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(54) Title: AUTOMATIC SCENE REPLACEMENT TECHNIQUE

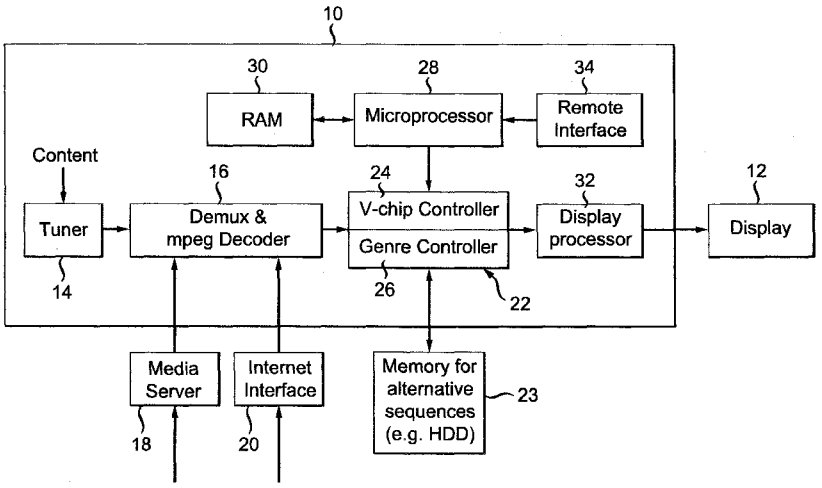

FIG. 1

(57) Abstract: A method for automatic scene replacement in content commences by detecting for at least one scene in the content whether objectionable subject matter is present according to at least one received criterion identifying objectionable subject matter. If a scene having objectionable subject matter is detected, that scene is replaced with an alternative scene having subject matter not deemed objectionable according to the at least one criteria.

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AUTOMATIC SCENE REPLACEMENT TECHNIQUE

TECHNICAL FIELD

This invention relates to a technique for replacing at least a portion (e.g., a scene) in content, such as a movie or television program, with an alternative scene.

BACKGROUND ART

As the number of different content distribution channels has increased so has the proliferation of content (e.g., movies and television programs) available to viewers. Not all content is appropriate for all viewers. For example, movies intended for adult audiences often have one or more objectionable scenes, because of violence, language and/or sexual content, rendering such scenes inappropriate for children under a certain age. Content providers seeking to distribute movies originally intended for adults to a broader audience that includes underage children will often delete or replace such objectionable scenes Similarly, content providers will modify content deemed objectionable to certain different societies and those holding certain religious beliefs by replacing objectionable scenes with scenes acceptable to such audiences.

Presently, content providers often maintain two versions of the same content (e.g., a television show or movie under a particular title) , one for restricted distribution (e.g., adults) and the other for unrestricted distribution. To appeal to a broad audience, content distributors typically will distribute both the restricted and unrestricted versions of the same content contemporaneously, thus requiring two different channels, each carrying a separate one of the two content versions. The need for additional channels increases transmission bandwidth and consequently incurs higher costs.

As an alternative to distributing separate versions of the same content, some content providers take advantage of V-chip technology in display devices to suppress viewing of the content entirely, or at least to suppress viewing of objectionable scenes. This "all or nothing" approach" regarding content suppression incurs the risk that a certain audience segment will not select such content for viewing knowing that they cannot view the content in its original form.

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Thus, a need exists for a technique for accomplishing automatic replacement of objectionable scenes for viewing by restricted audiences.

BRIEF SUMMARY

Briefly, in accordance with an aspect of the present principles, a method for automatic scene replacement in content commences by detecting for at least one scene in the content whether objectionable subject matter is present according to at least one received criterion identifying objectionable subject matter. If a scene having objectionable subject matter is detected, that scene is replaced with an alternative scene having subject matter not deemed objectionable according to the at least one criteria.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 depicts a block schematic diagram of the combination of a set-top box and a display device for practicing the automatic scene replacement technique of the present principles;

FIGURE 2 depicts a graphical representation of content playout over time indicating instances of automatic scene replacement in accordance with the present principles;

FIGURE 3 depicts a graphical representation of content playout over time indicating instances of automatic scene replacement for three different genre ratings in accordance with the present principles;

FIGURE 4 depicts a three-dimensional graphical representation of content playout over time indicating instances of automatic scene replacement taking into account age ratings and genre ratings in accordance with the present principles;

FIGURE 5 depicts in flow-chart form the steps of a process executed by the display device of FIGURE 1 for accomplishing automatic scene replacement in accordance with the present principles; and

FIGURE 6 depicts transmission of content and replacement content scenes over time in accordance with the present principles.

DETAILED DESCRIPTION

FIGURE 1 depicts a block schematic of a set-top box 10 that selects content for a display on a television display device 12. In accordance with the present principles, the set-top box 10 (or a television set that includes the functionality of the set-top box) accomplishes automatic replacement of objectionable scenes with alternative scenes based on an input indicating at least one criterion for identifying such objectionable scenes. As discussed in detail below, the set-top box 10 accomplishes such scene replacement using well-known V-chip technology now mandatory in present day television sets and set-top boxes to restrict viewing based on age ratings. Very often, only a short scene in a movie or television program violates a particular age rating, thus restricting viewing of the entire movie by a general audience. The automatic scene replacement of the present principles advantageously allow a content provider to distribute a single copy of content (e.g., a movie or television program) knowing that scenes deemed objectionable for certain audiences will undergo replacement with alternative scenes to render the content suitable for viewing by such restricted audiences.

For purposes of discussion the term "scene," and as used throughout, refers to a portion of the content. Thus, a scene can include a video sequence, an audio sequence, and a portion of data (e.g., text) or a combination of any of these items.

Traditional V-chip technology uses the vertical blanking interval in a television signal to transmit content ratings from a content provider to specify viewing restrictions. The ANSI-CEA-766-C standard at page 15 provides the following with regard to transmission of such content ratings:

> (c) Transmission Format
>
> (1) Analog television program rating information shall be transmitted on line 21 of field 2 of the vertical blanking interval of television signals, in accordance with § 73.682(a) (22) of this chapter.
>
> (2) Digital television program rating information shall be transmitted in digital television signals in accordance with § 73.682(d) of this chapter.
>
> (d) Operation
>
> (1) Analog television receivers will receive program ratings transmitted pursuant to EIA-744: "Transport of Content Advisory Information Using Extended Data Service (XDS)" (incorporated by reference, see § 15.38) and EIA-608: "Recommended Practice for Line 21 Data Service" (incorporated by reference, see § 15.38). Blocking

of programming shall occur when a program rating is received that meets the pre-determined user requirements.

(2) Digital television receivers shall react in a similar manner as analog televisions when programmed to block specific rating categories. Effective March 15, 2006, digital television receivers will receive program rating descriptors transmitted pursuant to industry standard EIA/CEA -766-A "U.S. and Canadian Region Rating Tables (RRT) and Content Advisory Descriptors for Transport of Content Advisory Information using ATSC A/65-A Program and System Information Protocol (PSIP)," 2001 (incorporated by reference, see §15.38). Blocking of programs shall occur when a program rating is received that meets the pre-determined user requirements. Digital television receivers shall be able to respond to changes in the content advisory rating system.

Referring to FIG. 1, the set-top 10 includes a tuner 14 for tuning content from a content source (not shown). The content source supplies content to the set-top box 10 via either a wired connection (e.g., a cable television network) or a wireless connection, (e.g., a satellite downlink). In the case of compressed content, e.g., content encoded via the MPEG encoding standard, such content will undergo demultiplexing and decoding at a decoder 16. In addition to receiving content from the tuner 14, the decoder 16 can also receive content from a media server 18 that supplies content from a home network (not shown). The decoder 16 can also receive content from the Internet via an internet interface 20.

The set-top box 10 includes a content restriction block 22 that includes both a V-chip content controller 24 and a genre controller 26. The V-chip controller 24 embodies well-known V-chip technology to identify an age rating of the content. In accordance with an aspect of the present principles, the same technique used to specify the content rating could also serve to identify specific portions of the content (e.g., scenes) containing objectionable subject matter based, taking into account the content rating transmitted with the content, as well as user input specifying at least one criteria input indicating at least one criteria for identifying objectionable subject matter.

The V-chip controller 24 or the like of the content restriction block 22 blocks those portions of the content (e.g., the scene or scenes) having a content rating in violation of a user-specified age rating input to the set-top box 10 at the outset of operation as discussed in greater detail with respect to FIG. 5. In place of the scenes blocked because of objectionable subject matter violating the user-specified age rating, the content restriction block 22 will substitute alternative scenes (e.g., scenes not having the objectionable subject matter). The V-chip controller obtains such alternate scenes from a memory 23. In practice, the memory 23

could comprise a hard-disk drive located within, or separate from, the set-top box 10, or a flash memory.

The content restriction block 22 also includes a genre controller 26, which operates in a manner similar to the V-chip controller 24, to block objectionable content, based on a genre rating input by a user. In place of scenes deemed objectionable based on the genre rating, the genre controller 26 will substitute alternative scenes stored in the memory 23. To implement the genre-rating feature of the present principles, some of the reserved bits in the Regional Ratings Table (RRT) associated with V-Chip technology or reserved bits in the Program Specific Information Protocol (PSIP) sent to the set-top box 10 to build a program guide could serve to transmit the genre of the program. Alternatively, the PSIP information received by the set-top box 10 could include an additional table containing genre information. Further, the genre controller 26 could analyze the textual description of the program in the program guide established from the PSIP information to determine the genre of the content. Alternatively, the genre controller 26 could obtain genre information for the particular from the Internet (Hybrid Broadcast Broadband TV (HBBTV), or the program provider or an external database, (all not shown.).

To identify scenes objectionable scenes based on genre, a content provider could identify scenes having objectionable subject matter based on genre using V-Chip technology. Such information would accompany information provided by the content provider identifying objectionable scenes based on content rating also using V-Chip technology. Alternatively, the content provider could supply metadata to the set-top box 10 to identify objectionable scenes based on age and genre ratings. Such metadata could appear within the content itself or the content provider could supply such metadata separately. Other mechanisms exist for identifying objectionable scenes based on age and genre rating and for supplying such information to the set-top box to enable automatic scene replacement based on the present principles.

The set-top box 10 of FIG. 1 further includes a microprocessor 28 for executing program instructions stored in a Random Access Memory (RAM) 30 to control the set-top box 10 functionality, and in particular, the functionality of the content restriction block 22. Although the content restriction block 22 appears separate from the microprocessor 28 of FIG. 1, the microprocessor could subsume the functions of the content restriction block. The microprocessor 28 receives signals from a remote interface 34 that interfaces with a user-operated remote control (not shown as a specific individual element but can be considered

part remote interface or interface system). Using the remote control, a user can enter commands to the set-top box 10 for processing by the microprocessor 28. In particular, the user can enter commands to change default content ratings and enter new ratings, including a new age and/or genre rating.

As discussed above, the memory 23 of FIG. 1 normally stores alternative scenes to enable automatic scene replacement as described. In practice, a content provider will typically provide such alternative scenes prior to or contemporaneously with delivery of the content. However, circumstances could arise such that the memory 23 lacks one or more needed scenes for replacement. Under such circumstances, the set-top 10 box will search alternative sources for such scenes. Such alternative sources can include the Internet (via the Internet interface 34) and the media server 18. Further, the set-top box 10 could receive alternative content from a broadcaster (not shown) via the tuner 14.

To appreciate the manner in which the set-top box 10 accomplishes automatic scene replacement as discussed above, refer to FIGURE 2, which depicts a graphical representation of content playout over time showing instances of automatic replacement of scenes having objectionable subject matter. In the example of FIG. 2, the scenes having objectionable subject matter constitute scenes which have a parental control level (i.e., an age rating) too high for the intended audience. The content undergoing playout in FIG. 2 appears in the form of a solid black line emanating from the ordinate at a parental control level "Older than 14 years." Here, for example, a user provides input to the set-top box 10 that an age rating of "Under 14 years of age" is the criterion for restricting content. In accordance with the present principles, when the content undergoing playout contains a scene not suited for children younger than 14, the set-top box 10 will automatically substitute an alternative scenes, obtained from the memory 23 of FIG. 1, for those scenes having objectionable subject matter, i.e., subject matter that violates the age rating for children under 14 years of age. The replaced scenes appear in FIG. 2 in the form of the two black line segments, each having a parental control level (age rating) well below that for children under 14 years of age.

In accordance with the present principles, audiences, including children above the age of 14, will see the original content. In contrast, audiences with children below the age of 14 will see the original movie, except each time a scene with objectionable subject matter would otherwise appear, the set-top box will 10 substitute a scene with acceptable subject matter, based on the user entered restriction criterion, in this case an age rating. In this way, the content provider can accommodate different audiences by sending just the original content

and a much shorter sequence of alternative scenes, including alternative audio, still pictures and/or text sequences. Using the automatic scene replacement technique of the present principles saves bandwidth since sending the alternative scenes requires only a small fraction of the total content bandwidth. Indeed, transmission of the alternative content could occur in advance of a scene needing replacement. Such alternative content would undergo storage (e.g., buffering) until needed. Using buffers for transmission of both the original content and alternative scenes eliminates the need for the original objectionable scene and the alternative scene for replacement to have the same length. Thus, the alternative scenes do not need to have the same length (in time), and a buffer system and/or a slow-down or speed-up the display speed will allow easily matching of scenes.

In accordance with another aspect of the present principles, the content restriction block 22 in the set-top box of FIG. 1 can employ V-chip technology for accomplishing automatic scene replacement based on based on criteria associated with content genre (mood, emphasis or subject matter for example) via the genre controller 26. In this way, the content restriction block 22 of FIG. 1 can automatically replace objectionable scenes based on an age rating as well as a genre rating. This implies that the content theme can readily accommodate different emphasis in certain scenes based on a genre rating and an age rating.

The genre emphasis could be:

Genre 1: Basic movie (no specific emphasizes)

Genre 2: Romantic emphasis

Genre 3: Action emphasis

FIGURE 3 depicts a graphical representation of content playout over time showing instances of automatic replacement of scenes that do not meet a user-specified genre rating (e.g., genre emphasis) as indicated along the graph ordinate. The solid line appearing at the bottom of the graph of FIG. 3 represents the original content undergoing playout with no specified genre rating. The short line segments aligned with the label "Romantic" on the graph ordinate of FIG. 3 correspond to scenes replaced in the original content with alternate scenes emphasizing romance in accordance with a user input genre rating emphasizing romance. Similarly, the short line segments aligned with the label "Action" on the graph ordinate of FIG. 3 correspond to scenes replaced in the original content with alternate scenes emphasizing action in accordance with a user input genre rating emphasizing action.

FIGURE 4 depicts a three-dimensional graphical representation of content playout over time, with the *x-axis* representing time, the *y-axis* representing a genre rating and the *z-*

axis representing age rating. A given piece of content will have a genre rating and an age rating and thus can appear anywhere in FIG. 4 as a solid line. For purposes of discussion, assume the content depicted by the solid line in FIG. 4 has an age rating suitable for adults and children age 12 and older and a genre rating emphasizing action. As seen in FIG. 4, a scene in the original content appearing during the interval between T1 and T2 having a genre rating emphasizing and a age rating for adults and children 16 years and older will undergo replacement with an age-appropriate scene emphasizing action. Thus, using V-chip technology, the set-top box 10 of FIG. 1 can accomplish automatic scene replacement for individual television sets. Further, the set-top box 10, can accomplish automatic scene replacement for a basic movie having many scenes with alternative scenes for different age ratings and genre ratings.

FIGURE 5 depicts in flow-chart form the steps of a process 500 for accomplishing automatic scene replacement in accordance with the present principle. The process 500 commences with the set-top box 10 establishing initial default settings for a genre rating (i.e., a genre emphasis) and an age-restriction during step 502 which typically occurs during initial installation or upon a reset of the set-top box. On or after step 502, a user can change one or both of the age rating and genre rating by entering appropriate commands during step 504. Regular viewing commences upon execution of step 506 during which a user will power-on the set-top box 10 of FIG. 1 or if the set-top box is already powered on, the user will tune to a new channel, or select a new program. With the set-top box 10 already on, and tuned to a channel, the set-top can now receive the user-selected content during step 508, which for the current example, comprises a feature-length movie. During step 510, the set-top box 10 determines the age rating and genre rating of the user-selected movie. Normally, the user-selected movie received by the set-top box during step 508 will have an age rating and genre rating. However, if not, the set-top box 10 can conduct a search during step 512, typically using the Internet and/or alternative databases (sources), to locate the age rating and genre rating for the user selected movie.

Next, the set-top box 10 of FIG. 1 will analyze the movie to determine whether the set-top box has access to the needed scenes to automatically replace those scenes having objectionable subject matter based on the age and genre ratings. If the set-top box 10 determines that it does not have access to all needed scenes, then the set-top box will look to alternative sources, such as the Internet, or the media server 18 of FIG. 1 to acquire the needed resources during step 516 of FIG. 5. Thereafter, the set-top box 10 will commence

playout of the movie during step 518, automatically replacing scenes containing objectionable subject matter based on the user-entered age and genre ratings. To the extent that the set-top box cannot automatically substitute a scene, the set-top box will omit that scene from display, typically by blanking the scene in a known manner.

The age-ratings described herein are exemplary and a full list appears in the ANSI standard described previously. The genre-ratings are also exemplary and many additional categories could exist. The age- or genre-rated content discussed can comprise, audio, video, still pictures and/or text (data). Thus, automatic scene replacement can entail replacing a portion of the content with other content comprising audio, video, still pictures, text-type (data) or a combination thereof. Moreover, a video sequence can be replaced by a text field or an audio file or a still picture only and vice versa.

FIGURE 6 depicts a graphical representation playout of a movie over time, with the moving having scenes with different age ratings and genre ratings. The movie starts at time To with a given age rating and genre rating. Between times T1 and T2, the set-top box 10 of FIG 1 receives additional content for a possible replacement of the scene appearing during the interval T3-T4 interval in accordance with the user-specified age rating. If neither the original movie nor the replacement sequence satisfies the user-specified age rating, the set-top box will blank the scene or rendered it indecipherable. During the interval T1-T2, the set-top box could receive an additional scene for a possible replacement during the interval T3-T4. This additional scene will have the same age-rating but different genre rating. The scene with the different genre rating will playout accordance with the user menu. If the two available scenes do not fit the age and genre ratings, set-top box 10 will playout the next best choice. For example, if the user has selected a genre rating of "romantic" and the set-top box only has access to a basic version and an "action" version, the basic version will constitute the next best choice. In practice, the set-top box 10 will typically query the user prior to playout to allow the user to make the ultimate decision.

As discussed above, the graphical representation of FIGURE 6 depicts a two-dimensional graphical representation of content replacement, taking into taking into account age and genre as the two "dimensions." However, the content replacement technique of the present principles practiced by the set-top box 10 (or potentially practiced by a television set or other device having the functionality of the set-top box) could readily accomplish content replacement taking into account additional criteria beyond age and genre. For example, the content replacement technique of the present principles could also take into account religious,

foreign language, extended/theatrical selectioning, and/or political criteria as well as an example. Taking into account, three or more such criterion would yield a multidimensional graphical representation of content replacement in place of the two-dimensional content replacement representation of FIG. 6, with each individual criterion corresponding to a separate dimension.

Also as discussed above, the transmission of replacement content to the set-top box 10 typically occurs in advance of the time at which content replacement becomes needed. If sent sufficiently in advance, the pre-transmission of the replacement content can occur at a lower bandwidth (e.g., lower than the transmission bandwidth of the original content into which the replacement content is inserted).

The foregoing describes a technique for accomplishing automatic scene replacement. While such automatic scene replacement has been in the context of a set-top box, such functionality could readily exist in other devices, such as advanced display devices, such television sets or video projectors that include the functionality of the set-top box 10, including the content restriction block, controller, or module for detecting those portions of the content which deviate from the user-specified restrictions, such as, but not limited age and genre.

Although the expression "objectionable" has been used throughout the specification and can be generally understood as having a somewhat negative connotation, the expression "objectionable" is intended to include a characterization of content in terms of just being less desirable or simply not preferred by a particular user at a given time.

CLAIMS

1. A method for automatic scene replacement in content, comprising,

detecting for at least one scene in the content, whether having objectionable subject matter is present according to at least one received criterion identifying objectionable subject matter; and if so

replacing the at least one scene with an alternative scene having subject matter not deemed objectionable according to the at least one criteria.

2. The method according to claim 1 wherein the input indicating at least one criterion for identifying objectionable subject matter in content destined for viewing is received from a viewer.

3. The method according to claim 1 wherein the receive input indicating at least one criterion for identifying objectionable subject matter in content destined for viewing alters a previously established default criterion for identifying objectionable subject matter.

4. The method according to claim 1 wherein the detecting step includes the steps of:

identifying a content rating for each scene in the content and

determining whether the content rating for each scene satisfies the at least one criteria.

5. The method according to claim 4 wherein the at least one criteria comprises an age rating.

6. The method according to claim 4 wherein the at least one criteria comprises a genre rating.

7. The method according to claim 4 wherein the at least one criteria includes a religious criterion.

8. The method according to claim 4 wherein the at least one criteria includes a political criterion.

9. The method according to claim 1 wherein the at least one alternate scene is transmitted prior to being needed for replacement.

10. The method according to claim 9 where the at least one alternate scene is transmitted at a rate lower than transmission of the content.

11. The method according to claim 1 wherein at least one alternate scene is received from at least one of a plurality of sources.

12. The method according to claim 11 wherein the plurality of sources include (a) broadcaster, (b) a media server and (c) Internet.

13. The method according to claim 1 wherein the at least one scene is replaced with an alternative scene having subject matter not deemed objectionable according to any of a plurality of criteria.

14. Apparatus for accomplishing automatic scene replacement in content, comprising:

a source of alternate scenes;

a content restriction module for detecting for at least one scene in the content, whether having objectionable subject matter is present according to at least one received criterion identifying objectionable subject matter; and if so, replacing, from the source of alternative scenes, the at least one scene with an alternative scene having subject matter not deemed objectionable according to the at least one criteria.

15. The apparatus method according to claim 14 further including an interface for enabling a user to enter the least one criterion for identifying objectionable subject matter in the content.

16. The apparatus according to claim 15 wherein the user-entered at least one criterion alters a previously established default criterion for identifying objectionable subject matter.

17 The apparatus according to claim 14 wherein content restriction module detects, for at the least one scene in the content, whether having objectionable subject matter is present by (a) identifying a content rating for each scene in the content and (b) determining whether the content rating for each scene satisfies the at least one criteria.

18. The apparatus according to claim 16 wherein the at least one criteria comprises an age rating.

19. The apparatus according to claim 16 wherein the at least one criteria comprises a genre rating.

20. The apparatus according to claim 16 herein the at least one criteria includes a religious criterion.

21 The apparatus according to claim 13 wherein the at least one criteria includes a political criterion.

22. The apparatus according to claim 14 wherein the content restriction module detects at least one scene in the content having objectionable subject matter according to any plurality of criteria identifying objectionable subject matter and replaces, from the source of

alternative scenes, the at least one scene with an alternative scene having subject matter not deemed objectionable according to any of the plurality of criteria.

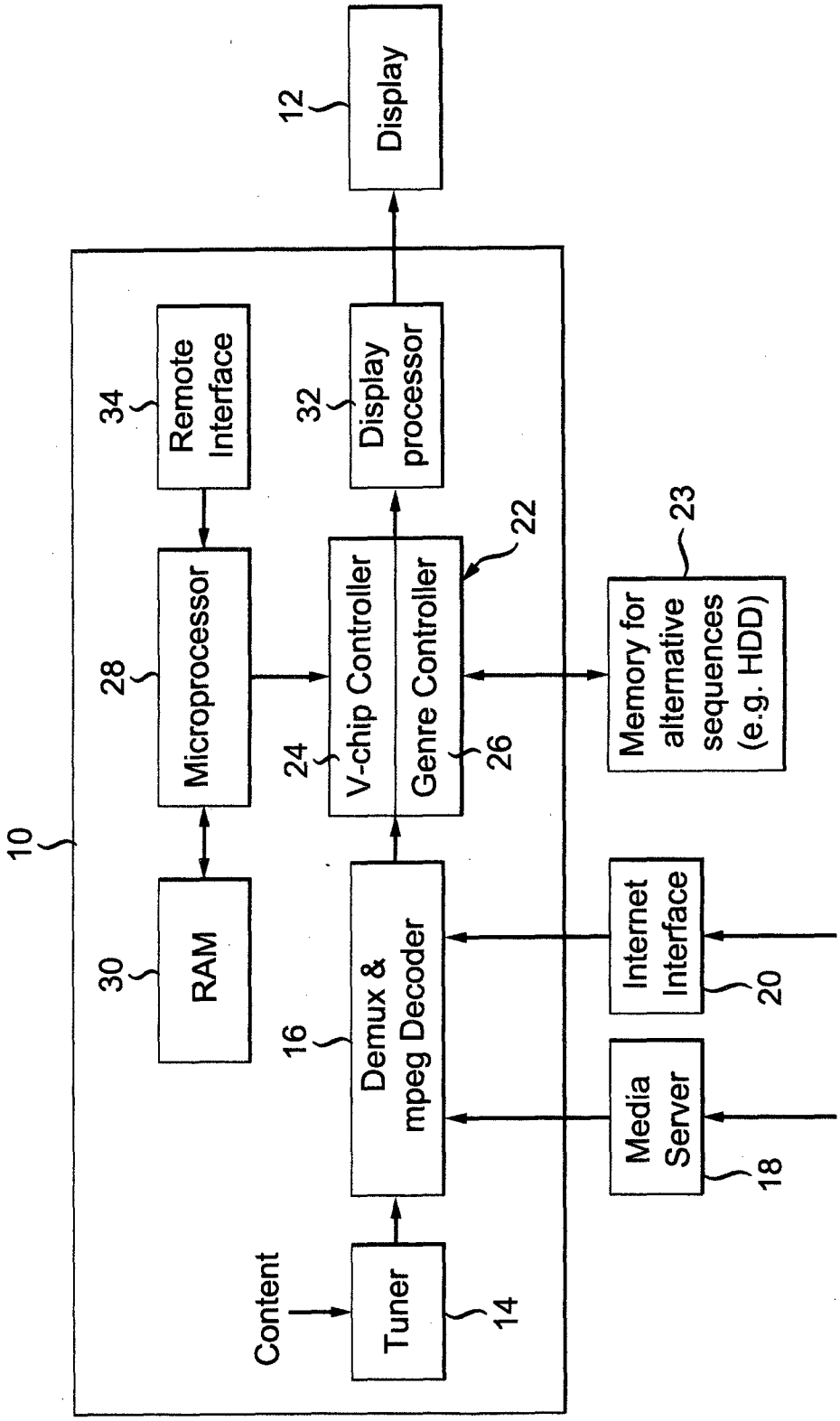
10
12
Display
34
Remote Interface
32
Display processor
28
Microprocessor
24
V-chip Controller
Genre Controller
22
26
23
Memory for alternative sequences (e.g. HDD)
30
RAM
16
Demux & mpeg Decoder
Internet Interface
20
Media Server
18
Content
Tuner
14

FIG. 1

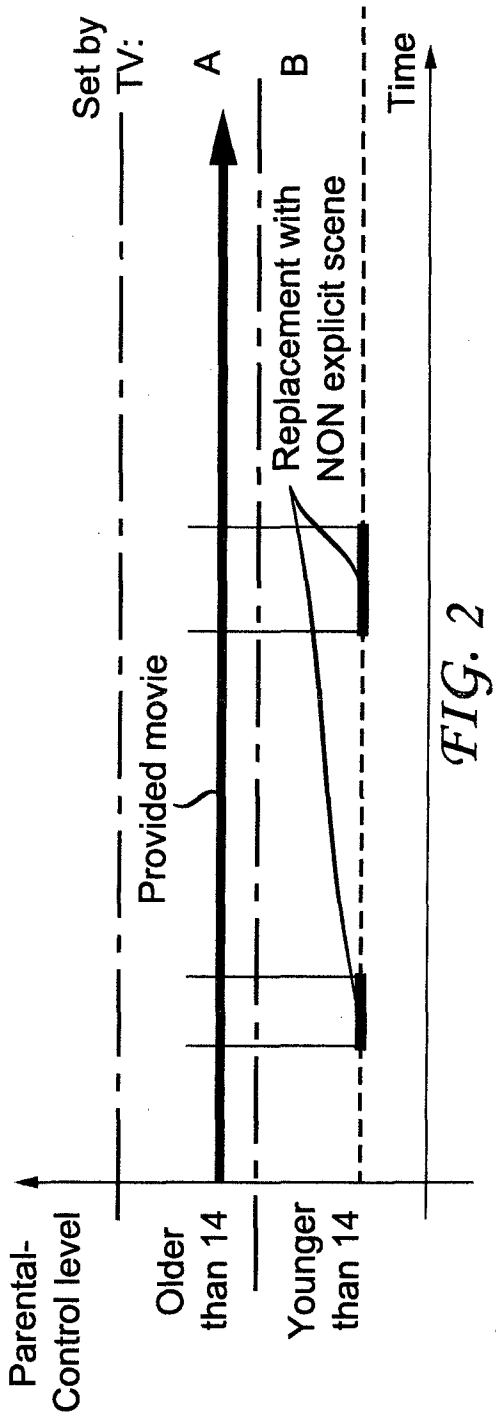
Parental-
Control level
Older
than 14
Younger
than 14
Provided movie
Set by
TV:
A
B
Replacement with
NON explicit scene
Time

FIG. 2

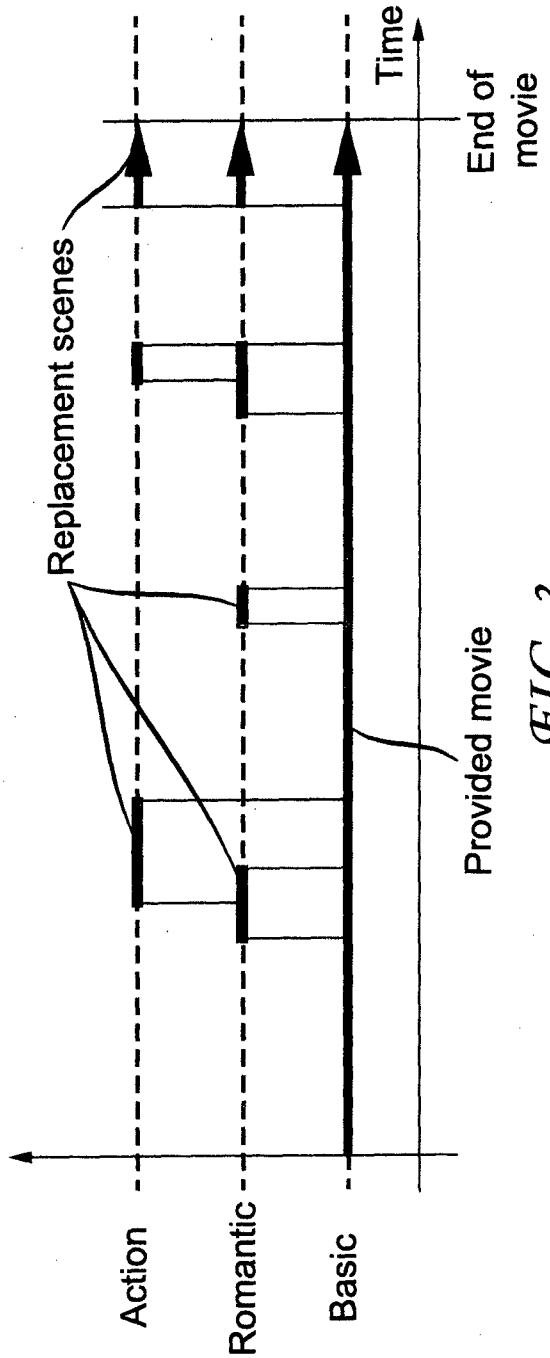
Time
End of movie
Replacement scenes
Provided movie
Action
Romantic
Basic

FIG. 3

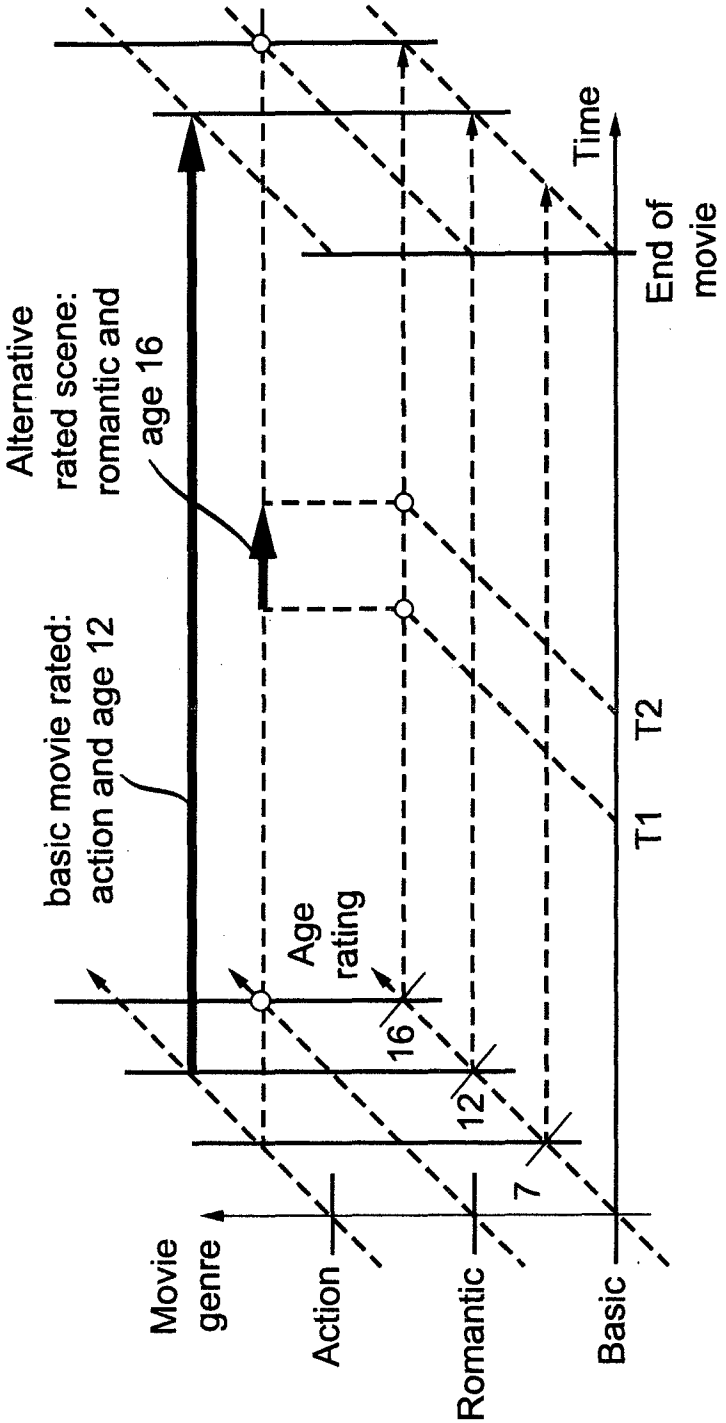
Alternative rated scene: romantic and age 16
basic movie rated: action and age 12
Age rating
16
12
7
Movie genre
Action
Romantic
Basic
Time
End of movie
T1
T2

FIG. 4

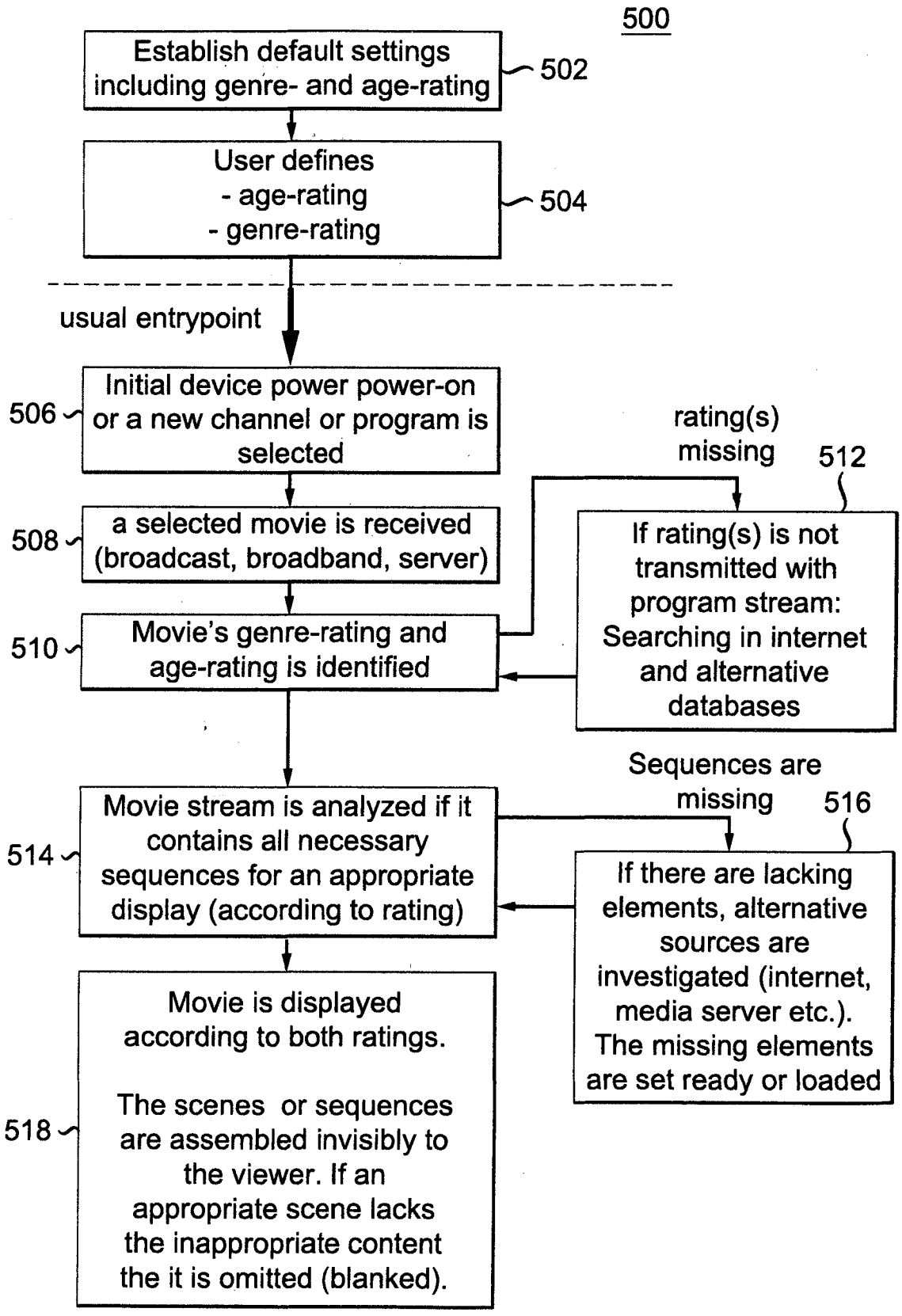
500
Establish default settings including genre- and age-rating
502
User defines
- age-rating
- genre-rating
504
usual entrypoint
506
Initial device power power-on or a new channel or program is selected
508
a selected movie is received (broadcast, broadband, server)
510
Movie's genre-rating and age-rating is identified
rating(s) missing
512
If rating(s) is not transmitted with program stream: Searching in internet and alternative databases
514
Movie stream is analyzed if it contains all necessary sequences for an appropriate display (according to rating)
Sequences are missing
516
If there are lacking elements, alternative sources are investigated (internet, media server etc.). The missing elements are set ready or loaded
518
Movie is displayed according to both ratings.
The scenes or sequences are assembled invisibly to the viewer. If an appropriate scene lacks the inappropriate content the it is omitted (blanked).

FIG. 5

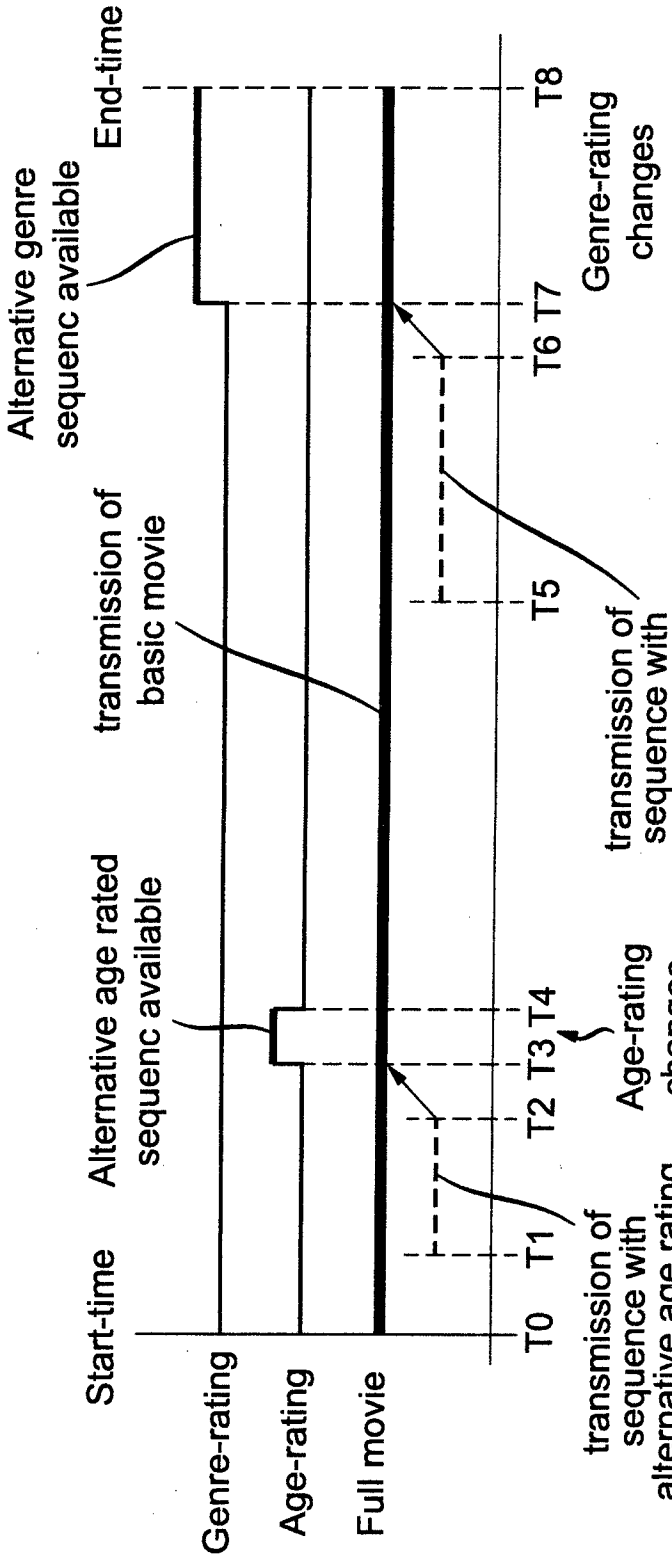
Start-time
Alternative age rated sequenc available
Alternative genre sequenc available
End-time
transmission of basic movie
Genre-rating
Age-rating
Full movie
T0
T1
T2
T3
T4
T5
T6
T7
T8
transmission of sequence with alternative age rating
Age-rating changes
transmission of sequence with alternative genre rating
Genre-rating changes
transmission on variable data rate possible
(content is buffered in TV)

FIG. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2014/001245

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04N21/44 H04N21/475
ADD.

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)
H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2004/049780 A1 (GEE JEANETTE [US] GEE JEANETTE [US] ET AL) 11 March 2004 (2004-03-11) abstract paragraphs [0047], [0048], [0050] - [0052], [0069], [0146], [0170], [0172], [0185], [0195] -----	1-22
X	US 2009/222853 A1 (WHITE SCOTT ANTHONY [US] ET AL) 3 September 2009 (2009-09-03) abstract paragraphs [0045], [0046], [0055], [0061] ----- -/--	1-22

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"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
17 February 2015	25/02/2015

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Troya Chinchilla, A

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INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2014/001245

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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X	EP 0 720 369 A2 (IBM [US]) 3 July 1996 (1996-07-03) abstract column 4, line 23 - column 5, line 4	1-22
X	US 2006/130119 A1 (CANDELORE BRANT L [US] ET AL) 15 June 2006 (2006-06-15)	1-8, 14-22
A	abstract paragraphs [0029], [0030], [0035]	9-13
X	WO 02/089473 A1 (KONINKL PHILIPS ELECTRONICS NV [NL]) 7 November 2002 (2002-11-07)	1-8, 14-22
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2014/001245

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