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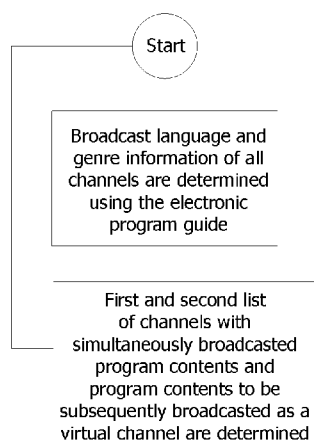
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(54) Title: IMAGE DISPLAY DEVICE WITH LANGUAGE-RESTRICTED PROGRAM CONTENT FUNCTION

Fig. 1



(57) Abstract: The present invention relates to an image display device capable of creating a dynamic broadcast program content virtual channel offered to the users. The present invention more particularly relates to an image display device having an electronic control unit dynamically determining channels broadcasting program contents in a specific language through the electronic program guide in a time-dependent manner and creating a continuously broadcasting virtual channel subsequently displaying determined program contents in a time-dependent manner through a second tuner other than a first tuner in the form of a picture-in picture window while said first tuner is used to view a broadcast program content other than said determined program contents.



Description**IMAGE DISPLAY DEVICE WITH LANGUAGE-RESTRICTED PROGRAM
CONTENT FUNCTION**

- [0001] The present invention relates to an image display device capable of creating a dynamic broadcast program content virtual channel offered to the users.
- [0002] Digital and interactive TV systems provide a significant amount of TV channels and programs leading to the general outcome that conventional methods for reaching a program content corresponding to the personal viewing preferences of a user from among a plurality of alternatives may become inefficient to the extent it is unperformable in a time-saving manner.
- [0003] Assuming that a TV service may have hundreds of channels, channel surfing might take several hours before every single channel is glanced at least once. It is to be noted that a plurality of channels from different countries may be broadcasted in a multitude of categories and an electronic program guide although proving in this respect more efficient, still involves the evident disadvantage of processing time inefficiency for a user in order for examining all the electronic program guide pages.
- [0004] Accordingly, user interaction is limited in the sense that the user has to engage in direct interaction with the image display device to initiate a desired function associated with the same. To this end, individual viewing preferences of users can be better processed and more relevant program content can be instantaneously offered to the user without losing the processing time spent in hunting preferable program contents.
- [0005] Among others, one of the prior art disclosures in the technical field of the present invention can be referred to as US2011219398, which defines a system of delivering a personalized media item to a user of an interactive television. The system comprises a television terminal, a computing device and a remote control device. The computing device further comprises a set top box. The computing device may be connected to a server through a communication network. The system stores a personal profile for each of its users. The user's identity is determined after a user switches on the

television. Personalized text messages for selected media items are displayed as scrolling tickers on the television display screen. The media items may include advertisement messages, headlines of news and selected stock prices. One of the tickers may be selected by the user employing the remote control device to display the next level of details using an enlarged display space or using the full television screen.

- [0006] The present invention therefore provides a system and method by which an image display device is operable to automatically provide alternative program contents delivered to the users as provided by the characterizing features defined in Claim 1.
- [0007] Primary object of the present invention is to provide a system and method by which an image display device automatically provides a list of alternative program contents on different channels in a reduced amount of time.
- [0008] The present invention proposes an image display device with an electronic control unit dynamically forming a list of channels simultaneously broadcasting program contents in a specific language, using the electronic program guide. The user can view these simultaneously broadcasted programs in the form of a picture-in picture window through a second tuner while a first tuner is used to view a broadcast program content not present in the list of programs.
- [0009] Alternatively, the electronic control unit prepares an alternative list of individual programs in a specific language in a time-dependent manner, thereby forming a non-interrupted broadcast stream in the form of a virtual channel through the second tuner to be displayed in the form of a picture-in picture window while the first tuner is used to view a broadcast program content not present in the alternative list of programs. The user may switch to the virtual channel if desired.
- [0010] Accompanying drawings are given solely for the purpose of exemplifying an image display device, whose advantages over prior art were outlined above and will be explained in brief hereinafter.
- [0011] The drawings are not meant to delimit the scope of protection as identified in the claims nor should they be referred to alone in an effort to interpret

the scope identified in said claims without recourse to the technical disclosure in the description of the present invention.

- [0012] Fig. 1 demonstrates a general diagram according to which the image display device of the invention executes two general alternative list generation function according to the present invention.
- [0013] Fig. 2 demonstrates a general diagram according to which the image display device of the invention executes the method of creating a virtual channel according to the present invention.
- [0014] The present invention proposes an image display device or a set-top box receiving programs via satellite, cable or terrestrial broadcasting for instance in the form of separate subscription formats. A set-top box may typically contain a plurality of tuner inputs, operating in connection with an image display device. Alternatively, the image display device itself can receive programs using built-in tuners.
- [0015] Digital and interactive TV systems provide a comprehensive amount of TV channels and programs. A conventional structure receiving program contents receives a transport stream via a tuner. In order for viewing a first program content and processing a second program content, the receiver-decoder should have at least two tuners, which also enables various types of services including interactive functions such as picture-in-picture (PIP).
- [0016] The image display device in accordance with the invention can be connected to a set-top box, the latter having at least two tuners. The image display device itself or the receiver (set-top box) can therefore have multiple tuners as well as demodulators suitable for receiving broadcast multimedia content. In this regard, receivers capable of receiving and tuning to signals of different generations (e.g. DVB-T and DVB-T2 (TUN1, TUN2), DVB-S and DVB-S2 (TUN3, TUN4), DVB-C and DVB-C2) can be in use.
- [0017] It is further known that digital broadcasting services provide information in regards to the genre of the programs being watched. The genre information may typically define a certain number of categories characterizing the content of a program. A content identifier therefore

describes the contextual category of the digital program so as to let the users obtain information as to the classification of an event or a program.

[0018] Therefore, a significant amount of data in the form of metadata information containing channel names, broadcasting program names, types and broadcasting time interval descriptions is receivable from the broadcasting service providers by way of using the electronic program guide (EPG).

[0019] The invention proposes an image display device receiving a plurality of broadcasting services and comprising an electronic control unit effecting operation of said image display device. The electronic control unit is configured to analyze program information of real-time program contents on different channels and generate a channel list as will be delineated hereinafter. The present invention therefore provides that the image display device enables a user to reach broadcast program contents according to her/his personal preferences in a reduced amount of time.

[0020] The present invention proposes an image display device having an interactive channel viewing system to provide the user with an alternative broadcast program content of potential interest. A dynamically changing list of channels with a certain user-defined broadcasting language is formed by the electronic control unit and these channels with alternative program contents are reachable in the picture-in-picture mode. In other words, when the user views a first channel and activates language-restricted program content function by way of pressing a dedicated button, alternative program contents can be viewed by using special channel up or channel down buttons by which channels with language-restricted program content can be viewed in the picture-in-picture (PIP) window on the screen while the user continues to view the first channel.

[0021] The image display device therefore comprises or communicates with at least a pair of tuners for viewing a first program content and for simultaneously activating picture-in-picture function.

[0022] The language-restricted program content function opens a picture-in-picture window on the screen and when the user views a first channel and simultaneously activates the language-restricted program content function,

this picture-in picture window is used in viewing alternative channels conventionally by channel up (P+) or channel down (P-) buttons.

[0023] According to the present invention, a virtual channel that can be called a language channel is created as a regular continuously broadcasting channel, subsequently broadcasting program contents of different channels in a certain language and optionally also in a certain genre. Therefore, the user can be provided with a virtual channel broadcasting only in a preferred language and genre selection can be alternatively applied to determine which program content is to be displayed if a plurality of options is available. In other words, the virtual channel according to the invention subsequently broadcasts different program contents from different channels throughout the day, all programs being in a certain language. The hence created virtual channel is then viewable through the picture-in-picture window just like a regular channel. The second tuner will be used in this case to view only one alternative channel at a time and this alternative channel will be displayed in PIP mode. In other words, the second tuner will be used to subsequently view alternative programs from different channels and a continuously broadcasting channel will therefore be created. The user can either view a plurality of alternative channels to be changeably viewed in the PIP mode or alternatively create a virtual language channel optionally with the addition of a genre criterion restriction if multiple programs in the same language are concurrently present.

[0024] In a nutshell, the present invention proposes an image display device receiving a plurality of broadcasting services, being in electrical connection with a plurality of tuners and comprising an electronic control unit configured to control operation of the image display device.

[0025] In one embodiment of the invention, the electronic control unit dynamically determines channels broadcasting program contents in a specific language through the electronic program guide in a time-dependent manner and creates a continuously broadcasting virtual channel subsequently displaying determined program contents in a time-dependent manner through a second tuner other than a first tuner in the form of a

picture-in picture window while said first tuner is used to view a broadcast program content other than said determined program contents.

[0026] In a further embodiment of the invention, determined program contents simultaneously broadcasted on different channels are changeably viewable through said second tuner in the form of a picture-in picture window while said first tuner is used to view a broadcast program content other than said determined program contents.

[0027] In a further embodiment of the invention, the electronic control unit is configured to analyze program genre information of real-time program contents on different channels through the electronic program guide and to generate a real-time genre-based channel selection list comprising a number of channels broadcasting program contents on a user-defined program genre.

[0028] In a further embodiment of the invention, only one of the simultaneously broadcasted program contents on different channels is displayed on said virtual channel based on a specific program genre.

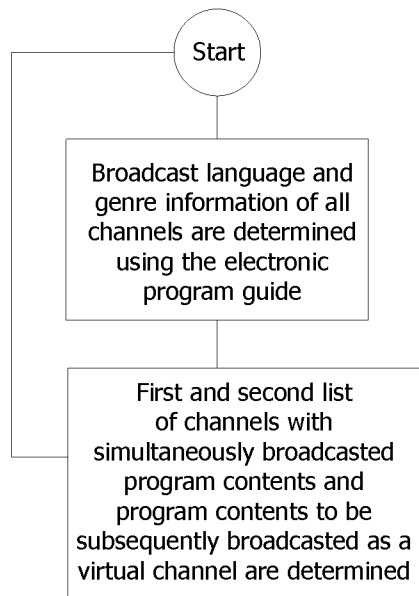
[0029] In a further embodiment of the invention, a radio broadcast as received by a tuner, a radio receiver or a network adapter of the image display device is broadcasted by said virtual channel during a time duration for which no program content is determined by said electronic control unit in said specific language.

[0030] In this regard, the invention ensures that a user is dynamically offered a virtual channel continuously broadcasting in a single language just like a regular channel but whose program content can be dynamically altered by way of using the second tuner.

Claims

1. An image display device receiving a plurality of broadcasting services, being in electrical connection with a plurality of tuners and comprising an electronic control unit configured to control operation of the image display device **characterized in that;**
the electronic control unit dynamically determines channels broadcasting program contents in a specific language through the electronic program guide in a time-dependent manner and creates a continuously broadcasting virtual channel subsequently displaying determined program contents in a time-dependent manner through a second tuner other than a first tuner in the form of a picture-in picture window while said first tuner is used to view a broadcast program content other than said determined program contents.
2. An image display device as in Claim 1, **characterized in that** determined program contents simultaneously broadcasted on different channels are changeably viewable through said second tuner in the form of a picture-in picture window while said first tuner is used to view a broadcast program content other than said determined program contents.
3. An image display device as in Claim 1, **characterized in that** the electronic control unit is configured to analyze program genre information of real-time program contents on different channels through the electronic program guide and to generate a real-time genre-based channel selection list comprising a number of channels broadcasting program contents on a user-defined program genre.
4. An image display device as in Claim 3, **characterized in that** only one of the simultaneously broadcasted program contents on different channels is displayed on said virtual channel based on a specific program genre.
5. An image display device as in Claim 4, **characterized in that** a radio broadcast as received by a tuner, a radio receiver or a network adapter of the image display device is broadcasted by said virtual channel during a time duration for which no program content is determined by said electronic control unit in said specific language.

Fig. 1



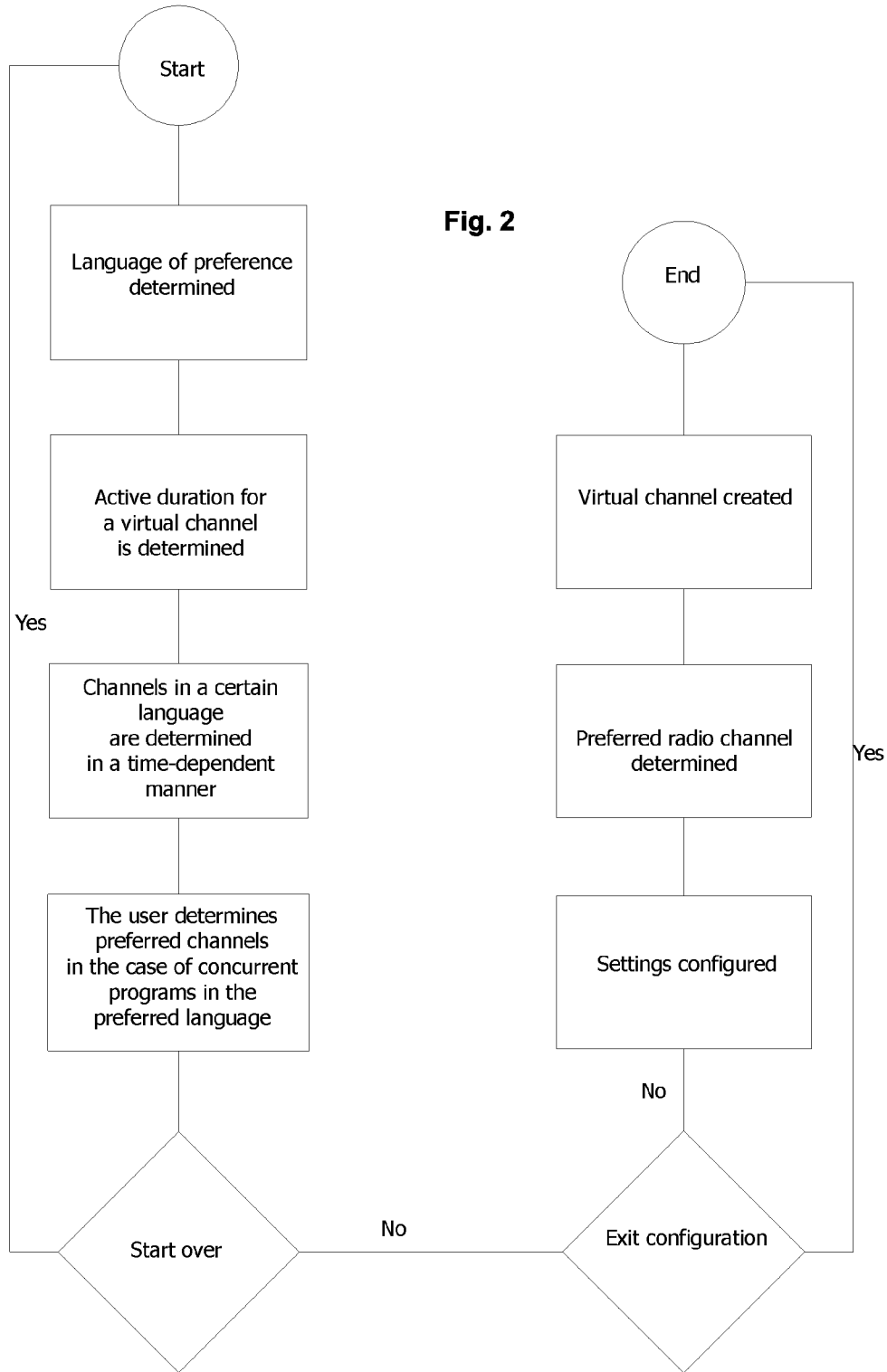


Fig. 2

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. H04N21/485 H04N5/45 H04N21/431 H04N21/426 H04N21/482
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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/088872 A1 (MAISSEL JONATHAN [IL] ET AL) 8 May 2003 (2003-05-08) abstract; figures 9d,10b paragraphs [0168], [0194], [0203], [0285], [0300] -----	1-5
A	WO 2005/101842 A1 (PAPAYA LTD [GB]; BAKER EDWARD HENDRY [GB]) 27 October 2005 (2005-10-27) page 35, lines 8-24 -----	1-5
A	EP 1 675 392 A2 (GEMSTAR DEV CORP [US]) 28 June 2006 (2006-06-28) paragraph [0022] -----	2

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See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2017/069670

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003088872	A1	08-05-2003	NONE
WO 2005101842	A1	27-10-2005	NONE
EP 1675392	A2	28-06-2006	NONE