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(71) Applicant: **NAGRAVISION S.A.** [CH/CH]; Route de Genève 22-24, CH-1033 Cheseaux-sur-Lausanne (CH).

(72) Inventors: **RAMACHANDRAN, Vaidyanathan**; #12, Sengothai Amman Koil Street, First Cross, Sembakkam, Chennai 600073 (IN). **KALIAMOORTHI, Amudha**; #B-308,Deepicas residency Nagavarpalya main road, CV-ramannagar post old madras road, Bangalore 560093 (IN). **BAJAJ, Haresh**; # 7, R.B.Park, Near Pushpak Society, Hansol, Ahmedabad 382475 (IN). **SINKAR, Hrishikesh**; # B-3 Madhumanisha Coop Society,Vakola Police Stn Road Santacruz (E), Mumbai 400055 (IN).

(74) Agent: **WENGER, Joel**; LEMAN CONSULTING S.A., Chemin de Précossy 31, CH-1260 Nyon (CH).

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(54) Title: SYSTEM AND METHOD TO PROCESS INFORMATION DATA FROM A MULTIMEDIA RECEIVER DEVICE

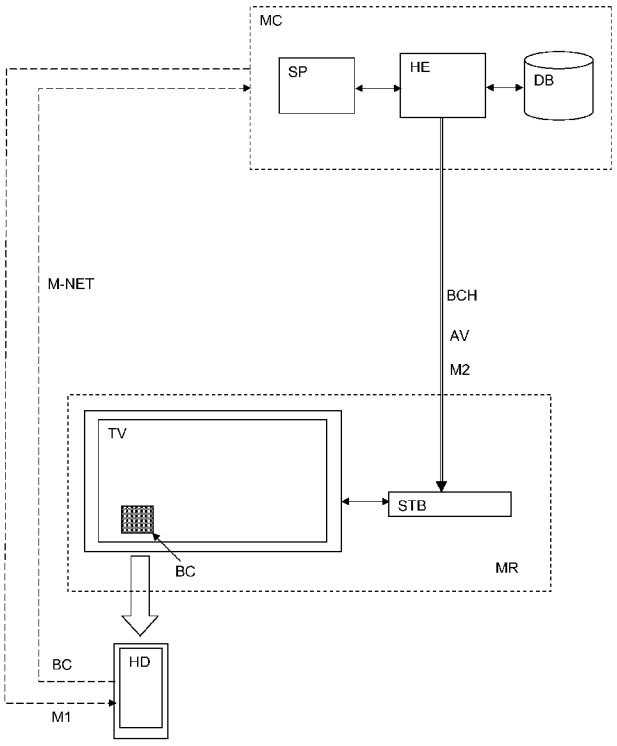


Fig. 1

(57) Abstract: A system and a method for transmitting to a managing center, by a handheld device, information data related to a multimedia receiver device configured at least to receive and display digital audio / video content from a stream broadcast unidirectionally by the managing center via a broadcast channel. The multimedia receiver device executes a self test program to generate information data related to a status of the multimedia receiver device. The multimedia receiver device displays the generated information data in form of an image representing a one dimensional or two dimensional barcode comprising at least a unique identifier, time information and specific status data associated to the multimedia receiver device. The handheld device acquires and transmits,via a mobile communication network, the image to the managing center for processing the received image and extracting the specific status data related to the multimedia receiver device. In response to the image transmission, the handheld device receives a first message via the mobile communication network while the multimedia receiver device receives a second message via the broadcast channel for deleting the displayed image.

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SYSTEM AND METHOD TO PROCESS INFORMATION DATA FROM A MULTIMEDIA RECEIVER DEVICE

Field of the invention

The invention relates to a system and method to report information data retrieved from a digital multimedia receiver device to a service provider for processing. In particular, the retrieved information data are specific to a given multimedia receiver device and user profile.

Technical background

The most of low cost digital multimedia receiver devices presently in service do not support a return channel to a head end or service provider due to limited hardware / software and connection capabilities. When a user wants to purchase an on-demand service as VOD (Video On Demand), a subscription, or interact in general with a service provider for other benefits, it becomes necessary to establish an alternative communication channel independent form the multimedia receiver.

Several solutions are based on portable devices such as personal computers, tablet computers, smart phones etc. able to communicate with services providers via a mobile network.

In the field of interactive advertising, document US2012/0084807Al discloses a system for interactive video advertising containing a video display capable of displaying an advertisement tag, wherein the advertisement tag prompts for user interaction and allows a registry of an interaction history. The video display is a device such as a television, monitor, digital video recorder, video game system, portable multimedia device, etc. The advertisement tag is a visual and/or audible notification. Upon display of an advertisement tag, the user is thereby prompted for interaction with the system. By interacting with the system after an advertisement tag is displayed, an interaction history archive, in the form of an advertising cart user interface is populated with an interaction history record. The user interface comprises controls that allow data viewing, saving, deleting, sorting, distributing, or combinations thereof. The user interacts with the system through a remote control, Bluetooth™ device, infrared device, radio frequency device, computer mouse,

trackball, touchpad, pointing stick, keyboard, barcode reader, or any other pointing or capturing device.

Document US2010096448A1 describes a method and apparatus for bar code data interchange. This apparatus is generally comprised of a bar code reader which is capable of scanning bar codes displayed on a variety of video displays, a decoder which transforms the scanned bar code into data which may then be manipulated in a variety of ways by a host device, such as a computer, personal digital assistant (PDA) or any other device in which bar code data input may be desirable. In a preferred embodiment, a consumer will scan in bar code information from a video display, such as a television screen, through the use of a high scan rate LED scanner and obtain information on a desired product, a link to the product's web site, or other useful information. Businesses too, will scan in bar code information directly from video displays into their desired host device. This scanned information is not formatted specifically for any business software and therefore is easily transferable between businesses which may use different software applications to manipulate the same data to suit their needs. This minimizes the need for many of the conversion programs or interpretation programs, commonly known as middleware, and provides data interchange across a wide variety of settings for a myriad of purposes.

Document US2012/0153015A1 discloses a system for accessing content corresponding to a matrix barcode, such as a video and/or audio content. The system may include a mobile computing device in communication with a content receiver. The mobile computing device may be configured to capture the matrix barcode, for example, via using an optical component and/or barcode scanner to record and/or scan the matrix barcode. The mobile computing device may also include a network interface component configured to transmit the matrix barcode to the content receiver. The content receiver may then receive the matrix barcode from the mobile computing device. The content receiver may include a processor to determine and/or access the content corresponding to the matrix barcode. The content receiver may then transmit the content to a display device.

Document US2012/0137318A1 discloses a method and a system for tracking user interaction with a television receiver, such as a set-top box, cable box, or other electronic device appropriately configured to receive, decode and display audiovisual

information. Such tracking may be accomplished through the use of a matrix code displayed on a display device along with audiovisual content; the matrix code may be captured by a reader device that processes the matrix code to retrieve data embedded therein. The data may be transmitted from the receiving device to a monitoring party who, in turn, may process the data to track user interaction, audience participation, the time at which audiovisual content was viewed and/or stored, and the like.

Document US2004/0093370A1 discloses a method and system for remote diagnostics in a Digital Subscriber Line (DSL) set-top box network having a head-end unit and a set-top box having diagnostics software. The diagnostics software stored in the set-top box enables the head-end unit to remotely query the set-top box about the current condition of the set-top box and, as a result, reduces the necessity of service calls and/or shipping charges that would otherwise be required. The diagnostics software generates data in response to various information and check requests received from the head end. Execution of the diagnostics software may be initiated as part of a periodical diagnostic test of the set-top box, at the request of a customer having difficulties with the set-top box, or in response to an alarm or alert message generated by the set-top box.

Summary of the invention

The aim of the present invention is to report information data specific to a multimedia receiver device to a head end, managing center or service provider in an efficient way particularly when the multimedia receiver device is not provided with a direct return channel.

The aim is achieved by a method to process information data from a multimedia receiver device according to claim 1.

A further object of the invention relates to a system configured to process information data from a multimedia receiver device according to claim 13.

The multimedia receiver device runs a self-test program in order to retrieve and generate information data related to a status of the multimedia receiver device. The latter creates a barcode by combining at least status information data, time and date

and its own unique identifier. The barcode is then displayed in a predefined area of a screen coupled to the multimedia receiver device in order to be scanned by a handheld device preferably consisting of a smart phone provided with the appropriate application.

The scanned image is sent by the smart phone, via a mobile communication network, to a managing center for processing and analyzing the status information data for taking targeted actions related to the effective status of the multimedia receiver device. An acknowledgement and/or additional information is returned via the mobile network in form of a first message such as a SMS for example to the smart phone. Other messages may be also sent by the managing center through the broadcast channel (push mode) to the multimedia receiver device for display on the screen of the multimedia receiver device. A second message sent via the broadcast channel by the managing center in response to the image transmission by the smart phone deletes the displayed image.

According to an embodiment the managing center may also send advertisements in relation to the received status information. A bidirectional communication or interactive communication is thus enabled between the multimedia receiver device and managing center even if the current broadcasting channel is unidirectional.

The managing center is defined here as an entity maintaining a plurality of multimedia receiver devices as well as a central database containing various data related to users, multimedia receiver devices identification, configuration, subscription data, usage history and statistics, etc. The managing center may also be associated to a head end or service provider managed by one or several multimedia operators.

Brief description of the figure

The invention will be better understood with the following detailed description, which refers to the attached figure given as non-limitative example.

Figure 1 shows a block diagram of the system of the invention where a multimedia receiver device displays a status information data barcode readable by a handheld device configured to transmit this barcode to a managing center.

Detailed description of the invention

The system illustrated by figure 1 comprises a multimedia receiver device MR preferably consisting of a set top box STB connected to a television set TV. In another configuration, the set top box may be integrated in the television set to form a single device. The multimedia receiver device MR receives digital audio / video content from a stream broadcast unidirectionally, via a broadcast channel BCH, by an entity managed by one or more broadcast operator(s) such as a managing center MC associated to a head end HE and a service provider SP. The managing center MC maintains a plurality of multimedia receiver devices MR as well as a central database DB containing users' data coupled to multimedia receiver devices identification, configuration characteristics, subscription data, content usage history and statistics, etc.

According to the method and system of the invention, the multimedia receiver device MR generates information data related to its status by executing a self test program either at operating start or stop of the multimedia receiver device, periodically, at scheduled time or upon a request from a user by pressing a button on a remote control for example. This self test program may also be launched from a peripheral device associated to the multimedia receiver device MR such as an optical disc recorder / player, a personal computer or any other device. According to an embodiment, the self test program may start after a failure of a hardware and/or software component of the multimedia receiver device or a peripheral device is detected.

The generated information data is converted into an image BC displayed on a screen coupled to the multimedia receiver device MR such as the television set TV of figure 1 representing a one dimensional or two dimensional barcode. The two dimensional barcode or matrix barcode also called QR code is preferred for its higher data capacity up to more than 4000 alphanumeric characters while the one dimensional or linear barcode is limited to 10-15 characters. The matrix barcode including data in both the horizontal and vertical directions may contain almost any type of data and/or other information. For example, the matrix barcode may include numeric, alphanumeric, binary, symbols and the like. In particular, according to the invention, the information data comprise at least a unique identifier, time information and

specific status data associated to the multimedia receiver device as for example error messages reporting failures of components included in the multimedia receiver device.

The specific status data of the multimedia receiver device MR may additionally comprises activity reports of the multimedia receiver device within a predetermined period, user profile including subscription data to broadcast services and/or purchased video-on-demand services, system information including hardware and software version information of peripherals associated to multimedia receiver device and / or global hardware and software version information of the multimedia receiver device.

The displayed image preferably representing a matrix barcode BC is acquired by a handheld or portable device HD like a smart phone, a personal assistant, a tablet personal computer etc. provided with a camera which scans the barcode image BC and forwards it via a mobile communication network M-NET to the managing center MC in an MMS (Multimedia Messages Service) message for example. The image BC is preferably decoded by the managing center MC which verifies, analyzes and interprets the included information data with the help of corresponding data in the central database DB.

According to a further embodiment, the image BC is transferred to the handheld device HD via a local wireless channel based on Bluetooth technology or other radio frequency transmission protocol.

According to an embodiment the image may be partially or entirely decoded by the handheld device HD before forwarding to the managing center MC so that the user can know the status data and/or additional data contained in the matrix barcode BC. One or more URL (Uniform Resource Locator) address(es) or a phone number(s) may be extracted by the handheld device HD for getting further information on the multimedia receiver device MR or associated peripherals. The URL addresses may also be directed to manufacturer websites, advertising websites, promotional offers or other commercial information related to user system configuration and so on.

The matrix barcode image BC is generally displayed on an edge of the television set TV screen over a current television program displaying, on a particular display

window or beside program information items in an electronic program guide created on the basis of the services information broadcast in the content stream. According to an embodiment, the image may be displayed at each above mentioned location on the display or only at a specific place at user choice in preferences set up menu.

In response to the transmission of the barcode image BC to the managing center MC, a first message M1 is sent via the mobile communication network M-NET to the handheld device HD as acknowledgment. This message M1 may further inform the user on actions to take in relation to the status of the multimedia receiver device MR. For example, the user may be informed on available updates and on the way to perform the updates. In case of failures, the response message invites the user to change a defective component such as a memory, a hard disc, a card reader, etc.

Upon reception of the barcode image BC, the managing center MC further transmits a second message M2 to the multimedia receiver device MR, via the broadcast channel BCH in push mode i.e. addressed to a specific user or multimedia receiver device MR. This second message M2 comprises a command to delete the displayed barcode image which is become useless since it is processed by the managing center. In addition to the command, the second message may also contain information for the user to be temporarily displayed on the screen, such as processing results, multimedia receiver device status information, advices to the user, etc.

An advantage of the method is to allow a remote diagnosis and support to the users for maintaining their devices in an optimal operating state to minimize interventions of technicians on user's premises.

The method of the invention may further be applied to VOD (Video On Demand) purchasing where the user selects a program on a displayed program guide and launches in the same time the self test program for generating a matrix barcode.

In this case, in addition to the multimedia receiver device / user identification, status and time data, the matrix barcode BC includes specific information related to the selected program.

The matrix barcode BC is then forwarded to the managing center and VOD services provider which will send an acknowledgment and broadcast the selected content to the multimedia receiver device MR. The user data extracted from the matrix barcode BC and completed thanks to the database DB are forwarded to a billing system managed by the service provider SP.

CLAIMS

1. Method for transmitting to a managing center (MC), by a handheld device (HD), information data related to a multimedia receiver device (MR) configured at least to receive and display digital audio / video content (AV) from a stream broadcast unidirectionally by the managing center (MC), via a broadcast channel (BCH), comprising steps of:

- executing, by the multimedia receiver device (MR), a self test program to generate information data related to a status of the multimedia receiver device (MR),

- displaying, by the multimedia receiver device (MR), the generated information data in form of an image (BC) representing a one dimensional or two dimensional barcode comprising at least a unique identifier, time information and specific status data associated to the multimedia receiver device (MR),

- acquiring the image (BC) by the handheld device (HD), and transmitting the image (BC), via a mobile communication network (M-NET), to the managing center (MC) for processing the received image (BC) and extracting the specific status data related to the multimedia receiver device (MR).

- receiving by the handheld device (HD), via the mobile communication network (M-NET), a first message (M1) from the managing center (MC) in response of the image transmission to the managing center (MC),

- receiving by the multimedia receiver device (MR), via the broadcast channel (BCH), a second message (M2) from the managing center (MC) in response of the image transmission by the handheld device (HD), said second message (M2) comprising a command to delete the displayed image (BC).

2. Method according to claim 1 characterized in that the handheld device (HD) acquires the image (BC) by reading with a camera the image displayed on a screen (TV) coupled to the multimedia receiver device (MR), said image (BC) being forwarded via the mobile communication network (M-NET) to the managing center (MC).

3. Method according to claim 1 characterized in that the handheld device (HD) acquires the image (BC) via a local wireless communications channel and forwards said image (BC) via the mobile communication network (M-NET) to the managing center (MC).

4. Method according to claim 3 characterized in that the local wireless communications channel is based on Bluetooth technology.

5. Method according to anyone of claims 1 to 4 characterized in that the self test program is executed either at operating start or stop of the multimedia receiver device (MR) or associated peripherals, periodically, at scheduled time, after detection of a failure or upon a request from a user.

6. Method according to anyone of claims 1 to 5 characterized in that the specific status data of the multimedia receiver device (MR) comprises error messages reporting failures of components included in the multimedia receiver device (MR).

7. Method according to anyone of claims 1 to 6 characterized in that the specific status data of the multimedia receiver device (MR) comprises activity reports of the multimedia receiver device (MR) within a predetermined period.

8. Method according to anyone of claims 1 to 7 characterized in that the specific status data of the multimedia receiver device (MR) comprises user profile including subscription data to broadcast services and/or purchased video-on-demand services.

9. Method according to anyone of claims 1 to 8 characterized in that the specific status data of the multimedia receiver device (MR) comprises system information including hardware and software version information of peripherals associated to multimedia receiver device (MR) and / or global hardware and software version information of the multimedia receiver device (MR).

10. Method according to anyone of claims 1 to 9 characterized in that the image (BC) is displayed on an edge of the screen (TV) over a current television program displaying or in a particular display window.

11. Method according to anyone of claims 1 to 9 characterized in that the image (BC) is displayed beside program information items in an electronic program guide.

12. Method according to anyone of claims 1 to 11 further comprising a step of pre-processing the image (BC) acquired by the handheld device (HD) before sending the image (BC) to the managing center (MC), the pre-processing comprising extracting an URL and additional information for displaying on the handheld device (HD).

13. A system comprising a multimedia receiver device (MR) configured at least to receive and display digital audio / video content (AV) from a stream broadcast unidirectionally via a broadcast channel (BCH), a handheld device (HD) configured to transmit information data related to the multimedia receiver device (MR) via a mobile communication network (M-NET) and a managing center (MC) configured to process received information data, wherein

- the multimedia receiver device (MR) comprises a module adapted to execute a self test program generating information data related to a status of the multimedia receiver device (MR),

- the multimedia receiver device (MR) further comprises a screen (TV) to display the generated information data in form of an image (BC) representing a one dimensional or two dimensional barcode comprising at least a unique identifier, time information and specific status data associated to the multimedia receiver device (MR),

- the handheld device (HD) is configured to acquire the displayed image (BC) for transmitting to the managing center (MC) via the mobile network (M-NET) and to receive a first message (M1) from the managing center (MC) in response transmission of the image (BC), the multimedia receiver device (MR) being further configured to receive, via the broadcast channel (BCH), a second message (M2) from the managing center (MC) in response to the transmission of the image (BC) by the handheld device (HD), said second message (M2) comprising a command to delete the displayed image (BC),

- the managing center (MC) is provided with a processor for processing the received image (BC) by extracting the specific status data related to the multimedia receiver device (MR).

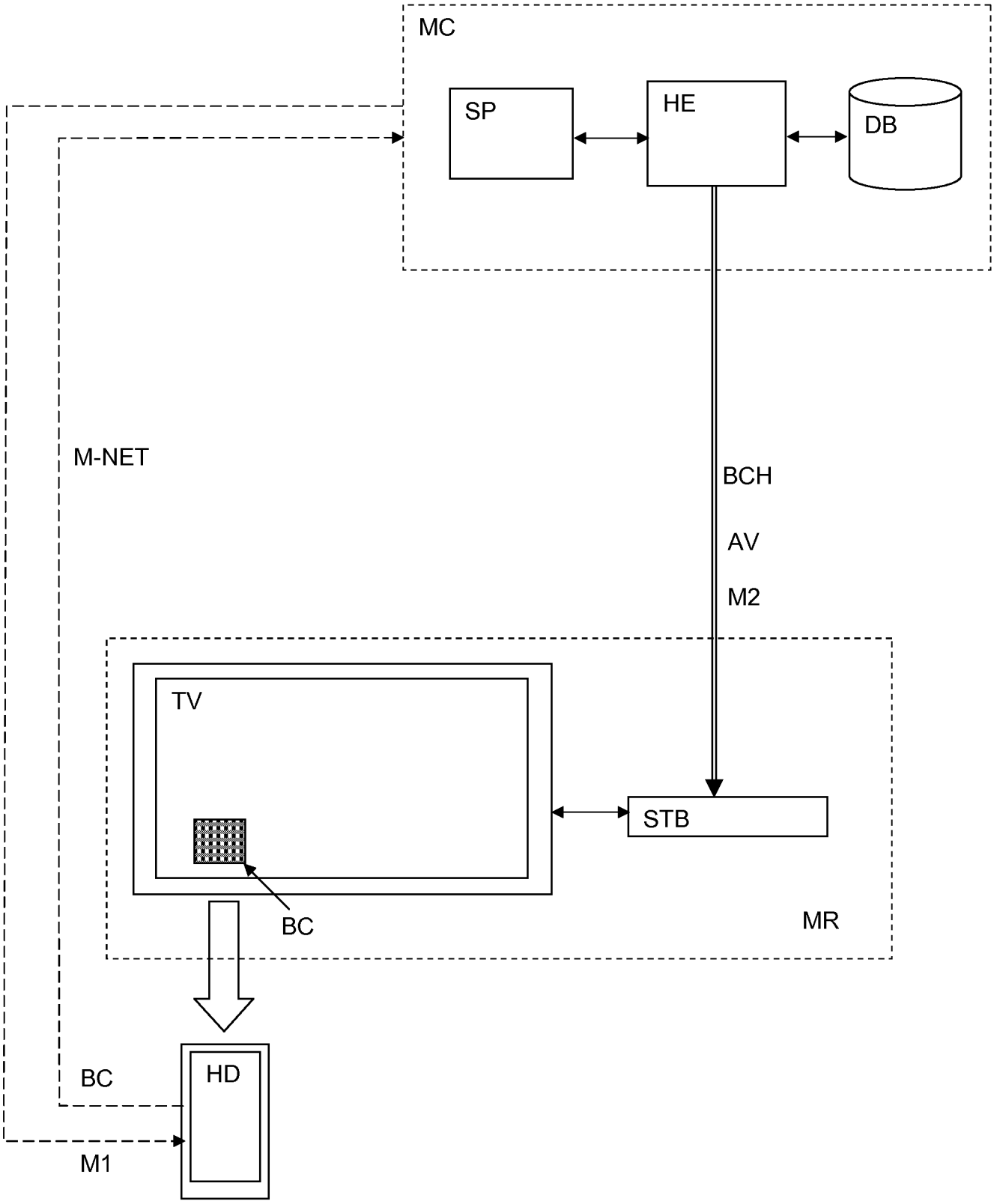


Fig. 1

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. H04N21/41 H04N21/4223 H04N21/431 H04N21/441 H04N21/442
H04N21/45 H04N21/488 H04N21/658 H04N21/61 H04N21/437
H04N21/4425 H04N21/858

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 G06Q

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.
Y	US 2012/137318 A1 (KILARU KRANTI [US] ET AL) 31 May 2012 (2012-05-31) paragraphs [0024], [0033] - [0036]; figure 2	1-13
Y	US 2004/093370 A1 (BLAIR RONALD LYNN [US] ET AL) 13 May 2004 (2004-05-13) paragraphs [0004], [0015], [0016]; figure 2	1-13
A	US 2009/083808 A1 (MORRISON STEPHEN D [US]) 26 March 2009 (2009-03-26) pages 1, 2	1-13
A	US 2009/294538 A1 (WIHLBORG ANDERS [SE] ET AL) 3 December 2009 (2009-12-03) pages 2,4	1-13

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

☒ See patent family annex.

* Special categories of cited documents :

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
7 January 2014	16/01/2014

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	Folea, Octavian

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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