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(71) Applicant: **ARCELIK ANONIM SIRKETI** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR).

(72) Inventors: **MALKOS, Sibel Sezen**; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR). **DIRIL, Gizem**; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR). **EGE, Murat**; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR). **KOSAR, Oguzhan**; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR). **ASLAN, Fatih**; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR). **KOC, Omer**; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR).

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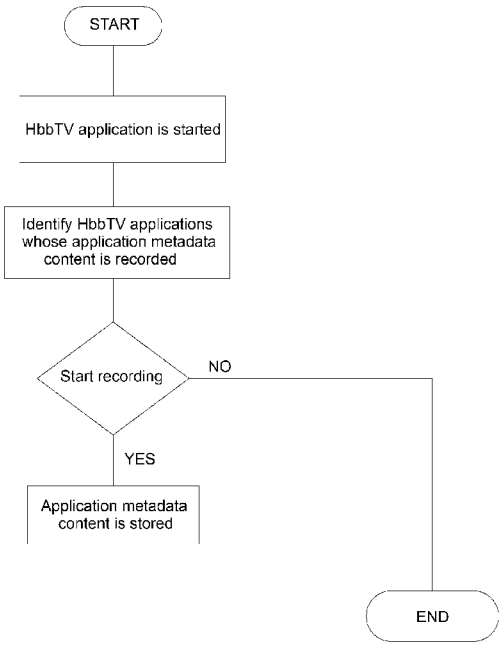
(54) Title: SYSTEM AND METHOD FOR ACCESSING HYBRID BROADCAST BROADBAND TV CONTENT IN A FACILITATED MANNER

Fig. 1



(57) Abstract: The present invention relates to an image display device providing improved offline access to HbbTV (Hybrid Broadcast Broadband TV) contents. The present invention more particularly relates to an image display device for receiving a plurality of broadcasting and broadband services from service providers, the image display device being fitted with an internal or external storage medium and comprising an electronic control unit effectuating operation of the image display device.

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Description

SYSTEM AND METHOD FOR ACCESSING HYBRID BROADCAST BROADBAND TV CONTENT IN A FACILITATED MANNER

[0001] The present invention relates to an image display device providing facilitated offline access to HbbTV (Hybrid Broadcast Broadband TV) contents.

[0002] Digital TV broadcasters and Internet service providers enable delivery of entertainment content to the users through smart TVs and set-top boxes. Services based on the HbbTV system can operate over different broadcasting technologies, such as satellite, cable or terrestrial communication systems. The HbbTV standard therefore supports broadcasting of digital television content from various sources.

[0003] HbbTV typically delivers a wide variety of services including traditional services such as EPG or teletext and more modern services including video-on-demand, games or social networking. Hybrid digital TV devices combine various services on a single image display device. Users are provided with access to personalized content storable on a storage medium.

[0004] Smart TVs having HbbTV capabilities allow the users to access to the HbbTV portal on certain broadcast channels, that is when a rounding circle appear in a corner of the screen indicating that HbbTV services are available. When the user initiates the HbbTV service on a broadcast channel allowing HbbTV access, the full range of HbbTV services associated with the given broadcast channel will be accessible by pressing a single button. Therefore, HbbTV contents are only reachable through the currently viewed broadcast program in association therewith.

[0005] Among others, one of the prior art disclosures in the technical field of the present invention can be referred to as CN104079987, which discloses an HbbTV multi-screen interactive system based on a digital TV set-top box and an implementation method. The method includes the steps that a transmission stream of the set-top box is analyzed so as to obtain the network link address of the HbbTV; the set-top box sends the network link address of the HbbTV to a corresponding intelligent device through a

multi-screen interaction protocol; the intelligent device obtains the network link address of the HbbTV through the multi-screen interaction protocol and has access to a website. According to the HbbTV multi-screen interactive system based on the digital TV set-top box and the implementation method, combination of the HbbTV technology with the multi-screen interaction technology is accordingly provided.

[0006] The present invention provides a system by which an image display device is operated such that users are also offered offline HbbTV service and are able to access to the same during Internet interruption. The present invention ensures that stored data conveniently allows offline use of the embedded HbbTV applications.

[0007] The present invention therefore provides a system by which an image display device is operable to automatically offer offline processable HbbTV content as provided by the characterizing features defined in Claim 1 and subsequent Claims.

[0008] Primary object of the present invention is to provide a system and method by which an image display device undertakes offline processing of the HbbTV content provided by the broadcaster.

[0009] The present invention proposes an image display device with an electronic control unit configured to process Hybrid Broadcast Broadband TV (HbbTV) contents of different channels in cooperation with a dynamic content management utility so as to distinguish application-based metadata contents from media contents that include video and audio streams on a channel-specific basis.

[0010] A first class of HbbTV content in direct association with channel-specific applications being accessed and a second class of HbbTV content in direct association with channel-specific media content containing video and audio files are defined and the content management utility, while selectively storing the first class of HbbTV content on the storage medium, stores the second class of HbbTV content only if a broadcast program on a currently viewed channel is also recorded.

[0011] Further, the main page of a predetermined channel's HbbTV service is linked to a general applications page of the image display device whereby

HbbTV applications are viewable and directly reachable independently from the main page of the channel-specific HbbTV service.

[0012] Accompanying drawings are given solely for the purpose of exemplifying an image display device providing improved offline access to HbbTV content, whose advantages over prior art were outlined above and will be explained hereinafter in brief.

[0013] 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 the claims without recourse to the technical disclosure in the description of the present invention.

[0014] Fig. 1 demonstrates a general flow diagram according to which the image display device of the invention executes recording of the first class of HbbTV content according to the present invention.

[0015] Fig. 2 demonstrates a general flow diagram according to which the image display device of the invention executes recording of the second class of HbbTV content according to the present invention.

[0016] The present invention proposes an image display device which automatically undertakes offline processing of the HbbTV content provided by the broadcaster.

[0017] Smart TVs offering HbbTV service allow the users to access to the HbbTV portal on certain broadcast channels. When the user initiates the service on a broadcast channel, the full range of HbbTV services associated with the given broadcast channel will be accessible. Therefore, HbbTV contents are reachable through the currently viewed broadcast program in association therewith.

[0018] It is known that the HbbTV portal delivers a wide variety of services such as enhanced teletext, EPG, video-on-demand, games or social networking. Therefore, the user has access to hybrid digital TV services in a combined manner on the same device. On the other hand, when the HbbTV icon appears in the corner of the screen, the user may have access to media files as well, such media content including video content being directly associated with the currently viewed broadcast program, such as for instance earlier episodes of a certain program content.

Likewise, such media files may include any other video content as provided by the broadcaster.

[0019] Alternatively, a plurality of different HbbTV applications may retrieve information from various sources such as broadcast service providers or Internet resources, such applications for instance offering information as to weather forecast data, road traffic data, sporting events results or stock market data. Therefore, through the HbbTV service, the image display device may receive dynamically updated information such as sporting event scores, headlines of news or selected stock prices. Such applications typically access application metadata content on a remote server being periodically updated by service providers.

[0020] To this end, the image display device of the present invention is fitted with an internal or external storage medium and an electronic control unit in cooperation with a dynamic content management utility so as to selectively store the channel-specific HbbTV applications together with associated application metadata content as well as any media files as will be delineated hereinafter.

[0021] The invention proposes an image display device receiving a plurality of broadcasting services. The electronic control unit in cooperation with a dynamic content management utility effectuates operation of the image display device. The dynamic content management utility is configured to process the channel-specific HbbTV content so as to define and distinguish application-based metadata content from media content that include video and audio streams. To this end, the dynamic content management utility defines a first class HbbTV content in direct association with channel-specific applications such as those processing dynamically updated data in the form of weather forecast data, road traffic data, sporting events results or stock market data and a second class HbbTV content which contains potentially larger media files not suitable for continued storage.

[0022] In other words, every single side program within the HbbTV portal of a broadcast channel program is not stored unless the broadcast program itself is recorded. In that case, the dynamic content management utility

defines those side programs in the form of additional media files in relation with the channel-specific HbbTV content and separately stores these additional files on the storage medium.

[0023] The main page of the HbbTV allows the user to benefit from EPG and catch-up services for programs, news, personalization, games, social networking, and other multimedia applications. According to the present invention, the main page of a predetermined channel's HbbTV service is linked to the general applications page of the image display device. It is advantageous in that the user can view and use HbbTV applications independently from the main page of the channel-specific service. This enables the user to directly reach HbbTV applications without necessarily viewing a certain broadcast channel. The user can configure the predetermined channel whose HbbTV service applications are to be directly reachable on the general applications page of the image display device.

[0024] According to the present invention, the storage medium's content is effectively reached during offline use of the HbbTV applications or during replaying of a recorded broadcast program. Recorded metadata content in association with different HbbTV applications is replaced as soon as Internet access is available. On the other hand, recorded media files in association with the media file library of a channel-specific HbbTV service is maintained until the user deletes such files.

[0025] Distinguishing the first class HbbTV content containing application-based metadata content from the second class HbbTV content containing video and audio streams is crucial in that recording each and every media file in association with any viewed broadcast program for each channel is unperformable due to storage space constraints. The invention therefore advantageously distinguishes those files more effective in ensuring continued usage of HbbTV applications when access to the Internet is not possible. Further, media files in association with a broadcast program and offered by the HbbTV service are recorded only when the broadcast program itself is also recorded. These additional files within the HbbTV media library will be accessible during offline usage.

[0026] In summary, the present invention proposes an image display device for receiving a plurality of broadcasting and broadband services from service providers, the image display device being fitted with an internal or external storage medium and comprising an electronic control unit effectuating operation of the image display device.

[0027] In one embodiment of the present invention, the electronic control unit is configured to receive Hybrid Broadcast Broadband TV (HbbTV) contents of different channels obtainable from a service provider, said electronic control unit being further configured to operate in cooperation with a dynamic content management utility effectuating operation of the image display device in the manner that channel-specific HbbTV contents are processed to distinguish application-based metadata contents from media contents that include video or audio streams on a channel-specific basis.

[0028] In a further embodiment of the present invention, the dynamic content management utility defines a first class of HbbTV content in direct association with channel-specific applications being accessed.

[0029] In a further embodiment of the present invention, the dynamic content management utility defines a second class of HbbTV content in direct association with channel-specific media content containing video and audio files.

[0030] In a further embodiment of the present invention, the content management utility selectively stores the first class of HbbTV content being accessed in the form of channel-specific HbbTV applications together with associated application metadata content on the internal or external storage medium.

[0031] In a further embodiment of the present invention, application metadata content being stored on a channel-specific basis contains dynamically updated metadata content of applications including weather forecast data, road traffic data, sporting events results or stock market data applications.

[0032] In a further embodiment of the present invention, the content management utility selectively stores the second class of HbbTV content being accessed in the form of channel-specific HbbTV media content only if a broadcast program on a currently viewed channel is also recorded.

[0033] In a further embodiment of the present invention, the main page of a

predetermined channel's HbbTV service is linked to a general applications page of the image display device whereby HbbTV applications are viewable and directly reachable independently from the main page of the channel-specific HbbTV service.

[0034] In a further embodiment of the present invention, the predetermined channel whose HbbTV service applications are directly reachable on the general applications page of the image display device is separately configurable.

[0035] In a further embodiment of the present invention, the storage medium's content is effectively reached during offline use of the HbbTV applications or during replaying of a recorded broadcast program.

[0036] In a further embodiment of the present invention, recorded application metadata content in association with an HbbTV application is replaced by an updated version thereof as soon as Internet access is available.

[0037] In a further embodiment of the present invention, recorded application metadata content replaces dynamically downloaded application metadata content during offline use.

[0038] In a further embodiment of the present invention, recorded second class of HbbTV content in the form of channel-specific HbbTV media content is maintained until such files are deleted.

[0039] The present invention provides a system by which an image display device is operated such that users are also offered offline HbbTV service and are able to access to the same during Internet interruption. The present invention ensures that stored data conveniently allows offline use of the embedded HbbTV applications.

Claims

1. An image display device for receiving a plurality of broadcasting and broadband services from service providers, the image display device being fitted with an internal or external storage medium and comprising an electronic control unit effectuating operation of the image display device, **characterized in that**

   the electronic control unit is configured to receive Hybrid Broadcast Broadband TV (HbbTV) contents of different channels obtainable from service providers, said electronic control unit being further configured to operate in cooperation with a dynamic content management utility effectuating operation of the image display device in the manner that channel-specific HbbTV contents are processed to distinguish application-based metadata contents from media contents that include video or audio streams on a channel-specific basis.
2. An image display device as in Claim 1, **characterized in that** the dynamic content management utility defines a first class of HbbTV content in the form of channel-specific applications being accessed.
3. An image display device as in Claim 2, **characterized in that** the dynamic content management utility defines a second class of HbbTV content in the form of channel-specific media content containing video and audio files.
4. An image display device as in Claim 2 and 3, **characterized in that** the content management utility selectively stores the first class of HbbTV content being accessed in the form of channel-specific HbbTV applications together with associated application metadata content on the internal or external storage medium.
5. An image display device as in Claim 4, **characterized in that** application metadata content being stored on a channel-specific basis contains dynamically updated metadata content of applications including weather forecast data, road traffic data, sporting events results or stock market data applications.
6. An image display device as in Claim 2 and 3, **characterized in that** the content management utility selectively stores the second class of HbbTV content being accessed in the form of channel-specific HbbTV media content only if a broadcast program on a currently viewed channel is also recorded.

7. An image display device as in Claim 2 or 3, **characterized in that** the main page of a predetermined channel's HbbTV service is linked to a general applications page of the image display device whereby HbbTV applications are viewable and directly reachable independently from the main page of the channel-specific HbbTV service.
8. An image display device as in Claim 7, **characterized in that** the predetermined channel whose HbbTV service applications are directly reachable on the general applications page of the image display device is separately configurable.
9. An image display device as in Claim 4 or 6, **characterized in that** the storage medium's content is effectively reached during offline use of the HbbTV applications or during replaying of a recorded broadcast program.
10. An image display device as in Claim 9, **characterized in that** recorded application metadata content in association with an HbbTV application is replaced by an updated version thereof as soon as Internet access is available.
11. An image display device as in Claim 9 or 10, **characterized in that** recorded application metadata content replaces dynamically downloaded application metadata content during offline use.
12. An image display device as in Claim 9, **characterized in that** recorded second class of HbbTV content in the form of channel-specific HbbTV media content is maintained until such files are deleted.

Fig. 1

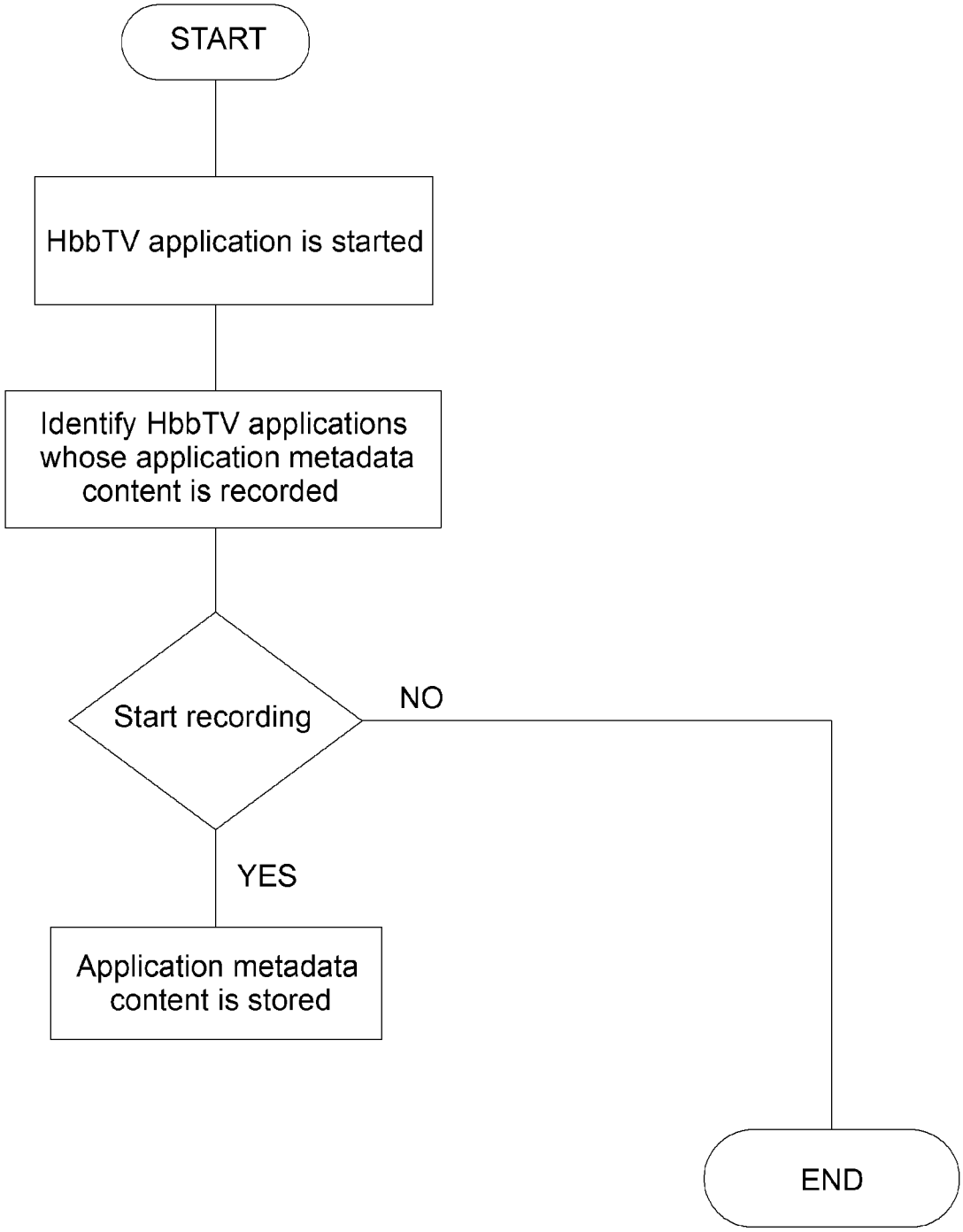
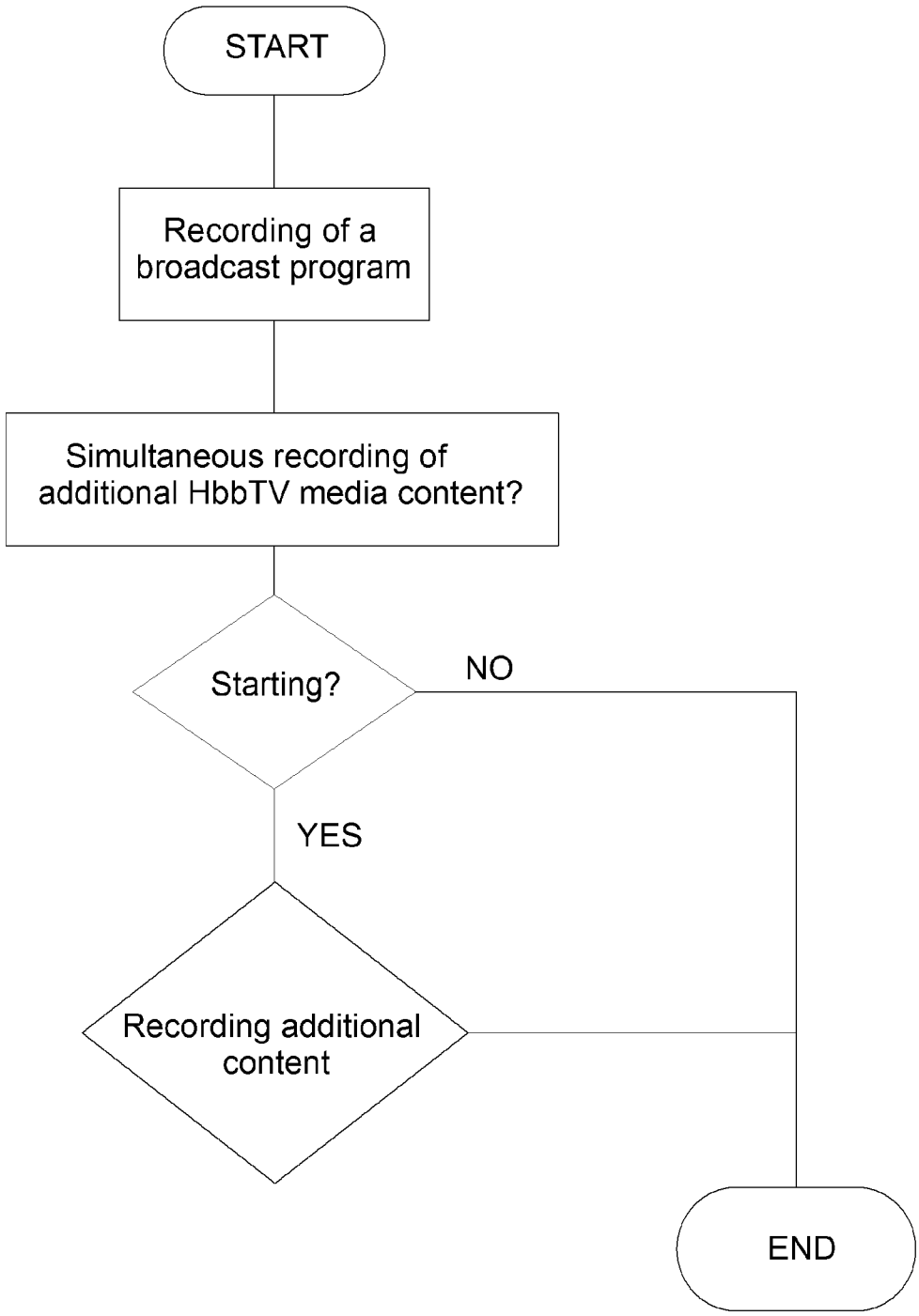

START
HbbTV application is started
Identify HbbTV applications whose application metadata content is recorded
Start recording
NO
YES
Application metadata content is stored
END

Fig. 2


START
Recording of a broadcast program
Simultaneous recording of additional HbbTV media content?
Starting?
NO
YES
Recording additional content
END

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/075945

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04N21/426 H04N21/435 H04N21/442 H04N21/478 H04N21/488
H04N21/61
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	PECNIK KIEMEN ET AL: "Extending the HbbTV standard for advanced services - Tackling the digital di", 2014 9TH INTERNATIONAL SYMPOSIUM ON COMMUNICATION SYSTEMS, NETWORKS & DIGITAL SIGN (CSNDSP), IEEE, 23 July 2014 (2014-07-23), pages 531-535, XP032660570, DOI: 10.1109/CSNDSP.2014.6923886 [retrieved on 2014-10-14] the whole document -----	1-12
A	US 2001/054182 A1 (LODOLA PATRICK [FR]) 20 December 2001 (2001-12-20) the whole document -----	1-12
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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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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
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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/EP2015/075945

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 2 693 765 A2 (SAMSUNG ELECTRONICS CO LTD [KR]) 5 February 2014 (2014-02-05) the whole document -----	1-12
A	EP 2 528 339 A2 (LG ELECTRONICS INC [KR]) 28 November 2012 (2012-11-28) abstract -----	1-12

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2015/075945

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