non-volatile memory.

3. The method of claim 1, further comprising the following steps after step (a):

   (a1) determining (210) that two erasable portions of the non-volatile memory may both contain the data; and
   (a2) determining (214) that one of the two erasable portions identified in step (a1) was written to first, and designating that portion as a first erasable portion for use in step (b).

4. The method of claim 1, step (b) further comprising the following steps:

   (b1) designating a memory location in the first erasable portion of the non-volatile memory as an identification location;
   (b2) writing the data to the first erasable portion of the non-volatile memory, after the identification location; and
   (b3) writing an identification, corresponding to the data, in the identification location.

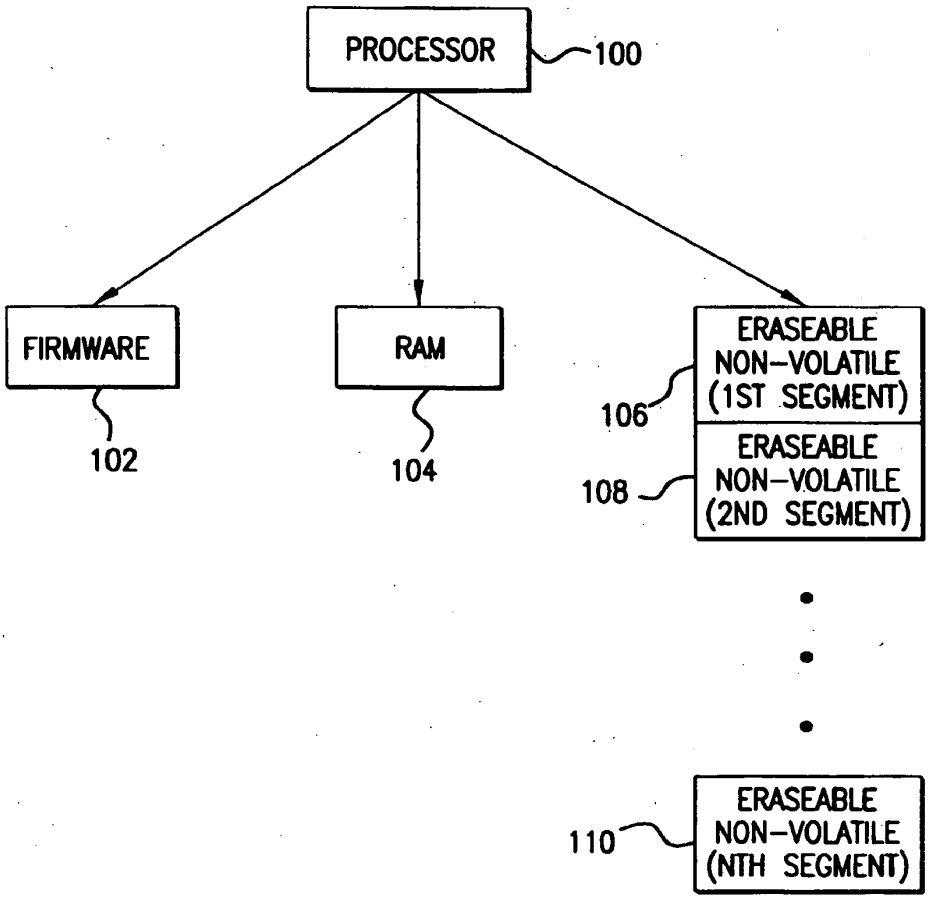
PROCESSOR
100
FIRMWARE
102
RAM
104
ERASEABLE NON-VOLATILE (1ST SEGMENT)
106
ERASEABLE NON-VOLATILE (2ND SEGMENT)
108
ERASEABLE NON-VOLATILE (NTH SEGMENT)
110

FIG.1

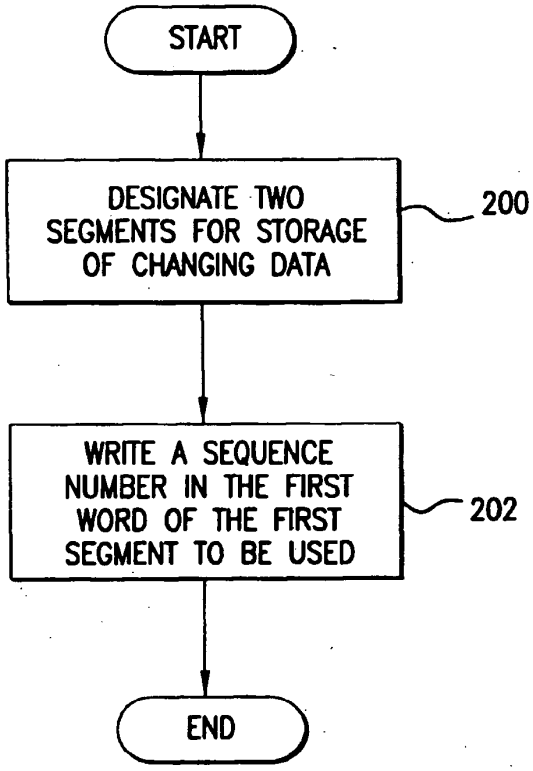
START
DESIGNATE TWO SEGMENTS FOR STORAGE OF CHANGING DATA
200
WRITE A SEQUENCE NUMBER IN THE FIRST WORD OF THE FIRST SEGMENT TO BE USED
202
END

FIG.2A

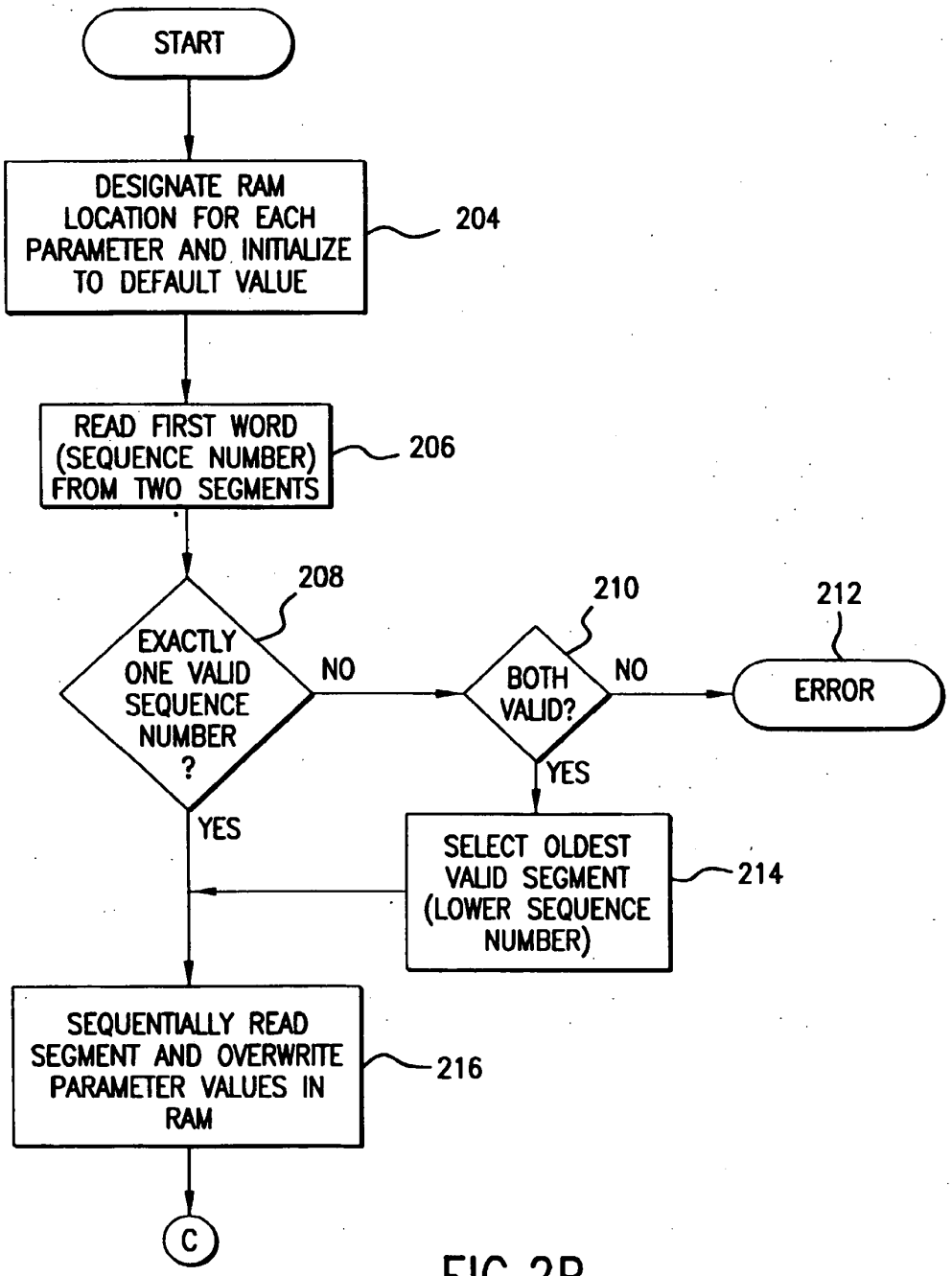
START
DESIGNATE RAM LOCATION FOR EACH PARAMETER AND INITIALIZE TO DEFAULT VALUE
204
READ FIRST WORD (SEQUENCE NUMBER) FROM TWO SEGMENTS
206
208
EXACTLY ONE VALID SEQUENCE NUMBER ?
NO
210
BOTH VALID?
NO
212
ERROR
YES
YES
SELECT OLDEST VALID SEGMENT (LOWER SEQUENCE NUMBER)
214
SEQUENTIALLY READ SEGMENT AND OVERWRITE PARAMETER VALUES IN RAM
216
C

FIG.2B

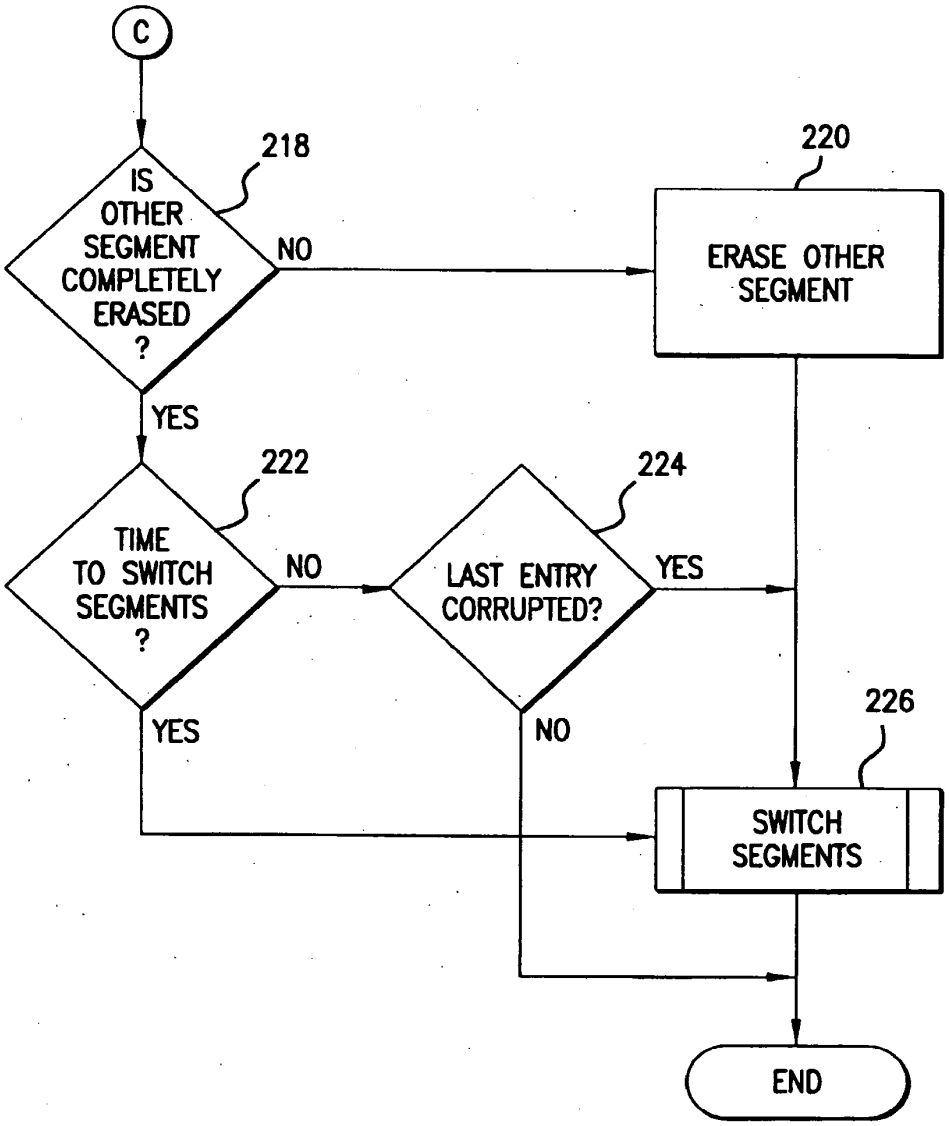
C
218
IS OTHER SEGMENT COMPLETELY ERASED ?
NO
220
ERASE OTHER SEGMENT
YES
222
TIME TO SWITCH SEGMENTS ?
NO
224
LAST ENTRY CORRUPTED?
YES
YES
NO
226
SWITCH SEGMENTS
END

FIG.2C

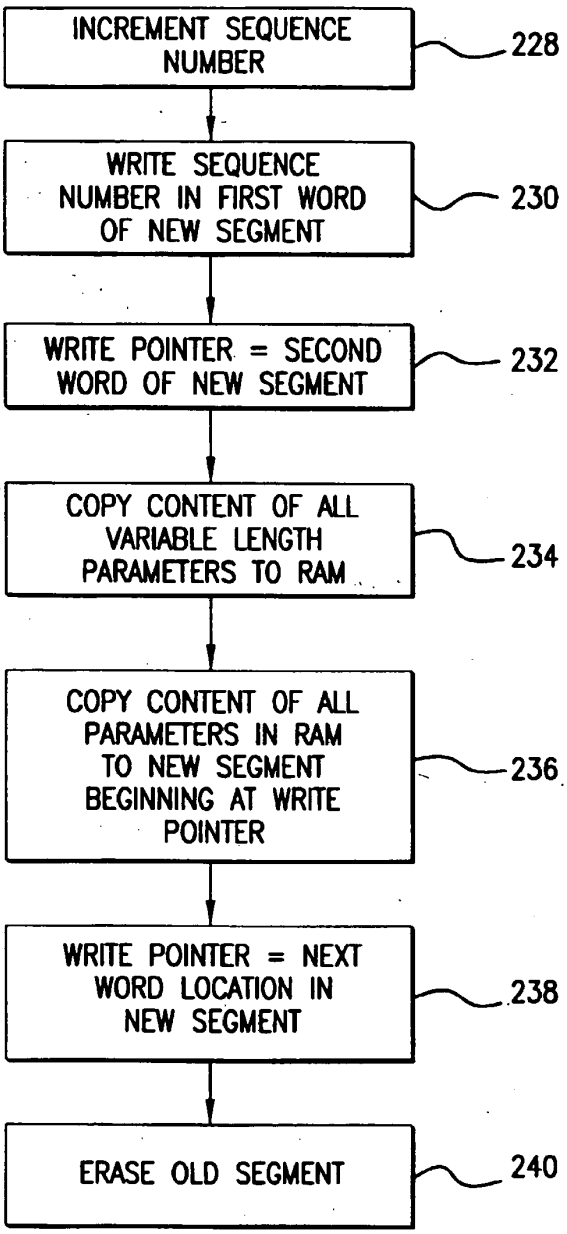
INCREMENT SEQUENCE NUMBER
228
WRITE SEQUENCE NUMBER IN FIRST WORD OF NEW SEGMENT
230
WRITE POINTER = SECOND WORD OF NEW SEGMENT
232
COPY CONTENT OF ALL VARIABLE LENGTH PARAMETERS TO RAM
234
COPY CONTENT OF ALL PARAMETERS IN RAM TO NEW SEGMENT BEGINNING AT WRITE POINTER
236
WRITE POINTER = NEXT WORD LOCATION IN NEW SEGMENT
238
ERASE OLD SEGMENT
240

FIG.2D

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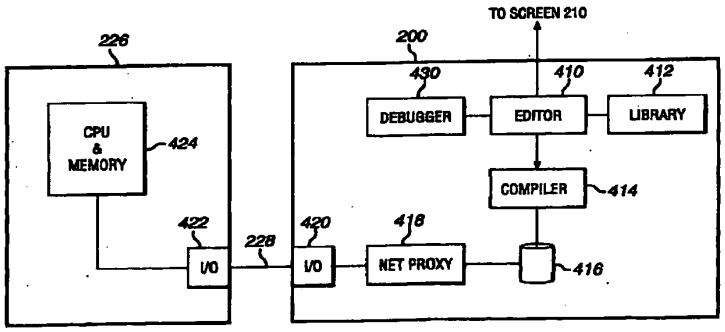
## (54) Running and testing applications

(57) A receiver/decoder for testing an application, for example, for an analogue or a digital television system, is disclosed, the receiver/decoder comprising means for exchanging messages with a network, and means for running the application in dependence on a message received from the network. The receiver/decoder may be used for debugging the application. An associated workstation, and an application development tool for editing and testing applications, are also disclosed. Also disclosed is a method of transferring an application from a workstation to a receiver/decoder, and methods of running an application on a receiver/decoder.

FIG. 6

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## Description

**[0001]** The invention relates to a receiver/decoder (for example, for an analogue or a digital television system), a workstation and an authoring tool, and to a method of transferring an application to a receiver/decoder and to methods of running an application on a receiver/decoder.

**[0002]** The invention has particular application in the context of developing, testing and debugging applications for receiver/decoders, although it may also be used, for example, for demonstrating such applications.

**[0003]** In the case of digital television systems, these transmit television channels to the viewer in digital, rather than analogue, form. The digital channels are encoded into a digital data stream at the transmitter end, and are decoded at the receiver end using a digital decoder, which may be either in a digital set-top box (DSTB) or in an integrated digital television. To allow interactivity, an uplink may be provided, either via the same medium that delivers the television channels, or else via a different medium such as a telephone link. As used herein, the term "digital television system" includes for example any satellite, terrestrial, cable and other system.

**[0004]** Digital decoders typically contain a processor on which programs known as applications may be run. Examples of such applications include program guides, tele-shopping, quizzes, home-banking and tele-voting. Such applications typically display a menu on the television screen from which the user may select a particular option. The data used in the application may be transmitted to the decoder in the same data stream as the television channels. The result of the selection can be directly interpreted by the application running on the decoder or it can be transmitted via the uplink to allow the appropriate action to be taken.

**[0005]** Applications may be permanently resident in the DSTB or integrated digital television, or they may be downloaded via the digital medium as and when required. To run applications, the decoder has a run time environment such as a virtual machine (VM) to run, for example, Java applications.

**[0006]** With the rapidly increasing number of services that are being provided to the user, there is a demand for application development tools, which can allow applications to be designed, created, debugged and tested. An example of such an application tool is *Media*highwayApplication Workshop, supplied by *CANAL+*.

**[0007]** Known application development tools typically allow applications to be developed on a workstation, such as a PC or UNIX workstation. When the application is ready for testing, it is downloaded to a digital decoder such as a DSTB.

**[0008]** As disclosed in International Patent Application Number WO 98/43165 in the name of the present applicant, the subject matter of which is incorporated herein by reference, a workstation coupled to a receiver/decoder type unit may be provided for debugging applications. In order to debug the application, it is downloaded in its entirety to the receiver/decoder using a link. A debugger on the workstation is then used to monitor and/or to control operation of the application, using two further links for passing control signals to and from the receiver/decoder.

**[0009]** According to one aspect of the present invention there is provided a receiver/decoder operable in a debugging mode for debugging an application, comprising means for communicating a debugging message over a network.

**[0010]** Hitherto, such an arrangement had not been considered, principally due to the extra complexity involved in providing the receiver/decoder with networking capabilities, in comparison to a simple one-to-one link. However, it has now been appreciated pursuant to the present invention that, in the context of testing and/or debugging applications, various advantages may result from providing a receiver/decoder with network capabilities.

**[0011]** By providing the receiver/decoder with means for communication debugging messages over a network, the receiver/decoder can become part of an application developer's environment, so that, for example, files, control signals or information signals can be exchanged between the receiver/decoder and a workstation while testing an application. This can allow more flexibility in the testing of applications than was previously the case.

**[0012]** Furthermore, resources may be shared between the receiver/decoder, the workstation, and other devices connected to the network. For example, the receiver/decoder may have direct access to an external storage device, such as a hard disk in the workstation, via the network.

**[0013]** Due to the provision of networking capabilities, the receiver/decoder may be physically remote from the workstation while the application is being debugged. The network may provide for amplification of signals, so that the receiver/decoder may be separated by greater distances than would otherwise be possible.

**[0014]** The term "debugging" as used herein preferably implies that the application is controlled and/or monitored to enable errors, or "bugs", in the application to be identified. Debugging messages preferably include control and/or monitoring messages for debugging the application, which messages may be received or transmitted by the receiver/decoder. For example, the receiver/decoder may receive a command instructing it to send certain information about the status of the application or the receiver/decoder, and both the command and the information are termed debugging messages. In this way, debugging functions such as monitoring variables, starting and stopping execution, trace function, monitoring status of the receiver/decoder, and other debugging functions may be implemented.

**[0015]** The term "network" preferably implies that devices are assigned address. This preferably provides the ability to have more than two devices in a logical network, the devices being distinguished by means of addresses. This is dis-

tinct from, for example, a simple serial link between two devices. Preferably the network has a protocol which enables the receiver/decoder to access files on a remote storage device, such as the hard disk of a workstation. Preferably the network transmits signals in the form of packets of data having a destination address. Preferably, the receiver/decoder includes means for storing the address (or identifier) of the receiver/decoder.

**[0016]** Where the application comprises a plurality of files, the receiver/decoder may comprise means for selectively reading at least one of the files from an external storage means, although a receiver/decoder without such means may also be provided.

**[0017]** The means for communicating a debugging message may be adapted to receive the debugging message from the network, preferably to control the execution of the application in dependence on the message. An operator at a remote location (such as a workstation) can thereby control execution of the application.

**[0018]** Preferably, the debugging mode is invoked by the debugging message, which message includes an identifier of a remote host, and the means for communicating a debugging message is adapted to communicate a further debugging message with the remote host identified in the message.

**[0019]** The means for communicating the debugging message may also or alternatively be adapted to transmit a debugging message to the network, the message preferably containing information concerning execution of the application. An operator at a remote location can thereby monitor execution of the application.

**[0020]** The receiver/decoder preferably includes means for running the application, which means may be runtime means such as a processor, a virtual machine, a runtime engine, or another suitable runtime means or environment.

**[0021]** In another aspect of the invention there is provided a receiver/decoder comprising a processor programed to operate in a debugging mode for debugging an application, and an interface (such as an input/output port) for communicating a debugging message over a network. It will be appreciated that the receiver/decoder may include intermediate means, such as a virtual machine, between the processor and the application.

**[0022]** In another aspect of the invention there is provided a workstation adapted to debug an application running on a receiver/decoder, comprising means for communicating a debugging message with the receiver/decoder over a network, preferably to control and/or to monitor execution of the application on the receiver/decoder.

**[0023]** The invention also provides an application development tool comprising a receiver/decoder in any of the forms described above and a workstation in any of the forms described above. The application development tool may include a net proxy operative to implement communication between the receiver/decoder and the workstation.

**[0024]** The invention also provides an application development environment comprising an application development tool as described above and a network over which the workstation and the receiver/decoder exchange messages.

**[0025]** In a method aspect of the present invention there is provided a method of debugging an application on a receiver/decoder comprising operating the receiver/decoder in a debugging mode and communicating a debugging message over a network.

**[0026]** The receiver/decoder may receive a debugging message from the network, preferably to control the execution of the application in dependence on the message. The method may further comprise invoking the debugging mode by the debugging message, which message includes an identifier of a remote host, and communicating a further debugging message with the remote host identified in the message.

**[0027]** The method may also or alternatively comprising transmitting a debugging message to the network, the message preferably containing information concerning execution of the application.

**[0028]** A problem in the prior art which has been identified pursuant to the present invention, is that, if any changes are required to be made to the application as a result of testing on the receiver/decoder, the appropriate changes must be made in the application development tool, the application re-compiled as resident, and then the entire resident application and the virtual machine downloaded to the decoder, which process may be time consuming and cumbersome.

**[0029]** According to another aspect of the present invention, which may be provided either independently or in dependence on the receiver/decoder in any of the forms described above, there is provided a receiver/decoder comprising means for running an application, the application comprising a plurality of files, and means for selectively reading at least one of the files from the network.

**[0030]** The invention also provides a receiver/decoder comprising means for running an application, the application comprising a plurality of files, and means for selectively reading at least one of the files from an external storage means. Preferably the external storage means is connected to the network and the receiver/decoder comprises means for selectively reading the at least one of the files from the network.

**[0031]** By providing a receiver/decoder which can selectively read a file from the network, parts of the application may be read by the receiver/decoder, for example following a modification of some of the parts.

**[0032]** In any aspect, the means for running an application may be runtime means such as a processor, a virtual machine, a runtime engine, or another suitable runtime means or environment, and the means for reading at least one of the files from the network or external storage means may be an input/output port and associated drivers. The external storage means may be the hard disk of a computer or a network file store, or any other storage medium.

**[0033]** The term "receiver/decoder" used herein may connote a receiver for receiving either encoded or non-

encoded signals, for example, television and/or radio signals, which may be broadcast or transmitted by some other means. The term may also connote a decoder for decoding received signals. Embodiments of such receiver/decoders may include a decoder integral with the receiver for decoding the received signals, for example, in a "set-top box", such a decoder functioning in combination with a physically separate receiver, or such a decoder including additional functions, such as a web browser, a video recorder, or a television. As used herein, the term "receiver/decoder" also includes a receiver/decoder-type unit which may be used for testing and/or debugging applications.

**[0034]** Preferably the receiver/decoder is adapted to receiver a message which includes an identifier of the location where the files are stored. Preferably the receiver/decoder is adapted to read an individual file from the network or external storage means, so that no more data than necessary is transferred.

**[0035]** The application may contain some files which are not always required to run the application, and thus rather than downloading the whole of the application at one time, the receiver/decoder is preferably adapted to read said at least one file as it is required to run the application.

**[0036]** The receiver/decoder may be adapted to read updated files, so that if files are modified, the receiver/decoder will be updated with the modified files.

**[0037]** The external storage means may be part of a workstation, for example, a workstation which is used to edit applications. The external storage means may also be a file store mounted on a network. In order to compensate for the fact that the receiver/decoder may not have a network stack, the receiver/decoder may be adapted to use as its network stack a simulated network stack on the workstation. Alternatively, the receiver/decoder may be provided with a network stack.

**[0038]** In order to initiate the application, the receiver/decoder is preferably adapted to load a boot file from the external storage means.

**[0039]** According to another aspect of the present invention, which may be provided either independently or in dependence on the workstation in any of the forms described above, there is provided a workstation comprising storage means (such as a hard disk or other storage medium) storing an application to be run on a receiver/decoder, the application comprising a plurality of files, and means (such as an input/output port and associated drivers) for allowing access to at least one of the files by a receiver/decoder connected to the workstation by a network.

**[0040]** According to another aspect of the present invention there is provided a workstation comprising storage means (such as a hard disk or other storage medium) for storing an application, the application comprising a plurality of files, and means (such as an input/output port and associated drivers) for allowing access to at least one of the files by a receiver/decoder.

**[0041]** The means for allowing access to said at least one file may be adapted to allow an individual file to be read. The workstation may further comprise means for editing the application.

**[0042]** According to another aspect of the invention, which may be provided either independently or in dependence on the application development tool in any of the forms described above, there is provided an application development tool comprising a workstation for editing an application and a receiver/decoder for running the application, wherein the receiver/decoder has means for selectively reading at least a part of the application from a network file store and the workstation has means for initiating communication of the or each part to the receiver/decoder.

**[0043]** According to another aspect of the present invention there is provided an application development tool comprising a workstation for editing an application and a receiver/decoder for running the application, wherein the receiver/decoder has means for selectively reading at least a part of the application from the workstation and the workstation has means for communicating the or each part to the receiver/decoder. The workstation may further comprise storage-means, such as a hard disk or other storage medium, for storing the application.

**[0044]** In the above aspects, the application may comprise a plurality of files. The receiver/decoder may be adapted to read an individual file from the storage means. The receiver/decoder may be adapted to read a file as it is required to run the application. The editing tool may be adapted to update a file and the receiver/decoder may be adapted to read said file once updated.

**[0045]** In order to ensure that updated files are used by the receiver/decoder, the receiver/decoder may be adapted to read the most recent version of a file. Additionally or alternatively, the workstation may be adapted to instruct the receiver/decoder to discard a file, for example an old version of a file that has been updated, so that when the receiver/decoder next needs that file, the updated file will be read from the workstation.

**[0046]** The application development tool may further include a net proxy operative to implement communication between the receiver/decoder and a network. Moreover, the workstation is typically also connected to the network.

**[0047]** In preferred embodiments of an application development tool, the workstation further comprises a debugger operable to control and/or monitor execution of the application on the receiver/decoder. The debugger and the application may exchange control signals over a network. In particular, the files and the control signals may be carried on the same network.

**[0048]** According to a method aspect of the present invention there is provided a method of transferring an application from a workstation to a receiver/decoder, the application comprising a plurality of files, comprising transferring (typ-

ically over a network) an individual file from the workstation to the receiver/decoder. The file may be transferred only when it is required to run the application. The method may further comprise updating a file and transferring the updated file to the receiver/decoder.

**[0049]** According to another method aspect there is provided a method of running an application on a receiver/decoder, the application comprising a plurality of files, comprising transferring files to the receiver/decoder as they are required to run the application.

**[0050]** According to another method aspect there is provided a method of running an application on a receiver/decoder, the application comprising a boot file, comprising:

transferring (optionally over a network) a boot file to the receiver/decoder; and
executing the boot file in the receiver/decoder.

**[0051]** In some circumstances the boot file may contain the whole application, and thus only the boot file need be transferred. However, the application may contain the boot file and at least one further file. Thus, according to a further method aspect there is provided a method of running an application on a receiver/decoder, the application comprising a boot file and at least one further file, comprising:

transferring (optionally over a network) a boot file to the receiver/decoder;
executing the boot file in the receiver/decoder; and
transferring (optionally over a network) the at least one further file when it is required.

**[0052]** In either of the last two aspects of the invention, at least one of the boot file and the at least one other file may be transferred from a network file store.

**[0053]** From a further aspect, the invention provides a receiver/decoder comprising runtime means (e.g. a runtime environment, a processor, or a virtual machine, amongst other possibilities) in which the runtime means is operative to receive signals from a remote workstation over a network, which signals control execution of an application by the receiver/decoder.

**[0054]** Moreover, the invention further provides a receiver/decoder, optionally according to the last-preceding paragraph, comprising runtime means (e.g. a runtime environment, a processor, or a virtual machine, amongst other possibilities) in which the runtime means is operative to send signals to a remote workstation over a network, which signals contain information relating to execution of an application by the receiver/decoder.

**[0055]** A receiver/decoder according to either of the two last-preceding paragraphs may be operable in a debugging mode, in which signals sent to and/or received from a remote workstation control and/or monitor execution of an application by the runtime means.

**[0056]** Another aspect of the invention provides a method of operating a receiver/decoder in which a control signals for controlling and/or monitoring operation of the receiver/decoder are sent between the receiver/decoder and a remote workstation over a network.

**[0057]** The invention also provides a computer readable medium having stored thereon a program for carrying out any of the methods described above, and a computer program product comprising a program for carrying out any of the methods described above.

**[0058]** The invention also provides apparatus substantially as described with reference to and as illustrated in the accompanying drawings, and a method substantially as described with reference to Figure 7 of the accompanying drawings.

**[0059]** Features of one aspect may be applied to other aspects; apparatus features may be applied to the method aspects and *vice versa*.

**[0060]** Preferred features of the present invention will now be described, purely by way of example, with reference to the accompanying drawings, in which:-

Figure 1 shows the architecture of a typical digital television system;
Figure 2 shows the architecture of an interactive system of the digital television system of Figure 1;
Figure 3 is a schematic diagram of the structure of a receiver/decoder of the system of Figure 1;
Figure 4 is a functional block diagram of the layered architecture of the receiver/decoder;
Figure 5 shows an overview of an authoring tool;
Figure 6 shows the main components of the authoring tool of Figure 5;
Figure 7 shows the operation of the authoring tool of Figure 5; and
Figure 8 shows the architecture of input/output layers of the authoring tool of Figure 5;
Figure 9 is a diagram illustrating a network data frame; and
Figure 10 is a functional diagram of another embodiment of the invention.

**Overview of a digital television system**

**[0061]** An overview of a digital television system 1 is shown in Figure 1. The invention includes a mostly conventional digital television system 2 that uses the known MPEG-2 compression system to transmit compressed digital signals. In more detail, MPEG-2 compressor 3 in a broadcast centre receives a digital signal stream (typically a stream of video signals). The compressor 3 is connected to a multiplexer and scrambler 4 by linkage 5.

**[0062]** The multiplexer 4 receives a plurality of further input signals, assembles the transport stream and transmits compressed digital signals to a transmitter 6 of the broadcast centre via linkage 7, which can of course take a wide variety of forms including telecommunications links. The transmitter 6 transmits electromagnetic signals via uplink 8 towards a satellite transponder 9, where they are electronically processed and broadcast via notional downlink 10 to earth receiver 12, conventionally in the form of a dish owned or rented by the end user. Other transport channels for transmission of the data are of course possible, such as terrestrial broadcast, cable transmission, combined satellite/cable links, telephone networks etc.

**[0063]** The signals received by receiver 12 are transmitted to an integrated receiver/decoder 13 owned or rented by the end user and connected to the end user's television set 14. The receiver/decoder 13 decodes the compressed MPEG-2 signal into a television signal for the television set 14. Although a separate receiver/decoder is shown in Figure 1, the receiver/decoder may also be part of an integrated digital television. As used herein, the term "receiver/decoder" includes a separate receiver/decoder, such as a set-top box, and a television having a receiver/decoder integrated therewith.

**[0064]** In a multichannel system, the multiplexer 4 handles audio and video information received from a number of parallel sources and interacts with the transmitter 6 to broadcast the information along a corresponding number of channels. In addition to audiovisual information, messages or applications or any other sort of digital data may be introduced in some or all of these channels interlaced with the transmitted digital audio and video information.

**[0065]** A conditional access system 15 is connected to the multiplexer 4 and the receiver/decoder 13, and is located partly in the broadcast centre and partly in the decoder. It enables the end user to access digital television broadcasts from one or more broadcast suppliers. A smartcard, capable of deciphering messages relating to commercial offers (that is, one or several television programmes sold by the broadcast supplier), can be inserted into the receiver/decoder 13. Using the decoder 13 and smartcard, the end user may purchase commercial offers in either a subscription mode or a pay-per-view mode. As used herein, the term "smartcard" includes, but not exclusively so, any chip-based card device, or object of similar function and performance, possessing, for example, microprocessor and/or memory storage. Included in this term are devices having alternative physical forms to a card, for example key-shaped devices such as are often used in TV decoder systems.

**[0066]** As mentioned above, programmes transmitted by the system are scrambled at the multiplexer 4, the conditions and encryption keys applied to a given transmission being determined by the access control system 15. Transmission of scrambled data in this way is well known in the field of pay TV systems. Typically, scrambled data is transmitted together with a control word for descrambling of the data, the control word itself being encrypted by a so-called exploitation key and transmitted in encrypted form.

**[0067]** The scrambled data and encrypted control word are then received by the decoder 13 having access to an equivalent to the exploitation key stored on a smart card inserted in the decoder to decrypt the encrypted control word and thereafter descramble the transmitted data. A paid-up subscriber will receive, for example, in a broadcast monthly ECM (Entitlement Control Message) the exploitation key necessary to decrypt the encrypted control word so as to permit viewing of the transmission.

**[0068]** An interactive system 16, also connected to the multiplexer 4 and the receiver/decoder 13 and again located partly in the broadcast centre-and partly in the decoder, enables the end user to interact with various applications via a modemmed back channel 17. The modemmed back channel may also be used for communications used in the conditional access system 15. An interactive system may be used, for example, to enable the viewer to communicate immediately with the transmission centre to demand authorisation to watch a particular event, to download an application etc.

**[0069]** Figure 2 shows the general architecture of the interactive television system 16 of the digital television system 1 of the present invention.

**[0070]** For example, the interacting system 16 allows an end user to buy items from on-screen catalogues, consult local news and weather maps on demand and play games through their television set.

**[0071]** The interactive system 4000 comprises in overview four main elements:-

- an authoring tool 4004 at the broadcast centre or elsewhere for enabling a broadcast supplier to create, develop, debug and test applications;
- an application and data server 4006, at the broadcast centre, connected to the authoring tool 4004 for enabling a broadcast supplier to prepare, authenticate and format applications and data for delivery to the multiplexer and scrambler 4 for insertion into the MPEG-2 transport stream (typically the private section thereof) to be broadcast to

the end user;

- a virtual machine including a run time engine (RTE) 4008, which is an executable code installed in the receiver/decoder 13 owned or rented by the end user for enabling an end user to receive, authenticate, decompress, and load applications into the working memory of the decoder 13 for execution. The engine 4008 also runs resident, general-purpose applications. The engine 4008 is independent of the hardware and operating system; and
- a modemmed back channel 17 between the receiver/decoder 13 and the application and data server 4006 to enable signals instructing the server 4006 to insert data and applications into the MPEG-2 transport stream at the request of the end user.

**[0072]** The interactive television system operates using "applications" which control the functions of the receiver/decoder and various devices contained therein. Applications are represented in the engine 4008 as "resource files". A "module" is a set of resource files and data. A "memory volume" of the receiver/decoder is a storage space for modules. Modules may be downloaded into the receiver/decoder 13 from the MPEG-2 transport stream.

**Receiver/decoder**

**[0073]** Referring to Figure 3, the elements of the receiver/decoder 13 or set-top box will now be described. The elements shown in this figure will be described in terms of functional blocks.

**[0074]** The receiver/decoder 13 comprises a central processor 20 including associated memory elements and adapted to receive input data from a serial interface 21, a parallel interface 22, a modem 23 (connected to the modem back channel 17 of Fig. 1), and switch contacts 24 on the front panel of the decoder.

**[0075]** The receiver/decoder is additionally adapted to receive inputs from an infra-red remote control 25 via a control unit 26 and also possesses two smartcard readers 27, 28 adapted to read bank or subscription smartcards 29, 30 respectively. The subscription smartcard reader 28 engages with an inserted subscription card 30 and with a conditional access unit 29 to supply the necessary control word to a demultiplexer/descrambler 30 to enable the encrypted broadcast signal to be descrambled. The decoder also includes a conventional tuner 31 and demodulator 32 to receive and demodulate the satellite transmission before being filtered and demultiplexed by the unit 30.

**[0076]** Processing of data within the receiver/decoder is generally handled by the central processor 20. Figure 4 illustrates the software architecture of the central processor 20 of the receiver/decoder. With reference to Figure 4, the software architecture comprises a Run-Time-Engine 4008, a Device Manager 4068 and a plurality of Devices 4062 and Device Drivers 4066 for running one or more applications 4056.

**[0077]** As used in this description, an application is preferably a piece of computer code for controlling high level functions of preferably the receiver/decoder 13. For example, when the end user positions the focus of remote control 25 on a button object seen on the screen of the television set 14 and presses a validation key, the instruction sequence associated with the button is run.

**[0078]** An interactive application proposes menus and executes commands at the request of the end user and provides data related to the purpose of the application. Applications may be either resident applications, that is, stored in the ROM (or FLASH or other non-volatile memory) of the receiver/decoder 13, or broadcast and downloaded into the RAM or FLASH memory of the receiver/decoder 13.

**[0079]** Applications are stored in memory locations in the receiver/decoder 13 and represented as resource files. The resource files may for example comprise graphic object description unit files, variables block unit files, instruction sequence files, application files and data files, as described in more detail in the above-mentioned patent specifications.

**[0080]** The receiver/decoder contains memory divided into a RAM volume, a FLASH volume and a ROM volume, but this physical organization is distinct from the logical organization. The memory may further be divided into memory volumes associated with the various interfaces. From one point of view, the memory can be regarded as part of the hardware; from another point of view, the memory can be regarded as supporting or containing the whole of the system shown apart from the hardware.

**[0081]** The central processor 20 can be regarded as centred on a run time engine 4008 forming part of a virtual machine 4007. This is coupled to applications on one side (the "high level" side), and, on the other side (the "low level" side), via various intermediate logical units discussed below, to the receiver/decoder hardware 4061, comprising the various ports as discussed above (that is, for example, the serial interface 21, the parallel interface 22, modem 23, and control unit 26).

**[0082]** With specific reference to Figure 4, various applications 4057 are coupled to the virtual machine 4007; some of the more commonly used applications may be more or less permanently resident in the system, as indicated at 4057, while others will be downloaded into the system, eg from the MPEG data stream or from other ports as required.

**[0083]** The virtual machine 4007 includes, in addition to the run time engine 4008, some resident library functions 4006 which include a toolbox 4058. The library contains miscellaneous functions in C language used by the engine

4008. These include data manipulation such as compression, expansion or comparison of data structures, line drawing, etc. The library 4006 also includes information about firmware in the receiver/decoder 13, such as hardware and software version numbers and available RAM space, and a function used when downloading a new device 4062. Functions can be downloaded into the library, being stored in FLASH or RAM memory.

**[0084]** The run time engine 4008 is coupled to a device manager 4068 which is coupled to a set of devices 4062 which are coupled to device drivers 4060 which are in turn coupled to the ports or interfaces. In broad terms, a device driver can be regarded as defining a logical interface, so that two different device drivers may be coupled to a common physical port. A device will normally be coupled to more than one device driver; if a device is coupled to a single device driver, the device will normally be designed to incorporate the full functionality required for communication, so that the need for a separate device driver is obviated. Certain devices may communicate among themselves.

**[0085]** Each function of the receiver/decoder 13 is represented as a device 4062 in the software architecture of the receiver/decoder 13. Devices can be either local or remote. Local devices 4064 include smartcards, SCART connector signals, modems, serial and parallel interfaces, a MPEG video and audio player and an MPEG section and table extractor. Remote devices 4066, executed in a remote location, differ from local devices in that a port and procedure must be defined by the system authority or designer, rather than by a device and device driver provided and designed by the receiver/decoder manufacturer.

**[0086]** The run time engine 4008 runs under the control of a microprocessor and a common application programming interface. They are installed in every receiver/decoder 13 so that all receiver/decoders 13 are identical from the application point of view.

**[0087]** The engine 4008 runs applications 4056 on the receiver/decoder 13. It executes interactive applications 4056 and receives events from outside the receiver/decoder 13, displays graphics and text, calls devices for services and uses functions of the library 4006 connected to the engine 4008 for specific computation.

**[0088]** The run time engine 4008 is an executable code installed in each receiver/decoder 13, and includes an interpreter for interpreting and running applications. The engine 4008 is adaptable to any operating system, including a single task operating system (such as MS-DOS). The engine 4008 is based on process sequencer units (which take various events such as a key press, to carry out various actions), and contains its own scheduler to manage event queues from the different hardware interfaces. It also handles the display of graphics and text. A process sequencer unit comprises a set of action-groups. Each event causes the process sequencer unit to move from its current action-group to another action-group in dependence on the character of the event, and to execute the actions of the new action-group.

**[0089]** The engine 4008 comprises a code loader to load and download applications 4056 into the receiver/decoder memory. Only the necessary code is loaded into the RAM or FLASH memory, in order to ensure optimal use. The downloaded data is verified by an authentication mechanism to prevent any modification of an application 4056 or the execution of any unauthorized application. The engine 4008 further comprises a decompressor. As the application code (a form of intermediate code) is compressed for space saving and fast downloading from the MPEG stream or via a built-in receiver/decoder mode, the code must be decompressed before loading it into the RAM. The engine 4008 also comprises an interpreter to interpret the application code to update various variable values and determine status changes, and an error checker.

**Authoring tool**

**[0090]** As mentioned above, authoring tool 4004 is provided to enable applications to be designed, created, tested and debugged. The authoring tool is run on a workstation (WS), such as a personal computer (PC) running Windows NT, Windows 95 or Windows 98, or a UNIX machine, or a workstation running any other operating system. The authoring tool allows an application developer to design and create applications by editing them on the workstation screen.

**[0091]** According to a preferred embodiment, in order to test and debug applications, a receiver/decoder is provided which is linked to the workstation. The receiver/decoder is linked to the workstation in such a way that the various files which make up an application can be downloaded to the receiver/decoder as and when they are needed.

**[0092]** Referring to Figure 5, in overview the authoring tool comprises workstation 200 which is linked to receiver/decoder 226 by link 228. The workstation 200 comprises screen 210, computer 212, keyboard 214 and mouse 216. Computer 212 comprises a processor 218, memory 220, hard disk 222, input/output (I/O) ports 224, as well as other pieces of hardware and software that are conventional in such computers. Receiver/decoder 226 is connected to television 230, or other display.

**[0093]** The various components of the authoring tool 4004 are shown in more detail in Figure 6. The authoring tool comprises an editor 410 for creating and editing the various files that make up an application, library 412 which stores existing files for use by the editor 410, and compiler 414 for compiling files which have been produced by editor 410 into the intermediate language which can be understood by a virtual machine, such as virtual machine 4007 in Figure 4. The compiled files, which are called "class files" are saved in directory 416, which is a directory on the hard disk 222 of

the workstation 200 or in another volume on a network to which the workstation is connected. Receiver/decoder 226 comprises CPU 424 and associated memory, input/output (I/O) port 422, as well as other components found in conventional receiver/decoders, such as those shown in Figure 3. Net proxy 418 (as described later) is provided in the workstation to allow the receiver/decoder 226 to access class files stored in directory 416 via receiver/decoder I/O port 422, serial link 228, and workstation I/O port 420. Also provided is debugger 430 (as described later) for debugging applications running on receiver/decoder 226.

**[0094]** An application developer creates new files, and/or makes use of existing files which are stored in the library 412, to produce files for his application using the editor 410. An application comprises source files, which contain instructions written in comprehensive language, such as Java, designed for a virtual machine, and, optionally, data files, which contain data which is to be used by the application. Files which are being edited are displayed on the workstation screen 210 and changes are entered using keyboard 214 and mouse 216. The files may be displayed in various ways; for example graphic files may be displayed as graphics on the screen, whereas for resource files, the code in the files may be displayed, or a representation of the overall structure or architecture of the code may be displayed.

**[0095]** In a specific implementation, which uses a programming language known as Pantalk, an application may comprise one of more of the following types of resource files:

- source files - to define the entry points of the application
- panel files - to define the screens (these are graphical source files)
- class files - to define the data structures used by the application
- optionally, script files - to define the behaviour of the application

**[0096]** Examples of data files are as follows:

- icon library files - these contain a collection of, for example, 4 bits per pixel bitmaps. These icons can be used by the panels as buttons or as decoration.
- images - these files contain a single bitmap of any size with four bits per pixel, giving 256 colours. This type of image is typically used as a background to a panel.
- colour tables - these are used to define the colours which a module can display on the screen.
- user data files - these files are defined by the user for use by the application. They are ASCII text files or binary data files..

**[0097]** In alternative implementations other programming languages, such as Java, are used. As will be apparent to the skilled person, different languages may result in different application structures, appropriate to that language.

**Testing applications**

**[0098]** Once an application has been created, it is converted into the intermediate language which can be understood by a virtual machine by compiler 414, and stored as class files in directory 416. The application may then be tested by running it on the processor 424 of receiver/decoder 226. In order to test an application, the workstation 200 sends a request to the receiver/decoder 226 in the form of a message containing the name of the server which is to be used for communication and the name of the directory in which the class files are stored.

**[0099]** In contrast to a conventional receiver/decoder, the receiver/decoder 226 of the present embodiment is programmed such that, when it is first turned on, it runs a resident program called network file system (NFS) loader. This program waits for a request to be received from the workstation 200. When the program receives a request, it accesses the directory specified in the request, using the specified port. The directory 416 contains a file called startup.txt which contains the name of the boot file, that is, the file which initiates the application. The NFS loader reads the name of the boot file and then downloads that file from the workstation directory and stores it in memory in the receiver/decoder. The boot file is then run by the processor 424 in the receiver/decoder.

**[0100]** The boot file may contain calls to routines which are contained in other files, in which case the required file needs to be loaded into the processor. In this case, the processor first looks in the receiver/decoder memory to see if the file that it needs is stored locally, for example, because it has already been used. If the file is not stored locally, then the processor looks in the workstation directory, specified in the request from the workstation, to find the file. The file is then downloaded and stored in the receiver/decoder memory (for example RAM or FLASH memory) for use by the receiver/decoder. In this way, applications which have been created by the editor 410 and stored in directory 416, are run on the receiver/decoder 226. The output from receiver/decoder 226 is displayed on television set 230. This allows the application developer to see how the application looks when run on a receiver/decoder and television.

**[0101]** Referring to Figure 7, the various steps in creating and testing an application will be described. In step 450 an application is created using the editor 410. In step 452 the application is compiled, and in step 454 the compiled

application is saved in directory 416 as class files. In step 456 a request is sent from the workstation to the receiver/decoder, specifying the name of the directory and the port to be used for communication. In step 458 the boot file is loaded from the directory into the receiver/decoder and in step 460 the boot file is run on the processor of the receiver/decoder. In step 462, it is decided by the processor whether or not a new class file is required. If a new class file is required, then in step 464 that new class file is loaded into the receiver/decoder and in step 466 the new class file is run. Further class files are loaded into the receiver/decoder and run by the processor as required.

**[0102]** The editor 410 may be used to make changes to the application, for example as a result of the testing. As a result of such changes, some or all of the files stored in the directory 416 may be updated. The updated files may then be transferred to the receiver/decoder 226 in one of several ways, as-will now be described.

**[0103]** In one embodiment, no special provision is made for updating files in the receiver/decoder 226. When the receiver/decoder is turned on, it simply downloads the files that it requires from the directory 416. In this case, if changes have been made to files that have already been downloaded into the receiver/decoder, then the receiver/decoder must be restarted, so that the updated files will be downloaded. This may be done, for example, by switching the receiver/decoder off and then on again. The receiver/decoder then downloads all files, including any modified files, that are needed to run the application.

**[0104]** In another embodiment, files in the receiver/decoder are updated by sending an "unload file" command from the workstation to the receiver/decoder. When the receiver/decoder receives this command, it deletes the specified files. The next time that the file is required, it will not be present locally in the receiver/decoder, and so the updated version of the file will be downloaded from the directory 416.

**[0105]** In a further embodiment, the receiver/decoder checks the time and date of last modification of all files that are available to it both locally and in the workstation, and uses the latest version of all files. In this way, modified files are transferred automatically to the receiver/decoder.

**Authoring tool network**

**[0106]** Figure 8 illustrates the architecture of the various layers that are used to give the receiver/decoder 226 access to the workstation's hard disk, or the network volume, as the case may be, containing the directory 416. The receiver/decoder is provided with a client network file system (NFS) which permits the receiver/decoder to use the workstation's hard disk or a directory on a network volume as if it were a local storage device. In the present example, the receiver/decoder does not have a network stack, and so a proxy stack ("NetProxy") 418 is provided on the workstation for use by the receiver/decoder. This proxy establishes a link between the workstation's network stack and the physical port which is connected to the receiver/decoder.

**[0107]** Referring to Figure 8, the receiver/decoder 226 includes a physical layer 250, a data link layer 252, a net proxy layer 254, a NFS/RPC layer 256 and a file system layer 258.

**[0108]** The physical layer 250 provides the physical port between the receiver/decoder 226 and the workstation 200. As such, it may include (amongst other possibilities) any or all of a serial port, a parallel port or a modem.

**[0109]** The purpose of the data link layer 252 is to handle exchange of frames of data between the physical layer 250 and the net proxy layer 254. It serves to ensure the integrity of the frames which are exchanged, and to demultiplex frames arriving from different destinations.

**[0110]** The data link layer 252 may use a protocol identified as SLPD. SLPD protocol handles data in frames which include five fields, represented diagrammatically in Figure 9. The fields contained within this frame as follows:

- SYNC_WORD (500): a fixed 16-bit value that identifies the start of a SLPD frame.
- LENGTH (502): a 16-bit value being the count of bytes to follow in the SLPD frame.
- PROTOCOL_ID (504): a 16-bit value that identifies the protocol of the data contained within the SLPD frame. This field is used in multiplexing of data.
- DATA (506): A variable-length field containing LENGTH - 4 bytes of data transported by the SLPD frame.
- CRC 16 (508): A 16-bit field containing data to verify the integrity of the SLPD frame. The field contains a 16-bit cyclic redundancy checking value calculated on the fields PROTOCOL_ID and DATA.

**[0111]** The functionality of the data link layer 252 includes provision of the following public methods:

**[0112]** *MhwNFSRpcComRegisterProtocol*: This function registers callback functions associated with a protocol. Two callback functions, *aSendCallback* and *aRevCallback*, are associated with each protocol, and are respectively, called to indicate completion of the transmission of a frame of data and the other to indicate reception of a frame of data.

**[0113]** *MhwNFSRpcComUnregisterProtocol*: This function is used to delete callback functions associated with a protocol.

**[0114]** *MhwNFSRpcComPortInit, MhwNFSRpcComPortClose*: Used, respectively, to initialise and to close a communication port (such as a serial port, a parallel port, or a modem device) and to obtain a context address of the port.

In a preferred embodiment, it is permitted to call this function several times for the same device. Initialisation of the device is not effected other than on the first call. The data link layer 252 stores in a counter the number of calls made to *MhwNFSRpcComPortInit* for each device. Each time a subsequent call is made to *MhwNFSRpcComPortClose* for a device, the counter for that device is decremented. The port is not actually closed until its counter reaches zero.

**[0115]** *MhwNFSRpcComInit, MhwNFSRpcComClose*: These functions are called, respectively, to initialise and to correctly close down the data link layer 252.

**[0116]** *MhwNFSRpcComDatagramSend*: This function transmits a SLPD frame *via* a communication port. On completion of transmission, the callback function *aSendCallback* for the protocol identified in the SLPD frame is called to indicate to the client that the frame has been sent.

**[0117]** The net proxy layer 254 is a software layer which compensates for the absence of a network stack in the decoder. The net proxy 254 layer communicates with a net proxy layer 264 in the workstation 200 through intermediate data link layers 252,262 and physical layers 250,260 in the receiver/decoder 226 and the workstation 200. Within the workstation 200, all messages received by the net proxy layer 264 are passed to a network stack 266 for onward transmission to a remote host via a UDP socket 268; similarly all messages received by the UDP socket 268 are transferred to receiver/decoder 226. NFS/RPC layer 256 in the receiver/decoder provides the interface between the file system 258 of the receiver/decoder and the NetProxy layer, while NFS/RPC layer 270 in the workstation provides the interface between the workstation's file system and the network stack.

**[0118]** The net proxy layer (whether in the receiver/decoder 226 or in the workstation 200) handles data packets which contain a host name and a data packet of arbitrary length. The net proxy layer provides the following public methods:

**[0119]** *NFSRpcProxyInit, NFSRpcProxyClose*: These functions respectively initialise and close down the net proxy layer.

**[0120]** *NFSRpcProxyBindHostName, NFSRpcProxyUnbindHostName*: The first of these functions associates a host name with a physical interface. The latter deletes a previously-registered host name from the list of hosts maintained by the net proxy.

**[0121]** NFSRpcProxyBindResolveName: This function obtains the address of a host identified by name.

**[0122]** *NFSRpcProxyRpcSend*: This function is used to make an RPC call on a remote host.

**[0123]** The NFS/RPC layer implements the functionality necessary to invoke RPC commands in conformity with RFC1057, RFC1094 and relevant ISO standards.

**[0124]** A modified embodiment is shown in Figure 10. In this embodiment, the directory 416 is stored in network volume on an NFS server 600 remote from the workstation 200. A developer working on a development workstation 620 can gain access to the files in the directory 416 *via* a network 612 connection to the server 600. A net proxy 610 separate from the developer's workstation 620 is provided in order that the receiver/decoder 226 can gain access to the network.

**[0125]** In the arrangement of Figure 10, the receiver/decoder is configured as described above with reference to the preceding figures. The net proxy 610 can conveniently be implemented as software executing on hardware such as a PC workstation. Typically, the development workstation is a more powerful development machine, such as a Unix workstation. It will be understood that the execution environment of the receiver/decoder 226 can, through the net proxy 610, access files on a number of directories in various volumes connected to the network 612, including the developer's workstation 620, a common file server 600, and other local or remote developer's workstations (not shown).

**Debugger**

**[0126]** Referring again to Figure 6, the workstation 200 includes a debugging tool 430 in the form of software which monitors and controls execution of code in the runtime execution environment of the receiver/decoder 226. As was disclosed in International Patent Application number WO 98/43165 cited above, a debugger running on a development workstation can exchange control messages with an execution environment of a receiver/decoder 226 to control and/or to monitor execution of a program executing in the execution environment.

**[0127]** In the present embodiment, in order that the debugger can control operation of an application running on receiver/decoder 226, control messages are carried between the network and the receiver/decoder 226 by way of net proxy 418 or 610. On initiation of a remote debugging session, the debugger 430 is invoked with the host name of the remote host as an invocation parameter. This causes a data packet to be sent to the specified remote host, and thence via the net proxy 418 or 610 to the receiver/decoder 226. The data packet contains a command signal for the execution environment which instructs it to enter debugging mode, and further contains the name of a host to and from which debugging control signals are to be sent (normally, the host name of the developer's workstation). During debugging operation, the execution environment will then send and receive control signals through the net proxy of the receiver/decoder and through a local communication port.

**[0128]** During debugging operation, an application running on the receiver/decoder is monitored and controlled in

accordance with commands sent to the debugger. Class files forming the application are downloaded to the receiver/decoder as they are needed, in the same way as described above in relation to testing operations. Updated files may also be transferred to the receiver/decoder in any of the ways described in relation to testing operations.

**[0129]** Various debugging operations may be carried out by debugger 430. For example, the debugger 430 can monitor variables in the- application, a list of variables to be monitored being defined for this purpose. The values of the defined variables can be displayed at defined points in the execution of the application, and/or the values of variables can be displayed (along with the variable names) on any change of value. Further, the debugger 430 can be used to modify variable values in the receiver/decoder; this gives the operator the ability to see almost immediately what the effect of setting variables to different values will have. These variable control functions can, of course, also be cleared by the debugger (as all debugger functions can be cleared).

**[0130]** Similarly, the debugger 430 can set the receiver/decoder to signal when other types of entity, such as modules, variables block unit files, and objects, are encountered during the running of the application.

**[0131]** The debugger 430 can also control the execution of the application, by inserting break-points (and deleting them). More specifically, execution may be allowed to run without interruption, to run to a break-point and stop, to run to a break-point and step on (restart) when desired, to run to a subroutine call or return from a subroutine, or to proceed step by step (ie stepping on from each statement only in response to the operator), either between defined points and/or defined sub-routines or for the full application. (A sub-routine may be an instruction sequence, which is a sequence of statements which can be called or executed by the application.)

**[0132]** The debugger 430 can operate a trace function, which detects and signals one or more of a variety of operations such as continuing, loading, returning or jumping to, starting or ending the execution of, or interrupting one or more specified routines or types thereof.

**[0133]** The debugger 430 can also monitor and report the status of the receiver/decoder and the application at desired points in the execution of the application. Among the elements whose status can be so monitored and reported are the following: memory size, free memory, buffer pool characteristics, system version number, and so on; the memory contents (memory dump) of the whole memory or specified parts thereof (eg RAM, Flash, and ROM); volumes mounted, modules loaded (and current module), and variables block unit files (number, memory used, list of variables block unit files); instruction sequence status (number, number running and/or interrupted, memory used, etc); and return stack contents (ie a list of subroutines to be returned to).

**[0134]** Examples of debugger functions which are available in a preferred embodiment are shown in the following table.

| Command | Description |
|---|---|
| next | execution of a line of code without following its functions |
| step | execution of a line of code following its functions |
| cont | continue execution until a stop point or the end of the program |
| until ⟨line number⟩ | continue execution until the specified line number |
| finish | continue execution until the end of the current function |
| break ⟨string⟩ | insert a break point |
| break ⟨string if ⟨condition⟩ | insert a conditional break point |
| breakcount ⟨number⟩ ⟨string⟩ | insert a break point with a counter (the program will stop after break point has been passed a specified number of times) |
| breakcount ⟨number⟩ ⟨string⟩if ⟨condition⟩ | insert a conditional break point with counter |
| delete ⟨breakpoint number⟩ | delete break point |
| disable ⟨breakpoint number⟩ | deactivate a break point |
| enable ⟨breakpoint number⟩ | activate a break point |
| command ⟨breakpoint number⟩ | associate a command with a break point |
| watchexception ⟨exception⟩ | insert a break point when an exception is raised |
| unwatchexception ⟨watchexeception number⟩ | suppress a break point associated with an exception |

(continued)

| Command | Description |
|---|---|
| info | display list and status of break points |
| print ⟨expression⟩ | print the value of an expression |
| set ⟨expression1⟩⟨expression2⟩ | set the value of expression 2 to expression 1 |
| whatis ⟨expression⟩ | indicate the type of the expression |
| inherit ⟨expression⟩ | display list of mother classes of the expression |
| fields ⟨expression⟩ | display list of fields of an expression |
| methods ⟨expression⟩ | display list of methods of an expression |
| dump ⟨format⟩⟨address⟩⟨count⟩ | display the contents of a section of memory |
| where | display the stack of current thread |
| up | select the frame calling the current frame |
| down | select the called frame |
| threads | display a list of threads and their main attributes |
| getthr | display a detailed list of the attributes of a thread |
| monitors | display list of monitors of threads |
| getmon | display detailed list of attributes of a monitor |
| dbginfo | lists modules for which a trace level is defined |
| dbgset | modify the trace level of a module |
| fs ⟨action⟩⟨parameters⟩ | used to obtain information from the file system |

**[0135]** In some circumstances, it may be desirable for more than one host to be in communication with the receiver/decoder 226. For example, the execution environment may be configured to send debugging information in real time to a network printer.

**[0136]** In an alternative embodiment, the receiver/decoder 226 is provided with a network stack, and the NetProxy layers described above are dispensed with.

**[0137]** A workstation and receiver/decoder have been described above with reference to an authoring tool; however the receiver/decoder and workstation may also be used for other purposes, such as for demonstrating applications.

**[0138]** The device simulator described in co-pending European Patent Application Number 99401744.0 in the name of the present applicant may be used in conjunction with the present invention. The subject matter of that patent application is incorporated herein by reference.

**[0139]** It will be understood that the present invention has been described above purely by way of example, and modifications of detail can be made within the scope of the invention.

**[0140]** Each feature disclosed in the description, and (where appropriate) the claims and drawings may be provided independently or in any appropriate combination.

**[0141]** Reference numerals appearing in the claims are by way of illustration only and shall have no limiting effect on the scope of the claims.

**Claims**

1. A receiver/decoder operable in a debugging mode for debugging an application, comprising means for communicating a debugging message over a network.

2. A receiver/decoder according to claim 1 wherein the means for communicating a debugging message is adapted to receive the debugging message from the network, preferably to control the execution of the application in dependence on the message.

3. A receiver/decoder according to claim 2 wherein the debugging mode is invoked by the debugging message, which message includes an identifier of a remote host, and the means for communicating a debugging message is

adapted to communicate a further debugging message with the remote host identified in the message.

4. A receiver/decoder according to claim 1, 2 or 3 wherein the means for communicating the debugging message is adapted to transmit a debugging message to the network, the message preferably containing information concerning execution of the application.

5. A workstation adapted to debug an application running on a receiver/decoder, comprising means for communicating a debugging message with the receiver/decoder over a network.

6. An application development tool comprising a receiver/decoder according to any of claims 1 to 4 and a workstation according to claim 5.

7. An application development tool according to claim 6 including a net proxy operative to implement communication between the receiver/decoder the workstation.

8. An application development environment comprising an application development tool according to claim 6 or 7 and a network over which the workstation and the receiver/decoder communicate.

9. A method of debugging an application on a receiver/decoder comprising operating the receiver/decoder in a debugging mode and communicating a debugging message over a network.

10. A receiver/decoder preferably according to any of claims 1 to 4 comprising means for running an application, the application comprising a plurality of files, and means for selectively reading at least one of the files from the network.

11. A workstation preferably according to claim 5 comprising storage means storing an application to be run on a receiver/decoder, the application comprising a plurality of files, and means for allowing access to at least one of the files by a receiver/decoder connected to the workstation by a network.

12. An application development tool preferably according to claim 6 or 7 comprising a workstation for editing an application and a receiver/decoder for running the application, wherein the receiver/decoder has means for selectively reading a part of the application from a network file store and the workstation has means for initiating communication of the part to the receiver/decoder.

13. A method of running an application on a receiver/decoder, the application comprising a boot file and at least one further file, comprising:

transferring a boot file to the receiver/decoder;
executing the boot file in the receiver/decoder; and
transferring the at least one further file when it is required,
at least one of the boot file or the at least one further file being transferred over a network.

14. A method according to claim 13 in which at least one of the boot file and the at least one other file is transferred from a network file store.

FIG. 1

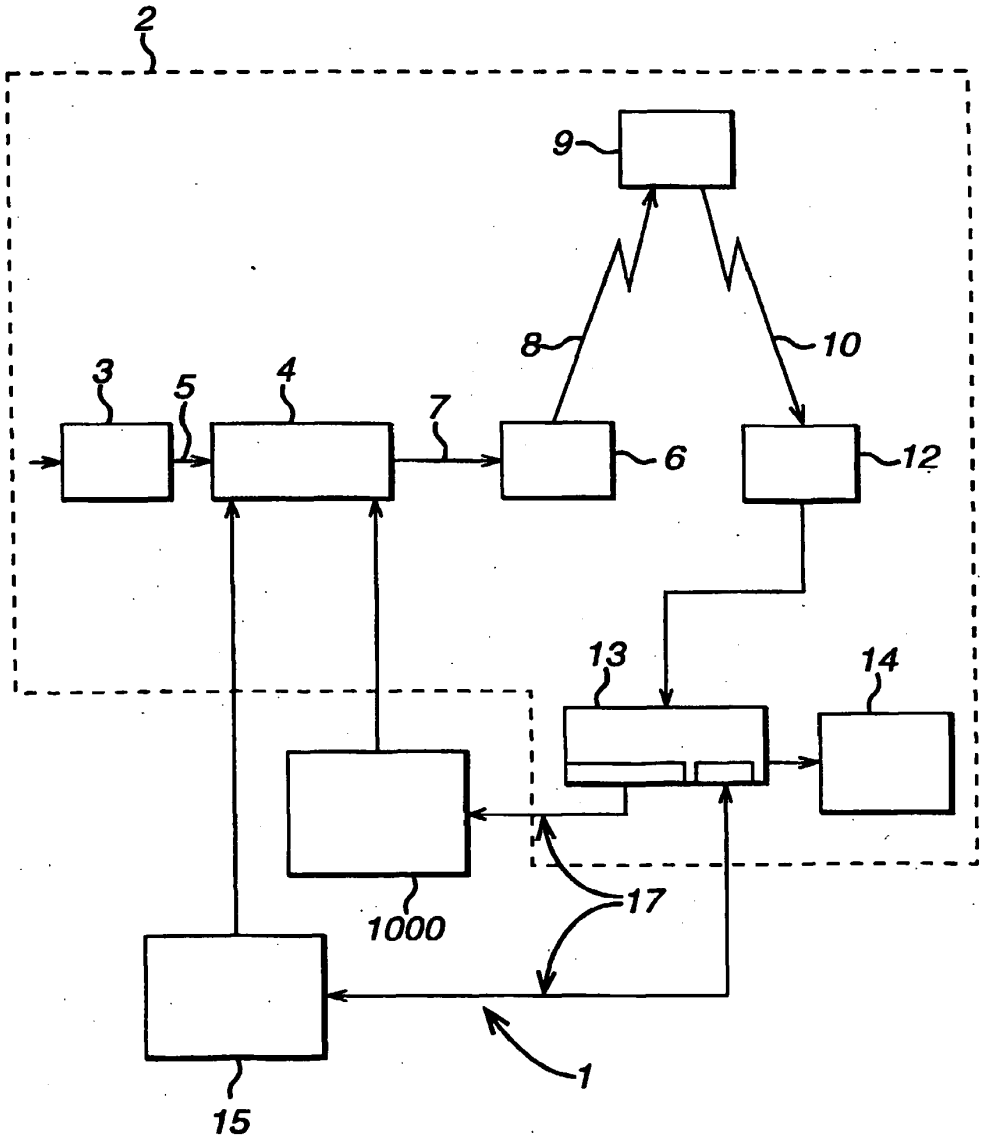


FIG. 2

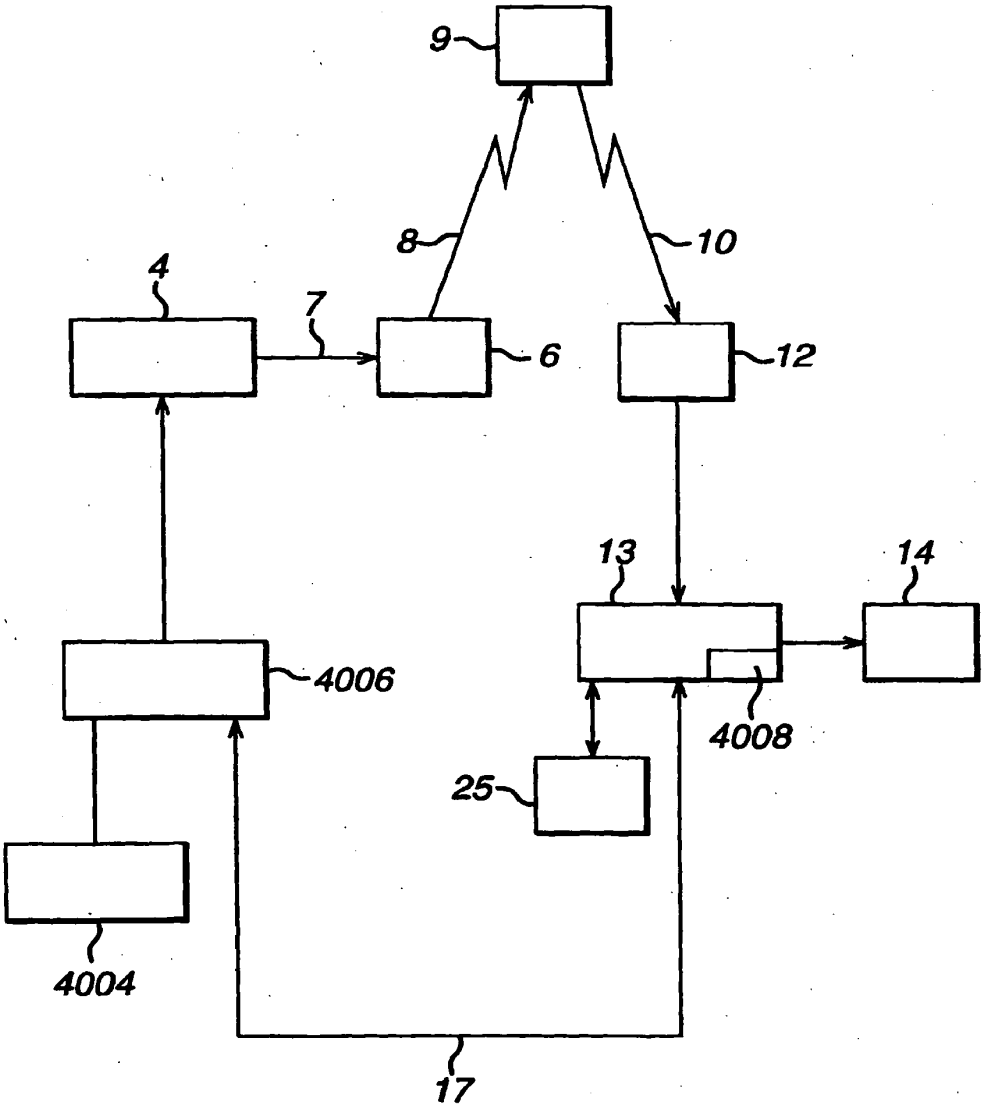


FIG. 3

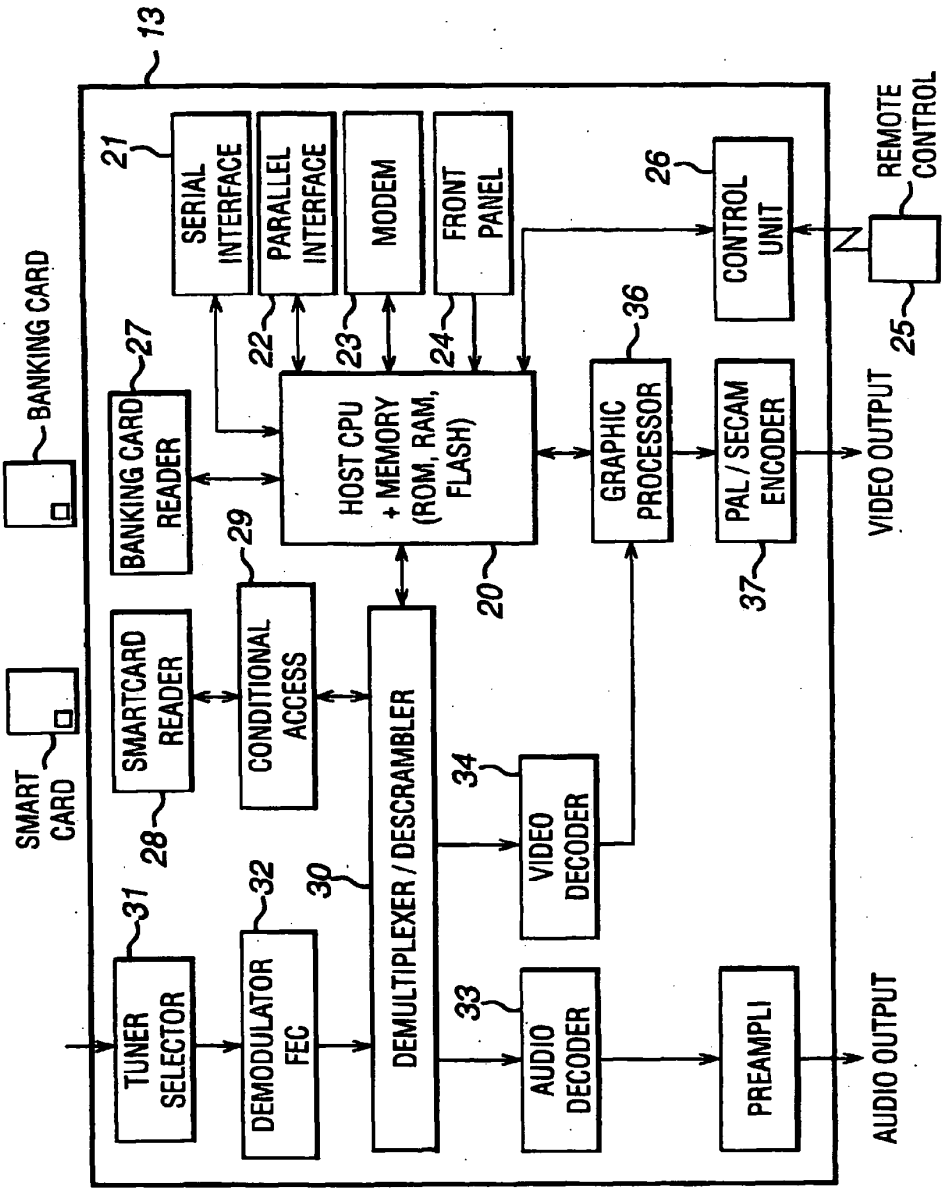
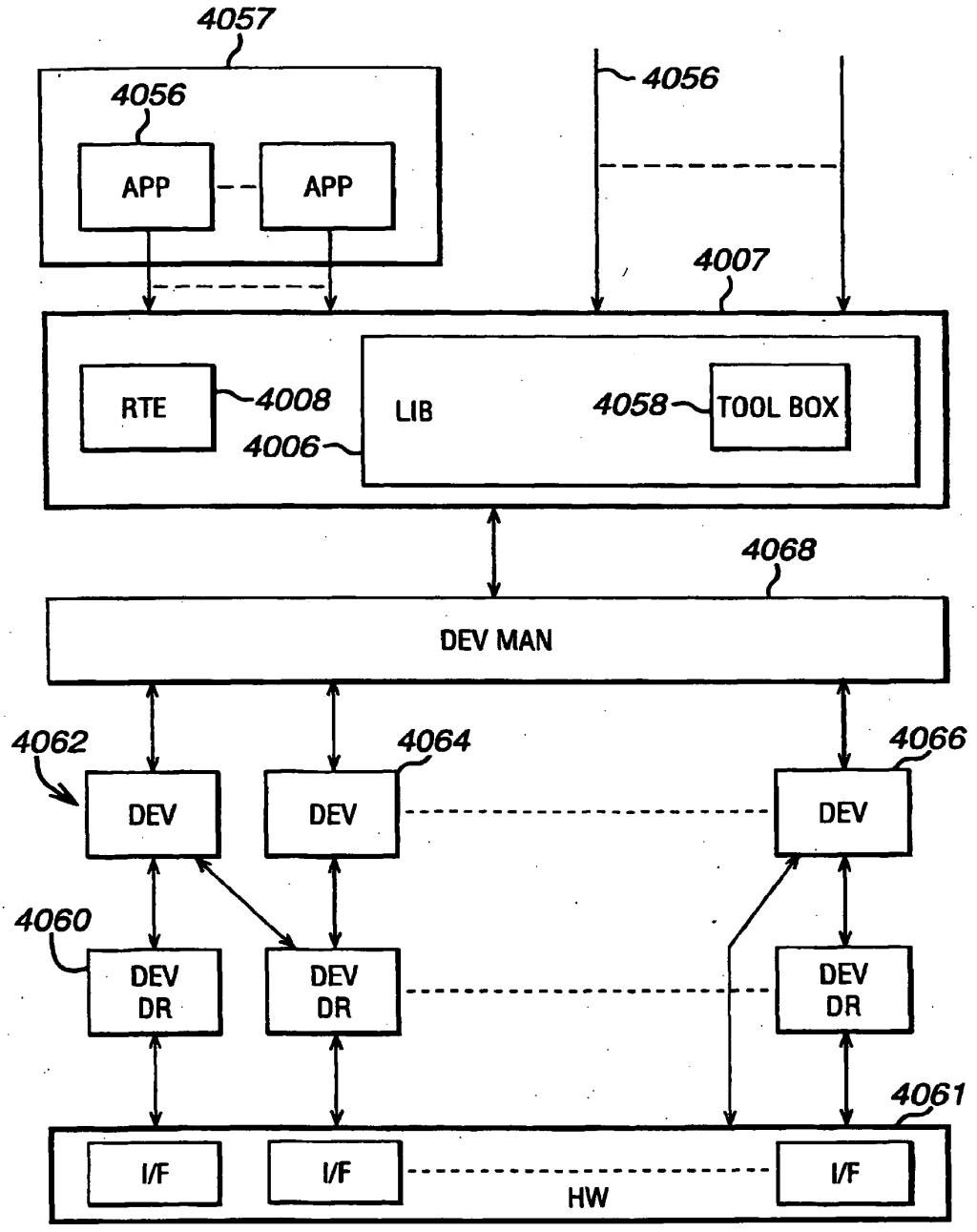

13
21
SERIAL INTERFACE
PARALLEL INTERFACE
MODEM
FRONT PANEL
22
23
24
26
CONTROL UNIT
REMOTE CONTROL
25
BANKING CARD
27
BANKING CARD READER
HOST CPU + MEMORY (ROM, RAM, FLASH)
20
36
GRAPHIC PROCESSOR
PAL / SECAM ENCODER
37
VIDEO OUTPUT
29
CONDITIONAL ACCESS
SMARTCARD READER
28
SMART CARD
34
VIDEO DECODER
DEMULTIPLEXER / DESCRAMBLER
30
31
TUNER SELECTOR
32
DEMODULATOR FEC
33
AUDIO DECODER
PREAMPLI
AUDIO OUTPUT

FIG. 4


4057
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APP
APP
4056
4007
RTE
4008
4006
LIB
4058
TOOL BOX
4068
DEV MAN
4062
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DEV DR
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I/F
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I/F
HW

FIG. 5

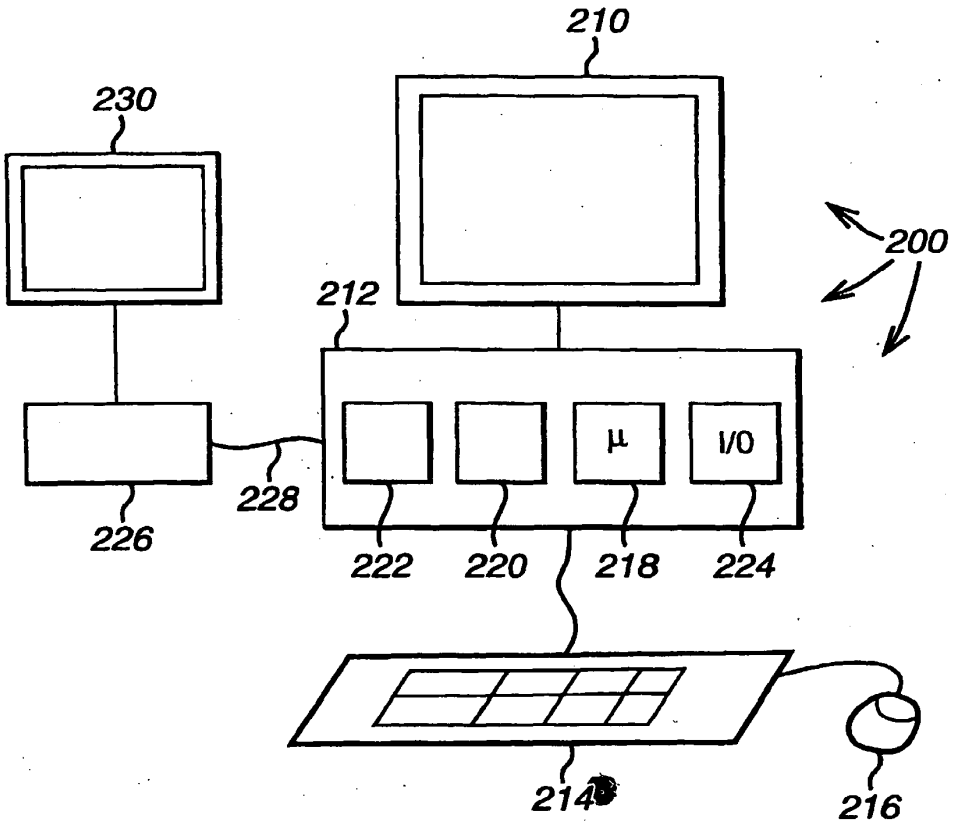


FIG. 6

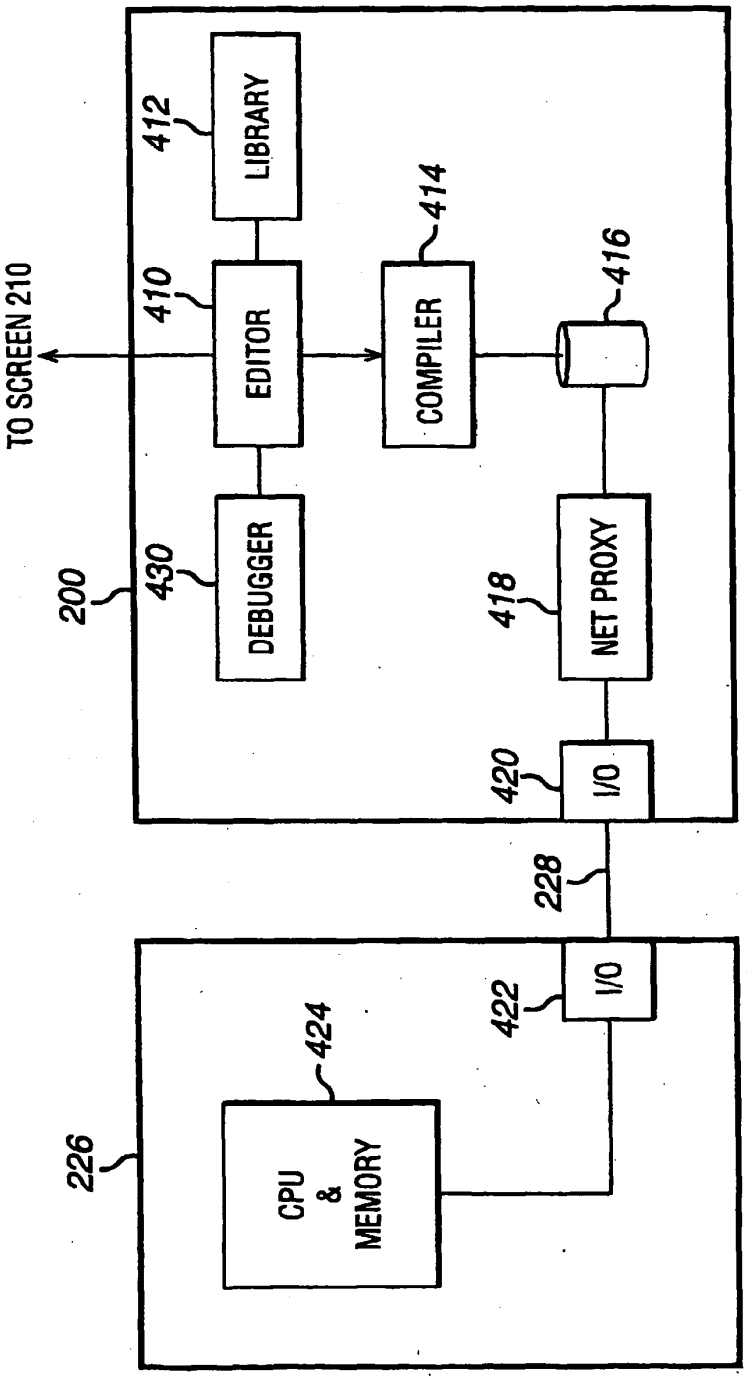

TO SCREEN 210
200
226
228
410
412
414
416
418
420
422
424
430
EDITOR
LIBRARY
COMPILER
DEBUGGER
NET PROXY
I/O
I/O
CPU & MEMORY

FIG. 7

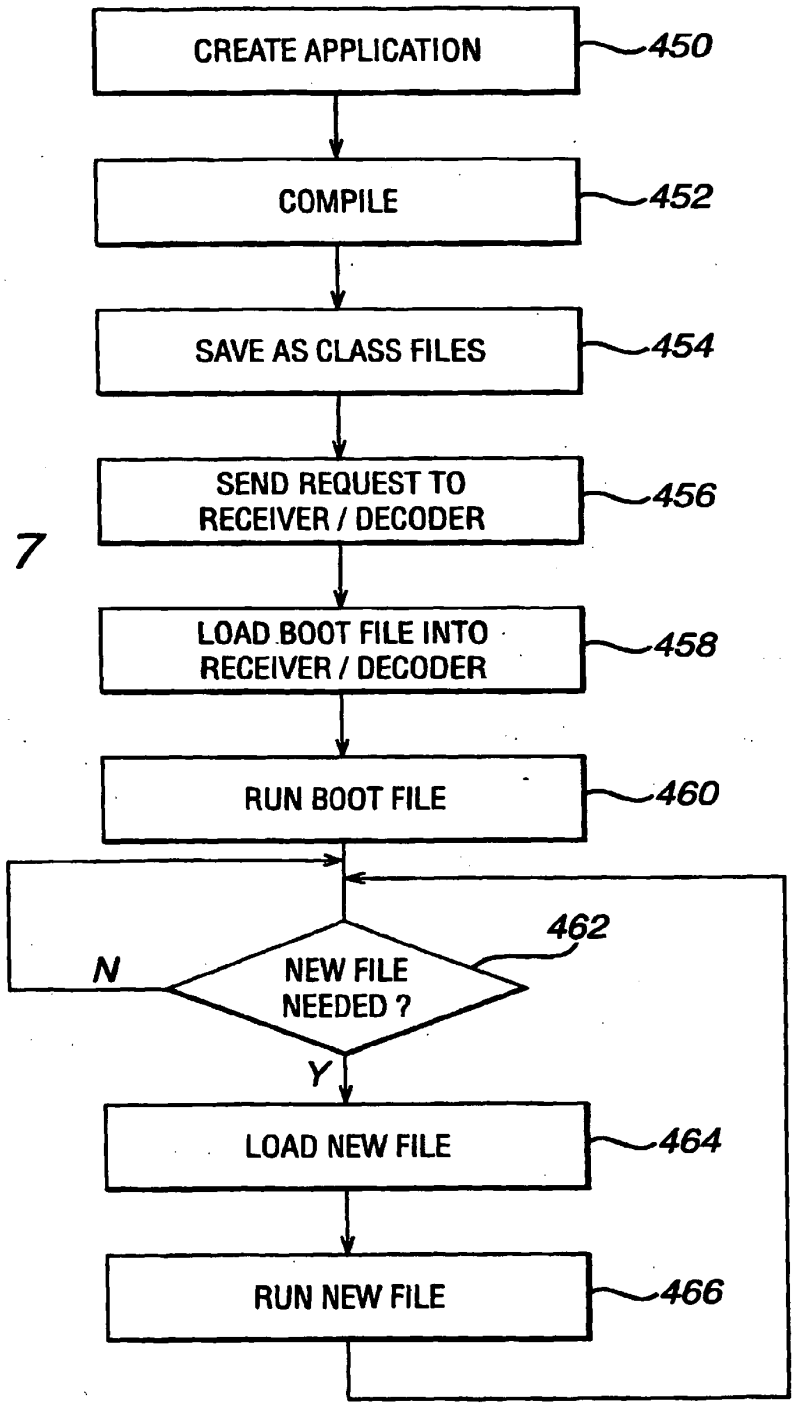
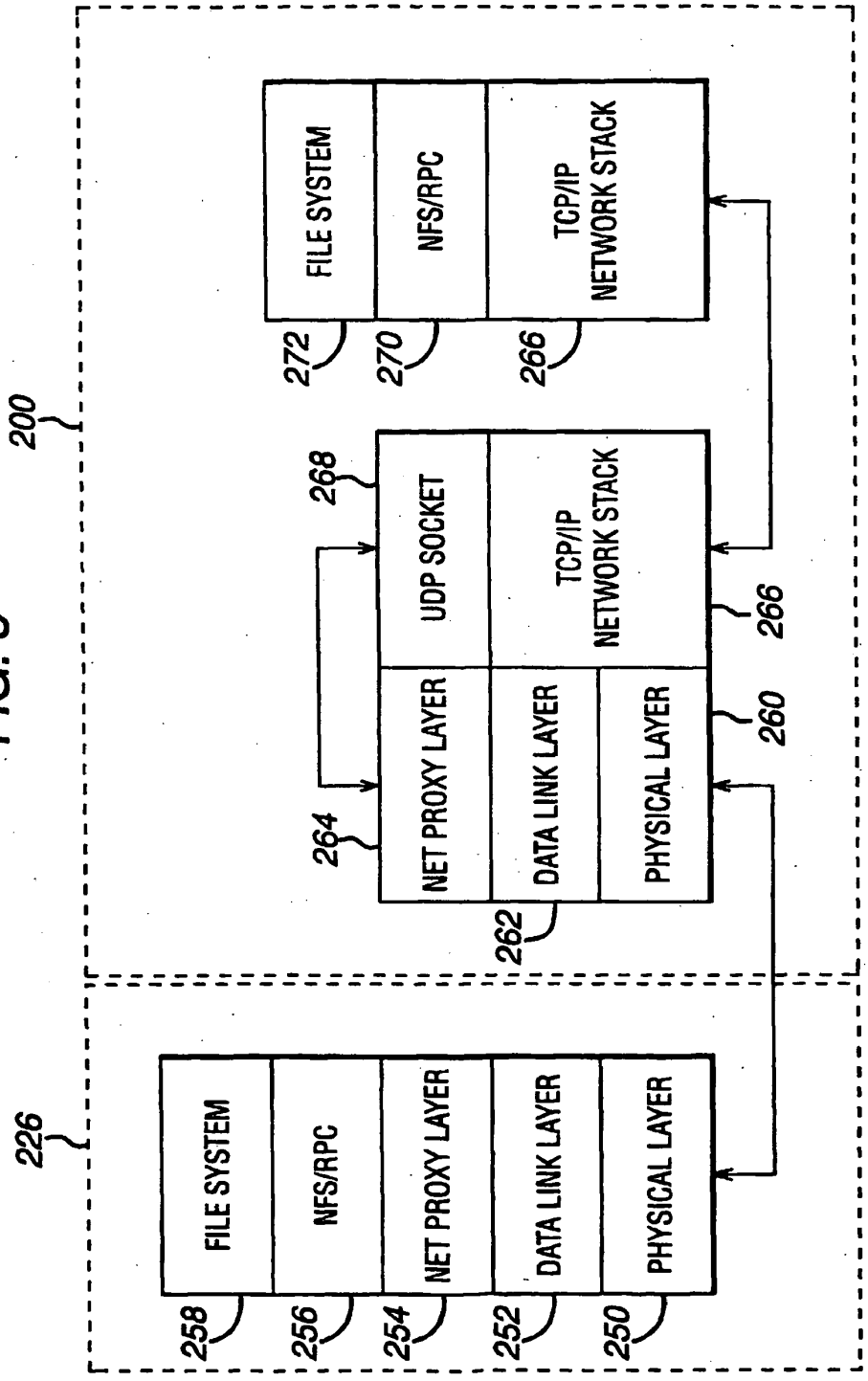

CREATE APPLICATION
450
COMPILE
452
SAVE AS CLASS FILES
454
SEND REQUEST TO RECEIVER / DECODER
456
LOAD BOOT FILE INTO RECEIVER / DECODER
458
RUN BOOT FILE
460
462
N
NEW FILE NEEDED ?
Y
LOAD NEW FILE
464
RUN NEW FILE
466

FIG. 8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FILE SYSTEM
NFS/RPC
TCP/IP NETWORK STACK
272
270
266
268
UDP SOCKET
TCP/IP NETWORK STACK
266
NET PROXY LAYER
DATA LINK LAYER
PHYSICAL LAYER
260
264
262
226
FILE SYSTEM
NFS/RPC
NET PROXY LAYER
DATA LINK LAYER
PHYSICAL LAYER
258
256
254
252
250

FIG. 9

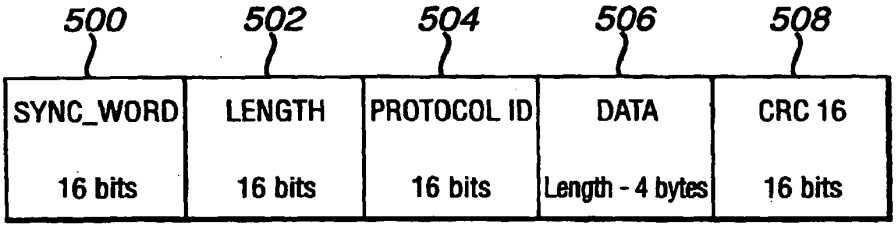
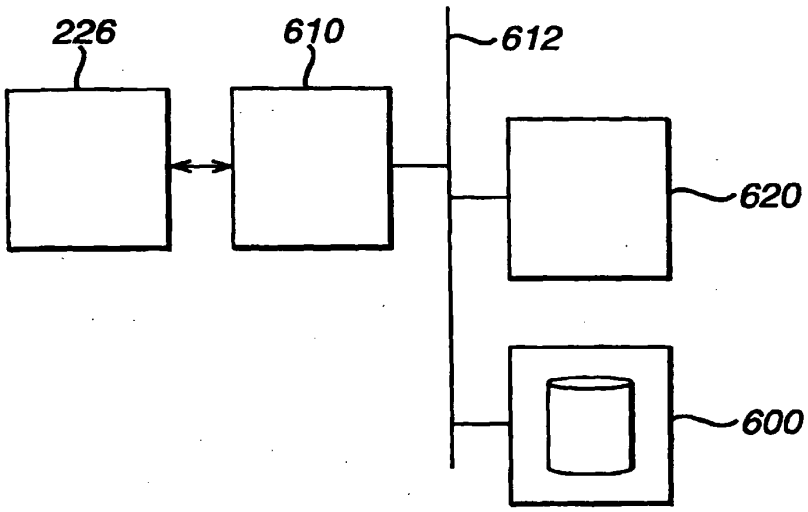

500
502
504
506
508
SYNC_WORD
16 bits
LENGTH
16 bits
PROTOCOL ID
16 bits
DATA
Length - 4 bytes
CRC 16
16 bits

FIG. 10


226
610
612
620
600

EP 1 067 458 A1

European Patent Office

# EUROPEAN SEARCH REPORT

Application Number
EP 00 10 2043

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.7) |
|---|---|---|---|
| X | WO 98 36356 A (ADVANCED MICRO DEVICES, INC.) 20 August 1998 (1998-08-20)<br>* abstract * | 1-14 | G06F11/36 |
| X | WO 98 21653 A (SYMBIOS, INC.)<br>22 May 1998 (1998-05-22)<br>* abstract * | 1-14 | |
| X | US 5 615 331 A (TOORLANS ET AL.)<br>25 March 1997 (1997-03-25)<br>* abstract * | 1-14 | |
| | | | TECHNICAL FIELDS SEARCHED (Int.Cl.7) |
| | | | G06F |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 30 May 2000 | Corremans, G |

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
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E : earlier patent document, but published on, or after the filing date
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L : document cited for other reasons

& : member of the same patent family, corresponding document

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## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 10 2043

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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30-05-2000

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| WO 9836356 A | 20-08-1998 | EP 0961971 A | 08-12-1999 |
| WO 9821653 A | 22-05-1998 | US 5983017 A<br>AU 5249198 A | 09-11-1999<br>03-06-1998 |
| US 5615331 A | 25-03-1997 | NONE | |

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

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 770 956 A1

# (12) EUROPEAN PATENT APPLICATION

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## (54) Information based on location and activity of a user

(57) The present invention relates to context or location aware computing, and in particular though not exclusively to providing an activity based view of a location. The invention provides a method for providing activity based information for a virtual location (100), and comprises determining the virtual location (410); automatically determining data about a process associated with an activity on a device within the virtual location (430); receiving at another device within the virtual location activity based information which is dependent on the determined process data (420).

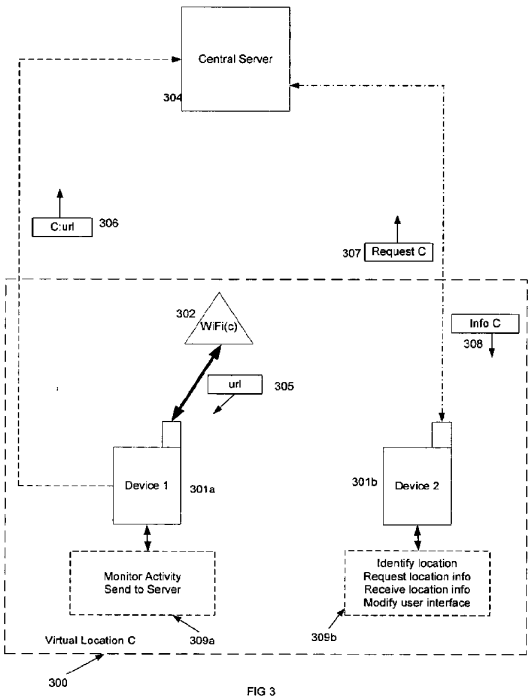


FIG 3

Printed by Jouve, 75001 PARIS (FR)

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## Description

### Field of the Invention

**[0001]** The present invention relates to context or location aware computing, and in particular though not exclusively to providing an activity based view of a location.

### Background of the Invention

**[0002]** The Internet and World Wide Web (The Web) have been successful in providing users with the ability to access information and computing or information technology (IT) services from virtually any location. This has been further enhanced by the development of wireless access technologies which in addition to enhancing the connectivity coverage, additionally provides the user with mobility. On the other hand, there has also been a growing demand for context aware provision of connectivity and IT services. Such services include the provision of local information such as nearby restaurants and the automatic connection to different types of networks depending on location, for example home or work. Numerous other examples of context aware services are increasingly available.

**[0003]** "Future of Location Based Experiences" by Steve Benford University of Nottingham, TSW0501, JISC Technology and Standards Watch, January 2005, describes various examples of context aware computing, including the ability of tourists to upload comments about a tourist attraction for later download by other tourists, and the ability to adjust the virtual location of a computer game depending on the actual physical location of the player.

**[0004]** The Massachusetts Institute of Technology (MIT) Media Lab Reality Mining Project at http://reality.media.mit.edu/ describes monitoring user activities of time and place using wireless identifiers such as Bluetooth ™ fixed equipment (eg printer) as locators. This information is used to model human interactions.

**[0005]** US2005/0020307 discloses configuring computing or electronic devices depending on the user's current context which in turn is related to their current location. For example a so configured device may only show secure work-related wireless connections when the user is at work, but any wireless connections when the user is elsewhere, for example at home.

**[0006]** US2004/0203851 discloses monitoring of activities the user engages in at a location for uploading to service providers serving that location; in order that they may better configure their services at that location based on user activity.

**[0007]** JP9053957 (English Abstract) discloses monitoring of activities over location and time on a device, for use in re-configuring the device to better service the user's habits.

### Summary of the Invention

**[0008]** In general terms the present invention provides a method and system for providing activity based information for a virtual location. The virtual location may be defined according to an actual physical or geographical location, or it may be defined solely according to the services provided there, for example a virtual location may be defined by a WiFi identifier which could change its physical location. The virtual location is also associated with the current and/or past activities performed there, for example by a high percentage of user media streaming in that virtual location. This information can be used by new devices entering the virtual location, or devices already in the virtual location, to reconfigure themselves, dependent on the activities of other devices in the virtual location. For example if the virtual location is associated with a library, this may result in a lot of wireless connections being established to download the library's information index, and this activity based information could be used to automatically present the user of a device entering the virtual location with an option to do the same activity. In another example, as more and more devices within a virtual location associated with a theatre start turning their device ringers off prior to the performance, this might prompt other user's who have not yet done this with the option to switch off their device ringers.

**[0009]** Such an arrangement eases operation of user interfaces on devices by automatically providing likely options for a user. Also the provision of an activity based view of a location allows a user to manually re-configure their device according to user preferences and expectations, for example the activities the user believes they are most likely to engage in. Users may set their device to automatically action (rather than manually action) local dynamic group activity such as the theatre example outlined above.

**[0010]** The activity information gathered about a virtual location may also be used by service providers supporting the virtual location, for example to rationalize their information delivery processes. This could include the caching of 'popular' information on a local server that is most likely to be requested by others in that location. Alternatively, likely information could be temporarily cached on the users device in anticipation of it being requested.

**[0011]** In one aspect the present invention provides a method of providing activity based information associated with a virtual location. The method comprises automatically determining data about a process on a device within the virtual location, the process associated with an activity; and receiving at another device activity based information which is dependent on the determined process data.

**[0012]** An embodiment provides a view of most popular information requested at this location, for example the top 10 WebPages viewed at this virtual location, or the most popular games. Alternatively or additionally the user



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device may be configured such that a user looking for places and times where people gather to play mobile a specific Bluetooth games is alerted by their mobile device that the virtual location they have just encountered is a 'gaming hotspot'.

**[0013]** The virtual location is defined by reference to services provided within a space or area, for example a WLAN having a specific WiFi BSSID and/or encryption key. Thus any device which is able to receive the corresponding WLAN beacon is said to be within the virtual location. The beacon provides a virtual location clue, and can be used by the device to identify that it has entered a predefined virtual location. The predefined virtual location may be stored on the device's memory, such that when it detects the corresponding signature or clue, it assumes it has entered the virtual location. Alternatively, the WLAN access point may transmit an identifier according to a predetermined protocol which the device is able to recognise. In another alternative, the device may send a request to a central server together with the virtual location clue or clues it has detected. In another alternative, a service provider such as a Wi-Fi access point associated with defining a virtual location may recognise devices that enter its network coverage area. This information can then be used by the server to forward a virtual location identifier and/or virtual location dependent activity based information. The virtual location clues will typically correspond to one or more wireless technologies, for example a WiFi and a Bluetooth beacon carrying a respective identifier which can be used together with the technology type (eg IEEE802.11g and BT v2).

**[0014]** The virtual location may or may not correspond with a geographical location, for example the definition of the virtual location may also include a range of GPS coordinates. On the other hand, where the virtual location is defined by reference to a WLAN, the WLAN could move geographical location but the virtual location defined by it would be the same. In an embodiment, the virtual locations are defined by reference to one or more wireless technologies, for example a WiFi identifier and/or GPS provided coordinates. Virtual locations could also be defined using GPS or even WLAN signal strength to subdivide a large wireless network thereby creating a cluster of individual Virtual Locations.

**[0015]** Alternatively the virtual location may be defined by the devices that form it, for example whenever three predetermined devices are within a certain range of each other, they are said to be in a virtual location and carry out the above defined method. The range may be that sufficient for them to communicate with each other using a nominated wireless technology for example Bluetooth. A record of activities performed at this virtual location can be recorded (on the devices rather than on a server) for future reference. Rather than the system being reliant on a server in this example a smaller system could run on each host device.

**[0016]** More generally a virtual location is an area defined by available wireless network technologies (server-client or peer-to-peer) for the purpose of situation or activity profiling. Situation profiling combines the users activities (applications, services, content utilised be users), activity chronology, and user or device profiling to provide enhanced application, service or content customisation.

**[0017]** The process data may be determined by each device within the virtual location uploading its respective data to a central server. Alternatively, each device may use peer-to-peer connections with other devices within the virtual location in order to determine the process data. The process data corresponds to an application executed or a function carried out on the device. Examples include an email client, a web browser, or switching the devices backlight or ringer off. The processes are associated with an activity such as sending and receiving email, surfing the internet, or putting the device in a "sleep" mode. The activities are typically user initiated in the sense that a user of the device activates or instructs the device to carry out the function or application associated with the process. This can include an automatic procedure that a user has previously set-up. For example when entering a virtual location (toilet, library, managers office, customer reception area) divert all incoming calls to my answer phone or turn my ringer off.

**[0018]** The relationship between the process data and the activity based information could be one-to-one, or typically the process data is processed for example by deriving statistics relating to the process data from a number of devices within the location. For example the most popular activity in a virtual location as determined from the process data from all the devices in the virtual location can be provided to a requesting device.

**[0019]** Either a client-server or a peer-to-peer architecture can be used for implementing the automatic gathering and provision of activity based information to the devices within the virtual location. Virtual location definition in a peer-to-peer architecture may use a predetermined virtual location clue such as a WLAN beacon, or alternatively devices within a space or area may form a virtual location according to a predetermined protocol, for example using an ad hoc WLAN in which each device is with range of every other device within the WLAN. Thus the virtual location definition or clue can be the identifier or BSSID and the corresponding beacon.

**[0020]** The virtual location can be defined using multiple wireless technologies, for example WiFi; Bluetooth; UMTS; and/or GPS. In an embodiment a virtual location is defined using a number of clues which combine the wireless technology and a corresponding identifier such as a WiFi BSSID.

**[0021]** Examples of user initiated activities include: establishing an Internet connection; establishing an email connection; establishing a streaming media connection; changing the user interface of the device, for example switching on the backlight or executing a process such as a game. Some of this information may be more specific such as the web-site visited or the game played - though this type of information would typically not be linked to a



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particular user for privacy reasons, but used only to provide an indication of the most popular web-site or game currently in the virtual location for example.

**[0022]** A time dimension may also be added to the activity based information, which may change depending on the time of day. For example users in a coffee shop at lunchtime may receive different activity based information than users in the same coffee shop after work.

**[0023]** A user profile dimension can also be added to the activity based information, for example the activity based information downloaded to a teenage user of a virtual location may be different to that downloaded for a middle-aged salesman. For example the teenager may be more interested in gaming levels or popularity for the virtual location whereas the salesman may be more interested in the most popular websites visited in the same virtual location. Similarly, mobile police officers may be interested in information related to the activities of previous police officers, such as relevant and/or recent incidents at the same virtual location.

**[0024]** Thus the activity based information downloaded to a device may be provided in the form of a virtual location profile (VLP) whose content may vary depending on the time of day and/or a user profile for the downloading device. The VLP may include for example the most popular websites visited at that virtual location, the most popular games played, the most popular media streamed, and the most common device control resetting such as ringer volume reduction in an eBook zone.

**[0025]** The activity based information provided about a virtual location may be used to infer additional information or context likelihood's, for example a high number of gaming activities might designate a virtual location as a gaming hot-spot. In another example, high eBook application usage may indicate that the virtual location is likely to offer seating and food facilities.

**[0026]** The activity based information associated with a virtual location can also be used by other devices or users not within the virtual location, for example a home personal computer (PC). Where the virtual location can be associated with a geographical location, the activity based information can be mapped for use by others in identifying locations corresponding to certain activity profiles. For example a teenager may use a map based application or search engine on their home PC to find local gaming hotspots, such as places where people in the past (or possibly currently) have played a particular peer-to-peer game. Similarly, a local area suitable for reading an eBook could be identified based on the activities (ie reading eBooks) of others.

**[0027]** In another aspect the presenting invention provides a method of providing activity based information associated with a location. The method comprises automatically determining data about a process on a number of devices within the location, the process associated with an activity; and receiving at another device activity based information which is dependent on the determined process data. The activities are not limited to interactions with a single wireless service provider, and include all of a number of predetermined activities on the devices within the location.

**[0028]** The location may be a virtual location, or it may be a physical location.

**[0029]** The determined process data can be associated with a geographical identifier corresponding of the location, for example GPS co-ordinates or a post code. This data or information can then be used with mapping applications, for example to identify physical locations having a high incidence of a particular activity, such as gaming or a particular P2P game.

## Brief Description of the Drawings

**[0030]** Embodiments will now be described with reference to the following drawings, by way of example only and without intending to be limiting, in which:

Figure 1 illustrates a number of virtual locations according to an embodiment;

Figure 2 illustrates a client-server architecture for automatically gathering activity based data from devices within a virtual location according to an embodiment;

Figure 3 illustrates the provision of activity based information to a device entering a virtual location according to an embodiment;

Figure 4 is a flow chart illustrating a method of operating a device according to an embodiment;

Figure 5 is a flow chart illustrating a method of operating a server according to an embodiment;

Figure 6 illustrates a number of virtual locations according to another embodiment;

Figure 7 illustrates the gathering of activity based information using a peer-to-peer architecture according to another embodiment; and

Figure 8 is a flow chart illustrating a method of operating a device in the peer-to-peer architecture of figure 7.

## Detailed Description

**[0031]** Referring to figure 1, a number of virtual locations 100 (A-D) are illustrated. These virtual locations are defined by reference to a number of virtual location clues, in this case provided by a number of wireless technology providers 102. These wireless service providers 102 include a global positioning system satellite (GPS), WLAN access points WiFi(a), WiFi(b), and WiFi(c), static Bluetooth devices such as printers or PC's BT, and a cellular



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radio network base station GSM. The clues are provided by an identifier associated with each wireless service provider 102 relied upon to define the virtual location 100. For example the virtual location clue provided by the GPS satellite are coordinates, the clue provided by the WLAN access points WiF(a)-(c) are their respective BSSID's, the virtual location clue provided by the static Bluetooth device is its Bluetooth MAC address, and the clue provided by the cellular base station is the cellular ID. The clues may also comprise an identifier for each respective wireless technology, for example for virtual location C, the clue may be - "IEEE802.11b + BSSID=BT00223029", and may also comprise an encryption key.

**[0032]** The first virtual location 100A is defined according to predetermined GPS coordinates, a WLAN identifier WiFi(a), and a Bluetooth device MAC address BT. Thus to be in virtual location A, the GPS coordinates of a candidate device must be within a predetermined range - of longitude, latitude, and altitude. The candidate device must also be able to receive the beacon from the WLAN access point (102WiFi(a)), and the beacon from the static Bluetooth device (102BT). Thus each of the identifiers or clues received matches those required for defining the virtual location A. If one of these virtual location identifiers or "clues" if not detected by the candidate device, then it is not within the virtual location A - it may perhaps be in another virtual location. Indeed it is possible that one virtual location may be within a larger virtual location, for example when seeing only the GPS coordinates and the WiFi(a) clues, the candidate device may be within a larger virtual location A' (not shown).

**[0033]** The second virtual location B is identified or defined by reference to identifiers for two wireless service providers 102, and is detected or confirmed when a candidate device (not shown) can detect both the beacon from another WLAN (102WiFi(b)) and the beacon from the cellular base station (GSM). This may or may not overlap the first virtual location A.

**[0034]** The third virtual location C is defined solely by reference to a third WLAN beacon - 102 WiFi(c) - provided by the corresponding wireless service provider or access point 102. If a device can detect this WLAN (WiFi (c)), then it is said to be in the virtual location C. Note that this virtual location C is not associated with a permanent physical location, as the WiFi(c)access point 102 for the WLAN could be moved to another geographical location. This compares with the first virtual location A, which is defined by reference to GPS coordinates and so is associated with a permanent physical location - unless it is later defined by different location clues.

**[0035]** The fourth virtual location D is defined solely be reference to geographical coordinates provided by the GPS wireless service provider 102. The "clue" in this case is simply geographical coordinates within a predetermined range.

**[0036]** The virtual locations A-D are all defined by wireless technologies - GPS (global positioning system), WLAN for example WiFi, cellular wireless such a GSM, CDMA2000, UMTS, and piconets such a Bluetooth. Other types of wireless technologies could also be used, and the virtual locations 100 may be defined by reference to two or more wireless technologies for greater certainty and accuracy. In some cases redundancy may also be an issue, in which case if for example the WLAN access point 102 (WiFi(a)) of virtual location A was disabled, the virtual location A might be temporarily redefined according to the remaining two wireless technologies - GPS and BT.

**[0037]** Figure 2 illustrates a number of devices 201 within a virtual location 200 and communicating with a number of wireless access points or gateways 202, using wireless links 203. The communication between the devices and the wireless service providers 202 allow the devices to carry out various activities or processes. Examples of activities include surfing the Internet, sending and/or receiving email, and streaming media. The activities carried out need not involve the wireless communications links 203, for example playing a game on a device 201, or switching on the backlight. The activities may be user initiated such as surfing the Internet, or may be automatic such as adjusting the device's sound output according to ambient sound levels. Various processes are carried out on the device in order to support the user activities, for example to support a user surfing the Internet a wireless application must establish and maintain a connection with one of the wireless service providers 202, and an Internet browsing application must be executed. Data about the types of processes carried out on each device 201 are monitored and uploaded to a central server 204, via a suitable upload channel 205. The uploading 205 of the processes or activity based data may be carried out using the wireless links 203 or some other manner. For example some devices may have a wired as well as a wireless capability, in which case the uploaded or determined process data may be uploaded using the wired link.

**[0038]** As discussed with respect to figure 1, the virtual location 200 each of the devices 201 is operating within can be defined by reference to the various wireless service providers 202 shown.

**[0039]** The activity data uploaded may simply be a virtual location identifier (eg A from figure 1) together with a predetermined activity type such as playing a game, sending email and so on. In this way the user's identity is not associated with the activity, and merely the numbers or types of different activities being engage in within the virtual location is made available to the server 204. Devices using the system may be configured to send the processes or activity data periodically, for example once every minute. More specific information may be gathered, for example actual URL's visited during web browsing activities, or songs downloaded or Internet radio stations "tuned" to during streaming activities. In this way, the most requested song in the virtual location may be made available to other user's in the location. Similarly at a concert, where an unknown band has taken the



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stage, the most popular activity may be visiting the band's web-site, and this may then be provided to users of the system, for example so that they can go straight to the web-site as well. Thus the activity based information provided to a user in a virtual location may simply be the most popular activities within a number of categories.

**[0040]** Typically the data about processes activated or running on a device described above is related to user initiated activity in which the user is required to actuate a user interface button for example, and that is context or location dependent, such as an eBook or Gaming application. However in some configurations it may be extended to location independent activities such as receiving information, for example emails.

**[0041]** Figure 3 illustrates determining process data on a first device 301a and receiving activity based information at another device 301b within the same virtual location 300. In the example the first device 301a is interacting with a WLAN access point WiFi(c) 302 to surf the Internet, and has just downloaded a website 305. Additional functionality 309a within the device 301 a monitors the processes carried out on the device to support these user activities, and sends this process data or data dependent on it to a central server 304. The data 306 uploaded to the server 304 may be a periodic packet with the virtual location's identifier C together with the URL of the website visited, or simply a code corresponding to the generic activity of web-browsing or internet surfing; and depending on configuration of the system the connection (eg to WiFi(c)) supporting this. The central server 304 may process this data from a number of similar devices 301 within the same virtual location C, for example by determining the most visited web-sites within the last ten minutes within the virtual location, or simply that the most popular current activity within the virtual location C is web-browsing.

**[0042]** When a second device 301b enters the virtual location C, additional functionality 309b within it determines the virtual location C and requests 307 from the system the corresponding activity based information. Determining the virtual location may involve noting the various wireless service 302 available to the new device 301b, and sending this information with the request 307 to the server 304 which returns a corresponding virtual location identifier C. The server 304 forwards the processed information 308 (and if appropriate the virtual location identifier C) to the second device 301b, which may simply display this for the user, or may use this information to reconfigure the device for use in the virtual location C. Thus a user of the new device 301b may be able to determine that a particular url or web-site is currently very popular within the virtual location, and may be prompted to visit this. Alternatively at a lower level of information granularity, the user of the device may be informed that the most popular activity within the virtual location is media streaming, and the device's start top-level menu may be adjusted to show this activity at the top of the list. Each of the devices 301 within the virtual location C may be configured to periodically request 307 activity based information from the server 304, or this might be provided automatically to each device "registered" in the virtual location C.

**[0043]** The embodiment might be alternatively configured such that each device 301 monitoring its own processes sends an "activity ranking list" to the central server 304, rather than each process at a time.

**[0044]** Alternatively or additionally, each device 301 may be further configured to notify the server 304 of its type, for example laptop or mobile phone. In this way, the process data provided by each device 301 may be categorised such that devices only receive activity based information for their own device type within the virtual location. Thus what occurs on a laptop may have little effect on what information is provided to a mobile device which has substantially less processing power and likely less bandwidth over wireless communications links. Alternatively the same activity based information may be downloaded to each device 301, but the device itself may be configured to handle it differently depending on its device type.

**[0045]** Each device may also or alternatively be categorised by a user type or profile. Examples include teenager interested in gaming; middle aged executive; elderly retired; male/female. The user profile may be extended to membership of special interest groups such as the police; specific employer or company; fan club; and so on. This may be indicated to the server using a predetermined tag on capable devices for uploading gathered process data 306, and requesting virtual location profile (VLP) data or activity based information in a request 307. The server 304 can then send VPL or information 308 according to the device's associated user profile.

**[0046]** The server 304 may also be configured to vary the downloaded activity based information according to the time of day. Thus the activity based view of a café/bar at lunchtime may differ significantly from the activity based view of the same virtual location in the evening. Similarly the activity based characterisation of the virtual location may be different at weekends compared with week days; or there may even be seasonal or annual variations.

**[0047]** Figure 4 illustrates a method of operating a device according to an embodiment. Referring also to figure 3, when a device 301b is operating according to the method (400), it looks for wireless systems or service providers 302 that can offer clues as to its virtual whereabouts or location. These can include GPS, Bluetooth, GPRS, and WLAN signatures or beacons. The device 301b monitors for predetermined virtual location clues (410), such as identifiers associated with the identified wireless systems 302, for example GPS coordinates, WLAN BSSID, and GPRS cell ID. The device may be configured to periodically send these clues (415) to the system server 304, or it may have various virtual locations pre-identified within its memory and then simply match the detected clues with those stored in order to determine that it has entered



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the virtual location. As a further alternative it may only request a virtual location identity when a new clue and/or wireless service provider 302 is identified.

**[0048]** The device then receives the virtual location information (420), and if required a virtual location identifier C. The device may not require the virtual location identifier at all, and may simply receive the activity based location information. The device may be configured simply to display or store this information, or it may be configured to adjust an operating or user interface parameter dependent on the received activity based information (425). For example the user interface start menu may be rearranged to put the most popular activities currently or historically engaged in by others in the virtual location towards the top of the menu. As mentioned above, the other users on which the downloaded activity based information is dependent may be restricted to suers having the same profile - for example middle aged executive compared with teenage gamer. In an alternative arrangement, the user may be directly prompted as to whether they wish to start the most popular activity. If the virtual location corresponds to a darkened room for example, other users may have switched their backlights on, and the device of the user newly entering the virtual location may be configured to automatically switch its backlight on.

**[0049]** Another example of device adjustment or automatic re-configuration when receiving the activities based information, the device may determine that it is unlikely to carry out certain activities such as playing games, and may therefore shut down its 3D graphics capability in order to reduce power consumption. The device may also be configured to provide a quick-link list of things to do in the new virtual location. Other examples include changing on-line presence from "Available" to "Do not disturb" in a chat application for example, automatically downloading some service or content, and vibrate on ringer off.

**[0050]** The activity based information (or VLP) provided to a user device by the system or server is system configurable. For example the information may simply be a list of the most popular activities within certain predefined activity categories such as web browsing, media streaming, gaming, and device re-configuring. Respective activity examples include most popular web-sites visited within the virtual location, most popular songs or videos streamed, most popular peer-to-peer games played, and the most common device adjustments such as ringer off and/or backlight on. These lists of activities in each activity category may be further categorised for example according to user profile and/or time.

**[0051]** The provided activity based information may alternatively relate to changes or anomalies in activity patterns. For example some groups (eg Police) may be interested in building a view of the least popular activities or significant changes in type of content consumed at a location.

**[0052]** The device 301 is also likely to be configured to automatically monitor its own user activities (430), for example by simply noting a code for each of a number of predetermined processes - web-browser application, email client, media streaming client, game playing application, e-book reading application, and so on. This information may be accumulated locally over a period, and then sent to the central server (435). This may even extend to the device 301 storing activity related data for a number of different virtual locations and then uploading the data to the central server 304 say at the end of the day, when it is synchronised with a wired PC for example. Alternatively each new process activated on the device may trigger it to report this to the server 304. As a further alternative, the device 301 may have a standard template which is updated periodically and forwarded to the server after a period. The recorded processes can be time-stamped in order to aid processing by the central server, and the data sent may also include the length of time over which a process was active. The method (400) then returns to the receiving activity based information step (420) to refresh this information. In this way, users of devices in a virtual location may affect each other over time, for example an event may cause a number of users to access a particular web-site, which in turn may prompt other users in the virtual location to do the same.

**[0053]** The system may be configured to bias towards current or recent user activity information, or it may be more historically based, using data about the processes run on many devices over a considerable period of time.

**[0054]** Figure 5 shows a method for the central server 304 which receives device process data from a number of devices 301 in a number of virtual locations 300. The method (500) comprises two branches, in the first the server processes requests for identifiers for virtual locations, and receives clues from devices (505) such as the various wireless services providers it is able to currently access and/or their identifiers. The server determines from these clues a corresponding virtual location (515). This may be achieved simply by attempting to match the received clues with clues corresponding to a number of predetermined virtual locations. The server 304 then retrieves and sends the virtual location identifier to the requesting device (520). The method (500) then moves on to sending activity based information for that virtual location to the requesting device (535).

**[0055]** The second branch of the method (500) relates to monitoring and sending activity based information to devices within a virtual location. The server 304 receives data about processes on each device within a virtual location (525), and updates the activity based information it holds for that virtual location (530). This may comprise re-processing all the stored activity based information, for example the new process data may be used to adjust a "top activities" list within the activity based information. The updated information is then sent to the devices within the corresponding virtual location (535), and the method returns to receive further data about processes on the devices (525).



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**[0056]** Figure 6 illustrates another embodiment in which virtual locations can include non-wireless devices. The virtual locations 600 include wireless devices 601 which determine whether they are within a virtual location 600 by reference to wireless clues associated with a number of wireless service providers 602. For example in the case of the first virtual location A, the wireless clues 602 are a coordinates range provided by the GPS system, a WLAN access point identifier WiFi(a), and a Bluetooth MAC address BT. If the device 601 detects all three clues 602, then it can assume it is within virtual location A.

**[0057]** However a fixed or wired device 603a can also be determined to be within the virtual location A without reference to the wireless clues 602. In this example, a personal computer PC is connected for example by Ethernet to the WLAN access point WiFi(a), and by virtue of the type of wired connection (Ethernet is typically used only locally) is determined to be within the virtual location. For example the system could automatically link wired devices together by fact that they are all connected into a switch and use specific IP addresses within a certain range. The wireless access point that provides the wireless network would also be connected on to the same LAN and switch and have a specific IP addresses within the same range. Also the LAN switch and WLAN access point may be connected to the Internet via a specific router or gateway. An external service could therefore assume that any information request via this router or gateway was within the same virtual location. Alternatively a static PC could simply be assigned to a virtual location. In this way the system still records user initiated activities (time, device and user specific) at specified locations and provides that information back to any device, service, or application within that virtual location that could benefit.

**[0058]** For example, in a library setting corresponding to a virtual location, all the wired computers provided to users of the library may be determined to be within the library virtual location. The wired device 603a may in fact not be within the physical range of the various wireless service providers 602 providing the virtual location clues, however is consider logically to be within the virtual location.

**[0059]** In the example of virtual location B, there is no Ethernet or other (relatively) short distance wired connection between the wired device 603b and a wireless service provider 602 associated with that virtual location. In this case, a personal computer PC or other device is not at all associated by physical location with other devices within the virtual location, but is logically associated by being assigned as being part of the virtual location B. The remote device 603b may be connected to the server via the internet for example. For example, a pub regular may be in another country on business but may want to virtually interact with his friends in their usual or local pub, and may do so according to this embodiment by assigning the PC the virtual location identifier B of the virtual location B, in order to receive the activities based information corresponding to the virtual location B from the server. The assigned PC 603b may or may not upload data about its own activities or processes to the central server. In this way, the remote PC 603b may also be influenced by what other devices are doing within the virtual location B. This might be extended for example to supporters of a football team, some of whom may not be in a particular location to watch a match, but want to participate remotely at the location with other members of the football team supporters club. This concept could even be used as a way to build and support virtual communities, groups and Special Interest Groups.

**[0060]** Figure 7 illustrates another embodiment using a peer-to-peer architecture to implement the activities based view of a virtual location. As with the arrangement of figure 2, each of the devices 701 is using a number of wireless gateways or service providers 702 to perform various activities such as surfing the Internet. Other activities not requiring wireless links 703 may also be carried out on the devices 701. Each device 701 also includes additional functionality 704 to carry out the monitoring of device based processes within the virtual location. Each device polls 705 each other device 701 within the virtual location 700 about the types of activities it is engaging in. Instead of this data being stored in a central server, each respective device 701 stores this information locally and if so configured, adjusts its user interface or some other operating parameter depending on the activities based information received.

**[0061]** A protocol for determining and agreeing a virtual location can be used, for example all devices that recognise the Bluetooth piconet coordinator BT, the WLAN access point WiFi, and the cellular base station CDMA.

**[0062]** Figure 8 is a flow chart showing operation of a device using the peer-to-peer architecture of figure 7. Following initiation (805) of the system or method (800), the device determines location clues (810) for example various wireless technology beacons and GPS coordinates. It agrees with other wireless devices within its vicinity that it is within a particular virtual location, and requests data from other devices using the same virtual location identifier about the user processes running on them (815). Activity based information from the other devices in the same virtual location is received (820), and the device updates its own on-board database or store of activity based information within the virtual location (825). The device may then adjust its user interface or other operating parameter as described above according to the activities based information recovered (830). The method then returns to the requesting step (815) in order to refresh the activity based information for the devices current virtual location.

**[0063]** Although not shown, the device is also configured to respond to requests for its own processes data from other devices within the same virtual location, forwarding this data to them.

**[0064]** Whilst the embodiments have been described with respect to providing or acting on downloaded activity based information, this information could also be used



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to infer further information or context about a virtual location. For example a high number or percentage of eBook applications may indicate a library or coffee shop with a high likelihood of having seating and food facilities for reading eBooks.

**[0065]** Whilst embodiments have been described with respect to automatically determining process data related to user activities in a virtual location, and providing this to other users within the virtual location, this gathered information or process data could additionally or alternatively be provided to others who are not in the virtual location. For example a user at a home PC may be reviewing the activity based view of a number of nearby locations, to identify a gaming hotspot. This facility may also be used by others at significant geographical distances but who are intending to visit a city and want to view it in an activity based way, for example in order to plan a nightlife "tourist" itinerary. The gathered process data in this case may be associated with a geographical location, which may be provided using a definition of the virtual location which includes real coordinates such as provided by GPS.

**[0066]** This geographically associated activity based information can then be used by other users, for example in mapping and/or search engine type applications. Thus a map of a city may show gaming hotspots, quiet spaces for reading eBooks, areas having high numbers of website hits relating to a particular pop-star, or even bars or cafes where certain user profiles are prevalent.

**[0067]** The skilled person will recognise that the above-described apparatus and methods may be embodied as processor control code, for example on a carrier medium such as a disk, CD- or DVD-ROM, programmed memory such as read only memory (Firmware), or on a data carrier such as an optical or electrical signal carrier. For many applications embodiments of the invention will be implemented on a DSP (Digital Signal Processor), ASIC (Application Specific Integrated Circuit) or FPGA (Field Programmable Gate Array). Thus the code may comprise conventional programme code or microcode or, for example code for setting up or controlling an ASIC or FPGA. The code may also comprise code for dynamically configuring re-configurable apparatus such as reprogrammable logic gate arrays. Similarly the code may comprise code for a hardware description language such as Verilog ™ or VHDL (Very high speed integrated circuit Hardware Description Language). As the skilled person will appreciate, the code may be distributed between a plurality of coupled components in communication with one another. Where appropriate, the embodiments may also be implemented using code running on a field-(re) programmable analogue array or similar device in order to configure analogue hardware.

**[0068]** The skilled person will also appreciate that the various embodiments and specific features described with respect to them could be freely combined with the other embodiments or their specifically described features in general accordance with the above teaching. The skilled person will also recognise that various alterations and modifications can be made to specific examples described without departing from the scope of the appended claims.

## Claims

1. A method for providing activity based information for a virtual location, the method comprising:

   defining a geographical location;
   automatically determining data about a process associated with an activity on a device within the location;
   receiving at another device activity based information which is dependent on the determined process data and the geographical location.

2. A method according to claim 1 wherein the activity based information comprises a geographical identifier.

3. A method according to claim 1 or 2 wherein the determined process data comprises a geographical identifier.

4. A method according to claim 2 or 3 wherein the geographical identifier comprises GPS coordinates and/or a post code.

5. A method according to any one preceding claim wherein the determining data about activity associated processes comprises uploading said data to a server and wherein the activity based information is downloaded from the server to the receiving device.

6. A method according to any one preceding claim wherein the determining data about activity associated processes comprises the receiving device requesting said data from other devices within the virtual location over peer-to-peer communication links; and wherein receiving said information comprises receiving said data over said links.

7. A method according to any one preceding claim wherein the activity comprises: establishing an Internet connection and/or browsing the Internet; establishing an email connection; establishing a streaming media connection; downloading files; uploading files; changing the user interface of the respective device; executing an application on the respective device.

8. A method according to any one preceding claim wherein the received activity based information comprises a number of the most popular activities in a number of activity categories.



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9. A method according to any one preceding claim wherein the automatically determined process data comprises an indication of each of a number of predetermined processes running on the device together with a virtual location identifier.

10. A method according to any one preceding claim wherein the received activity based information is further dependent on a user profile associated with the other device.

11. A method according to any one preceding claim wherein the received activity based information is further dependent on the time at which it is received.

12. A method according to any one preceding claim wherein operational parameters of the receiving device are adjusted according to the received activity based information.

13. A carrier medium carrying processor code which when implemented on a processor is arranged to carry out a method according to any one preceding claim.

14. A system for providing activity based information for a virtual location, the system comprising:

means for defining a geographical virtual location;
means for automatically determining data about a process associated with an activity on a device within the virtual location;
means for receiving at another device within the virtual location activity based information which is dependent on the determined process data and the geographical location.

15. A device comprising:

means for identifying a geographical location;
means for automatically determining data about a process on the device associated with an activity;
means for receiving activity based information which is dependent on determined process data associated with other devices and the geographical location.

16. A device according to claim 15 wherein the activity based information and/or the determined process data comprises a geographical identifier.

17. A device according to claim 15 or 16 wherein the means for determining data about activity associated processes comprises means for uploading said data to a server and wherein the means for receiving activity based information comprises means for downloading said information from the server.

18. A device according to claim 15 or 16 wherein the determining data about activity associated processes comprises means for requesting said data from other devices within the virtual location over peer-to-peer communication links; and wherein the means for receiving said information comprises means for receiving said information over said links from the other devices.

19. A device according to any one of claims 15 to 18 wherein the means for determining the process data comprises means for sending an indication of each of a number of predetermined processes running on the device together with a virtual location identifier.

20. A device according to any one of claims 15 to 19 wherein the received activity based information is further dependent on a user profile associated with the device.

21. A device according to any one claims 15 to 20 and arranged such that operational parameters of said device are adjusted according to the received activity based information.

22. A server for providing activity based information for a virtual location, the server comprising:

means for identifying a geographical location;
means for receiving from a device within the location automatically determined data about a process associated with an activity on the device;
means for forwarding to another device within the virtual location activity based information which is dependent on the determined process data and the geographical location.



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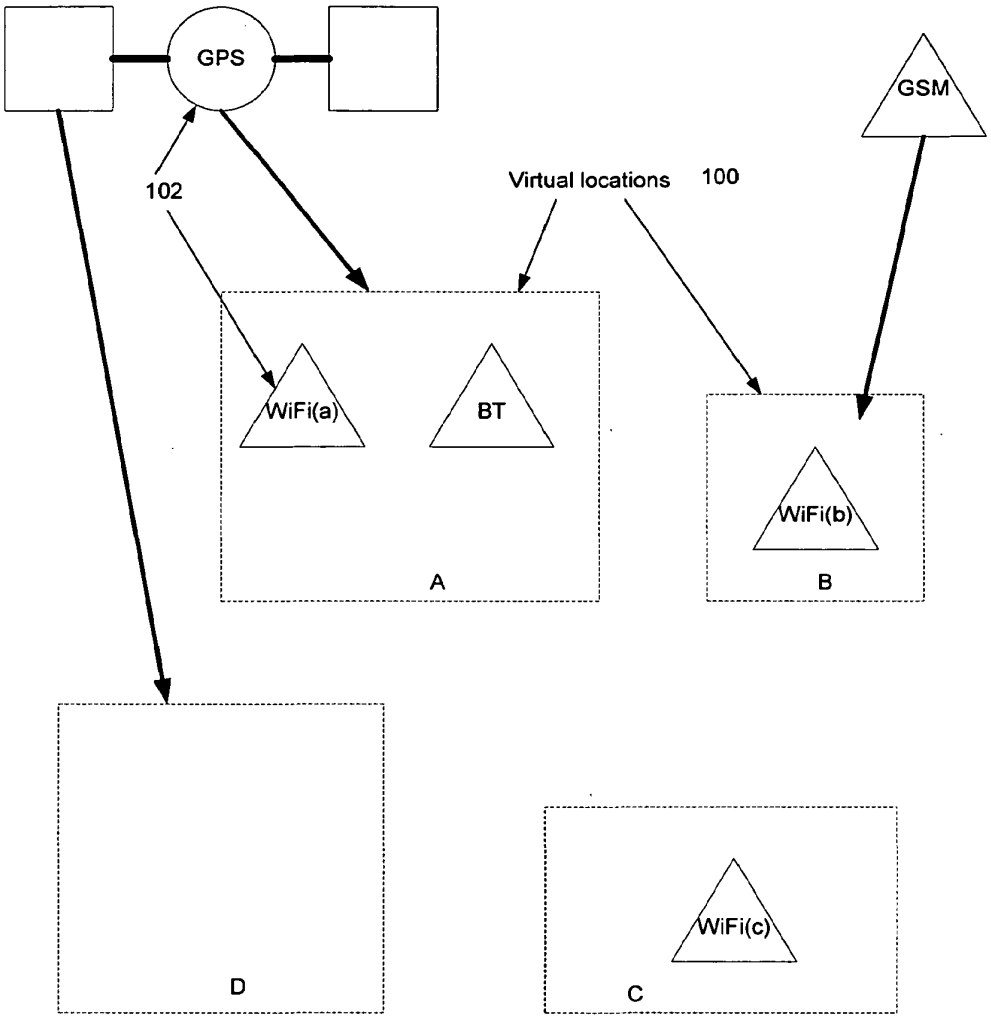


FIG 1

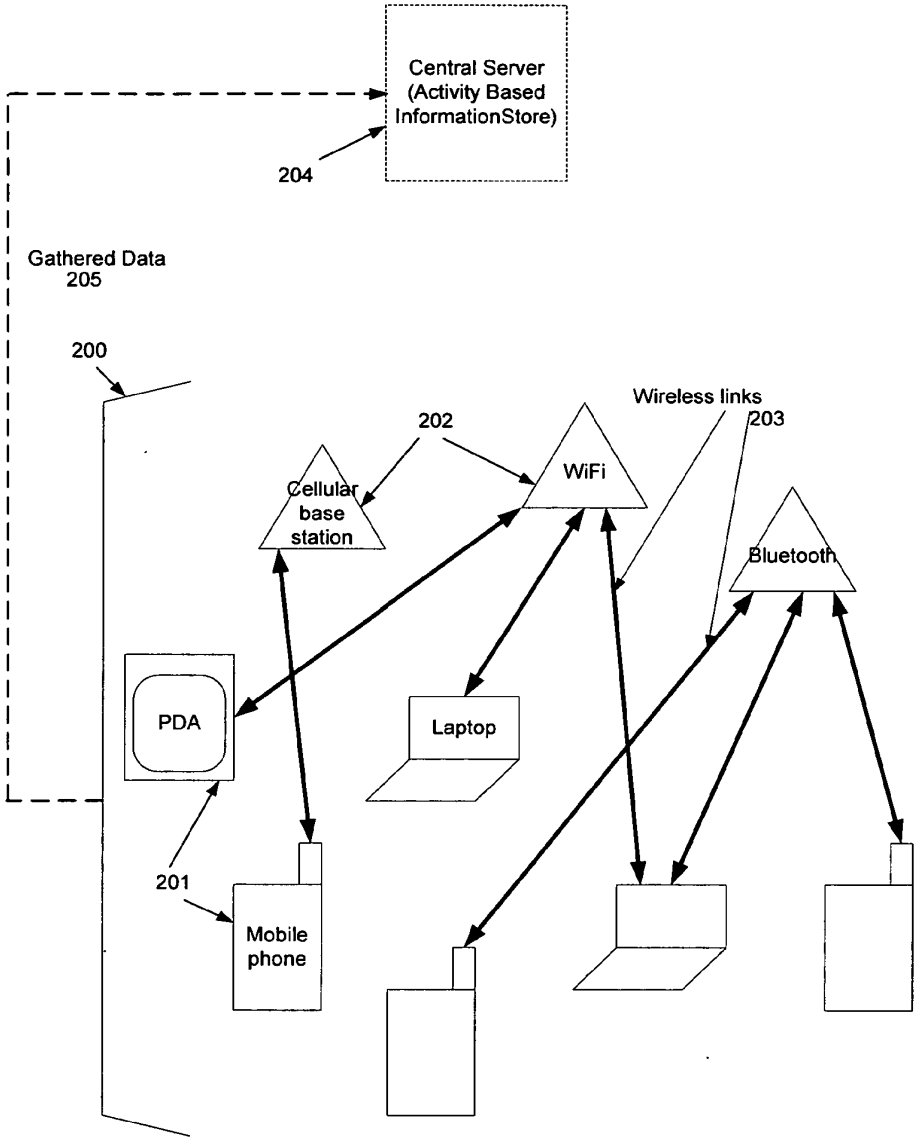
Central Server
(Activity Based
InformationStore)
204
Gathered Data
205
200
202
Wireless links
203
WiFi
Cellular
base
station
Bluetooth
PDA
Laptop
201
Mobile
phone

FIG 2

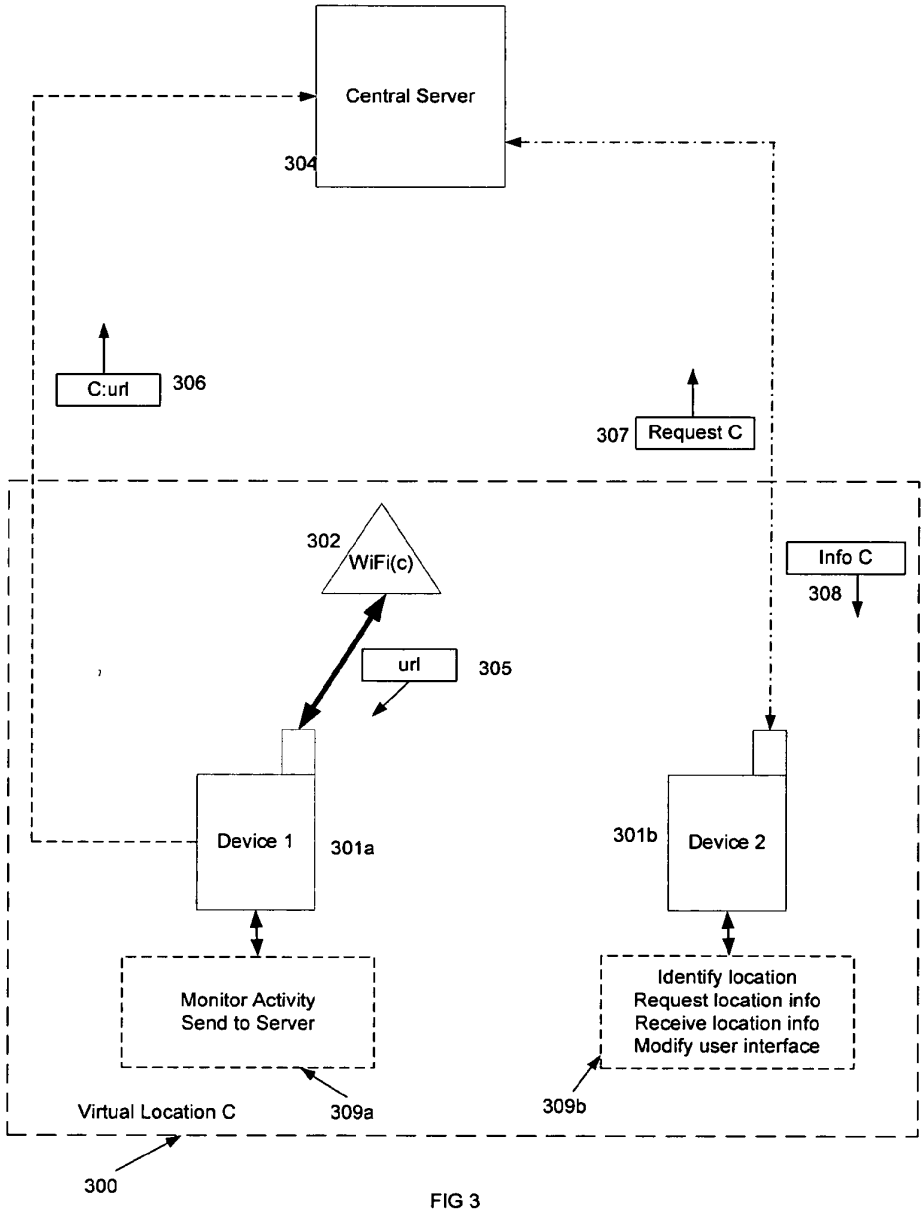
Central Server
304
C:url
306
307
Request C
302
WiFi(c)
Info C
308
url
305
Device 1
301a
301b
Device 2
Monitor Activity
Send to Server
Identify location
Request location info
Receive location info
Modify user interface
Virtual Location C
309a
309b
300

FIG 3

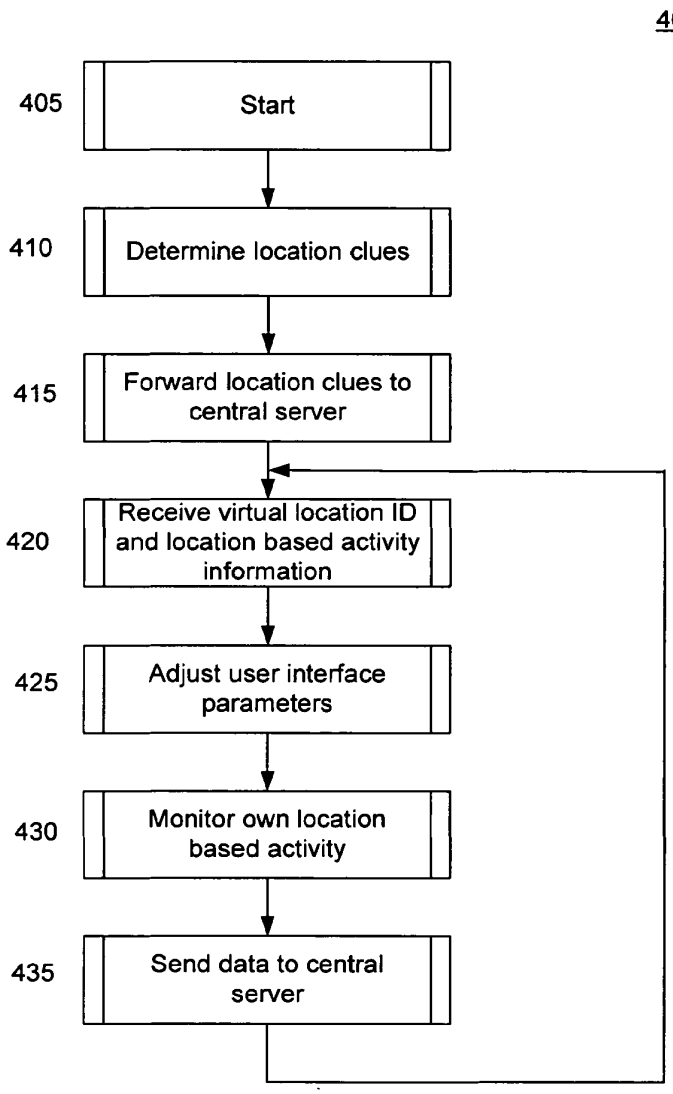
400
405
Start
410
Determine location clues
415
Forward location clues to central server
420
Receive virtual location ID and location based activity information
425
Adjust user interface parameters
430
Monitor own location based activity
435
Send data to central server

FIG 4

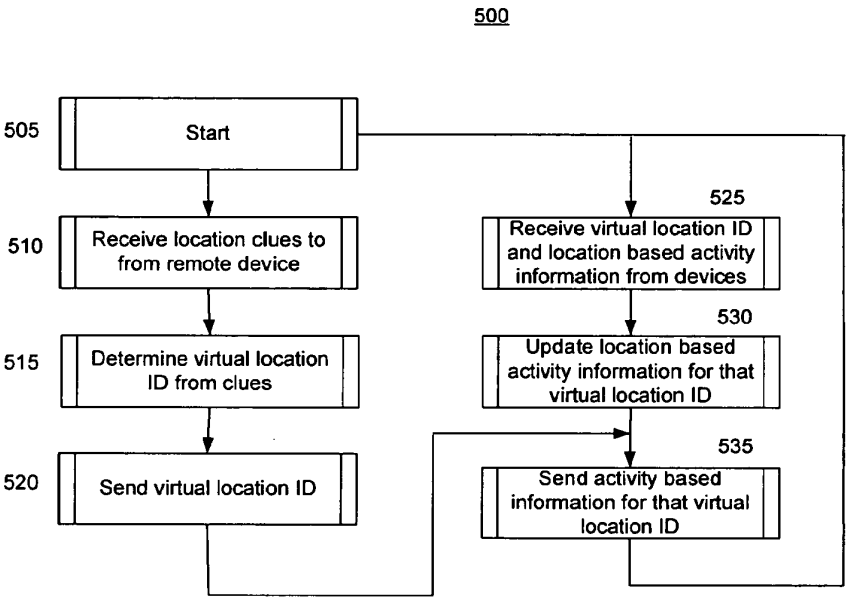
500
505
Start
510
Receive location clues to from remote device
515
Determine virtual location ID from clues
520
Send virtual location ID
525
Receive virtual location ID and location based activity information from devices
530
Update location based activity information for that virtual location ID
535
Send activity based information for that virtual location ID

FIG 5

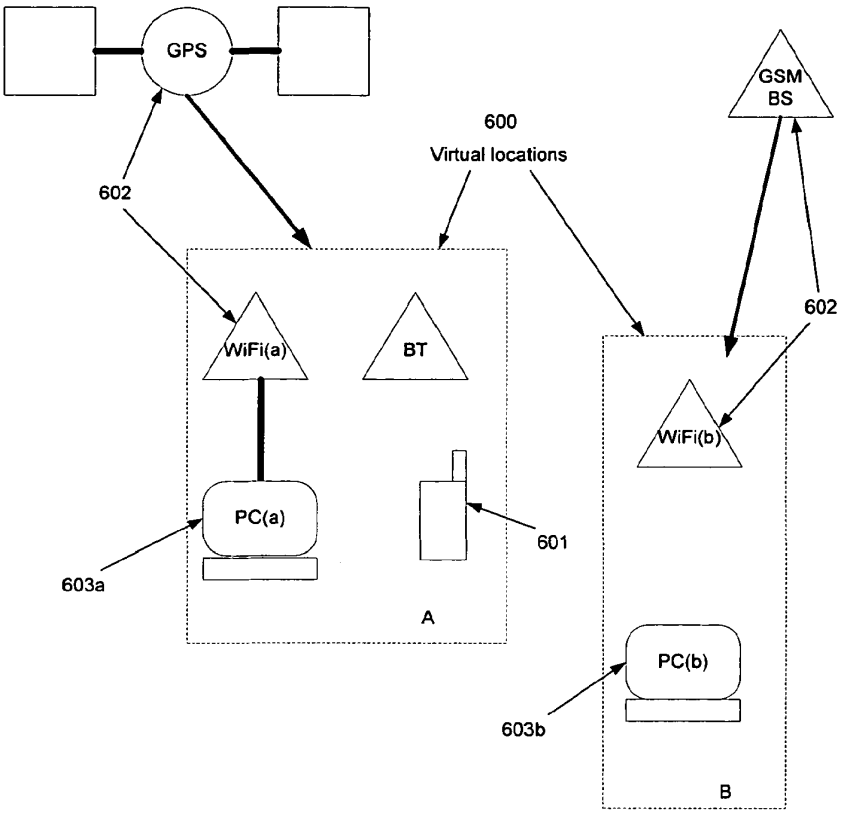
GPS
GSM
BS
600
Virtual locations
602
602
WiFi(a)
BT
WiFi(b)
PC(a)
601
603a
A
PC(b)
603b
B

FIG 6

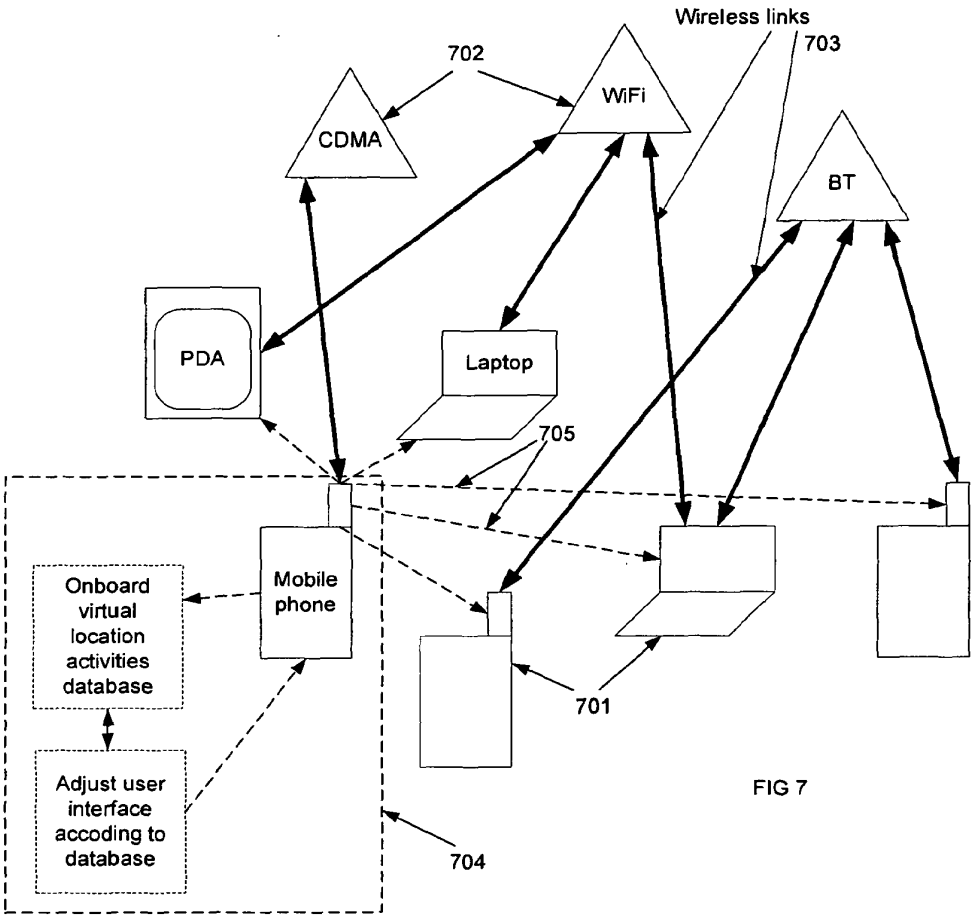
Wireless links
703
702
WiFi
CDMA
BT
PDA
Laptop
705
Mobile phone
Onboard virtual location activities database
Adjust user interface accoding to database
701
704

FIG 7

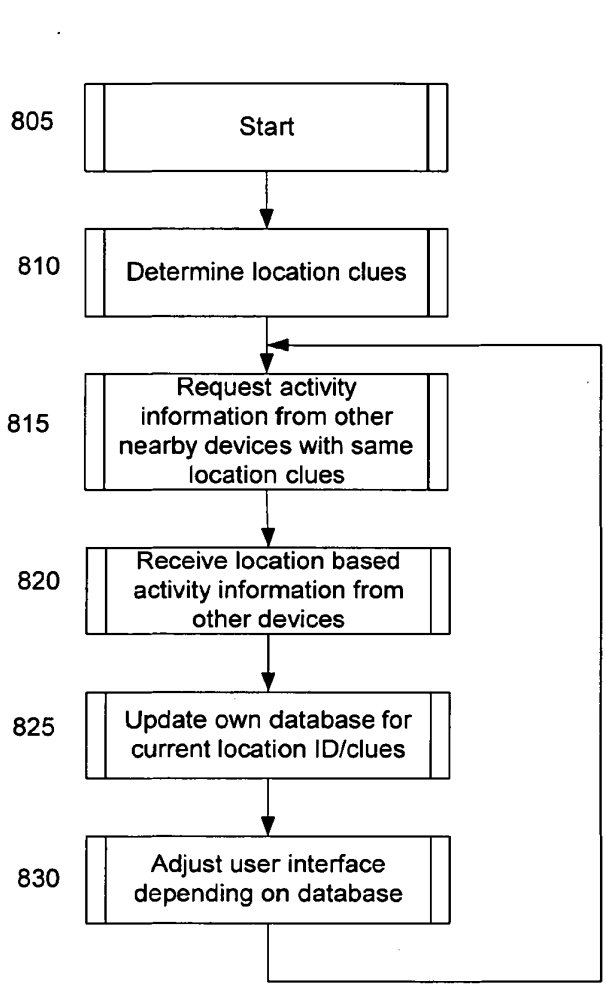


FIG 8



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European Patent Office

# EUROPEAN SEARCH REPORT

Application Number
EP 05 25 6148

## 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 | US 5 603 054 A (THEIMER ET AL)<br>11 February 1997 (1997-02-11)<br>* abstract *<br>* figures 1-3 *<br>* column 2, paragraph 7 *<br>* column 4, paragraph 2 *<br>* column 4, paragraph 5 *<br>* column 8, paragraph 2 - column 10, paragraph 3 * | 1-11, 13-20,22 | H04L29/08 |
| X<br>Y | WO 02/42921 A (BUTTERFLY.NET, INC)<br>30 May 2002 (2002-05-30)<br>* abstract *<br>* page 3, paragraph 4 - page 5, paragraph 3 * | 1-11, 13-20,22<br>12,21 | |
| D,Y | US 2005/020307 A1 (PARUPUDI GOPAL ET AL)<br>27 January 2005 (2005-01-27)<br>* abstract *<br>* paragraphs [0008], [0034] * | 12,21 | |
| D,A | US 2004/203851 A1 (VETRO ANTHONY ET AL)<br>14 October 2004 (2004-10-14)<br>* abstract *<br>* paragraphs [0013] - [0016], [0020] * | 1-22 | TECHNICAL FIELDS SEARCHED (IPC)<br>H04L |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Munich | 8 February 2006 | Hackl, A |

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
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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

EPO FORM 1503 03.82 (P04C01)



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## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 05 25 6148

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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08-02-2006

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(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 865 723 A1

# (12) EUROPEAN PATENT APPLICATION

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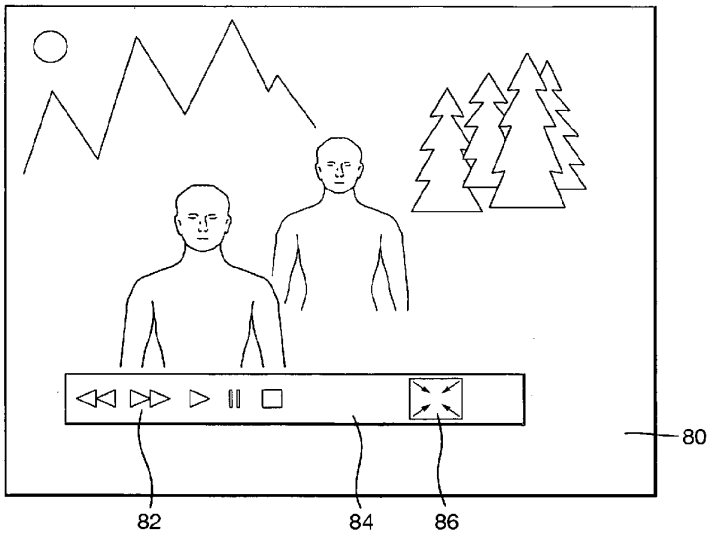
## (54) Video-on-demand system

(57) A video-on-demand system in which an optical disk can be used to configure an optical disk player without a hard-drive memory to operate as a video-on-demand player. The server of the system makes use of a unique identifier for the disk so as to store profiles of the history of viewing video-on-demand programmes for the users of the respective disks. Recommendations of video-on-demand programmes can be made on the basis of the stored profiles. Furthermore, video-on-demand programmes can be provided in a first layer of a multi-layer page wherein overlay images relating to advertising content can be provided in another layer. Similarly, overlay images corresponding to respective control functions for the video-on-demand stream can be provided in other layers.

Fig.7.




Printed by Jouve, 75001 PARIS (FR)

EP 1 865 723 A1

## Description

**[0001]** The present invention relates to a video-on-demand system and methods relating to it.

**[0002]** For some time, there has been a recognition of the desire to be able to provide to a large number of remote users the choice of receiving any of a large number of video programmes as and when desired. With improvements in compression and increased availability of large-bandwidth communications networks, such systems have become more practical.

**[0003]** Near video-on-demand systems have been available in which each video programme is repeatedly broadcast throughout the day at a number of closely spaced times, thereby allowing users to watch those programmes at almost any time. It is also known to make available over the internet video programmes for streaming or download to personal computers connected to the internet. Generally, these systems can be cumbersome to operate and can have limited functionality. The steps required for a user to make a connection or to arrange a subscription with a service provider may be inconvenient.

**[0004]** It is an object of the present invention to provide improved features for a video-on-demand system

**[0005]** The present application also recognises for the first time the possibility and advantages of using a simple optical disk player as a means for accessing a video-on-demand system without the need of a hard-drive memory. It also recognises for the first time the possibility of providing personal recommendations of video-on-demand programmes based on profiles stored centrally and remotely from user terminals. Furthermore, it recognises for the first time the possibility of providing video-on-demand in pages having a layered structure and allowing functional and advertising overlays to be provided in layers other than that in which the video streaming occurs.

**[0006]** According to the present invention there is provided a method of operating an optical disk player as a video-on-demand player without the need of a hard-drive memory, the optical disk player having an optical disk reader, a processor, a RAM and a port allowing connection to the internet, the method including:

> providing a unique identifier on an optical disk;
> providing code components on the optical disk which can be run directly from the optical disk on only the processor and RAM of the optical disk player so as to cause the optical disk player to send the unique identifier over the internet to a video streaming service, to operate as a web browser for accessing pages of the video streaming service over the internet and to operate as a video decoder for decoding streamed video data received from pages of the video streaming service wherein the video streaming service can monitor use by a user with reference to the unique identifier.

**[0007]** According to the present invention, there is also provided an optical disk for operating an optical disk player as a video-on-demand player without the need of a hard-drive memory, the optical disk player having an optical disk reader, a processor, a RAM and a port allowing connection to the internet, the optical disk having recorded thereon:

> a unique identifier; and
> code components which can be run directly from the optical disk on only the processor and RAM of the optical disk player so as to cause the optical disk player to send the unique identifier over the internet to a video streaming service, to operate as a web browser for accessing pages of the video streaming service over the internet and to operate as a video decoder for decoding streamed video data received from pages of the video streaming service wherein the unique identifier allows the video streaming service to monitor use by a user with reference to the unique identifier.

**[0008]** In this way, there may be provided a video-on-demand system including such an optical disk and also at least one optical disk player for use in combination with the optical disk as a video-on-demand player, the optical disk player including an optical disk reader, a processor, a RAM and a port allowing connection to the internet; and

a video streaming service remote from the optical disk player including at least one server for providing, as pages available over the internet, streams of video data.

**[0009]** In this way, it is not necessary for terminal devices to have hard-drive memories in order to access the video-on-demand service. Flexibility is allowed for a user in choosing which devices are used to connect to a video-on-demand service. Devices without hard disks can be produced more cheaply. Also, there is a general reluctance by consumers to have PC-based systems placed in proximity to large display screens in living rooms due to the sometimes intrusive sound made by fans to cool the circuitry of the PC.

**[0010]** Optical disks can be sold including the browser and video decoder required for the terminal, in the form of an optical disk player, to have access to the video-on-demand service. Furthermore, by providing the unique identifier, the video streaming service is able to identify and/or authenticate the disk so as to establish that it corresponds to a genuine user. It is only necessary for a user to purchase an appropriate disk for that user to be given easy and immediate access to the video streaming service. Furthermore, by way of the unique identifier, the video streaming service can maintain a profile history related to that unique identifier and provide personal recommendations to a user of that unique identifier. Furthermore, it is possible to maintain anonymity of the user with regard to the profile history, since it need only be kept in conjunction with the unique identifier itself.

**[0011]** Preferably, the video streaming service in-



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cludes a controller responsive to a request from the optical disk player to provide selective access to a plurality of video-on-demand programmes and stream a selected one of the plurality of video-on-demand programmes through an internet page.

**[0012]** Hence, receipt of a streamed video-on-demand programmes is possible merely using the browser and video decoder of the disk in the optical disk player.

**[0013]** Preferably, the controller is arranged to provide through an internet page a menu of available video-on-demand programmes.

**[0014]** Thus, again, a user is able to view and select from a plurality of video-on-demand programmes by means only of the code components provided on the optical disk and any menu information provided over the internet.

**[0015]** Preferably, the video-on-demand system further includes a profile memory remote from the optical disk player in which records of the video-on-demand programmes selected by the user of the optical disk player are stored; and

a matcher remote from the optical disk player for comparing the contents of video-on-demand programmes recorded in the profile memory with the contents of video-on-demand programmes available for streaming by the video streaming service and for outputting recommendations of video-on-demand programmes having contents similar to the video-on-demand programmes recorded in the profile memory.

**[0016]** In this way, profile histories for a plurality of different users having respective unique identifiers can be stored centrally and remote from the respective optical disk players. A separate matcher can be provided for analysing the content of the video-on-demand programmes noted in the profile for a particular unique identifier and for comparing this with the contents of the video-on-demand programmes available for streaming. By providing the profile memories remote from the optical disk players and available to the matcher, the matcher having access to the video-on-demand programmes available for streaming, detailed and accurate comparison can be conducted so as to provide good and useful recommendations to the users having respective unique identifiers.

**[0017]** Preferably, the controller is arranged to display on said menu details of video-on-demand programmes recommended by said recommender.

**[0018]** In this way, a user can effectively be provided with an indication of video-on-demand programmes that are likely to be of interest to him or her. Since this recommendation need not be based on any current choice of video-on-demand programme and is a personal recommendation rather than a contextual recommendation, the recommendation can be displayed even when the user is only viewing the general menu with the full choice of available video-on-demand programmes.

**[0019]** Preferably, the records of the video-on-demand programmes selected by the user are stored in conjunction with the unique identifier of the disk used by the user.

**[0020]** In this way, as discussed above, individual profile histories can be matched to users by means of the unique identifiers.

**[0021]** Preferably, the video-on-demand system further includes an account memory remote from the optical disk player for recording account information in conjunction with the unique identifier of the disk used by the user.

**[0022]** This allows the video-on-demand system to keep a record of the financial relationship with individual respective users, for instance by means of notional tokens, which can be assigned in varying amounts to the streaming of various video-on-demand programmes.

**[0023]** According to the present invention, there is also provided a method of providing a user with selective access to a plurality of video-on-demand programmes having respective contents, the method including:

according to selection by the user, streaming one of the plurality of video-on-demand programmes through an internet page including a first layer and a second layer;
providing the video-on-demand stream in the first layer;
providing an overlay image in the second layer which can be selectively combined with the video-on-demand of the first layer;
providing a link in association with the overlay image, selection of the link causing advertising content to be provided to the user;
monitoring selection by the user with regard to content of selected video-on-demand programmes;
judging content of video-on-demand programmes selected by the user; and
choosing one of a plurality of overlay images and associated links for provision in the second layer according to the step of judging.

**[0024]** According to the present invention, there is also provided a video-on-demand system accessible over the internet, the system including:

a video server storing a plurality of video-on-demand programmes having respective contents;
a controller responsive to a request from a user to provide selective access to the plurality of video-on-demand programmes and to stream a selected one of the plurality of video-on-demand programmes through an internet page including a first layer and a second layer wherein the controller is arranged:

to stream the selected video-on-demand programmes in the first layer;
to provide, in the second layer, an overlay image which can be selectively combined with the video-on-demand of the first layer;
to provide a link in association with the overlay image, selection of the link causing advertising content to be provided to the user;



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to monitor selection by the user with regard to content of selected video-on-demand programmes; and
to judge the content of video-on-demand programmes selected by the user; wherein
the system further comprises a memory storing a plurality of overlay images, together with respective links and advertising content; and
the controller is arranged to select one of the plurality of overlay images and associated links for provision in the second layer according to the judgement of the content of video-on-demand programme selected by the user.

**[0025]** In this way, advertising content can be provided to a user in a way that is tailored to an individual respective user. According to judgement of the video-on-demand programmes watched by a user, the controller can judge appropriate advertising content. This can be made available to the user merely by providing the associated overlay images and links in the second layer of the page being accessed by the user. There is no need at the video server and controller end to adapt the stream of video data provided in the first layer, since the personalised advertising content is made accessible to the user by a second layer, even though this is within the same page.

**[0026]** The controller can be arranged to select said one of the overlay images for the second layer based at least partly on the content of the video-on-demand being at that time streamed to the first layer.

**[0027]** In this way, advertising content can be chosen for a user on the basis of a contextual recommendation. In other words, the system will recommend and provide advertising content that relates to the video-on-demand programme being streamed at the same time as the overlay images for the advertising content are to be displayed.

**[0028]** It is also possible to provide overlay images that are based on personal recommendation. In this respect, the video-on-demand system can further include a profile memory in which records of the video-on-demand programmes selected by the user are stored;
a matcher for comparing the contents of video-on-demand programmes recorded in the profile memory with the advertising contents associated with respective overlay images and outputting a recommendation of an overlay image for display;
wherein, the controller is arranged to select said one of the overlay images for the second layer based at least partly on the recommendation from the matcher.

**[0029]** Thus, irrespective of the video-on-demand programme being watched at the time, the system is able to choose advertising content that is likely to be of interest to the user based on the history profile for that user.

**[0030]** The link provided by the video-on-demand system can be the address of a different internet page, the controller providing the advertising content in that different internet page.

**[0031]** Alternatively, selection of the link can cause the controller to provide the advertising content in the second layer. In this case, it is possible for the video-on-demand programme to be continued to be streamed. Of course, where the system takes a user to advertising content of a different internet page, it is also possible for the system to remember, for instance by means of a timestamp, the position to which the user had progressed in the video-on-demand programme and, hence, after viewing the advertising content, return to the video-on-demand programme at the right place.

**[0032]** Preferably, the controller is responsive to selection by the user to cause display of only the first layer or the first layer in combination with the second layer.

**[0033]** In this way, the user is able to view a streamed video-on-demand programme with or without the overlay images of possible advertising content. In one embodiment, it is possible to provide the user with the option of being charged less, for instance in notional tokens, for watching a video-on-demand programme with the overlay images of the second layer on display.

**[0034]** According to the present invention, there is also provided a method of transmitting video-on-demand including:

streaming, from a server on the internet, video-on-demand through an internet page including a first layer and a second layer;
providing the video-on-demand stream in the first layer;
providing, in the second layer, for selective combination with the video-on-demand of the first layer, a plurality of overlay images corresponding to respective control functions of the video-on-demand stream;
enabling a user at a remote location on the internet to select respective overlay images when the plurality of overlay images are displayed in combination with the video-on-demand at the remote location; and
responding at the server to selection of an overlay image at the remote location so as to change the video-on-demand stream in accordance with the corresponding respective control function.

**[0035]** According to the present invention, there is also provided a video-on-demand system accessible over the internet, the system including:

a video server storing video-on-demand content and for streaming video-on-demand through a first layer of an internet page having a first layer and a second layer; and
a controller for causing there to be formed in the second layer a plurality of selectable overlay images such that a user at a location on the internet remote from the video server and the controller can display streamed video-on-demand of the first layer in combination with the overlay images of the second layer



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and can select one of the overlay images; wherein the overlay images correspond to respective control functions for the video-on-demand stream; and the controller is responsive to selection of an overlay image to change the video-on-demand stream in accordance with the corresponding respective control function.

**[0036]** This provides an effective way of allowing control functions for the video-on-demand stream to be made available to the user without the user needing a hard-drive memory or any sophisticated processing. The user always receives nothing more than appropriately streamed video data even though the system gives the appearance and feel that functions are occurring at the user end. When a particular overlay image and function is selected at the user end, it is the controller at the video-server end that responds by changing the streamed video data accordingly. With the overlay images already present, but in the second layer of the page, the user terminal need only switch between displaying and not displaying the second layer so as to give the user the feel of enabling or disabling the respective functions. Furthermore, changing the display in this way need not change how the controller streams the video-on-demand.

**[0037]** It is possible that the controller is arranged to provide the overlay images in the internet page in a form for storage by the user in a cache and to control display of the overlay images in combination with the video-on-demand stream.

**[0038]** This allows greater efficiency in use of bandwidth.

**[0039]** Preferably, the controller is arranged to provide alternative overlay images for storage simultaneously in the cache with the overlay images such that, when an overlay image is selected, the controller causes display of the selected overlay image to be replaced by display of the corresponding alternative overlay image.

**[0040]** In this way, the alternative overlay images can be used as feedback to the user and to provide highlighting of overlay images to enable the user to understand which corresponding function is to be selected. With the overlay images and alternative overlay images being stored in cache locally at the user end, scrolling through the various overlay images can be achieved without communication with the controller and with the resulting benefits of avoiding unnecessary use of bandwidth.

**[0041]** It will be appreciated that a similar arrangement is possible with the overlay images discussed above for advertising content.

**[0042]** Preferably, the controller is responsive to selection by the user to cause display of only the first layer or the first layer in combination with the second layer.

**[0043]** In this way, a user is able to view only the video-on-demand programmes by means of the first layer and, when desired, can cause the second layer to be displayed in combination with the first layer, thereby allowing access to the various control functions.

**[0044]** Preferably, the controller is arranged to cause the plurality of overlay images to be displayed together as a function bar. The plurality of overlay images can include one or more respective overlay images corresponding to functions of stopping, playing, pausing, rewinding and fast forwarding the video-on-demand stream appearing in the first layer.

**[0045]** Preferably, the video server stores a plurality of video-on-demand programmes having respective contents;
the controller is responsive to a request from the user to provide selective access to the plurality of video-on-demand programmes;
the controller is arranged to judge the content of the video-on-demand programme selected by the user;
for at least one control function, there are a plurality of different overlay images relating to different types of video-on-demand content; and
the controller is arranged to select an appropriate one of the plurality of different overlay images for provision in the second layer according to the judgement of the content of the video-on-demand programme selected by the user.

**[0046]** In this way, it is possible to provide overlay images that have an appearance relevant to the content of the video-on-demand programme being streamed in the first layer.

**[0047]** The invention will be more clearly understood from the following description, given by way of example only, with reference to the accompanying drawings in which:

Figure 1 illustrates schematically an overall system embodying the present invention;

Figure 2 illustrates one of the terminals of Figure 1 embodying the present invention;

Figure 3 illustrates schematically a disk for use in the present invention;

Figure 4 illustrates schematically a main menu to be presented to the user in an embodiment of the present invention;

Figure 5 illustrates a video-on-demand programme menu for presentation to a user according to an embodiment of the present invention;

Figure 6 illustrates schematically a page of video streaming provided according to the present invention;

Figure 7 illustrates schematically functional overlay images for use with the present invention;

Figure 8 illustrates schematically advertising-con-



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tent overlay images for use with the present invention; and

Figure 9 illustrates schematically a video streaming server for use with the present invention.

**[0048]** The present application relates to video streaming over a network such as is illustrated in Figure 1.

**[0049]** A video streaming service 2 is configured for connection to the internet 4. A plurality of users are provided with respective terminals 6, each of which is also configured for connection to the internet 4. It will be appreciated that, while the video streaming service 2 and terminals 6 are configured for connection to the internet 4, it is also possible for them to be connected to other networks allowing video data to be streamed from the video streaming service 2 over the network to individual terminals 6.

**[0050]** According to one important aspect of the present invention, in order to enable a terminal 6 to be used as a video-on-demand player, each respective user is provided with a disk 8 which, when loaded in the terminal 6, allows that terminal to operate as a video-on-demand player. It will be appreciated that the terminals 6 are also provided with display monitors of any form suitable for displaying received video-on-demand programmes.

**[0051]** Figure 2 illustrates schematically a typical terminal 6 suitable for use in the arrangement of Figure 1.

**[0052]** An optical disk player is provided with an optical disk drive or optical disk receiver 12. The optical disk player includes a processor 14 which is capable of reading information from the optical disk receiver 12, carrying out various functions on the basis of data from the optical disk receiver 12 and displaying any images on a monitor 16. A user interface 18 may be connected to the optical disk player 10 in order to allow a user to control the optical disk player 10.

**[0053]** As illustrated, the optical disk player 10 may also be provided with a Random Access Memory (RAM) 20. This is merely for use in a well-known manner for enabling the processor to conduct any processes as required for correct functioning of the optical disk player 10. Importantly, in consideration of the present invention, it is not necessary for the optical disk player 10 to have any hard-drive memory. An optical disk 30 is inserted into the optical reader 12 of the optical disk player 10 by a user and the processor 14 is able to carry out any required processes, for instance as instructed by the user interface 18, directly from data recorded on the optical disk 30 without the need first to transfer large sections of data or indeed complete executable programs to a hard-drive memory.

**[0054]** A typical optical disk player suited for the functioning of the optical disk player 10 would be a gaming console, for instance consoles from Sony's PlayStation (trade mark) series. Consoles or other devices having in-built or interconnected hard disk devices or other mass storage memory devices (such as semi-conductor memory) are not precluded from use within the system of the present invention.

**[0055]** As illustrated, the optical disk player 10 is also provided with a port 22 allowing connection to the internet. In some embodiments, the port itself may include the necessary interfaces for connection directly to a telecommunications line providing internet access. However, in the illustrated embodiment, the port 22 connects to an internet adaptor 24. The internet adaptor 24 contains all necessary interfaces and can be connected to a telecommunications line providing internet connectivity.

**[0056]** Figure 3 illustrates schematically an optical disk for use with the optical disk player of Figure 2.

**[0057]** The optical disk 30 includes, as part of its structure, code components constituting a video decoder 32 and also code components constituting a web browser 34. Importantly, both the video decoder and the browser are executable directly from the disk 30 and, unlike prior-art disks, do not come with installation routines for causing their installation onto the hard-drive memory of the machine in which they are loaded. The video decoder 32 is of any suitable form for decoding streamed video data as received from the video streaming service 2. This includes MPEG2 or MPEG4 decoders or decoders of any other suitable standard whether proprietary or not. The web browser 34 can be a generally conventional web browser, but is stored in conjunction with the address or URL of the main portal (like a home page) of the video streaming service 2. More preferably, the browser is accompanied by or includes some custom features which, as will be described below, allow identification and/or authentication of the optical disk 30 and its user.

**[0058]** In practice, a user purchases an optical disk 30 for use with his or her optical disk player 10. Where the optical disk player 10 is a games console, the optical disk 30 can be sold alongside other optical disks which enable the optical disk player 10 to function as respective video games, the games enabling user control from the user interface 18 and display of images on the monitor 16.

**[0059]** Leaving aside the authentication steps to be discussed below, with the optical disk 30 loaded in the optical reader 12 of the optical disk player 10, the processor 14 causes the browser 34 of the optical disk 30 to run and operate. As mentioned above, the optical disk 30 includes the address or URL of the main portal or homepage on the internet to the video streaming service 2. Hence, the browser 34 immediately and automatically causes the optical disk player 10 to access the main portal of the video streaming service 2. From this point onwards, the optical disk player 10 works as an internet browser, receiving image data from the video streaming service 2, for instance in the form of HTML pages, with appropriate selection being made by the user using the user interface 18. Selection and interaction with the video streaming service 2 may take the form of selection of various regions of a displayed page and, for instance using HTML, transfer of the browser to a different URL



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on the basis of a link provided in conjunction with that region of the image.

**[0060]** Where the optical disk player 10 takes the form of a games console, the user interface 18 can be the associated games handset, possibly of conventional form In addition to up, down, left, right, enter/OK, functions may be assigned to other keys such as those represented by "X", "O", triangle or square on a PlayStation (TM) controller.

**[0061]** Using the user interface 18 and browser 34, a user can navigate to a part of the video streaming service 2 that streams a video-on-demand programme according to the choice of that user. The streamed video data will be received by the optical disk player 10 as part of an internet page. In a well-known manner, the browser 34 can then make use of the video decoder 32 to decode that video data stream and provide appropriate video images for output to the monitor 16. However, unlike prior-art arrangements, the video decoder 32 is executed directly from the optical disk 30 and not from any hard-disk memory forming part of the optical disk player 10.

**[0062]** As mentioned above, the system can include an identification/authentication process for the optical disk 30. In its most basic form, this process can merely identify the optical disk 30 and allow the video streaming service 2 to keep a record of video-on-demand programmes accessed by a user with the use of that particular optical disk 30. However, in conjunction with that operation, the video streaming service 2 can actually perform some form of check or authentication to ensure that the optical disk 30 is a valid optical disk as endorsed by the video streaming service 2.

**[0063]** In one embodiment, when the optical disk 30 is loaded in the optical disk reader 12 of the optical disk player 10, the browser 34 takes the optical disk player 10 to a page at which the video streaming service 2 sends the optical disk player 10 data causing the optical disk player 10 to display on the monitor 16 a request for entry of a unique identifier, for instance of the form of an alphanumeric sequence. Perhaps when purchasing the optical disk 30 or by contacting the video streaming service 2, the user of the optical disk 30 has been provided with the unique identifier. By entering that unique identifier, such that it is transmitted to the video streaming service 2, the video streaming service 2 can recognise the user and permit the browser 34 of the optical disk player 10 to access other pages available from the video streaming service 2.

**[0064]** In an alternative embodiment, as illustrated schematically in Figure 3, the unique identifier 36 is provided as data on the optical disk 30 itself. In this case, the browser 34 includes or is accompanied by some custom code or routine such that, when it first connects with the main portal or opening page provided by the video streaming service 2 and the video streaming service 2 requests notification of the unique identifier, the custom code or routine automatically retrieves the unique identifier 36 present on the optical disk 30 and provides this to the video streaming service 2. In this way, no user intervention is required and loading of the optical disk 30 in the optical disk player 10 is sufficient for the user to gain access to the video streaming service 2.

**[0065]** In some embodiments, different unique identifiers can be associated with different levels of service to be provided by the video streaming service 2. In other words, certain unique identifiers will allow access to pages within the video streaming service 2 which other unique identifiers will not.

**[0066]** In some embodiments, the video streaming service 2 may require the user to be using an authorised optical disk player 10. In this case, the initial authentication process may additionally require the video streaming service 2 to be provided with a unique device identifier of the optical disk player 10 itself This could be entered manually by the user using the user interface 18 or, again, the browser 34 may be accompanied by a special custom code or routine which causes that device identifier to be returned to the video streaming service 2 automatically upon request.

**[0067]** At this point, it is worth noting that a similar authentication process could be used even to allow the optical disk 30 and optical disk player 10 to be used with internet connectivity and before the browser 34 of the optical disk player 10 even connects with the main portal of the video streaming service 2.

**[0068]** Figure 4 illustrates schematically a possible main menu to be provided by the video streaming service 2 to the optical disk player 10 for display on the monitor 16.

**[0069]** On the right of the page 40, there is displayed a list of possible options. A user, using the user interface 18, is able to scroll through and select these various options.

**[0070]** As illustrated, there is a linear live TV stream 42 available and also an electronic programme guide 44. In this regard, it is considered most likely that only a limited amount of linear live TV would be available and the electronic programme guide would merely provide guidance to the user as to what is available as linear live TV, for instance using some other TV receiver. However, as will be discussed further below, the video streaming service 2 is preferably able to analyse content of programmes. In this regard, the electronic programme guide 44, if selected, could provide contextual recommendations to the user of similar programmes available as video-on-demand programmes or indeed indicate where that same programme is already available as a video-on-demand programme.

**[0071]** The page 40 also lists a series of categories of video-on-demand programmes 46 to be discussed below.

**[0072]** By way of example, the page 40 illustrates a selectable option which takes the user to a section allowing the purchasing of goods, for instance downloadable games in the case illustrated.

**[0073]** Finally, the service option 50 may be a customer



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service page enabling a user to get "Help", find "FAQs", contact Customer Support or purchase tokens.

**[0074]** On the left of the displayed page 40, in this preferred embodiment, personalised recommendations 52 of other video-on-demand programmes are shown. This will be discussed further below.

**[0075]** Figure 5 illustrates, again schematically and by way of example, a page where a user has selected a particular category of video-on-demand 46 as illustrated in the display page 40. This display page 60 includes on the right a list of video-on-demand programmes 62 through which a user may scroll using the user interface 18. Each item of the list 62 could include a very brief summary, perhaps only the title, together with a representative image. It might also include, as a contextual recommendation, details or a link to another video-on-demand programme of similar or related content.

**[0076]** On the left of the display page 60, there is displayed a control bar 64, which is active for the currently selected video-on-demand programme of the list 62. The control bar 64 includes a plurality of selectable functions through which the user may scroll using the user interface 18. Where there are too many functions to be displayed conveniently, the page can be arranged to scroll through all of the available functions and display only a limited number at any one time. The video-on-demand programmes listed as items of the list 62 can similarly be scrolled through with only a limited number being displayed at any one time.

**[0077]** As illustrated, the control bar 64 includes a symbol 66 for play of a selected video-on-demand programme and a symbol 68 linking the browser 34 of the optical disk player 10 to another page providing additional information about the selected video-on-demand programme. The control bar 64 may also include information 70 relating to the cost to the user of receiving the currently highlighted video-on-demand programme. This will be discussed further below, but as illustrated is represented as a cost in notional tokens.

**[0078]** A similar display could be used as a page for providing shopping where the control bar includes a selectable function of purchasing a selected item in a list.

**[0079]** Moving from the display page 60 of Figure 5, if a user selects the play function 66 for a video-on-demand programme, the browser 34 of the optical disk player 10 is redirected to a page 80 as illustrated schematically in Figure 6 within which the video data of the selected video-on-demand programme is streamed. As mentioned above, the browser 34 of the optical disk player 10 makes use of the decoder 32 and, hence, the requested video-on-demand programme is displayed on the monitor 16.

**[0080]** The internet page 80 may not be provided as only one layer, but can be provided as two or more layers which are all received as part of the page 80 by the optical disk player 10, but are displayed selectively according to a request from the user. For instance, a predetermined button on the user interface 18 may be pre-assigned to make this selection.

**[0081]** Figure 7 illustrates an example where a second layer containing a plurality of overlay images 82 arranged as a function bar 84 are displayed in conjunction with the first layer carrying the video-on-demand programme. As illustrated, respective overlay images 82 are provided for rewind, fast-forward, play, pause and stop functions. Using the user interface 18, a user may scroll through the various overlay images and select one of the images and its corresponding function. The video streaming service 2 is responsive to this selection in the second layer of the page 80 to carry out the required function. In other words, the video data being streamed in the first layer of the page 80 gives the appearance of the video-on-demand programme being fast rewound, fast-forwarded, played, paused or stopped. It will be appreciated that, although the user has the feeling that the functions are being carried out locally, it is in fact the video streaming server 2 that is providing a different stream of video data.

**[0082]** The actual overlay images themselves can be transferred from the video streaming service 2 for storage locally in cache at the optical disk player 10. For instance the RAM 20 can be used.

**[0083]** For each function, alternative overlay images can be held in cache. In particular, in some embodiments, each function can have an overlay image having a normal appearance and an overlay image having a highlighted appearance such that when a user scrolls through the various overlay images, the position to which the user has scrolled is indicated by an overlay image having a highlighted appearance. It is possible also for a third alternative appearance to be stored and then displayed when a user actually selects the function corresponding to that image.

**[0084]** It is also possible for the video streaming service 2 to provide a plurality of different versions of overlay image for each corresponding function. Indeed, a plurality of different sets of overlay images can be provided for different versions of function bar 84. The video streaming service 2 is then arranged to provide in the second layer a set of overlay images 82 appropriate to the content of the video-on-demand programme being streamed in the first layer of that page. Thus, in contrast to the example illustrated in Figure 7, if the video-on-demand programme being streamed in the first layer of the page is a football match, then the overlay images could have a football theme, for instance a player running forwards to signify fast forwards and a goalkeeper catching a football to signify stop. In other words, the appearance of the overlay images provided in the second layer of a page are matched contextually to the content of the video stream in the first layer of that page.

**[0085]** In one preferred embodiment, as illustrated in Figure 7, an overlay image 86 may be provided corresponding to a minimising function for reducing the size of the streamed video-on-demand programme. In particular, upon selecting the function of this overlay image, the first layer can be replaced by a relatively small window in which the video-on-demand programme continues to



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be streamed, leaving the remainder of the area of the display to show other information, for instance information regarding the video-on-demand programme.

**[0086]** As illustrated in Figure 8, it is possible to provide other overlay images 90. These may be provided in the second layer of the page 80 or, indeed, in other layers of the page 80. It is proposed that each of these overlay images 90 relates to respective advertising content available to the user. Using the user interface 18, a user may select a particular overlay image 90. Each overlay image 90 has associated with it a link to associated advertising content. For instance, the link could take the form of a URL address redirecting the browser 34 of the optical disk player 10 to a different page showing the associated advertising content. That advertising content could be text, images or streamed video in the same manner as discussed above. Advertising content may for example be related to products or services or other video material available over the video-on-demand service. Alternatively, the link could change the content of a layer of the page or bring an additional layer into view. In one embodiment, the video-on-demand programme currently being streamed could be moved to a small window as described above with the advertising content being displayed in other parts of the full display.

**[0087]** Turning now to Figure 9, there is illustrated a schematic representation of the video streaming service 2.

**[0088]** A connection 100 provides connectivity to the internet and allows terminals 6, including optical disk players 10, to access the portal and pages of the video streaming service 2.

**[0089]** As illustrated, a controller 102 has access to and control of a video streamer 104 and a database 106. By means of previously stored data and information received from external sources, the controller 102 is able to provide the pages and layers discussed above. In conjunction with this, the video streamer can provide streams of video data corresponding to video-on-demand programmes selected by users at terminals 6.

**[0090]** Figure 9 illustrates schematically the fact that the video streaming service 2 includes an account memory 110. In particular, it is proposed that each user identified by the unique identifier 36 discussed above is assigned an account, which is debited according to use of the service. It is proposed that each video-on-demand programme is assigned a notional value, for instance recorded in notional tokens. Whenever a user requests access to a video-on-demand programme, the corresponding number of tokens are debited from the account stored for the corresponding unique identifier in the account memory 110. In one embodiment, the optical disk 30 bought originally by the user is assigned a particular value in terms of tokens. When the user first uses the optical disk 30 and the video streaming service 2 authenticates the optical disk 30 as discussed above, the user is credited that amount to the corresponding account memory. Various systems can be considered for crediting the account memory 110 with more tokens, for instance with credit card transactions over the internet.

**[0091]** As illustrated, the video streaming service 2 is also provided with a recommender 112 comprising a profile memory 114 and separate matcher 116.

**[0092]** The profile memory 114 is arranged to store, in conjunction with the unique identifier, a record of the video-on-demand programmes selected by the user of that unique identifier. In this way, the video streaming service 2 can look at the history of video-on-demand programmes accessed by a particular user and recommend other video-on-demand programmes that the user might enjoy. To do this, the recommender 112 includes a matcher 116, which compares the content of video-on-demand programmes recorded in the profile memory 114 for a particular unique identifier with video-on-demand programmes available from the video streamer 104. As a result of this comparison, the recommender 112 is able to provide the controller 102 with a list of personalised video-on-demand recommendations. Returning to Figure 4, these can be provided as recommendations 52 on page 40. By storing profiles in the profile memory 114 remote from the terminals 6, it is possible for the matcher 116 to carry out relatively sophisticated comparison of the video-on-demand programmes previously watched by a user and those available. Hence, relatively accurate recommendations may be made to a particular user. Where the recommender 112 is able to provide a very large number of recommendations, in the preferred embodiment, the controller 102 is arranged to display only the most relevant recommendations.

**[0093]** By making use of the unique identifier, it will be appreciated that an individual's personal profile can be kept anonymous. The system need only relate a profile to a unique identifier 36 and it is not necessary that that unique identifier be related to a particular individual.

**[0094]** The recommender 112 can also be used in conjunction with the overlays 90 and advertising content described with reference to Figure 8.

**[0095]** In the same way as discussed above, the matcher 116 can compare the personal profile associated with a particular unique identifier with advertising content stored either in the database 106 or video streamer 104. As a result, the recommender 112 can recommend to the controller 102 advertising content appropriate to a user having a particular unique identifier. On the basis of this recommendation, the controller 102 can thus cause to be displayed, in a layer of page 80, overlay images 90 with links to advertising content of potential interest to the user. Of course, the controller 102 could also cause to be displayed overlay images 90 with links to advertising content having contextual relevance to the particular video-on-demand programme being streamed at that time. Indeed both the contextual recommendation and the personal recommendation could be taken into account when deciding which overlay images 90 and links to provide in a layer in association with transmission of a video-on-demand programme in a first layer.



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**[0096]** Considering again the account memory 110, it is proposed that, in one embodiment, selection by a user of an overlay 90 and the corresponding link to its advertising content could be arranged to result in a credit of some tokens to the user's account. Alternatively, in a menu list such as illustrated in Figure 5, a user could be given the option of receiving a video-on-demand programme with or without advertising content. In that case, the user would be able to obtain the video-on-demand programme together with advertising content at a lower rate of tokens than without the advertising content.

## Claims

1. A video-on-demand system accessible over the internet, the system including:

   a video server (2) storing video-on-demand content and for streaming video-on-demand through a first layer of an internet page (80) having a first layer and a second layer; and
   a controller (102) for causing there to be formed in the second layer a plurality of selectable overlay images (82) such that a user (10) at a location in communication with the internet (4) remote from the video server (2) and the controller (102) can display streamed video-on-demand of the first layer in combination with the overlay images of the second layer and can select one of the overlay images; wherein
   the overlay images (82) correspond to respective control functions for the video-on-demand stream; and
   the controller (102) is responsive to selection of an overlay image (82) to change the video-on-demand stream in accordance with the corresponding respective control function.

2. A video-on-demand system according to claim 1 wherein the controller is arranged to provide the overlay images (82) in the internet page (80) in a form for storage by the user in a cache and to control display of the overlay images (82) in combination with the video-on-demand stream.

3. A video-on-demand system according to claim 2 wherein the controller (102) is arranged to provide alternative overlay images (82) for storage simultaneously in the cache with the overlay images (82) such that, when an overlay image (82) is selected, the controller (102) causes display of the selected overlay image (82) to be replaced by display of the corresponding alternative overlay image.

4. A video-on-demand system according to claim 1, 2 or 3 wherein the controller (102) is responsive to selection by the user to cause display of only the first layer or the first layer in combination with the second layer.

5. A video-on-demand system according to any preceding claim wherein the controller (102) is arranged to cause the plurality of overlay images (82) to be displayed together as a function bar (84).

6. A video-on-demand system according to any preceding claim wherein the plurality of overlay images (82) include one or more respective overlay images (82) corresponding to functions of stopping, playing, pausing, rewinding and fast forwarding the video-on-demand stream.

7. A video-on-demand system according to any preceding claim wherein:

   the video server (2) stores a plurality of video-on-demand programmes having respective contents;
   the controller (102) is responsive to a request from the user (10) to provide selective access to the plurality of video-on-demand programmes;
   the controller (102) is arranged to judge the content of the video-on-demand programme selected by the user;
   for at least one control function, there are a plurality of different overlay images (82) relating to different types of video-on-demand content; and
   the controller (102) is arranged to select an appropriate one of the plurality of different overlay images (82) for provision in the second layer according to the judgement of the content of the video-on-demand programme selected by the user (10).

8. A method of transmitting video-on-demand including:

   streaming, from a server (2) on the internet (4), video-on-demand through an internet page (80) including a first layer and a second layer;
   providing the video-on-demand stream in the first layer;
   providing, in the second layer, for selective combination with the video-on-demand of the first layer, a plurality of overlay images (82) corresponding to respective control functions of the video-on-demand stream;
   enabling a user (10) at a remote location on the internet (4) to select respective overlay images (82) when the plurality of overlay images (82) are displayed in combination with the video-on-demand at the remote location; and
   responding at the server (2) to selection of an overlay image (82) at the remote location so as



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to change the video-on-demand stream in accordance with the corresponding respective control function.



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Fig.1.

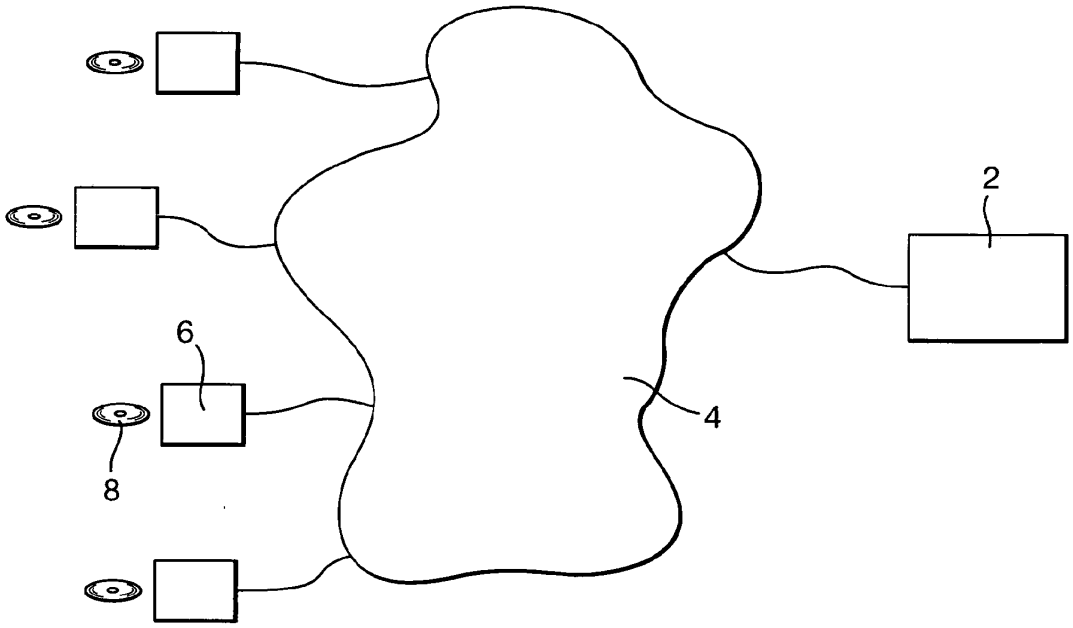


Fig.3.

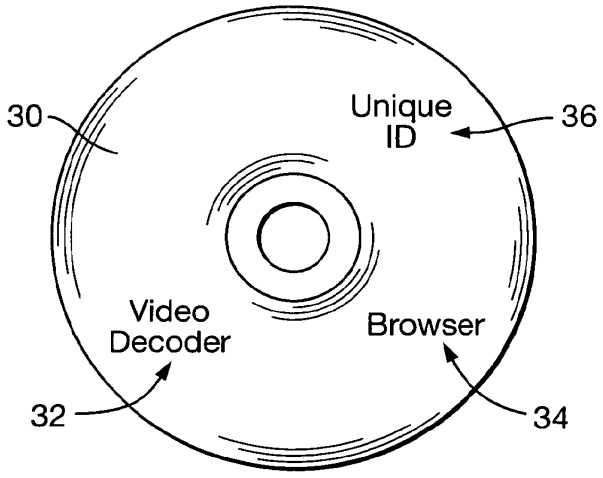




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Fig.2.

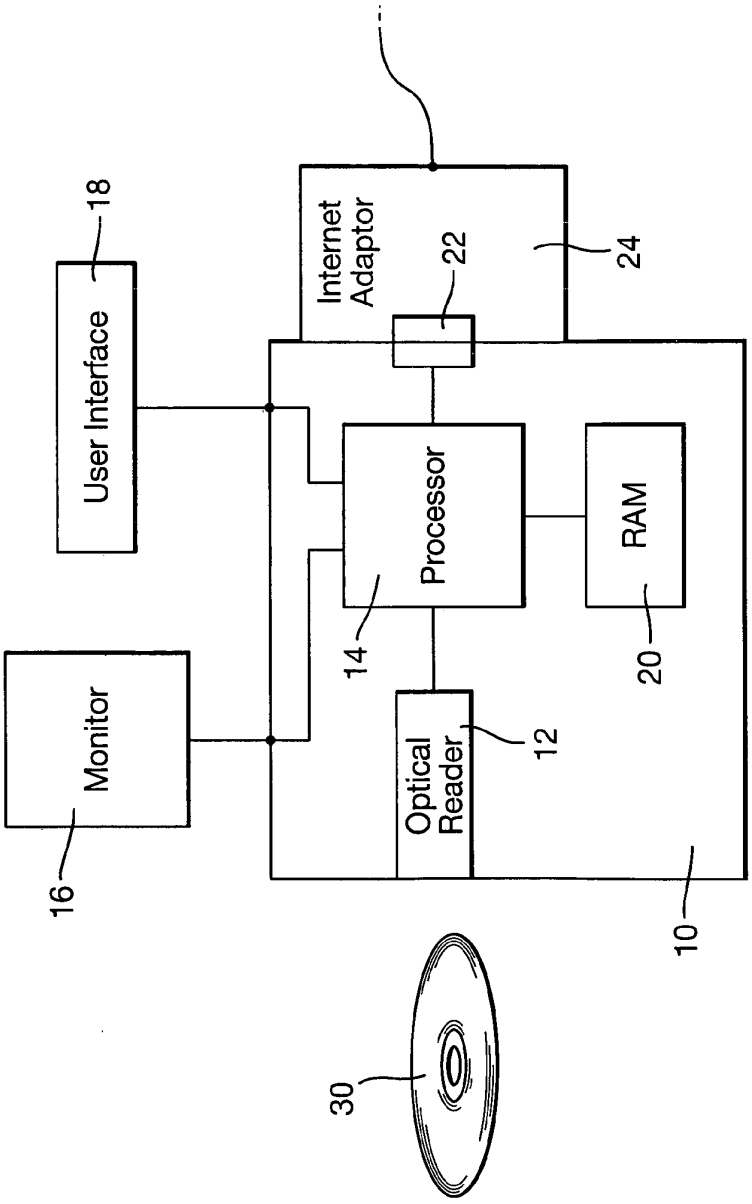
User Interface
18
Internet Adaptor
22
24
Processor
RAM
14
20
Monitor
16
Optical Reader
12
10
30

Fig.4.

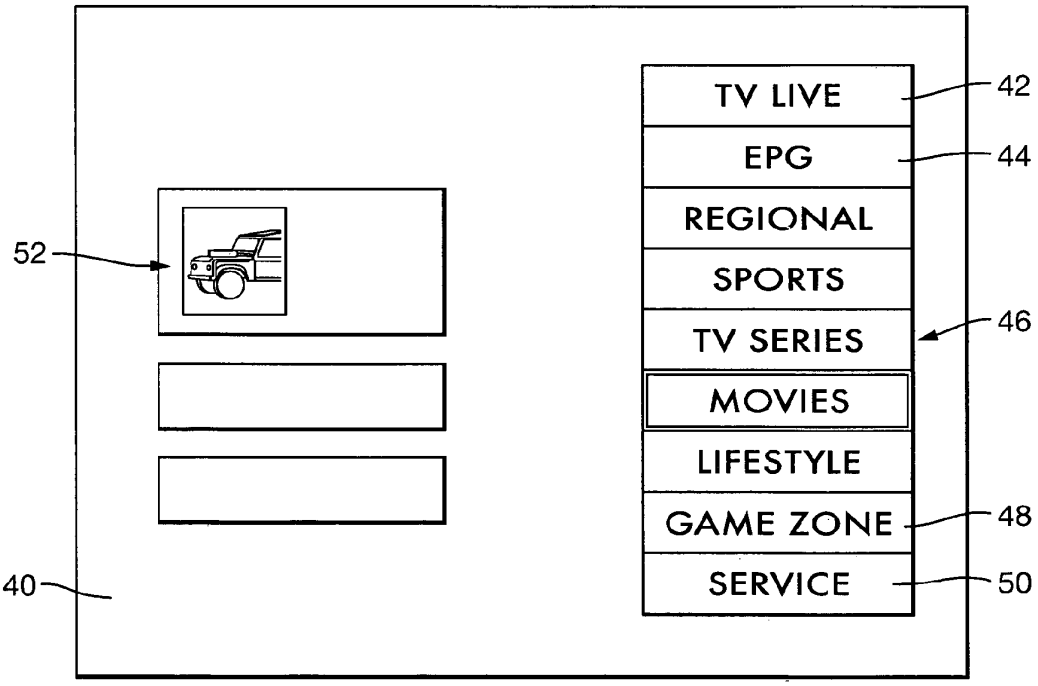




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Fig.5.

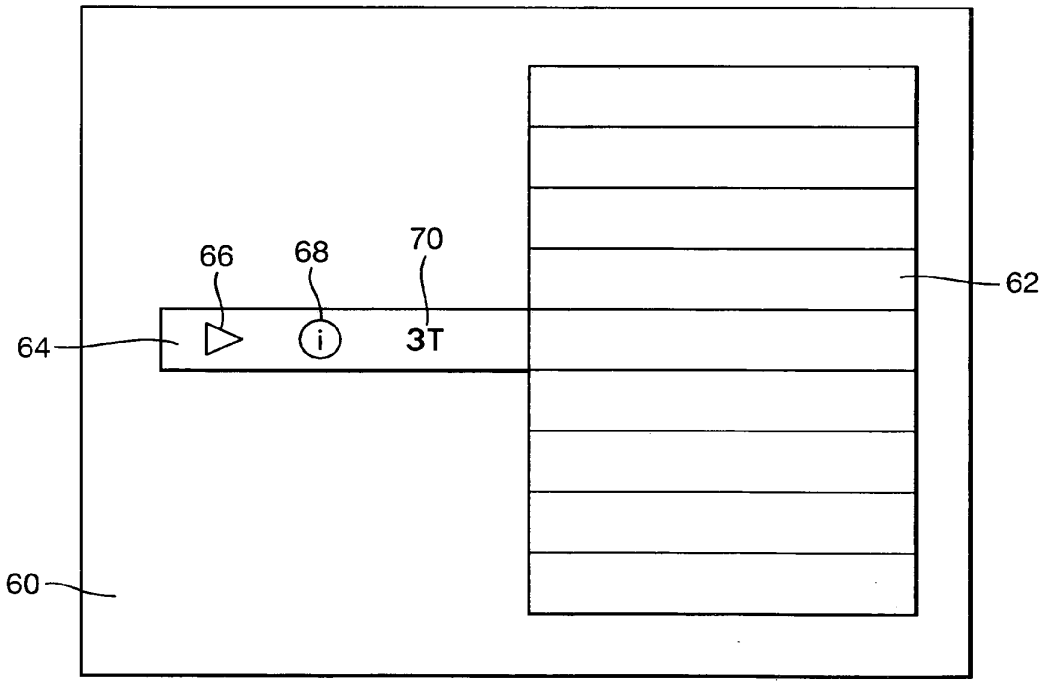




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Fig.6.

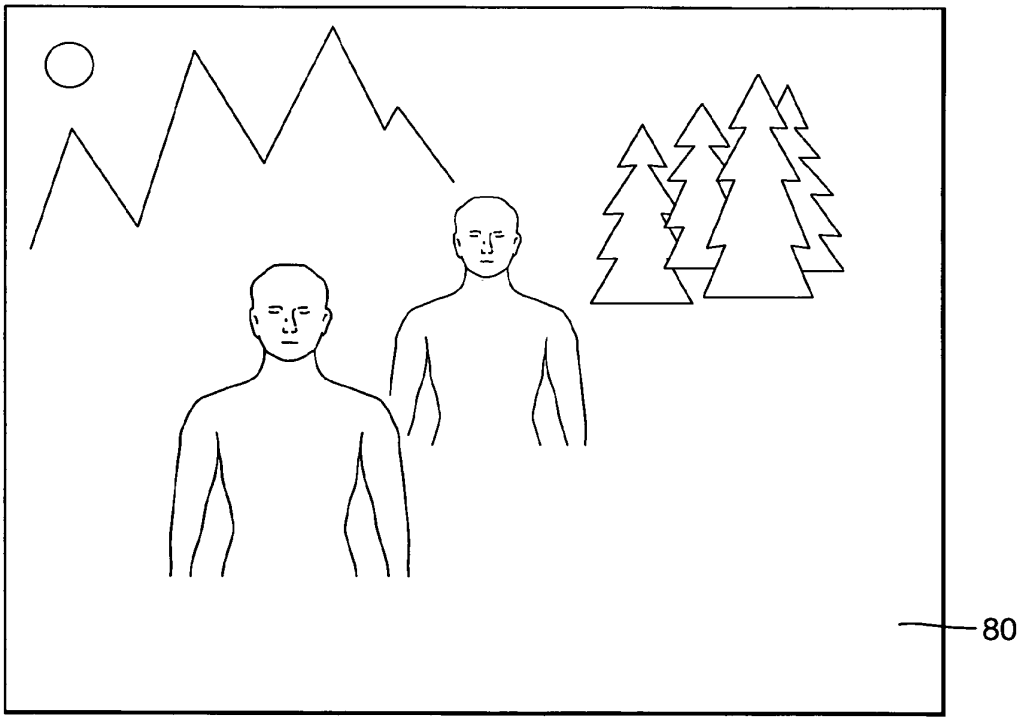




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Fig.7.

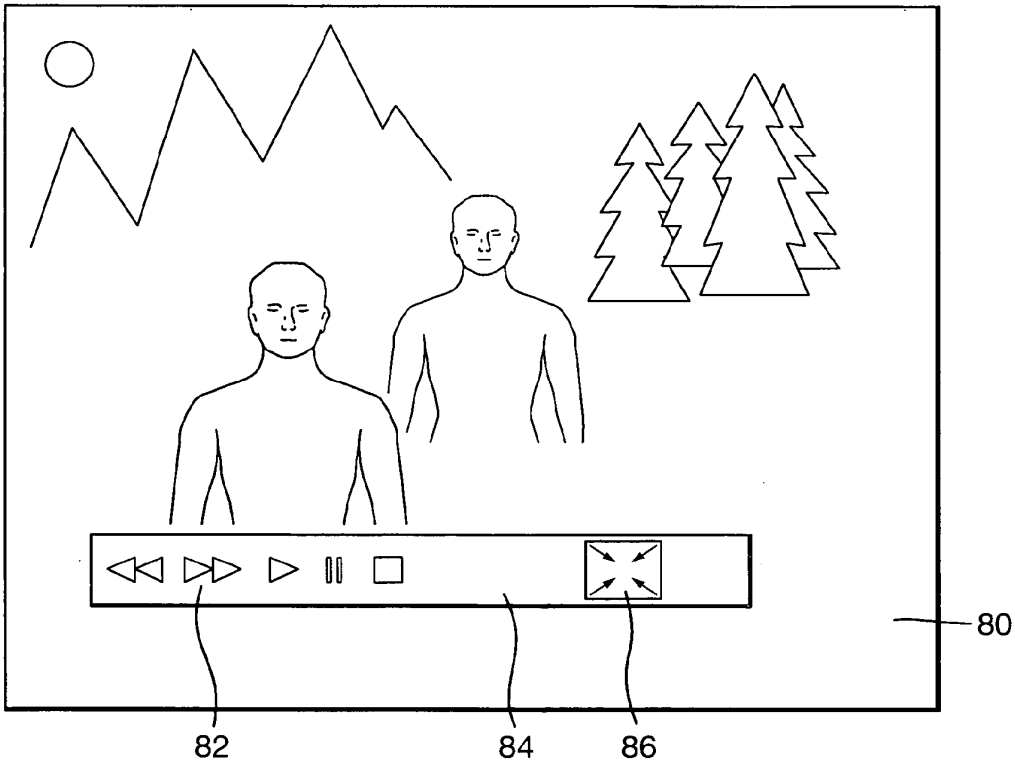




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Fig.8.

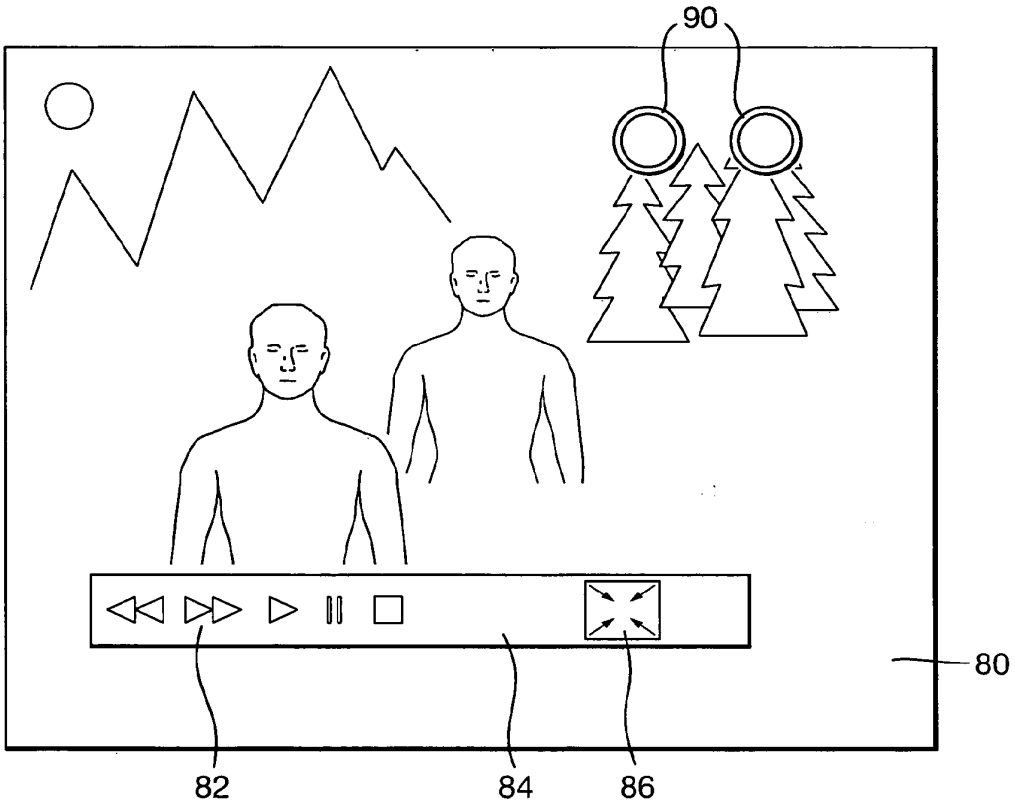




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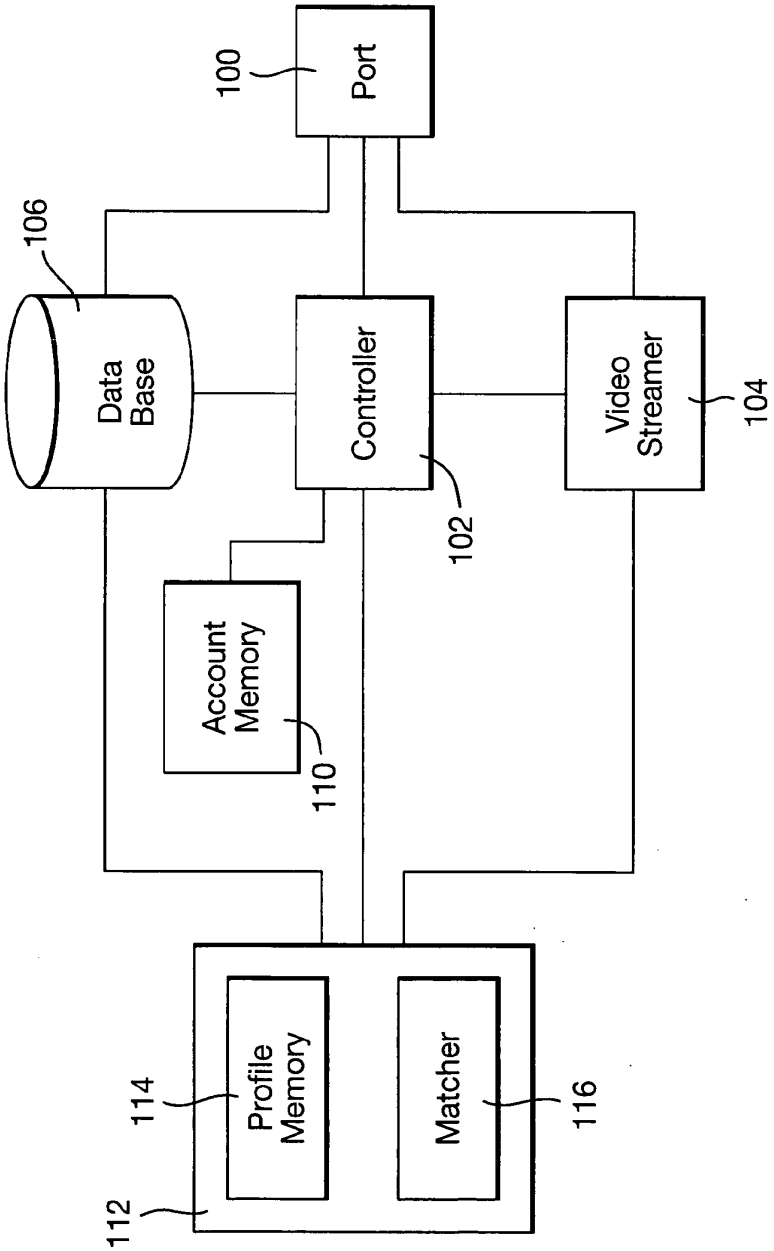
Fig.9.



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European Patent Office

# EUROPEAN SEARCH REPORT

Application Number
EP 06 25 2937

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
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| Y | WO 2005/022891 A2 (YAHOO INC [US]; DUKES DEREK [US]; VAKILI VALLA [US]; BEHHNAM-DEHKORDY)<br>10 March 2005 (2005-03-10)<br>* page 16 *<br>* page 34; figure 12B * | 7 | |
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| A | WO 02/095558 A (DIGEO INC [US])<br>28 November 2002 (2002-11-28)<br>* pages 12-16 * | 1-8 | |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Berlin | 17 November 2006 | Bertrand, Frédéric |

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

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## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 25 2937

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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17-11-2006

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



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(19) Europäisches Patentamt
European Patent Office
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(11) EP 2 328 346 A1

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**29.12.2005 US 324204 P**
**29.12.2005 US 324185 P**
**29.12.2005 US 324173 P**

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**06847656.3 / 1 969 846**

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Remarks:
This application was filed on 24-01-2011 as a divisional application to the application mentioned under INID code 62.

## (54) Systems and Methods for Managing Content

(57) A "New to Me" feature is provided for an interactive media guidance system implemented as a home network having multiple user equipment devices. Functionally speaking, the "New to Me" feature of the interactive media guidance system identifies programs or advertisements that have been previously viewed by an individual user or a user equipment device within the home network, or even by a household. The interactive media guidance system may use the information gathered regarding the programs and/or advertisements that have already been seen by a user, device or household to, for example, remove the programs or advertisements from future displays of recommendations, search results or listings of available programming.

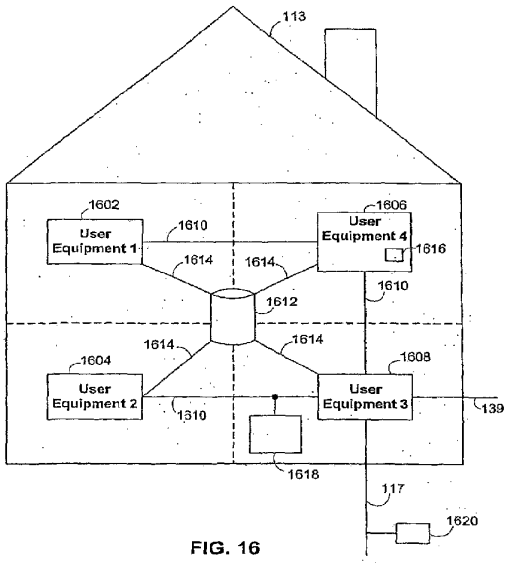


FIG. 16

EP 2 328 346 A1

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## Description

### Background of the Invention

**[0001]** The present invention relates to systems and methods for managing content. More particularly, the present invention relates to generating interactive content presented to users based on programming viewed or played on user equipment devices that are networked together.

**[0002]** User equipment devices today may have the ability to, for example, take into account the content that a user has seen before when presenting interactive information to the user, or when performing an operation such as recording television programming at the user's direction. Such user equipment devices are aimed at being customizable to a particular user. However, with the advent of localized networks of user equipment devices, such as a home network of interconnected user equipment devices, users have a tendency to view media on many if not all of the user equipment devices in a given network on a regular basis. Beyond that, as user equipment devices become increasingly prevalent, users have a greater tendency to view media on user equipment devices that are outside of a home network, and yet that still may be connected to the overarching network to which user equipment devices in the home network are connected. It would therefore be desirable to provide a system for allowing network-connected user equipment devices to be customized to users based on users' viewing histories.

**[0003]** Furthermore, the ability of known systems to identify previously viewed content, and then make use of such information, is limited both in terms of breadth of functionality with which this information is utilized, and the depth of information concerning previously viewed content that is generated. For example, current television program guides provide features that include, among others, "Repeats", "First Run" and "Season Pass". The "Repeats" feature identifies a particular program that has been previously broadcast, regardless of whether or not that program has actually been watched by a specific viewer. The "First Run" feature identifies programming that is being broadcast or run for the very first time. The "Season Pass" feature, meanwhile, allows users to purchase an entire upcoming season of a program. Other features of such guides include recommendations, searches, and other interactive displays of content including programming, advertisements or other media. All of these features, however, currently do not enable users to view in a detailed manner, if at all, the extent to which the identified programs have been previously viewed. It would be desirable to provide users with such information in order to better help users identify the programming in which they have the most interest. Also, even those program guides that are presently capable of identifying previously viewed content provide little detail about the viewing history of such content, in addition to lacking sophisticated ways of representing such content. It would be desirable, therefore, to provide a system that is capable of providing a greater level of sophistication in connection with the viewing history and displays of previously viewed content.

### Summary of the Invention

**[0004]** The present invention addresses the above and other problems by providing systems and methods for managing the display of interactive content based on a viewing history for an individual, a device, or a home network. By managing content based on a viewing history for an individual, a device, or a home network, the present invention may efficiently accommodate the viewing habits of one or more users interacting with one or more user devices that are communicatively coupled to a home network, or are interacting with two or more home networks that are communicatively coupled to each other.

**[0005]** The viewing history may include compilation of content that has been displayed,'viewed, or played on at least one user device that is communicatively coupled to a home network. In addition, a viewing history may be created, modified, and updated for a particular user, a particular user device, or a home network. The viewing history may provide a framework or guideline for enabling an interactive media guidance application to generate interactive content. Interactive content may be content that is displayed by a interactive media guidance application such as, for example, listings of programming, advertisements, and information screens.

**[0006]** An advantage of the present invention is that the interactive content may be customized based on the viewing history. For example, the interactive media guidance system may display a list of programming that has not been viewed according to the viewing history. As another example, the interactive media guidance application may display advertisements that have not been viewed according to the viewing history.

**[0007]** Content management at an individual level within a home network may enable a media guidance application to provide interactive content that is specific to each user regardless of which user device the user uses. For example, when a first user views a particular program (e.g., a television show) in the living room, the viewing history for the first user may be updated to reflect the fact that the first user has viewed that particular program. Thereafter, when the first user retires to the bedroom (or any other room having a user device communicatively coupled to the home network), and decides to watch another program, the system may omit the listing of the particular program that the first user viewed in the living room from a listing of programs that may be displayed on a user device in the bedroom. In contrast, if a second user accesses the user device in either the living room or the bedroom and has not viewed the particular program viewed by the first user, the system may display the particular program in a listing for the second user.



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**[0008]** Content management at a user device level within a home network may enable a media guidance application to provide interactive content that is based on the content viewed at a selected user device. For example, a selected user device may be treated as the master and the other user devices may be treated as slaves. In a master/slave arrangement, the viewing history may be created, modified, or updated based on the content viewed at the master user device. Thus, the interactive content generated for display on both the master and slave devices is based on the viewing history of the master user device.

**[0009]** Content management at a home network level may enable a media guidance application to provide interactive content that is based on the content viewed at any one of several user devices communicatively coupled to a home network. In this arrangement, whenever an item of programming is viewed on a user device that is communicatively coupled to the home network, that program may not be presented in a listing of programming on that particular user device, nor any other user device that is communicatively coupled to the home network. For example, assume that a home network is communicatively coupled to three different user devices. If "Superman" is viewed on a first user device, a viewing history for the home network may be updated to reflect this viewing event. Thus, none of the user devices may display "Superman" in a listing of programming. If "Wonderwoman" is viewed on a second user device, the viewing history for the home network may be updated to reflect this viewing event. Again, none of the user devices may display "Wonderwoman" in a listing of programming.

**[0010]** Managing content across two or more home networks may enable the media guidance application to provide interactive content that is based on the content viewed at a selected home network. For example, a user may have a first home network (e.g., located at his or her house) and a second home network (e.g., located at his or her vacation house). In one embodiment, which assumes that the first home network is the selected home network, any item of programming that is viewed at the first home network may not be presented in a listing of programming at the second network.

Brief Description of the Drawing

**[0011]** FIG. 1 is a diagram of an illustrative interactive television system in accordance with the present invention.

**[0012]** FIG. 2 is a diagram of illustrative user television equipment in accordance with the present invention.

**[0013]** FIG. 3 is a diagram of additional illustrative user television equipment in accordance with the present invention.

**[0014]** FIG. 4 is a diagram of an illustrative remote control in accordance with the present invention.

**[0015]** FIG. 5 is a diagram of illustrative user computer equipment in accordance with the present invention.

**[0016]** FIG. 6 is a generalized diagram of illustrative user equipment in accordance with the present invention.

**[0017]** FIG. 7 is a diagram of an illustrative home network in which a plurality of user equipment is implemented in a star configuration in accordance with the present invention.

**[0018]** FIG. 8a is a diagram of an illustrative home network in which a plurality of user equipment is implemented in a tree configuration in accordance with the present invention.

**[0019]** FIG. 8b is a diagram of an illustrative home network in which a plurality of user equipment is implemented in a ring configuration in accordance with the present invention.

**[0020]** FIG. 8c is a diagram of an illustrative home network in which a plurality of user equipment is implemented in a bus configuration in accordance with the present invention.

**[0021]** FIG. 9 is a diagram of an illustrative home network in which a plurality of user equipment and a server are implemented in a client-server configuration in accordance with the present invention.

**[0022]** FIG. 10 is a diagram of an illustrative home network in a client-server configuration and in which the set-top-box acts as the server in accordance with the present invention.

**[0023]** FIG. 11a is a diagram of a plurality of home networks implemented in an illustrative neighborhood node configuration in accordance with the present invention.

**[0024]** FIG. 11b is a diagram of an illustrative system in which servers are located at network nodes in accordance with the present invention.

**[0025]** FIG. 11c is a diagram of two illustrative home networks that have been interconnected in accordance with the present invention.

**[0026]** FIG. 11d is a diagram of two illustrative home networks that have been interconnected via a server in accordance with the present invention.

**[0027]** FIG. 12 shows several different types of content that may be monitored for creating, modifying, or updating a viewing history in accordance with the present invention.

**[0028]** FIG. 13 shows several monitors that may be used to track various aspects of the viewed or played content in accordance with the present invention.

**[0029]** FIG. 14 shows an illustrative display screen for allowing a user to manually enter previously viewed content in accordance with the present invention.

**[0030]** FIG. 15 shows an illustrative flow diagram in connection with allowing a user to manually enter previously viewed content in accordance with the present invention.

**[0031]** FIG. 16 is a diagram of an illustrative home network in which a plurality of user equipment devices are coupled to a local database server in accordance with the present invention.

**[0032]** FIG. 17 shows several different types of inter-



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active content that may be generated and displayed by an interactive media guidance application in accordance with the present invention.

**[0033]** FIG. 18a shows an illustrative flow diagram for displaying media content based on the viewing history of a user in a home network in accordance with the present invention.

**[0034]** FIG. 18b shows an illustrative flow diagram for updating a viewing history for several identified users in accordance with the present invention.

**[0035]** FIG. 18c shows an illustrative flow diagram for generating interactive contented based on a viewing history of a selected user devices in accordance with the present invention.

**[0036]** FIG. 18d shows an illustrative flow diagram for generating interactive content based on a viewing history of a home network in accordance with the present invention.

**[0037]** FIG. 18e shows an illustrative flow diagram for generating interactive content based on a selected one of at least two home networks in accordance with the present invention.

**[0038]** FIG. 19 shows an illustrative display screen for selecting a user profile at a user equipment device in a home network in accordance with the present invention.

**[0039]** FIG. 20 shows an illustrative flow diagram for displaying interactive content or media content based on a ranking process that is applied to previously viewed media content in accordance with the present invention.

**[0040]** FIG. 21a shows an illustrative display screen for displaying previously viewed content in accordance with the present invention.

**[0041]** FIG. 21b shows another illustrative display screen for displaying previously viewed content in accordance with the present invention.

**[0042]** FIG. 21c shows yet another illustrative display screen for displaying previously viewed content in accordance with the present invention.

**[0043]** FIG. 21d shows yet another illustrative display screen for displaying previously viewed content in accordance with the present invention.

**[0044]** FIG. 21e shows yet another illustrative display screen for displaying previously viewed content in accordance with the present invention.

**[0045]** FIG. 21f shows yet another illustrative display screen for displaying previously viewed content in accordance with the present invention.

**[0046]** FIG. 21g shows yet another illustrative display screen for displaying previously viewed content in accordance with the present invention.

**[0047]** FIG. 21h shows yet another illustrative display screen for displaying previously viewed content in accordance with the present invention.

**[0048]** FIG. 22 shows an illustrative display screen for allowing a user to enable, disable or modify settings relating to the feature of tracking previously viewed content in accordance with the present invention.

Detailed Description of the Preferred Embodiments

**[0049]** The amount of media available to users in any given media delivery system can be substantial. Consequently, many users desire a form of media guidance, an interface that allows users to efficiently navigate media selections and easily identify media that they may desire. An application which provides such guidance is referred to herein as an interactive media guidance application or, sometimes, a guidance application.

**[0050]** Interactive media guidance applications may take various forms depending on the media for which they provide guidance. One typical type of media guidance application is an interactive television program guide. Interactive television program guides are well-known guidance applications that, among other things, allow users to navigate among and locate television programming viewing choices and, in some systems, digital music choices. The television programming (and music programming) may be provided via traditional broadcast, cable, satellite, Internet, or any other means. The programming may be provided on a subscription basis (sometimes referred to as premium programming), as pay-per-view programs, or on-demand such as in video-on-demand (VOD) systems.

**[0051]** With the advent of the Internet, mobile computing, and high-speed wireless networks, users are able to access media on personal computers (PCs) and devices on which they traditionally could not. Non-television-centric platforms (i.e., platforms that distribute media with equipment not part of the user's broadcast, cable or satellite television-delivery network) allow users to navigate among and locate desirable video clips, full motion videos (which may include television programs), images, music files, and other suitable media. Consequently, media guidance is also necessary on modern non-television-centric platforms. For example, media guidance applications may be provided as on-line applications (i.e., provided on a web-site), or as stand-alone applications or clients on hand-held computers, personal digital assistants (PDAs) or cellular telephones. In some systems, users may control equipment remotely via a media guidance application. For example, users may access an on-line media guide and set recordings or other settings on their in home equipment. This may be accomplished by the on-line guide controlling the user's equipment directly or via another media guide that runs on the user's equipment. Remote access of interactive media guidance applications is discussed in greater detail in U.S. Patent Application No. 11/246,392, filed October 7, 2005, which is hereby incorporated by reference herein in its entirety.

**[0052]** An illustrative interactive media guidance system 100 in accordance with the present invention is shown in FIG. 1. System 100 is intended to illustrate a number of approaches by which media of various types, and guidance for such media, may be provided to (and accessed by) end-users. The present invention, however, may be applied in systems employing any one or a



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subset of these approaches, or in systems employing other approaches for delivering media and providing media guidance.

**[0053]** The first approach represents a typical television-centric system in which users may access television (and in some systems music) programming. This includes programming sources 102 and distribution facility 104. Media such as television programming and digital music is provided from programming sources 102 to distribution facility 104, using communications path 106. Communications path 106 may be a satellite path, a fiber-optic path, a cable path, or any other suitable wired or wireless communications path or combination of such paths.

**[0054]** Programming sources 102 may be any suitable sources of television and music programming, such as television broadcasters (e.g., NBC, ABC, and HBO) or other television or music production studios. Programming sources 102 may provide television programming in a variety of formats in high definition and standard definition, such as, for example, 1080p, 1080i, 720p, 480p, 480i, and any other suitable format.

**[0055]** Distribution facility 104 may be a cable system headend, a satellite television distribution facility, a television broadcaster, or any other suitable facility for distributing video media (e.g., television programs, video-on-demand programs, pay-per-view programs) and audio media (e.g., music programming and music clips) to the equipment of subscribers of the corresponding cable, satellite, or IPTV system. In some approaches, distribution facility 104 may also distribute other media to users, such as video and audio clips, web pages, and interactive applications, that may be offered to subscribers of a given cable, satellite, or IPTV system. There are typically numerous distribution facilities 104 in system 100, but only one is shown in FIG. 1 to avoid overcomplicating the drawing.

**[0056]** Distribution facility 104 may be connected to various user equipment devices 108, 110, and 112. Such user equipment devices may be located, for example, in the homes of users. User equipment devices may include user television equipment 110, user computer equipment 112, or any other type of user equipment suitable for accessing media. User equipment 108 may be any type of user equipment (e.g., user television equipment, user computer equipment, cellular phones, handheld video players, gaming platforms, etc.) and, for simplicity, user equipment devices may be referred to generally as user equipment 108.

**[0057]** User equipment devices 108, 110, and 112 may receive media (such as television, music, web pages, etc.) and other data from distribution facility 104 over communications paths, such as communications paths 114, 116, and 118, respectively. User equipment devices 108, 110, 112 may also transmit signals to distribution facility 104 over paths 114, 116, and 118, respectively. Paths 114, 116, and 118 may be cables or other wired connections, free-space connections (e.g., for broadcast or other wireless signals), satellite links, or any other suitable link or combination of links.

**[0058]** A second approach illustrated in FIG. 1 by which media and media guidance are provided to end users is a non-television-centric approach. In this approach media such as video (which may include television programming), audio, images, web pages, or a suitable combination thereof, are provided to equipment of a plurality of users (e.g., user equipment 108, user television equipment 110, and user computer equipment 112) by server 130 via communications network 126. This approach is non-television-centric because media (e.g., television programming) is provided by and delivered at least partially, and sometimes exclusively, via equipment that have not traditionally been primarily focused on the television viewing experience. Non-television-centric equipment is playing a larger role in the television viewing experience.

**[0059]** In some embodiments for this approach, communications network 126 is the Internet. Server 130 may provide for example, a web site that is accessible to the user's equipment and provides an on-line guidance application for the user. In such approaches, the user's equipment may be, for example, a PC or a hand-held device such as a PDA or web-enabled cellular telephone that incorporates a web browser. In other embodiments, server 130 uses the Internet as a transmission medium but does not use the Web. In such approaches, the user's equipment may run a client application that enables the user to access media. In still other approaches, communications network 126 is a private communications network, such as a cellular phone network, that does not include the Internet.

**[0060]** In yet other approaches, communications network 126 includes a private communications network and the Internet. For example, a cellular telephone or other mobile-device service provider may provide Internet access to its subscribers via a private communications network, or may provide media such as video clips or television programs to its subscribers via the Internet and its own network.

**[0061]** The aforementioned approaches for providing media may, in some embodiments, be combined. For example, a distribution facility 104 may provide a television-centric media delivery system, while also providing users' equipment (e.g., 108, 110 and 112) with access to other non-television-centric delivery systems provided by server 130. For example, a user's equipment may include a web-enabled set-top box or a television enabled PC. Distribution facility 104 may, in addition to television and music programming, provide the user with Internet access whereby the user may access server 130 via communications network 126. Distribution facility 104 may communicate with communications network 126 over any suitable path 134, such as a wired path, a cable path, fiber-optic path, satellite path, or combination of such paths.

**[0062]** Media guidance applications may be provided



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using any approach suitable for the type of media and distribution system for which the applications are used. Media guidance applications may be, for example, stand alone applications implemented on users' equipment. In other embodiments, media guidance applications may be client-server applications where only the client resides on the users' equipment. In still other embodiments, guidance applications may be provided as web sites accessed by a browser implemented on the users' equipment. Whatever the chosen implementation, the guidance application will require information about the media for which it is providing guidance. For example, titles or names of media, brief descriptions, or other information may be necessary to allow users to navigate among and find desired media selections.

**[0063]** In some television-centric embodiments, for example, the guidance application may be a stand-alone interactive television program guide that receives program guide data via a data feed (e.g., a continuous feed, trickle feed, or data in the vertical blanking interval of a channel). Data source 120 in system 100 may include a program listings database that is used to provide the user with television program-related 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.), program format (e.g., standard definition, high definition) and information on actors and actresses. Data source 120 may also be used to provide advertisements (e.g., program guide advertisements and advertisements for other interactive television applications), real-time data such as sports scores, stock quotes, news data, and weather data, application data for one or more media guidance applications or other interactive applications, and any other suitable data for use by system 100. As another example, data source 120 may provide data indicating the types of information that may be included in interactive media guidance overlays (e.g., at the request of the user, absent user modification, etc.).

**[0064]** Program guide data may be provided to user equipment, including user equipment located on home network 113, using any suitable approach. For example, program schedule data and other data may be provided to the user equipment on a television channel sideband, in the vertical blanking interval of a television channel, using an in-band digital signal, using an out-of-band digital signal, or by any other suitable data transmission technique. Program schedule data and other data may be provided to user equipment on multiple analog or digital television channels. Program schedule data and other data may be provided to the user equipment with any suitable frequency (e.g., continuously, daily, in response to a request from user equipment, etc.).

**[0065]** In some television-centric embodiments, guidance data from data source 120 may be provided to users' equipment using a client-server approach. For example, a guidance application client residing on the user's equipment may initiate sessions with server 140 to obtain guidance data when needed. In some embodiments, the guidance application may initiate sessions with server 140 via a home network server (e.g., a server located in home network 113 that supports the user equipment devices located in home network 113).

**[0066]** There may be multiple data sources (such as data source 120) in system 100, although only one data source is shown in FIG. 1 to avoid overcomplicating the drawing. For example, a separate data source may be associated with each of a plurality of television broadcasters and may provide data that is specific to those broadcasters (e.g., advertisements for future programming of the broadcasters, logo data for displaying broadcasters' logos in program guide display screens, etc.). Data source 120 and any other system components of FIG. 1 may be provided using equipment at one or more locations. Systems components are drawn as single boxes in FIG. 1 to avoid overcomplicating the drawings.

**[0067]** Data source 120 may provide data to distribution facility 104 over communications path 122 for distribution to the associated user equipment and home network 113 (discussed below) over paths 114, 116, 118, and 119 (e.g., when data source 120 is located at a main facility). Communications path 122 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 path that supports Internet communications, or other suitable path or combination of such paths.

**[0068]** In some television-centric and non-television centric approaches, data source 120 may provide guidance data directly to user equipment 108 over path 124, communications network 126, and path 128 (e.g., when data source 120 is located at a facility such as one of programming sources 102). In some embodiments of the present invention, data source 120 may provide guidance data directly to user equipment located on home network 113 (discussed below) over path'124, communications network 126, and path 139 (e.g., when data source 120 is located at a facility such as one of programming sources 102). Paths 124, 128, and 139 may be wired paths such as telephone lines, cable paths, fiber-optic paths, satellite paths, wireless paths, any other suitable paths or a combination of such paths. Communications network 126 may be any suitable communications network, such as the Internet, the public switched telephone network, or a packet-based network.

**[0069]** User equipment devices, including user equipment devices located on home network 113 (discussed below), such as user television equipment and personal computers, may use the program schedule data and other interactive media guidance application data to display program listings and other information (e.g., information on digital music) for the user. An interactive television program guide application or other suitable interactive media guidance application may be used to display the information on the user's display (e.g., in one or more



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overlays that are displayed on top of video for a given television channel). Interactive displays may be generated and displayed for the user using any suitable approach. In one suitable approach, distribution facility 104, server 130, or another facility, may generate application display screens and may transmit the display screens to user equipment for display. In another suitable approach, user equipment may store data for use in one or more interactive displays (e.g., program schedule data, advertisements, logos, etc.), and an interactive media guidance application implemented at least partially on the user equipment may generate the interactive displays based on instructions received from distribution facility 104, server 130 or another facility. In some embodiments of the present invention, user equipment may store only the data that is used to generate the interactive television displays (e.g., storing logo data for a particular television broadcaster only if the logo is to be included in one or more interactive television displays). In some embodiments of the present invention, user equipment may store data that is not necessarily used to generate the interactive television displays (e.g., storing advertisements associated with a particular television broadcaster that may or may not be displayed depending on, for example, the outcome of negotiations with the television broadcaster). Any other suitable approach or combination of approaches may be used to generate and display interactive overlays for the user.

**[0070]** In still other embodiments, interactive media guidance applications (television-centric and non-television centric) may be provided online as, for example, websites. For example, server 130 may provide an online interactive television program guide. As another example, user equipment 108 may be a mobile device, such as a cellular telephone or personal digital assistant (PDA). The mobile device may be web-enabled to allow the user to access an on-line guidance application (which may be modified from its original version to make it appropriate for a cellular phone). Alternatively, the mobile device may have an applet that communicates with server 130 to obtain guidance data via the Internet.

**[0071]** Server 130 may receive program schedule data and other data from data source 120 via communications path 124, communications network 126, and communications path 132 or via another suitable path or combination of paths. Path 132 may be a satellite path, fiber-optic path, wired path, or any other path or combination of paths. User equipment 108 may access the on-line interactive media guidance application and other sources from server 130 via communications path 128. User equipment 108 may also access the application and other services on server 130 via communications path 114, distribution facility 104, and communications path 134. For example, a cable modem or other suitable equipment may be used by user equipment 108 to communicate with distribution facility 104.

**[0072]** User equipment such as user television equipment 110, user computer equipment 112, and user equipment located on home network 113 may access the on-line interactive media guidance application and server 130 using similar arrangements. User television equipment 110 may access the on-line interactive media guidance application and server 130 using communications path 136 or using path 116, distribution facility 104, and path 134. User computer equipment 112 may access the on-line interactive media guidance application, and server 130 using communications path 138 or using path 118, distribution facility 104, and path 134. User equipment located on home network 113 may access the on-line media guidance application and server 130 using communications path 139 or using path 119, distribution facility 104, and path 134. Paths 136, 138, and 139 may be any suitable paths such as wired paths, cable paths, fiber-optic paths, wireless paths, satellite paths, or a combination of such paths.

**[0073]** In some embodiments, system 100 may support other interactive applications in addition to the interactive media guidance applications. Such applications may be implemented using any suitable approach. For example, the interactive applications may be implemented locally on the user equipment or in a distributed fashion (e.g., using a client-server architecture in which the user equipment serves at least partly, and for at least some of the time, as the client and a server, such as server 140 at distribution facility 104, server 130, or other suitable equipment acts as the server). Other distributed architectures may also be used if desired. Moreover, some or all of the features of the interactive applications of system 100 (including the media guidance application) may be provided using operating system software or middleware software. Such operating system software and middleware may be used instead of or in combination with application-level software. In yet other approaches, interactive applications may also be supported by servers or other suitable equipment at one or more service providers such as service provider 142. Regardless of the particular arrangement used, the software that supports these features may be referred to as an application or applications.

**[0074]** For example, an interactive application such as a home shopping service may be supported by a service provider such as service provider 142 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 such features to the user. The user equipment may access service provider 142 via distribution facility 104 and communications path 144 or via communications network 126 and communications path 146. Communications paths such as paths 144 and 146 may be any suitable paths such as wired paths, cable paths, fiber-optic paths, satellite paths, or a combination of such paths.

**[0075]** Another example of an interactive application is a home banking application. A home banking service



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may be supported using personnel at facilities such as service provider 142. An interactive home banking application that is implemented using the user equipment may access the home banking service via distribution facility 104 and communications path 144 or via communications network 126 and communications path 146.

**[0076]** If desired, an interactive media guidance application such as a network-based video recorder or a video-on-demand application may be supported using server 140, server 130, a home network server, or equipment at service provider 142. Video-on-demand content and video recorded using a network-based video recorder arrangement may be stored on server 140 or server 130 or a home network server or at service provider 142 and may be provided to the user equipment when requested by users. An interactive television program guide, for example, may be used to support the functions of a personal video recorder (sometimes called a digital video recorder) that is implemented using user equipment 108. Illustrative equipment that may be used to support personal video recorder functions include specialized personal video recorder devices, integrated receiver decoders (IRDs), set-top boxes with integrated or external hard drives, or personal computers with video recording capabilities.

**[0077]** Interactive applications such as media guidance applications (e.g., interactive television program guide applications and video-on-demand applications), home shopping applications, home banking applications, game applications, 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, games, video-on-demand services, home shopping services, network-based video recorder functions, personal video recorder functions, navigational functions, program guide functions, communications functions, and other suitable functions may be provided using one application or any other suitable number of applications. The one or more applications may display various overlays on user equipment including, for example, interactive television information on top of video for a given television channel.

**[0078]** Interactive television program guide applications, home banking applications, home shopping applications, network-based video recorder and personal video recorder applications, video-on-demand applications, gaming applications, communications applications, and navigational applications are only a few illustrative examples of the types of interactive media guidance and other applications that may be supported by system 100. Other suitable interactive applications that may be supported include news services, web browsing and other Internet services, and interactive wagering services (e.g., for wagering on horse races, sporting events, and the like). Interactive television overlays that are displayed by these applications may also be customized in accordance with the present invention.

**[0079]** Users may have multiple types of user equipment by which they access media and obtain media guidance. For example, some users may have home networks that are accessed by in-home and mobile devices. As shown in FIG. 1, home network 113 communicates with distribution facility 104 and server 130 over paths 119 and 139 (and, in the case of server 130, communications network 126). Such home networks 113 may be located, for example, in homes of users or distributed, for example, among homes of users. Home networks 113 may each include a plurality of interconnected user equipment devices, such as, for example user equipment devices 108, 110 and 112. In some embodiments, users may control in-home devices via a media guidance application implemented on a remote device. For example, users may access an online media guidance application on a website via a personal computer at their office, or a mobile device such as a PDA or web-enabled cellular telephone. The user may set settings (e.g., recordings, reminders, or other settings) on the on-line guidance application to control the user's in-home equipment. The on-line guide may control the user's equipment directly, or by communicating with a media guidance application on the user's in-home equipment.

**[0080]** FIGS. 2-6 show illustrative arrangements for user equipment. An illustrative set-top box-based arrangement for user equipment 110 is shown in FIG. 2. User television equipment 110 may be stand-alone or a part of home network 113 (FIG. 1). Input/output 202 may be connected to communications paths such as paths 116 and 136 (FIG. 1). Input/output functions may be provided by one or more wires or communications paths, but are shown as a single path in FIG. 2 to avoid overcomplicating the drawing. Television programming, program guide data, and any other suitable interactive media guidance application data or other data may be received using input/output 202. Commands and requests and other data generated as a result of user interactions with the interactive media guidance application may also be transmitted over input/output 202.

**[0081]** Set-top box 204 may be any suitable analog or digital set-top box (e.g., a cable set-top box). Set-top box 204 may contain an analog tuner for tuning to a desired analog television channel (e.g., a channel comprising television programming, interactive television data, or both). Set-top box 204 may also contain digital decoding circuitry for receiving digital television channels (e.g., channels comprising television or music programming, interactive television data, etc.). Set-top box 204 may also contain a high-definition television tuner for receiving and processing high-definition television channels. Analog, digital, and high-definition channels may be handled together if desired. Multiple tuners may be provided (e.g., to handle simultaneous watch and record functions or picture-in-picture (PIP) functions). Box 204 may be an integrated receiver decoder (IRD) that handles satellite



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television. If desired, box 204 may have circuitry for handling cable, over-the-air broadcast, and satellite content.

**[0082]** Set-top box 204 may be configured to output media, such as television programs, in a preferred format. Because television programs may be received in a variety of formats, set-top box 204 may contain scaler circuitry for upconverting and downconverting television programs into the preferred output format used by set-top box 204. For example, set-top box 204 may be configured to output television programs in 720p. In this example, the scaler circuitry may upconvert standard-definition television programs having 480 lines of vertical resolution to 720p format and downconvert certain high-definition television programs having 1080 lines of vertical resolution to 720p format.

**[0083]** Box 204 may include a storage device (e.g., a digital storage device such as a hard disk drive) for providing recording capabilities. Box 204 may also be connected to a recording device 206 such as a video cassette recorder, personal video recorder, optical disc recorder, or other device or devices with storage capabilities. In some embodiments, box 204 may be configured to record either standard-definition television programs or high-definition television programs. In some embodiments, box 204 may be configured to record both standard-definition television programs and high-definition television programs.

**[0084]** Set-top box 204 contains a processor (e.g., a microcontroller or microprocessor or the like) that is used to execute software applications. Set-top box 204 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 in box 204 or in recording device 206 may be used to back up data and to otherwise support larger databases and storage requirements than may be supported using random-access memory approaches. Hard disk storage in box 204 or in recording device 206 may also be used to store and back up program guide settings or saved user preferences.

**[0085]** Set-top box 204 may have infrared (IR) or other communications circuitry for communicating with a remote control or wireless keyboard. Set-top box 204 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.

**[0086]** Set-top box 204 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, or a wireless modem for communications with other equipment. Such communications may involve the Internet or any other suitable communications networks or paths. If desired, the components of set-top box 204 may be integrated into other user equipment (e.g., a television or video recorder).

**[0087]** Recording device 206 may be used to record videos provided by set-top box 204. For example, if set-top box 204 is tuned to a given television channel, the video signal for that television channel may be passed to recording device 206 for recording on a videocassette, compact disc, digital video disk, or internal hard drive or other storage device. In some embodiments, recording device 206 may be configured to record either standard-definition television programs or high-definition television programs. In some embodiments, recording device 206 may be configured to record both standard-definition television programs and high-definition television programs. Recording device 206 may have communications circuitry such as a cable modem, an ISDN modem, a DSL modem, or a telephone modem for communications with other equipment. Such communications may involve the Internet or any other suitable communications networks or paths. The components of recording device 206 may be integrated into other user equipment (e.g., a television, stereo equipment, etc.).

**[0088]** Recording device 206 may be controlled using a remote control or other suitable user interface. If desired, video recorder functions such as start, stop, record and other functions for device 206 may be controlled by set-top box 204. For example, set-top box 204 may control recording device 206 using infrared commands directed toward the remote control inputs of recording device 206 or set-top box 204 may control recording device 206 using other wired or wireless communications paths between box 204 and device 206.

**[0089]** The output of recording device 206 may be provided to television 208 for display to the user. In some embodiments, television 208 may be capable of displaying high-definition programming (i.e., HDTV-capable). If desired, multiple recording devices 206 or no recording device 206 may be used. If recording device 206 is not present or is not being actively used, the video signals from set-top box 204 may be provided directly to television 208. Any suitable television or monitor may be used to display the video. For example, if the video is in a high-definition format, an HDTV-capable television or monitor is required to display the video. In the equipment of FIG. 2 and the other equipment of system 100 (FIG. 1), the audio associated with various video items is typically distributed with those video items and is generally played back to the user as the videos are played. In some embodiments, the audio may be distributed to a receiver (not shown), which processes and outputs the audio via external speakers (not shown).

**[0090]** Another illustrative arrangement for user television equipment 110 (FIG. 1) is shown in FIG. 3. User television equipment 110 may be stand-alone or a part of home network 113 (FIG. 1). In the example of FIG. 3, user television equipment 110 includes a recording device 302 such as a digital video recorder (e.g., a personal video recorder (PVR)) that uses a hard disk or other storage for recording video. Recording device 302 may alternatively be a digital video disc recorder, compact disc recorder, videocassette recorder, or other suitable re-



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cording device. Equipment 110 of FIG. 3 may also include a television 304. In some embodiments, television 304 may be HDTV-capable. Input/output 306 may be connected to communications paths such as paths 116 and 136 (FIG. 1). Television programming, program schedule data, and other data (e.g., advertisement data, data indicating one or more television channels for which the display of an overlay is to be customized, etc.) may be received using input/output 306. Commands and requests and other data from the user may be transmitted over input/output 306.

**[0091]** Recording device 302 may contain at least one analog tuner for tuning to a desired analog television channel (e.g., to display video for a given television channel to a user, to receive program guide data and other data) and multiple other tuners may also be provided. Recording device 302 may also contain digital decoding circuitry for receiving digital television programming, music programming, program guide data, and other data on one or more digital channels. Recording device 302 may also contain circuitry for receiving high-definition television channels. If desired, recording device 302 may contain circuitry for handling analog, digital, and high-definition channels. Recording device 302 also contains a processor (e.g., a microcontroller or microprocessor or the like) that is used to execute software applications. Recording device 302 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 recording device 302 may be used to support databases (e.g., program guide databases or other interactive television application databases). The hard disk or other storage in recording device 302 may also be used to record video such as television programs or video-on-demand content or other content provided to recording device 302 over input/output 306.

**[0092]** Recording device 302 may have IR communications circuitry or other suitable communications circuitry for communicating with a remote control. Recording device 302 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 recording device is tuned.

**[0093]** Recording device 302 may also have communications circuitry such as a cable modem, an ISDN modem, a DSL modem, a telephone modem, or a wireless modem for communications with other equipment. Such communications may involve the Internet or other suitable communications networks or paths.

**[0094]** If desired, recording device 302 may include a satellite receiver or other equipment that has wireless communications circuitry for receiving satellite signals.

**[0095]** Recording device 302 of FIG. 3 or recording device 206 of FIG. 2 may record new video while previously recorded video is being played back on television 304 or 208. 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 302. When the user presses play, the recorded video may be played back. This arrangement allows the user to seamlessly pause and resume television viewing. Recording devices 302 and 206 may also be used to allow a user to watch a previously-recorded program while simultaneously recording a new program.

**[0096]** The set-top box arrangement of FIG. 2 and the personal video recorder with a built-in 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 204, recording device 302, a WebTV box, or PC/TV or the like may be integrated into a television or personal computer or other suitable device.

**[0097]** An illustrative remote control 400 for operating user television equipment 110 (FIG. 1) or suitable user computer equipment 112 is shown in FIG. 4. Remote control 400 is only illustrative and any other suitable user input interface may be used to operate user equipment (e.g., a mouse, trackball, keypad, keyboard, touch screen, voice recognition system, etc.). Remote control 400 may have function keys 402 and other keys 404 such as keypad keys, power on/off keys, pause, stop, fast-forward and reverse keys. Volume up and down keys 406 may be used for adjusting the volume of the audio portion of a video. Channel up and down keys 408 may be used to change television channels and to access content on virtual channels. Cursor keys 410 may be used to navigate on-screen menus. For example, cursor keys 410 may be used to position an on-screen cursor, indicator, or highlight (sometimes all generically referred to herein as a highlight or highlight region) to indicate interest in a particular option or other item on a display screen that is displayed by the interactive television application.

**[0098]** OK key 412 (sometimes called a select or enter key) may be used to select on-screen options that the user has highlighted.

**[0099]** Keys 402 may include RECORD key 414 for initiating recordings. MENU button 416 may be used to direct an interactive media guidance application to display a menu on the user's display screen (e.g., on television 208 or 304 or on a suitable monitor or computer display). INFO button 418 may be used to direct an interactive media guidance application to display an information display screen. For example, when a user presses INFO key 418 while video for a given television channel is displayed for the user, an interactive television program guide may display a FLIP/BROWSE overlay including program schedule information for the current program on the given television channel on top of the video. As another example, when a particular program listing in an interactive television program listings display screen is



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highlighted, the user pressing INFO button 418 may cause an interactive television program guide to provide additional program information associated with that program listing (e.g., a program description, actor information, schedule information, etc.).

**[0100]** LOCK button 420 may be used to modify access privileges. For example, a parent may use LOCK button 420 or on-screen options to establish parental control settings for the interactive media guidance application. The parental control settings may be time-based settings (e.g., to prevent a child from watching television during a particular time block, such as from 3:00 PM to 5:00 PM). The parental control settings may also be used to, for example, block programming based on rating, channel, and program title. A locked or blocked program (or other media) is typically not viewable until the interactive media guidance application is provided with a suitable personal identification number (PIN). Once this PIN has been entered, the interactive media guidance application will unlock the user's equipment and allow the locked content to be accessed.

**[0101]** EXIT button 422 may be used to exit the interactive media guidance application or to exit a portion of the interactive media guidance application (e.g., to cause an interactive television program guide to remove a FLIP, BROWSE, or other interactive television overlay from the display screen). GUIDE button 424 may be used to invoke an interactive television program guide (e.g., a program guide menu screen, program listings screen, or other program guide screen).

**[0102]** The keys shown in FIG. 4 are merely illustrative. Other keys or buttons may be provided if desired. For example, a music button may be used to access music with the interactive media guidance application. An edit button may be used to edit stored content (e.g., to remove commercials, remove portions of a video, etc.). Alphanumeric buttons may be used to enter alphanumeric characters. A last or back button may be used to browse backward in the interactive media guidance application (e.g., to return to a previous channel, web page, or other display screen). Video recorder function buttons such as a play button, pause button, stop button, rewind button, fast-forward button, and record button, may be used to control video recorder functions (local or network-based) in system 100 (FIG. 1). A help key may be used to invoke help functions such as context-sensitive on-screen help functions.

**[0103]** Illustrative user computer equipment 112 (FIG. 1) is shown in FIG. 5. User computer equipment 112 may be stand-alone or a part of home network 113 (FIG. 1). In the arrangement of FIG. 5, personal computer unit 502 may be controlled by the user using keyboard 504 and/or other suitable user input device such as a trackball, mouse, touch pad, touch screen, voice recognition system, or a remote control, such as remote control 400 of FIG. 4. Video content, such as television programming or web pages having video elements, and interactive media guidance application display screens may be displayed on monitor 506. Television and music programming, media guidance application data (e.g., television program guide data), video-on-demand content, video recordings played back from a network-based video recorder, and other data may be received from paths 118 and 138 (FIG. 1) using input/output 508. User commands and other information generated as a result of user interactions with the interactive media guidance application and system 100 (FIG. 1) may also be transmitted over input/output 508.

**[0104]** Personal computer unit 502 may contain a television or video card, such as a television tuner card, for decoding analog, digital, and high-definition television channels and for handling streaming video content. Multiple video cards (e.g., tuner cards) may be provided if desired. An illustrative television tuner card that may be used may contain an analog television tuner for tuning to a given analog channel, digital decoding circuitry for filtering out a desired digital television or music channel from a packetized digital data stream, and a high-definition television tuner for tuning to a high-definition channel. Any suitable card or components in computer unit 502 may be used to handle video and other content delivered via input/output line 508 if desired.

**[0105]** Personal computer unit 502 may contain one or more processors (e.g., microprocessors) that are used to run the interactive media guidance application or a portion of the interactive media guidance application.

**[0106]** Personal computer unit 502 may include a hard drive, a recordable DVD drive, a recordable CD drive, or other suitable storage device or devices that stores video, program guide data, and other content. The interactive media guidance application and personal computer unit 502 may use a storage device or devices to, for example, provide the functions of a personal video recorder.

**[0107]** User equipment, such as user equipment 108, user television equipment 110, user computer equipment 112, and user equipment located on home network 113 (FIG. 1), may be used with network equipment such as server 130, server 140, a home network server, and equipment at service providers such as service provider 142 of FIG. 1 to provide network-based video recording functions. Video recording functions may be provided by storing copies of television programs and other video content on a remote server (e.g., server 130 or server 140 or a home network server) or other network-based equipment, such as equipment at a service provider such as service provider 142.

**[0108]** Video recordings may be made in response to user commands that are entered at user equipment 108 or user equipment located on home network 113 (FIG. 1). In a personal video recorder arrangement, the interactive media guidance application may be used to record video locally on the user equipment in response to the user commands. In a network-based video recorder arrangement, the interactive media guidance application may be used to record video or to make virtual recordings (described below) on network equipment such as server



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130, server 140, a home network server, or equipment at service provider 142 in response to the user commands. The user commands may be provided to the network equipment over the communications paths shown in FIG. 1. The personal video recorder arrangement and the network-based video recorder arrangement can support functions.such as fast-forward, rewind, pause, play, and record.

**[0109]** To avoid unnecessary duplication in a network-based video recorder environment, system 100 may provide network-based video recording capabilities by using virtual copies or recordings. With this approach, each user may be provided with a personal area on the network that contains a list of that user's recordings. The video content need only be stored once (or a relatively small number of times) on the network equipment, even though a large number of users may have that video content listed as one of their recordings in their network-based video recorder personal area. Personal settings or any other suitable data may be stored in a user's personal area on the network.

**[0110]** The user television equipment and user computer equipment arrangements described above are merely illustrative. A more generalized embodiment of illustrative user equipment 108, 110, and 112 (FIG. 1) and user equipment located on home network 113 (FIG. 1) is shown in FIG. 6. Control circuitry 602 is connected to input/output 604. Input/output 604 may be connected to one or more communications paths such as paths 114, 116, 118, 128, 136, and 138 of FIG. 1. Media (e.g., television programming, music programming, other video and audio, and web pages) may be received via input/output 604 (e.g., from programming sources 102, servers or other equipment, such as server 130, service providers such as service provider 142, distribution facility 104, etc.). Interactive media guidance application data, such as program schedule information for an interactive television program guide, may be received from data source 120 via input/output 604. Input/output 604 may also be used to receive data from data source 120 for other interactive television applications. The user may use control circuitry 602 to send and receive commands, requests, and other suitable data using input/output 604.

**[0111]** Control circuitry 602 may be based on any suitable processing circuitry 606 such as processing circuitry based on one or more microprocessors, microcontrollers, digital signal processors, programmable logic devices, etc. In some embodiments, control circuitry 602 executes instructions for an interactive media guidance application or other interactive application (e.g., web browser) from memory. Memory (e.g., random-access memory and read-only memory), hard drives, optical drives, or any other suitable memory or storage devices may be provided as storage 608 that is part of control circuitry 602. Tuning circuitry such as one or more analog tuners, one or more MPEG-2 decoders or other digital video circuitry, high-definition tuners, or any other suitable tuning or video circuits or combinations of such circuits may also be included as part of circuitry 602. Encoding circuitry (e.g., for converting over-the-air, analog, or digital signals to MPEG signals for storage) may also be provided. The tuning and encoding circuitry may be used by the user equipment to receive and display, play, or record a particular television or music channel or other desired audio and video content (e.g., video-on-demand content or requested network-based or local video recorder playback). Television programming and other video and on-screen options and information may be displayed on display 610. Display 610 may be a monitor, a television, or any other suitable equipment for displaying visual images. In some embodiments, display 610 may be HDTV-capable. Speakers 612 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 610 may be played through speakers 612. In some embodiments, the audio may be distributed to a receiver (not shown), which processes and outputs the audio via speakers 612.

**[0112]** A user may control the control circuitry 602 using user input interface 614. User input interface 614 may be any suitable user interface, such as a mouse, trackball, keypad, keyboard, touch screen, touch pad, voice recognition interface, or a remote control.

**[0113]** Peripheral device 618 may also be connected to processing circuitry 606 over communications path 616. Peripheral devices may include cellular phones, personal data assistants, handheld media players, and any other suitable peripheral device. Communications path 616 may include for example, USB cables, IEEE 1394 cables, or wireless paths (e.g., Bluetooth, infrared). Processing circuitry 606 may provide content and data to peripheral device 618.

**[0114]** In some embodiments, user equipment device 108, 110, and 112 may comprise a peripheral device connected to a docking station. The display, speakers, user input interface, processing circuitry, and storage may be provided by the peripheral device. The docking station may allow the peripheral device to connect to input/output 604.

**[0115]** Processing circuitry 606 of user equipment device 108, 110, and 112 may further be coupled to identification system 620. Identification system 616 may be any suitable device for identifying a user in viewing vicinity of, or interacting with, a user equipment device. Such an identification system may increase or enhance a user's media viewing experience because there may be no need for the user to manually indicate the identity of the person viewing or interacting with the user device. Moreover, the identification system may enhance the user's ability to maintain or update personal user profiles (e.g., viewer history). An example of an identification system 616 may include a fingerprinting system, which may scan in a user a scanner (e.g., located on a remote control). Another example identification system 616 may include a retina scanner that is able to determine the identity of a user based on his or her retina. Yet another example



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of identification system 620 is a thermal imaging system that is able to identify a person based on his or her thermal profile. A further example of identification system 620 may include a motion sensor/camera system that takes a picture when a user trips the motion sensor. The picture may be cross-referenced with predetermined data (e.g., height and width) to ascertain the identity of the person or persons in the picture.

**[0116]** FIGS. 7, 8a, 8b, 8c, 9, and 10 show various illustrative home networks 113. The user equipment devices located on home network 113 may be able to share program data (such as program listings and program information), recorded content, program guide settings, and any other suitable data with other user equipment devices located on home network 113. Interactive television applications implemented on or accessible from user equipment devices located on home network 113 may be able to adjust program guide settings for interactive television applications implemented on or accessible from other user equipment devices located on home network 113.

**[0117]** FIG. 7 shows an illustrative home network 113 in accordance with the present invention. Home network 113 may include primary user equipment 702 and secondary user equipment 704, 706, and 708. Primary user equipment 702 may be connected to secondary user equipment 704, secondary user equipment 706, and secondary user equipment 708 via communication paths 710. Primary and secondary user equipment may each be any of user equipment 108, 110, and 112 (FIG. 1). Communications paths 710 may be any suitable communications path for in-home networks, such as wired paths, cable paths, fiber-optic paths, wireless paths, or a combination of such paths. Communications paths 119 and 139 may connect home network 113 to television distribution facility 104 (FIG. 1) and communications network 126 (FIG. 1), respectively, via primary user equipment 702. As shown, one or more pieces of secondary user equipment may be connected to primary user equipment 702 in a star configuration, if desired. User equipment devices may be located in different rooms within a home. For example, primary user equipment 702 may be placed in the parents' bedroom, secondary user equipment 708 may be placed in the children's room, secondary user equipment 704 may be placed in a living room, and secondary user equipment 706 may be placed in a guest room. With such an arrangement, the parents' bedroom may be used as a master location to adjust user settings for the program guides on the user equipment in the children's room and the other rooms.

**[0118]** FIG. 8a is a diagram of an illustrative home network 113 in which a plurality of user equipment are implemented in a tree configuration in accordance with the present invention. Home network 113 may include user equipment 802, 804, 806, and 808, which are connected to each of the others via communications paths 810. User equipment 802, 804, 806, and 808 may each be any of user equipment 108, 110, and 112 (FIG. 1). It should be understood by one skilled in the art that not all of user equipment 802, 804, 806, and 808 may include recording devices (e.g., recording device 206 (FIG. 2) and recording device 302 (FIG. 3)). Communications paths 810 may be any suitable communications path for in-home networks, such as wired paths, cable paths, fiber-optic paths, wireless paths, or a combination of such paths. Two or more pieces of user equipment may be connected in this way. Communications paths 119 and 139 may connect home network 113 to television distribution facility 104 (FIG. 1) and communications network 126 (FIG. 1), respectively, via user equipment 808. Although, as illustrated, communications paths 119 and 139 are connected to user equipment 808, it could be connected to any one or more of user equipment 802, 804, 806, or 808. The equipment mentioned above may be placed in various rooms within a home. For example, user equipment 802 may be placed in a parents' bedroom, user equipment 804 may be placed in a children's room, user equipment 806 may be placed in a living room, and user equipment 808 may be placed in a guest room. With the arrangement of FIG. 8a, each piece of user equipment on home network 113 may communicate with each other piece of user equipment on home network 113 over communications paths 810.

**[0119]** Peripheral device 814 may be connected to user equipment device 808, which may provide peripheral device 814 with content and data. It should be understood by one skilled in the art that one or more peripheral devices 814 may be connected to any user equipment device regardless of the configuration of the home network. In some cases, peripheral devices may act as user equipment devices in a home network. For example, the role of user equipment 804 may be limited to receiving data and content from user equipment 808. This role may be filled by a peripheral device (e.g., a handheld media player) that is configured to communicate with user equipment 808 over communications path 810.

**[0120]** FIG. 8a shows home network 113 connected in a tree topology. If desired, this level of interconnectivity may be achieved using communications paths that are arranged in a ring configuration (FIG. 8b), bus configuration (FIG. 8c) or other suitable topology. Any of these topologies may use the types of communications paths described in connection with the arrangement of home network 113 shown in FIG. 8a. Home network 113 that is arranged in a bus topology may include bus 812 to interconnect the pieces of user equipment on home network 113 and communications paths 119 and 139.

**[0121]** FIG. 9 shows an illustrative home network 113 based on a client-server architecture. Home network 113 may include server 902 and user equipment 904, 906, and 908. Server 902 may be connected to user equipment 904, 906, and 908 via communication paths 910. In some embodiments, server 902 may be embedded within one of the user equipment devices. Communications paths 119 and 139 may connect home network 113 to television distribution facility 104 (FIG. 1) and commu-



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nications network 126 (FIG. 1), respectively, via server 902. User equipment 904, 906, and 908 may each be any of user equipment 108, 110, and 112 (FIG. 1). User equipment 904, 906, and 908 and server 902 may be placed in various rooms within a home. For example, server 902 may be placed in a den, user equipment 904 may be placed in a children's room, user equipment 906 may be placed in a living room, user equipment 908 may be placed in a parents' room. Communication paths 910 may be any suitable communications path for in-home networks, such as wired paths, cable paths, fiber-optic paths, wireless paths, or a combination of such paths.

**[0122]** As in the examples of FIGS. 8a, 8b, and 8c, different communications path arrangements such as buses, rings and the like, may be used to interconnect a server and user equipment on home network 113 based on a client-server architecture.

**[0123]** FIG. 10 shows an illustrative configuration of home network 113 based on a single set-top box. Home network 113 may include set-top box 1002, optional recording device 1004, and televisions 1006, 1008, 1010, and 1012. Set-top box 1002 may be similar to set-top box 204 (FIG. 2) Recording device 1004 may be similar to recording device 206 (FIG. 2). Televisions 1006, 1008, 1010, and 1012 may be similar to television 208 (FIG. 2). Set-top box 1002 may be connected to recording device 1004 and televisions 1008, 1010, and 1012 via communication paths 1014. Recording device 1004 may be connected to television 1006. Set-top box 1002 and recording device 1004 may be within a single box. If desired, any combination of televisions with or without recording devices may be connected in a similar manner. The set-top box, recording device and televisions of FIG. 10 may be placed in different rooms within a home. For example, set top box 1002, recording device 1004 and television 1006 may be placed in a parent's bedroom, television 1008 may be placed in a children's room, and television 1010 may be placed in a living room, and television 1012 may be placed in a guest room. Communication paths 1014 may be any suitable communications path for in-home networks, such as wired paths, cable paths, fiber-optic paths, wireless paths, satellite paths, or a combination of such paths. Communications paths 119 and 139 may connect home network 113 to television distribution facility 104 (FIG. 1) and communications network 126 (FIG. 1), respectively, via set top box 1002.

**[0124]** FIGS. 11a, 11b, 11c, and 11d show illustrative configurations of connections between home networks and television distribution facility 104 (FIG. 1). Only one user equipment device is shown on the home networks in FIGS. 11b, 11c, and 11d to avoid over-complicating the drawings. However, the home networks shown in FIGS. 11a, 11b, 11c, and 11d may contain multiple pieces of user equipment configured as shown in FIGS. 7, 8a, 8b, 8c, 9, or 10.

**[0125]** FIG. 11a shows an illustrative configuration in which multiple homes are connected to a common server. Server 140 (FIG. 1) may be located at television distribution facility 104 (FIG. 1). Television distribution facility 104 may be at or may be one of private home, a commercial building, a network node, or other suitable structure that may be connected to a plurality of homes. In the example of FIG. 11a, server 140 is connected to user equipment 1110, 1112, 1114, and 1116 that is located in homes 1104, 1102, 1106, and 1108, respectively via communication paths 114 (FIG. 1). When multiple user equipment devices exist within a home, such as home 1109, as shown by devices 1118a and 1118b, each user equipment device may communicate with the server 140 independently via communication paths 119 (FIG. 1). Alternatively, only one device may communicate with server 140 while the other device communicates via a home network. In other words, in separate arrangements, there are any of 1) multiple connections to server 140 and each user equipment device communicates with server 140 independently with no need for an in-home network, 2) only one connection to server 140 and each user equipment device communicates with each other through an in-home network, or 3) each user equipment device communicates with server 140 and with each other through an in-home network.

**[0126]** As shown in FIG. 11b, the capabilities of server 140 (FIG. 1) may be provided using servers 1122 located at network nodes 1120. Servers, such as servers 1122, may be used instead of server 140 or may be used in conjunction with a server 140 located at television distribution facility 104 (FIG. 1). Servers 1122 may be connected to one or more user equipment 108 (FIG. 1). Servers 1122 may also be connected to one or more home networks, such as, for example home network 113 (FIG. 1).

**[0127]** As shown in FIG. 11c, user equipment in different homes may be connected by communications links. For example, user equipment 1136 may be connected to user equipment 1138 via link 1140.

Link 1140 may be a wired or wireless link. In this manner, home 1132 and home 1134 may share program guide settings and recorded content. Home networks located in different homes may also be interconnected in this manner. In some embodiments, a group of homes (i.e., more than two homes) may also be connected to share program guide settings and recorded content. A tree, ring, or bus configuration may be used to connect the group of homes.

**[0128]** As shown in FIG. 11d, user equipment in different homes may be connected via an outside server. For example, user equipment 1156 may be connected to user equipment 1158 via server 1150. Communication paths 1160 may be a wired or wireless path. In this manner, home 1152 and home 1154 may share program guide settings and recorded content. Home networks located in different homes may also be interconnected in this manner. In some embodiments, a group of homes (i.e., more than two homes) may also be connected to server 1150 to share program guide settings and recorded content. A tree, ring, or bus configuration may be used to



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connect the group of homes and server 1150.

**[0129]** In a home network, a user may wish to record television programming from any given user equipment device and view the recorded programming from another user equipment device located on the home network. For example, the user may access an interactive media guidance application implemented on user equipment located in the living room to record "American Idol". After the recording is completed, the user may access an interactive media guidance application implemented on user equipment located, for example, in the bedroom to access and view the recording of "American Idol".

**[0130]** However, the display and recording capabilities of the user equipment devices may differ. As a result, some user equipment devices in the home network may not be able to display content recorded by other user equipment devices in the home network. For example, a cellular phone and a high-definition digital video recorder may be part of two separate user equipment devices in a home network. The cellular phone cannot display recordings having a resolution greater than 160 x 100 pixels. Therefore, the cellular phone cannot display, for example, a recording of a high-definition television program on the digital video recorder. In addition, the cellular phone may also lack the bandwidth to download the high-definition recording in a reasonable amount of time.

**[0131]** In addition to supporting different resolutions and having different bandwidths, other capabilities that may differ among user equipment devices in a home network may include, for example, the types of media supported by the user equipment devices, the processing power of the user equipment devices, the ability of the user equipment devices to decode various video and audio formats, and any other suitable capabilities.

**[0132]** The present invention provides systems and methods for providing content, for example, interactive content or media content, for use in one or more home networks. Some of the interactive content may be provided in a "New to Me" context, which may identify content that has been previously viewed or recorded, or which may present information or otherwise perform an action based on identifying previously viewed content, in a flexible manner that optimizes a user's program guide and viewing experience. It may be especially important to keep track of and manage previously viewed content in a home network environment, where users typically interact with multiple different user devices in the home network on a regular basis. Management of content may be performed at different levels of specificity. In one embodiment of the invention, content may be managed at an individual level or at a device level within a particular home network. In another embodiment of the invention, content may be managed at the household level, or across multiple home networks. In yet another embodiment of the invention, content may be managed across multiple home networks, but with respect to an individual or a user device. Each of these aspects are discussed in further detail below, but in order to facilitate an understanding of the various embodiments, several terms, all of which are applicable to various embodiments of the present invention, are discussed first. A few of these terms include viewing history, interactive content, and media content.

**[0133]** The viewing history may represent a history of viewed, played, or displayed content. More particularly, viewing history, as defined herein includes, but is not limited to, a compilation of content that has been displayed, viewed, or played on at least one user device that is communicatively coupled to a home network. In other words, the viewing history is akin to logbook or profile that keeps track of content that has been viewed, played, recorded, or any combination thereof for a particular individual, device, or home network. Thus, a viewing history may be provided for individuals, user devices, and home networks.

**[0134]** The viewing history may provide a framework or guidelines that enables the interactive media guidance application to manage content. For example, if content is managed at the individual level, a viewing history may be specifically maintained for each individual that interacts with a device communicatively coupled to a home network. When a particular user accesses various user devices communicatively coupled to the home network, the interactive media guidance application may access the viewing history for that particular user to determine the content to be provided to the user device being used by that user. As another example, a viewing history may be maintained for a selected device that is communicatively coupled to a home network. In yet another example, a viewing history may be maintained for one or more home networks, or for an individual or device that is maintained across two or more home networks.

**[0135]** FIG. 12 shows several different types of content (also referred to as media content) that may be monitored for creating, modifying, or updating a viewing history in accordance with the principles of the present invention. As shown, FIG. 12 includes television programming 1202, music programming 1204, advertisements 1206, interactive media guide application content 1208, additional information 1210, and recorded programming 1212. Television programming 1202 may include content such as broadcast programming, recorded programming, pay-per-view programming, video-on-demand programming, near video-on-demand programming, streaming media programming, Internet accessible programming (e.g., programming that may be downloaded from the Internet or a website), or any other suitable television programming. Music programming 1204 may include music programming such as satellite radio, Internet radio, stored music files (e.g., .mp3 or .wav files), or any other music programming. Advertisements 1206 may include advertisements that are displayed as part of television programming viewed by a user (e.g., displayed at the beginning, middle, and/or end of the programming) or by interactive media guide applications in, for example, an overlay, a flip or browse overlay, a full screen overlay,



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a partial screen overlay, in an advertisement window or region, or as a banner advertisement, a targeted advertisement, a channel advertisement, a pop-up advertisement, an interactive advertisement, or any other suitable advertisement. Interactive media guidance application content 1208 may include, for example, a listing of programming, media guide display screens, a listing of recorded programming, or any other suitable interactive media guide content. Additional information 1210 may include, for example, any information from the Internet not previously described, or information stored in databases or servers accessible by the interactive media guidance system. Recorded programming 1212 includes any type of programming that has been recorded on physical media. It is understood that the various types of content shown in FIG. 12, and the discussion accompanying each type of content, that may be monitored for creating or updating a viewing history is not exhaustive, and that other types of content (e.g., media) not specifically discussed herein, or has yet to be developed, may be monitored.

**[0136]** FIG. 13 shows several monitors that may be used to track various aspects of the viewed or played content. Content viewed monitor 1302 may monitor which content (e.g., any of the content discussed above in connection with FIG. 12) has been viewed. For example, if the first season, fourth episode, of "Family Guy" is viewed, viewed content monitor 1302 may update the viewing history to reflect the fact that this particular episode of "Family Guy" has been viewed. If a particular advertisement is displayed, for example, by the interactive media guidance application, viewed content monitor 1302 may update a viewing history to reflect the fact that this particular advertisement has be displayed. Viewed content monitor 1302 may designate content as being viewed when at least a predetermined portion of the content has been viewed. For example, if a majority of the content (e.g., at least half of the length of the content) has been viewed, the content may be marked as having been viewed. Note that the predetermined viewing portion may vary depending on the type of content being viewed. For example, a user that begins playing a video-on-demand program, but stops play five minutes into the program (because he or she did not like the program) may result in monitor 1302 deeming this program as having been viewed. If desired a timestamp, indicating a date or time the content was last viewed may be stored in the viewing history.

**[0137]** Frequency monitor 1304 may monitor the number of times particular content has been viewed. For example, the number of times a television program or advertisement is viewed may be stored in the viewing history. In other approaches, frequency monitor 1304 may monitor the number of times a user requests or views, for example, previews or supplemental information such as information blurbs on various programming may be recorded in a viewer history.

**[0138]** Bookmark monitor 1306 may keep track of the program (e.g., television program) being viewed or a location in a program (e.g., a video-on-demand or a recorded program) being viewed when the user paused or stopped play. The following example illustrates a use of bookmarked information. Assume that a user is watching a recorded program on user equipment located in a first room, but stops play of the recorded program. The point at which the recorded program is stopped may be bookmarked. Further, assume that the user interacts with user equipment in the second room. The bookmark may enable the user equipment in the second room to resume play of the recorded program at point at which the user stop playback in the first room.

**[0139]** In some embodiments, in addition to or instead of creating or updating the viewing history using, for example, one of the monitors discussed above, the interactive media guidance application may allow a user to manually create or update a viewing history. For example, the interactive media guidance application may provide one or more display screens that allows a user to specify a viewing history for an individual, a device, or a home network. The display screens may be accessible from an option in a menu provided by the interactive media guidance application that the user may navigate to and select. In other embodiments, a user may be allowed to enter in the content they have viewed, or that they have little or no interest in viewing, at a site that is remote from the home network, but is communicatively coupled to the interactive media guidance system. For example, the user may create or update a viewing history on a website. At the website, the user may specify that they have seen all of the episodes of the first two seasons of the television series "24", or that they have viewed certain episodes of the show "Seinfeld." The user may also describe, among other things, the date that they last viewed specified content, or the frequency with which they have viewed specified content. After the information has been entered, it may be downloaded and incorporated into or supplant an existing viewing history.

**[0140]** FIG. 14 shows an illustrative screen 1400 provided by an Internet website in which users may manually specify their viewing history. Generally, allowing a user to manually specify or update certain components of their viewing history may be important to more accurately reflect their complete viewing history that has not automatically been captured by the interactive media guide application. This may be necessary for the entry of, for example, programming that a viewer watched prior to the installation of the interactive media guide application, or programming that a viewer watches in an environment outside of the interactive media guide application. Returning to FIG. 14, it will be understood that screen 1400 may also be provided locally by the interactive media guidance application. First, the user may specify a title or description of the previously viewed content in text field 1402. Aides such as an on-screen keyboard or voice dictation may be provided to assist the user in entering in this information into text field 1402. After entering in



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the title or description of the previously viewed content, the user may select button 1404 to look up the entered content in a database of all the available content. The interactive media guidance application may present either the content that matches the entered information, or a number of the closest matches, to the user in one or more additional screens. The user may then select the appropriate content, and that content may then be displayed in a format recognizable by the interactive media guidance application in text field 1402.

**[0141]** Alternatively, if the user is not familiar with the title or the description of the previously viewed content, the user may select button 1406 to search for content. In response to the selection of button 1406, the interactive media guidance application may provide the user with one or more screens for specifying various parameters or criteria for the previously viewed content. For example, the user may be provided with the opportunity to specify the genre of the content (which may be divided into a category and subcategory, such as movies and drama, television show and sitcom, sports and baseball, or advertisement and car commercial), the date the content was viewed, the channel on which the content was viewed, or additional qualifiers that further narrow the content (e.g., rating, actors). After the parameters are entered, the interactive media guidance application may perform a search based on the entered parameters and provide the user with an opportunity to select from the content that matches the entered parameters.

**[0142]** After identifying the previously viewed content, the user may have an opportunity to provide further details about the previously viewed content. For example, the user may enter in selection area 1408 the dates that the content was viewed (for determining the exact episodes of a television series that the user viewed), or the seasons that the content was viewed. Using drop-down menu 1410, the user may specify, among other things, how many times the content was viewed, how often the content was viewed (e.g., twice in the past week), the date the content was last viewed, how much of the content the viewer viewed (information that may be used by the bookmark monitor), etc.

**[0143]** When the user has specified the details about the previously viewed content, the user may specify the profile that should be updated by the manually entered previously viewed content. To do this, the user may type in the name of the user, device or household into text field 1412. If the user wants to make the manually entered content part of a new profile, the user may select button 1414. In response to selection of button 1414, the interactive media guidance application may prompt the user to enter in the name of the new profile, as well as any additional information associated with the new profile. The user may also select button 1416 to browse the available profiles and select the appropriate one. If the user wishes to update multiple profiles based on the entered information regarding previously viewed content, the user may identify a first profile, and then select button 1418 to add more user profiles. In response to selection of button 1418, the interactive media guidance application may prompt the user to enter in names of the additional profiles by direct entry or browsing the database of profiles.

**[0144]** After selecting in the desired profile or profiles to be affected by this information, the user may further specify whether the manually entered viewing history should be incorporated with the existing viewing history associated with the selected profile or profiles, or should replace the viewing history for the selected profile or profiles. If the user selects radio button 1420, the interactive media guidance application may add the entered viewing history into the existing viewing history for the selected profile or profiles. If the user selects radio button 1422, the interactive media guidance application may replace the existing viewing history for the selected profile or profiles with the entered viewing history.

**[0145]** The user may be provided with the opportunity to select how the manually entered content should affect different interactive content displays or functions provided by the interactive media guidance application where the "New to Me" feature is applicable. If the user selects checkbox 1424, the interactive media guidance application will take the manually entered viewing history into consideration in automatically generated displays of content (i.e., the manually entered content, such as advertisements or programming, will not be automatically displayed to the viewer) . If the user selects checkbox 1426, the interactive media guidance application will take the entered viewing history into consideration in automatic recording operations (e.g., in connection with the recording of a season of a television series). If the user selects checkbox 1428, the interactive media guidance application will take the entered viewing history into consideration when presenting recommendations. If the user selects checkbox 1430, the interactive media guidance application will take the entered viewing history into consideration when presenting search results. If the user selects checkbox 1432, the interactive media guidance application will take the entered viewing history into consideration when displaying visual indicators for listings of previously viewed or unviewed content, as will be discussed below in connection with FIGS. 19A-G. If the user selects checkbox 1434, the interactive media guidance application will take the entered viewing history into consideration when displaying visual indicators for displays of previously viewed or unviewed content, as will also be discussed below in connection with FIGS. 21A-H. If the user wishes to select all of the above options, the user may select checkbox 1436. If the user does not select any of checkboxes 1424-1436, the interactive media guidance application may apply the entered viewing history to the same functions specified for the existing viewing history, or according to a default rule, which will be described in connection with FIG. 22.

**[0146]** When a user has entered in the viewing history and the other above-described details concerning it, the



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user may submit this information to the website by selecting submit button 1438. The user may also clear the entered information, or cancel out of the function to enter a viewing history completely, by selecting clear button 1440 or cancel button 1442, respectively. Once the information has been submitted, it is processed, and the viewing history details and corresponding instructions, such as the interactive media guidance applications functions that should be affected by the entered viewing history, are transmitted in an appropriate format to the appropriate interactive media guidance system or systems. Alternatively, if the feature of manually entering a viewing history is provided by a local interactive media guidance system, the local interactive media guidance application may process and format the information and transmit it directly to the appropriate interactive media guidance system or systems.

**[0147]** FIG. 15 shows illustrative flow diagram 1500 for allowing a user to manually enter a viewing history of previous viewed content in accordance with the principles of the present invention. First, at step 1502, the interactive media guidance application allows a user to specify previously viewed content and details concerning the viewing of the specified content. At step 1504, the interactive media guidance application compiles a viewing history based on the information entered in by the user at step 1502. At step 1506, the user specifies a new or existing user, device or household profile to which the viewing history should be applied. At step 1508, the interactive media guidance application applies the viewing history specified at step 1502 to the profile specified at step 1506. At step 1510, the user specifies how the viewing history should affect the functionality of the interactive media guidance application. At step 1512, the interactive media guidance application updates its own functionality for the profile specified at step 1508 according the specification by the user at step 1510. More generally, it will be understood that steps 1504, 1508 and 1512 may occur after the user has submitted the information in steps 1502, 1506 and 1510 by, for example, selecting submit button 1438 in FIG. 14.

**[0148]** The viewing history may be stored on one or more databases, which may be either or both locally or remotely accessible by the user devices and/or home networks. In addition, as will be discussed in more detail below, profiles such as user profiles, device profiles, and/or home network profiles may also be stored on databases.

**[0149]** FIG. 16 is an illustrative block diagram of an illustrative home network 113 that shows user equipment devices 1602, 1604, 1606 and 1608 each being directly connected to a database 1612, which may store, among other things, viewing history data. Although a home network topology similar to that discussed in connection with FIG. 8a is being used to discuss a database that may store viewing history data, it will be understood that other home network configurations or topologies may be used such as those discussed in connection with FIGS. 8b-c, 9, 10, and 11. User equipment devices 1602, 1604, 1606 and 1608 may send viewing history data to and receive the same from the same database server via communication paths 1614, which may be any suitable communications path for in-home networks, such as wired paths, cable paths, fiber-optic paths, wireless paths, or a combination of such paths. The connection between and database 1612 and user devices 1602, 1604, 1606, and 1608 illustrates that the viewer history data is accessible by user devices communicatively coupled to the home network. Such accessibility may ensure that all user devices are properly configured to manage content according to, for example, a particular individual, a selected device, or home network.

**[0150]** Moreover, it will further be understood that FIG. 16 shows storing viewer history data for a given home network in a single database on a single, local, standalone server, which is accessible by all the user equipment devices in the home network is merely illustrative. A wide range of alternative arrangements exist for viewer history data. For example, the database may be stored at one of the user equipment devices in the home network (shown as database 1616); the database may be communicatively coupled to the home network as shown with database 1618, or it may be located in a remote location outside of the home network as shown with database 1620 (e.g., at a user equipment device or server within a different home network, at a distribution facility, a server, etc.). In other embodiments, the database may be split up or duplicated for redundancy or added performance, and distributed among any permutations of the previously described locations, or at other suitable sites for hosting such information, in any suitable manner. In addition, the database may, for example, be accessible by only a subset of the user equipment devices in the home network, either because the other user equipment devices lack a communicative coupling to the database, or because those other user equipment devices lack the proper authorization to access the particular database, user profile, or viewing history of interest. In those instances, the user equipment devices that do not have direct access to the database may establish communicative links with user equipment devices that can access the database.

**[0151]** The content may be identified using unique identifiers such as strings or numbers that are stored by the interactive media guidance system when the content is viewed by the user. In other embodiments, the interactive media guidance application may store the identifiers for all the content that a particular user has not previously viewed.

**[0152]** The interactive media guidance application may store viewing history in any number of ways. In some embodiments, when the viewer history of interest is stored at a location other than at the user equipment device in use, the user equipment may download and retain a locally cached copy of the viewing history. The interactive media guidance application may then make mod-



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ifications to the viewing history of the locally cached copy and then upload the updated viewing history to the externally located database at predefined intervals, on demand (e.g., in response to a request to furnish such information) or in response to a user action (e.g., logging out of the user equipment device), or by any other approach.

**[0153]** FIG. 17 shows several different types of interactive content that may be generated and displayed by the interactive media guidance application. As shown, FIG. 17 includes menus 1702, program listings 1704, recommendations 1706, search results 1708, advertisements 1710, and additional information 1712. Menus 1702 may include textual menus that enable users to navigate the various functions provided by the interactive media guidance application. Program listings 1704 may include display of available programming of any of the types previously mentioned. Such listings may be organized, for example, by channel, by date, by genre, by user-specified criteria, or by any other suitable manner. Recommendations 1706 may include any displays of recommendations by the interactive program guidance application to a user of available programming or other content for viewing or recording. Search results 1708 may include results of searches that are conducted by users, or automatically performed by the interactive media guidance application for available content. Advertisements 1706 may include the types of advertisement 1206 described in connection with FIG. 12. Finally, additional information 1712 may encompass any of type of information generated by the interactive media guidance application and not described above.

**[0154]** Content management at the individual level is now described. Managing content on an individual basis within a home network may enable the media guidance system to provide interactive content that is specific to each user regardless of which user device the user uses. Individualized content management offers many advantages that enhance a particular user's media guidance application experience. For example, when a first user views a particular program (e.g., a television show) in the living room, the system may update a viewing history for the first user, to reflect the fact that the first user has viewed that particular program. Thereafter, when the first user retires to the bedroom (or any other room having a user device communicatively coupled to the home network), and decides to watch another program, the system may omit the listing of the particular program that the first user viewed in the living room from a listing of programs that may be displayed on a user device in the bedroom. By contrast, if a second user accesses the user device in either the living room or the bedroom and has not viewed the particular program viewed by the first user, the system may display the particular program in a listing for the second user. It is understood that the references to living room and bedroom are merely illustrative and are not intended to be limiting. It is further understood that the system is not required to omit the particular program from a listing of programs, but that this is one of many different ways in which content can be displayed. For example, the particular program listing may be "specially" presented to indicate that the particular program has been viewed by the first user or additional information (e.g., information indicating the particular program was date last viewed) may be displayed in connection with the particular program listing. Additional examples for different ways content may be displayed are discussed in connection with the description accompanying FIG. 17.

**[0155]** Another advantage of individualized content management may be applied to settings or preferences. For example, any settings a particular user sets at any of the user devices can automatically be applied to all user devices coupled to the home network. Thus, there is no need for the particular user to manually define any desired settings for each user device coupled to the home network. Moreover, whenever the particular user changes a setting on one of the user devices, the updated settings may be applied to all user devices without requiring additional user input. Such settings may be stored, for example, as part of a user profile. It is noted that the viewing history, which may include settings, may be stored as part of a user profile.

**[0156]** FIG. 18a shows illustrative flow diagram 1800 for displaying interactive or media content based on the viewing history for an identified user using a user device communicatively coupled to a home network. At step 1802, the identity of a user using a user device communicatively coupled to a home network is determined. In one embodiment, the identity of a user may be determined when the user selects a user profile. Referring briefly to FIG. 19, an illustrative user profile selection screen 1900 is shown. Display screen 1900 may be displayed in response to the selection of a button or buttons on a remote control or by navigating a highlight in an interactive media guidance application means to select an option that causes screen 1900 to be displayed. Screen 1900 may include user profile selection area 1902, user profile create button 1904, user profile delete button 1906, and user profile modify button 1908. It is understood that the contents of screen 1900 are merely illustrative and that additional buttons and other selectable features may be added, and that various features may be omitted.

**[0157]** User profile selection area 1902 may include a highlight region 1910 and user profile buttons 1912, 1914, and 1916. User profile buttons 1912 correspond to user profiles created for a particular individual (shown as Mom and Mary). User profile button 1914 corresponds to a user profile created for a group of individuals (shown as Family). For example, a group profile may be selected when both Mary and Mom are viewing programming. User profile button 1916 corresponds to an anonymous or guest user (shown as Guest). For example, button 1916 may be selected when a user does not have a profile or wishes to view programming without having his or her interactions with the media guidance application moni-



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tored as part of a specified individual or group profile. The interactive media guidance application may allow the user to navigate highlight region 1910 to one of user profile buttons 1912, 1914, and 1916 and select the highlighted user profile button. When the user selects one of the user profile buttons 1912, 1914, and 1916, the identity or identities of the user or users, or whether the user is anonymous, is determined.

**[0158]** The interactive media guidance application may further allow the user to navigate highlight region 1910 to user profile create button 1904, user profile delete button 1906, or user profile modify button 1908, and if desired the user may select a highlighted button. Selection of user profile create button 1904 may cause the interactive media guidance application to display one or more setup screens for the purpose of creating a new user profile. Selection of user profile delete button 1906 may cause the interactive media guidance application to delete a specified user profile that has been created. In some embodiments, in response to the selection of the user profile delete button 1906, the interactive media guidance application may position highlight region 1910 on one of user profile buttons 1912 in user profile selection area 1902 to allow the user to select the user profile that the user would like to delete. Selection of user profile modify button 1904 may cause the interactive media guidance application to display one or more setup screens for the purpose of modifying an existing user profile.

**[0159]** Referring back to FIG. 18a, an identification system may be used in addition to, or in lieu of, the user profile selection screen 1800 to perform step 1802 of determining the identify of the user. An identification system (e.g., system 620 of FIG. 6) may enable the interactive media guidance application to intelligently identify the user or users using the user device communicatively coupled to the home network. For example, the identification system may perform fingerprinting, retinal or thermal scanning in order to determine the user and load the corresponding user profile.

**[0160]** At step 1804, the viewing history of the identified user is provided. As discussed above, the viewing history may be stored on a database that is communicatively coupled to a user device being used by the identified user, If desired, the viewing history may be stored in a user profile associated with the identified user and it is the user profile that is stored on the database. In some embodiments, the user profile and/or viewing history information for a user may be made publicly or privately available to some or all user equipment devices within or outside of a home network.

**[0161]** The interactive media guidance system may identify all the user equipment devices in a home network or elsewhere that are using the same user profile in order to provide up-to-date information on the viewing history of the identified user. In some embodiments, for example, an interactive media guidance application at a user equipment device on which a user has logged in (e.g., selected a user profile) or has been identified by an identification system may make a determination as to which, if any, user equipment devices in the home network are using the same user profile, and then proceed to communicate directly with those user equipment devices. In other embodiments, whenever the one or more databases for storing viewing history data and/or user profiles receive updated data, the database or databases may automatically communicate the entire updated viewing history and/or user profile, or only the updated portion of the viewing history and/or user profile to those other user equipment devices having viewing history data and/or user profile data for the identified user.

**[0162]** At step 1806, interactive content is generated based on the viewing history of the identified user for display on user equipment that is communicatively coupled to the home network. Interactive content generally refers to any type of display screen or series of screens such as menus, prompts, listing of programming, etc., that are generated by the interactive media guidance application and that either prompt or are the result of user interaction. In some embodiments, for example, the interactive media guidance application may generate (based on the viewing history) a listing of programming in which the media content (e.g., television programming) that the identified user has previously viewed, or at least has identified as being viewed, from the list. The listing may be a favorites listings, a recommendation listing, or a search results listing of programming.

**[0163]** The various parameters or monitors for a viewing history may be further used in the determination of whether to display previously viewed content. If desired, the interactive media guidance application may define or allow the user to define thresholds for determining whether programming or other content should actually be displayed even though it has been previously viewed. For example, a user may instruct the interactive media guidance application not to remove content from generated displays of interactive content unless, for instance, the content was viewed before a specified date or viewed within a range of dates, or unless the content was viewed at least a specified number of times or within a range of times. In other embodiments, the interactive media guidance application may define or allow the user to define a set of weighted criteria, including whether the user has previously viewed the media content, for determining whether to remove the previously viewed content from displayed interactive content.

**[0164]** The feature of removing from displays of interactive content the media that the user has previously viewed has numerous applications. For example, an interactive media guidance application may use the information regarding the media content that a user has already viewed to modify the list of programs that it may actively recommend a user to watch or record on the basis of, among other things, preferences that have been specified by the user. In other embodiments, the interactive media guidance application may remove from a



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search conducted by the user for particular media content or categories of media content the media that the user has previously seen. In still other embodiments, the interactive media guidance application may, automatically or in response to user input, filter and remove from displays of program listings of future programming the media content which the identified user has previously viewed.

**[0165]** In yet other embodiments, the interactive media application may provide results of a search including only the programming the user has not seen. For example, if the user searches for content on Lucille Ball and the entire "I LOVE LUCY" collection (e.g., all 300 episodes) is available on a VOD server, the media application may display listings for the programs the user has not seen. That is, the media application may not display all 300 episodes if the user has seen, for example, 230 of them. More generally, it will be understood that the interactive media guidance application may remove any type of content from any of the types of interactive content defined in FIG. 17 if the content has been previously viewed.

**[0166]** It will be understood that the above-described embodiment of the present invention may be applied to various home network environments. In one illustrative example, a user who has viewed television programming at a user equipment device in one room of their home may not be interested in viewing the same programming again, regardless of the user equipment device which the user is using. To solve this, the present invention allows the user to simply create a user profile for himself or herself, and then select the user profile at any user equipment device in the home network prior to using the user equipment device.

**[0167]** Besides using a user's viewing history to remove previously viewed media content from displays of interactive content, the interactive media guidance application may remove previously viewed media content from displays of media content, as in specified in step 1806 of FIG. 18a. In some embodiments, advertisements (e.g., commercials) or other forms of promotional media, such as previews of television programs or movies, that a given user has already seen may be suppressed from display and substituted with advertisements that the user has not yet seen. As a result, this feature may help advertisers better attract potential buyers of their products. One scenario in which this feature may be particularly beneficial is with serial advertisements, which are a set of advertisements that, when strung together, are designed to tell a story. Such advertisements may be played sporadically and not in any particular order. By presenting a user with only those advertisements that he or she has not previously seen, then, the interactive media guidance application helps viewers to view all of the different individual advertisements within a given set of serial advertisements, and thus be able to piece together the underlying storyline behind the advertisements.

**[0168]** The interactive media guidance application may provide further support for situations where a user decides to operate a user equipment device in a home network without first selecting a user profile. Some users may not want to go through the burden of choosing a user profile prior to using the user equipment device. In such cases, the interactive media guidance system may, for example, add the programs that the anonymous user has viewed to the viewing history of all of the stored user profiles for the home network. In other embodiments, the interactive media guidance system may provide one or more setup screens for handling the viewing history of anonymous users. The setup screens may provide options that allow a user to specify explicitly those user profiles that are to include the viewing history of anonymous users.

**[0169]** In some embodiments, the interactive media guidance application may generate displays of previously viewed content using predetermined criteria. For example, the interactive media guidance application may rank previously viewed programs and display the programs based on their ranking. A more detailed discussion of ranking is discussed below in connection with FIG. 20.

**[0170]** In some embodiments, the interactive media guidance application may support identification of multiple users viewing a user device that is communicatively coupled to a home network. FIG. 18b shows illustrative flow diagram 1810 of an embodiment that supports multiple user identification in accordance with the principles of the present invention. Beginning at step 1812, the identity of a plurality of users viewing content on a particular user device that is communicatively coupled to a home network is determined. The identity of the users may be determined based on selection of multiple user profiles or by an identification system (e.g., identification system 612 of FIG. 6). At step 1814, the content (e.g., television programming) being viewed on the user device is monitored. At step 1816, a viewing history of each identified user is updated.

Such updating enhances content management for each user because the viewing history for each user now reflects the fact that the particular program has been viewed by the identified users. For example, after a group of users watch a recording of the movie "When Harry Met Sally," a future generated list of recorded programing may not display the "When Harry Met Sally" program listing.

**[0171]** Content management at the user device level is now described. Managing content on a user device level within a home network may enable the media guidance system to provide interactive content that is based on the content viewed at a selected user device. In one embodiment, a selected user device may be treated as the master and the other user devices be treated as slaves. In a master/slave arrangement, the viewing history may be created, modified, or updated based on the content viewed at the master user device. Thus, the interactive content generated for display on both the master and slave devices is based on the viewing history of the master user device.



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**[0172]** FIG. 18c shows flow diagram 1820 to illustrate content management at the user device level in accordance with the principles of the present invention. At step 1822, one of several user devices that are communicatively coupled to a home network is selected. For example, the interactive media guidance application may allow the user to select a desired user device by selecting a user device profile. As another example, hardware protocols (e.g., bios settings) may be configured to select a particular user device. At step 1824, a viewing history for the selected user device may be provided. At step 1826, the interactive media guidance application may generate interactive content based on the viewing history of the selected user equipment for display on user equipment communicatively coupled to the home network.

**[0173]** Content management at the home network level and across multiple home networks is now described. Managing content on a home network level enables the media guidance system to provide interactive content that is based on the content viewed at any one of several user devices communicatively coupled to a home network. In this arrangement, whenever an item of programming is viewed on a user device that is communicatively coupled to the home network, that program may not be presented in a listing of programming on that particular user device, nor any other user device that is communicatively coupled to the home network. It will be understood that this arrangement can be contrasted to the master/slave arrangement as discussed above in connection with FIG. 18c. In fact, this arrangement is akin to master/master relationship, where each user device communicatively coupled to the home network may manage content. For example, assume that a home network is communicatively coupled to three different user devices. If "Superman" is viewed on a first user device, a viewing history for the home network may be updated to reflect this viewing event. Thus, none of the user devices may display "Superman" in a listing of programming. If "Wonderwoman" is viewed on a second user device, the viewing history for the home network is updated to reflect this viewing event. Again, none of the user devices may display "Wonderwoman" in a listing of programming.

**[0174]** FIG. 18d shows illustrative flow diagram 1830 managing content based on the viewing history at home network. At step 1832, a plurality of user devices that are communicatively coupled to a home network is provided. At step 1834, a viewing history for the home network is provided. At step 1836, interactive content based on the viewing history of the home network is generated for display on all of the user devices that are communicatively coupled to the home network.

**[0175]** Managing content across two or more home networks may enable the media guidance system to provide interactive content that is based on the content viewed at a selected home network or viewed at each home network. For example, a user may have a first home network (e.g., located at his or her house) and a second home network (e.g., located at his or her vacation house). In one embodiment, which assumes that the first home network is the selected home network, any item of programming that is viewed at the first home network may not be presented in a listing of programming at the second network. In another embodiment, assuming that none of the home networks are selected, any item of programming viewed at the first network may not be presented in a listing of programming at the second network, and any item of programming viewed at the second network may not be presented in a listing of programming at the first network.

**[0176]** FIG. 18e shows illustrative flow diagram 1840 for displaying interactive content based on the viewing history of a selected home network in accordance with the principles of the present invention. At step 1842, a home network is selected out of at least two home networks that are communicatively coupled to each other. At step 1844, a viewing history is provided based on the selected home network. At step 1846, interactive content based on the viewing history of the selected home network is generated for display at each home network.

**[0177]** It is understood that in cross-coupled home network arrangements (e.g., see FIGS. 11c and 11d), a selected user device or an identified user may determine the interactive content that is generated for display for user devices communicatively coupled to the cross-coupled home networks.

**[0178]** The foregoing discussion of managing content across multiple home networks illustrates the ability to share a viewing history for a particular home network with external user equipment devices or home networks. This concept may extend to the user-level and device-level aspects of the present invention as well. For example, a user at a user equipment device that is outside of a home network may still access the profile for a particular user or device within the home network, provided that the user equipment device is communicatively coupled to the home network. In this manner, a user spending time at their vacation house may access a user or device profile from their regular house, which may have a more complete viewing history for the user and therefore be more desirable.

**[0179]** FIG. 20 shows illustrative flow diagram 2000 for displaying ranked interactive content based on a predetermined criteria that is applied to previously viewed programming. At step 2002, the interactive media guidance application may assign rankings to some or all of the previously viewed media (e.g., an episode of a television series, a movie, or an advertisement) based on one or more criteria. In some embodiments, the interactive media guidance application may rank previously viewed media on the sole basis of when the media was last viewed. In other embodiments, the interactive media guidance application may assign a cumulative ranking to each previously viewed media based on a number of criteria that may include when the media was last viewed, how frequently the media was viewed, and any particular preferences that the user has specified for the media. The



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criteria may be weighted in determining the ranking for the particular media that has been previously viewed. Parameters such as the different criteria for determining the ranking of previously viewed media, whether or not they are weighted, the particular weightings for each of the different criteria, and the specific media or types of media to actually apply the ranking to may be preset by the interactive media guidance application in an optimized fashion, or may be customized by the user and for each user profile, using for example a display screen provided by the interactive media guidance application for specifying such settings.

**[0180]** After rankings have been applied to the previously viewing media, the interactive media guidance application may, at step 2004, display interactive content or media content based on the assigned rankings. By default, unviewed content may be ranked higher than previously viewed content. In some embodiments, previously viewed media content that was more recently viewed or that has been viewed more often, for example, may be ranked lower, and as a result may be less likely to be displayed, or may be displayed lower in a ranked list of interactive content. In other embodiments, previously viewed media content that has been ranked may be displayed in interactive content based on a color gradient that corresponds with the ranking of the previously viewed content. In this manner, interactive listings for content that has been viewed more recently or that has been viewed more frequently may appear brighter or more intense than interactive listings for less recently or less frequently viewed content, or vice-versa. In still other embodiments, the viewing history for previously viewed media content, such as the date that the content was last viewed, or the number of the times that the content was viewed, may be displayed in the interactive content generated by the interactive media guidance application.

**[0181]** Media content may similarly be displayed based on rankings of previously viewed content. In some embodiments, advertisements or promotional media that were more recently or more frequently viewed than other available media content may be less likely to be displayed.

**[0182]** FIGS. 21A-F show illustrative content 2100 that may be generated and displayed by the interactive media guidance application based on a viewing history for an identified user, a selected device, or a home network in accordance with the present invention. In particular, FIGS. 21A-F show different illustrative visual indicators that may be used by the interactive media guidance application to represent displays and/or listings of previously viewed content. In FIGS. 21A-F, display screen 2100 may include selectable advertisement 2102, selectable pay-per-view ("PPV") advertisement 2104, picture-in-guide ("PIG") screen 2106, and program listings 2108, 2110, 2112 and 2114. Advertisements 2102 and 2104 may be referred to as selectable advertisements because the user can select the advertisements, and in response, the user may be provided with an opportunity to order the advertised product, may be automatically directed to the advertised show, etc.

**[0183]** In FIG. 21A, program listing 2108 for the movie "Matrix" is displayed with a watched icon to indicate that the movie has been previously viewed. In FIG. 21B, program listing 2110 for the movie "Top Gun" is displayed with text indicating that the movie was last viewed on October 26, 2005. In FIG. 21C, program listing 2112 for the movie "X-Men" is shaded to denote that the movie has been previously viewed. As described above in connection with FIG. 20, the brightness or color of program listing 2112 may vary based on factors such as, for example, the date that the content corresponding to the program listing was last viewed, how often it was viewed, etc. In FIG. 21D, program listing 2114 for episode three from season one of the television series "Entourage" is displayed with textual information describing that the particular episode has been viewed two times. In FIG. 21E, selectable advertisement 2102 and selectable PPV advertisement 2104 may include visual indicators to denote that either the particular advertisement or the advertised content has been previously viewed. For example, as shown in FIG. 21E, selectable advertisements 2102 and 2104 may be displayed with the circle icon with the letter "W" to denote that either the particular advertisement, or the advertised content has been previously viewed. Different visual indicators may be used to distinguish for the viewer when advertisements themselves have been previously viewed from when the content being advertised has been viewed. In FIG. 21F, PIG screen 2106 may also display an indicator that content has been previously viewed when, for example, a user selects one of the program listings 2108, 2110, 2112, or 2114 or one of selectable advertisements 2102 or 2104 using highlight region 2118, and media content relating to the selected listing or advertisement is displayed in the PIG.

**[0184]** In some embodiments, the interactive media guidance application may display visual indicators to denote that content is "New to Me" instead of or in addition to displaying visual indicators to denote previously viewed content, as is shown in FIGS. 21A-F. As will be explained below in connection with FIG. 22, the decision to display visual indicators for unviewed versus viewed content may be set by the user. If this preference has not yet been specified by the user, the interactive media guidance application may by default (i.e., according to a default rule either chosen by the user or defined by the interactive media guidance system) display visual indicators in accordance with one of the above-described alternatives. If the interactive media guidance application is in fact configured to display visual indicators for previously unviewed content, visual indicators similar to those described above may be employed. For example, a rectangular icon with the word "New to Me", or a circular icon with the letters "NM" may be used to denote content that is new to the viewer, according to the particular user, device or household profile that has been loaded. Alternatively, the previously unviewed content (e.g., program



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listing, advertisement, or PIG screen content) may be shaded to indicate that it is new. The shading for previously unviewed content may be purposely set to be a different color or level of brightness from the shading for previously viewed content to make it easier for a user to distinguish the two types of content when, for example, the user desires to view different visual indicators for both unviewed and viewed content. Also, any combination of the visual indicators described above may be used to denote unviewed or viewed content. For example, the interactive media guidance application may apply shading to represent previously unviewed or viewed content within the program listing portion of a display screen, and then apply the circular icons to the advertisement, PIG or other areas of the display screen where previously unviewed or viewed content may be presented. The actual visual indicators that are to be employed for the different areas of a display may be specified either by the user or by the interactive media guidance system. Moreover, it will be generally understood that the visual indicators described in FIGS. 21A-F are only illustrative and not intended to be limiting, and that other forms of indicators appropriate for interactive media guidance applications may be used to represent unviewed or viewed content.

**[0185]** FIG. 21G shows an illustrative screen in which previously viewed content has been ranked according to predetermined criteria. Here, it will be assumed program listings 2108, 2110, 2112 and 2114 all correspond to previously viewed content, and are ranked according to the date that the content was last viewed. The interactive media guidance application may' rank the most recently viewed program first, and thus display the most recently viewed program on the top of the display. Alternatively, the user may specify, or the interactive media guidance application may automatically set, a different order in which the previously viewed content should be ranked. Also, as discussed above, the ranking may be determined based on a weighted combination of criteria that again may be specified by the user or automatically set by the interactive media guidance application. Therefore, if, for example, program listings 2108, 2110, 2112 and 2114 were ranked on the basis of not only when the content represented in the listings was last viewed, but also how many times the content was viewed, it is entirely possible that program listing 2110 for "Top Gun" may not be the highest ranked program listing, and thus would not be displayed. Also, it will be understood that the indicators that are displayed in a ranked list do not necessarily have to correspond to the way in which the content is being ranked. For example, as will be explained below in connection with FIG. 22, the user may specify that visual indicators for identifying the frequency with which previously viewed content was viewed be used, and then separately specify that the criterion of when content was last viewed be used to rank such content.

**[0186]** FIG. 21H illustrates the use of "New to Me" visual indicators to denote content that has been previously viewed, where the previously viewed content corresponds to reruns or repeats of television program episodes (i.e., episodes that have aired at least once in the past). FIG. 21H shows a display screen 2150 that may include selectable advertisement 2152, selectable PPV advertisement 2154 and PIG screen 2156. Display screen 2150 also includes program listings 21.58, 2160, 2162 and 2164 that each correspond to an episode of a television series. Each of program listings 2158, 2160, 2162 and 2164 may be selected using highlight region 2166.

**[0187]** It is seen in FIG. 21H that program listings 2158, 2160, and 2164 are all indicated as being reruns. However, "New to Me" indicators 2168 are displayed only in connection with program listings 2160 and 2164, meaning that although the episodes identified by program listings 2160 and 2164 -- Season 1, Episode 9 of Prison Break and Season 1, Episode 3 of Entouragehave presumably aired before, depending on the profile that has been loaded, those reruns have not been previously viewed by the corresponding viewer, device or household.

**[0188]** This example emphasizes the usefulness of the "New to Me" feature applied to television shows that have been airing for a considerable amount of time, or that are otherwise in syndication. When a particular episode of a television program is a rerun, the listing of, or the detailed program schedule information for the episode typically indicates that the episode is a rerun, suggesting to a viewer that they have already watched the episode. However, viewers who have only begun to consistently watch the television program often have not seen many of the reruns. It is not until the viewers start watching more episodes of the program that the episodes that are flagged as reruns actually correspond to episodes that the viewer has seen. These repeat indicators are thus at least initially of little use to viewers who did not begin to watch a television series from the outset, when the program first started airing. Compounding this problem is the fact that repeat indicators can sometimes be inaccurate. By enabling users to maintain a viewing history for a viewer, device or household, then, the "New to Me" feature alleviates these problems by keeping track of the precise episodes of the programs that have been previously viewed.

**[0189]** FIG. 22 shows an illustrative menu screen 2200 that allows a user to activate, deactivate and configure the "New to Me" feature at will. In some embodiments, menu screen 2200 may be presented to a user, by default, immediately preceding or following the display of profile selection screen 1900 shown in FIG. 19. Menu screen 2200 may also be generally designed to be accessible at any time by pressing a corresponding "New to Me" function button on the remote control, or by selecting a "New to Me" function button displayed on any display screen generated by the interactive media guidance application. In particular, screen 2200 may include buttons 2202, 2204, 2206 and 2208. It is understood that



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the contents of screen 2200 are merely illustrative and that additional selectable features may be added, and that existing features may be omitted.

**[0190]** Button 2202 allows a user to run the "New to Me" feature on specific content. Thus, button 2202 may be selected when a user is interested in invoking the feature only on content for which the user believes that it worth identifying whether the content has been previously viewed. In response to selection of button 2202, the user may be presented with another screen for specifying the type or types of content that the user wishes to invoke the "New to Me" feature on. For example, the user may specify to invoke the feature only on advertisements, or on specific television programs, or on specific genres of movies. Any suitable type of display screen for entering in such information may be provided by the interactive media guidance application.

**[0191]** Button 2204 enables a user to run the "New to Me" feature on specific functions or interactive content provided by the interactive media guidance application. In response to selection of button 2204, the interactive media guidance application provide one or more display screens in order to allow the user to select the type of functions or interactive content that the "New to Me" feature should impact. For example, the user may choose to turn on the "New to Me" feature only with respect to menu displays, program listing displays, recommendations, search results, automatic displays of advertisements or other content, any combination of these functions or interactive content, or any additional types of functions or interactive content supported by the interactive media guidance application for which the "New to Me" feature is applicable. The amount of user control may be even more refined in that a user may choose that, for each type of applicable function, a different "rule" be provided. The different available rules may include not displaying previously viewed content, displaying previously viewed or unviewed content using indicators, and displaying previously unviewed content according to a ranking. Where appropriate, these rules may be combined. For example, a user may opt to display previously viewed content using indicators and according to a ranking. Alternatively, selection of these rules may be applied globally across and independent of the different functions provided by the interactive media guidance application for which the "New to Me" function applies (e.g., by a button other than button 2204). The interactive media guidance application may also set a default rule that applies absent any selection of a rule by a user.

**[0192]** Button 2206 enables a user to activate the "New to Me" function on all the available types of content provided, and for every instance in which the "New to Me" function is applicable. In some embodiments, absent any specification by the user, the interactive media guidance application may run the "New to Me" function by default according to this nondiscretionary rule. In response to selection of button 2206, the interactive media guidance application may proceed to track the viewing history of all content for the specified user, device or household profile, and then use this information to update or modify the functions or interactive content provided based on this viewing history.

**[0193]** Button 2208 allows a user to configure additional options associated with the "New to Me" feature. For example, by selecting button 2208, the user may be presented with the opportunity via one or more display screens to, among other things, explicitly set the different types of visual indicators to be employed by the interactive media guidance application as described above in connection with FIGS. 21A-H, set default rules, etc.

**[0194]** Finally, button 2210 enables a user to voluntarily turn off the "New to Me" feature. In response to selection of button 2210, the interactive media guidance application may completely stop keeping track of the content viewed by the user.

**[0195]** The foregoing is merely illustrative of the principles of this invention and various modifications can be made by those skilled in the art without departing from the scope and spirit of the invention.

**[0196]** The following embodiments are disclosed:

1. A method for using an interactive media guidance application implemented on a user equipment device, comprising:

   providing a profile for use by the interactive media guidance application, wherein the profile comprises a viewing history of previously viewed content, and further wherein the profile is shared among a plurality of user equipment devices; and
   displaying interactive content using the interactive media guidance application based on the viewing history for the profile.

2. The method of item 1, further comprising receiving a user input for selecting the profile.

3. The method of item 1, further comprising automatically selecting the profile using the interactive media guidance application.

4. The method of item 1, wherein the interactive media guidance application automatically selects the profile after a predetermined time.

5. The method of item 4, wherein the predetermined time is set by a user, or is set by default by the interactive media guidance application.

6. The method of item 1, wherein the profile corresponds to a user profile comprising a viewing history of previously viewed content by a user associated with the user profile.

7. The method of item 1, wherein the profile corre-



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sponds to a device profile comprising a viewing history of previously viewed content on one of the user equipment devices.

8. The method of item 1, wherein the plurality of user equipment devices comprises a smaller plurality of user equipment devices that are located in a household, and further wherein the profile corresponds to a household profile comprising a viewing history of previously viewed content by the smaller plurality of user equipment devices located in the household.

9. The method of item 1, wherein the previously viewed content comprises programming, advertisements, content identified based on interactions by a user with the interactive media guidance application, or additional information.

10. The method of item 1, wherein displaying interactive content using the interactive media guidance application based on the viewing history for the profile comprises displaying a display of recommended content based on the viewing history for the profile.

11. The method of item 10, wherein the recommended content comprises advertisements, programming or additional information.

12. The method of item 1, wherein displaying interactive content using the interactive media guidance application based on the viewing history for the profile comprises displaying a display of results of a search for content based on the viewing history for the profile.

13. The method of item 1, wherein displaying interactive content using the interactive media guidance application based on the viewing history for the profile comprises displaying a display of program listings based on the viewing history for the profile.

14. The method of item 1, wherein displaying interactive content using the interactive media guidance application based on the viewing history for the profile comprises displaying an automatic display of content based on the viewing history for the profile.

15. The method of item 14, wherein the automatic display of content comprises advertisements, programming or additional information.

16. The method of item 1, wherein displaying interactive content using the Interactive media guidance application based on the viewing history for the profile comprises displaying an interactive menu based on the viewing history for the profile.

17. The method of item 1, wherein displaying interactive content using the interactive media guidance application based on the viewing history for the profile comprises displaying a display comprising at least one indicator to denote previously viewed or unviewed content.

18. The method of item 17, wherein a user sets whether the indicator should denote previously viewed content, previously unviewed content, or both.

19. The method of item 17, wherein the interactive media guidance application sets by default whether the indicator should denote previously viewed content previously unviewed content, or both.

20. The method of item 17, wherein the display comprises a first indicator to denote previously viewed content, and a second indicator to denote previously unviewed content.

21. The method of item 17, wherein the indicator comprises an icon, or a shading of the previously viewed or unviewed content.

22. The method of item 17, wherein the indicator indicates the last time the previously viewed content was viewed, the number of times the previously viewed content was viewed, how often the previously viewed content was viewed, or how much of the previously viewed content was viewed.

23. The method of item 17, wherein the indicator is displayed with an advertisement in a panel display.

24. The method of item 17, wherein the indicator is displayed with an advertisement to denote that the advertisement has been previously viewed or not viewed.

25. The method of item 17, wherein the indicator is displayed with an advertisement for an advertised program to denote that the advertised program has been previously viewed or not viewed.

26. The method of item 17, wherein the indicator is displayed with a program listing for a particular program to denote that the particular program has been previously viewed or not viewed.

27. The method of item 17, wherein the indicator is displayed in a picture-in-guide display to denote that content displayed in the picture-in-guide display has been previously viewed or not viewed.

28. The method of item 27, wherein the content displayed in the picture-in-guide display corresponds to an advertisement, a preview for a program, or a



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program.

29. The method of item 1, wherein displaying interactive content using the interactive media guidance application based on the viewing history for the profile comprises displaying interactive content that does not include the previously viewed content.

30. The method of item . 1, wherein displaying interactive content using the interactive media guidance application based on the viewing history for the profile comprises displaying previously viewed content according to a rank within a display of interactive content.

31. The method of item 1, wherein the viewing history of previously viewed content is defined by the interactive media guidance application.

32. The method of item 1, wherein the viewing history of at least a portion of the previously viewed content is defined by a user.

33. The method of item 32, wherein the user enters the viewing history of the portion of the previously viewed content on an Internet website or on a display generated by the interactive media guidance application.

34. The method of item 1, wherein displaying interactive content using the interactive media guidance application based on the viewing history for the profile comprises displaying a portion of the previously viewed content that has not yet been viewed.

35. The method of item 1, further comprising receiving a user input to display interactive content using the interactive media guidance application based on the viewing history for the profile.

36. The method of item 1, further comprising receiving a user input to display interactive content using the interactive media guidance application based only on a portion of the previously viewed content in the viewing history for the profile.

37. The method of item 1, further comprising receiving a user input to display interactive content using the interactive media guidance application for only a portion of the functionality provided by the interactive media guidance application based on the viewing history for the profile.

38. The method of item 1, further comprising receiving a user input to stop displaying interactive content using the interactive media guidance application based on the viewing history for the profile.

39. The method of item 1, wherein the interactive media guidance application is an interactive television program guide or an online television program guide.

40. A system that uses an interactive media guidance application, comprising:

a plurality of user equipment devices connected by a network, wherein at least one of the plurality of user equipment devices is operative to:

provide a profile for use by the interactive media guidance application, wherein the profile comprises a viewing history of previously viewed content, and further wherein the profile is shared among the plurality of user equipment devices; and
display interactive content using the interactive media guidance application based on the viewing history for the profile.

41. The system of item 40, wherein at least one of the user equipment devices receives a user input for selecting the profile.

42. The system of item 40, wherein at least one of the plurality of user equipment devices automatically selects the profile.

43. The system of item 42, wherein the user equipment device selects the profile after a predetermined time.

44. The system of item 43, wherein the predetermined time is set by a user, or is set by default.

45. The system of item 40, wherein the profile corresponds to a user profile comprising a viewing history of previously viewed content by a user.

46. The system of item 40, wherein the profile corresponds to a device profile comprising a viewing history of previously viewed content on one of the user equipment devices.

47. The system of item 40, wherein the plurality of user equipment devices comprises a smaller plurality of user equipment devices that are located in a household, and further wherein the profile corresponds to a household profile comprising a viewing history of previously viewed content by the smaller plurality of user equipment devices located in the household.

48. The system of item 40, wherein the previously viewed content comprises programming, advertisements, content identified based on interactions by a



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user with at least one of the plurality of user equipment devices, or additional information.

49. The system of item 40, wherein the user equipment device is operative to display recommended content based on the viewing history for the profile.

50. The system of item 49, wherein the recommended content comprises advertisements, programming or additional information.

51. The system of item 40, wherein the user equipment device is operative to display results of a search for content based on the viewing history for the profile.

52. The system of item 40, wherein the user equipment device is operative to display program listings based on the viewing history for the profile.

53. The system of item 40, wherein the user equipment device is operative to display content based on the viewing history for the profile.

54. The system of item 53, wherein the automatic display of content comprises advertisements, programming or additional information.

55. The system of item 40, wherein the user equipment device is operative to display an interactive menu based on the viewing history for the profile.

56. The system of item 40, wherein the user equipment device is operative to display at least one indicator to denote previously viewed or unviewed content.

57. The system of item 56, wherein a user sets whether the indicator should denote previously viewed content, previously unviewed content, or both.

58. The system of item 56, wherein the user equipment device sets by default whether the indicator should denote previously viewed content previously unviewed content, or both.

59. The system of item 56, wherein the display comprises a first indicator to denote previously viewed content, and a second indicator to denote previously unviewed content.

60. The system of item 56, wherein the indicator comprises an icon, or a shading of the previously viewed or unviewed content.

61. The system of item 56, wherein the indicator indicates the last time the previously viewed content was viewed, the number of times the previously viewed content was viewed, how often the previously viewed content was viewed, or how much of the previously viewed content was viewed.

62. The system of item 56, wherein the indicator is displayed with an advertisement in a panel display.

63. The system of item 56, wherein the indicator is displayed with an advertisement to denote that the advertisement has been previously viewed or not viewed.

64. The system of item 56, wherein the indicator is displayed with an advertisement for an advertised program to denote that the advertised program has been previously viewed or not viewed.

65. The system of item 56, wherein the indicator is displayed with a program listing for a particular program to denote that the particular program has been previously viewed or not viewed.

66. The system of item 56, wherein the indicator is displayed in a picture-in-guide display to denote that content displayed in the picture-in-guide display has been previously viewed or not viewed.

67. The system of item 66, wherein the content displayed in the picture-in-guide display corresponds to an advertisement, a preview for a program, or a program.

68. The system of item 40, wherein the user equipment device is operative to display interactive content that does not include the previously viewed content.

69. The system of item 40, wherein the user equipment device is operative to display previously viewed content according to a rank within a display of interactive content.

70. The system of item 40, wherein the viewing history of previously viewed content is defined by the interactive media guidance application.

71. The system of item 40, wherein the viewing history of at least a portion of the previously viewed content is defined by a user on at least one of the plurality of user equipment devices.

72. The system of item 71, wherein the user enters the viewing history of the portion of the previously viewed content on an Internet website or on a display generated by the interactive media guidance application.



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73. The system of item 40, wherein the user equipment is operative to display a portion of the previously viewed content that has not yet been viewed.

74. The system of item 40, wherein at least one of the plurality of user equipment devices receives a user input to display interactive content based on the viewing history.

75. The system of item 40, wherein at least one of the plurality of user equipment devices receives a user input to display interactive content based only on a portion of the previously viewed content in the viewing history.

76. The system of item 40, wherein at least one of the plurality of user equipment devices receives a user input to display interactive content for only a portion of the functionality based on the viewing history.

77. The system of item 40, wherein at least one of the plurality of user equipment devices receives a user input to stop display of interactive content based on the viewing history.

78. The system of item 40, wherein the interactive media guidance application is an interactive television program guide or an online television program guide.

79. A method for using an interactive media guidance application, comprising:

providing a plurality of user equipment devices each capable of supporting an interactive media guidance application and that are communicatively coupled to each other via a home network;
determining the identity of a user using one of the user devices;
providing a viewing history of the identified user, the viewing history including monitored interactions by the identified user on all of the user devices; and
generating interactive content based on the viewing history of the identified user for display using any user device communicatively coupled to the home network.

80. The method of item 79, further comprising displaying the generated interactive content on a display screen of a first one of the user devices for the identified user.

81. The method of item 79, further comprising displaying the generated interactive content on a display screen of a second one of the user devices for the identified user.

82. The method of item 79, wherein the determining comprises using an identification system to determine the identity of the identified user.

83. The method of item 79, wherein the determining comprises receiving a user input command that indicates the identity of the identified user.

84. The method of item 79, wherein the determining comprises selecting a default identity for the user.

85. The method of item 79, further comprising:

selecting a user profile for the identified user.

86. The method of item 85, wherein the selected user profile comprises the viewer history for the identified user.

87. The method of item 79, further comprising:

monitoring interactions performed by the identified user on all of the user devices; and
updating the viewer history for the identified user based on the monitored interactions.

88. The method of item 79, wherein the generated interactive content is accessible by each of the user devices.

89. The method of item 79, wherein the viewer history is accessible by each of the user devices.

90. The method of item 79, further comprising:

storing the viewer history on a database.

91. The method of item 90, wherein the database is located locally on one of the user devices.

92. The method of item 90, wherein the database is a home network database that is communicatively coupled to the home network.

93. The method of item 90, wherein the database is a remote database that is communicatively coupled to the home network.

94. The method of item 93, wherein the remote database is located on a server or a distribution facility.

95. The method of item 79, wherein the viewing history comprises data that indicates which programming has been viewed by the identified user, data that monitors the identified user's interactions with the interactive media guidance application, data that indicates which advertisements have been viewed or selected by the identified user, or data that indi-



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cates which additional information has been viewed or selected by the identified user.

96. The method of item 79, wherein the generated interactive content comprises a list of programming that has not been viewed by the identified user, advertisements that have not been viewed by the identified user, additional information that has not been viewed by the identified user, additional information that informs the identified user whether a particular program has been viewed, additional information that informs the identified user the last time a particular program was viewed, or a list of programming that has been ranked according to predetermined criteria.

97. The method of item 79, wherein the generated interactive content comprises a listing of programming, the method further comprising:

storing in a database an identifier associated with each program that has been viewed by the identified user; and
cross-referencing identifiers associated with all available programming with the identifiers stored in the database to determine which programming can be included in the listing of programming.

98. The method of item 79, wherein the generated interactive content comprises a listing of programming, the method further comprising:

providing a group of identifiers corresponding to all programming available that can be viewed for the identified user, wherein the listing of programming is derived from the group of identifiers; and

removing from the group identifiers corresponding to programming that has been viewed by the identified user.

99. The method of item 98, further comprising:

adding new identifiers to the group as new programming becomes available; and
deleting identifiers from the group when programming corresponding to the deleted identifiers is no longer available.

100. The method of item 79, wherein the identified user is a first user and the generated interactive content is first user generated interactive content, the method further comprising:

determining that a second user is using one of the user devices; and

generating second user interactive content based on a viewing history for the second user for display on a display screen of any user device communicatively coupled to the home network.

101. The method of item 79, wherein the interactive media guidance application is an interactive television program guide or an online television program guide.

102. A system for using an interactive media guidance application, comprising:

a plurality of user equipment devices communicatively coupled to each other via a home network, wherein at least one user equipment device is operative to:

determine the identity of a user;
provide a viewing history of the identified user, the viewing history including monitored interactions by the identified user on the plurality of user equipment devices; and
generate interactive content based on the viewing history of the identified user for display.

103. The system of item 102, wherein any one of the user equipment devices is operative to display the generated interactive content for the identified user.

104. The system of item 102, wherein the at least one user equipment device is operative to display the generated interactive content for the identified user.

105. The system of item 102, wherein the at least one user equipment device is operative to determine the identity of the identified user using an identification system.

106. The system of item, 102, wherein the at least one user equipment device is operative to receive a user input command that indicates the identity of the identified user.

107. The system of item 102, wherein the at least one user equipment device is operative to select a default identity for the user.

108. The system of item 102, wherein the at least one user equipment device is operative to:

select a user profile for the identified user.

109. The system of item 108, wherein the selected user profile comprises the viewer history for the identified user.



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110. The system of item 102, wherein the at least one user equipment device is operative to:

monitor interactions performed by the identified user on all of the user devices; and
update the viewer history for the identified user based on the monitored interactions.

111. The system of item 102, wherein the generated interactive content is accessible by each of the user equipment devices.

112. The system of item 102, wherein the viewer history is accessible by each of the user equipment devices.

113. The system of item 102, wherein the at least one user equipment device is operative to:

store the viewer history on a database.

114. The system of item 113, wherein the database is located locally on one of the user equipment devices.

115. The system of item 113, wherein the database is a home network database that is communicatively coupled to the home network.

116. The system of item 113, wherein the database is a remote database that is communicatively coupled to the home network.

117. The system of item 116, wherein the remote database is located on a server or a distribution facility.

118. The system of item 102, wherein the viewing history comprises data that indicates which programming has been viewed by the identified user, data that monitors the identified user's interactions with the user equipment devices, data that indicates which advertisements have been viewed or selected by the identified user, or data that indicates which additional information has been viewed or selected by the identified user.

119. The system of item 102, wherein the generated interactive content comprises a list of programming that has not been viewed by the identified user, advertisements that have not been viewed by the identified user, additional information that has not been viewed by the identified user, additional information that informs the identified user whether a particular program has been viewed, additional information that informs the identified user the last time a particular program was viewed, or a list of programming that has been ranked according to predetermined criteria.

120. The system of item 102, wherein the generated interactive content comprises a listing of programming, wherein the at least one user equipment device is operative to:

store in a database an identifier associated with each program that has been viewed by the identified user; and
cross-reference identifiers associated with all available programming with the identifiers stored in the database to determine which programming can be included in the listing of programming.

121. The system of item 102, wherein the generated interactive content comprises a listing of programming, wherein the at least one user equipment device is operative to:

provide a group of identifiers corresponding to all programming available that can be viewed for the identified user, wherein the listing of programming is derived from the group of identifiers; and
remove from the group identifiers corresponding to programming that has been viewed by the identified user.

122. The system of item 121, wherein the at least one user equipment device is operative to:

add new identifiers to the group as new programming becomes available; and
delete identifiers from the group when programming corresponding to the deleted identifiers is no longer available.

123. The system of item 102, wherein the identified user is a first user and the generated interactive content is first user generated interactive content, wherein the at least one user equipment device is operative to:

determine that a second user is using one of the user devices; and
generate second user interactive content based on a viewing history for the second user for display on a display screen of any user device communicatively coupled to the network.

124. The system of item 102, wherein the interactive media guidance application is an interactive television program guide or an online television program guide.

125. A method for using an interactive media guid-



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ance application, comprising:

providing a plurality of user equipment devices each capable of supporting an interactive media guidance application and that are communicatively coupled to each other via a home network;
providing a viewing history of a selected one of the user devices, the viewing history including monitored interactions that occurred at the selected user device; and
generating interactive content based on the viewing history of the selected user device for display on all of the user devices communicatively coupled to the home network.

126. The method of item 125, wherein the selected user device is a master device and all remaining user devices are slave devices that display generated interactive content based on the viewing history of the master device.

127. The method of item 125, further comprising displaying the generated interactive content on a display screen of any user device communicatively coupled to the home network.

128. The method of item 125, further comprising:

enabling a user to select which user device is the selected device.

129. The method of item 125, further comprising:

selecting a device profile for the selected device.

130. The method of item 129, wherein the selected user profile comprises the viewer history for the selected device.

131. The method of item 125, further comprising:

monitoring interactions performed on the selected user device; and
updating the viewer history for the selected device based on the monitored interactions.

132. The method of item 125, wherein the generated interactive content is accessible by each of the user devices.

133. The method of item 125, wherein the viewer history is accessible by each of the user devices.

134. The method of item 125, further comprising:

storing the viewer history on a database.

135. The method of item 134, wherein the database is located locally on one of the user devices.

136. The method of item 134, wherein the database is a home network database that is communicatively coupled to the home network.

137. The method of item 134, wherein the database is a remote database that is communicatively coupled to the home networks.

138. The method of item 137, wherein the remote database is located on a server or a distribution facility.

139. The method of item 125, wherein the viewing history comprises data that indicates which programming has been viewed on the selected user device, data that monitors interactions with the interactive media guidance application on the selected user device, data that indicates which advertisements have been displayed on a display screen of the selected user device, or data that indicates which additional information has been displayed on a display screen of the selected user device.

140. The method of item 125, wherein the generated interactive content comprises a list of programming that includes programming that has not been displayed on a display screen of the selected user device, advertisements that have not been displayed on a display screen of the selected user device, additional information that has not been displayed on a display screen of the selected user device, additional information that indicates whether a particular program has been viewed, additional information that indicates the last time a particular program was viewed, or a list of programming that has been ranked according to predetermined criteria.

141. The method of item 125, wherein the generated interactive content comprises a listing of programming, the method further comprising:

storing in a database an identifier associated with each program that has been viewed by the selected user device; and
cross-referencing identifiers associated with all available programming with the identifiers stored in the database to determine which programming can be included in the listing of programming.

142. The method of item 125, wherein the generated interactive content comprises a listing of programming, the method further comprising:

providing a group of identifiers corresponding to all programming available that can be viewed



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on any of the user devices communicatively coupled to the home network, wherein the listing of programming is derived from the group of identifiers; and
removing from the group identifiers corresponding to programming that has been viewed on the selected user device.

143. The method of item 142, further comprising:

adding new identifiers to the group as new programming becomes available; and
deleting identifiers from the group when programming corresponding to the deleted identifiers is no longer available.

144. The method of item 125, wherein the interactive media guidance application is an interactive television program guide or an online television program guide.

145. A system for using an interactive media guidance application, comprising:

a plurality of user equipment devices communicatively coupled to each other via a home network, wherein the system is operative to:

provide a viewing history of a selected one of the plurality of user equipment devices, the viewing history including monitored interactions that occurred at the selected user equipment device; and
generate interactive content based on the viewing history of the selected user equipment device for display.

146. The system of item 145, wherein the selected user device is a master device and all remaining user devices are slave devices that display generated interactive content based on the viewing history of the master device.

147. The system of item 145, wherein the at least one user equipment device is operative to display the generated interactive content.

148. The system of item 145, wherein the system is operative to:

enable a user to select which user device is the selected device.

149. The system of item 145, wherein the system is operative to:

select a device profile for the selected device.

150. The system of item 149, wherein the selected user profile comprises the viewer history for the selected device.

151. The system of item 145, wherein the system is operative to:

monitor interactions performed on the selected user device; and
update the viewer history for the selected device based on the monitored interactions.

152. The system of item 145, wherein the generated interactive content is accessible by each of the user devices.

153. The system of item 145, wherein the viewer history is accessible by each of the user devices.

154. The system of item 145, wherein the system is operative to:

store the viewer history on a database.

155. The system of item 154, wherein the database is located locally on one of the user devices.

156. The system of item 154, wherein the database is a network database that is communicatively coupled to the network.

157. The system of item 154, wherein the database is a remote database that is communicatively coupled to the network.

158. The system of item 157, wherein the remote database is located on a server or a distribution facility.

159. The system of item. 145, wherein the viewing history comprises data that indicates which programming has been viewed on the selected user device, data that monitors interactions on the selected user device, data that indicates which advertisements have been displayed by the selected user device, or data that indicates which additional information has been displayed by the selected user device.

160. The system of item 145, wherein the generated interactive content comprises a list of programming that includes programming that has not been displayed by the selected user device, advertisements that have not been displayed by the selected user device, additional information that has not been displayed by the selected user device, additional information that indicates whether a particular program has been viewed, additional information that indicates the last time a particular program was viewed,



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or a list of programming that has been ranked according to predetermined criteria.

161. The system of item 145, wherein the generated interactive content comprises a listing of programming, wherein the system is operative to:

store in a database an identifier associated with each program that has been viewed by the selected user device; and
cross-reference identifiers associated with all available programming with the identifiers stored in the database to determine which programming can be included in the listing of programming.

162. The system of item 145, wherein the generated interactive content comprises a listing of programming, wherein the system is operative to:

provide a group of identifiers corresponding to all programming available that can be viewed on any of the user devices communicatively coupled to the network, wherein the listing of programming is derived from the group of identifiers; and

remove from the group identifiers corresponding to programming that has been viewed on the selected user device.

163. The system of item 162, wherein the system is operative to:

add new identifiers to the group as new programming becomes available; and
delete identifiers from the group when programming corresponding to the deleted identifiers is no longer available.

164. The system of item 145, wherein the interactive media guidance application is an interactive television program guide or an online television program guide.

165. A method for using an interactive media guidance application, comprising:

providing at least two home networks that are communicatively coupled to each other, each home network comprising at least one user equipment device capable of supporting an interactive media guidance application;
providing a viewing history for at least a first of the home networks, the viewing history including monitored interactions that occurred at the first home network; and
generating interactive content based on the viewing history for the first home network.

166. The method of item 165, further comprising:

displaying the generated interactive content on a display device of at least one user device of at least one of the home networks.

167. The method of item 165, further comprising:

displaying the generated interactive content on at least one display device of a second of the home networks.

168. The method of item 165, further comprising:

displaying the generated interactive content on at least one display device of the first of the home networks.

169. The method of item, 165, wherein the generated interactive content is accessible by each of the home networks.

170. The method of item 165, wherein the viewing history of the first of the home networks is accessible by each of the home networks.

171. The method of item 165, further comprising:

providing a home profile, wherein the home profile comprises the viewer history for at least the first of the home networks.

172. The method of item 165, further comprising:

monitoring interactions performed on the first of the home networks; and
updating the viewer history for at least the first of the home networks based on the monitored interactions.

173. The method of item 165, wherein the viewer history is associated with the first of the home networks and a second of the home networks, the method further comprising:

monitoring interactions performed on a second of the home networks; and
updating the viewer history for the first and second of the home networks.

174. The method of item 165, further comprising:

storing the viewer history on a database.

175. The method of item 174, wherein the database is located locally on a user device that is communi-



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catively coupled to one of the home networks.

176. The method of item 174, wherein the database is a home network database that is communicatively coupled to one of the home networks.

177. The method of item 174, wherein the database is a remote database that is communicatively coupled to each of the home networks.

178. The method of item 177, wherein the remote database is located on a server or a distribution facility.

179. The method of item 165, wherein the viewing history comprises data that indicates which programming has been viewed on the first of the home networks, data that monitors interactions with the interactive media guidance application on the first of the home networks, data that indicates which advertisements have been displayed on the first of the home networks, or data that indicates which additional information has been displayed on the first of the home networks.

180. The method of item 165, wherein the generated interactive content comprises a list of programming that includes programming that has not been displayed on the first of the home networks, advertisements that have not been displayed on the first of the home networks, additional information that has not been displayed on the first of the home networks, additional information that indicates whether a particular program has been viewed, additional information that indicates the last time a particular program was viewed, or a list of programming that has been ranked according to predetermined criteria.

181. The method of item 165, wherein the generated interactive content comprises a listing of programming, the method further comprising:

storing in a database an identifier associated with each program that has been viewed on the first of the home networks; and
cross-referencing identifiers associated with all available programming with the identifiers stored in the database to determine which programming can be included in the listing of programming.

182. The method of item 165, wherein the generated interactive content comprises a listing of programming, the method further comprising:

providing a group of identifiers corresponding to all programming available that can be viewed at any of the home networks, wherein the listing of programming is derived from the group of identifiers; and
removing from the group identifiers corresponding to programming that has been viewed on the first of the home networks.

183. The method of item 182, further comprising:

adding new identifiers to the group as new programming becomes available; and
deleting identifiers from the group when programming corresponding to the deleted identifiers is no longer available.

184. The method of item 165, wherein the interactive media guidance application is an interactive television program guide or an online television program guide.

185. A system for using an interactive media guidance application, comprising:

at least two home networks that are communicatively coupled to each other, each home network comprising at least one user equipment device, wherein the system is operative to:

provide a viewing history for at least a first of the home networks, the viewing history including monitored interactions that occurred at the first home network; and
generate interactive content based on the viewing history for the first home network.

186. The system of item 185, wherein the system is operative to:

display the generated interactive content on a display device of at least one user equipment device of at least one of the home networks.

187. The system of item 185, wherein the system is operative to:

display the generated interactive content on at least one display device of a second of the home networks.

188. The system of item 185, wherein the system is operative to:

display the generated interactive content on at least one display device of the first of the home networks.

189. The system of item 185, wherein the generated interactive content is accessible by each of the home networks.



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190. The system of item 185, wherein the viewing history of the first of the home networks is accessible by each of the home networks.

191. The system of item 185, wherein the system is operative to:

provide a home profile, wherein the home profile comprises the viewer history for at least the first of the home networks.

192. The system of item 185, wherein the system is operative to:

monitor interactions performed on the first of the home networks; and
update the viewer history for at least the first of the home networks based on the monitored interactions.

193. The system of item 185, wherein the viewer history is associated with the first of the home networks and a second of the home networks, wherein the system is operative to:

monitor interactions performed on a second of the home networks; and
update the viewer history for the first and second of the home networks.

194. The system of item 185, wherein the system is operative to:

store the viewer history on a database.

195. The system of item 194, wherein the database is located locally on a user device that is communicatively coupled to one of the home networks.

196. The system of item 194, wherein the database is a home network database that is communicatively coupled to one of the home networks.

197. The system of item 194, wherein the database is a remote database that is communicatively coupled to each of the home networks.

198. The system of item 197, wherein the remote database is located on a server or a distribution facility.

199. The system of item 185, wherein the viewing history comprises data that indicates which programming has been viewed on the first of the home networks, data that monitors interactions with the user equipment device on the first of the home networks, data that indicates which advertisements have been displayed by the first of the home networks, or data that indicates which additional information has been displayed by the first of the home networks.

200. The system of item. 185, wherein the generated interactive content comprises a list of programming that includes programming that has not been displayed by the first of the home networks, advertisements that have not been displayed by the first of the home networks, additional information that has not been displayed by the first of the home networks, additional information that indicates whether a particular program has been viewed, additional information that indicates the last time a particular program was viewed, or a list of programming that has been ranked according to predetermined criteria.

201. The system of item 185, wherein the generated interactive content comprises a listing of programming, wherein the system is operative to:

store in a database an identifier associated with each program that has been viewed on the first of the home networks; and
cross-reference identifiers associated with all available programming with the identifiers stored in the database to determine which programming can be included in the listing of programming.

202. The system of item 185, wherein the generated interactive content comprises a listing of programming, wherein the system is operative to:

provide a group of identifiers corresponding to all programming available that can be viewed at any of the home networks, wherein the listing of programming is derived from the group of identifiers; and
remove from the group identifiers corresponding to programming that has been viewed on the first of the home networks.

203. The system of item 202, wherein the system is operative to:

add new identifiers to the group as new programming becomes available; and
delete identifiers from the group when programming corresponding to the deleted identifiers is no longer available.

204. The system of item 185, wherein the interactive media guidance application is an interactive television program guide or an online television program guide.

205. A method for creating a viewing history using an interactive media guidance application, compris-



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ing:

creating a viewing history for a user based on previously viewed content;
automatically updating the viewing history based on content that is viewed by the user on a user equipment device; and
allowing the user to manually update the viewing history using the interactive media guidance application.

206. The method of item 205, wherein the user equipment device is a first user equipment device, the method further comprising automatically updating the viewing history based on content that is viewed by the user on a second user equipment device.

207. The method of item 206, wherein the second user equipment device is part of a home network, the home network comprises a plurality of user equipment devices, including the first user equipment device.

208. The method of item 206, wherein the second user equipment device is not part of a home network, the home network comprises a plurality of user equipment devices, including the first user equipment device.

209. The method of item 205, wherein allowing the user to manually update the viewing history through the interactive media guidance application comprises:

receiving a first user input for specifying previously viewed content; and
receiving a second user input for selecting a user profile, wherein the user profile comprises the viewing history for the user based on the previously viewed content.

210. The method of item 209, further comprising:

updating the viewing history of the selected user profile with the specified content.

211. The method of item, 209, wherein receiving a first user input for specifying previously viewed content comprises:

allowing a user to perform a search for the previously viewed content; and
receiving a user input of the previously viewed content based on the search.

212. The method of item 209, wherein receiving a first user input for specifying previously viewed content further comprises receiving a user input for specifying details of the viewing of the previously viewed content.

213. The method of item 209, wherein receiving a second user input for selecting a profile comprises:

allowing a user to perform a search for the profile; and
receiving a user input of the profile based on the search.

214. The method of item 209, further comprising receiving a user input for creating a profile.

215. The method of item 210, wherein updating the viewing history of the selected profile with the specified content comprises adding the specified content to the viewing history of the selected profile, or replacing the viewing history of the selected profile with the specified content.

216. The method of item 209, further comprising receiving a user input to begin displaying interactive content using the interactive media guidance application for only a portion of the functionality provided by the interactive media guidance application based on the specified content.

217. The method of item. 209, wherein the specified content and the selected profile are provided on a website, and further wherein the interactive media guidance application receives the specified content and the selected profile from the website to perform the updating.

218. The method of item 209, wherein the specified content and the selected profile are provided to the interactive media guidance application.

219. The method of item 205, wherein the interactive media guidance application is an interactive television program guide, or an online television program guide.

220. The method of item 205, wherein the previously viewed content comprises programming, advertisements, content identified based on interactions by a user with the interactive media guidance application, or additional information.

221. The method of item 205, wherein the viewing history makes up a portion of a user profile for the user.

222. The method of item 221, wherein the user profile is stored in a single database that is accessible by at least one of a plurality of user equipment devices that are part of a home network, wherein the plurality



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of user equipment devices in the home network includes the user equipment device, and further wherein the plurality of user equipment devices in the home network are communicatively coupled to one another.

223. The method of item 222, wherein the single database is located in a local server within the home network.

224. The method of item 223, wherein the local server is a standalone local server.

225. The method of item 222, wherein the single database is located in a remote server outside of the home network.

226. The method of item 222, wherein the single database is located in one of the plurality of user equipment devices in the home network, or in another user equipment device outside of the home network.

227. The method of item 222, wherein authorization is required to access the single database, the user profile, or the viewing history portion of the user profile.

228. The method of item 222, wherein a first user equipment device in the home network accesses the viewing history stored in the single database by establishing a communicative link with at least a second user equipment device that has direct access to the single database.

229. The method of item 221, wherein the user profile is stored in a single database that is accessible by the user equipment device.

230. The method of item 221, wherein the user profile is duplicated and stored in a plurality of databases, at least one of which is accessible by at least one of a plurality of user equipment devices that are part of a home network, and wherein the plurality of user equipment devices in the home network includes the user equipment device.

231. The method of item 230, wherein the plurality of databases are located at any of the locations from the group consisting of a local server within the home network, a remote server outside of the home network, and at least one of the plurality of user equipment devices in the home network.

232. The method of item 231, wherein the user profile, including the viewing history, is stored in a plurality of databases, at least one of which is accessible by at least one of a plurality of user equipment devices that are part of a home network, and wherein the plurality of user equipment devices in the home network includes the user equipment device.

233. The method of item 232, wherein the plurality of databases are located at any of the locations from the group consisting of a local server within the home network, a remote server outside of the home network, and at least one of the plurality of user equipment devices in the home network.

234. A system for creating a viewing history using an interactive media guidance application, the system comprising a user equipment device operative to:

create a viewing history for a user based on previously viewed content;
automatically update the viewing history based on content that is viewed by the user on the user equipment device; and
allow the user to manually update the viewing history.

235. The system of item 234, wherein the viewing history is automatically updated based on content that is viewed by the user on a second user equipment device.

236. The system of item 235, wherein the second user equipment device is part of a home network, wherein the home network comprises a plurality of user equipment devices that includes the user equipment device.

237. The system of item 235, wherein the second user equipment device is outside of a home network, wherein the home network comprises a plurality of user equipment devices that includes the user equipment device.

238. The system of item 234, wherein the user equipment device is operative to:

receive a first user input for specifying previously viewed content; and
receive a second user input for selecting a user profile, wherein the user profile comprises the viewing history for the user based on the previously viewed content.

239. The system of item 238, wherein the user equipment is operative to:

update the viewing history of the selected user profile with the specified content.

240. The system of item 234, wherein the user equipment device is operative to:



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allow a user to perform a search for the previously viewed content; and

receive a user input of the previously viewed content based on the search.

241. The system of item 234, wherein the user equipment device is operative to receive a user input for specifying details of the viewing of the previously viewed content.

242. The system of item 234, wherein the user equipment device is operative to:

allow a user to perform a search for a profile; and receive a user input to select a profile based on the search.

243. The system of item 234, wherein the user equipment device is operative to receive a user input for creating a profile.

244. The system of item 239, wherein the user equipment device is operative to add the specified content to the viewing history of the selected profile, or to replace the viewing history of the selected profile with the specified content.

245. The system of item 239, wherein the user equipment device is operative to receive a user input to begin displaying interactive content for only a portion of the functionality based on the specified content.

246. The system of item 238, wherein the specified content and the selected profile are provided on a website, and further wherein the user equipment device is operative to receive the specified content and the selected profile from the website to perform the update.

247. The system of item 238, wherein the specified content and the selected profile are provided to the interactive media guidance application.

248. The system of item 234, wherein the interactive media guidance application is an interactive television program guide, or an online television program guide.

249. The system of item 234, wherein the previously viewed content comprises programming, advertisements, content identified based on interactions by a user with the user equipment, or additional information.

250. The system of item 234, wherein the viewing history makes up a portion of a user profile for the user.

251. The system of item 250, wherein the user profile is stored in a single database that is accessible by at least one of a plurality of user equipment devices that are part of a home network, wherein the plurality of user equipment devices in the home network includes the user equipment device, and further wherein the plurality of user equipment devices in the home network are communicatively coupled to one another.

252. The system of item 251, wherein the single database is located in a local server within the home network.

253. The system of item 252, wherein the local server is a standalone local server.

254. The system of item 251, wherein the single database is located in a remote server outside of the home network.

255. The system of item 251, wherein the single database is located in one of the plurality of user equipment devices in the home network, or in another user equipment device outside of the home network.

256. The system of item 251, wherein authorization is required to access the single database, the user profile, or the viewing history portion of the user profile.

257. The system of item 251, wherein a first user equipment device in the home network accesses the viewing history stored in the single database by establishing a communicative link with at least a second user equipment device that has direct access to the single database.

258. The system of item 250, wherein the user profile is stored in a single database that is accessible by the user equipment device.

259. The system of item. 250, wherein the user profile is duplicated and stored in a plurality of databases, at least one of which is accessible by at least one of a plurality of user equipment devices that are part of a home network, and wherein the plurality of user equipment devices in the home network includes the user equipment device.

260. The system of item 259, wherein the plurality of databases are located at any of the locations from the group consisting of a local server within the home network, a remote server outside of the home network, and at least one of the plurality of user equipment devices in the home network.

261. The system of item 260, wherein the user pro-



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file, including the viewing history, is stored in a plurality of databases, at least one of which is accessible by at least one of a plurality of user equipment devices that are part of a home network, and wherein the plurality of user equipment devices in the home network includes the user equipment device.

262. The system of item 261, wherein the plurality of databases are located at any of the locations from the group consisting of a local server within the home network, a remote server outside of the home network, and at least one of the plurality of user equipment devices in the home network.

263. A method for displaying a list of previously viewed content in an interactive media guidance application implemented on a user equipment device, comprising:

ranking previously viewed content according to at least one predetermined criterion; and
displaying interactive content using the interactive media guidance application based on the ranking.

264. The method of item. 263, wherein the predetermined criterion is specified by a user.

265. The method of item. 263, wherein a user specifies an order in which the previously viewed content is ranked.

266. The method of item 263, wherein the predetermined criterion comprises the last time the previously viewed content was viewed, the number of times the previously viewed content was viewed, how often the previously viewed content was viewed, or how much of the previously viewed content was viewed.

267. The method of item 263, further comprising ranking previously viewed content according to a plurality of predetermined criteria, wherein the predetermined criteria are combined according to a weighting.

268. The method of item 267, wherein the weighting is specified by a user.

269. The method of item 263, wherein the previously viewed content comprises programming, advertisements, content identified based on interactions by a user with the interactive media guidance application, or additional information.

270. A system for creating a viewing history using an interactive media guidance application, the system comprising a user equipment device operative to:

rank previously viewed content according to at least one predetermined criterion; and
display interactive content based on the ranking.

271. The system of item. 270, wherein the predetermined criterion is specified by a user.

272. The system of item 270, wherein a user specifies an order in which the previously viewed content is ranked.

273. The system of item 270, wherein the predetermined criterion comprises the last time the previously viewed content was viewed, the number of times the previously viewed content was viewed, how often the previously viewed content was viewed, or how much of the previously viewed content was viewed.

274. The system of item 270, wherein the user equipment device is operative to rank previously viewed content according to a plurality of predetermined criteria, wherein the predetermined criteria are combined according to a weighting.

275. The system of item 274, wherein the weighting is specified by a user.

276. The system of item 270, wherein the previously viewed content comprises programming, advertisements, content identified based on interactions with the user equipment device, or additional information.

277. A method for displaying a list of programming in an interactive media guidance application, the method comprising:

providing a plurality of user equipment devices capable of supporting an interactive media guidance application and that are communicatively coupled to each other via a home network;
assigning a timestamp to each program that has been viewed on at least one of the user devices;
ranking programming according to predetermined criteria to determine the order in which the programming is displayed in a ranked list of programming, the predetermined criteria comprising the timestamp; and
displaying the ranked list of programming using at least one of the user devices.

278. The method of item 277, wherein the ranking comprises placing previously viewed programs in the list according to their timestamps.

279. The method of item 277, wherein the ranking comprises placing programs having timestamps that are more recent lower in the list of programming than programs having timestamps that are less recent



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and programs that do not have an assigned timestamp.

280. The method of item 277, wherein the ranking comprises placing the most recently viewed program at the bottom of the list of programming.

281. The method of item 277, wherein the list of programming includes programming that has been viewed and programming that has not been viewed.

282. The method of item 277, wherein the list of programming includes only programming that has not been viewed.

283. The method of item 277, wherein the displayed list of programming is a list available for display on any one of the user devices based on a viewing history for an identified user.

284. The method of item 277, wherein the displayed list of programming is based on a viewing history for a selected one of the plurality of user devices.

285. The method of item 277, wherein the displayed list of programming is based on a viewing history for at least one home network.

286. The method of item 277, further comprising:

displaying additional information for a particular program displayed in the list of programming.

287. The method of item 286, wherein the additional information comprises an indicator that indicates that the particular program has been previously viewed.

288. The method of item 287, wherein the indicator comprises an icon or a change in an appearance of the particular program.

289. The method of item 286, wherein the additional information comprises the timestamp associated with the particular program.

290. The method of item 277, wherein programs that are ranked lower may be colored different than higher ranked programs.

291. A system for using an interactive media guidance application, comprising:

a plurality of user equipment devices connected by a network, wherein the system is operative to:

assign a timestamp to each program that has been viewed on the user equipment device;

rank programming according to predetermined criteria to determine the order in which the programming is displayed in a ranked list of programming, the predetermined criteria comprising the timestamp; and

display the ranked list of programming.

292. The system of item 291, wherein the system is operative to place previously viewed programs in the list according to their timestamps.

293. The system of item 291, wherein the system is operative to place programs having timestamps that are more recent lower in the list of programming than programs having timestamps that are less recent and programs that do not have an assigned timestamp.

294. The system of item 291, wherein the system is operative to place the most recently viewed program at the bottom of the list of programming.

295. The system of item 291, wherein the list of programming includes programming that has been viewed and programming that has not been viewed.

296. The system of item 291, wherein the list of programming includes only programming that has not been viewed.

297. The system of item 291, wherein the displayed list of programming is a list available for display on any one of the user devices based on a viewing history for an identified user.

298. The system of item 291, wherein the displayed list of programming is based on a viewing history for a selected one of the plurality of user devices.

299. The system of item 291, wherein the displayed list of programming is based on a viewing history for at least one home network.

300. The system of item 291, wherein the system is operative to:

display additional information for a particular program displayed in the list of programming.

301. The system of item 300, wherein the additional information comprises an indicator that indicates that the particular program has been previously viewed.

302. The system of item 301, wherein the indicator comprises an icon or a change in an appearance of the particular program.



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303. The system of item 300, wherein the additional information comprises the timestamp associated with the particular program.

304. The system of item 291, wherein programs that are ranked lower may be colored different than higher ranked programs.

## Claims

1. A method for using an interactive media guidance application, comprising:

   providing a plurality of user equipment devices, each having an interactive media guidance application implemented thereon, communicatively coupled to each other via a network;
   providing a viewing history of a user, the viewing history including monitored interactions by the user on all of the user equipment devices; and
   generating interactive content based on the viewing history of the user for display using the plurality of user equipment devices communicatively coupled to the network.

2. The method of claim 1, wherein the network is a home network.

3. The method of claim 1, wherein each interactive media guidance application is configured to provide media guidance services independent of other interactive media guidance applications and provide media guidance services in communication with one or more of the other media guidance applications.

4. The method of claim 1, further comprising determining the identity of the user using one of the user equipment devices, wherein the determining comprises at least one of using an identification system to determine the identity of the identified user, receiving a user input command that indicates the identity of the identified user, selecting a default identity for the user, and selecting for the user a user profile comprising the viewing history of the user.

5. The method of claim 1, wherein the generated interactive content comprises at least one of menus, program listings, recommendations, search results, advertisements, and additional information.

6. The method of claim 1, further comprising:

   displaying the generated interactive content on a display screen of a first one of the user equipment devices for the user; and
   displaying the generated interactive content on a display screen of a second one of the user equipment devices for the user.

7. The method of claim 1, further comprising:

   monitoring interactions performed by the user on all of the user equipment devices; and
   updating the viewing history for the user based on the monitored interactions.

8. The method of claim 1, wherein at least one of the generated interactive content and the viewing history is accessible by each of the user equipment devices.

9. The method of claim 1, further comprising:

   storing the viewing history on a database, wherein the database is at least one of a local database on one of the user equipment devices, a network database that is communicatively coupled to the network, and a remote database that is communicatively coupled to the network and located on a server or a distribution facility.

10. The method of claim 1, wherein:

    the viewing history comprises data that indicates which programming has been viewed by the user, data that monitors the user's interactions with the interactive media guidance application, data that indicates which advertisements have been viewed or selected by the user, or data that indicates which additional information has been viewed or selected by the user; and
    the generated interactive content comprises a list of programming that has not been viewed by the user, advertisements that have not been viewed by the user, additional information that has not been viewed by the user, additional information that informs the user whether a particular program has been viewed, additional information that informs the identified user the last time a particular program was viewed, or a list of programming that has been ranked according to predetermined criteria.

11. The method of claim 1, wherein the generated interactive content comprises a listing of programming, the method further comprising:

    storing in a database an identifier associated with each program that has been viewed by the user; and
    cross-referencing identifiers associated with all available programming with the identifiers stored in the database to determine which programming can be included in the listing of programming.



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**12.** The method of claim 1, wherein the user is a first user and the generated interactive content is first user interactive content generated for the first user, the method further comprising:

determining that a second user is using one of the user equipment devices; and
generating second user interactive content for the second user based on a viewing history for the second user for display on a display screen of any user equipment device communicatively coupled to the network.

**13.** The method of claim 1, wherein the interactive media guidance application is an interactive television program guide or an online media guide.

**14.** A system that performs any of the methods of claims 1-13.



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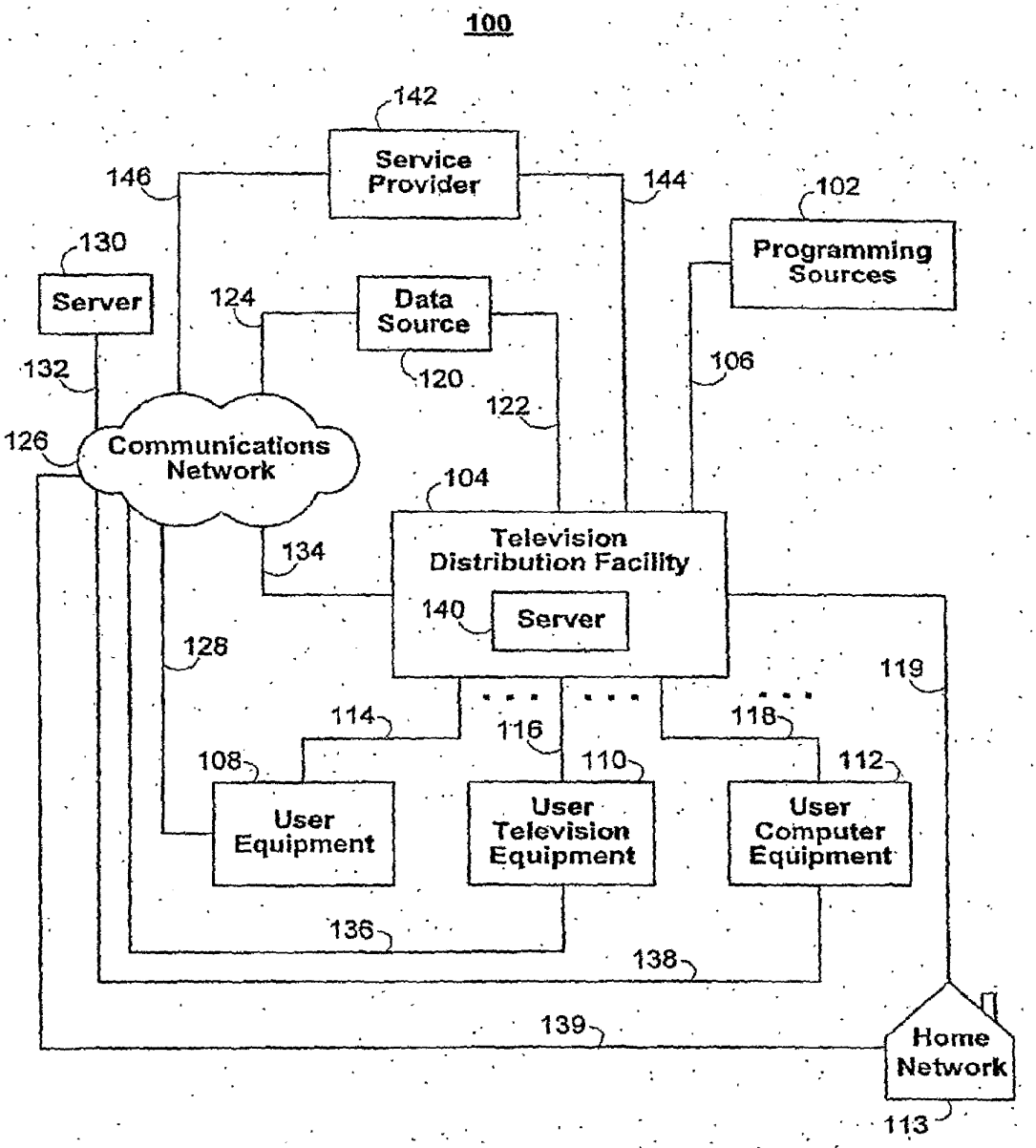
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Service Provider
146
144
102
Programming Sources
130
Server
124
Data Source
132
120
122
106
126
Communications Network
104
Television Distribution Facility
134
140
Server
128
119
114
116
118
108
110
112
User Equipment
User Television Equipment
User Computer Equipment
136
138
139
Home Network
113

FIG. 1

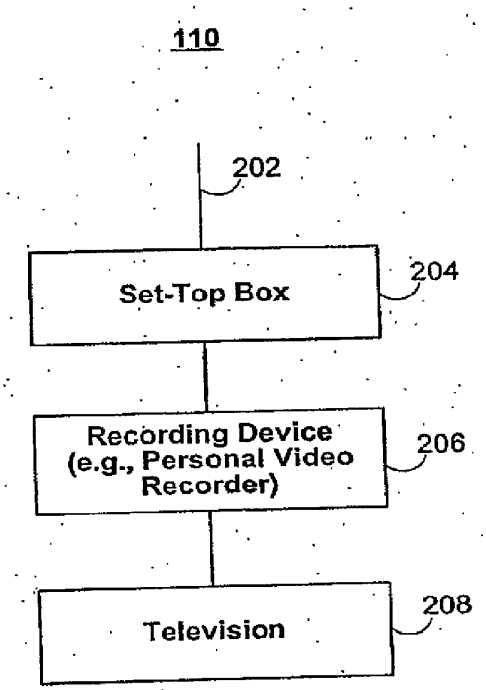


FIG. 2



EX. 1002
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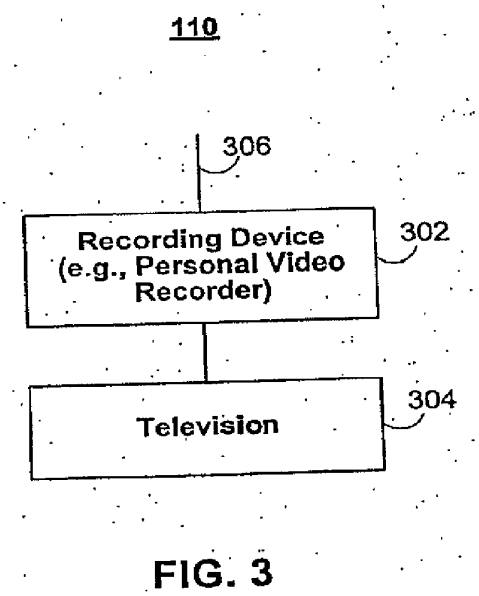


FIG. 3



EX. 1002
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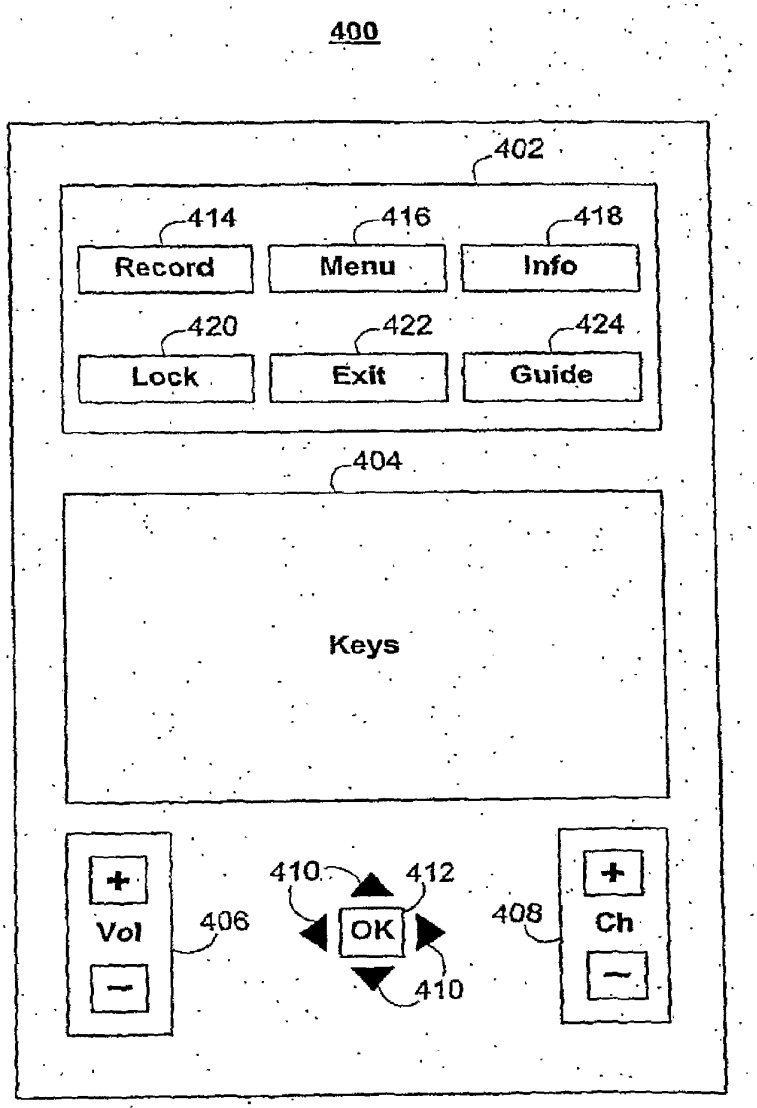


FIG. 4



EX. 1002
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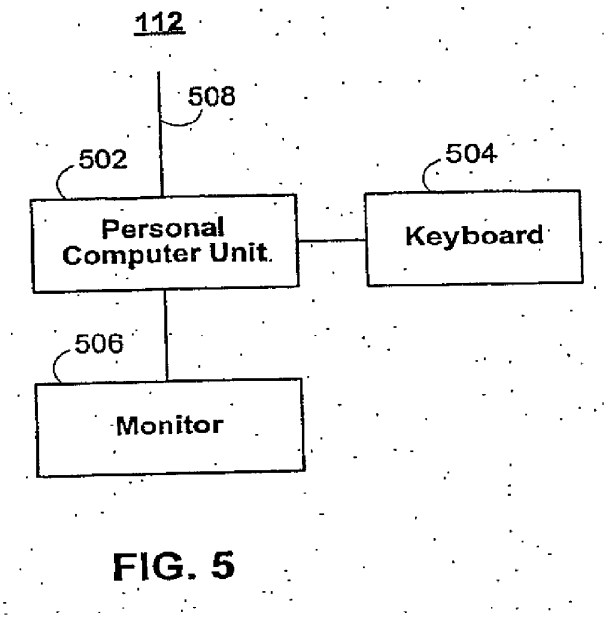
112
508
502
504
Personal Computer Unit
Keyboard
506
Monitor

FIG. 5

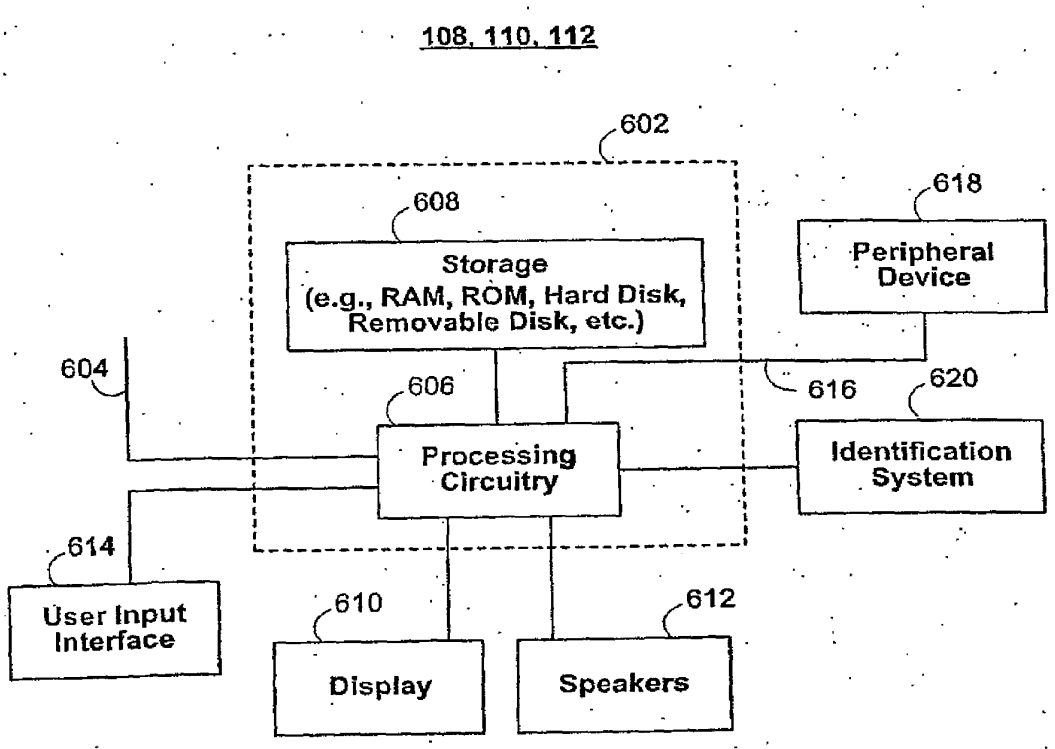
108, 110, 112
602
608
Storage
(e.g., RAM, ROM, Hard Disk, Removable Disk, etc.)
618
Peripheral Device
604
606
616
620
Processing Circuitry
Identification System
614
User Input Interface
610
Display
612
Speakers

FIG. 6

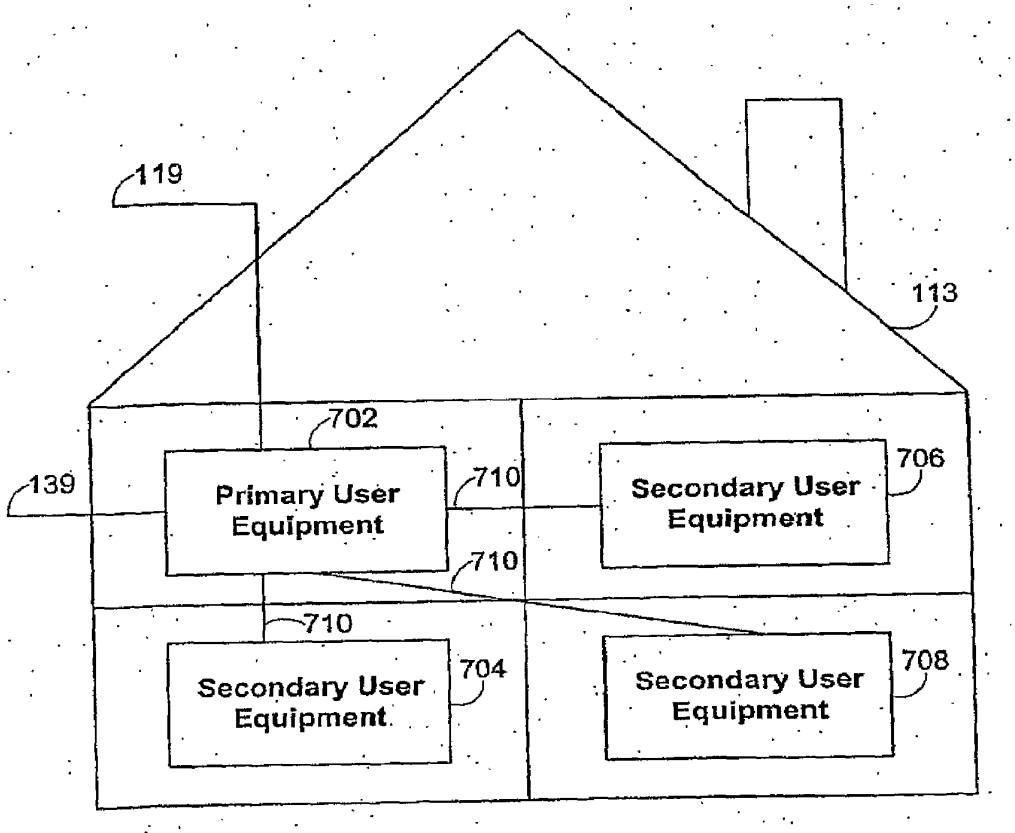
119
113
702
139
Primary User Equipment
710
Secondary User Equipment
706
710
710
Secondary User Equipment
704
Secondary User Equipment
708

FIG. 7

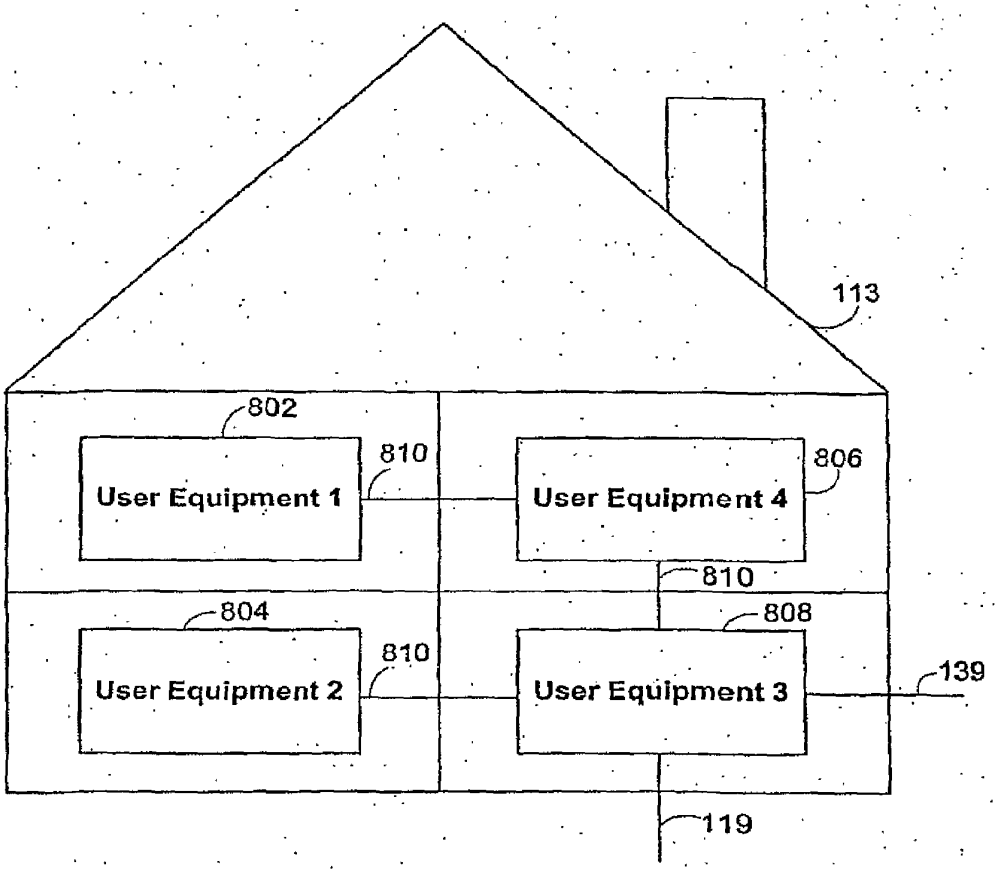
113
802
User Equipment 1
810
User Equipment 4
806
810
804
User Equipment 2
810
808
User Equipment 3
139
119

FIG. 8a

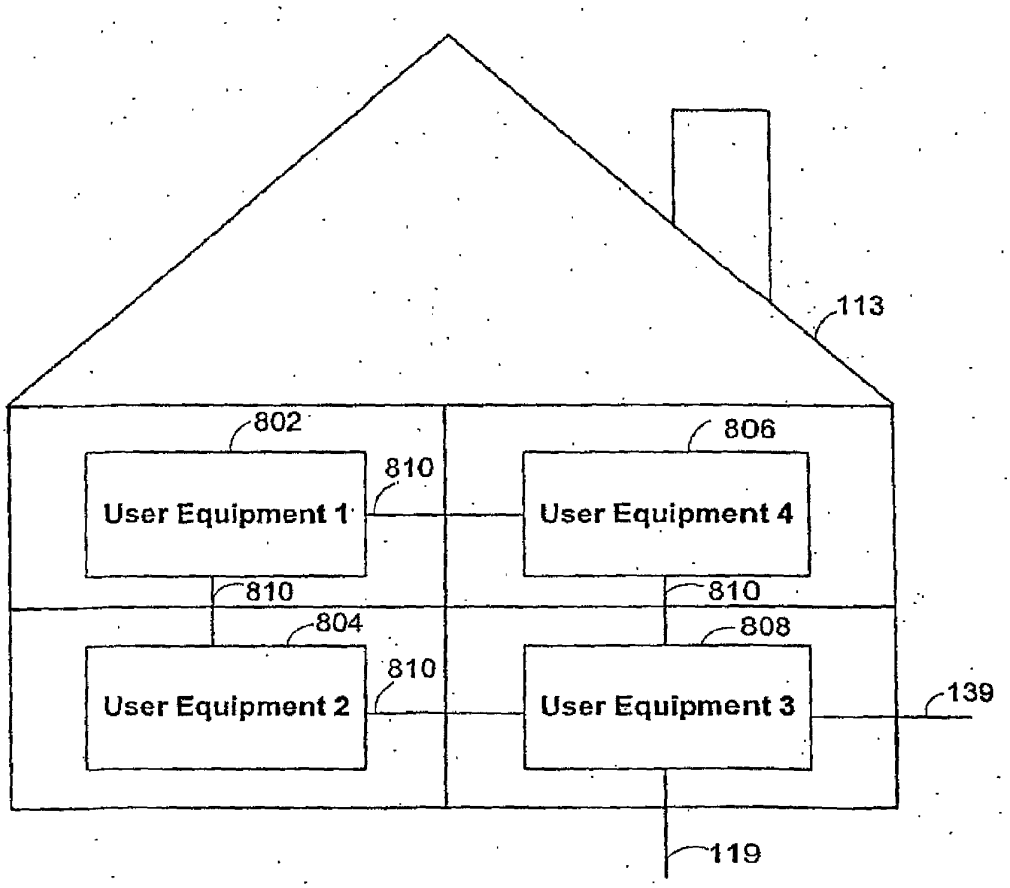
113
802
806
810
User Equipment 1
User Equipment 4
810
810
804
808
810
User Equipment 2
User Equipment 3
139
119

FIG. 8b

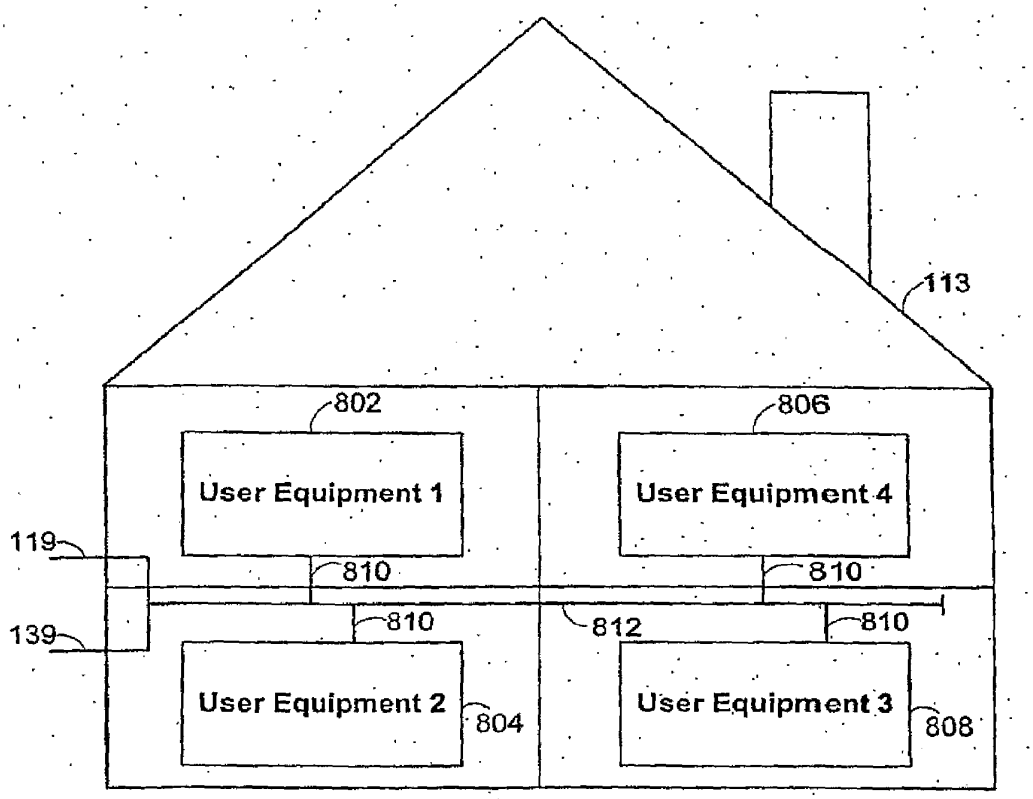
113
802
806
User Equipment 1
User Equipment 4
119
810
810
139
810
812
810
User Equipment 2
804
User Equipment 3
808

FIG. 8c

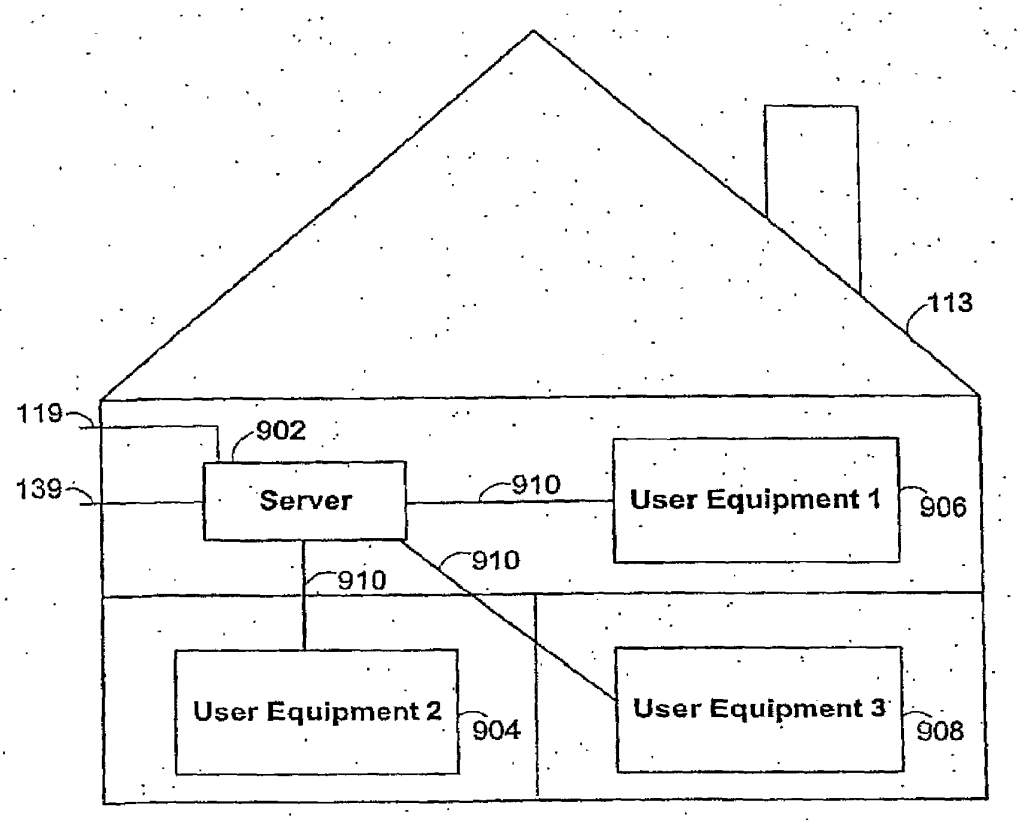
113
119
902
139
Server
910
User Equipment 1
906
910
910
User Equipment 2
904
User Equipment 3
908

FIG. 9

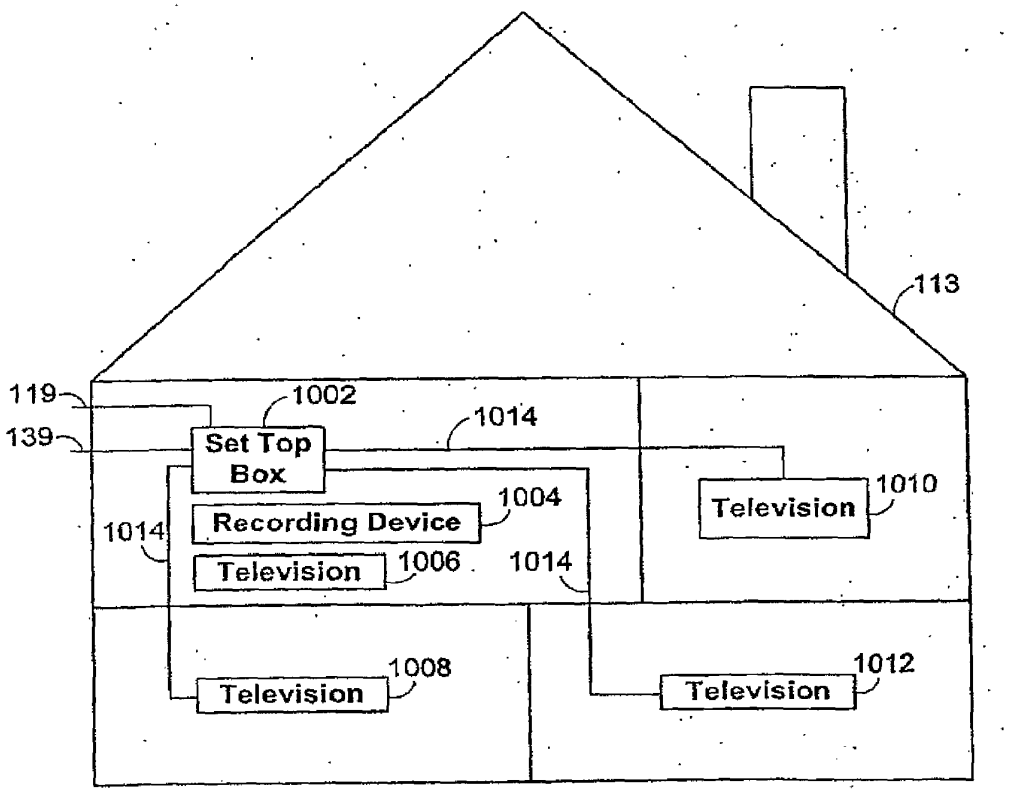
113
119
139
1002
1014
Set Top Box
1014
Recording Device
1004
Television
1006
1014
Television
1010
Television
1008
Television
1012

FIG. 10

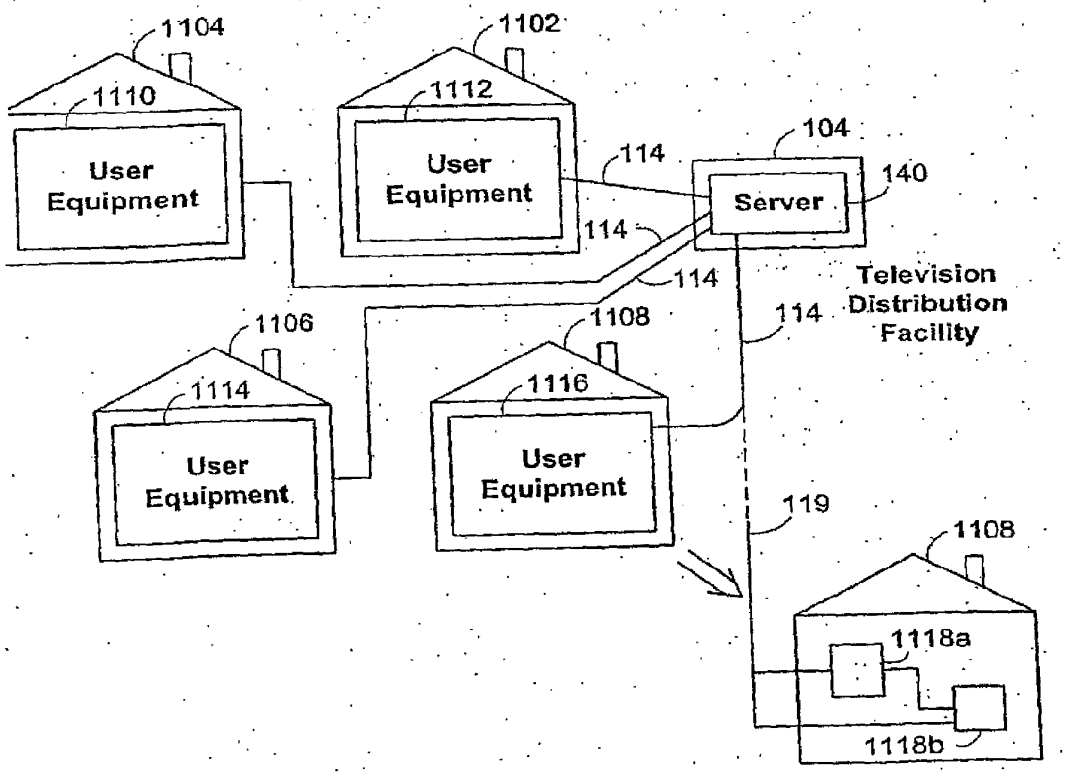
1104
1110
User Equipment
1102
1112
User Equipment
104
114
Server
140
114
114
Television Distribution Facility
114
1106
1114
User Equipment
1108
1116
User Equipment
119
1108
1118a
1118b

FIG. 11a

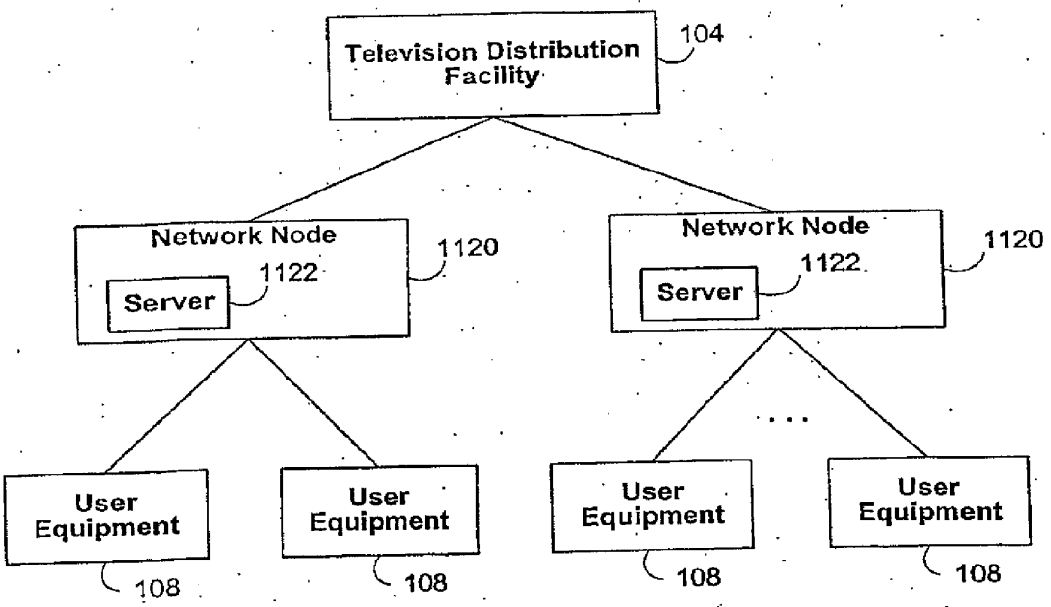
Television Distribution Facility
104
Network Node
1120
Server
1122
Network Node
1120
Server
1122
User Equipment
108
User Equipment
108
User Equipment
108
User Equipment
108

FIG. 11b

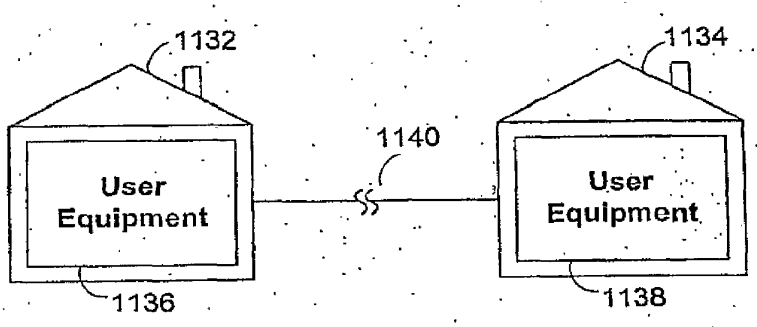


FIG. 11c

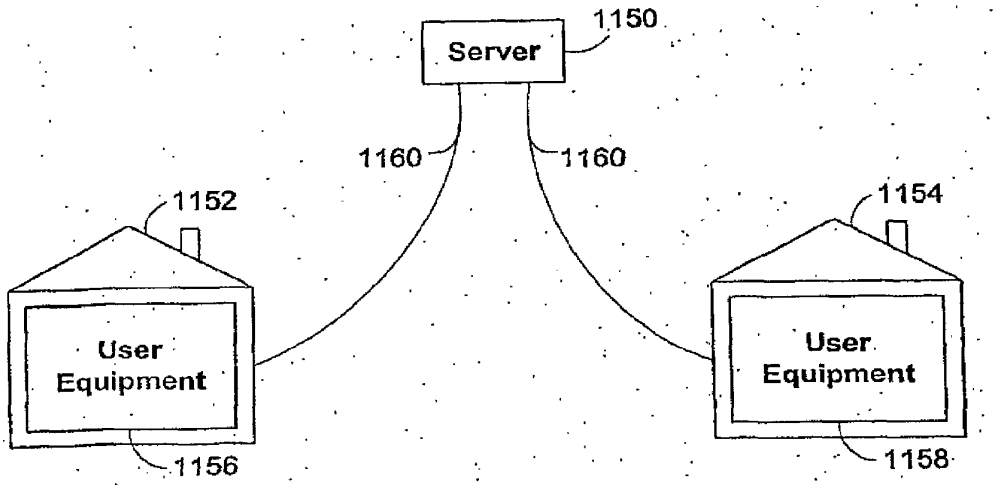


FIG. 11d

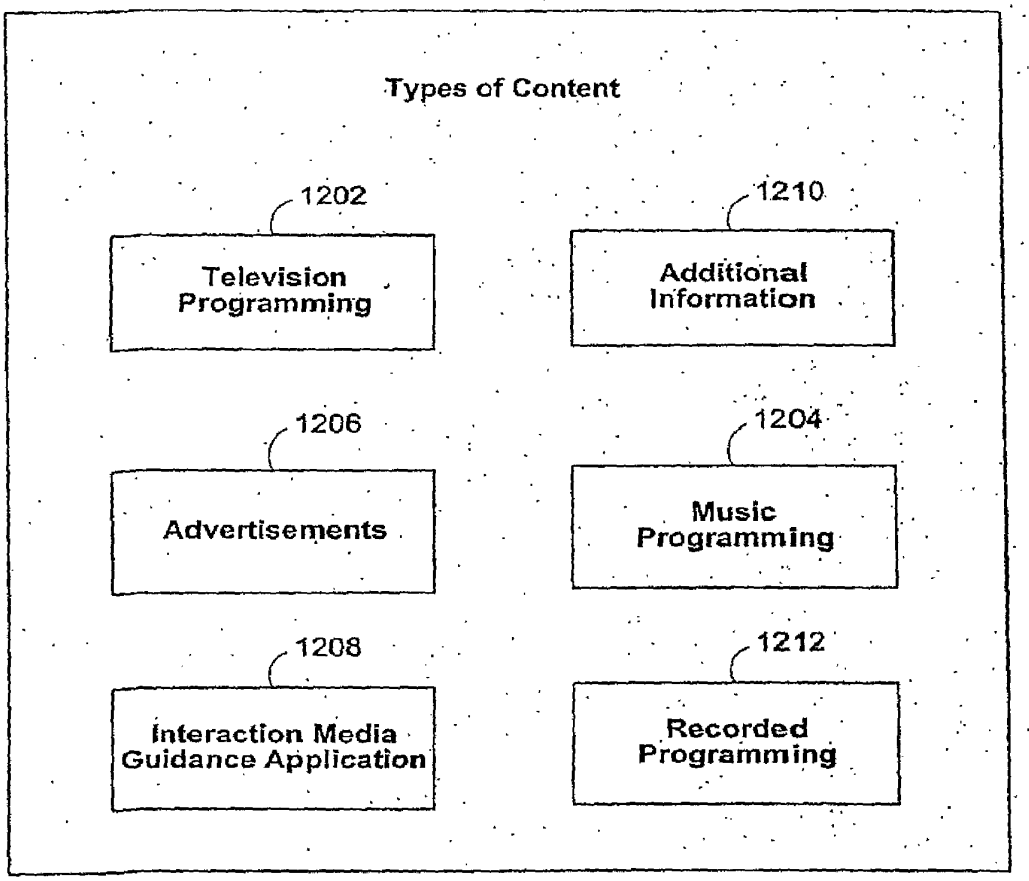
Types of Content
1202
Television Programming
1210
Additional Information
1206
Advertisements
1204
Music Programming
1208
Interaction Media Guidance Application
1212
Recorded Programming

FIG. 12

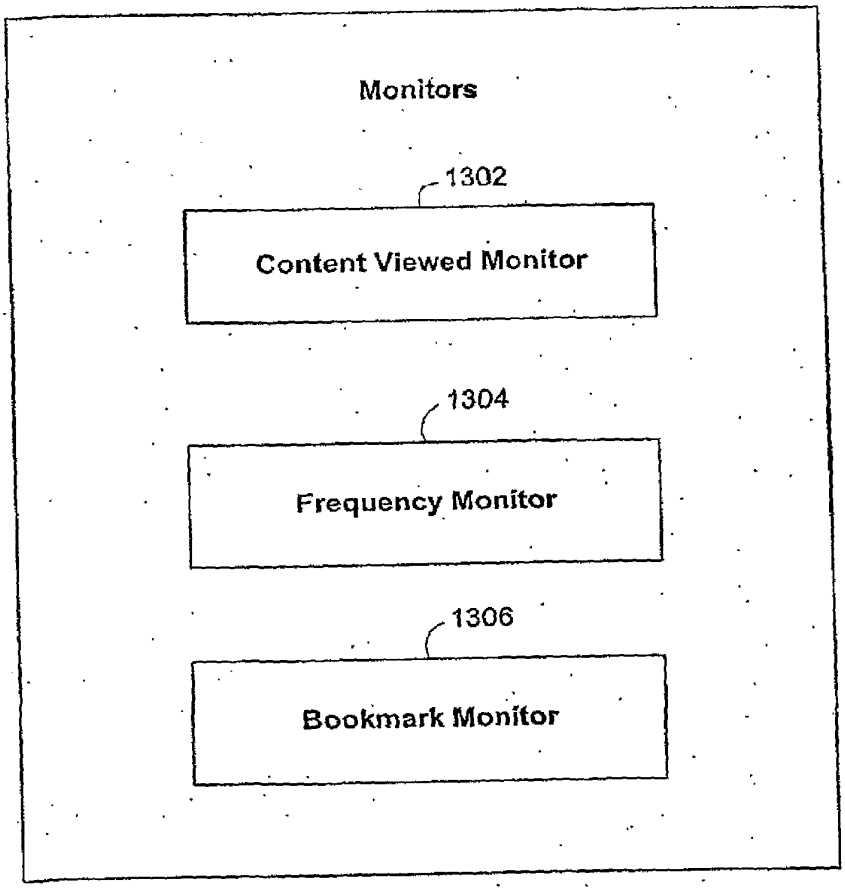
Monitors
1302
Content Viewed Monitor
1304
Frequency Monitor
1306
Bookmark Monitor

FIG. 13

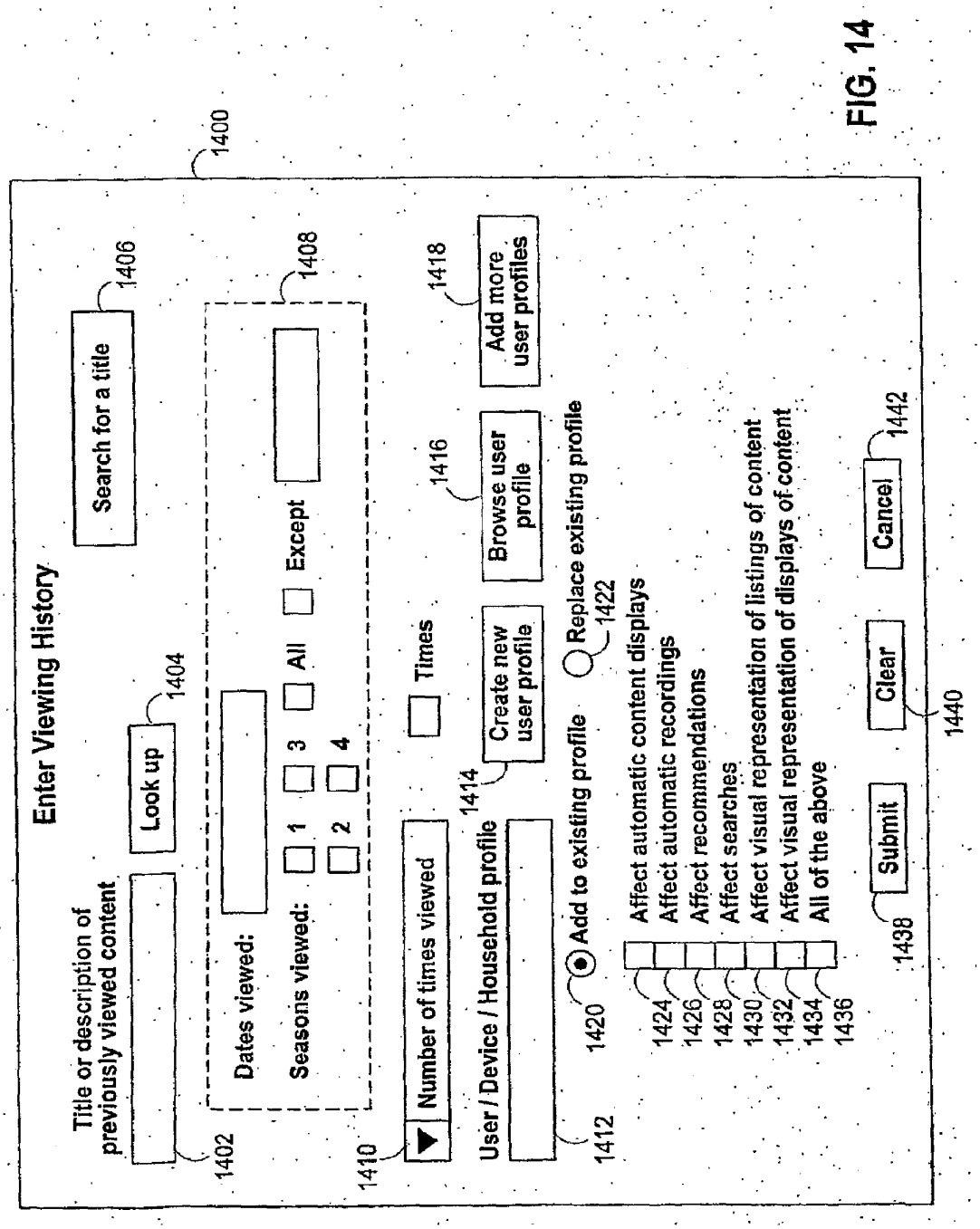
Enter Viewing History
1400
Title or description of previously viewed content
1402
Look up
1404
Search for a title
1406
Dates viewed:
Seasons viewed:
1 2 3 4
All
Except
1408
1410
Number of times viewed
Times
1416
Browse user profile
1418
Add more user profiles
User / Device / Household profile
1412
1414
Add to existing profile
1420
Create new user profile
Replace existing profile
1422
Affect automatic content displays
Affect automatic recordings
Affect recommendations
Affect searches
Affect visual representation of listings of content
Affect visual representation of displays of content
All of the above
1424
1426
1428
1430
1432
1434
1436
Submit
1438
Clear
1440
Cancel
1442

FIG. 14

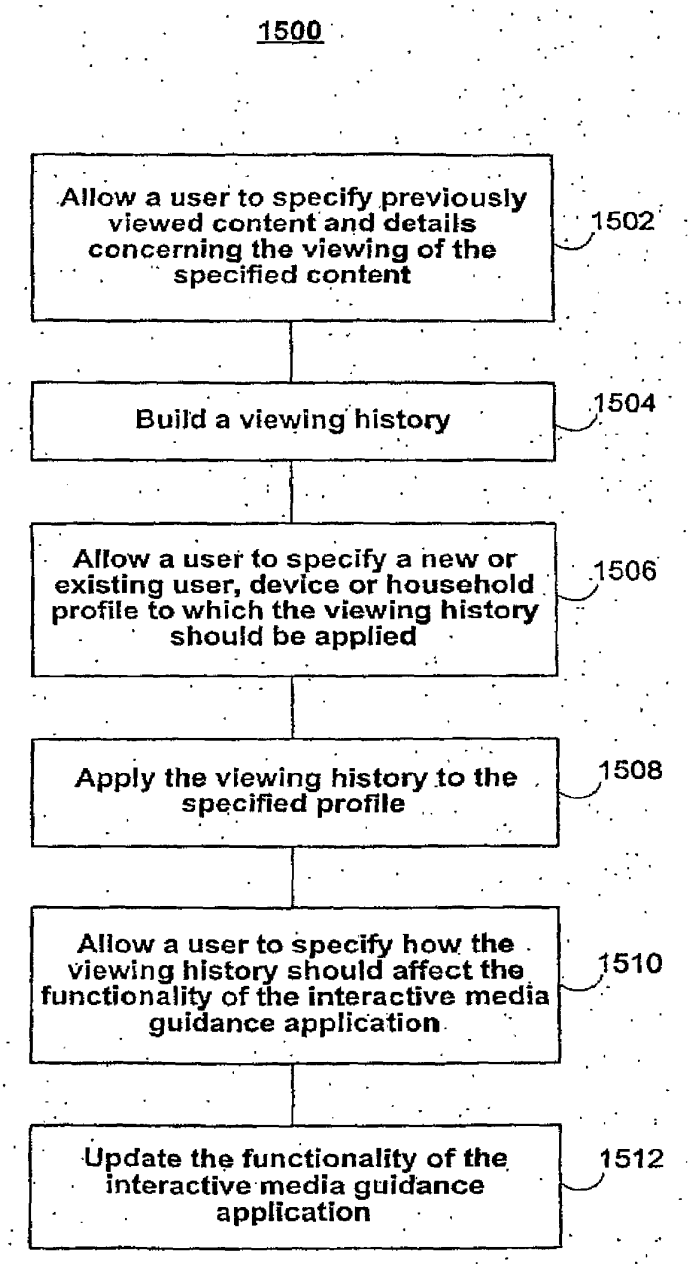


FIG. 15



EX. 1002
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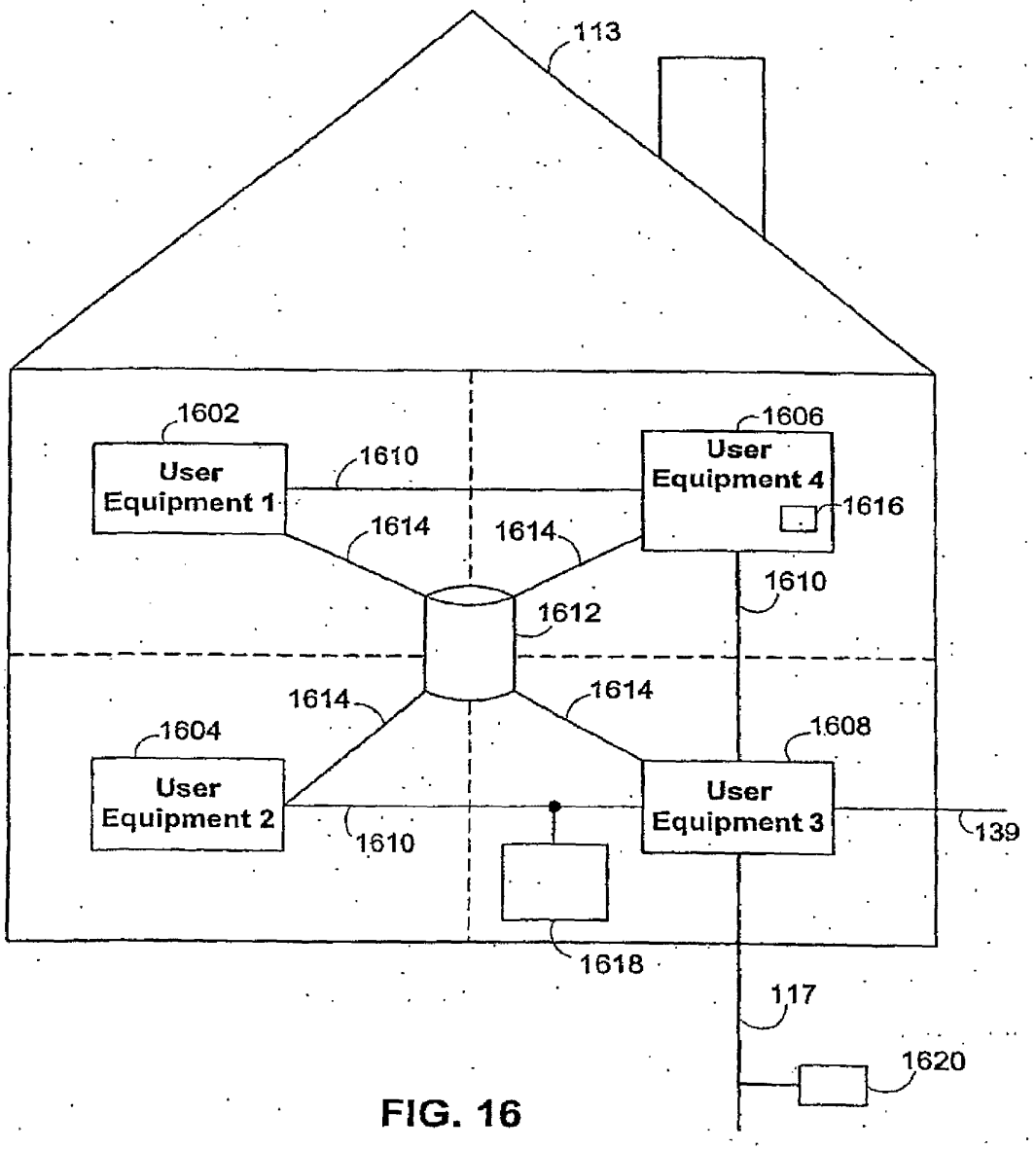
113
1602
User Equipment 1
1610
1606
User Equipment 4
1616
1614
1614
1610
1612
1614
1614
1604
User Equipment 2
1610
1608
User Equipment 3
139
1618
117
1620

FIG. 16

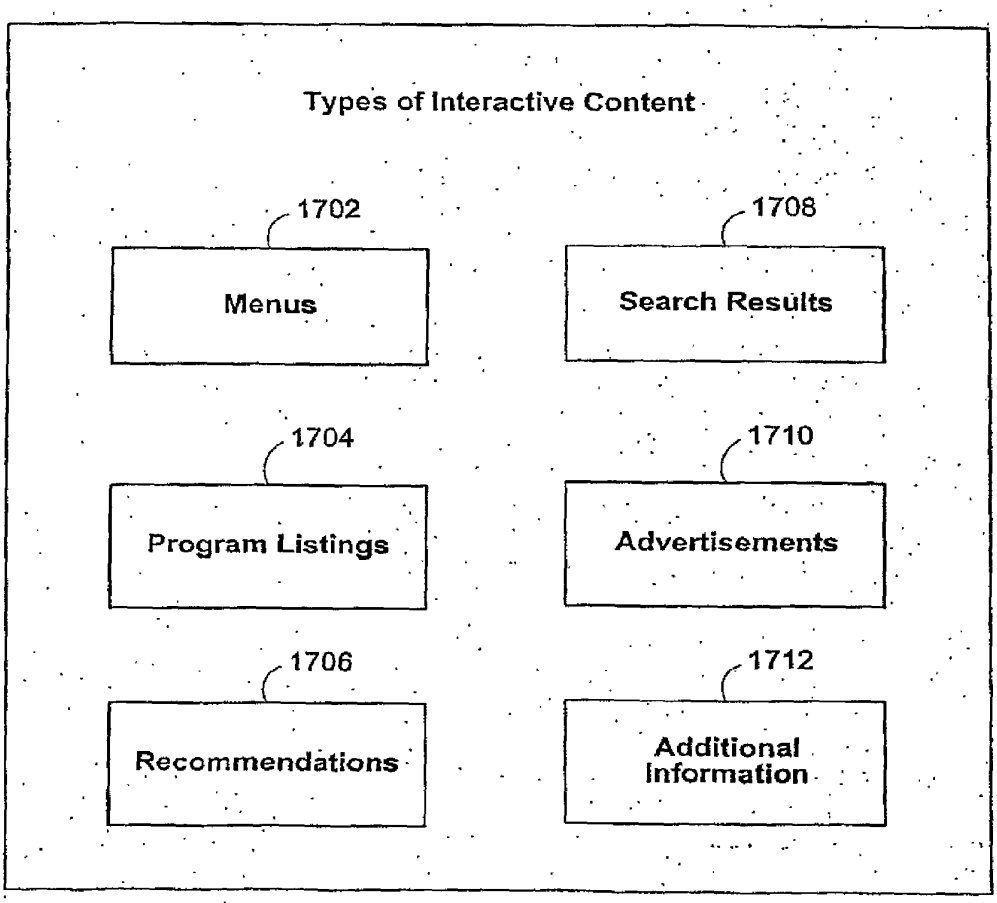
Types of Interactive Content
1702
Menus
1708
Search Results
1704
Program Listings
1710
Advertisements
1706
Recommendations
1712
Additional Information

FIG. 17

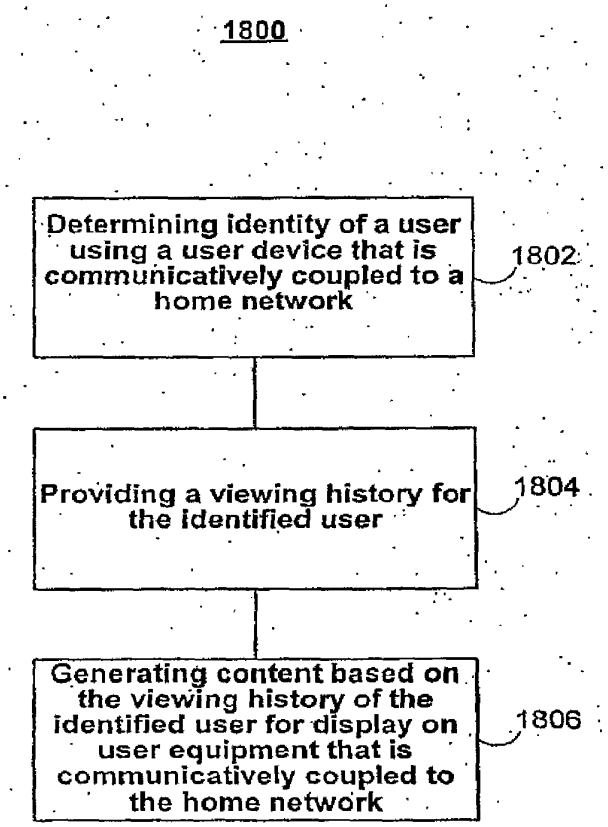
1800
Determining identity of a user using a user device that is communicatively coupled to a home network
1802
Providing a viewing history for the identified user
1804
Generating content based on the viewing history of the identified user for display on user equipment that is communicatively coupled to the home network
1806

FIG. 18a

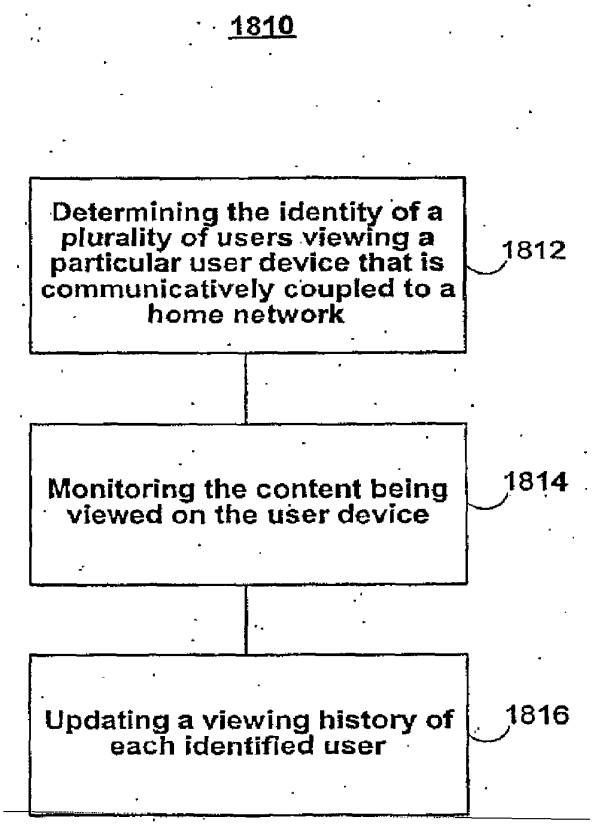
1810
Determining the identity of a plurality of users viewing a particular user device that is communicatively coupled to a home network
1812
Monitoring the content being viewed on the user device
1814
Updating a viewing history of each identified user
1816

FIG. 18b

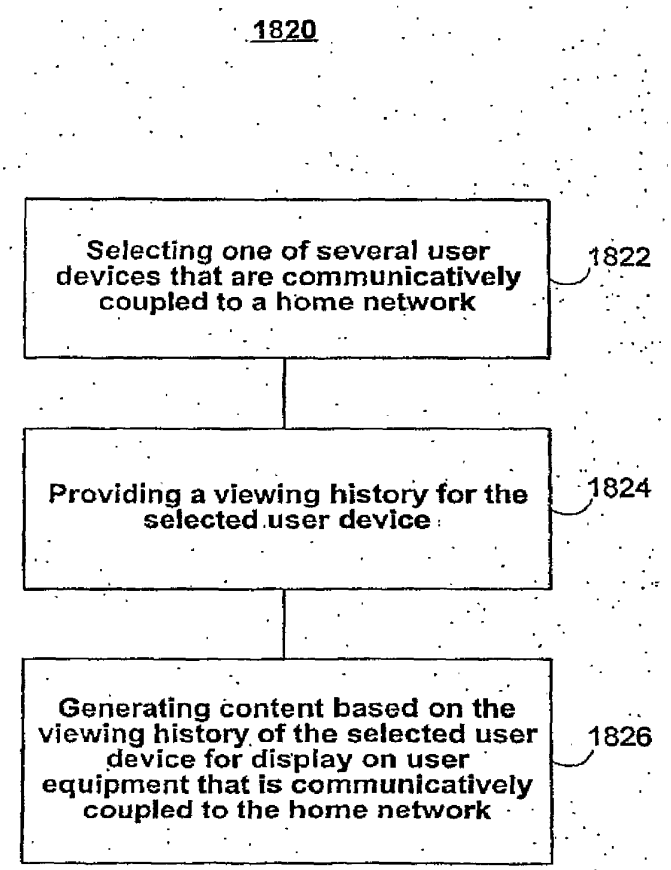
1820
Selecting one of several user devices that are communicatively coupled to a home network
1822
Providing a viewing history for the selected user device
1824
Generating content based on the viewing history of the selected user device for display on user equipment that is communicatively coupled to the home network
1826

FIG. 18c

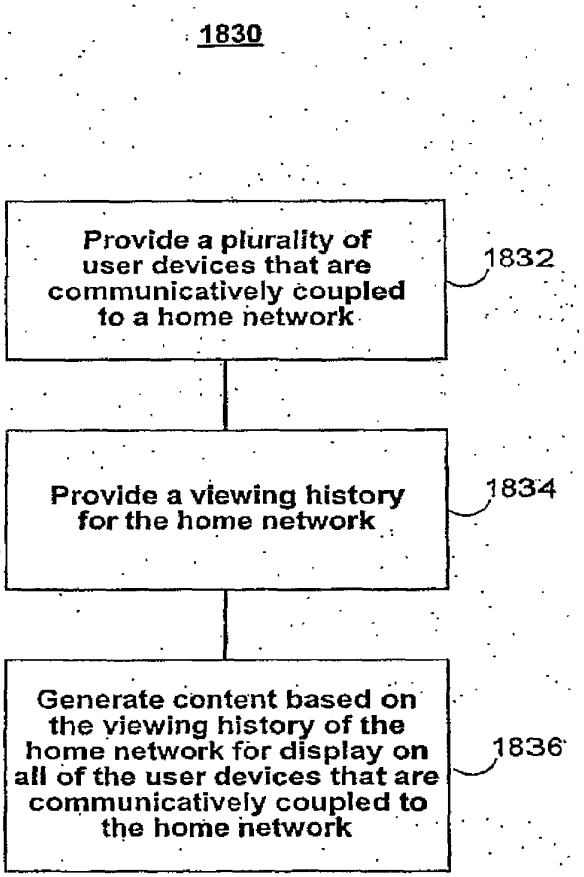
1830
Provide a plurality of user devices that are communicatively coupled to a home network
1832
Provide a viewing history for the home network
1834
Generate content based on the viewing history of the home network for display on all of the user devices that are communicatively coupled to the home network
1836

FIG. 18d

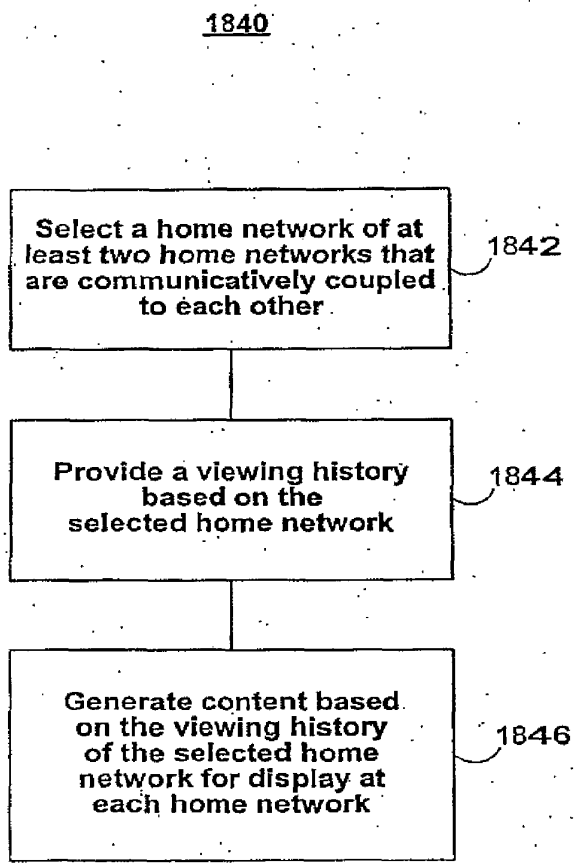
1840
Select a home network of at least two home networks that are communicatively coupled to each other
1842
Provide a viewing history based on the selected home network
1844
Generate content based on the viewing history of the selected home network for display at each home network
1846

FIG. 18e

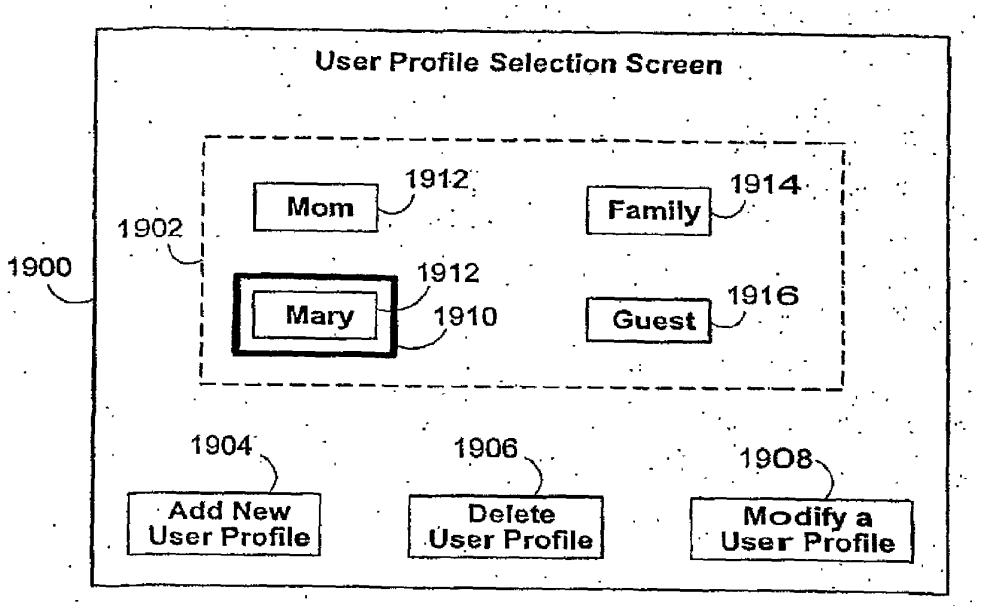
User Profile Selection Screen
1900
1902
Mom
1912
Family
1914
Mary
1912
1910
Guest
1916
1904
Add New User Profile
1906
Delete User Profile
1908
Modify a User Profile

FIG. 19

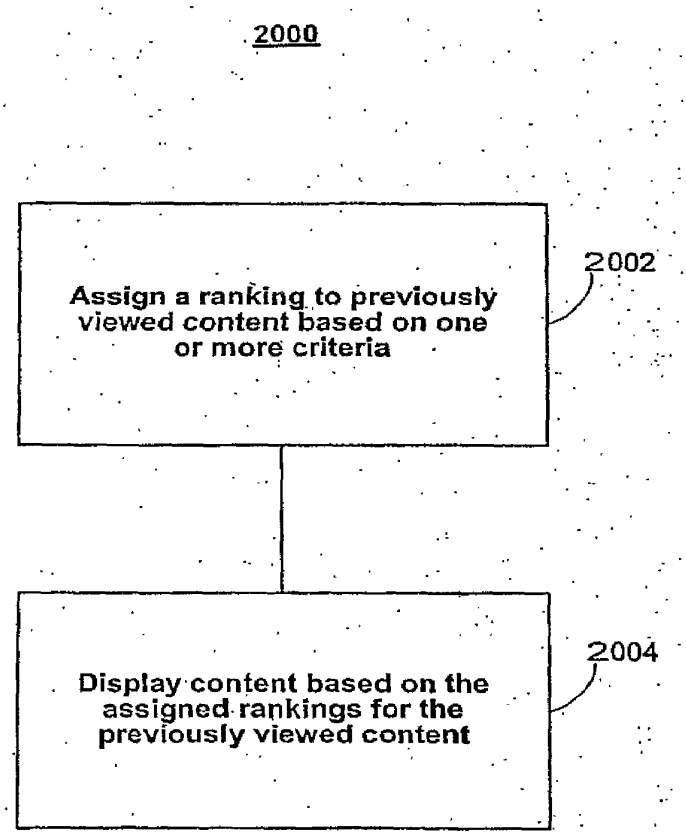
2000
Assign a ranking to previously viewed content based on one or more criteria
2002
Display content based on the assigned rankings for the previously viewed content
2004

FIG. 20

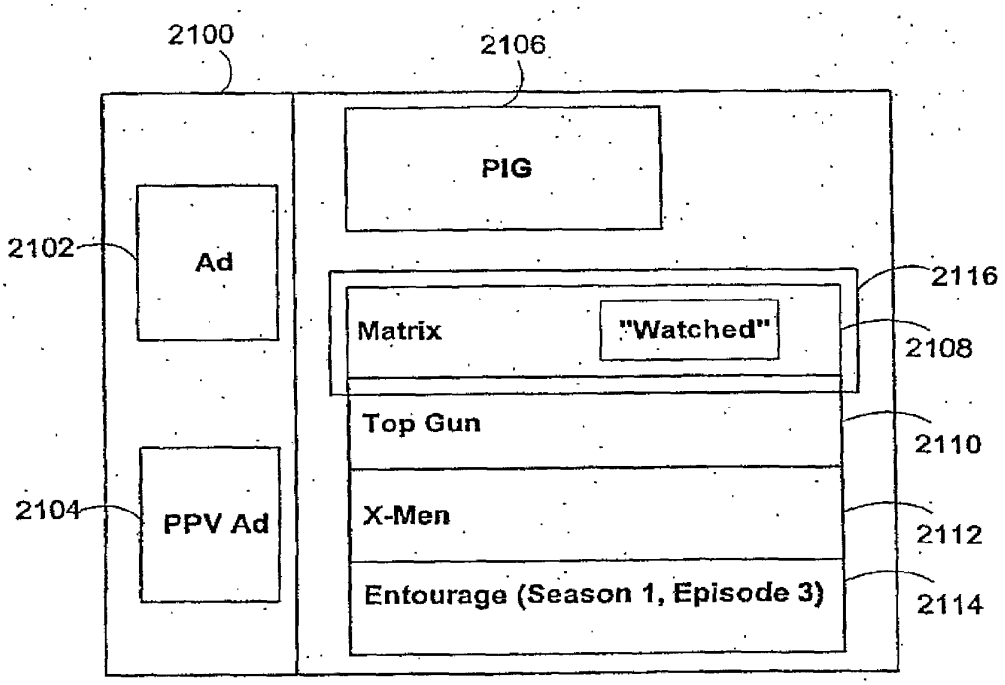
2100
2106
PIG
2102
Ad
2116
Matrix
"Watched"
2108
Top Gun
2110
2104
PPV Ad
X-Men
2112
Entourage (Season 1, Episode 3)
2114

FIG. 21a

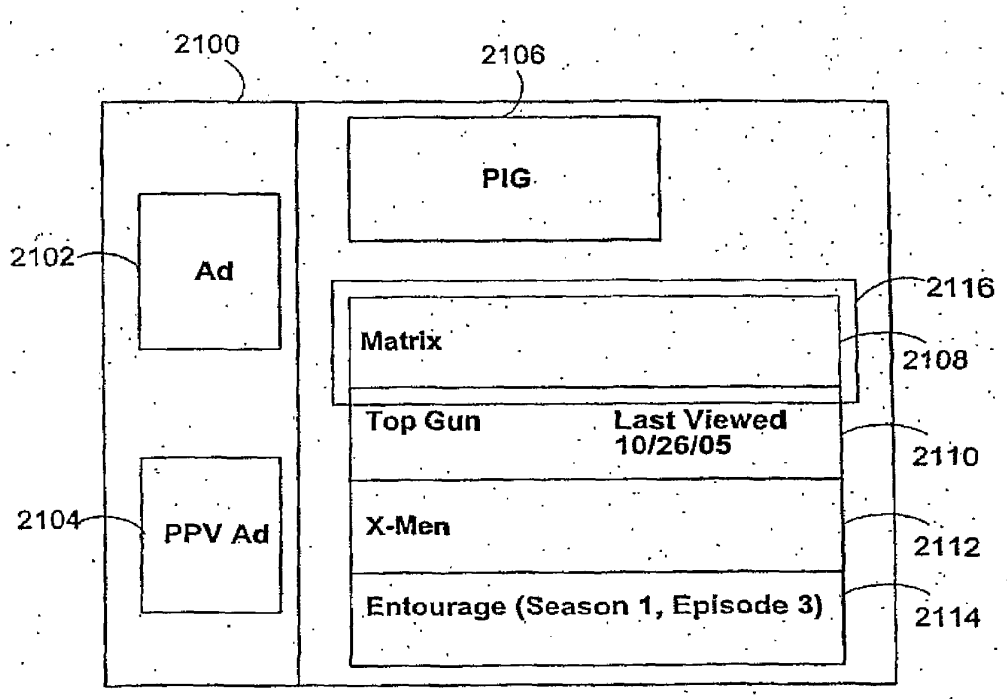


FIG. 21b



EX. 1002
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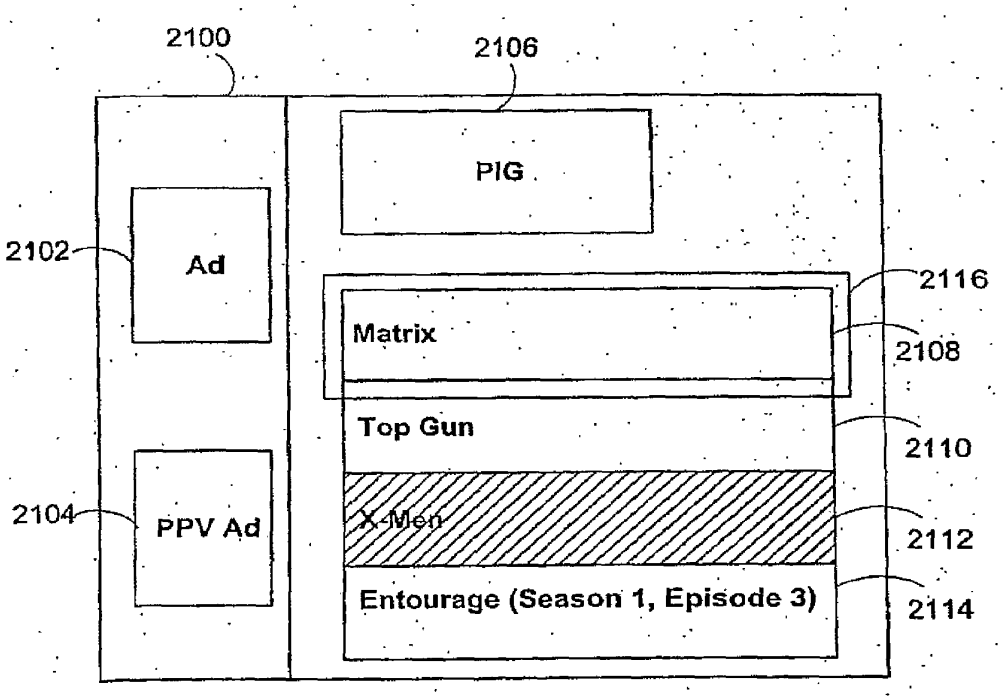
2100
2106
PIG
2102
Ad
2116
Matrix
2108
Top Gun
2110
2104
PPV Ad
X-Men
2112
Entourage (Season 1, Episode 3)
2114

FIG. 21c

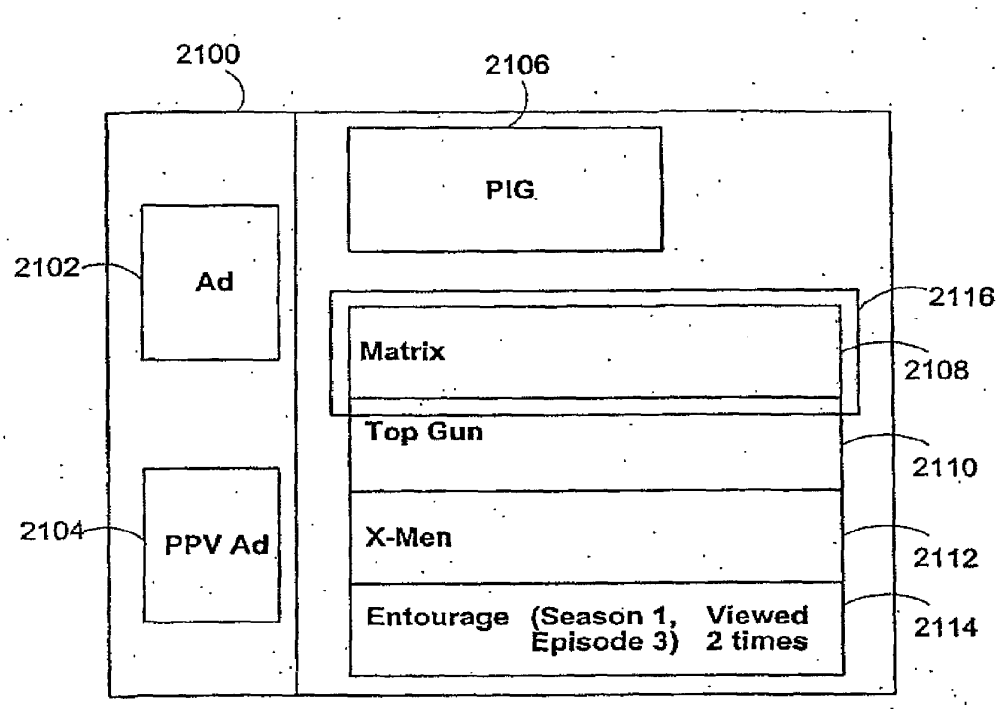
2100
2106
PIG
2102
Ad
2116
Matrix
2108
Top Gun
2110
2104
PPV Ad
X-Men
2112
Entourage (Season 1, Episode 3) Viewed 2 times
2114

FIG. 21d

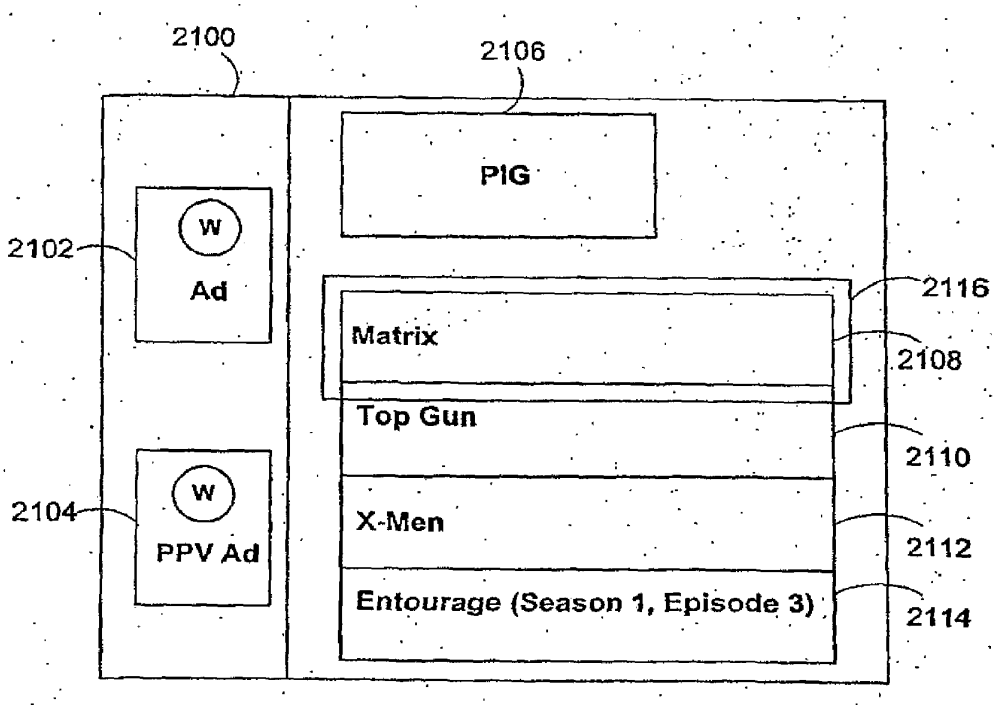
2100
2106
PIG
W
Ad
2102
Matrix
2116
2108
Top Gun
2110
W
PPV Ad
2104
X-Men
2112
Entourage (Season 1, Episode 3)
2114

FIG. 21e

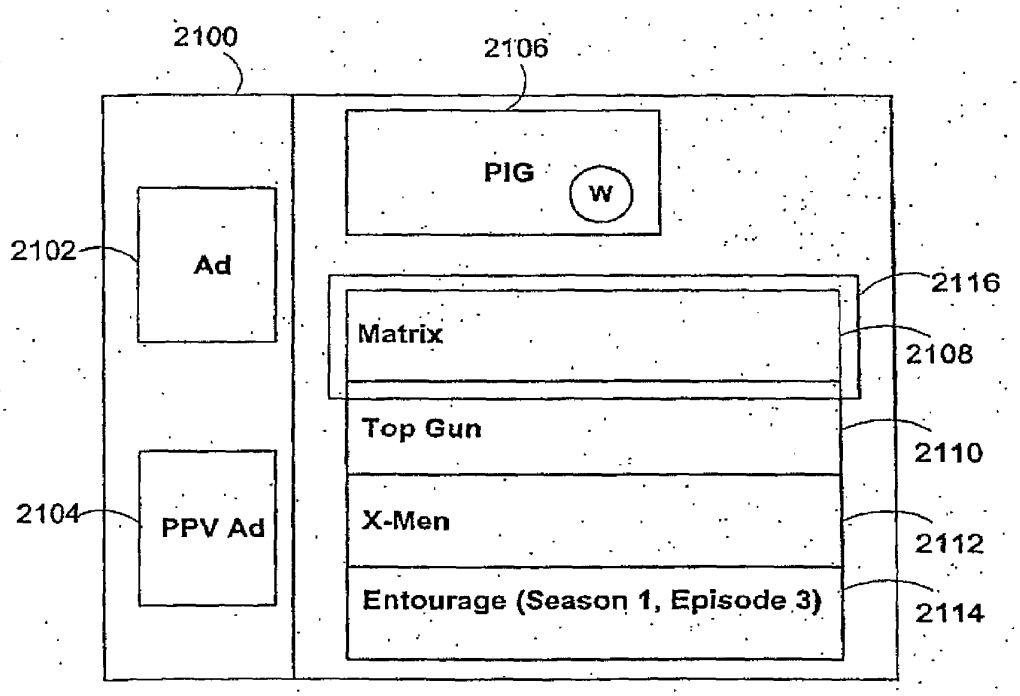
2100
2106
PIG
W
2102
Ad
2116
Matrix
2108
Top Gun
2110
2104
PPV Ad
X-Men
2112
Entourage (Season 1, Episode 3)
2114

FIG. 21f

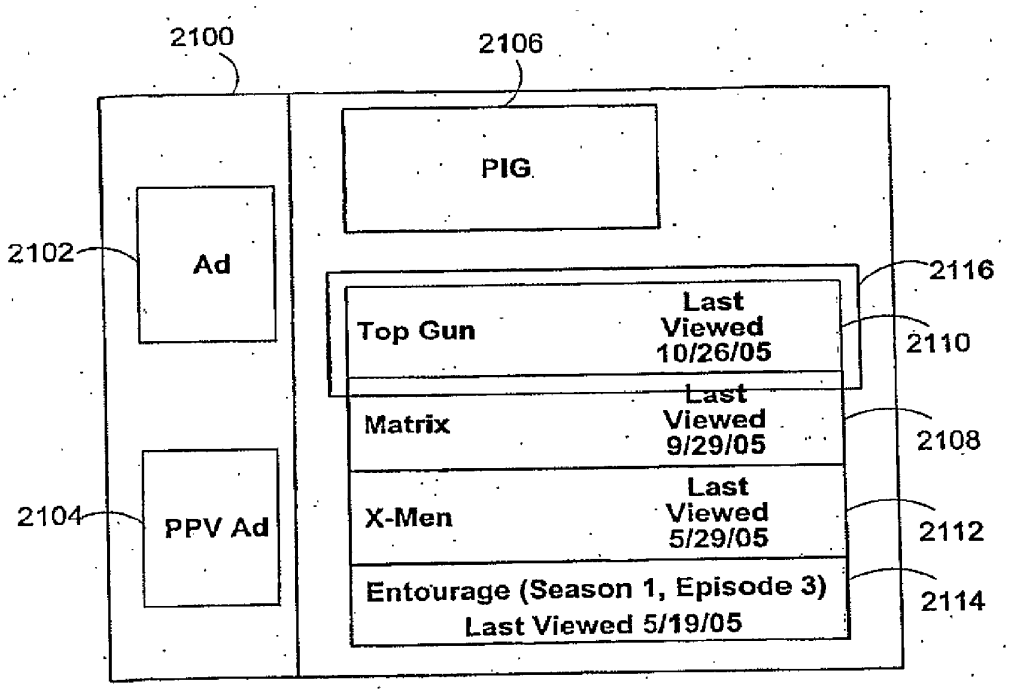
2100
2106
PIG
2102
Ad
2116
Top Gun
Last Viewed 10/26/05
2110
Matrix
Last Viewed 9/29/05
2108
2104
PPV Ad
X-Men
Last Viewed 5/29/05
2112
Entourage (Season 1, Episode 3) Last Viewed 5/19/05
2114

FIG. 21g

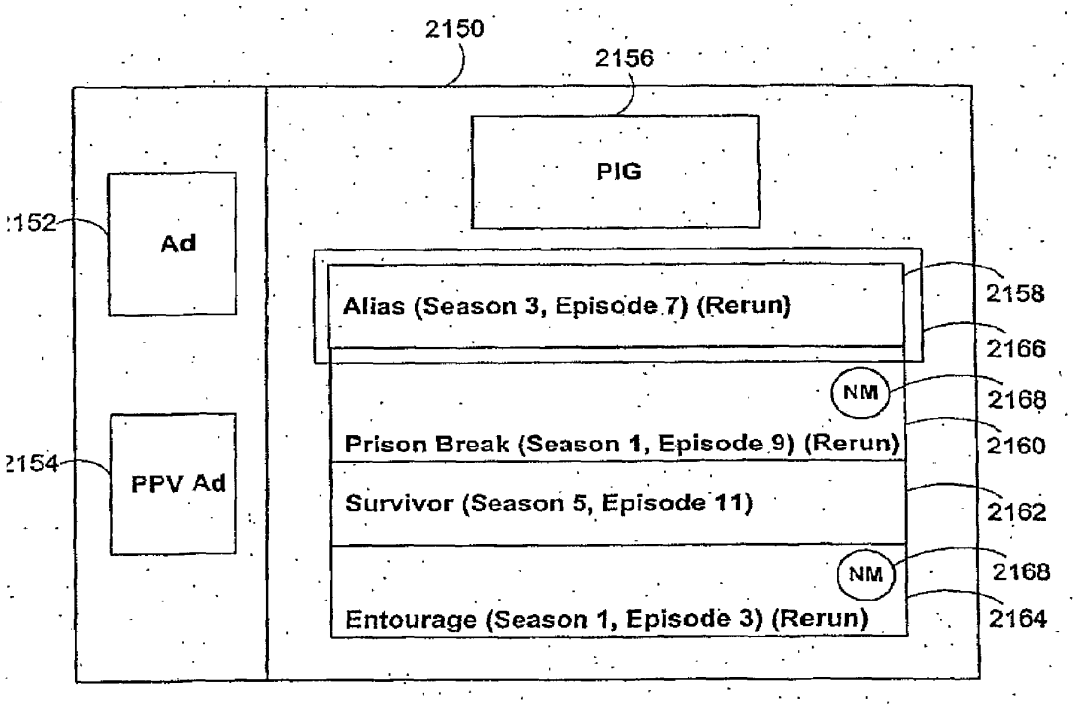
2150
2156
PIG
2152
Ad
Alias (Season 3, Episode 7) (Rerun)
2158
2166
NM
2168
2154
PPV Ad
Prison Break (Season 1, Episode 9) (Rerun)
2160
Survivor (Season 5, Episode 11)
2162
NM
2168
Entourage (Season 1, Episode 3) (Rerun)
2164

FIG. 21h

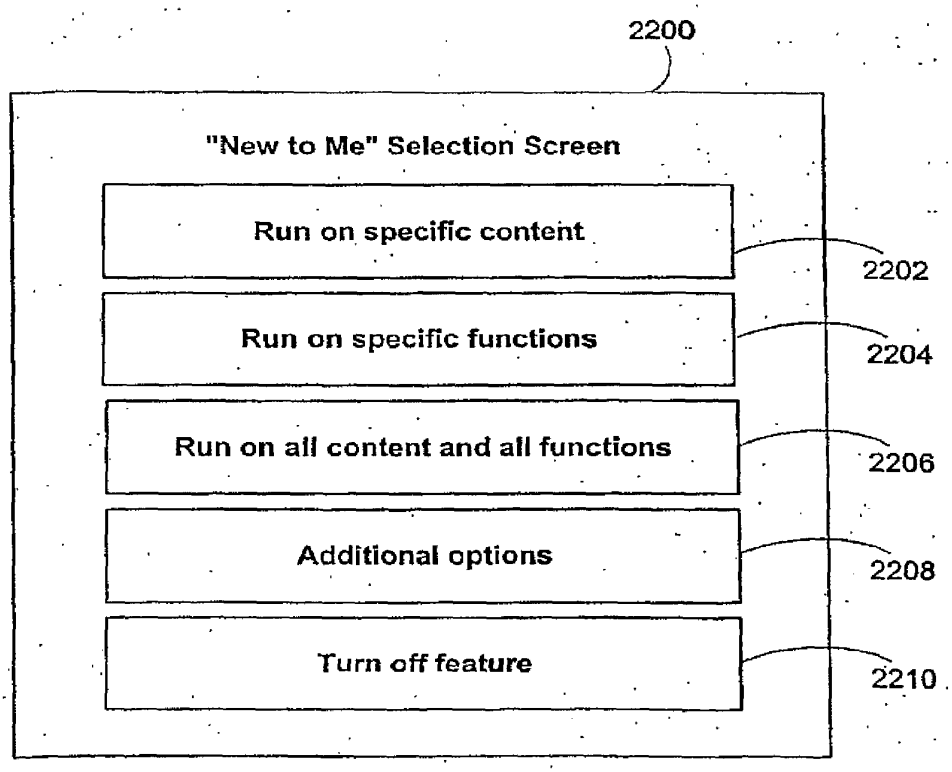
2200
"New to Me" Selection Screen
Run on specific content
2202
Run on specific functions
2204
Run on all content and all functions
2206
Additional options
2208
Turn off feature
2210

FIG. 22

Europäisches Patentamt
European Patent Office
Office européen des brevets

# EUROPEAN SEARCH REPORT

Application Number
EP 11 15 1835

## 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 | EP 1 515 549 A1 (SAMSUNG ELECTRONICS CO LTD [KR]) 16 March 2005 (2005-03-16)<br>* abstract *<br>* paragraphs [0010] - [0020], [0024] - [0029], [0032] - [0044] *<br>* figure 4 *<br>----- | 1-14 | INV.<br>H04N7/16<br>H04N5/00 |
| X | WO 2004/054264 A1 (KONINKL PHILIPS ELECTRONICS NV [NL]; GUTTA SRINIVAS [US]) 24 June 2004 (2004-06-24)<br>* abstract *<br>* page 2, line 4 - line 27 *<br>* page 4, line 19 - line 20 *<br>* page 6, line 3 - page 9, line 7 *<br>* figures 2,3a,3b *<br>----- | 1-14 | |
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CATEGORY OF CITED DOCUMENTS

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# EUROPEAN SEARCH REPORT

Application Number
EP 11 15 1835

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L : document cited for other reasons

& : member of the same patent family, corresponding document

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PCT/US2013/055286 02.12.2013

(11) EP 2 348 724 A2

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## (54) Electronic program guide with video-on-demand functionality

(57) A method of providing an electronic program guide in an apparatus for receiving and decoding digital television signals. The method comprises providing an electronic program guide screen having at least a first and a second window, wherein the first window displays a grid guide format of time and channel having a plurality of cells in which television program listings are displayed; providing input means for controlling a cursor to select between the first and the second window and to navigate and provide control functionality within each of the first and second window, wherein, if the first window is selected, the cursor selectively high-lights one of the television program listings displayed in the grid guide; wherein the second window displays Video-On-Demand program listings, wherein, if the second window is selected, the cursor selectively highlights one of the Video-On-Demand program listings and provides means for activating said Video-On-Demand program listing.

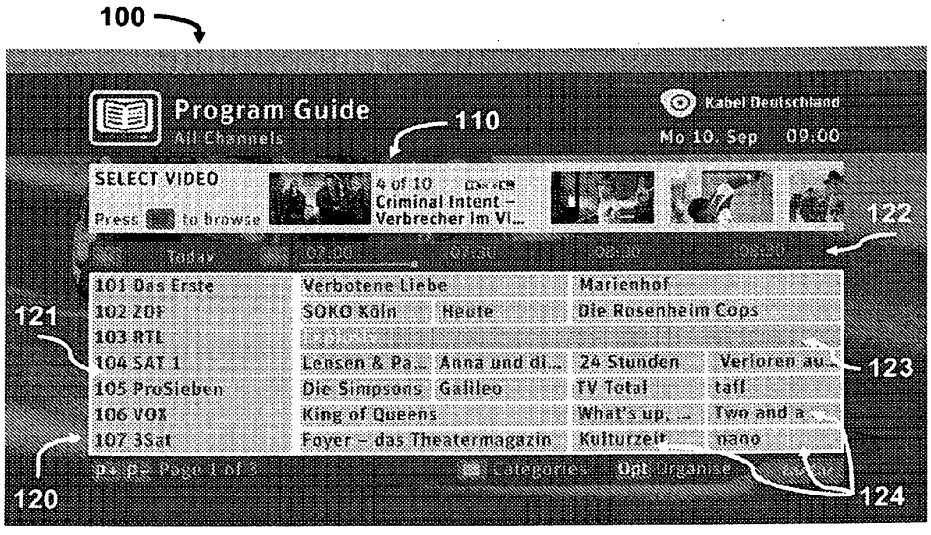


Figure 1a

EP 2 348 724 A2

## Description

### TECHNICAL FIELD

**[0001]** The present invention relates generally to methods of providing an electronic program guide (EPG) in an apparatus for receiving and decoding digital television signals, wherein the method comprises providing an electronic program guide screen having at least a first and a second window, wherein the first window displays a grid guide format of time and channel having a plurality of cells in which television program listings are displayed; providing input means for controlling a cursor to select between the first and the second window and to navigate and provide control functionality within each of the first and second window, wherein, if the first window is selected, the cursor selectively highlights one of the television program listings displayed in the grid guide.

### BACKGROUND OF THE INVENTION

**[0002]** Electronic Program Guides (EPGs) are well known tools to ease viewer navigation in an electronic listing of broadcast programs. Particularly, Electronic Program Guides are used to provide an overview to scheduled broadcast television or radio programs. EPGs are typically displayed on a television screen. Additional functionality enables viewers to navigate, select, and discover content by time, title, channel, genre, etc. by use of a remote control, a keyboard, or other input devices such as a phone keypad. An EPG may also be employed to book content for future recording by a digital video recorder or personal video recorder. The on-screen information may be delivered by a dedicated channel or assembled by the receiving equipment from information sent by each program channel, the network operator or other data providers.

**[0003]** Electronic Program Guides are often run on an integrated receiver/decoder such as a set-top box (STB). An integrated receiver/decoder (IRD) is an electronic device used to pickup a radio-frequency signal and convert digital information transmitted in it. A Consumer IRD, commonly called a set-top box or set-top unit is a device that connects to a television and an external source of signal, turning the signal into content which is then displayed on the television screen.

**[0004]** Other environments to run an Electronic Program Guide may be Integrated Digital Televisions (IDTV). An IDTV set is a television set with a built in digital tuner, be it for DVB-T, DVB-T2,DVB-S, DVB-S2, DVB-C, DVB-C2, DMB-T/H, IP, ATSC or ISDB. Most of them also allow reception of analogue signals (PAL, SÉCAM or NTSC). They do away with the need for a STB for converting those signals for reception on a television. Some are integrated with a personal video recorder and / or a means to descramble encrypted programs or data streams (e.g. a Common Interface Plus module).

**[0005]** Systems which enable users to select and watch audio/video content on demand are generally referred to as Video-On-Demand (VOD) systems. VOD systems used in the context of a TV set either stream content through a STB, allowing viewing in real time, or download it to a device such as a computer, digital video recorder (or personal video recorder) or portable media player for viewing at any time. Most television providers offer both VOD streaming, such as pay-per-view, whereby a user buys or selects a movie or television program and it begins to play on the television set almost instantaneously, or downloading to a digital video recorder (DVR) rented from the provider, for viewing in the future. VOD contents can also be free of charge or subscription based.

**[0006]** US 7,188,356 B1 describes a program transmitting/receiving system having a center device and a terminal device connected through a communication device to the center device. The center device has a program information memory, a program information transmitter, a broadcasting device, and a request program transmitter. The terminal device has a program information receiver, a program receiver, an image information generator, a program request signal transmitter, and a request program receiver. The memory stores program information. The program information transmitter transmits the program information to the terminal device. The broadcasting device broadcasts the program to the terminal device in accordance with a schedule, and stores the program. The request program transmitter receives a request signal of the program from the terminal device, and transmits the program corresponding to the request signal to the terminal device. Then, the program information receiver receives the program information. The program receiver receives the program. The image information generator generates image information for a program selection of a user on the basis of the program information. The program request signal transmitter transmits the request signal of the program selected by the user to the center device, if the program selected in accordance with the image information is a past broadcast program. The request program receiver receives the program corresponding to the request signal.

**[0007]** WHO 20071091781 A1 describes an electronic programming guide (EPG) providing apparatus and method to collectively manage broadcast content using stored EPG information. The EPG providing apparatus includes a storing unit which stores broadcast content o and EPG information, an EPG screen configuring unit which configures an EPG screen including information on past, current, and future broadcast content using the EPG information, and a control unit which collectively manages broadcast content provided on the EPG screen based on a user input signal.

**[0008]** The Electronic Program Guides described above include past times on the time axis to offer so called catch-up events of past broadcast, wherein either the catch-up events are stored automatically on the set-top box such that the viewer can watch the requested pro-

grams some time after they have been broadcasted, or the catch-up events are provided by connecting to a Video-On-Demand catalogue of past broadcast programs offered by the provider. Thus, a disadvantage of these EPGs is that the Video-On-Demand contents are only displayed in the context of a strict time-ordering and in the context of the particular channel where they have been broadcasted.

**[0009]** US 5,751,282 A describes an interactive television system having a centrally located head end server coupled to service multiple, remotely located set-top boxes. Each set-top box runs an electronic programming guide that provides an on-screen program grid listing program titles in relation to their scheduled viewing times and channel numbers. The viewer is permitted to scroll through the program grid to list titles of past, current, and future programs. A database, resident at the head end server, supplies the program titles and scheduled viewing times of the past, current, and future programs to the electronic programming guide. The head end server transmits real-time video data streams of the available programs to the EPG. A continuous media server, resident at the head end server, stores the video data streams to build a reserve of previously played programs. The media server can also store video preview clips of future programs. When a viewer selects a current program, the real-time video data stream of the current program is displayed by the set-top box. When the viewer selects a past program, the head end server retrieves a stored video data stream of the selected past program and transmits it to the set-top box. When the viewer selects a future program, the head end server retrieves a stored video preview clip of the future program and transmits it to the set-top box.

**[0010]** It is an object of the present invention to provide an improved electronic program guide.

## SUMMARY OF THE INVENTION

**[0011]** The above object is achieved by a method of providing an electronic program guide in an apparatus for receiving and decoding digital television signals. The method comprises providing an electronic program guide screen having at least a first and a second window, wherein the first window displays a grid guide format of time and channel having a plurality of cells in which television program listings are displayed. The method further comprises providing input means for controlling a cursor to select between the first and the second window and to navigate and provide control functionality within each of the first and second window, wherein, if the first window is selected, the cursor selectively high-lights one of the television program listings displayed in the grid guide. According to the present invention, the second window displays Video-On-Demand program listings, wherein, if the second window is selected, the cursor selectively highlights one of the Video-On-Demand program listings and provides means for activating said Video-On-Demand program listing.

**[0012]** Further, the present invention relates to an apparatus for receiving and decoding digital television signals. The apparatus comprises an electronic program guide screen having at least a first and a second window, wherein the first window displays a grid guide format of time and channel having a plurality of cells in which television program listings are displayed. The apparatus further comprises input means for controlling a cursor to select between the first and the second window and to navigate and provide control functionality within each of the first and second window, wherein, if the first window is selected, the cursor selectively highlights one of the television program listings displayed in the grid guide. According to the present invention the second window displays a Video-On-Demand listing, wherein, if the second window is selected, the cursor selectively high-lights one of the Video-On-Demand program listings and provides means for activating said Video-On-Demand program listing.

**[0013]** Further, the present invention relates to one or more computer-readable media having computer readable instructions thereon which, when executed by one or more processors, cause the processors to implement the above-described method.

**[0014]** The Electronic Program Guide described herein is advantageous as it attracts the viewer's attention by providing an additional window for Video-On-Demand program listings which are highlighted in the EPG. As a consequence, the viewer is offered two information sources on the same screen, one referring to time-dependent broadcast content, one referring to time-independent VOD content. VOD contents may reflect the viewer's broadcast or genre preferences and are not limited to past broadcast programs.

**[0015]** In addition, said window has the advantage that contents shown therein are independent of the channel or time selected in the EPG grid window. A viewer is offered the functionality of at least two interactive windows with different contents: television program listings and Video-On-Demand listings.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0016]** In the following, preferred embodiments of the present invention shall be discussed with reference to the following figures:

Figure 1 a shows an electronic program guide screen according to a first embodiment of the present invention.

Figure 1b shows another mode of the electronic program guide screen according to the embodiment shown in Figure 1a.

Figure 2a shows an electronic program guide screen according to a second embodiment of the present

invention.

Figure 2b shows another mode of the electronic program guide screen according to the embodiment shown in Figure 2a.

Figure 3a shows an electronic program guide screen according to the embodiment shown in Figures 1 a and 1 b with a further options window.

Figure 3b shows an electronic program guide screen according to the embodiment shown in Figures 2a and 2b with a further options window.

Figure 4 shows a remote control according to an embodiment of the present invention.

## DESCRIPTION OF PREFERRED EMBODIMENTS

**[0017]** According to the embodiments of the present invention described herein, Video-On-Demand content shall be listed and accessed from different Electronic Program Guide screens such as the "Electronic Program Guide listings grid" or the "TV viewing Now and Next banner" to be described herein below.

### Electronic Program Guide Listings Grid with Video-On-Demand

**[0018]** Figures 1a and 1b show a first embodiment of an electronic program guide screen 100 according to the invention. Electronic program guide screen 100 comprises a first window 120 displaying an Electronic Program Guide Listings Grid and a second window 110 displaying a mini showcase of Video-On-Demand content (to be described in more detail below). VOD content may comprise assets, bundles, trailers, tutorials, or other Web VOD services.

**[0019]** In the embodiment shown in Figures 1a and 1b, the Electronic Program Guide Listings Grid 120 is placed at the bottom of the screen and Video-On-Demand mini showcase 110 is displayed above.

**[0020]** By default, if the viewer is in a Video-On-Demand service area and has a working back channel then mini showcase 110 displaying Video-On-Demand content is shown within the Electronic Program Guide 100. The content is displayed both within the Electronic Program Guide Listings Grid screen 120 and TV Viewing Now and Next banner (to be described below). If the viewer is not in a Video-On-Demand service area or does not have a working back channel, then Video-On-Demand content is not displayed within the Electronic Program Guide 100.

**[0021]** In the embodiment shown in Figures 1a and 1b, Electronic Program Guide Listings Grid 120 comprises a horizontal time axis 122 and a vertical TV channel axis 121, although other orientations as well as other axis values are possible. In the embodiment shown in Figures 1 a and 1 b, time axis 122 displays a time period selected by the viewer. However, instead of a specific time interval, a viewer may also choose to only view certain times of certain days. For instance, if a viewer typically only watches TV in the evening, time axis 122 may show the preferred viewing times (e.g. between 8 pm and 10 pm) for today, tomorrow, the day after tomorrow, etc. in the embodiment shown in Figures 1a and 1b, TV channel axis 121 displays a subset of available TV channels. However, instead of showing a list of TV channels, axis 121 may also present a summary list of the viewer's preferred genre types, such as Musicals, Comedy, or Sports events, etc. In addition, other combinations of axis values rather than channel versus time are possible, such as channel versus genre. In the preferred embodiment, EPG listings grid 120 is further subdivided into program cells 124 which display the titles of TV programs corresponding to a time and channel specified by a viewer.

### Navigation

**[0022]** Typically, a viewer navigates within an Electronic Program Guide screen by making use of a remote control, a keyboard, or other input devices such as a phone keypad. For the purpose of this description, remote control shall refer to any input means for controlling a cursor to select portions of the Electronic Program Guide and navigate therein. A remote control 400 to control an Electronic Program Guide according to the embodiments described herein is shown in Figure 4 shall comprise at least the following keys:

- Up, Down, Left, Right
- oak button
- OPT button
- Blue button
- VOD button

**[0023]** The functionality of said keys in the context of the present invention is described below.

**[0024]** Moving the cursor between the program cells 124 (by means of the Up, Down, Left, and Right keys) highlights selected items 123. Pressing the OK button can then trigger a further activity, such as scheduling for recording (if the broadcast time is in the future), accessing additional information such as a synopsis, or switching to the according channel. In general, any action that can be performed within a commonly known EPG can be executed within the EPG Listings Grid as well.

**[0025]** By means of a remote control, a viewer may also navigate to window 110. If the viewer presses a specific key (e.g. the Blue button) on the remote control then the highlight moves into the mini showcase 110, as shown in Figure 1b. The viewer can then move the high-

light back into the Electronic Program Guide Listings Grid 120 by pressing the Down arrow or by pressing the Blue button.

**[0026]** The items displayed in mini showcase 110 may or may not depend on the channel selected in the Electronic Program Guide Listings Grid 120. If the selected channel offers its own Video-On-Demand offerings, such as for example a Video-On-Demand Shop in Shop, then the promoted items in the mini showcase may be updated by showing the channel's Shop In Shop highlights. Otherwise the promoted items may depend on the category selected in the Electronic Program Guide Listings Grid 120; e.g. Movies, Music, Sports, etc. It is also possible that the promoted items are recommendations based on the viewer's preferences (see section "Recommendation engine" below). Thus, a viewer who likes to watch certain types of broadcast, e.g. Sports, Music, or Comedy, would get Video-On-Demand recommendations from a similar genre. In a similar manner, promoted items may be based on the preferences of other viewers, such as most popular shows, shows which are liked by viewers with comparable preferences etc.

**[0027]** If the Video-On-Demand button (currently named "Select Video") is pressed when the mini showcase 110 containing e.g. Video-On-Demand highlights is on-screen then the Video-On-Demand application opens and displays the respective showcase carousel where the previously highlighted item 111 in the Video-On-Demand application will be the same Video-On-Demand item highlighted in the Electronic Program Guide Listings Grid screen 120. Video and Audio of last viewed channel will continue in the background.

**[0028]** Default item 111 in the mini showcase will typically be selected randomly from the items displayed, and may differ each time the Electronic Program Guide Listings Grid 120 is entered. However, default item 111 may as well be correlated with the user's broadcast preferences or with the last show watched by the viewer, see below.

**[0029]** In a STB, the items in the mini showcase 110 must be cached so that there is no loss of performance because of fetching them as the viewer moves up and down from channel to channel in the Electronic Program Guide Listings Grid 120.

**[0030]** If the viewer presses and holds the Up or Down arrows on a remote control to navigate channels in the Electronic Program Guide Listings Grid 120, then the mini showcase 110 need only update when the key is released. If the viewer presses the OPT button on a remote control then a sub-menu is opened - see below.

**[0031]** If the viewer navigates from the mini showcase 110 (or any other area within the Electronic Program Guide 110) into the Video-On-Demand application, a Navigation Tracker described in more detail below may record the viewer's navigation behaviour.

TV Viewing Now & Next Banner and Video-On-Demand

**[0032]** Figures 2a and 2b show a second embodiment of an electronic program guide screen 200 according to a further aspect of the present invention. Electronic program guide screen 200 comprises a first window 230 displaying a TV Viewing Now & Next banner and a second window 210 displaying a mini showcase of Video-On-Demand content. In the embodiment shown in Figure 2a and 2b, the TV Viewing Now & Next banner 230 is placed at the bottom of the screen and Video-On-Demand mini showcase 210 is displayed above.

**[0033]** By default, if the viewer is in a Video-On-Demand service area and has a working back channel then mini showcase 210 displaying Video-On-Demand content is shown within the Electronic Program Guide 200. If the viewer is not in a Video-On-Demand service area or does not have a working back channel then Video-On-Demand content is not displayed within the Electronic Program Guide 200.

**[0034]** In the embodiment shown in Figures 2a and 2b, TV Viewing Now & Next banner 230 comprises a horizontal time axis 232 and a vertical TV channel axis 231 with a single entry, although other orientations as well as other axis values are possible. In the embodiment shown in Figures 2a and 2b, time axis 232 displays a time period in accordance with the broadcast program shown at the presently viewed channel. In the embodiment shown in Figures 2a and 2b, TV channel axis 231 displays the current TV channel. In the preferred embodiment, TV Viewing Now & Next banner 230 is further subdivided into program cells 234 which display the titles of TV programs corresponding to the current time and channel.

**[0035]** The items displayed in mini showcase 210 may or may not depend on the selected channel. If the selected channel offers its own Video-On-Demand offerings, such as for example a Video-On-Demand Shop in Shop, then the promoted items in the mini showcase may be updated by showing the channel's Shop In Shop highlights. Otherwise the promoted items may depend on a viewer-selected category, e.g. Movies, Music, Sports, etc. It is also possible that the promoted items are recommendations based on the viewer's preferences. Thus, a viewer who likes to watch certain types of broadcast, e.g. Sports, Music, or Comedy, would get Video-On-Demand recommendations from a similar genre. In a similar manner, promoted items may be based on the preferences of other viewers, such as most popular shows, shows which are liked by viewers with or without comparable preferences etc.

**[0036]** Default item 211 in the mini showcase will typically be selected randomly from the items displayed, and may differ each time the TV Viewing Now & Next Banner 230 is invoked. However, default item 211 may as well be correlated with the user's broadcast preferences or with the last show watched by the viewer.

**[0037]** If the viewer presses and holds the Up or Down arrows on a remote control to navigate channels in the

TV Viewing Now & Next Banner 230, then the mini showcase 210 need only update when the key is released. If the viewer presses the OPT button on a remote control then a sub-menu is opened - see below. If the viewer presses the Blue button on the remote control then the highlight moves into the mini showcase 210. The viewer can then move the highlight back into the TV Viewing Now & Next Banner 230 by pressing the Down arrow or by pressing the Blue button.

**[0038]** If the Video-On-Demand button (currently named "Select Video") is pressed when the mini showcase 210 containing e.g. Video-On-Demand highlights is on-screen then the Video-On-Demand application opens and displays respective showcase carousel where the previously highlighted item 211 in the Video-On-Demand application will be the same Video-On-Demand item highlighted in the TV Viewing Now & Next Banner 330. Video and Audio of last viewed channel will continue in the background.

**[0039]** If the viewer navigates from the mini showcase 310 (or any other area within the Electronic Program Guide 300) into the Video-On-Demand application, a Navigation Tracker described in more detail below may record the viewer's navigation behaviour.

**[0040]** Mini showcase 110 shall be described in the following in more detail with reference to Figures 1a a and 1 b

Mini showcase

**[0041]** The mini showcase 110 displays multiple pictures of the Video-On-Demand items available in landscape format.

**[0042]** For one of the items (the default item for the highlight) 111 the information which is displayed may comprise the title (truncated by "..." to fit the space available), a Channel icon, an Item number (within items available in format "<x> of <n>", e.g. "4 of 10"; specific texts always depend on selected On Screen language), etc.

**[0043]** By using the Left and Right arrow keys the viewer can move the showcase right or left causing a different item to be highlighted. The showcase may be circular (i.e. when reaching the last item the first will be the next highlighted), but other listing are possible as well.

**[0044]** The VOD items can be assets, bundles, trailers, tutorial videos or hyperlinks to Web Video-On-Demand services.

**[0045]** By highlighting an item and pressing OK:

- If the item is an asset or a bundle the appropriate detailed description page within the Video-On-Demand application is opened. From here the normal Video-On-Demand operations (e.g. Watch / Rent) can be completed.
- If the item is a trailer then the (Video-On-Demand) trailer may be played directly. On completion of the trailer the appropriate detailed description page within the Video-On-Demand application is opened.
- If the item is a tutorial video then the video is played directly. On completion of the tutorial the Electronic Program Guide grid or TV Viewing Now and Next banner is displayed again with the highlight on the tutorial item.
- If the item is a link to a Web Video-On-Demand service then the appropriate web-page should be displayed.

Option Sub-Menu

**[0046]** Figures 3a and 3b display further features of the preferred embodiment. Upon pressing the OPT key on a remote control, an additional window 350a, 350b is overland on the Electronic Program Guide Listings Grid 320 or on the TV Viewing Now & Next Banner 330. The sub-menu shown in Figures 3a and 3b contains two options:

- to navigate the Electronic Program Guide Listings Grid 320 or the TV Viewing Now & Next Banner 330 directly to primetime;
- if the viewer has a Video-On-Demand entitlement, is in a Video-On-Demand service area and has a working back channel, to hide ("Hide VOD") or show ("Show VOD") the Video-On-Demand content (whichever is not currently active).

**[0047]** Further options are possible and may also be defined by the viewer, e.g. navigating the Electronic Program Guide Listings Grid 320 or the TV Viewing Now & Next Banner 330 directly to the viewer's preferred broadcasting time (e.g. during his or her lunch break), or adding additional windows with an Electronic Program Guide Listings Grid, with an TV Viewing Now & Next Banner, or with a mini showcase.

**[0048]** If the viewer selects to hide the Video-On-Demand content then the mini showcase 310a, 310b displaying Video-On-Demand content is removed from the Electronic Program Guide screen 300, leaving only Electronic Program Guide Listings Grid 320 or TV Viewing Now and Next Banner 330.

**[0049]** On selecting "Show VOD", the mini showcase 310a, 310b displaying Video-On-Demand content is shown again as detailed in the sections above. The Hide / Show Video-On-Demand setting is persistent across Electronic Program Guide application sessions.

User Navigation Tracking Tool

**[0050]** In a further aspect of the present invention, viewing behaviour when browsing between VOD content in the mini showcase and broadcast content in the EPG listings grid or in the TV Viewing Now & Next banner may be tracked and registered. Information on user interest and user navigation may then be used to further improve the suggested items.

**[0051]** In particular, changing between mini showcase

and broadcasting grid (i.e. EPG listings grid or TV Viewing Now & Next banner) may be recorded together with further information such as date and time, the last viewed program, the times spent in particular subsections etc.

Recommendations engine

**[0052]** In a still further embodiment of the present invention, VOD contents listed in the mini showcase may be recommendations in response to the viewing behaviour of a user or other users. Such a recommendations engine may be able to provide recommended VOD content tailored to the viewer's broadcast preferences (e.g. thriller or comedy, etc.), to the date and time (e.g. soccer on Saturday afternoons, soap operas on late weekday afternoons, etc.), to the viewer location (e.g. local area weather or traffic reports) or to suggestions by viewers with similar preferences.

**[0053]** In particular, the VOD contents shown in the mini showcase may vary depending on the highlighted item in the EPG listings grid or in the TV Viewing Now & Next Banner. Likewise, the VOD contents listed in the mini showcase may be selected in response to the list of channels displayed on TV channel axis 121 or to the date and time selected on horizontal time axis 122.

**Claims**

1. A method of providing an electronic program guide in an apparatus for receiving and decoding digital television signals, the method comprising the steps of:

   providing an electronic program guide screen having at least a first and a second window,

   wherein the first window displays a grid guide format of time and channel having a plurality of cells in which television program listings are displayed;

   providing input means for controlling a cursor to select between the first and the second window and to navigate and provide control functionality within each of the first and second window,

   wherein, if the first window is selected, the cursor selectively highlights one of the television program listings displayed in the grid guide;

   **characterized in that**
   the second window displays video-on-demand program listings,

   wherein, if the second window is selected, the cursor selectively highlights one of the video-on-demand program listings and provides means for activating said video-on-demand program listing.

2. The method according to claim 1 wherein the grid guide displays only one channel.

3. The method according to claims 1 or 2, wherein the apparatus for receiving and decoding digital television signals is a Digital Receiver in particular a Set-Top-Box or an integrated Digital TV.

4. The method according to one of the preceding claims, wherein the input means are capable of controlling a selective hiding of the second window.

5. The method according to one of the preceding claims, wherein the input means is a remote control device.

6. The method according to one of the preceding claims, wherein the video-on-demand program listings are selected from a list of recommended video-on-demand program listings, wherein the list of recommended video-on-demand program listings reflects a viewer's preferences.

7. The method according to one of the preceding claims wherein the second window is only displayed if a video-on-demand service is available.

8. An apparatus for receiving and decoding digital television signals, the apparatus comprising:

   an electronic program guide screen having at least a first and a second window,

   wherein the first window displays a grid guide format of time and channel having a plurality of cells in which television program listings are displayed;

   input means for controlling a cursor to select between the first and the second window and to navigate and provide control functionality within each of the first and second window,

   wherein, if the first window is selected, the cursor selectively highlights one of the television program listings displayed in the grid guide;

   **characterized in that**
   the second window displays a video-on-demand listing,

   wherein, if the second window is selected, the cursor selectively highlights one of the

video-on-demand program listings means for activating said video-on-demand program listing.

9. The apparatus according to claim 8 wherein the grid guide displays only one channel.

10. The apparatus according to claims 8 or 9, wherein the apparatus is a Digital Receiver in particular a Set-Top-Box or an integrated Digital TV.

11. The apparatus according to one of claims 8-10, further comprising input means for selectively hiding the second window.

12. The apparatus according to one of claims 8-11, wherein the input means is a remote control device.

13. The apparatus according to one of claims 8-12, wherein the video-on-demand program listings are selected from a list of recommended video-on-demand program listings, wherein the list of recommended video-on-demand program listings reflects a viewer's preferences.

14. The apparatus according to one of claims 8-13 wherein the second window is only displayed if a video-on-demand service is available.

15. One or more computer-readable media having computer readable instructions thereon which, when executed by one or more processors, cause the processors to implement the method according to one of claims 1-7.

16. One or more input means suitable to control the input means of the apparatus according to one of claims 8-14.

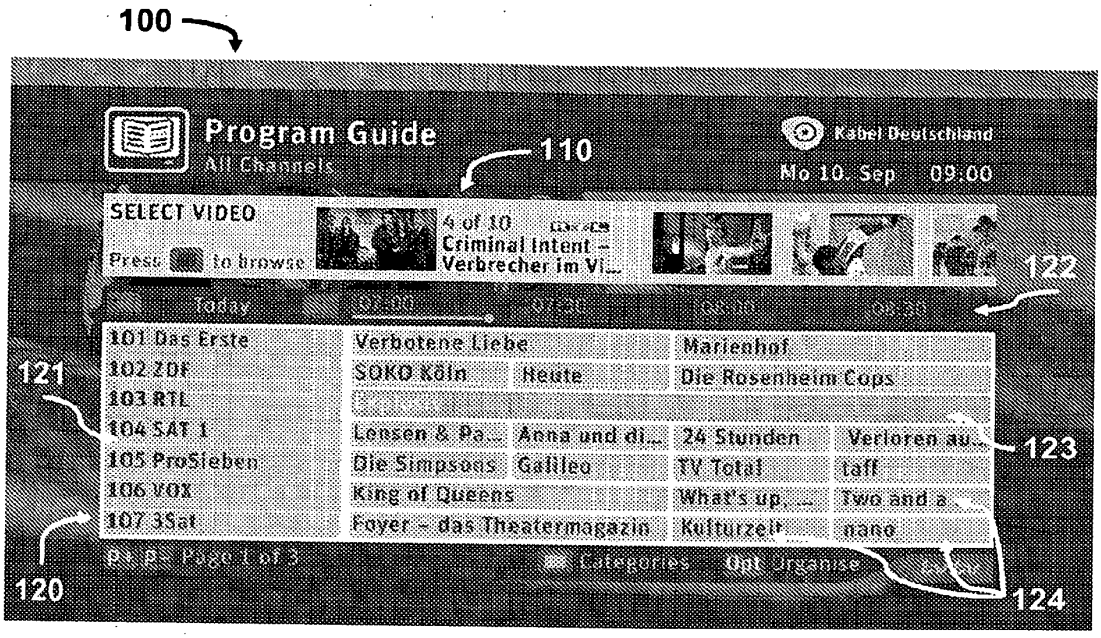


Figure 1a

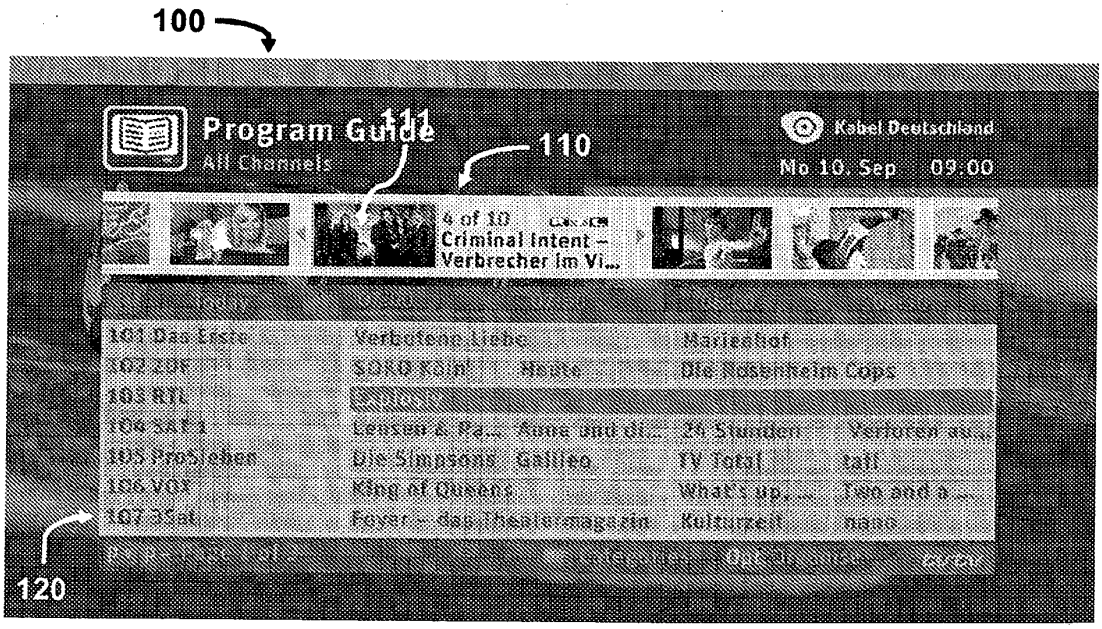


Figure 1b

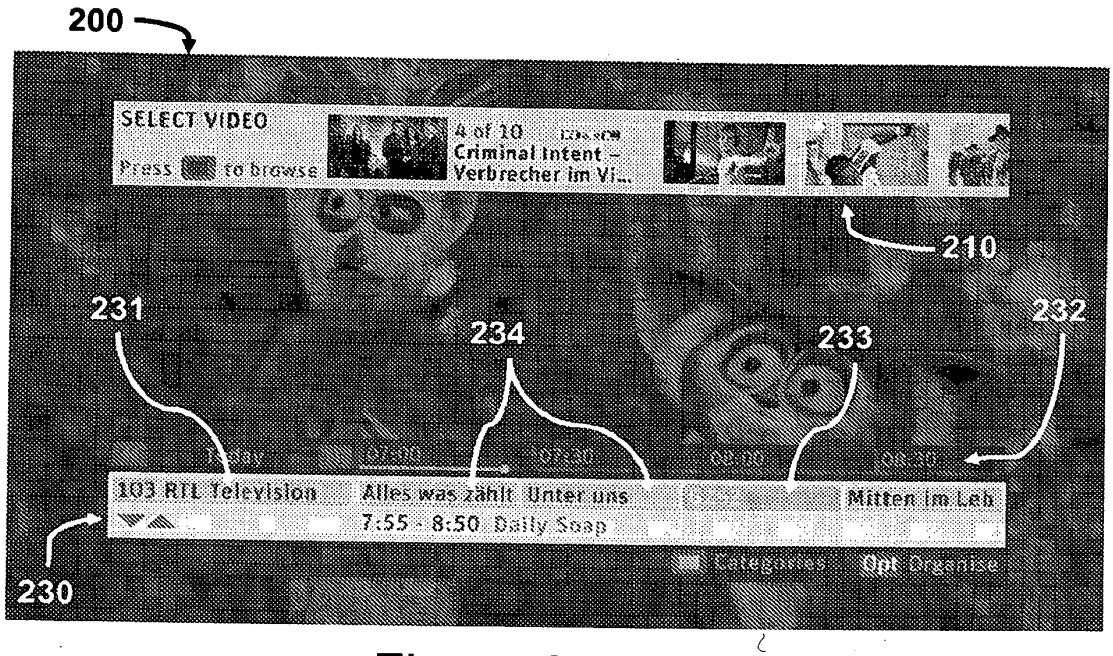


Figure 2a

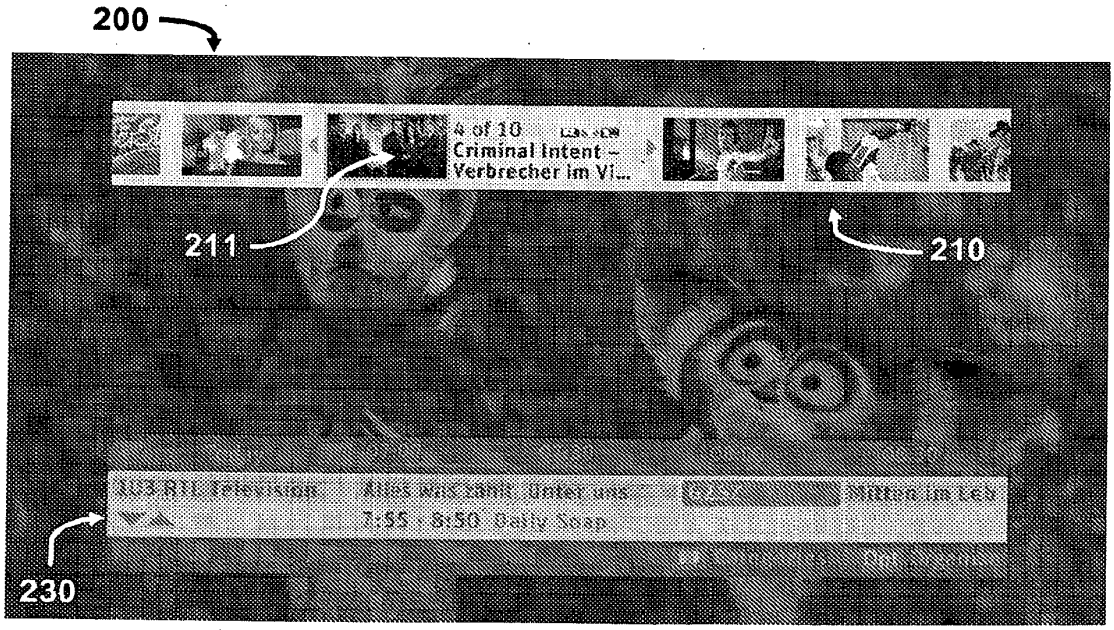


Figure 2b

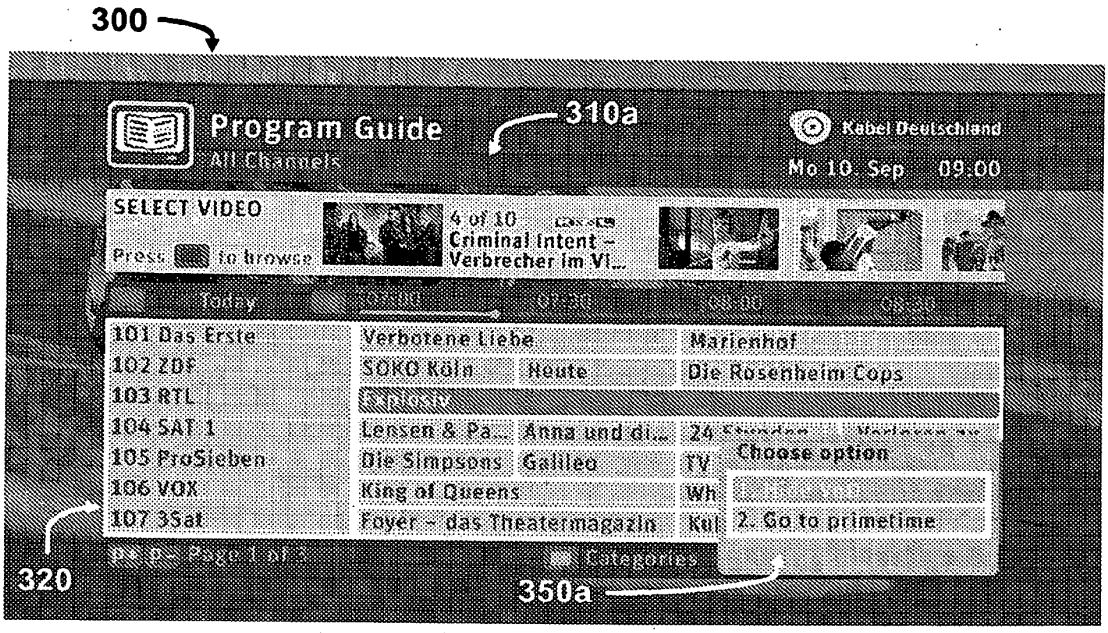


Figure 3a

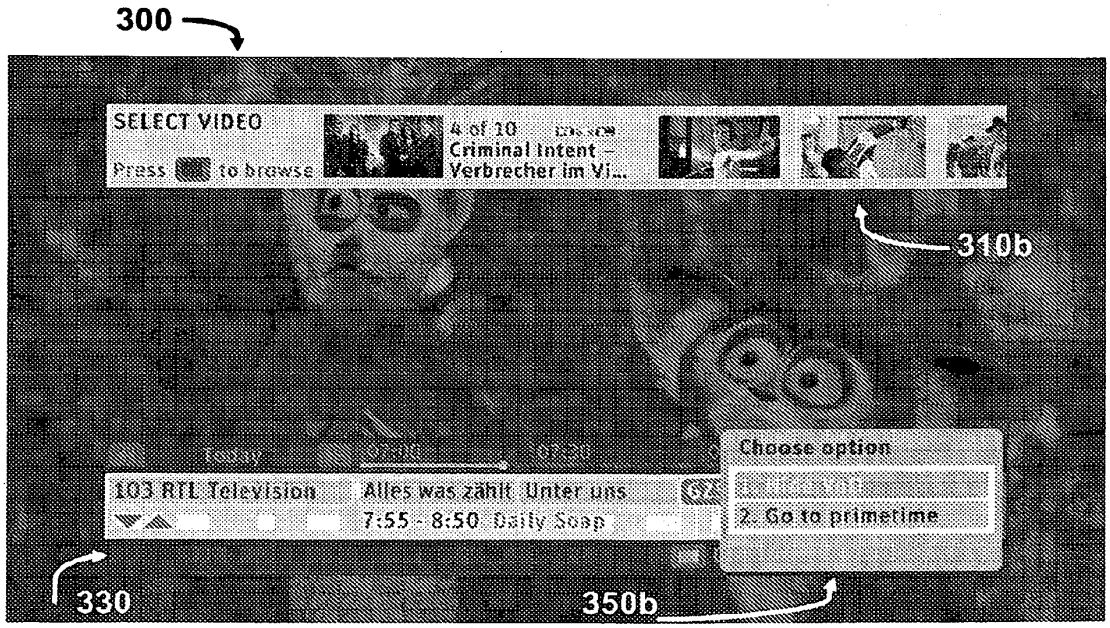


Figure 3b

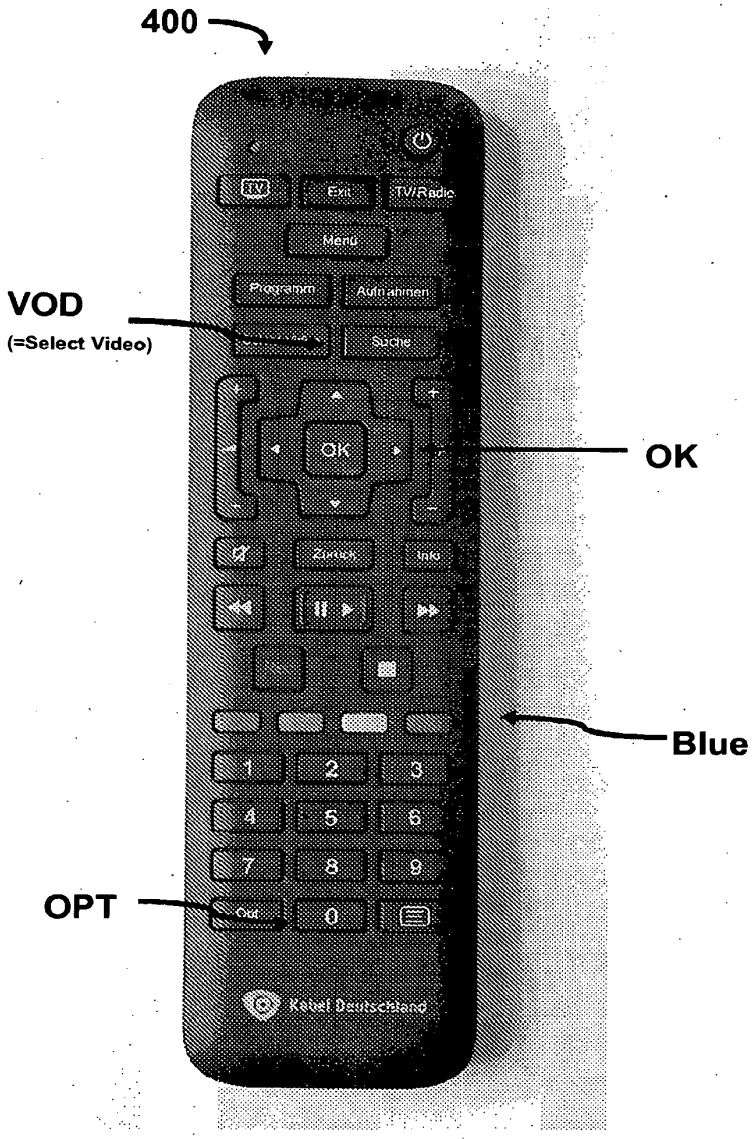
400
VOD
(=Select Video)
OK
Blue
OPT
TV
Exit
TV/Radio
Menu
Programm
Aufnahmen
Suche
OK
Zurück
Info
1
2
3
4
5
6
7
8
9
Opt
0
Kabel Deutschland

Figure 4

## REFERENCES CITED IN THE DESCRIPTION

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- WO 20071091781 A1 **[0007]**
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(54) **Display apparatus and method for controlling the display apparatus**

(57) A multifunctional display device includes a processor to control simultaneously display of visual information and monitoring information on a same screen. The monitoring information provides an indication of status of one or more applications executed at a same time the visual information is displayed, and the visual information corresponds to one of content provider, broadcast signal, or website information.

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## Description

CROSS-REFERENCE TO RELATED APPLICATIONS

**[0001]** This application claims the benefit of the US provisional application No. 61/391,091, filed on October 8, 2010 and the Korean patent application No. 10-2010-0113792, filed on November 16, 2010, the contents of which are incorporated herein by reference.

BACKGROUND

1. Field

**[0002]** One or more embodiments described herein related to managing and displaying information on an electronic device.

2. Background

**[0003]** A display apparatus have been developed which integrate the display of broadcast and internet-related information. Unfortunately, these devices only have a finite amount of memory, which limits their capability. Also, displaying this information requires payment of costly access fees. Improvements are needed to address these and/or other drawbacks.

BRIEF DESCRIPTION OF THE DRAWINGS

**[0004]** FIG. 1 shows one embodiment of a broadcasting system.
**[0005]** FIG. 2 shows another embodiment of a broadcasting system.
**[0006]** FIG. 3 shows steps for receiving channel information in a display device by accessing a service provider.
**[0007]** FIG. 4 shows an example of data used in the aforementioned steps.
**[0008]** FIG. 5 shows an example of a display device.
**[0009]** FIG. 6 shows another example of a display device.
**[0010]** FIGS. 7 and 8 show a display device having or coupled to a set-top box.
**[0011]** FIG. 9 shows a communication procedure performed between a display device and one or more other devices.
**[0012]** FIG. 10 shows one example of a control module.
**[0013]** FIG. 11 shows one example of a platform structure for a display device.
**[0014]** FIG. 12 shows another embodiment of a platform structure.
**[0015]** FIG. 13 shows steps included in one embodiment of a method for controlling a remote controller of a display device.
**[0016]** FIG. 14 shows a remote controller for controlling a display device.
**[0017]** FIG. 15 shows a first example of a user interface for a display device.
**[0018]** FIG. 16 shows a second example of a user interface for a display device.
**[0019]** FIG. 17 shows a third example of a user interface for a display device.
**[0020]** FIG. 18 shows a fourth example of a user interface for a display device.
**[0021]** FIG. 19 shows a procedure for providing an application monitoring screen on a display device according to any of the aforementioned embodiments or examples.
**[0022]** FIG. 20 shows one example of a display screen that includes a menu item for enabling a monitoring menu.
**[0023]** FIGS. 21 and 22 show additional examples of display screens that include menu items for enabling a monitoring menu.
**[0024]** FIGS. 23 and 24 show examples of display screens that include a transparency setup menu for controlling display of a menu item for a monitoring menu.
**[0025]** FIG. 25 shows an example of a display screen which allows a position of a menu item to be changed.
**[0026]** FIG. 26 shows an example of a display screen that includes a menu item for enabling a monitoring menu on a home screen of a smart TV system.
**[0027]** FIG. 27 shows an example of a screen that includes a monitoring menu displayed on a home screen of a smart TV system.
**[0028]** FIGS. 28 and 29 show additional examples of display screens that include monitoring menus.
**[0029]** FIG. 30 shows an example of a display screen that includes a monitoring menu containing billing information.
**[0030]** FIG. 31 shows an example of a display screen that includes a monitoring menu containing memory use information.
**[0031]** FIG. 32 shows an example of a display screen that includes a monitoring menu containing billing information.
**[0032]** FIG. 33 shows an example of a display screen that includes a monitoring menu containing an application execution screen.
**[0033]** FIGS. 34 to 39 show examples of home screens that may be used to execute various functions of a smart TV system.
**[0034]** FIGS. 40 to 43 show additional examples of home screens that may be used to execute various functions of a smart TV system.
**[0035]** FIG. 44 shows one way in which screen switching of a display apparatus may be performed.
**[0036]** FIG. 45 shows one embodiment of a procedure for automatically enabling a monitoring menu.
**[0037]** FIG. 46 shows an example of the first level of a monitoring menu.
**[0038]** FIG. 47 shows an example of a second level of the monitoring menu.
**[0039]** FIG. 48 shows an example of a third level of a monitoring menu.



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**[0040]** FIG. 49 shows an example of a forcible termination screen.

**[0041]** FIG. 50 shows another example of a forcible terminal screen

**[0042]** FIG. 51 shows one embodiment of a forcible termination method.

**[0043]** FIG. 52 shows one embodiment of a monitoring service method.

**[0044]** FIG. 53 shows another embodiment of a monitoring service method.

**[0045]** FIG. 54 is a block diagram illustrating a mobile terminal according to one embodiment of the present invention.

**[0046]** FIG. 55 is a front perspective view illustrating a mobile terminal according to one embodiment of the present invention.

**[0047]** FIG. 56 is a rear perspective view illustrating a mobile terminal according to one embodiment of the present invention.

**[0048]** FIG. 57 is a diagram illustrating a screen of a mobile terminal, in which a monitoring indicator according to one embodiment of the present invention is displayed.

**[0049]** FIG. 58 is a diagram illustrating a screen of a mobile terminal, in which a monitoring indicator according to another embodiment of the present invention is displayed.

**[0050]** FIG. 59 is a diagram illustrating a first screen that displays monitoring services according to one embodiment of the present invention;

**[0051]** FIG. 60 is a diagram illustrating a second screen that displays monitoring services according to one embodiment of the present invention;

**[0052]** FIG. 61 is a diagram illustrating a third screen that displays monitoring services according to one embodiment of the present invention; and

**[0053]** FIG. 62 is a diagram illustrating a fourth screen that displays monitoring services according to one embodiment of the present invention.

## DETAILED DESCRIPTION

**[0054]** FIG. 1 shows one embodiment of a broadcasting system which includes a content provider (CP) 10, a service provider (SP) 20, a network provider (NP) 30, and a home network end user (HNED) 40. The HNED 40 corresponds, for example, to a client 100 which is a display device according to one or more of the aforementioned embodiments. The client 100 corresponds to the display device according to one or more of the aforementioned embodiments, wherein examples of the display device include network TV, smart TV, and IPTV.

**[0055]** The content provider 10 manufactures various contents and provides them. Examples of the content provider 10 include a terrestrial broadcaster, a cable system operator (SO), a multiple system operator (MSO), a satellite broadcaster, and an Internet broadcaster, as illustrated in FIG. 1.

**[0056]** Also, the content provider 10 may provide various applications in addition to broadcast contents, which will be described in more detail later.

**[0057]** The service provider 20 can provide contents provided by the content provider 10 by service packaging them. For example, the service provider 20 of FIG. 1 can package first terrestrial broadcasting, second terrestrial broadcasting, cable MSO, satellite broadcasting, various kinds of Internet broadcasting, application, etc. and provide the packaged one to a user.

**[0058]** Also, the service provider 20 may provide a service to the client 100 by using a unicast or multicast mode. The unicast mode is to transmit data between a single transmitter and a single receiver 1:1. In case of the unicast mode, for example, if the receiver requests a server to transmit data, the server can transmit data to the receiver in accordance with the request. The multicast mode is to transmit data to a plurality of receivers of a specific group. For example, the server can transmit data to a plurality of receivers, which are previously registered therewith, at one time. For this multicast registration, IGMP (Internet Group Management Protocol) can be used.

**[0059]** The network provider 30 may provide a network for providing a service to the client 100. The client 100 may construct a home network end user (HNED) to receive a service.

**[0060]** In the system of the aforementioned display device, conditional access or content protection can be used to protect contents which are transmitted. For conditional access or content protection, a cable card or downloadable conditional access system (DCAS) can be used.

**[0061]** In the mean time, the client 100 may provide contents through the network. In this case, the client 100 may be a content provider contrary to the above. The content provider 10 may receive contents from the client 100. In this case, it is advantageous in that bidirectional content service or data service is available.

**[0062]** FIG. 2 shows another embodiment of a broadcasting system which includes a display device 100. This embodiment is connected with a broadcast network or Internet network. Examples of the display device 100 include network TV, smart TV, and HBBTV.

**[0063]** The display device 100 includes a broadcast interface 101, a section filter 102, an AIT filter 103, an application data processor 104, a broadcast data processor 111, a media player 106, an Internet protocol processor 107, an Internet interface 108, and a runtime module 109, for example.

**[0064]** Application information table (AIT) data, a real-time broadcast content, application data, and stream event are received through the broadcast interface 101. In the mean time, the real-time broadcast content may be designated as a linear A/V content.

**[0065]** The section filter 102 performs section filtering for four kinds of data received through the broadcast interface 101. Then, the section filter 102 transmits AIT data to the AIT filter 103, the linear A/V content to the



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broadcast data processor 111, and stream event and application data to the application data processor 104.

**[0066]** In the mean time, a non-linear A/V content and application data are received through the Internet interface 108. The non-linear A/V content may be content on demand (COD) application, for example.

**[0067]** The non-linear A/V content is transmitted to the media player 106, and the application data is transmitted to the runtime module 109. The runtime module 109, as illustrated in FIG. 2, includes an application manager and a browser, for example. The application manager controls a lifecycle for an interactive application by using the AIT data. The browser serves to display and process the interactive application.

**[0068]** FIG. 3 shows steps for receiving channel information in a display device by accessing a service provider. The service provider performs service provider discovery (S301). The display device transmits a service provider (SP) attachment request signal (S302). If SP attachment is finished, the display device receives provisioning information (S303). Moreover, the display device receives a master SI table from the service provider (S304), receives a virtual channel map table (S305), receives a virtual channel description table (S306), and receives a source table (S307).

**[0069]** Hereinafter, the process steps for receiving channel information will be described in more detail. The service provider discovery may mean that service providers, which provide IPTV related services, discover a service discovery (SD) server that provides information on the service providers.

**[0070]** For example, three methods for discovering an address list that can receive information (for example, SP discovery information) on the SD server will be provided as follows. First of all, an address previously set by the display device or an address set by a manual operation of the user can be used. Second, a DHCP based SP discovery method can be used. Third, a DNS SRV-based SP discovery method can be used. Also, the display device accesses a server of an address acquired by any one of the above three methods and receives a service provider discovery record that includes information required for service discovery per SP. Then, the display device performs a service search step by using the received service provider discovery record. The above steps can be performed in a push mode or pull mode.

**[0071]** The display device performs a registration procedure (or service attachment procedure) by accessing the SP attachment server designated by an SP attachment locator of the SP discovery record.

**[0072]** Moreover, after performing a separate authentication procedure by accessing an SP authentication service server designated by an SP authentication locator, the display device may perform a service authentication procedure. After the service attachment procedure is successfully performed, data transmitted from the server to the display device may be a form of a provisioning information table.

**[0073]** The display device transmits the data to the service attachment server during the service attachment procedure, wherein the data includes ID and location information of the display device. The service attachment server can define a service subscribed by the display device, based on the received data. Moreover, address information that can acquire service information desired to be received by the display device is provided in the form of the provisioning information table. The address information corresponds to access information of the master SI table. In this case, it is easy to provide a customized service per subscriber.

**[0074]** The service information includes a master SI table record that manages access information and version on the virtual channel map, a virtual channel map table that provides a package type service list, a virtual channel description table that includes detailed information of each channel, and a source table that includes access information that enables actual access to services.

**[0075]** FIG. 4 shows an example of data used in the aforementioned steps. The mater SI table includes location information that can receive each virtual channel map and version information of each virtual channel map.

**[0076]** Each virtual channel map is uniquely identified by a virtual channel map identifier, and virtual channel map version represents version information of the virtual channel map. If any one of all tables connected to one another along an arrow starting from the master SI table illustrated in FIG. 4 is changed, version of all upper tables (to reach master SI table) is increased together with increase of the corresponding table. Accordingly, it is advantageous in that the display device can identify change on all SI tables directly by monitoring the master SI table.

**[0077]** For example, if there is any change of the source table, version of the source table is increased, and version of the virtual channel description table for reference of the source table is also changed. Accordingly, change of a lower table causes change of an upper table, whereby version of the master SI table is finally changed.

**[0078]** The master SI table may exist per service provider. However, if configuration of the service is varied per location or subscriber (or subscriber group), the service provider is designed to have a plurality of master SI tables, thereby providing a customized service per each unit. In this way, if the service provider is designed, it is possible to efficiently provide a customized service for location of a subscriber and subscription information through the master SI table.

**[0079]** The virtual channel map table may have one or more virtual channels, and includes location information that can acquire detailed information of the channel without including the detailed information in the virtual channel map. Virtual channel description location of the virtual channel map table indicates location of the virtual channel description table that includes detailed information of the channel.



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**[0080]** The virtual channel description table includes detailed information of the virtual channel, and can access the virtual channel description table by using the virtual channel description location of the virtual channel map table.

**[0081]** The source table provides access information (for example, IP address, port, AV codec, transport protocol, etc.) per service, wherein the access information is required for actual access to the service.

**[0082]** The aforementioned master SI table, the virtual channel map table, the virtual channel description table, and the source table are transferred through four flows, which are logically divided from one another, in a push mode or pull mode. In the mean time, the master SI table can be transmitted in a multicast mode for version management, and monitors version change by receiving multicast streaming.

**[0083]** FIG. 5 shows an example of a display device 700, which includes a network interface 701, a TCP/IP manager 702, a service delivery manager 703, a demultiplexer (Demux) 705, a PSI& (PSIP and/or SI) decoder 704, an audio decoder 706, a video decoder 707, a display A/V and OSD module 708, a service control manager 709, a service discovery manager 710, a metadata manager 712, an SI&Metadata DB 711, a UI manager 714, and a service manager 713.

**[0084]** The network interface 701 receives packets from a network, and transmits the packets to the network. In other words, the network interface 701 receives services, contents, etc. from the service provider through the network.

**[0085]** The TCP/IP manager 702 is involved in packets received in the display device 700 and packets transmitted from the display device 700, i.e., packet transfer from the source to the destination. The TCP/IP manager 702 sorts the received packets to correspond to a proper protocol, and outputs the sorted packets to the service delivery manager 705, the service discovery manager 710, the service control manager 709, and the metadata manager 712.

**[0086]** The service delivery manager 703 takes the role of control of received service data. For example, if the service delivery manager 703 controls real-time streaming data, it can use RTP/RTCP. If the service delivery manager 703 transmits the real-time streaming data by using RTP, it parses the received packets in accordance with RTP and transmits the parsed packets to the demultiplexer 705 or stores the parsed packets in the SI&Metadata DB 711 under the control of the service manager 713. The service delivery manager 703 feeds the received information back to a server, which provides a service, by using RTCP.

**[0087]** The demultiplexer 705 demultiplexes the received packets to audio, video and PSI (Program Specific Information) data and then transmits the demultiplexed data to the audio decoder 706, the video decoder 707, and the PSI&(PSIP and/or SI) decoder 704, respectively.

**[0088]** The PSI&(PSIP and/or SI) decoder 704 decodes service information such as PSI, for example. Namely, the PSI&(PSIP and/or SI) decoder 704 receives and decodes PSI section, PSIP (Program and Service Information Protocol) section or SI (Service Information) section, which is demultiplexed by the demultiplexer 705.

**[0089]** Also, the PSI&(PSIP and/or SI) decoder 704 decodes the received sections to make a database for service information, and stores the database for service information in the SI&Metadata DB 711.

**[0090]** The audio/video decoders 706/707 decode the video data and the audio data, which are received from the demultiplexer 705. Te audio data decoded by the audio decoder 706 and the video data decoded by the video decoder 707 are provided to the user through the display 708.

**[0091]** The UI manager 714 and the service manager 713 manage the whole state of the display device 700, provide a user interface, and manage other managers.

**[0092]** The UI manager 714 provides a graphic user interface for the user by using an on screen display (OSD), and performs a receiving operation based on a key input from the user. For example, if a key input signal for channel selection is input from the user, UI manager 714 transmits the key input signal to service manager 713.

**[0093]** The service manager 713 controls managers related to the service, such as the service delivery manager 703, the service discovery manager 710, the service control manager 709, and the metadata manager 712.

**[0094]** Also, the service manager 713 makes a channel map and selects a channel by using the channel map in accordance with the key input signal received from the UI manager 714. The service manager 713 receives service information of the channel from the PSI&(PSIP and/or SI) decoder 704 and sets audio/video PID (Packet Identifier) of the selected channel in the demultiplexer 705.

**[0095]** The service discovery manager 710 provides information required to select the service provider that provides services. If a signal related to channel selection is received from the service manager 713, the service discovery manager 710 discovers a corresponding service by using the received information.

**[0096]** The service control manager 709 takes the role of selection and control of the service. For example, if the user selects a live broadcasting service like the existing broadcasting mode, the service control manager 709 uses IGMP or RTSP. If the user selects a video on demand (VOD) service, the service control manager 709 selects and controls the service by using RTSP. The RTSP protocol can provide a trick mode for real-time streaming. Also, the service control manager 709 can initiate and manage a session through IMC gate by using IMS (IP Multimedia Subsystem) and Session Initiation Protocol (SIP). The above protocols are only exemplary, and other protocols may be used depending on embodiments.

**[0097]** The metadata manager 712 manages metada-



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ta related to the service and stores the metadata in the SI&Metadata DB 711. The SI&Metadata DB 711 stores the service information decoded by the PSI&(PSIP and/or SI) decoder 704, the metadata managed by the metadata manager 712, and the information required to select the service provider provided by the service discovery manager 710. Also, the SI&Metadata DB 711 may store setup data for the system. The SI&Metadata DB 711 may be implemented by using a NonVolatile RAM (NVRAM) or a flash memory. The IG 750 is a gateway where functions required for access to IMS based IPTV services are gathered.

**[0098]** FIG. 6 shows another example of a display device 100, which includes a broadcast receiver 105, an external device interface module 135, a memory module 140, a user input interface module 150, a control module 170, a display module 180, an audio output module 185, a power supply module 190, and a camera module (not shown). The broadcast receiver 105 includes a tuner 110, a demodulation module 120, and a network interface module 130. As occasion demands, the broadcast receiver 105 may be designed in such a manner that it includes a tuner 110 and a demodulation module 120 but does not include a network interface module 130.

**[0099]** On the contrary, the broadcast receiver 105 may be designed in such a manner that it includes a network interface module 130 but does not include a tuner 110 and a demodulation module 120.

**[0100]** The tuner 110 selects one of RF (radio frequency) broadcast signals received through an antenna, which corresponds to a channel selected by the user or all previously stored channels. Also, the tuner 110 converts the selected RF broadcast signal to an intermediate frequency signal or a baseband video or audio signal.

**[0101]** For example, if the selected RF broadcast signal is a digital broadcast signal, the tuner 110 coverts the selected RF broadcast signal to a digital IF (DIF) signal. If the selected RF broadcast signal is an analog broadcast signal, the tuner 110 coverts the selected RF broadcast signal to an analog baseband video or audio signal (CVBS/SIF). In other words, the tuner 110 can process both the digital broadcast signal and the analog broadcast signal. The analog baseband video or audio signal (CVBS/SIF) output from the tuner 110 may directly be input to the control module 170.

**[0102]** Also, the tuner 110 can receive RF broadcast signal of a single carrier based on an advanced television system committee (ATSC) mode and RF broadcast signal of multiple carriers based on a digital video broadcasting mode (DVB).

**[0103]** In the mean time, the tuner 110 sequentially selects RF broadcast signals of all broadcast channels stored through a channel memory function from RF broadcast signals received through the antenna, and converts the selected RF broadcast signals to intermediate frequency signals or baseband video or audio signals.

**[0104]** The demodulation module 120 receives the digital IF (DIF) signal converted by the tuner 110 and demodulates the received digital IF signal.

**[0105]** For example, if the digital IF signal output from the tuner 110 is based on the ATSC mode, the demodulation module 120 performs 8-vestigal side band (8-VSB) demodulation, for example. Also, the demodulation module 120 may perform channel decoding. To this end, the demodulation module 120 may include a trellis decoder, a de-interleaver, and a Reed-Solomon decoder to perform trellis decoding, de-interleaving, and Reed-Solomon decoding.

**[0106]** For example, if the digital IF signal output from the tuner 110 is based on the DVB mode, the demodulation module 120 performs coded orthogonal frequency division modulation (COFDMA) demodulation, for example. Also, the demodulation module 120 may perform channel decoding. To this end, the demodulation module 120 may include a convolution decoder, a de-interleaver, and a Reed-Solomon decoder to perform convolution decoding, de-interleaving, and Reed-Solomon decoding.

**[0107]** The demodulation module 120 can output a stream signal (TS) after performing demodulation and channel decoding. At this time, the stream signal may be a signal where a video signal, an audio signal and a data signal are multiplexed. For example, the stream signal may be MPEG-2 Transport Stream (TS) where a video signal of an MPEG-2 specification and an audio signal of Dolby AC-3 specification are multiplexed. Specifically, the MPEG-2 TS may include a 4 byte header and 184 byte payload.

**[0108]** The aforementioned demodulation module 120 may be provided separately depending on the ATSC mode and the DVB mode. Namely, an ATSC demodulation module and a DVB demodulation module may be provided separately.

**[0109]** The stream signal output from the demodulation module 120 may be input to the control module 170. The control module 170 performs demultiplexing, video/audio signal processing, etc. and then outputs video to the display module 180 and audio to the audio output module 185.

**[0110]** The external device interface module 135 may connect an external device to the display device 100. To this end, external device interface module 135 may include an A/V input/output unit (not shown) or a wireless communication unit (not shown).

**[0111]** The external device interface module 135 is connected to external devices such as Digital Versatile Disks (DVD), Blu-rays, game devices, cameras, camcorders, computers (e.g., notebook computers), etc. through wire/wireless cables. The external device interface module 135 transmits a video, audio, or data signal externally input through an external device connected thereto, to the control module 170 of the display device 100. Also, the external device interface module 135 outputs the video, audio or data signal processed by the control module 170 to the external device. To this end, the external device interface module 135 may include an



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A/V input/output unit (not shown) or a wireless communication unit (not shown).

**[0112]** The A/V input/output unit of the external input circuit may include a USB terminal, a composite Video Banking Sync (CVBS) terminal, a component terminal, an S-video terminal (analog), a Digital Visual Interface (DVI) terminal, a High Definition Multimedia Interface (HDMI) terminal, an RGB terminal, a D-SUB terminal, etc., to input video and audio signals of the external device to the display device 100.

**[0113]** The wireless communication unit may perform a short-distance wireless communication with other electronic devices. For example, communication standards such as Bluetooth, Radio Frequency Identification (RFID), infrared Data Association (IrDA), Ultra Wideband (UWB), ZigBee, Digital Living Network Alliance (DLNA), etc. can be used for the short-distance wireless communication, whereby network connection between the display device 100 and other electronic devices can be performed. ,

**[0114]** In addition, the external device interface module 135 may be connected to various set-top boxes through at least one of the above-mentioned various terminals to perform input/output operation with the set-top boxes.

**[0115]** Also, the external device interface module 135 receives an application of a neighboring external device or list of applications and transmits the received application or the list of applications to control module 170 or the memory module 140.

**[0116]** The network interface module 130 provides interface for connecting the display device 100 with wire/wireless networks including Internet network. The network interface module 130 may include an Ethernet terminal, for example, for wire network connection. Also, for example, Wireless LAN (WLAN)(Wi-Fi), Wireless broadband (Wibro), World Interoperability for Microwave Access (Wimax), High Speed Downlink Packet Access (HSDPA) can be used for the wireless network connection.

**[0117]** The network interface module 130 transmits or receives data to and from other users or other electronic devices through a network connected thereto or another network linked on the connected network. In particular, the network interface module 130 can transmit some contents data stored in the display device 100 to a user or electronic device selected from other users or electronic devices previously registered with the display device 100.

**[0118]** In the mean time, the network interface module 130 can access a predetermined web page through a network connected thereto or another network linked on the connected network. In other words, the network interface module 130 can transmit or receive data to and from a corresponding server by accessing the predetermined web page through the corresponding network. In addition, the network interface module 130 can receive contents or data provided by the content provider or the network operator.

**[0119]** In other words, the network interface module 130 can receive contents such as movies, advertisements, games, VOD, broadcast signals, etc. and related information, which are provided from the content provider or the network provider through the network. Also, the network interface module 130 can receive update information and update files of firmware provided by the network operator. Moreover, the network interface module 130 can transmit data to the Internet or content provider or the network operator.

**[0120]** Furthermore, the network interface module 130 can selectively receive a desired one of contents open to the public, through the network. Also, the network interface module 130 can transmit or receive contents or data of a list of contents to and from a predetermined server through the network.

**[0121]** The memory module 140 may store a program for processing and controlling each signal of the control module 170, or may store the processed video, audio or data signal. Also, the memory module 140 may temporarily store the video, audio or data signal input from the external device interface module 135 or the network interface module 130. The memory module 140 may store information on a predetermined broadcast channel through a channel memory function.

**[0122]** Also, the memory module 140 may store the application or the list of applications input from the external device interface module 135 or the network interface module 130.

**[0123]** Also, the memory module 140 may store the contents or the list of contents input from the external device interface module 135 or the network interface module 130.

**[0124]** For example, the memory module 140 may include a storage medium of at least one type of a flash memory type, a hard disk type, a multimedia card micro type, a card type memory (for example, SD or XD memory), RAM and ROM (EEPROM, etc.) The display device 100 can play contents files (moving picture files, still image files, music files, application files, etc.) stored in the memory module 140 to provide the played contents files to the user.

**[0125]** Although FIG. 6 illustrates that the memory module 140 and the control module 170 are provided separately, the embodiments described herein are not to be limited by the embodiment of FIG. 6. The memory module 140 may be included in the control module 170.

**[0126]** The user input interface module 150 transmits the signal input by the user to the control module 170 or transmits the signal from the control module 170 to the user. For example, the user input interface module 150 may receive a control signal such as power on/off, channel selection and screen setup from the remote controller 200 or transmit the control signal from the control module 170 to the remote controller 200 in accordance with various communication modes such as RF communication mode and IR communication mode.

**[0127]** Also, for example, the user input interface mod-



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ule 150 may transmit a control signal input by a local key (not shown) such as a power key, a channel key, a volume key, and a setup key to the control module 170.

**[0128]** Also, for example, the user input interface module 150 may transmit a control signal input by a sensing unit (not shown), which senses gesture of the user, to the control module 170, or may transmit the signal from the control module 170 to the sensing unit. In this case, the sensing unit may include a touch sensor, an audio sensor, a position sensor, an action sensor, etc.

**[0129]** Also, for synchronization and search of the contents stored in the display device, the user input interface module 150 may receive predetermined synchronization target content, a selection signal of the display device for synchronization, a content keyword, and a synchronization command from the user.

**[0130]** The control module 170 demultiplexes an input stream and processes the demultiplexed stream through the tuner 110, the demodulation module 120 or the external device interface module 130 to generate and output a signal for a video and audio output.

**[0131]** The video signal processed by the control module 170 may be input to the display module 180, so that the video signal may be displayed as image corresponding to the video signal. Also, the video signal processed by the control module 170 may be input to the external output device through the external device interface module 135.

**[0132]** The video signal processed by the control module 170 may be output to the audio output module 185. Also, the video signal processed by the control module 170 may be input to the external output device through the external device interface module 135.

**[0133]** Although not shown in FIG. 6, the control module 170 may include a demultiplexer and a video processor, which will be described later with reference to FIG. 10. In addition, the control module 170 controls overall operations of the display device 100. For example, the control module 170 may control the tuner 110 to tune RF broadcasting corresponding to the channel selected by the user or the previously stored channel.

**[0134]** Also, the control module 170 may control the display device 100 through a user command input through the user input interface module 150 or its internal program. In particular, the control module 170 may allow the user to access the network and download a desired application or a list of desired applications into the display device 100.

**[0135]** For example, the control module 170 controls the tuner 110 to input a signal of a channel selected in accordance with a predetermined channel selection command received through the user input interface module 150, and processes a video, audio or data signal of the selected channel. The control module 170 may allow the channel information selected by the user to be output through the display module 180 or the audio output module 185 together with the processed video or audio signal.

**[0136]** For another example, the control module 170 may allow a video signal or an audio signal from an external device, for example, camera or camcorder, which is input through the external device interface module 135, to be output through the display module 180 or the audio output module 185 in accordance with an external device video play command received through the user input interface module 150.

**[0137]** Also, the control module 170 may control the display device 100 through a user command input through the user input interface module 150 or its internal program. In particular, the control module 170 may allow the user to access the network and download a desired content or a list of contents into the display device 100.

**[0138]** The control module 170 may control the display module 180 to display video. For example, the control module 170 may control the display module 180 to display broadcasting image input through the tuner 110, external input image input through the external device interface module 135, image input through the network interface module, or image stored in the memory module 140. At this time, the image displayed in the display module 180 may be still image or moving image, and may be 2D image or 3D image.

**[0139]** If the control module 170 enters a contents viewing list, it may control the display module to display contents or a list of contents that can be downloaded in the display device 100 or from the external network.

**[0140]** Also, control module 170 may play contents. At this time, the contents may be contents stored in the display device 100, received broadcasting contents, or externally input contents. The contents may be at least one of broadcasting image, external input image, audio files, still image, accessed web screen, and document files.

**[0141]** According to one embodiment, the control module 170 may control the display module 180 to display a home screen in accordance with an input of movement to home screen.

**[0142]** The home screen may include a plurality of card objects sorted per content source. The card object may include at least one of a card object representing a thumbnail list of a broadcast channel, a card object representing a broadcast guide list, a card object representing a broadcasting reservation list or a broadcasting recording list, and a card object representing a media list within the display device or another device connected with the display device. Also, the card object may further include at least one of a card object representing a list of accessed external devices and a card object representing a list related with calls.

**[0143]** Also, the home screen may further include an application menu provided with at least one executable application list.

**[0144]** If there is an input of card object movement, the control module 170 may control the display module 180 to display the corresponding card object through movement or move a card object not displayed in the display module 180 to the display module 180.

**[0145]** If a predetermined one of a plurality of card ob-



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jects in the home screen is selected, the control module 170 may control the display module 180 to display image corresponding to the corresponding card object.

**[0146]** In the mean time, the control module 170 may control the display module 180 to display received broadcasting image and an object representing corresponding broadcasting image information in the card object displaying broadcasting image. The control module 170 may control the broadcasting image such that the size of the broadcasting image may be fixed by lock.

**[0147]** The control module 170 may control the display module 180 to display a setup object for at least one of video setup, audio setup, reservation setup, pointer setup of the remote controller, and network setup in the home screen.

**[0148]** The control module 170 may control the display module 180 to display an object of login, help message, or exit in a part of the home screen.

**[0149]** The control module 170 may control the display module 180 to display an object representing the number of all card objects or representing the number of card objects displayed in the display module 180 in a part of the home screen.

**[0150]** If a card object name of a predetermined one of card objects displayed in the display module 180 is selected, the control module 170 may control the display module 180 to display the corresponding card object as the whole screen.

**[0151]** Also, if an incoming call signal is received in the accessed external device or the display device, the control module 170 may control the display module 180 to focus and display a call related card object of a plurality of card objects or move the call related card object into the display module 180.

**[0152]** If the control module 170 enters an application viewing list, it may display an application or a list of applications that can be downloaded in the display device 100 or from the external network.

**[0153]** The control module 170 may control installation or driving of the application downloaded from the external network together with various user interfaces. Also, the control module 170 may control the display module 180 to display image related to the application implemented by selection of the user.

**[0154]** Although not shown, a channel browsing processor that generates thumbnail image corresponding to a channel signal or external input signal may further be provided.

**[0155]** The channel browsing processor extracts image from the stream signal (TS) output from the demodulation module 120 or the stream signal output from the external device interface module 135 to generate thumbnail image. The thumbnail image may be input to the control module 170 as it is or encoded. Also, the generated thumbnail image may be encoded in a stream format and then input to the control module 170. Therefore, the control module 170 may display a thumbnail list that includes a plurality of thumbnail images, by using the input thumbnail image. The thumbnail images of the thumbnail list may be updated in due order or at the same time. Then, the user can simply recognize contents of a plurality of broadcast channels.

**[0156]** According to one embodiment, for synchronization of contents of the display device, if contents for synchronization and a selection signal of the display device for synchronization are received from the user through the user input interface module 150, the control module 170 transmits the selection signal to a predetermined server through the network interface module 130. If a comparison result of the list of contents is received from the server, the control module 170 transmits the contents corresponding to the comparison result to the server.

**[0157]** According to another embodiment, if contents for synchronization are received from the predetermined server through the network interface module 130, the control module 170 outputs a list of the received contents through the display module 180. If a synchronization confirmation command for the received contents is input from the user through the user input interface module 150, the control module 170 controls the memory module 140 to update the list of contents of memory module 140.

**[0158]** Also, if contents for synchronization are received from the predetermined server through the network interface module 130, the control module 170 outputs a notification message to a predetermined zone of the display module 180. If a confirmation command for the received contents is input from the user through the user input interface module 150, the control module 170 controls the display module 180 to output a list of the received contents.

**[0159]** Also, the control module 170 may control the display module 180 to output the notification message together with image data corresponding to the received contents or information on the number of the received contents.

**[0160]** The control module 170 may control the memory module 140 such that the list of the received contents may additionally include contents previously stored in the memory module 140. Also, the control module 170 may control the display module to respectively display the received contents and the contents previously stored in the memory module.

**[0161]** According to another embodiment, if a content search keyword and a selection signal of the display device for search are received from the user through the user input interface module 150, the control module 170 transmits the received search information to a predetermined server through the network interface module 130 and receives the search result from the server through the network interface module 130.

**[0162]** The display module 180 converts the video, data and OSD signals processed by the control module 170 or the video and data signals received from the external device interface module 135 to R, G, B signals, respectively, to generate driving signals.



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**[0163]** Examples of the display module 180 may include PDP, LCD, OLED, flexible display, and 3D display. A touch screen may be used as the display module 180, whereby the display module may be used as an input module as well as an output module.

**[0164]** According to one embodiment, the display module 180 may output a user interface that includes contents or a list of contents for synchronization, which are stored in the memory module 140 for synchronization and search of contents, a contents synchronization menu, a synchronization notification message, and a contents search menu.

**[0165]** The audio output module 185 receives the signal audio-processed by the control module 170, for example, stereo signal, 3.1 channel signal or 5.1 channel signal, and outputs the received signal as sound. Various types of speakers may be used as the audio output module 185.

**[0166]** To sense gesture of the user, the display device 100 may further include a sensing unit (not shown) that includes at least one of a touch sensor, an audio sensor, a position sensor, and an action sensor, as described above. The signal sensed by the sensing unit may be transmitted to the control module 170 through the user input interface module 150.

**[0167]** The display device 100 may further include a camera module (not shown) that takes a user. Image information taken by the camera module may be input to the control module 170.

**[0168]** The control module 170 may sense gesture of the user by using the image taken from the camera module (not shown) and the signal sensed from the sensing unit, respectively or in combination.

**[0169]** The power supply module 190 supplies the corresponding power to the whole portion of the display device 100. In particular, the power supply module 190 can supply the power to the control module 170 that can be implemented in the form of a system on chip (SOC), the display module 180 for image display, and the audio output module 185 for audio output.

**[0170]** To this end, the power supply module 190 may further include a converter (not shown) that converts alternating current to direct current. In the mean time, if the display module 180 is implemented as a liquid crystal panel that includes a plurality of back light lamps, for example, for luminance variable or dimming driving, the power supply module 190 may further include an inverter (not shown) that enables PWN operation.

**[0171]** The remote controller 200 transmits a user input to the user input interface module 150. To this end, the remote controller 200 can use Bluetooth, Radio Frequency (RF) communication, infrared (IR) communication, Ultra Wideband (UWB), ZigBee, etc. Also, the remote controller 200 can receive the video, audio or data signal output from the user input interface module 150 to display the received signal or output audio or vibration.

**[0172]** The aforementioned display device 100 may be a fixed type digital broadcast receiver that can receive at least one of digital broadcasting of ATSC mode (8-VSB mode), digital broadcasting of DVB-T mode (COFDM mode), and digital broadcasting of ISDB-T mode (BST-OFDM mode).

**[0173]** The block diagram illustrated in FIG. 2 corresponds to but one of a plurality of embodiments. The respective elements of the block diagram may be incorporated, added or omitted depending on options of the display device 100 which is actually implemented. In other words, two or more elements may be incorporated into one element, or one element may be divided into two or more elements, as occasion demands.

**[0174]** Unlike the embodiment in FIG. 6, the display device 100 may receive and play video contents through the network interface module 130 or the external device interface module 135 without the tuner 110 and the demodulation module 120 illustrated in FIG. 6.

**[0175]** The display device 100 is an example of a video processor that performs signal processing of video stored therein or input video. Another examples of the video signal processor include a set-top box that excludes the display module 180 and the audio output module 185 illustrated in FIG. 6, the aforementioned DVD player, a blu-ray player, a game device, and a computer. Hereinafter, the set-top box will be described with reference to FIG. 7 and FIG. 8.

**[0176]** FIGS. 7 and 8 show a display device having or coupled to a set-top box. Referring to FIG. 7, a set-top box 250 and a displayer 300 can transmit or receive data through a wire or wireless cable.

**[0177]** The set-top box 250 includes a network interface module 255, a memory module 258, a signal processor 260, a user input interface module 263, and an external device interface module 265.

**[0178]** The network interface module 255 provides an interface for connection with wire/wireless network including Internet network. Also, the network interface module 255 transmits or receives data to and from other users or other electronic devices through a network connected thereto or another network linked on the connected network.

**[0179]** The memory module 258 may store a program for processing and controlling each signal of the signal processor 260, or may temporarily store the video, audio or data signal input from the external device interface module 265 or the network interface module 255. Also, the memory module 258 may store a platform illustrated in FIG. 11 and FIG. 12 which will be described later.

**[0180]** The signal processor 260 performs signal processing of an input signal. For example, the signal processor 260 may demultiplex or decode the input video signal, or may demultiplex or decode the input audio signal. To this end, the signal processor 260 may further include a video decoder or an audio decoder. The video signal or audio signal subjected to signal processing can be transmitted to the displayer 300 through the external device interface module 265.

**[0181]** The user input interface module 263 transmits



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the signal input by the user to the signal processor 260 or transmits the signal from the signal processor 260 to the user. For example, the user input interface module 263 may receive various control signals such as power on/off, action input and setup input, which are input by a local key (not shown) or a remote controller 200, to transmit the control signals to the signal processor 260.

**[0182]** The external device interface module 265 provides an interface for transmitting or receiving data to and from an external device connected thereto through a wire or wireless cable. In particular, the external device interface module 265 provides an interface for transmitting or receiving data to and from the displayer 300. In addition, the external device interface module 265 may provide an interface for transmitting or receiving data to and from external devices such as game devices, cameras, camcorders, computers (e.g., notebook computers), etc.

**[0183]** In the mean time, the set-top box 250 may further include a media input module (not shown) for playing separate media. An example of the media input module includes a blu-ray input module (not shown). In other words, the set-top box 250 may include a blu-ray player. Media of the input blu-ray disk are subjected to signal processing such as demultiplexing or decoding by the signal processor 260 and then transmitted to the displayer 300 through the external device interface module 265, whereby the media are displayed in the displayer 300.

**[0184]** The displayer 300 includes a tuner 270, an external device interface module 273, a demodulation module 275, a memory module 278, a control module 280, a user input interface module 283, a display module 290, and an audio output module 295.

**[0185]** Since the tuner 270, the demodulation module 275, the memory module 278, the user input interface module 283, the display module 290, and the audio output module 295 correspond to the tuner 110, the demodulation module 120, the memory module 140, the user input interface module 150, the display module 180, and the audio output module 185, which are illustrated in FIG. 6, their description will be omitted.

**[0186]** The external device interface module 273 provides an interface for transmitting or receiving data to and from an external device connected thereto through a wire or wireless cable. In particular, the external device interface module 273 provides an interface for transmitting or receiving data to and from the set-top box 250.

**[0187]** Accordingly, the video signal or audio signal input through the set-top box 250 is output to the display module 180 or the audio output module 185 through the control module 170.

**[0188]** Referring to FIG. 8, the set-top box 250 and the displayer 300 are similar to those illustrated in FIG. 7 but are different from those illustrated in FIG. 7 in that the tuner 270 and the demodulation module 275 are located in the set-top box 250 not the displayer 300. Hereinafter, the set-top box 250 and the displayer 300 of FIG. 8 will be described based on the difference from FIG. 7.

**[0189]** The signal processor 260 performs signal processing of a broadcast signal received through tuner 270 and demodulation module 275. Also, the user input interface module 263 receives an input signal of channel selection, channel storage, etc.

**[0190]** FIG. 9 shows a communication procedure performed between a display device and one or more other devices. As illustrated in FIG. 9, display device 100 can perform communication with a broadcasting station 210, a network server 220, or an external device 230.

**[0191]** The display device 100 receives a broadcast signal that includes a video signal transmitted from the broadcasting station 210. The display device 100 processes the video signal included in the broadcast signal and audio or data signal to be appropriately output from the display device 100. The display device 100 outputs video or audio based on the processed signal.

**[0192]** In the mean time, the display device 100 can perform communication with the network server. The network server 220 can transmit and receive a signal to and from the display device 100 through a random network. For example, the network server 220 may be a portable terminal that can be connected with the display device 100 through a wire or wireless base station. Also, the network server 220 may be a device that can provide contents to the display device 200 through Internet network. The content provider can provide contents to the display device by using the network server.

**[0193]** The display device 100 can perform communication with the external device 230. The external device 230 can directly transmit and receive a signal to and from the display device 100 through a wire or wireless cable. For example, the external device 230 may be a media memory device or a media player, which is used by the user. In other words, the external device 230 corresponds to a camera, a DVD player, a blu-ray player, or a personal computer.

**[0194]** The broadcasting station 210, the network server 220 or the external device 230 can transmit a signal, which includes a video signal, to the display device 100. The display device 100 can display video based on the video signal included in the input signal. Also, the display device 100 can transmit the signal, which is transmitted from the broadcasting station 210 or the network server 220 to the display device 100, to the external device 230. Also, the display device 100 can transmit the signal, which is transmitted from the external device 230 to the display device 100, to the broadcasting station 210 or the network server 220. In other words, the display device 100 serves to directly play and transmit the contents included in the signal transmitted form the broadcasting station 210, the network server 220 and the external device 230.

**[0195]** FIG. 10 shows one example of a control module which, for example, may be included in FIG. 6. The control module 170 includes a demultiplexer 310, a video processor 320, an OSD generator 340, a mixer 350, a frame rate converter 355, and a formatter 360. The con-



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trol module 170 may further include an audio processor (not shown) and a data processor (not shown).

**[0196]** The demultiplexer 310 demultipelxes input streams. For example, if MPEG-2 TS is input, the demultiplexer 310 demultiplexes the MPEG-2 TS and splits the demultiplexed MPEG-2 TS into a video signal, an audio signal and a data signal. In this case, the stream signal input to the demultiplexer 310 may be the stream signal output from the tuner 110, the demodulation module 120, or the external device interface module 135.

**[0197]** The video processor 320 can process the demultiplexed video signal. To this end, the video processor 320 includes a video decoder 325 and a scaler 335.

**[0198]** The video decoder 325 decodes the demultiplexed video signal, the scaler 335 performs scaling to output resolution of the decoded video signal through the display module 180.

**[0199]** The video decoder 325 may include decoders having various specifications. For example, if the demultiplexed video signal is an encoded video signal of the MPEG-2 specification, it may be decoded by an MPEG-2 decoder.

**[0200]** Also, for example, if the demultiplexed video signal is an encoded video signal of the H.264 specification based on a Digital Multimedia Broadcasting (DMB) mode or DVB-H mode, it may be decoded by an H.264 decoder.

**[0201]** The video signal decoded by video processor 320 is input to mixer 350.

**[0202]** The OSD generator 340 generates an OSD signal in accordance with input of the user or by itself. For example, the OSD generator 340 may generate a signal for displaying various kinds of information on the screen of the display module 180 in the form of graphic or text based on the control signal from the user input interface module 150. The generated OSD signal may include various data such as a user interface screen of the display device 100, a screen of various menus, widget, and icon.

**[0203]** For example, the OSD generator 340 may generate a signal for displaying broadcast information based on EPG or caption of broadcast video.

**[0204]** The mixer 350 mixes the OSD signal generated by the OSD generator 340 with the decoded video signal processed by the video processor 220. The mixed signal is provided to the formatter 360. As the decoded broadcast video signal or the external input signal is mixed with the OSD signal, the OSD may be overlaid on the broadcast video or the external input video.

**[0205]** The frame rate converter (FRC) 355 converts a frame rate of the input video. For example, the frame rate converter 355 converts a frame rate of 60Hz to a frame rate of 120Hz or 240Hz. If the frame rate converter 355 converts the frame rate of 60Hz to the frame rate of 120Hz, a first frame may be inserted between another first frame and the second frame, or a third frame predicted from the first frame and the second frame may be inserted between the first frame and the second frame. If the frame rate converter 355 converts the frame rate of 60Hz to the frame rate of 240Hz, three same frames may be inserted between another first frame and the second frame, or the third frame predicted from the first frame and the second frame may be inserted between the first frame and the second frame. In the mean time, the input frame rate may be maintained without separate conversion.

**[0206]** The formatter 360 receives an output signal of the frame rate converter 355, changes a format of the signal to conform to the display module 180, and then outputs the changed format. For example, the formatter 360 may output R, G, B data signals. The R, G, B data signals may be output by low voltage differential signaling (LVDS) or mini-LVDS.

**[0207]** In the mean time, the audio processor (not shown) in the control module 170 may perform audio processing of the demultiplexed audio signal. To this end, the audio processor may include various decoders.

**[0208]** If the demutliplexed audio signal is an encoded audio signal, the audio processor in the control module 170 may decode the encoded audio signal. For example, the demultiplexed audio signal may be decoded by an MPEG-2 decoder, MPEG-4 decoder, AAC decoder, or AC-3 decoder.

**[0209]** Also, the audio processor in the control module 170 can process base, treble and sound volume control.

**[0210]** The data processor (not shown) in the control module 170 can perform data processing of the demultiplexed data signal. If the demutliplexed data signal is an encoded data signal, the data processor in the control module 170 may decode the encoded data signal. The encoded data signal may be electronic program guide (EPG) information that includes broadcast information such as start time and end time of a broadcast program broadcasted from each channel. For example, the EPG information may be ATSC-Program and System information protocol (ATSC-PSIP) information in case of the ATSC mode, and may include DVB-Service Information (DVB-SI) in case of the DVB mode.

**[0211]** The ATSC-PSIP information or the DVB-SI information may be information included in the aforementioned stream, i.e., a header (4 byte) of the MPEG-2 TS.

**[0212]** In the mean time, since the block diagram of the control module 170 illustrated in FIG. 10 is for one embodiment, other modules may be added to the respective elements of the block diagram in accordance with the needs of those skilled in the art, or some of the modules or elements illustrated in FIG. 10 may be omitted.

**[0213]** FIG. 11 shows one example of a platform structure for a display device, and FIG. 12 shows another embodiment of a platform structure. A platform of any one of the display devices according to one or more embodiments may include OS based software to perform the aforementioned various operations.

**[0214]** Referring to FIG. 11, a platform of any one of the display devices according to one or more embodiments is a split-type platform and can be designed in such a manner that it is split into a legacy system platform



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400 and a smart system platform 405. An OS kernel 410 may be used in common for the legacy system platform 400 and the smart system platform 405.

**[0215]** The legacy system platform 400 includes a driver 420 on the OS kernel 410, a middleware 430, and an application layer 450.

**[0216]** The smart system platform 405 includes a library 435 on the OS kernel 410, a framework 440, and an application layer 455.

**[0217]** The OS kernel 410 is a core of the operating system, and can perform at least one of driving of a hardware driver, security of hardware and processor in the display device, efficient management of system resources, memory management, interface for hardware based on hardware abstraction, multi-process, and schedule management based on multi-process when the display device is driven. In the mean time, the OS kernel 410 may further perform power management.

**[0218]** The hardware driver in the OS kernel 410, for example, may include a display driver, a Wi-Fi driver, a Bluetooth driver, a USB driver, an audio driver, a power manager, a binder driver, and a memory driver.

**[0219]** Also, the hardware driver in the OS kernel 410 may further include a character device driver, a block device driver, and a network device driver as drivers for hardware devices therein. The block device driver may need a buffer equivalent to unit size in accordance with data transmission of a specific block unit. The character device driver may not need a buffer due to data transmission in a basic data unit, i.e., character unit.

**[0220]** As described above, the OS kernel 410 can be implemented as the kernel based on various operating systems such as unix (linux) based operating system and window based operating system. Also, the OS kernel 410 is an opened OS kernel, and can be used generally by other electronic devices.

**[0221]** The driver 420 is located between the OS kernel 410 and the middleware 430, and drives the device for operation of the application layer 450 together with the middleware 430. For example, the driver 420 may include drivers such as a micom in the display device, a display module, a graphic processing unit (GPU), a frame rate converter (FRC), a general purpose input/output pin (GPIO), HDMI, system decoder or demultiplexer (SDEC), video decoder (VDEC), audio decoder (ADEC), a personal video recorder (PVR), and an inter-integrated circuit (I2C). These drivers interact with the hardware driver in the OS kernel 410.

**[0222]** Also, the driver 420 may further include a driver of a remote controller 200, especially a spatial remote controller which will be described later. The driver of the spatial remote controller may be provided in the OS kernel 410 or the middleware 430 in addition to the driver 420.

**[0223]** The middleware 430 is located between the OS kernel 410 and the application layer 450, and serves as a medium that allows data to be exchanged between hardware and software. In this case, a standardized interface can be provided, various environments can be supported, and mutual interaction between tasks of different systems can be performed.

**[0224]** Examples of the middleware 430 in the legacy system platform 400 include data broadcasting related middleware, i.e., multimedia and hypermedia information coding experts group (MHEG) middleware and advanced common application platform (ACAP) middleware, broadcast information related middleware, i.e., PSIP middleware and SI middleware, and peripherals communication related middleware, i.e., DLNA middleware.

**[0225]** The application layer 450 on the middleware 430, namely the application layer 450 in the legacy system platform 400 may include a user interface application on various menus in the display device. The application layer 450 on the middleware 430 can be edited by selection of the user, and can be updated through the network. This application layer 450 enables the user to input a desired menu of various user interfaces in accordance with input of the remote controller during viewing broadcasting image.

**[0226]** Also, the application layer 450 in the legacy system platform 400 may further include at least one of TV guide application, Bluetooth application, reservation application, digital video recorder (DVR) application, hot key application.

**[0227]** In the mean time, the library 435 in the smart system platform 405 is located between the OS kernel 410 and the framework 440, and can form the base of the framework 440. For example, the library 435 includes security library, web engine library and media library, wherein the security library includes secure socket layer (SSL), the web engine library includes WebKit, libc (c library), and video and audio formats, and the media library includes media framework. The library 435 can be made based on C or C++, and can be exposed to a developer through the framework 440.

**[0228]** The library 435 may include a runtime 437 that includes a core java library and a virtual machine (VM). The runtime 437 forms the base of the framework 440 together with the library 435.

**[0229]** The virtual machine (VM) may be a virtual machine that enables a plurality of instances, i.e., multi-tasking. The virtual machine (VM) may be allocated in accordance with each application in the application layer 455. At this time, for schedule adjustment and interconnection between the plurality of instances, the binder driver (not shown) in the OS kernel 410 may be driven.

**[0230]** The binder driver and runtime 437 can connect java based application with C based library.

**[0231]** The binder driver and the runtime 437 can correspond to middleware of the legacy system.

**[0232]** The framework 440 in the smart system platform 405 includes a program based on the application in the application layer 455. The framework 440 is compatible with any one of the applications and enables reuse, movement or exchanges of components. The framework 440 may include a support program, and a program that



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compiles other software elements. For example, the framework 440 may include a resource manager, an activity manager related to activities of the application, a notification manager, and a content provider for briefing of information shared between the applications. The framework 440 can be made based on JAVA.

**[0233]** The application layer 455 on the framework 440 includes various programs that can be driven and displayed in the display device 100. For example, the application layer 455 may include core application that includes at least one of email, short message service (SMS), calendar, map, and browser. This application layer 455 can be made based on JAVA.

**[0234]** Also, the application layer 455 can be divided into application 465 that can be stored in the display device 100 and cannot be deleted by the user and application 475 that can be downloaded through the external device or network and can freely be installed or deleted by the user.

**[0235]** Internet phone service, video on demand (VOD) service, web album service, social networking service (SNS), location based service (LBS), map service, web search service and application search service may be performed by network access through the application in the application layer 455. Also, various functions such as games and schedule management may be performed through the application in the application layer 455.

**[0236]** Referring to FIG. 12, a platform of any one of the display devices according to one or more embodiments is an integrated-type platform and includes an OS kernel 510, a driver 520, a middleware 530, a framework 540, and an application layer 550.

**[0237]** The platform of FIG. 12 is different from that of FIG. 11 in that the library 435 illustrated in FIG. 11 is omitted and the application layer 550 is an integrated layer. The driver 520 and the framework 540 correspond to those of FIG. 11.

**[0238]** The platform of FIG. 12 can be designed such that the library 435 illustrated in FIG. 11 is incorporated into the middleware 530 illustrated in FIG. 12. In other words, the middleware 530 includes legacy system middleware and display system middleware. The legacy system middleware may include data broadcasting related middleware, i.e., multimedia and hypermedia information coding experts group (MHEG) middleware and advanced common application platform (ACAP) middleware, broadcast information related middleware, i.e., PSIP middleware and SI middleware, and peripherals communication related middleware, i.e., DLNA middleware.

**[0239]** The display system middleware may include security library, web engine library and media library, wherein the security library includes secure socket layer (SSL), the web engine library includes WebKit, libc, and the media library includes media framework. The display system middleware may further include runtime described above.

**[0240]** The application layer 550 in the legacy system may include menu application, TV guide application, and reservation application while the application layer 55 in the display system may include email, short message service (SMS), calendar, map, and browser.

**[0241]** The application layer 550 may be divided into application 565 that can be stored in the display device 100 and cannot be deleted by the user and application 575 that can be downloaded through the external device or network and can freely be installed or deleted by the user.

**[0242]** Based on the aforementioned platforms of FIG. 11 and FIG. 12, various API(Application Programming Interface) and SDK(Software Development Kit) can be opened for an application development. In the future or present time. Moreover, API can be implemented by calling the function that provides a connection to specific subroutine for implementation in a program.

**[0243]** For example, Those API and SDK can be opened by a source involved with hardware driver in OS kernel 410 such as display driver, Wi-fi driver, Bluetooth driver, USB driver, Audio driver, and so on. According to another embodiment, those API and SDK can be opened by a related source in a driver 420 such as a micom in the display device, a display module, a graphic processing unit (GPU), a frame rate converter (FRC), system decoder or demultiplexer (SDEC), video decoder (VDEC), audio decoder (ADEC), a spatial remote controller and so on.

**[0244]** According to another embodiment, the API and SDK can be opened by a related source such as PSIP involved with broadcasting information, SI middleware or DLNA middleware.

**[0245]** A developer skilled in the art can develop at least one of application that is used for display device 100 control or ran in display device 100 based on the aforementioned platforms of FIG. 11 and FIG. 12 by using those various open API.

**[0246]** The aforementioned platforms of FIG. 11 and FIG. 12 can be used generally for various electronic devices as well as the display device. In the mean time, the platforms of FIG. 11 and FIG. 12 may be stored or loaded in the memory module 140 or the control module 170 illustrated in FIG. 6 or a separate processor (not shown). Also, the platforms of FIG. 11 and FIG. 12 may be stored or loaded in the SI&Metadata DB 711, the UI manager 714 or the service manager 713 illustrated in FIG. 7. Also, a separate application processor (not shown) for implementing application may further be provided.

**[0247]** FIG. 13 shows steps included in one embodiment of a method for controlling a remote controller of a display device. As illustrated in FIG. 13(a), a pointer 205 corresponding to the remote controller 200 is displayed in the display module 180.

**[0248]** The user can move or rotate the remote controller 200 in up and down direction and left and right direction (FIG. 13(b)) and in front and rear direction (FIG. 13(c)). The pointer 205 displayed in the display module 180 of the display device corresponds to movement of



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the remote controller 200. Since the remote controller 200 moves to the corresponding pointer 205 in accordance with movement on 3D space as shown, it may be referred to as a spatial remote controller.

**[0249]** FIG. 13(b) illustrates that, if the user moves the remote controller 200 to the left, the pointer 205 displayed in the display module 180 of the display device moves to the left correspondingly.

**[0250]** Information on movement of the remote controller 200, which is sensed by a sensor of the remote controller 200, is transmitted to the display device. The display device can obtain a coordinate of the pointer 205 from the information on movement of the remote controller 200. The display device can display the pointer 205 to correspond to the above coordinate.

**[0251]** FIG. 13(c) illustrates that the user moves the remote controller 200 to be far away from the display module 180 in a state that the user pushes a specific button of the remote controller 200. In this case, a zone selected in the display module 180 corresponding to the pointer 205 is displayed through zoom-in.

**[0252]** On the contrary, if the user moves the remote controller 200 to be close to the display module 180, the zone selected in the display module 180 corresponding to the pointer 205 is displayed through zoom-out. If the remote controller 200 becomes far away from the display module 180, the selected zone may be subjected to zoom-out. If remote controller 200 becomes close to the display module 180, the selected zone may be subjected to zoom-in.

**[0253]** In a state that the specific button of the remote controller 200 is pushed, up and down movement and left and right movement may not be recognized. In other words, if the remote controller 200 moves to be far away from or close to the display module 180, front and rear movement may be recognized only without recognition of up and down movement and left and right movement. In a state that the specific button of the remote controller 200 is not pushed, the pointer 205 is only moved in accordance with up and down movement and left and right movement of the remote controller 200.

**[0254]** Movement speed or movement direction of the pointer 205 may correspond to that of the remote controller 200. In this specification, the pointer means an object displayed in the display module 180 to correspond to action of the remote controller 200. Accordingly, in addition to an arrow shape illustrated by the pointer 205, various shaped objects may be provided. For example, examples of the pointer may include dot, cursor, prompt, and thick outline. The pointer may be displayed to correspond to any one point of a horizontal axis and a vertical axis on the display module 180, or may be displayed to correspond to a plurality of points such as line and surface.

**[0255]** FIG. 14 shows a remote controller 200 for controlling a display device. The remote controller 200 includes a wireless communication module 225, a use input module 235, a sensor module 240, an output module 250, a power supply module 260, a memory module 270, and a control module 280.

**[0256]** The wireless communication module 225 transmits and receives a signal to and from any one of the aforementioned display devices.

**[0257]** In this embodiment, the remote controller 200 may include RF module 221 that can transmit and receive a signal to and from the display device 100 in accordance with the RF communication standard. The remote controller 200 may further include IR module 223 that can transmit and receive a signal to and from the display device 100 in accordance with the IR communication standard.

**[0258]** In this embodiment, the remote controller 200 transmits a signal, which includes information on its movement, to the display device 100 through the RF module 221.

**[0259]** Also, the remote controller 200 can receive the signal transmitted from the display device 100 through the RF module 221. Also, the remote controller 200 can transmit a command on power on/off, channel change and volume change to the display device 100 through the IR module 223.

**[0260]** The user input module 235 can include a key pad, a button, a touch pad, or a touch screen. The user can input the command related to the display device 100 to the remote controller 200 by manipulating the user input module 235. If the user input module 235 includes a hard key button, the user can input the command related to the display device 100 to the remote controller 200 through a push action of the hard key button.

**[0261]** If the user input module 235 includes a touch screen, the user can input the command related to the display device 100 to the remote controller 200 by touching a soft key of the touch screen. Also, the user input module 235 may include various kinds of user input units may be used including but not limited to a scroll key and jog key.

**[0262]** The sensor module 240 may include a gyro sensor 241 or an acceleration sensor 243. The gyro sensor 241 can sense the information on movement of the remote controller 200. For example, the gyro sensor 241 can sense the information on movement of the remote controller 200 based on x, y and z axes. The acceleration sensor 243 can sense information on movement speed of the remote controller 200. In the mean time, the sensor module 240 may further include a distance sensor that senses the distance between the display module 180 and the remote controller 200.

**[0263]** The output module 250 can output the video or audio signal corresponding to the manipulation of the user input module 235 or the signal transmitted from the display device 100. The user can recognize whether the user input module 235 has been manipulated or whether the display device 100 has been controlled, through the output module 250.

**[0264]** For example, if the user input module 235 is manipulated or if the output module 250 transmits and



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receives a signal to and from the display device 100 through the wireless communication module 225, the output module 250 may include an LED module 251 for lighting, a vibration module 253 that generates vibration, a sound output module 255 that outputs sound, or a display module 257 that outputs image.

**[0265]** The power supply module 260 supplies the power to the remote controller 200. If the remote controller 200 does not move for a predetermined time, the power supply module 260 can save the power by stopping power supply. The power supply module 260 can resume power supply if a predetermined key provided in the remote controller 200 is manipulated.

**[0266]** The memory module 270 may store various kinds of programs and application data required for control or operation of the remote controller 200. If the remote controller 200 transmits and receives a signal to and from the display device 100 through the RF module 221, the remote controller 200 and the display device 100 transmit and receive the signal to and from each other through a predetermined frequency band. The control module 280 of the remote control module 200 can store information on the frequency band, which can be transmitted and received to and from the display device 100 paired with the remote controller 200, and can refer to the stored information.

**[0267]** The control module 280 controls all matters related to control of the remote controller 200. The control module 280 can transmit the signal corresponding to predetermined key manipulation of the user input module 235 or the signal corresponding to movement of the remote controller 200, which is sensed by the sensor module 240, to the display device through the wireless communication module 225.

**[0268]** FIG. 15 shows a first example of a user interface for a display device, FIG. 16 shows a second example of a user interface for a display device, FIG. 17 shows a third example of a user interface for a display device, and FIG. 18 shows a fourth example of a user interface for a display device.

**[0269]** In FIG. 15, the list of applications on the network is displayed in the display module 180. In other words, the user can search and download various applications by directly accessing the corresponding content server or network server.

**[0270]** In FIG. 15(a), a list 610 of various applications in the accessed server is displayed in the display module 180. The list 610 of applications may include icon representing each application and brief information on each application. In the mean time, since the display device enables full browsing, it can display the icon or brief information received from the server through zoom-in. In this case, the user can easily identify the list of applications. This will be described later.

**[0271]** In FIG. 15(b), any one 620 of the list 610 of applications is selected using the pointer 205 of the remote controller 200. In this case, the corresponding application can be downloaded conveniently.

**[0272]** FIG. 16 illustrates that the list of applications in the display device is displayed in the display module 180. First of all, in FIG. 16(a), if the user views the list of applications by manipulating the remote controller 200, the list 660 of applications stored in the display device may be displayed in the display module 180. Although the icons representing each application are only shown in the drawing, the embodiments described herein are not limited to the icons. The list of applications may include brief information on each application as in FIG. 15, whereby the user can easily identify the list of applications.

**[0273]** In FIG. 16(b), any one 670 of the corresponding list 660 of applications is selected using the pointer 205 of the remote controller 200. In this case, the corresponding application can be implemented conveniently.

**[0274]** In order to select a predetermined item, the pointer 205 moves in accordance with movement of the user by using the remote controller 200 in FIG. 15 and FIG. 16. Also, various examples for selecting a predetermined item may be provided. For example, a cursor displayed on the screen by combination of a directional key and a confirmation key, which are arranged in a local key (not shown) or the remote controller 200, may be used to select a predetermined item.

**[0275]** For another example, if the remote controller 200 includes a touch pad, the pointer 205 is moved on the display module 180 by touch action of the touch pad. In this way, a predetermined item may be selected.

**[0276]** FIG. 17 illustrates that a web screen is displayed in the display module of the display device. In FIG. 17(a), a predetermined web screen 710 that includes a search window 720 is displayed in the display module 180. The user can input a predetermined text in the search window 720 by using a key pad (not shown) displayed on the screen, a text key (not shown) provided in a local key (not shown), or a text key (not shown) provided in the remote controller.

**[0277]** FIG. 17(b) illustrates that a search result screen 730 according to a search keyword input to the search window is displayed in the display screen 180. Since the display device according to this embodiment enables full browsing, the user can easily identify the web screen.

**[0278]** FIG. 18 illustrates that a web screen is displayed in the display portion of the display device. In FIG. 18(a), a mail service screen 810 having an ID input window 820 and a password input window 825 is displayed in the display module 180. The user can input a predetermined text in the ID input window 820 and the password input window 825 by using a key pad (not shown) displayed on the screen, a text key (not shown) provided in a local key (not shown), or a text key (not shown) provided in the remote controller. Accordingly, the user can log in the corresponding mail service.

**[0279]** In FIG. 18(b), a screen 830 after log in mail service is displayed in the display module 180. For example, 'read mail' item, 'write mail' item, 'sent box' item, 'received box' item, and 'recycle bin' item may be displayed in the display module. Also, the 'received box' item may be di-



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vided into 'sender' item and 'title' item. In this way, the received mails may be arranged and displayed in the display module 180.

**[0280]** Since the display device enables full browsing when the screen for mail service is displayed, the user can use the mail service conveniently.

**[0281]** FIG. 19 shows a procedure for providing an application monitoring screen on a display device according to any of the aforementioned embodiments or examples. According to one embodiment, a user can execute one or more applications in the display apparatus at the same time (S1901). Also, the executed applications are in the execution status while sharing the memory of the display apparatus. The applications may be executed on the display screen at the same time by screen split. Alternatively, the applications may be executed in such a manner that any one application is executed on the entire screen and the other applications are executed on a background.

**[0282]** Next, the display apparatus receives a signal for enabling a monitoring menu from the user (S1902). The signal for enabling the monitoring menu may include a remote controller or a hot-key input of the display apparatus. Also, the signal may include a selection signal of a predetermined menu item included in the display screen. At this time, the user can use various input means such as a spatial remote controller, an infrared remote controller, and a remote controller provided with a keyboard and a touch pad.

**[0283]** If the signal is received, the display apparatus displays the monitoring menu on the screen.

**[0284]** According to one embodiment, the monitoring menu may be displayed on a predetermined zone of the display screen currently used by the user in the form of window, or may be displayed on the entire screen to enhance readability. Also, the monitoring menu may be displayed in an opaque color so as not to disturb use of an application used before the signal for enabling the monitoring menu is input.

**[0285]** According to one embodiment, the monitoring menu may include various kinds of information such as billing information, memory use information and information on the number of use times and then may be provided to the user, as described in detail with reference to FIG. 30 to FIG. 32.

**[0286]** Next, the user selects whether to end what application based on the information on the monitoring menu (S1903).

**[0287]** The user can select one or more applications, or can select a signal to end all applications currently in service.

**[0288]** The selected signal can be input through a remote controller or various input means of the display apparatus.

**[0289]** If the selected signal is received, the display apparatus ends execution of the selected applications (S1904). If a problem such as loss of information or disconnection occurs due to the end of the applications, a message indicating that the problem will occur is displayed to warn the user of the problem.

**[0290]** Next, if the end of the applications is finished, the monitoring menu is updated.

**[0291]** According to one embodiment, the billing information, the memory use information and the information on the number of use times are again measured in a state that the selected applications are ended, whereby the monitoring menu is updated.

**[0292]** The user can further end another application with reference to the updated monitoring menu or disable the monitoring menu. Also, according to another embodiment, the display apparatus can disable the monitoring menu at the same time when the end of the selected applications is finished.

**[0293]** A module for displaying the monitoring menu in the display apparatus can be stored in the display apparatus and then provided to the user when a manufacturer of the display apparatus manufactures the module for displaying the monitoring menu.

**[0294]** Also, according to one embodiment, the module for displaying monitoring menu may not be stored in the initial display apparatus. Namely, the display apparatus may install the module for displaying the monitoring menu by accessing a predetermined web site and downloading data for displaying the monitoring menu.

**[0295]** FIG. 20 shows one example of a display screen that includes a menu item for enabling a monitoring menu. According to one embodiment, a menu item 2001 for enabling the monitoring menu may be displayed on a predetermined zone of the display screen in the form of icon so as not to disturb the display screen of contents currently in service in the display apparatus.

**[0296]** The contents can include various contents, such as movie contents, music contents, real-time broadcasting contents, web page contents and game contents, which can be used in the display apparatus. Also, the menu item for enabling the monitoring menu may be displayed while an execution screen of a predetermined application is being displayed in the display apparatus.

**[0297]** Also, the icon may be set in such a manner that it is not always displayed but displayed if a pointer is located at a random position designated by the user.

**[0298]** The icon may include image or text representing the menu item for enabling the monitoring menu. Also, color or transparency of the menu item 2001 may be changed depending on user setup, as described in detail with reference to FIG. 21 to FIG. 24.

**[0299]** FIGS. 21 and 22 show additional examples of display screens that include menu items for enabling a monitoring menu. In this menu, menu items 2101 and 2202 can be displayed on a predetermined zone of the display screen in the form of icon. Also, the icon may be displayed in various colors depending on the execution status of contents or applications currently in service in the display apparatus.

**[0300]** For example, it is supposed that the color is varied depending on the memory usage. In this case, if memory capacity currently remaining in the display ap-



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paratus is sufficient, the icon may be displayed in green color. If the remaining memory capacity corresponds to half of the total memory capacity, the icon may be displayed in yellow color. Also, as the remaining memory capacity is small, if the application or contents currently in service may forcibly be ended the icon may be displayed in red color.

**[0301]** The user can conveniently identify the status of the current memory through only the color of the icon.

**[0302]** Also, the green, yellow, or red is only exemplary, and more various colors may be displayed depending on memory use level. If the remaining memory capacity is reduced, the icon may be displayed in color that can easily be recognized by the user. In other words, if the remaining memory capacity corresponds to half of the total memory capacity, the icon is displayed as illustrated in FIG. 21 (2101). If the remaining memory capacity is small, the icon is displayed in darker color as illustrated in FIG. 22 (2201).

**[0303]** Also, if the remaining memory capacity is too small, the icon may be flickered to assist recognition of the user.

**[0304]** In addition to the memory use, if user fee is overcharged due to use of contents or applications in the display apparatus, or if overload is predicted due to increase of data processed by a processor of the display apparatus, the icon may be displayed variably in color, which can easily be recognized by the user, as the user fee is increased or the data are increased.

**[0305]** FIGS. 23 and 24 show examples of display screens that include a transparency setup menu for controlling display of a menu item for a monitoring menu. Transparency of the icon can be varied depending on user setup or the screen currently displayed in a display module of the display apparatus. For example, if the user calls a menu for controlling transparency of the icon through hot-key input of the remote controller or selection of a predetermined menu item, a transparency control menu can be displayed as illustrated in FIG. 23 and FIG. 24.

**[0306]** The transparency control menu may include respective number menu items 2302, 2303, 2304 and 2305 representing transparency. If the user selects a predetermined number, the transparency control menu is set in such a manner that the icon is displayed with transparency corresponding to the selected number.

**[0307]** In other words, for example, if the user selects a number '1' 2302 from the transparency control menu, the icon may be displayed in opaque color as illustrated in FIG. 23 (2301), or if the user selects a number '4' (2305), the icon may be displayed in clearer color than that of FIG. 23, as illustrated in FIG. 24 (2401), whereby the user can identify the display screen overlapped with the icon.

**[0308]** Also, the display apparatus may control transparency of the icon variably depending on the screen displayed in its display module without displaying the transparency control menu.

**[0309]** In other words, for example, if caption of contents currently in service in the display apparatus is displayed on a zone where the icon is located, the icon may be displayed with high transparency. If such contents are not displayed on the zone where the icon is located, the icon may be displayed with low transparency.

**[0310]** Furthermore, as described with reference to FIG. 21 and FIG. 22, if the remaining memory capacity of the display apparatus becomes small and user fees are overcharged, transparency of the icon may be lowered, whereby the user can easily recognize the icon.

**[0311]** FIG. 25 shows an example of a display screen which allows a position of a menu item to be changed. According to one embodiment, the user can move a menu item 2501 for enabling the monitoring menu through the user input device.

**[0312]** For example, the user can move the position of the menu item through a drag and drop action of a pointer 2502. In other words, after clicking the menu item through the pointer 2502, the user can move the pointer to a desired position through a drag action and fix the menu item to the desired position through a drop action.

**[0313]** Also, unlike shown, the user can set a mode for moving the menu item through a predetermined menu item or hot-key input, and can move the menu item to a desired position through a directional key.

**[0314]** As a result, since the user can locate the menu item to the desired position, the user can conveniently use predetermined contents through the display apparatus even in a state that the menu item is displayed.

**[0315]** FIG. 26 shows an example of a display screen that includes a menu item for enabling a monitoring menu on a home screen of a smart TV system. The home screen of the smart TV is displayed to use functions of the smart TV, and a menu item 2601 for enabling the monitoring menu is displayed in the form of icon. The home screen of the smart TV will be described later in detail with reference to FIG. 34.

**[0316]** Also, one or more applications can be executed in the display apparatus, and a menu item 2601 for enabling the monitoring menu can be displayed with the screen for the applications.

**[0317]** The menu item can be displayed in the form of icon that includes text or image. Also, a pointer 2602 can be moved through various input means such as a remote controller to input a selection signal of the menu item for enabling the monitoring menu.

**[0318]** FIG. 27 shows an example of a screen that includes a monitoring menu displayed on a home screen of a smart TV system. If a selection signal of the menu item 2701 for enabling the monitoring menu is input on the display screen of FIG. 26, a monitoring menu 2703 is displayed.

**[0319]** The monitoring menu 2703 includes billing information, memory use information and information on the number of use times, which will be described later in detail with reference to FIG. 30 to FIG. 32.

**[0320]** The monitoring menu 2703 can be displayed



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on a predetermined zone of the display screen currently used by the user in the form of window as shown.

**[0321]** According to one embodiment, the monitoring menu 2703 may be displayed on the entire screen to enhance readability unlike shown in FIG. 27. Moreover, the monitoring menu 2703 can be displayed in opaque color so as not to disturb use of application or content used before the signal for enabling the monitoring menu is input.

**[0322]** The user can end execution of a predetermined application by selecting an application end menu item from the monitoring menu, and can select the application item to move to the execution screen of the selected application. The selected item will be described with reference to FIG. 30 to FIG. 32.

**[0323]** FIGS. 28 and 29 show additional examples of display screens that include monitoring menus. As shown, a monitoring menu 2804 indicates execution information of application or content currently in service in the display apparatus can be displayed by miniaturization so as not to disturb the screen of another application or content displayed in the display apparatus.

**[0324]** In other words, as illustrated in FIG. 28, the number 2801 of applications currently in service in the display apparatus, the number 2802 of contents currently in service, and graph or number 2803 on memory use information of the display apparatus can be displayed on a predetermined zone of the display screen.

**[0325]** According to one embodiment, items included in the monitoring menu can be edited. In other words, as illustrated in FIG. 29 (2901), the monitoring menu can be set to include name of contents or applications currently in service.

**[0326]** Also, like the menu item for enabling the monitoring menu, transparency or color of the monitoring menu can be varied. In this case, even though the user uses predetermined contents or applications of the display apparatus, the user can easily identify execution information of the applications or contents through the miniaturized monitoring menu.

**[0327]** FIG. 30 shows an example of a display screen that includes a monitoring menu containing billing information. The monitoring menu can include a tab 3001 for displaying billing information. If the tab for displaying the billing information is selected, it can include reference information for billing such as access time and traffic capacity.

**[0328]** Referring to FIG. 30, if fee is calculated depending on access time (3002), the tab can include a list of applications or contents currently in service, information 3004, 3005 and 3006 on use time and remaining free of charge time, so as to identify billing information.

**[0329]** Also, if fee is calculated depending on traffic capacity (3003), the tab can include a list of applications or contents currently in service, information on used traffic capacity and remaining free of charge traffic capacity.

**[0330]** According to one embodiment, the display apparatus can display the list of applications and contents, which include name and icon of the applications and contents. Also, the tab can include end menu items for each of applications and contents 3008, 3009 and 3010, and can include an end menu item 3007 for ending all of the applications and contents currently in service.

**[0331]** Also, the access time information or the traffic capacity information can be displayed in the form of number of graph. If the access time or the traffic capacity exceeds a predetermined value, the color of the applications and contents can be varied to another color, whereby the user can easily recognize the applications and contents.

**[0332]** Also, if fee is calculated depending on another reference unlike shown, a tab for displaying the billing information together with reference information for billing can be displayed.

**[0333]** Also, the user can select name or icon of the applications and contents included in the list of applications or contents from the monitoring menu and switch the current screen to the execution screen of the selected applications and contents, as described later in detail with reference to FIG. 44.

**[0334]** In this case, the user can easily identify the billing information so that user fees may not be overcharged.

**[0335]** FIG. 31 shows an example of a display screen that includes a monitoring menu containing memory use information. The monitoring menu can include a tab 3101 for displaying memory information. If the tab for displaying the memory information is selected, the user can identify total memory capacity 3102 of the display apparatus and memory occupancy information 3103 of each of applications and contents.

**[0336]** According to one embodiment, the total memory capacity 3102 can include information on total memory capacity of the display apparatus, memory capacity currently in service, and remaining memory capacity.

**[0337]** In this case, since the user can identify redundancy capacity of the memory, the user can prevent forcible end or data loss from occurring in executing the applications and contents. Also, the memory occupancy information 3103 of each of the applications and contents can include a list of applications and contents currently in service, and information on memory capacity used by each of the applications and contents 3106.

**[0338]** According to one embodiment, the display apparatus can display the list of applications and contents, which includes name and icon of the applications and contents. Moreover, the display apparatus can display the list of applications and contents in the order of applications and contents having larger memory usage.

**[0339]** Also, the display apparatus can include information on memory capacity used by each of the applications and contents, and can display the used memory capacity in the form of number or graph.

**[0340]** Also, the display apparatus can include an end menu item 3105 for ending applications and contents for each of applications and contents, and can include an end menu item 3104 for ending all of the applications and



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contents currently in service.

**[0341]** Also, the user can select name or icon of the applications and contents included in the list of applications or contents from the monitoring menu and switch the current screen to the execution screen of the selected applications and contents, as described later in detail with reference to FIG. 44.

**[0342]** In this case, the user can decide to end what application and contents to efficiently manage the memory by referring to the information on remaining memory capacity in the total memory capacity.

**[0343]** FIG. 32 shows an example of a display screen that includes a monitoring menu containing billing information. The monitoring menu can include a tab 3201 for displaying Item information. The tab for displaying Item information can display the Item information together with information that can identify use item of each of applications and contents 3203.

**[0344]** According to one embodiment, if use of items is limited to a predetermined number of items as shown, the display apparatus can include a list of applications and contents, the number of total items, the number of used items, and the number of remaining items. The information on the number of items can be displayed in the form of number or graph.

**[0345]** According to one embodiment, the display apparatus can display the list of applications and contents together with name and icon of the applications, and can include an end menu item 3204 for ending applications and contents for each of applications and contents and an end menu item 3202 for ending all of the applications and contents currently in service.

**[0346]** Also, if the remaining items are reduced to reach a predetermined number of items or less, the display apparatus can display the color of applications and contents in another color, whereby the user can easily recognize the color of the applications and contents.

**[0347]** Also, unlike shown, if a use limit reference is another reference not item, such as a predetermined point or coin, the display apparatus can display the corresponding information together with information on the use limit reference.

**[0348]** Also, the user can select name or icon of the applications and contents included in the list of applications or contents from the monitoring menu and switch the current screen to the execution screen of the selected applications and contents, as described later in detail with reference to FIG. 44.

**[0349]** FIG. 33 shows an example of a display screen that includes a monitoring menu containing an application execution screen. In this embodiment, a selection signal of name or icon of the applications or contents included in the monitoring menu of FIG. 27 to FIG. 32 is input from the monitoring menu, whereby the current screen can be switched to a use screen 3302 of the applications or contents.

**[0350]** In other words, if the user selects name or icon of application, which can use a web site, from the monitoring menu through the user input device, the screen for using the selected application can be displayed as illustrated in FIG. 33.

**[0351]** Also, the switched screen can continue to provide execution information to the user by miniaturizing the monitoring menu 3301.

**[0352]** In this case, the user can easily switch to the execution screen of the applications or contents from the monitoring menu, and can exactly select application and contents for ending by identifying the status of the applications or contents displayed by name or icon only, in detail, from the monitoring menu.

**[0353]** FIG. 44 shows one way in which screen switching of a display apparatus may be performed. As illustrated in FIG. 44(a), if predetermined contents or applications are displayed from the display apparatus, the menu item for enabling the monitoring menu can be displayed on a predetermined zone of the display module of the display apparatus.

**[0354]** Also, in the display screen illustrated in FIG. 44 (a), if a selection signal of the menu item is received from the user, the display apparatus can display the screen illustrated in FIG. 44(b) to display the monitoring menu in detail.

**[0355]** Also, in the display screen illustrated in FIG. 44 (b), if the user inputs a selection signal of name or icon of predetermined contents or applications included in the monitoring menu, the display apparatus can display the display screen of the selected applications or contents as illustrated in FIG. 44(c) to allow the user to use the selected applications or contents.

**[0356]** In other words, since the user can easily identify execution information on each of the applications or contents on the display screen, the user can control the execution condition of the display apparatus more easily.

**[0357]** FIGS. 34 to 39 show examples of home screens that may be used to execute various functions of a smart TV system. The home screen(s) can include cards 3401, 3402, 3403 and 3404 related to applications or contents that can be used in the smart TV, and a launcher bar 3405 that includes icons 3406, 3407 and 3408 of the applications or contents. The launcher bar 3405 may be located above the cards as shown, or may be located below the cards or at the left or right of the cards.

**[0358]** Also, a predetermined icon included in the launcher bar can be displayed as image that can predict name or action of the applications.

**[0359]** Also, if a selection signal of the icon is received from the user, the cards 3401, 3402, 3403 and 3404 can be displayed to include predetermined information on applications or contents corresponding to the selected icon. Also, if a selection signal of any one of the cards is input from the user, the application corresponding to the selected card can be executed as the entire screen.

**[0360]** Referring to FIG. 34, it is noted from the card 3401 that terrestrial broadcast contents are displayed. Also, it is noted that the card 3402 is related to calendar application that enables schedule management. It is not-



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ed that the card 3403 is related to application that can play music through the display apparatus. In other words, the user can identify and execute the applications of the smart TV through the icon or the cards.

**[0361]** Furthermore, the card 3404 can allow information on the applications or contents of the smart TV, which is not displayed on the home screen, to be displayed, whereby the user can predict the contents or applications of the smart TV through the information. For example, as illustrated in FIG. 34, a part of the card 3404 is displayed at the right end of the display screen, whereby the user can identify information on the application or contents corresponding to the card existing at the right part of the display screen.

**[0362]** In other words, if the user scrolls the cards to the right side through the user interface module in a state that the home screen 3400 of FIG. 34 is displayed, although a home screen 3600 of FIG. 36 is displayed, even before the user directly performs the above scroll operation, the card 3404 of the application 'NETFLIX' is partially displayed at the right part on the home screen of FIG. 34. Accordingly, the user can predict that the entire card 3601 of the application 'NETFLIX' is displayed if the user scrolls the cards to the right side.

**[0363]** Also, a part 3501 of the card is displayed at the left side as illustrated in the home screen 3500 of FIG. 35, whereby the user can predict an application card 3701 of a home screen 3700 of FIG. 37.

**[0364]** Also, in addition to the left side or right side, a part of widgets card is displayed at upper sides 3901, 3902 and 3903 or lower sides 3801, 3802 and 3803 of the card, whereby the user can predict the corresponding application card by scrolling the card to the upper side or lower side on the home screen.

**[0365]** Also, unlike shown in FIG. 34 to FIG. 39, a part of each of the cards is displayed at the upper side, lower side, right side and left side at the same time, whereby the user can predict what card will be displayed if the user scrolls the cards to the upper side, lower side, right side and left side.

**[0366]** FIGS. 40 to 43 show additional examples of home screens that may be used to execute various functions of a smart TV system. In the same manner as FIG. 34 to FIG. 39, after a part of the icons displayed on the home screen is displayed, if the user scrolls the icon list, the user can predict what icon will be displayed.

**[0367]** The icon can be displayed as image data that can predict name or action of the application, not text. Accordingly, even though a part of the icon is displayed, the user can predict the application corresponding to the icon.

**[0368]** In other words, if a home screen 4000 is displayed as illustrated in FIG. 40, a part 4001 of the icon is displayed at the right side of the icon list, whereby the user can predict the corresponding icon by scrolling the icon list to the right side.

**[0369]** Also, if a home screen 4100 is displayed as illustrated in FIG. 41, the user can predict the corresponding icon by scrolling the icon list to the left side. If a home screen 4200 is displayed as illustrated in FIG. 42, the user can predict the corresponding icon by scrolling the icon list to the upper side. If a home screen 4300 is displayed as illustrated in FIG. 43, the user can predict the corresponding icon by scrolling the icon list to the lower side. In this way, the user can predict the corresponding icons through partial icons 4101, 4102 and 4103 displayed on each home screen.

**[0370]** Also, unlike shown in FIG. 40 to FIG. 43, a part of each icon may be displayed at the upper side, lower side, left side and right side at the same time like FIG. 34 to FIG. 39.

**[0371]** Accordingly, the user can predict the corresponding icon located at the scroll position before directly scrolling the icon list, whereby convenience in use of the display apparatus can be improved.

**[0372]** As described above, the network TV for processing data for a monitoring service according to one embodiment includes a broadcast interface receiving broadcast data through a broadcast network, wherein the broadcast data include audio data and video data, a demultiplexer demultiplexing the audio data and the video data of the received broadcast data, an audio decoder decoding the demultiplexed audio data, a video decoder decoding the demultiplexed video data, an Internet interface receiving at least one or more contents through an Internet network, a first controller controlling the received contents to be executed in a background type, a collector collecting state information on the at least one or more contents executed in the background type, a generator generating a monitoring indicator corresponding to the collected state information, a second controller controlling the display module to display the decoded video data in a first zone of the network TV and display the generated monitoring indicator in a second zone of the network TV, and a speaker outputting the decoded audio data.

**[0373]** The network TV according to one embodiment can be designed by considering the modules illustrated in FIG. 2 or FIG. 5. Hereinafter, the network TV will be described in more detail with reference to FIG. 2 or FIG. 5. However, it is to be understood that modules other than those illustrated in FIG. 2 or FIG. 5 may be included.

**[0374]** The broadcast interface corresponds to the reference numeral 101 of FIG. 2 or the reference numeral 701 of FIG. 5. The demultiplexer corresponds to the reference numeral 705 of FIG. 5, the audio decoder corresponds to the reference numeral 706 of FIG. 5, and the video decoder corresponds to the reference numeral 707 of FIG. 5. Moreover, the demultiplexer, the audio decoder, and the video decoder can be designed in such a manner that their functions are performed by the broadcast data processor 111 of FIG. 2.

**[0375]** The Internet interface corresponds to the reference numeral 108 of FIG. 2 or the reference numeral 701 of FIG. 5. The first controller, the collector, the generator, the second controller are designed in such a manner that their functions are performed by the second runtime mod-



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ule 109 of FIG. 2 or the service manager 713 of FIG. 5. In the mean time, the display module and the speaker correspond to the reference numeral 708 of FIG. 5.

**[0376]** Also, the monitoring indicator, for example, corresponds to the reference numeral 2001 of FIG. 20, the reference numeral 1201 of FIG. 21, the reference numeral 2201 of FIG. 22, the reference numeral 2301 of FIG. 23, the reference numeral 2401 of FIG. 24, the reference numeral 2501 of FIG. 25, the reference numeral 2601 of FIG. 26, etc. Moreover, the state information of the content includes at least one or more of information illustrated in FIG. 30 to FIG. 32.

**[0377]** According to another embodiment, if the displayed monitoring indicator is selected, the second controller displays the collected state information (for example, the state information includes current state information for each content). If the a specific content is selected from the displayed state information, the second controller stops execution of the background for the specific content, stops display of the decoded video data, and displays the specific content in the first zone of the network TV.

**[0378]** According to still another embodiment, the second controller is designed to determine whether the collected state information corresponds to what level of a plurality of levels and to display the generated monitoring indicator in the second zone of the network TV differentially depending on the level of the collected state information.

**[0379]** Moreover, the network TV according to still another embodiment is designed to further include a user interface that receives a signal for selecting a level of transparency of the monitoring indicator, and the second controller displays the generated monitoring indicator in the second zone of the network TV based on the selected level of transparency.

**[0380]** Also, the monitoring indicator according to still another embodiment is designed to include at least one or more of a first tab displaying the memory use state caused by at least one or more contents currently in service as the background, a second tab displaying an item use state caused by at least one or more contents currently in service as the background, and a third tab displaying a use state of a charged content of at least one or more contents currently in service as the background.

**[0381]** Also, according to still another embodiment, the second controller is designed to determine whether the collected state information corresponds to a warning range and to display the generated monitoring indicator in the second zone of the network TV only if the collected state information corresponds to the warning range. This second controller will be described in more detail with reference to FIG. 45.

**[0382]** The network TV according to still another embodiment further includes a user interface that receives a signal for selecting a reference category for automatic forcible end, and the second controller is designed to first and forcibly end a specific content currently in service as the background based on the selected reference category if the collected state information corresponds to a danger range. The reference category corresponds to memory use capacity or initial access time, for example. This will be described in more detail with reference to FIG. 49 to FIG. 51.

**[0383]** In the mean time, the content used in this specification includes at least one or more of application and web page. As the case may be, the content may further include other data that can be ordinarily defined by those skilled in the art.

**[0384]** FIG. 45 shows one embodiment of a procedure for automatically enabling a monitoring menu. If the aforementioned monitoring indicator is always enabled, it may be a little interference on a general broadcast screen of the user. Accordingly, in order to solve this problem, as illustrated in (a) of FIG. 45, the network TV 4500 according to one embodiment maintains a zone 4501 where the monitoring indicator is displayed, at off state.

**[0385]** However, a network TV 4550 is designed in such a manner that a monitoring indicator 4551 is automatically enabled as illustrated in FIG. 45(b) only if a specific event occurs while the collector is collecting the state information on the content currently in service as the background. Moreover, the specific event means that the use time of the charged content remains about 30 minutes or error may occur in general broadcasting of the network TV due to excessive memory capacity of the content operated as the background.

**[0386]** Accordingly, the network TV according to the embodiment is advantageous in that the user can receive only a danger state on the content such as application while viewing a general broadcast screen.

**[0387]** FIG. 46 shows an example of the first level of a monitoring menu, FIG. 47 shows an example of a second level of the monitoring menu, and FIG. 48 shows an example of a third level of a monitoring menu.

**[0388]** Considering the state information of the contents currently in service as the background, if the possibility of overload that may occur in the memory or the CPU of the network TV reaches 50% to 70%, or if the use time of the charged content remains 30 minutes or one hour, as illustrated in FIG. 46, the network TV 4600 according to one embodiment displays the monitoring indicator 4601 indicating first level warning.

**[0389]** Moreover, considering the state information of the contents currently in service as the background, if the possibility of overload that may occur in the memory or the CPU of the network TV reaches 70% to 90%, or if the use time of the charged content remains 10 minutes or 30 minutes, as illustrated in FIG. 47, the network TV 4700 according to one embodiment displays the monitoring indicator 4701 indicating second level warning. In this case, the second level warning message 4701 is displayed using a highlight scheme more emphasized than the warning message 4601 of FIG. 46 or a size greater than that of the warning message 4601 of FIG. 46.



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**[0390]** Also, considering the state information of the contents currently in service as the background, if the possibility of overload that may occur in the memory or the CPU of the network TV reaches 90% or more, or if the use time of the charged content remains 10 minutes or less, as illustrated in FIG. 48, the network TV 4800 according to one embodiment displays the monitoring indicator 4801 indicating third level warning. In this case, the third level warning message 4801 is displayed using a highlight scheme more emphasized than the warning message 4701 of FIG. 47 or a size greater than that of the warning message 4701 of FIG. 47.

**[0391]** FIG. 49 shows an example of a forcible termination screen. The network TV 4900 according to one embodiment performs a control operation to generate a message 4910 indicating that a specific content will forcibly be ended automatically, in a popup type, independently from or dependently on the embodiments illustrated in FIG. 45 to FIG. 48. Accordingly, according to this embodiment, throughput of the network TV can be prevented from being deteriorated by various contents or functions operated as the background.

**[0392]** FIG. 50 shows another example of another automatic forcible terminal screen. Unlike FIG. 49, the network TV 5000 illustrated in FIG. 50 performs a control operation to generate a message 5010 inquiring whether to forcibly end a specific content, in a popup type. This network TV 5000 is designed considering that the specific content scheduled for forcible end may be different from a content to be ended by the user.

**[0393]** FIG. 51 shows one embodiment of a forcible termination method. As illustrated in FIG. 49 or FIG. 50, if overload is predicted due to the content currently in service as the background, the network TV according to one embodiment may be designed to forcibly end a random content. However, for convenience of the user, as illustrated in FIG. 51, the network TV 5100 according to one embodiment displays a menu screen 5120 for setting a reference category of forcible end.

**[0394]** As illustrated in FIG. 51, the reference category of forcible end may be memory use capacity or initial access time. Accordingly, it is advantageous in that the contents are automatically ended in accordance with the reference desired by the user.

**[0395]** In more detail, if the memory use capacity is set based on the reference of forcible end and too many contents are operated as the background, the contents are forcibly ended automatically in the order of greater memory use capacity.

**[0396]** If the initial access time is set based on the reference of forcible end and too many contents are operated as the background, the contents are forcibly ended automatically in the order of earlier execution time.

**[0397]** As described above, programs or modules related to the monitoring service based on the monitoring indicator according to one embodiment may be designed in such a manner that the programs or modules are included in the network TV during initial manufacture of the network TV or the programs or modules are included in the network TV after manufacture of the network TV. This will be described with reference to FIG. 52 and FIG. 53.

**[0398]** FIG. 52 shows one embodiment of a monitoring service method. As illustrated in FIG. 52, the control method includes receiving broadcast data through a broadcast network, wherein the broadcast data include audio data and video data (S5201). The control method includes demultiplexing the audio data and the video data of the received broadcast data (S5202), and decoding the demultiplexed audio data (S5203). The control method includes decoding the demultiplexed video data (S5204).

**[0399]** The control method includes receiving at least one or more contents through an Internet network (S5205). The control method includes controlling the received contents to be executed in a background type (S5206). The control method includes collecting state information on the at least one or more contents executed in the background type (S5207).

**[0400]** The control method includes generating a monitoring indicator corresponding to the collected state information (S5208). The control method includes displaying the decoded video data in the first zone of the network TV and at the same time displaying the generated monitoring indicator in the second zone of the network TV (S5209).

**[0401]** Also, according to one embodiment, if the displayed monitoring indicator is selected, the control method includes displaying the collected state information. If a specific content is selected from the displayed state information, the control method includes stopping execution of the background for the specific content, stopping display of the decoded video data, and displaying the specific content in the first zone of the network TV. This embodiment can be understood in more detail from FIG. 44.

**[0402]** The step S5209 includes determining whether the collected state information corresponds to a warning range and displaying the generated monitoring indicator in the second zone of the network TV only if the collected state information corresponds to the warning range. This embodiment can be understood in more detail with reference to FIG. 45.

**[0403]** The step S5209 includes determining whether the collected state information corresponds to what level of a plurality of levels and displays the generated monitoring indicator in the second zone of the network TV differentially depending on the level of the collected state information. This embodiment can be understood in more detail with reference to FIG. 46 to FIG. 48.

**[0404]** Moreover, although not illustrated in FIG. 52, according to another embodiment, the control method further includes receiving a signal for selecting a reference category for automatic forcible end, and first and forcibly ending a specific content currently in service as the background based on the selected reference category if the collected state information corresponds to a



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danger range. The reference category corresponds to memory use capacity or initial access time, for example. This embodiment can be understood in more detail with reference to FIG. 49 to FIG. 51.

**[0405]** The step S5209 further includes receiving a signal for selecting a level of transparency of the monitoring indicator, and displaying the generated monitoring indicator in the second zone of the network TV based on the selected level of transparency. This embodiment can be understood in more detail with reference to FIG. 23 and FIG. 24. The content includes at least one or more of application and web page.

**[0406]** FIG. 53 shows another embodiment of a monitoring service method. The method includes downloading an application for execution of the aforementioned monitoring indicator (S5301). The method includes collecting state information on at least one or more contents executed in a background type (S5302). In this case, the content is received through the Internet network.

**[0407]** The method includes generating a monitoring indicator corresponding to the collected state information (S5303), displaying the generated monitoring indicator in the second zone of the network TV, wherein the second zone is different from the first zone where video data of broadcast data are displayed (S5304). Also, if the displayed monitoring indicator is selected, the method includes displaying the collected state information (S5305). The state information includes current state information for each content.

**[0408]** If a specific content is selected from the displayed state information, the method includes stopping execution of the background for the specific content, and displaying the specific content in the first zone of the network TV (S5307).

**[0409]** Although the description has been made for the respective drawings, a new embodiment can be implemented by combination of the embodiments described with reference to the drawings. Design of a recording medium that can be read from a computer that includes programs for implementing the methods disclosed herein, including those illustrated in FIG. 52 and FIG. 53 are provided.

**[0410]** FIG. 54 is a block diagram illustrating a mobile terminal according to one embodiment of the present invention. Hereinafter, a block diagram of a mobile terminal according to one embodiment of the present invention will be described with reference to FIG. 54.

**[0411]** As illustrated in FIG. 54, a mobile terminal 5400 according to one embodiment of the present invention includes a wireless communication module 5410, an audio/video (A/V) input module 5420, a user input module 5430, a sensing module 5440, an output module 5450, a memory module 5460, an interface module 5470, a controller 5480, and a power supply module 5490. The modules illustrated in FIG. 54 are not necessarily required. Accordingly, a mobile terminal provided with modules more than or less than those illustrated in FIG. 54 may be achieved.

**[0412]** Hereinafter, the aforementioned modules will be described in due order.

**[0413]** The wireless communication module 5410 can include one or more modules that enable wireless communication between the mobile terminal 5400 and the wireless communication system or between the mobile terminal 5400 and the network where the mobile terminal 5400 is located. For example, the wireless communication module 5410 can include a broadcast receiving module 5411, a mobile communication module 5412, a wireless Internet module 5413, a short range communication module 5414, and a location information module 5415.

**[0414]** The broadcast receiving module 5411 receives a broadcast signal and/or broadcast information from an external broadcast management server through a broadcast channel.

**[0415]** The broadcast channel can include a satellite channel and a terrestrial channel.

**[0416]** The broadcast management server may mean either a server that generates and transmits a broadcast signal and/or broadcast information, or a server that receives a previously generated broadcast signal and/or broadcast information and transmits it to the terminal. The broadcast signal can include a data broadcast signal combined with a TV broadcast signal or radio broadcast signal as well as the TV broadcast signal, the radio broadcast signal and the data broadcast signal.

**[0417]** The broadcast information may mean information related to a broadcast channel, a broadcast program or a broadcast service provider. The broadcast information may be provided through a mobile communication network. In this case, the broadcast information can be received by the mobile communication module 5412.

**[0418]** The broadcast information can exist in various forms. For example, the broadcast information can exist in the form of EPG (Electronic Program Guide) of DMB (Digital Multimedia Broadcasting) or ESG (Electronic Service Guide) of DVB-H (Digital Video Broadcast-Handheld).

**[0419]** The broadcast receiving module 5411 can receive a digital broadcast signal by using a digital broadcast system such as DMB-T (Digital Multimedia Broadcasting-Terrestrial), DMB-S (Digital Multimedia Broadcasting-Satellite), MediaFLO (Media Forward Link Only), DVB-H(Digital Video Broadcast-Handheld), and ISDB-T (Integrated Services Digital Broadcast-Terrestrial). The broadcast receiving module 5411 may be configured to conform to another broadcast system as well as the aforementioned digital broadcast systems.

**[0420]** The broadcast signal and/or the broadcast information received through the broadcast receiving module 5411 can be stored in the memory module 5460.

**[0421]** The mobile communication module 5412 transmits and receives a radio signal to and from at least one of a base station, an external terminal and a server on the mobile communication network. The radio signal can include an audio call signal, a video call signal, or various data based on transmission and reception of text/multi-



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media messages.

**[0422]** The wireless Internet module 5413 means a module for wireless Internet access, and may be stored inside or outside the mobile terminal 5400. WLAN(Wireless LAN)(Wi-Fi), Wibro(Wireless broadband), Wimax (World Interoperability for Microwave Access), HSDPA (High Speed Downlink Packet Access), etc. can be used for wireless Internet technology.

**[0423]** The short range communication module 5414 means a module for short range communication. Bluetooth, RFID(Radio Frequency Identification), infrared Data Association (IrDA), UWB(Ultra Wideband), ZigBee, etc. can be used for short range communication.

**[0424]** The location information module 5415 is a module for acquiring the location of the mobile terminal, and its example includes a GPS (Global Position System) module.

**[0425]** Referring to FIG. 54, the A/V(Audio/Video) input module 5420 is intended for input of audio signal or video signal, and its examples includes a camera 5421 and a mike 5422. The camera 5421 processes a picture image frame such as a still image or moving picture image obtained by an image sensor in a video call mode or camera mode. The processed picture image frame can be displayed in the display module 5451.

**[0426]** The picture image frame processed by the camera 5421 may be stored in the memory module 5460 or may be transmitted to the outside through the wireless communication module 5410. Two or more cameras 5421 may be provided depending on the use condition.

**[0427]** The mike 5422 receives an external audio signal through a microphone in a call mode or recording mode, a voice recognition mode, etc., and processes the received signal to electric audio data. The processed audio data can be output to the base station for wireless communication through the wireless communication module 5412 in the call mode. Various noise removal algorithms can be configured for the mike 5422 to remove noise occurring when the mike receives the external audio signal.

**[0428]** The user input module 5430 generates input data for allowing the user to control the operation of the terminal. The user input module 5430 can include a key pad dome switch, touch pad (static pressure/power failure), a jog wheel, and a jog switch.

**[0429]** The sensing module 5440 senses the current state of the mobile terminal 5400, such as the switching state of the mobile terminal 5400, the location of the mobile terminal 5400, information as to whether the user has contacted the mobile terminal, a direction of the mobile terminal, and acceleration/deceleration of the mobile terminal, and generates a sensing signal for controlling the operation of the mobile terminal 5400. For example, if the mobile terminal 5400 is a slide phone type, the sensing module 5440 can sense whether the slide phone has been opened or closed. Also, the sensing module 5440 may sense whether the power supply module 5490 has supplied the power or whether the interface module 5470 has been coupled to the external device. In the mean time, the sensing module 5440 can include a proximity sensor 5441.

**[0430]** The output module 5450 is intended to generate the output related to light sense, hearing sense, or tactile sense, and its examples include a display module 5451, an audio output module 5452, an alarm module 5453, and a haptic module 5454.

**[0431]** The display module 5451 displays (outputs) information processed by the mobile terminal 5400. For example, if the mobile terminal 5400 is in the call mode, the display module 5451 displays UI(User Interface) or GUI(Graphic User Interface) related to call. If the mobile terminal is in the video call mode or camera mode, the display module 5451 displays the taken image or/and the received image, or UI and GUI.

**[0432]** The display module 5451 can include at least one of a liquid crystal display (LCD), a thin film transistor-liquid crystal display (TFT LCD), an organic light-emitting diode (OLED), a flexible display, and a 3D display.

**[0433]** Some of the displays can be configured in a transparent type or a light-transmitting type, through which the outside can be viewed. This type display can be referred to as a transparent display, and its example includes a TOLED (Transparent OLED). The display module can be configured in a rear structure or a light-transmitting structure. According to this structure, the user can view an object located at the rear of a body of the terminal through a zone occupied by the display module 5451 of the body of the terminal.

**[0434]** Two or more display modules 5451 can exist depending on the structure of the mobile terminal 5400. For example, the mobile terminal 5400 may be provided with a plurality of display modules arranged to be spaced apart from one another or arranged to form a single body on one surface. Alternatively, the mobile terminal 5400 may be provided with a plurality of display modules arranged on different surfaces.

**[0435]** If the display module 5451 and a sensor (hereinafter, referred to as 'touch sensor') sensing a touch action configure a mutual layer structure (hereinafter, referred to as 'touch screen'), the display module 5451 may be used as an input device in addition to the output device. Examples of the touch sensor include a touch film, a touch sheet, and a touch pad.

**[0436]** The touch sensor can be configured to convert pressure applied to a specific zone of the display module 5451 or electrostatic capacity occurring in a specific zone of the display module 5451 to an electric input signal. The touch sensor can be configured to detect even the pressure during touch as well as the touched location and the touched area.

**[0437]** If there is the touch pressure on the touch sensor, signal(s) corresponding to the touch pressure are transmitted to a touch controller. The touch controller processes the signal(s) and then transmits data corresponding to the processed signals to the controller 5480. As a result, the controller 5480 can identify the touched



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zone of the display module 5451.

**[0438]** Referring to FIG. 54, the proximity sensor 5441 can be arranged in an inner zone of the mobile terminal covered by the touch screen or near the touch screen. The proximity sensor 5441 means a sensor that senses the presence of an object approaching a predetermined detection surface or an object existing near the touch screen without mechanical contact by using a force of electric field or infrared rays. The proximity sensor has a lifespan longer than that of a contact sensor and is used more widely than the contact sensor.

**[0439]** Examples of the proximity sensor include a light-transmitting photoelectric sensor, a direct reflective type photoelectric sensor, a mirror reflective photoelectric sensor, a high frequency oscillating proximity sensor, an electrostatic capacity type proximity sensor, a magnetic type proximity sensor, and an infrared proximity sensor. If the touch screen is the electrostatic type, the proximity sensor is configured to detect proximity of the pointer by using change of the electric field based on proximity of the pointer. In this case, the touch screen (touch sensor) may be regarded as the proximity sensor.

**[0440]** Hereinafter, for convenience of description, if it is recognized that the pointer is approaching the touch screen without contacting the touch screen, it is referred to as "proximity touch". If the pointer is actually contacted on the touch screen, it is referred to as "contact touch". If the location where the pointer is approaching on the touch screen means the location where the pointer vertically corresponds to the touch screen when the pointer is approaching on the touch screen.

**[0441]** The proximity sensor senses a proximity touch operation and proximity touch patterns (for example, proximity touch distance, proximity touch direction, proximity touch speed, proximity touch time, proximity touch location, proximity touch motion state, etc.). Information corresponding to the sensed proximity touch operation and the proximity touch patterns can be output on the touch screen.

**[0442]** The audio output module 5452 can output audio data received from the wireless communication module 5410 or stored in the memory module 5460 in a call signal reception mode, a call mode, a recording mode, an audio recognition mode, a broadcast receiving mode, etc. The audio output module 5452 may output an audio signal related to functions (for example, call signal receiving sound, message receiving sound, etc.) performed by the mobile terminal 5400. This audio output module 5452 may include a receiver, a speaker, and a buzzer.

**[0443]** The alarm module 5453 outputs a signal for notifying event occurrence of the mobile terminal 5400. Examples of the event occurring in the mobile terminal 5400 include call signal reception, message reception, key signal input, and touch input. The alarm module 5453 may output a signal for notifying event occurrence in the form of oscillation other than a video signal or audio signal. Since the video signal or audio signal may be output through the display module 5451 or the audio output module 5452, the display module 5451 and the audio output module 5452 may be regarded as parts of the alarm module 5453.

**[0444]** The haptic module 5454 generates various tactile effects that can be felt by the user. An example of the tactile effect generated by the haptic module 5454 includes oscillation. Strength and patterns of oscillation generated by the haptic module 5454 can be controlled. For example, the haptic module 5454 may output different kinds of oscillation in combination or in due order.

**[0445]** The haptic module 5454 can generate various tactile effects such as arrangement of pins that perform a vertical movement to a contact skin surface, a jet force or suction force of the air through a jet hole or suction hole, skimming along the skin surface, contact of electrode, effect of a stimulus such as static electricity, and effect of reproduction of cooling or heating based on an element that can absorb or generate heat.

**[0446]** The haptic module 5454 can transfer a tactile effect through direct contact and allow the user to feel a tactile effect through a sensory organ such as finger or arm. Two or more haptic modules 5454 may be provided depending on the structure of the mobile terminal 5400.

**[0447]** The memory module 5460 can store a program for the operation of the controller 5480, and may temporarily input/output data (for example, phone book, message, still image, moving picture, etc.). The memory module 5460 can store data on oscillation and audio of various patterns output during touch input on the touch screen.

**[0448]** The memory module 5460 can include at least one type of a flash memory type, a hard disk type, a multimedia card micro type, a card type memory (for example, SD or XD memory), a Random Access Memory (RAM), a Static Random Access Memory (SRAM), a Read-Only Memory (ROM), EEPROM(Electrically Erasable Programmable Read-Only Memory), PROM(Programmable Read-Only Memory), a magnetic memory, a magnetic disk, and an optical disk. The mobile terminal 5400 may be operated in connection with a web storage that performs a storage function of the memory module 5460 on the Internet.

**[0449]** The interface module 5470 serves as a path with all external devices connected to the mobile terminal 5400. The interface module 5470 receives data from the external device or is supplied with the power from the external device, and then transmits the data or the power to each module of the mobile terminal 5400 or allows the data in the mobile terminal 100 to be transmitted to the external device. For example, the interface module 5470 may include a wire/wireless headset port, an external charger port, a wire/wireless data port, a memory card port, a port for connecting a device provided with an identification module, an audio input/output (I/O) port, a video I/O port, and an earphone port.

**[0450]** The identification module is a chip that stores various kind of information for authenticating the use authority of the mobile terminal 5400, and can include a User Identity Module (UIM), a Subscriber Identity Module



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(SIM), and a Universal Subscriber Identity Module (USIM). The device (hereinafter, referred to as 'identification device') provided with the identification module can be manufactured in the form of a smart card. Accordingly, the identification device can be connected with the mobile terminal 5400 through the port.

**[0451]** When the mobile terminal 5000 is connected with an external cradle, the interface module may serve as a path through the power from the cradle is supplied to the mobile terminal 5400, or may serve as a path through which various command signals input from the cradle by the user are transmitted to the mobile terminal. The various command signals or the power input from the cradle may be operated as a signal for recognizing that the mobile terminal has been exactly mounted on the cradle.

**[0452]** The controller 5480 generally controls the overall operation of the mobile terminal. For example, the controller 5480 performs control and processing related to voice communication, data communication, and video communication. The controller 5480 may include a multimedia module 5481 for playing multimedia. The multimedia module 5481 may be provided in the controller 5480, or may be provided separately from the controller 5480.

**[0453]** The controller 5480 can perform pattern recognition processing for recognizing writing input or drawing input performed on the touch screen as text and image, respectively.

**[0454]** The power supply module 5490 supplies the power required for the operation of each module through the external power and internal power applied under the control of the controller 5480.

**[0455]** Various embodiments described herein can be implemented in a recording medium by a computer or similar device using various means, for example, software, hardware, or their combination.

**[0456]** If the embodiments are implemented by hardware, the embodiments can be implemented by at least one of application specific integrated circuits (ASICs), digital signal processors (DSPs), digital signal processing devices (DSPDs), programmable logic devices (PLDs), field programmable gate arrays (FPGAs), processors, controllers, micro-controllers, microprocessors, and an electric unit for performing other functions. In some case, the embodiments described herein can be implemented by the controller 5480.

**[0457]** If the embodiments are implemented by software, the embodiments including the procedures and functions described herein can be implemented by separate software modules. Each of the software modules can perform one or more functions or operations described herein. For example, a software code can be implemented by a software application written in a proper program language. The software code can be stored in the memory module 5460, and may be executed by the controller 5480.

**[0458]** FIG. 55 is a front perspective view illustrating a mobile terminal according to one embodiment of the present invention. Hereinafter, the front perspective view of the mobile terminal according to one embodiment of the present invention will be described with reference to FIG. 55.

**[0459]** As illustrated in FIG. 55, the mobile terminal 5400 includes a bar type terminal body. However, it is to be understood that the present invention is not limited to the bar type terminal body and various modifications can be made in the terminal body of the mobile terminal of the present invention. For example, the terminal body of the mobile terminal 5400 according to the present invention can be applied to various structures such as a slide type, a folder type, a swing type, and a swivel type, in which where two or more bodies are coupled to each other in relative movement.

**[0460]** The terminal body includes a case (casing, housing, cover, etc.) constituting appearance. In this embodiment, the case can be divided into a front case 5401 and a rear case 5402. Various electronic parts are built in a space formed between the front case 5401 and the rear case 5402. At least one intermediate case may additionally be arranged between the front case 5401 and the rear case 5402.

**[0461]** The cases may be formed by injection molding of a synthetic resin, or may be formed to have a metal material such as stainless steel (STS) or Ti.

**[0462]** The display module 5451, the audio output module 5452, the camera 5421, the user input modules 5430/5431, 5432, the mike 5422, and the interface 5470 can be arranged in the terminal body, mainly the front case 5401.

**[0463]** The display module 5451 occupies most of a main surface of the front case 5401. The audio output module 5451 and the camera 5421 are arranged at a region adjacent to one of both ends of the display module 5451, and the user input module 5431 and the mike 5422 are arranged at a region adjacent to the end of the display module 5451. The user input module 5432 and the interface module 5470 can be arranged at sides of the front case 5401 and the rear case 5402.

**[0464]** The user input module 5430 is manipulated to receive a command for controlling the operation of the mobile terminal 5400, and can include a plurality of manipulation units 5431 and 5432. The manipulation units 5431 and 5432 may be referred to as a manipulation portion, and can be used for all manners only if the user can manipulate them with a tactile feeling (tactile manner).

**[0465]** Contents input by the first and second manipulation units 5431 and 5432 can be set variously. For example, the first manipulation unit 5431 can receive a command such as start, end, scroll, etc., and the second manipulation unit 5432 can receive a command such as size control of the audio output from the audio output module 5452 or conversion of the display module 5451 to a touch recognition mode.

**[0466]** FIG. 56 is a rear perspective view illustrating a



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mobile terminal according to one embodiment of the present invention. Hereinafter, the rear perspective view of the mobile terminal according to one embodiment of the present invention will be described with reference to FIG. 56.

**[0467]** FIG. 56 is a rear perspective view of the mobile terminal illustrated in FIG. 55.

**[0468]** As illustrated in FIG. 56, the rear surface of the terminal body, that is, the rear case 5402 can additionally be provided with a camera 5421'. The camera 5421' has a picture-taking direction substantially contrary to that of the camera 5421 (see FIG. 55), and could be a camera having pixels different from those of the camera 5421.

**[0469]** For example, it is preferable that the camera 5421 takes a face of the user during video communication and thus has low pixels to transmit the taken face to the other user without any problem, and the camera 5421' has high pixels as it takes a general subject and is not likely to immediately transmit the taken subject to the user. The cameras 5421 and 5421' may be provided in the terminal body rotatably or to enable pop-up.

**[0470]** A flash 5423 and a mirror 5424 are additionally arranged to adjoin the camera 5421'. The flash 5423 emits light towards the subject if the camera 5421' takes the subject. The mirror 5424 allows the user to look his (her) face if the user desires to take himself(herself) (self picture-taking) using the camera 5421'.

**[0471]** An audio output module 5452' may be arranged on the rear surface of the terminal body. The audio output module 5452' may implement a stereo function together with the audio output module 5452 (see FIG. 55), and may be used to implement a speaker phone mode during communication.

**[0472]** In addition to an antenna for communication, an antenna 5416 for receiving a broadcast signal may additionally arranged at a side of the terminal body. The antenna 5416 constituting a part of the broadcast receiving module 5411 (see FIG. 54) may be arranged to be ejected from the terminal body.

**[0473]** The terminal body is provided with the power supply module 5490 that supplies the power to the mobile terminal 5400. The power supply module 5490 may be built in the terminal body, or may be configured detachably from the outside of the terminal body.

**[0474]** The rear case 5402 may additionally be provided with a touch pad 5435 for sensing touch. The touch pad 5435 may be configured in a light-transmitting type like the display module 5451. In this case, if the display module 5451 is configured to output visual information from both sides, the visual information may be recognized even through the touch pad 5435. The information output from both sides may be controlled by the touch pad 5435. Unlike this, the touch pad 5435 may additionally be provided with a display, whereby the touch screen may be arranged on the rear case 5402.

**[0475]** FIG. 57 is a diagram illustrating a screen of a mobile terminal, in which a monitoring indicator according to one embodiment of the present invention is displayed. Hereinafter, the screen of the mobile terminal, in which a monitoring indicator according to one embodiment of the present invention is displayed, will be described with reference to FIG. 57.

**[0476]** The description of the same reference numerals as those of FIG. 55 will be omitted in FIG. 57.

**[0477]** As illustrated in FIG. 57, the display module 5451 is designed to output a monitoring indicator 5701 together with applications that can be used by the user. Since the same description as that made with reference to FIG. 1 to FIG. 53 can be applied to the monitoring indicator 5701, the repeated description will be omitted. Accordingly, it is advantageous in that the user can more easily identify the current state of the mobile terminal which the user uses currently.

**[0478]** FIG. 58 is a diagram illustrating a screen of a mobile terminal, in which a monitoring indicator according to another embodiment of the present invention is displayed. Hereinafter, the screen of the mobile terminal, in which a monitoring indicator according to another embodiment of the present invention is displayed, will be described with reference to FIG. 58.

**[0479]** The description of the same reference numerals as those of FIG. 55 will be omitted in FIG. 58.

**[0480]** As illustrated in FIG. 58, the display module 5451 is designed to output a monitoring indicator 5801 together with applications that can be used by the user. As compared with FIG. 57, the monitoring indicator 5801 is characterized in that the number of applications currently in service, the number of contents currently in service, and the memory use state are displayed in more detail.

**[0481]** Moreover, since the same description as that made with reference to FIG. 1 to FIG. 53 can be applied to the monitoring indicator 5801, the repeated description will be omitted. Accordingly, it is advantageous in that the user can identify and access the applications and contents currently in service, and the memory state more easily.

**[0482]** FIG. 59 is a diagram illustrating a first screen that displays monitoring services according to one embodiment of the present invention, FIG. 60 is a diagram illustrating a second screen that displays monitoring services according to one embodiment of the present invention, FIG. 61 is a diagram illustrating a third screen that displays monitoring services according to one embodiment of the present invention, and FIG. 62 is a diagram illustrating a fourth screen that displays monitoring services according to one embodiment of the present invention. Hereinafter, a process of a monitoring service according to one embodiment of the present invention will be described with reference to FIG. 59 to FIG. 62.

**[0483]** First of all, as illustrated in FIG. 59, a multifunctional display device 5900 (for example, network TV) according to one embodiment of the present invention serves to identify a first zone 5910 displaying a menu screen from a second zone 5920 displaying a black screen. In particular, the multifunctional display device



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can be designed such that its function is performed by the aforementioned OSD generator.

**[0484]** Moreover, the first zone 5910 displaying a menu screen includes a plurality of items that can be selected. For example, the first zone 5910 includes a first item 5911 related to applications, a second item 5912 related to search, and a third item 5913 related to TV settings.

**[0485]** If the first item 5911 is selected, the screen illustrated in FIG. 59 is switched to the screen illustrated in FIG. 60. In other words, as illustrated in FIG. 60, a multifunctional display device 6000 according to one embodiment of the present invention serves to identify a first zone 6010 displaying applications from a second zone 6020 displaying a black screen. In particular, the multifunctional display device can be designed such that its function is performed by the aforementioned OSD generator.

**[0486]** Also, the first zone 6010 that displays applications includes a plurality of items that can be selected. For example, the first zone 6010 includes a first item 6011 related to monitoring services, a second item 6012 related to an application list, and a third item 6013 related to application management. In particular, the first item 6011 corresponds to the aforementioned monitoring indicator, and if the first item 6011 is selected, detailed information related to application currently in service is displayed.

**[0487]** If the first item 6011 is selected, the screen illustrated in FIG. 60 is switched to the screen illustrated in FIG. 61. In other words, as illustrated in FIG. 61, a multifunctional display device 6100 according to one embodiment of the present invention serves to identify a first zone 6110 displaying monitoring services from a second zone 6120 displaying a black screen. In particular, the multifunctional display device can be designed such that its function is performed by the aforementioned OSD generator.

**[0488]** Also, the first zone 6110 that displays monitoring services includes a plurality of items that can be selected. For example, the first zone 6110 includes status information 6111 of a first application which is running, and status information 6112 of a second application which is running. The status information includes information on a total of hours for which application is executed, and information on capacity of a memory which is used.

**[0489]** If the first item 6111 is selected, the screen illustrated in FIG. 61 is switched to the screen illustrated in FIG. 62. In other words, as illustrated in FIG. 62, a multifunctional display device 6200 according to one embodiment of the present invention serves to identify a first zone 6210 identifying whether to stop a specific application from a second zone 6220 displaying a black screen. In particular, the multifunctional display device can be designed such that its function is performed by the aforementioned OSD generator.

**[0490]** Accordingly, if "YES" is selected from the first zone 6210 to stop a specific application, the specific application currently in service is automatically stopped. The aforementioned description in respect of FIG. 59 to FIG. 62 may be achieved with reference to FIG. 1 to FIG. 58. In this case, it is advantageous in that the user can more quickly identify and stop the application currently in service.

**[0491]** Various modifications can be made in the aforementioned embodiments applied to the network TV and the method for controlling the network TV. For such various modifications, all or some of the embodiments may selectively be configured in combination.

**[0492]** The method for controlling the network TV according to one or more embodiments described herein can be implemented in a recording medium, which can be read by a processor provided in the network TV, as a code that can be read by the processor. The recording medium that can be read by the processor includes all kinds of recording media in which data that can be read by the processor are stored.

**[0493]** Examples of the recording medium include ROM, RAM, CD-ROM, magnetic tape, floppy disk, and optical data memory. Also, another example of the recording medium may be implemented in a type of carrier wave such as transmission through Internet. Also, the recording medium that can be read by the processor may be distributed in a computer system connected thereto through the network, whereby codes that can be read by the processor can be stored and implemented in a distributive mode.

**[0494]** One or more embodiments described herein relate to a method for processing data for monitoring service in a network TV and the network TV.

**[0495]** One or more embodiments also provide a network TV and a method for controlling the network TV, which can improve convenience in use of a user.

**[0496]** One or more other embodiments provide a network TV and a method for controlling the network TV, which can provide various user interfaces.

**[0497]** One or more other embodiments provide a solution for allowing a user to use various applications of a network TV under a proper consumption condition or optimized use condition.

**[0498]** One or more other embodiments provide a network TV and a method for controlling the network TV, in which even though a plurality of applications are executed in the network TV, a user can reduce unwanted consumption by identifying execution information on each application, and as the use condition that can allow the user to use the network TV under the optimized system is provided to the user, convenience of the user can be improved.

**[0499]** In accordance with one embodiment, a method for controlling a network TV for processing data for a monitoring service comprises receiving broadcast data through a broadcast network, the broadcast data including audio data and video data, demultiplexing the audio data and the video data of the received broadcast data, decoding the demultiplexed audio data, decoding the demultiplexed video data, receiving at least one or more



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contents through an Internet network, controlling the received contents to be executed in a background type, collecting state information on the at least one or more contents executed in the background type, generating a monitoring indicator corresponding to the collected state information, and displaying the generated monitoring indicator in a second zone of the network TV while displaying the decoded video data in a first zone of the network TV.

**[0500]** In accordance with one embodiment,, a network TV for processing data for a monitoring service includes a broadcast interface receiving broadcast data through a broadcast network, the broadcast data including audio data and video data, a demultiplexer demultiplexing the audio data and the video data of the received broadcast data, an audio decoder decoding the demultiplexed audio data, a video decoder decoding the demultiplexed video data, an Internet interface receiving at least one or more contents through an Internet network, a first controller controlling the received contents to be executed in a background type, a collector collecting state information on the at least one or more contents executed in the background type, a generator generating a monitoring indicator corresponding to the collected state information, a second controller controlling a display module to display the decoded video data in a first zone of the network TV and display the generated monitoring indicator in a second zone of the network TV, and a speaker outputting the decoded audio data.

**[0501]** In accordance with one embodiment,, states of various contents operated on the network TV can easily be checked.

**[0502]** According to another embodiment, a solution for an OSD that can monitor states of various contents at the same time while minimizing interruption on a general broadcast screen.

**[0503]** According to another embodiment, unnecessary cost caused by contents operated as background although not recognized by the user can be prevented from being consumed, and throughput of the network TV can be prevented from being deteriorated temporarily.

**[0504]** According to another embodiment, a multifunctional display device, comprises a display; a storage device to store data; a tuner to receive a broadcast signal; a network interface to receive packet data; an input interface to receive signals from a wireless remote controller; and a processor to control display of first information that includes visual information and second information corresponding to display of monitoring information. The visual information and second information are displayed simultaneously, the monitoring information provides an indication of status of one or more applications executed at a same time the visual information is displayed, and the visual information corresponds to one of content provider, broadcast signal, or website information.

**[0505]** The second information may include an icon, and the monitoring information is displayed when the icon is selected. The detailed information may correspond to the status of the one or more applications is displayed when the icon is selected.

**[0506]** The icon may be selected by placing a cursor on the icon, selection of the icon causing the monitoring information to be automatically displayed. Alternatively, the icon may be selected based on receipt of a selection signal from the remote controller.

**[0507]** The monitoring information may be displayed on a different screen from the icon when the icon is selected, and a preview of the monitoring information may be displayed on a same screen as the icon when the icon is selected.

**[0508]** The status condition may correspond to a condition of a storage device used for execution of the one or more applications. The condition of the storage device may include a remaining storage capacity of the storage device. Also, a color of the second information may provide an indication of the remaining storage capacity of the storage device.

**[0509]** The second information is displayed in at least a first color when the storage capacity is above a threshold value and is displayed in at least a second color when the storage capacity is below the threshold value.

**[0510]** The status condition may also correspond to billing for execution of the one or more applications, or the status condition may correspond to a number of times the one or more applications have been executed.

**[0511]** The processor may also control display of an indicator for controlling an appearance of display of the second information, and the monitoring information may provide an indication of a number of the one or more applications being executed and an amount of remaining storage capacity. The first information and the monitoring information is displayed simultaneously.

**[0512]** In addition, the visual information includes a home screen which includes a broadcast area, an application area, and a contents area. Also, the processor may cause warning information to be displayed when a condition of the status requires automatic termination of execution of the one or more applications.

**[0513]** According to another embodiment, a multifunctional display device comprises: a display; a storage device to store data; a tuner to receive a broadcast signal; a network interface to receive packet data; an input interface to receive signals from a wireless remote controller; and a processor to control display of a first information area, a second information area, and a monitoring indicator. The first and second information areas and the monitoring indicator are simultaneously displayed on a same screen.

**[0514]** Also, when the monitoring indicator is selected, detailed information of monitoring information is displayed corresponding to the first and second information areas, the monitoring information indicating status and a number of applications currently executed. The first information area includes information received through the network interface and the second information area includes information received through the tuner.



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**[0515]** According to another embodiment, an information management method comprises simultaneously displaying a first information area, a second information area, and a monitoring indicator on a same screen of a display device; and displaying detailed monitoring information when the monitoring indicator is selected, the detailed monitoring information corresponding to the first and second information areas and indicating status and a number of applications currently executed, wherein the first information area includes information received through a network interface and the second information area includes information received through a tuner of the display device.

**[0516]** According to another embodiment, a computer-readable multifunctional apparatus for monitoring status of a number of applications comprises a display; storage device to store data; a tuner to receive a broadcast signal; a network interface to receive packet data; an input interface to receive signals from a wireless remote controller; a processor to control display of a first information area generated by an on-screen display (OSD) generator and a second information area that includes at least one category, wherein the first information and second information areas are simultaneously displayed on a same screen.

**[0517]** When a category is selected, detailed information is displayed, the detailed information including a condition of a storage device used for execution of one or more applications currently being executed, and wherein the second information area is overlaid on the first information area.

**[0518]** The detailed information may further comprise information indicative of a running time for execution of the one or more applications, and the processor may control display of a monitoring indicator which is at least partially transparent. Moreover, the condition of the storage device includes a storage capacity of the storage device used for execution of the one or more applications.

**[0519]** Herein, the suffixes 'module' and 'unit' for the elements used in the following description are given or used in common by considering facilitation in writing this disclosure only but fail to have meanings or roles discriminated from each other.

**[0520]** A display device as described in this specification may be an intelligent display device additionally provided with, for example, a computer support function in addition to a broadcasting receiving function. The display device can be provided with a more convenient interface such as a manual input unit, a touch screen and a spatial remote controller, in accordance with additional Internet function in addition to a basic broadcasting receiving function.

**[0521]** Also, the device enables e-mailing, web browsing, banking or games by accessing Internet or computer in accordance with the support of wire or wireless Internet function. For these various functions, a standardized general-purpose operating system (OS) can be used. Accordingly, since the display device disclosed herein can freely be provided with or delete various applications on a general-purpose OS kernel, it may perform user-friendly various functions. More detailed examples of the display device include network TV, HBBTV, smart TV. The display device may be applied to a smart phone as the case may be. Also, the term, "contents" disclosed herein is the general term for digital information, which is provided through various wire and wireless communication networks and can be used through a display device, and its contents.

**[0522]** 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. The features of any one embodiment may be combined with the features of one or more other embodiments.

**[0523]** 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 multifunctional display device, comprising:

   a display;
   a storage device to store data;
   a tuner to tune to a broadcast signal;
   a network interface to receive packet data;
   an input interface to receive input signals from a wireless remote controller;
   and
   a processor to control display of first information that includes visual information and second information that corresponds to monitoring information, wherein the first information and second information are displayed simultaneously, wherein the monitoring information provides status information of one or more applications ex-



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ecuted at a same time as the visual information is displayed, wherein the visual information is received from a content provider or corresponds to one of a broadcast signal, wallpaper, or website information.

**2.** The device of claim 1, wherein:

the second information includes an icon, and the monitoring information is displayed when the icon is selected.

**3.** The device of claim 2, wherein detailed information corresponding to the status information of the one or more applications is displayed when the icon is selected.

**4.** The device of claim 2, wherein the monitoring information is displayed on a different screen area from a screen area the icon is displayed on.

**5.** The device of claim 1, wherein the status information corresponds to a condition of the storage device during execution of the one or more applications.

**6.** The device of claim 5, wherein the condition of the storage device includes a remaining storage capacity of the storage device.

**7.** The device of claim 6, wherein the processor controls display of warning information indicating the termination of an application when the storage capacity of storage device reaches a predetermined value.

**8.** The device of claim 1, wherein the status information corresponds to a number of times the one or more applications have been executed.

**9.** The device of claim 1, wherein the monitoring information provides an indication of a number of the one or more applications being executed and an amount of remaining storage capacity of the storage device.

**10.** The device of claim 1, wherein the one or more application comprises graphical data designed to help a user to perform a specific function in the multifunctional display device and is received via the network interface, and wherein the storage device is involved during execution of the one or more application.

**11.** A computer-readable multifunctional apparatus for monitoring a status of a number of applications, comprising:

a display;
a storage device to store data;
a tuner to tune to a broadcast signal, wherein the broadcast signal is comprised of at least one of video data, audio data or supplemental data;
a network interface to receive packet data, wherein the packet data is received from at least one of a service provider, content provider or an external device;
an input interface to receive input signals from a wireless remote controller;
and
a processor to control display of a first information area and a second information area that includes at least one item, wherein the first information area and the second information area are displayed on a same screen, and video data displayed in the first information area is either received from the tuner or generated by an OSD generator, further wherein:

when an item of the second information area is selected, a detailed information window is displayed listing at least one option corresponding to at least one application, the option indicating a condition of the storage device during execution of the at least one application, the detailed information window being superimposed over the first information area.

**12.** The apparatus of claim 11, wherein the at least one option further comprises additional information indicative of a running time for execution of the corresponding at least one application.

**13.** The apparatus of claim 12, wherein the processor further controls a specific application to stop running and removes a specific option from the detailed information window when the specific option corresponding to the specific application is selected from the detailed information window.

**14.** The apparatus of claim 11, wherein the condition of the storage device is changed depending on what applications are running.

**15.** The apparatus of claim 14, wherein the at least one application comprises graphical data designed to help a user to perform a specific function in the computer-readable multifunctional apparatus and is received via the network interface, and wherein the storage device is involved during execution of the at least one application.

**16.** The apparatus of claim 12, wherein the processor controls the detailed information window to rearrange an order of the at least one option corresponding to at least one application according to the condition of the storage device.



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FIG. 1

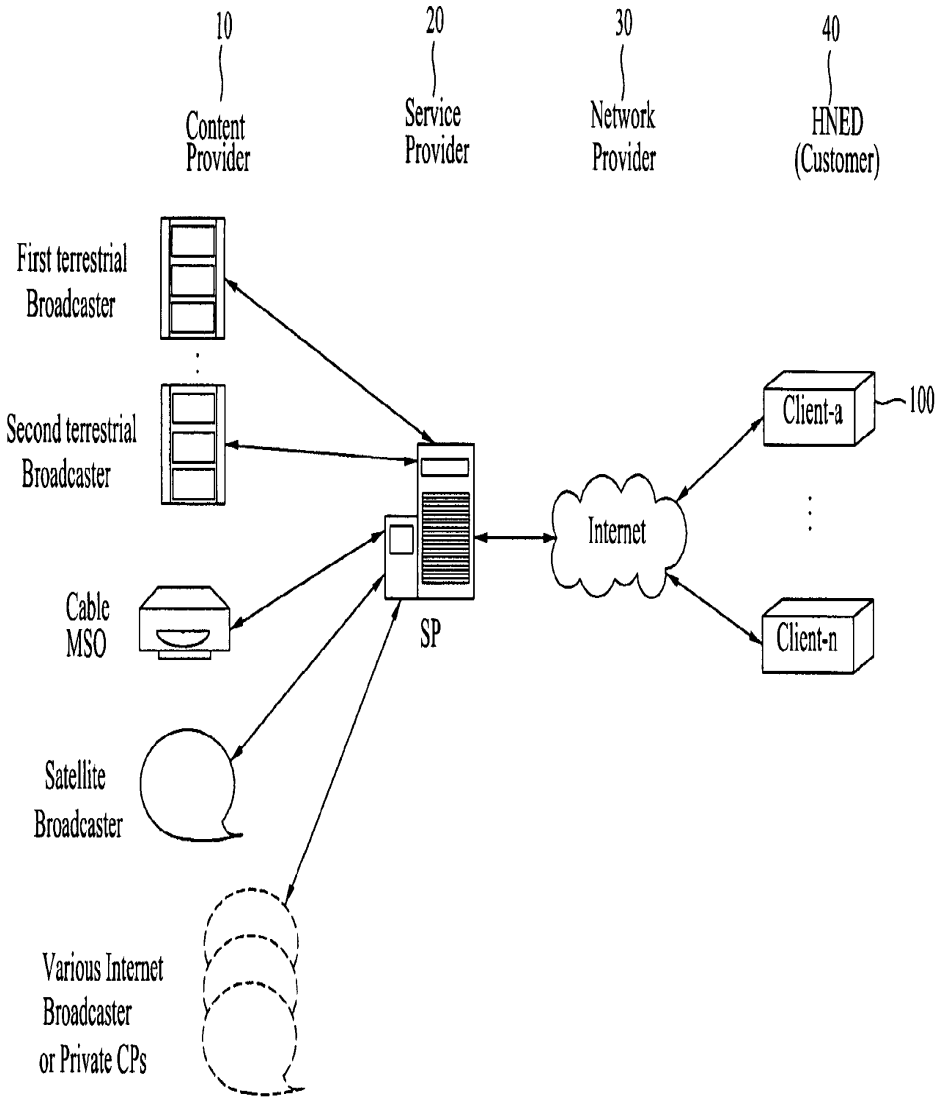
10
Content Provider
20
Service Provider
30
Network Provider
40
HNED (Customer)
First terrestrial Broadcaster
Second terrestrial Broadcaster
Cable MSO
Satellite Broadcaster
Various Internet Broadcaster or Private CPs
SP
Internet
Client-a
100
Client-n

FIG. 2

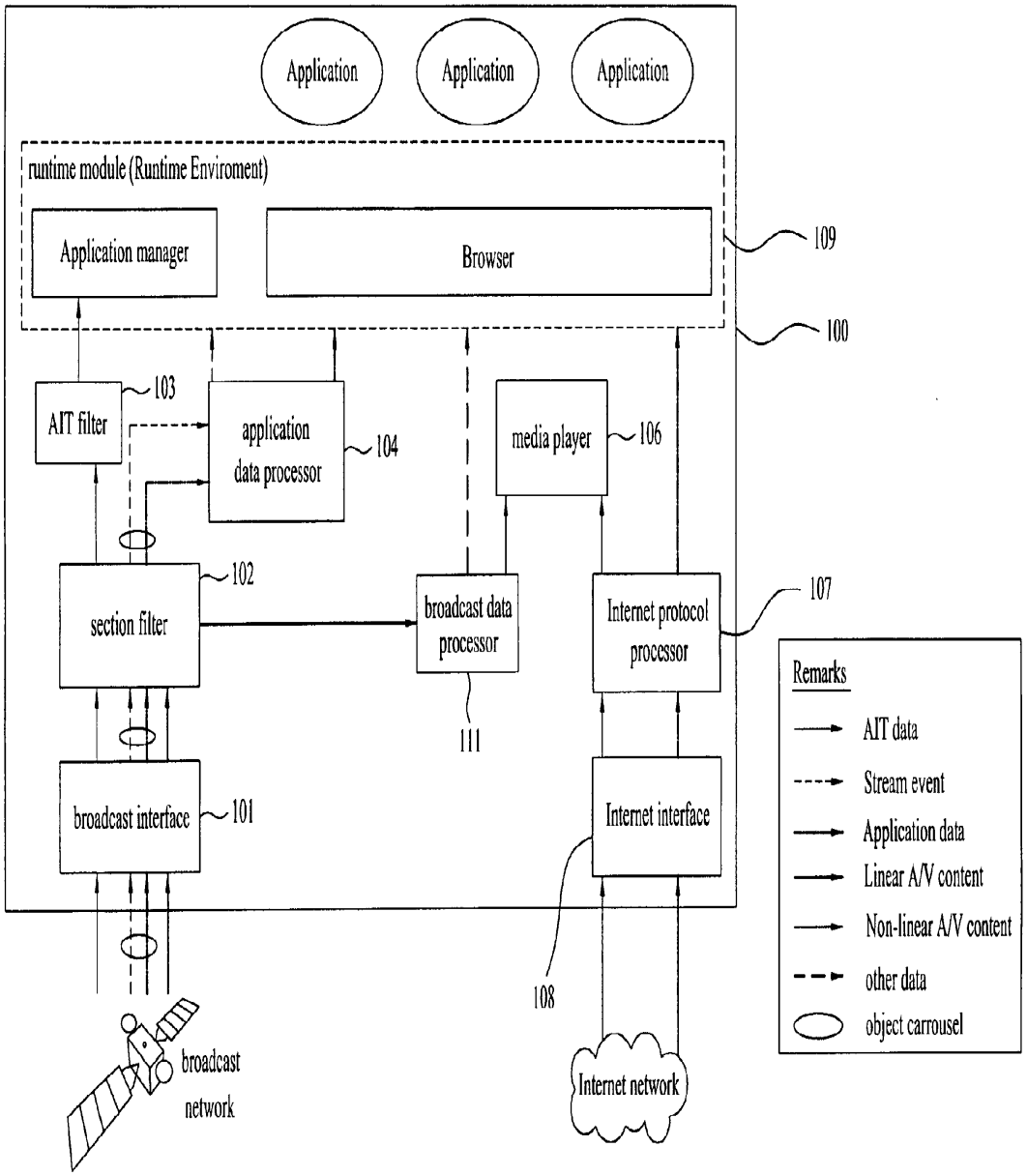
Application
Application
Application
runtime module (Runtime Enviroment)
Application manager
Browser
109
100
AIT filter
103
application data processor
104
media player
106
section filter
102
broadcast data processor
111
Internet protocol processor
107
broadcast interface
101
Internet interface
108
broadcast network
Internet network
Remarks
AIT data
Stream event
Application data
Linear A/V content
Non-linear A/V content
other data
object carrousel

FIG. 3

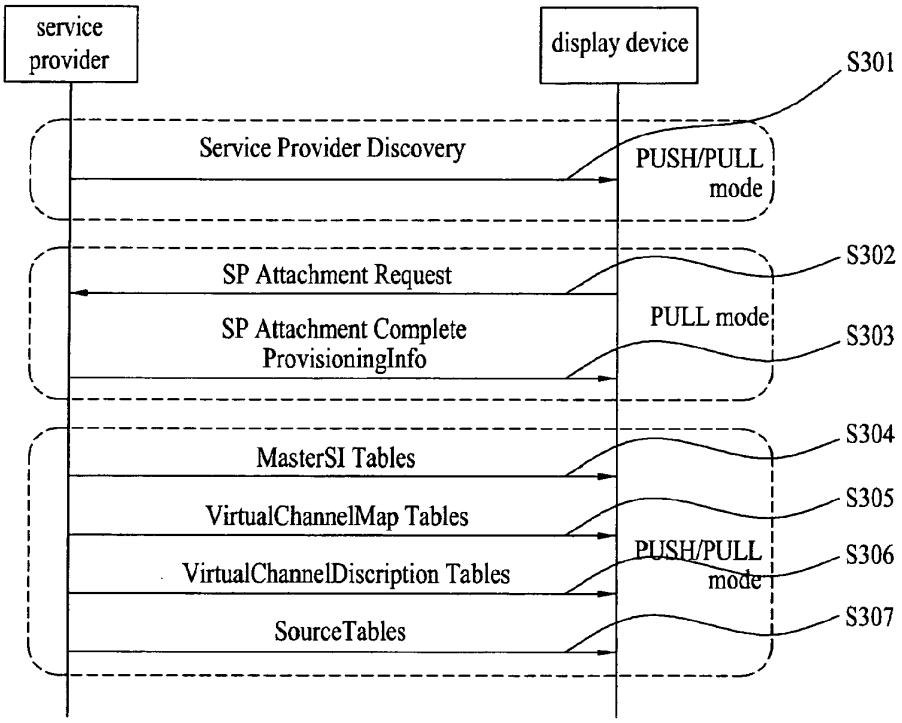




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FIG. 4

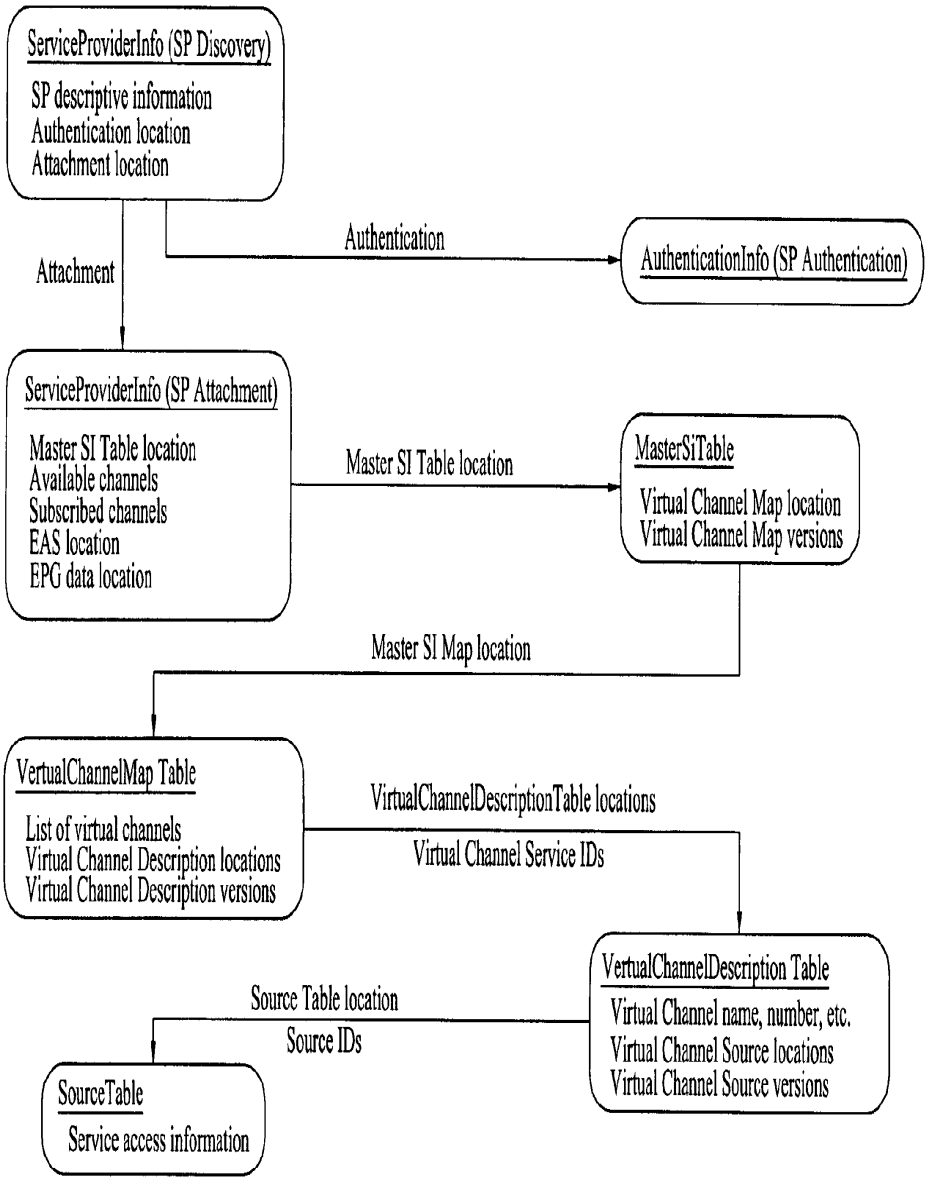




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FIG. 5

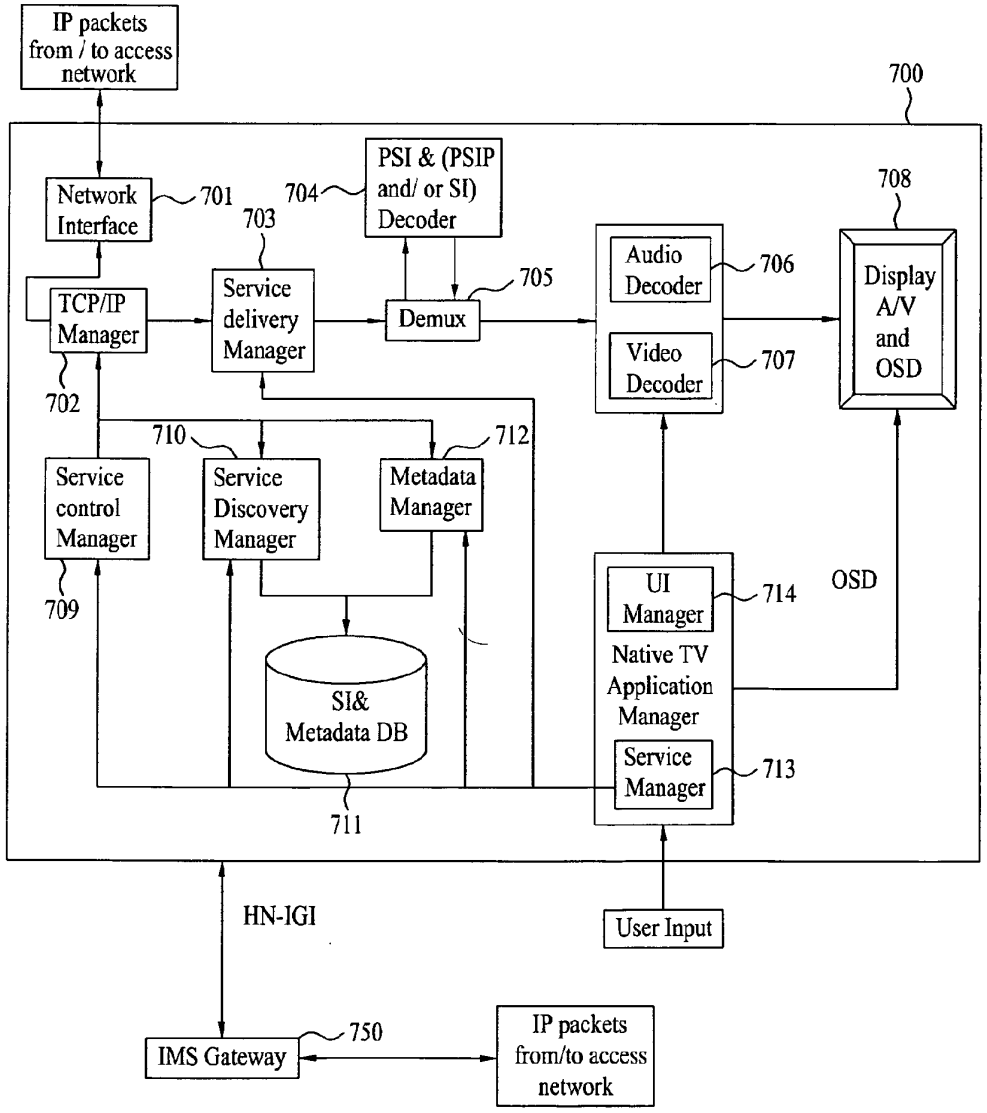
IP packets from / to access network
700
Network Interface
701
PSI & (PSIP and/ or SI) Decoder
704
703
708
Audio Decoder
706
Display A/V and OSD
TCP/IP Manager
Service delivery Manager
Demux
705
Video Decoder
707
702
710
712
Service control Manager
Service Discovery Manager
Metadata Manager
UI Manager
714
OSD
709
SI& Metadata DB
Native TV Application Manager
Service Manager
713
711
HN-IGI
User Input
IMS Gateway
750
IP packets from/to access network

FIG. 6

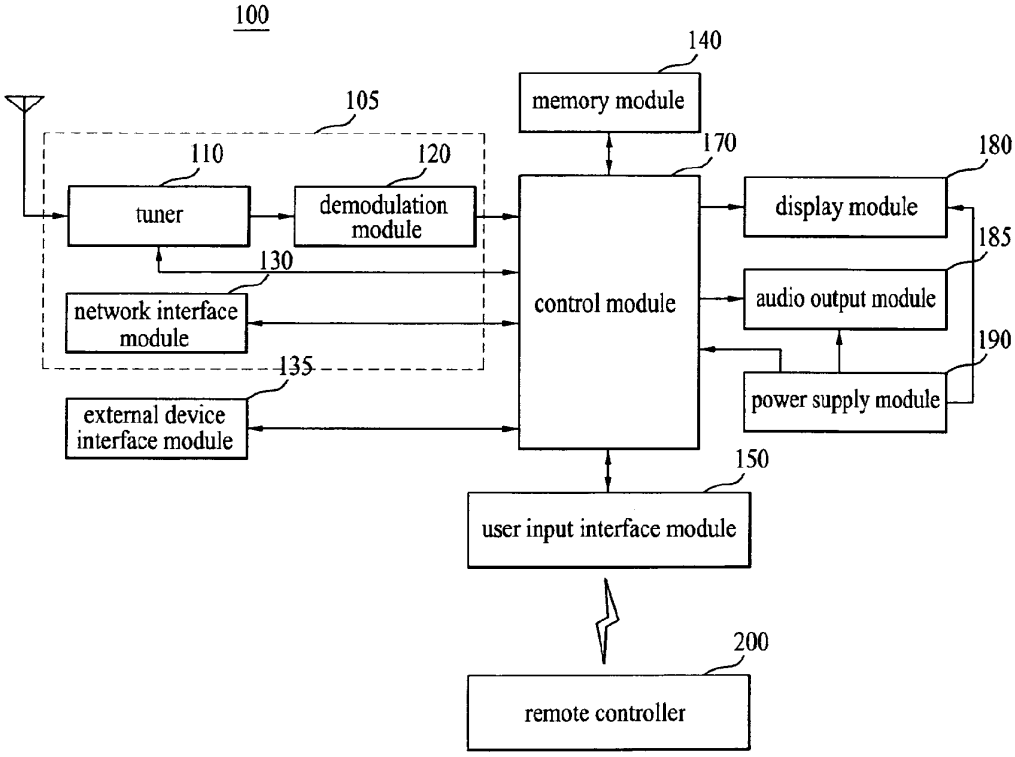
100
140
memory module
105
110
120
170
180
tuner
demodulation module
display module
185
130
network interface module
control module
audio output module
190
135
external device interface module
power supply module
150
user input interface module
200
remote controller

FIG. 7

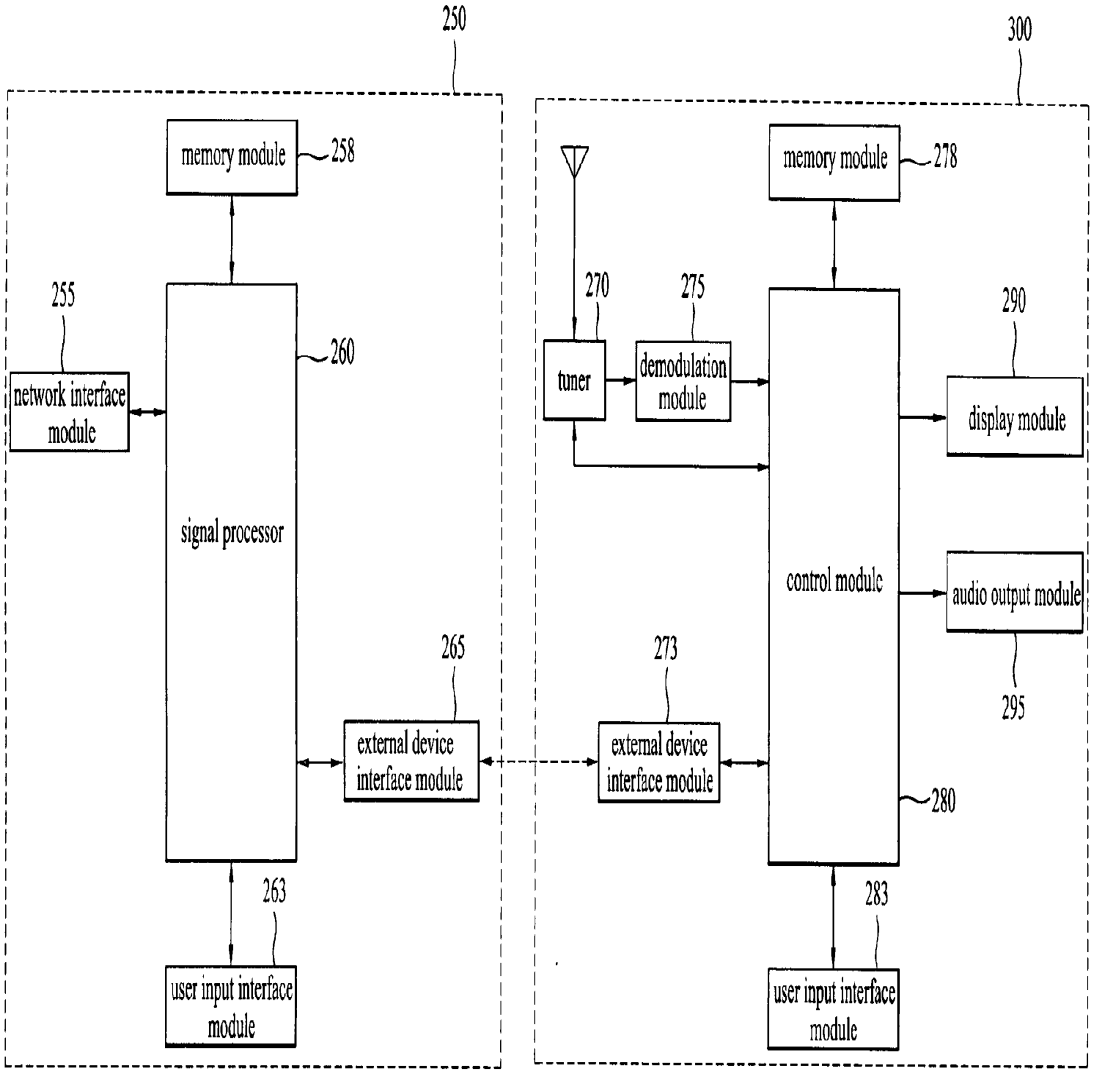




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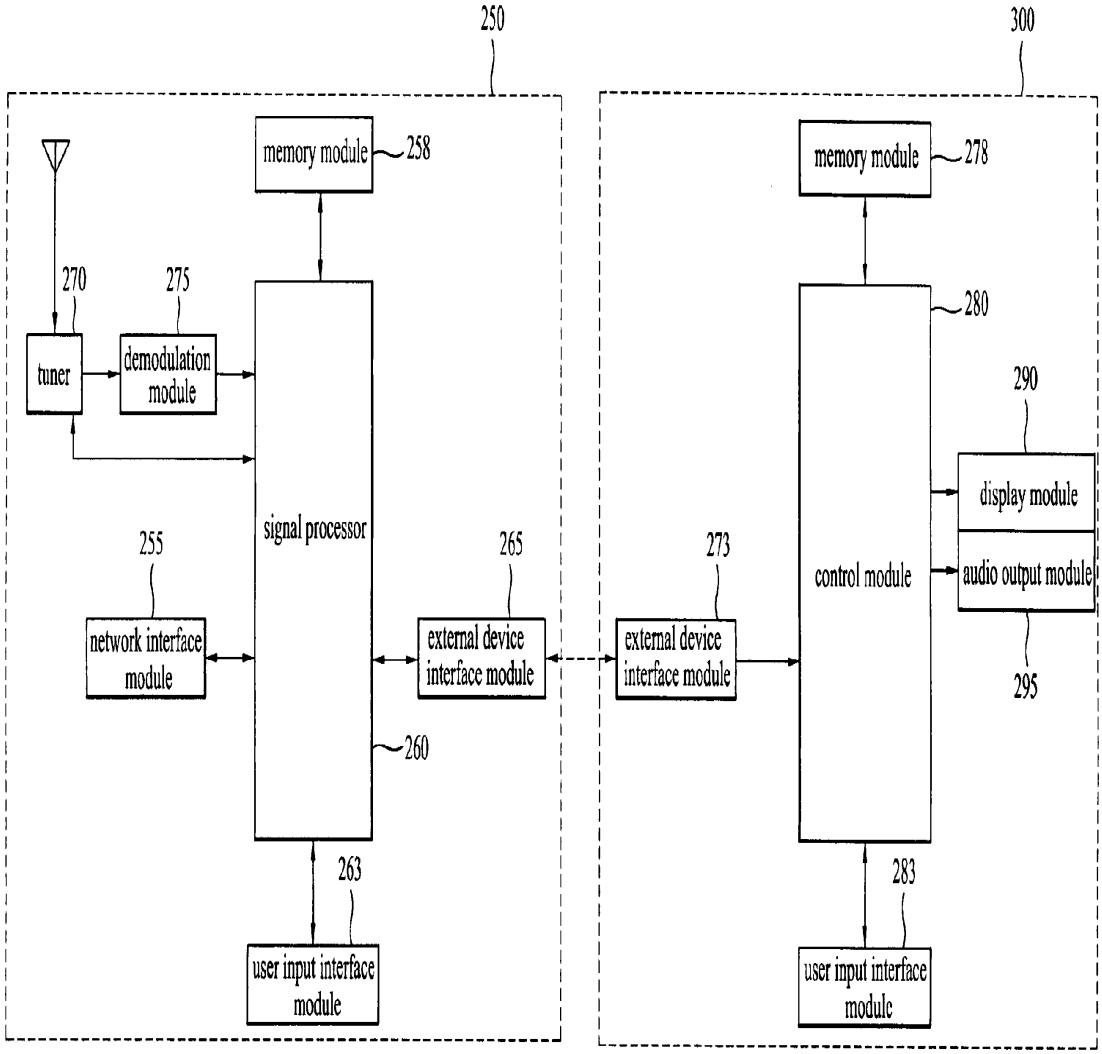
FIG. 8



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