



(51) International Patent Classification:

H04N 21/431 (2011.01) G09G 5/38 (2006.01)
H04N 21/45 (2011.01) H04N 5/45 (2011.01)
G06F 3/0482 (2013.01) H04N 21/422 (2011.01)
G09G 5/14 (2006.01) H04N 21/435 (2011.01)
G09G 5/373 (2006.01) H04N 21/84 (2011.01)
G09G 5/377 (2006.01)

(21) International Application Number:

PCT/EP2021/079799

(22) International Filing Date:

27 October 2021 (27.10.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

20306341.7 06 November 2020 (06.11.2020) EP

(71) Applicant: **INTERDIGITAL CE PATENT HOLDINGS, SAS** [FR/FR]; 3 rue du Colonel Moll, 75017 Paris (FR).

(72) Inventors: **MARQUANT, Gwenaelle**; c/o Interdigital, 975, avenue des Champs Blancs, CS 17616, 35576 CESSON-SEVIGNE (FR). **SCHMOUKER, Philippe**; c/o Interdigital, 975, avenue des Champs Blancs, CS 17616, 35576 CESSON-SEVIGNE (FR). **POREE, Corinne**; c/o Interdigital, 975, avenue des Champs Blancs, CS 17616, 35576 CESSON-SEVIGNE (FR).

(74) Agent: **INTERDIGITAL**, 975, avenue des Champs Blancs, 35576 CESSON-SEVIGNE (FR).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(54) Title: METHOD AND DEVICE FOR DISPLAYING ON A DISPLAY SCREEN GRAPHICAL INLAYS INSERTED IN A VIDEO STREAM

250

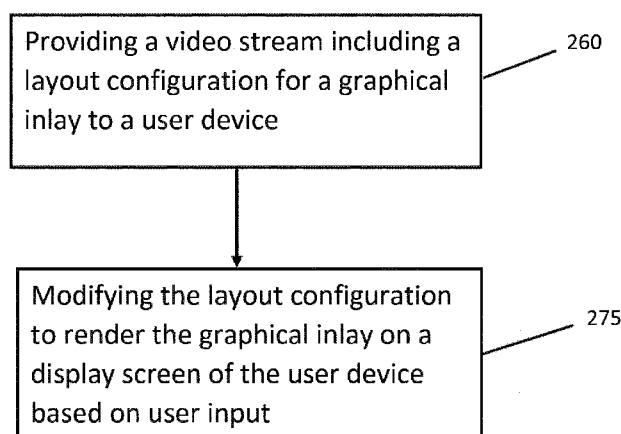


FIG. 3

(57) Abstract: A method and a device for displaying graphical inlays inserted in a video stream on a display screen is disclosed. A video stream including a layout configuration for a graphical inlay is provided to a device. The layout configuration is modified to render the graphical inlay on the display screen of the device based on user input. The user can personally arrange which graphical inlays are displayed on the display screen as well as in user defined positions.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

METHOD AND DEVICE FOR DISPLAYING ON A DISPLAY SCREEN GRAPHICAL INLAYS INSERTED IN A VIDEO STREAM

TECHNICAL FIELD

5 The present disclosure generally relates to audiovisual production and/or consumption applications. At least one embodiment relates to graphical inlays inserted in video frames.

BACKGROUND

10 Graphical inlays may contain objects of many different types, such as, for example, logos or other types of graphics, as well as numbers and/or text. Graphical inlays including such objects are typically inserted as banners in video frames by a producer/director or by the content owner in order to provide useful information to viewers during a live broadcast of a television program and/or a sporting event.

15 However, the accumulation of such banners inserted in the video frame takes up a lot of space on the display screen and not all of the information provided in the banners is of interest to everyone. For instance, in addition to the basis video, the useful information may include, for example, titles, the names/title of people speaking, channel logos, streaming stock market quotes, advertising for an upcoming program, a rolling strip with additional news and weather forecast for multiple locations, etc.

20 In this regard, the insertion of graphical inlays in a video frame can undesirably reduce the size of the video to be displayed to the viewer, and sometimes hide parts of the video that the user would like to see. The embodiments herein have been devised with the foregoing in mind.

25 SUMMARY

 The disclosure is directed to a method for displaying on a display screen graphical inlays inserted in a video stream. The method may take into account implementation on devices, such as, for example, mobile phones, tablets, set-top boxes, head mounted displays (HMD) and digital televisions.

According to a first aspect of the disclosure, there is provided a method, comprising: receiving a video stream including a layout configuration for a graphical inlay to a device; and modifying the layout configuration to render the graphical inlay on a display screen of the device based on user input.

5 The general principal of the proposed solution relates to configuring graphical inlays on a display screen of a device, which are provided to the device in a video stream according to the user's preference. As such, the user can personally arrange which graphical inlays are displayed on the display screen and in the positions he/she designates.

10 In an embodiment, modifying the layout configuration includes one of modifying a size of the rendered graphical inlay on the display screen and modifying a position of the rendered graphical inlay on the display screen.

 In an embodiment, modifying the layout configuration includes not rendering the graphical inlay on the display screen.

15 In an embodiment, modifying the layout configuration includes modifying the content of the graphical inlay.

 In an embodiment, modifying the layout configuration includes adding content to the graphical inlay.

 In an embodiment, the provided video stream further includes one or more optional video streams.

20 In an embodiment, the layout configuration includes pre-defined areas for rendering the graphical inlay on the display screen.

 In an embodiment, a selection menu details available graphical inlays for rendering on the display screen.

25 In an embodiment, a selection menu details graphical inlays for rendering in pre-defined areas on the display screen.

 In an embodiment, the graphical inlays are received in addition to the video stream in a global multiplex video bitstream.

According to a second aspect of the disclosure, there is provided a device, comprising a display screen and at least one processor. The at least one processor is configured to: receive a video stream including a layout configuration for a graphical inlay to a device; and modify the layout configuration to render the graphical inlay on a display screen of the device based on user input.

In an embodiment, modifying the layout configuration includes one of modifying a size of the rendered graphical inlay on the display screen and modifying a position of the rendered graphical inlay on the display screen.

In an embodiment, modifying the layout configuration includes not rendering the graphical inlay on the display screen.

In an embodiment, modifying the layout configuration includes modifying the content of the graphical inlay.

In an embodiment, modifying the layout configuration includes adding content to the graphical inlay.

In an embodiment, the provided video stream further includes one or more optional video streams.

In an embodiment, the layout configuration includes pre-defined areas for rendering the graphical inlay on the display screen.

In an embodiment, a selection menu details available graphical inlays for rendering on the display screen.

In an embodiment, a selection menu details graphical inlays for rendering in pre-defined areas on the display screen.

In an embodiment, the graphical inlays are received in addition to the video stream in a global multiplex video bitstream.

Some processes implemented by elements of the disclosure may be computer implemented. Accordingly, such elements may take the form of an entirely hardware embodiment, an entirely software embodiment (including firmware, resident software, microcode, etc.) or an embodiment combining software and hardware aspects that may all generally be referred to herein as “circuit”, “module” or “system”. Furthermore, such elements

may take the form of a computer program product embodied in any tangible medium of expression having computer useable program code embodied in the medium.

Since elements of the disclosure can be implemented in software. The present disclosure can be embodied as computer readable code for provision to a programmable apparatus on any suitable carrier medium. A tangible carrier medium may comprise a storage medium such as a floppy disk, a CD-ROM, a hard disk drive, a magnetic tape device or a solid-state memory device and the like. A transient carrier medium may include a signal such as an electrical signal, an optical signal, an acoustic signal, a magnetic signal or an electromagnetic signal, e.g., a microwave or RF signal.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features and advantages of embodiments shall appear from the following description, given by way of indicative and non-exhaustive examples and from the appended drawings, of which:

FIG. 1 is an exemplary system for displaying graphical inlays on a display screen based on a user's preferences;

FIG. 2 shows an exemplary video frame including several graphical inlays;

FIG. 3 is a flowchart of a particular embodiment of a proposed method for displaying graphical inlays inserted in a video stream;

FIG. 4 is an illustration depicting broadcast/broadband video content provided to an end-user;

FIG. 5 depicts an illustration of an exemplary user interface which may be used to implement the exemplary embodiment of the disclosure;

FIG. 6 depicts an illustration of exemplary user input to the exemplary user interface shown in FIG. 5;

FIG. 7 depicts an illustration showing a list of available content modifications available to a user when one exemplary area shown in FIG. 6 is selected;

FIG. 8 depicts an illustration showing a list of available content modifications available to a user when another exemplary area shown in FIG. 6 is selected; and

FIG. 9 depicts an illustration showing a list of available content modifications available to a user when yet another exemplary area shown in FIG. 6 is selected.

DETAILED DESCRIPTION

5 FIG. 1 illustrates an exemplary apparatus for displaying graphical inlays inserted in a video stream according to an embodiment of the disclosure. FIG. 1 illustrates a block diagram of an exemplary system 100 in which various aspects of the exemplary embodiments to be implemented. The system 100 may include front-end 110, back-end 120 and broadcast/broadband medium 130.

10 Back-end 120 includes at least one processor 124 configured for storing and producing/editing video and a video encoder 128. Processor 124 may include editing software that is configured to insert graphical inlays including objects such as, for example, the names/title of people speaking, channel logos, streaming stock market quotes, advertising for upcoming programs, a rolling strip with additional news and/or a weather forecast for multiple
15 locations, as discussed below. The video encoder 128 converts the produced/edited video frames to a compressed format suitable to be broadcast.

 The processor 124 may include embedded memory (not shown), an input-output interface (not shown), and various other circuitries as known in the art. Program code may be loaded into processor 124 to perform the various processes described hereinbelow.

20 Alternatively, back-end 120 may also include at least one memory (e.g., a volatile memory device, a non-volatile memory device) which stores program code to be loaded into the processor 120 for subsequent execution. Back-end 120 may additionally include a storage device (not shown), which may include non-volatile memory, including but not limited to EEPROM, ROM, PROM, RAM, DRAM, SRAM, flash, magnetic disk drive, and/or optical
25 disk drive. The storage device may comprise an internal storage device, an attached storage device, and/or a network accessible storage device, as non-limiting examples.

 Back-end 120 is coupled to broadcast/broadband medium 130. The encoded produced/edited video frames are transmitted to front-end 110 via broadcast/broadband medium 130.

Front-end 110 includes a video decoder 112, at least one processor 116 configured to implement an end user application and a user interface/display 118.

The video decoder 112 converts the encoded produced/edited video frames transmitted via broadcast/broadband medium 130 to a decompressed format. The decoded video frames are provided to processor 116. Processor 116 in conjunction with the user interface/display 118 may be configured to implement the user preferences for displaying graphical inlays.

Referring to FIG. 2, an exemplary decompressed video frame 200 is shown. Video frame 200 includes graphical inlays 225, 230, 235, 240 and 245. The graphical inlays 225, 230, 235, 240, 245 are inserted in the produced/edited video frames prior to encoding and transmission. The graphical inlays as shown in FIG. 2, for example, include a rolling news strip 225, channel logo 235, an advertisement for an upcoming program 240 and current program information/commentary 230, 245.

The general principal of the proposed solution relates to modifying a configuration file for graphical inlays on a display screen of a device according to the user's preference. The configuration file is provided along with the video to the user device. As such, the user can personally arrange which graphical inlays are displayed on the display screen and in the positions he/she designates.

FIG. 3 is a flowchart of a particular embodiment of a proposed method 250 for displaying graphical inlays inserted in a video stream. In this particular embodiment, the method 250 includes two consecutive steps 260 to 275.

In the exemplary implementation, the method is carried out by front-end device 110 (FIG. 1). As described in step 260, a video stream is provided to the front-end device 110. The video stream includes a layout configuration file for a graphical inlay (banner).

FIG. 4 shows an exemplary illustration depicting broadcast/broadband video content provided to an end-user. The video content includes the video with compulsory logos 315, along with a layout configuration file 325, graphical inlays (banners) 335. Optional video streams may also be included with the graphical inlays 335.

At the front-end 110, the video decoder 112 of FIG. 2, decodes the received video stream 315 with both the layout configuration file 325 and graphical inlays (banners) 335 for rendering on the display 118. The layout configuration file 325 specifies where in a video frame the graphical inlays (banners) are rendered. An original layout file renders the graphical inlays

(banners) 345 as received from the back-end 120 (FIG. 1), without any user input. The layout configuration file may also be device dependent and/or device adaptive. In one exemplary embodiment, a specific layout configuration file may be available with a mobile phone, digital television when purchased and/or available as an upgrade to such device firmware.

5 Referring again to FIG. 3 at step 275, the layout configuration is modified to render the graphical inlay on a display screen of the user device based on user input. FIG. 4 depicts views 355, 365 modified based on user input. In view 355, the user display includes an additional graphical inlay (banner) 360. In view 365, the user display includes an additional video stream 370 shown in a split screen format with the original broadcast/broadband content.

10 FIG. 5 shows an exemplary user interface which may be used to implement the exemplary embodiment of the disclosure. Many user devices include a user interface that has enhancements to process the picture and video rendered on the display screen. In one exemplary embodiment, in the display settings menu 410, under picture mode 420, an additional feature 430 may be added to the menu to allow the user to arrange how the graphical
15 inlays (banners) are rendered based on user input (MY_preferred_display).

FIG. 6 depicts an illustration 600 of user input to the exemplary user interface shown in FIG. 5. Once the user has selected the additional option 430 ("MY_preferred_display"), in one exemplary embodiment, the display screen depicted to the user is a screen with areas having a solid outline 610 or a dashed outline 620, 640. The area with the solid outline 610 is
20 the active area. The areas with the dashed outlines 620 are not active. In one exemplary embodiment, the user may browse from one area to another using arrow keys on remote control 630, or another browsing solution. The user may select an area by pressing enter on the remote control 630, for example. Each area 610, 620, 640 corresponds to areas for which the layout configuration may be modified.

25 Referring to FIG. 7, after the user has selected an area 610 using the remote control a selection menu 710 appears. The selection menu 710 displays on the screen a list of content that may be modified and/or rendered in this position on the display of the user device. The user may toggle through the list to view and/or select from the list of content options available for this area of the display. If the user input is to not select any content for display he/she may
30 select "none".

Referring to FIG. 8, after the user has selected an area 620 using the remote control a selection menu 810 appears. The selection menu 810 displays on the screen a list of content

that may be modified and/or rendered in this position on the display of the user device. The user may toggle through the list to view and/or select from the list of content options available for this area of the display. If the user input is to not select any content for display he/she may select “none”.

5 Referring to FIG. 9, after the user has selected an area 640 using the remote control a selection menu 910 appears. The selection menu 910 displays on the screen a list of content that may be modified and/or rendered in this position on the display of the user device. The user may toggle through the list to view and/or select from the list of content options available for this area of the display. If the user input is to not select any content for display he/she may
10 select “none”.

In another exemplary embodiment, the user interface may interact with the user to initially select data he/she would like to display. Once such data has been selected by the user then the user interface proposes available positions for rendering such data on the display.

In another exemplary embodiment, the user interface may interact with the user to
15 initially select data he/she would like to display. Once such data has been selected by the user then the user may select the format (e.g., position, size, font, font size, etc.) for rendering such data on the display. Default settings may also be proposed.

In another exemplary embodiment, the user interface may propose some pre-set configurations, or optionally the user can register personalized pre-sets with the device.

20 In another exemplary embodiment, the user may save their preferences for a given channel or program for a next viewing.

In another exemplary embodiment, the user may active/deactivate all or part of the rendered graphical inlays on the display using one button on a remote control device.

The graphical inlays which may include text may be embedded at the back end 120
25 (FIG. 1) in DVB and HbbTV dedicated tables/data (either specific or private) and HbbTV applications while broadcasting or broadbanding video content.

Although the present embodiments have been described hereinabove with reference to specific embodiments, the present disclosure is not limited to the specific embodiments, and modifications will be apparent to a skilled person in the art which lie within the scope of the
30 claim.

Many further modifications and variations will suggest themselves to those versed in the art upon making reference to the foregoing illustrative embodiments, which are given by way of example only and which are not intended to limit the scope of the invention, that being determined solely by the appended claims. In particular, the different features from different
5 embodiments may be interchanged, where appropriate.

CLAIMS

1. A method, comprising:

receiving a video stream including a layout configuration for a graphical inlay

5 to a device; and

modifying the layout configuration to render the graphical inlay on a display

screen of the device based on user input.

2. A device, comprising:

10 a display screen; and

at least one processor, configured to:

receive a video stream including a layout configuration for a graphical
inlay; and

15 modify the layout configuration to render the graphical inlay on the
display screen based on user input.

3. The method of claim 1, or the device of claim 2, wherein modifying the layout

configuration includes one of modifying a size of the rendered graphical inlay on the display
screen and modifying a position of the rendered graphical inlay on the display screen.

20

4. The method of any one of claims 1 and 3, or the device of any one of claims 2-3,

wherein modifying the layout configuration includes not rendering the graphical inlay on the
display screen.

25 5. The method of any one of claims 1 and 3-4, or the device of any one of claims 2-4,

wherein modifying the layout configuration includes modifying the content of the graphical
inlay.

6. The method of any one of claims 1 and 3-5, or the device of any one of claims 2-5, wherein modifying the layout configuration includes adding content to the graphical inlay.

5 7. The method of any one of claims 1 and 3-6, or the device of any one of claims 2-6, wherein the provided video stream further includes one or more optional video streams.

8. The method of any one of claims 1 and 3-7, or the device of any one of claims 2-7, wherein the layout configuration includes pre-defined areas for rendering the graphical inlay
10 on the display screen.

9. The method of any one of claims 1 and 3-8, or the device of any one of claims 2-8, wherein a selection menu details available graphical inlays for rendering on the display screen.

15 10. The method of claim 7, or the device of claim 7, wherein a selection menu details graphical inlays for rendering in pre-defined areas on the display screen.

11. The method of any one of claims 1 and 3-9, or the device of any one of claims 2-9, wherein the graphical inlays are received in addition to the video stream in a global multiplex
20 video bitstream.

12. A computer program product comprising instructions which when executed cause a processor to implement the method of any one of claims 1 and 3-9.

25

1/9

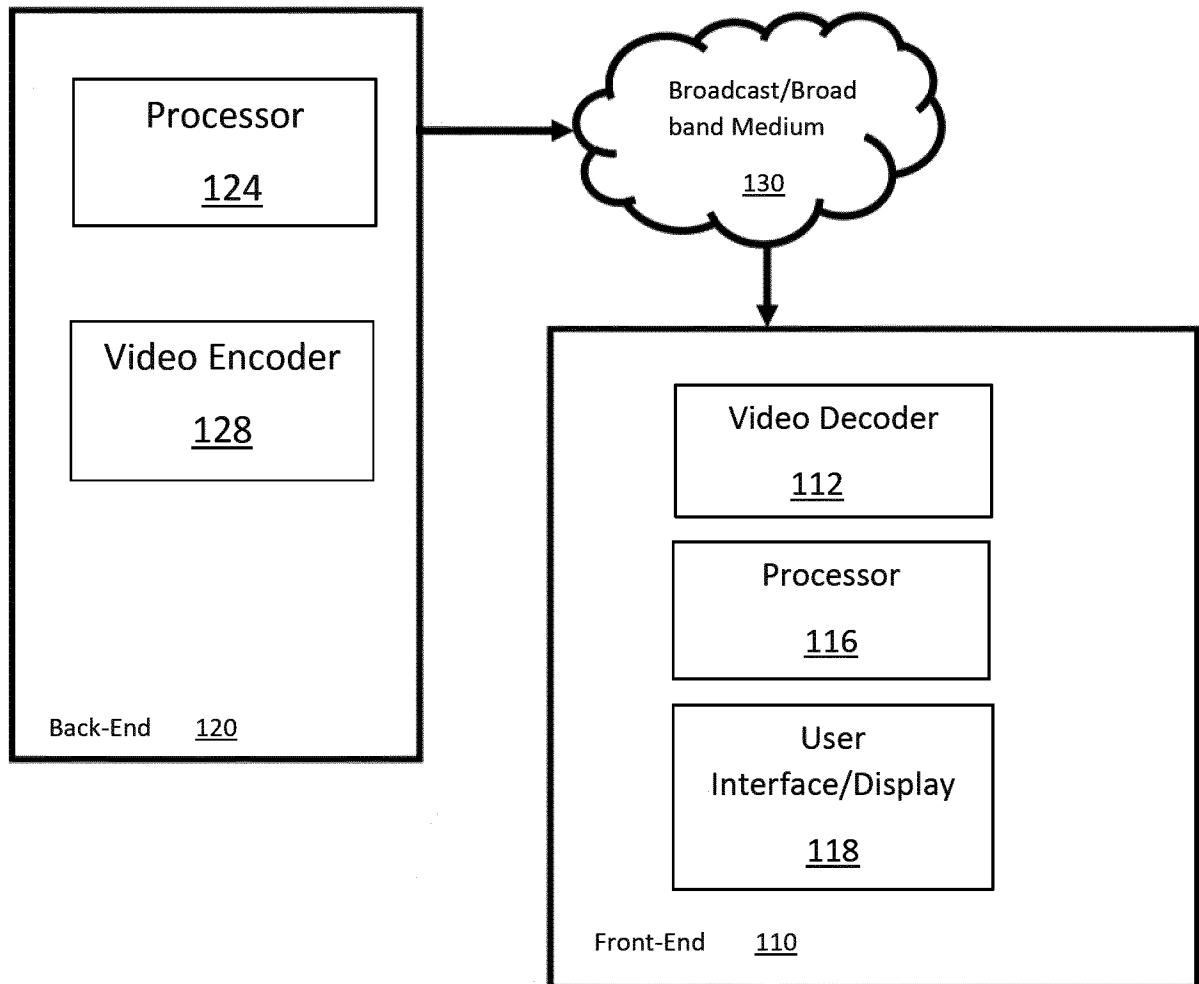
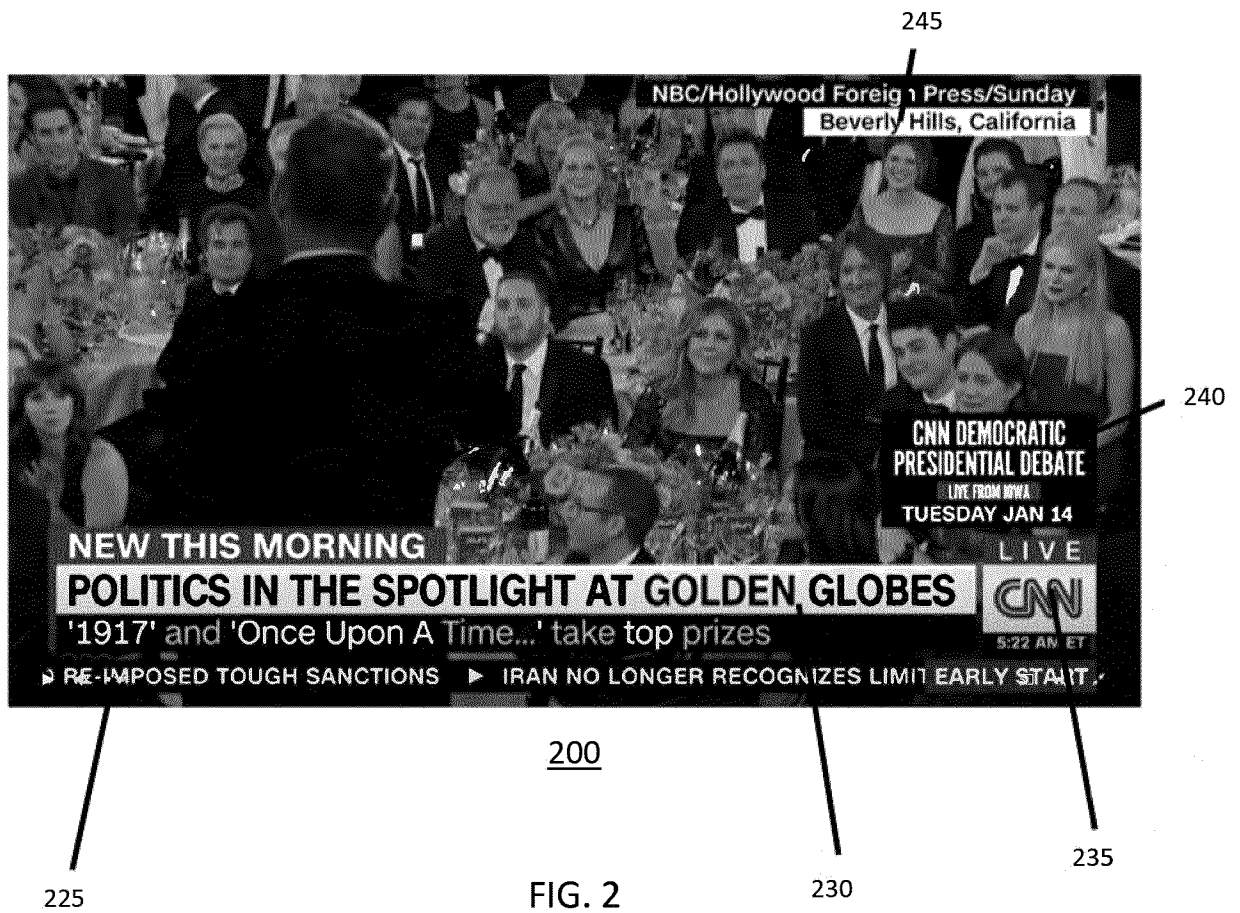
100

FIG. 1

2/9



3/9

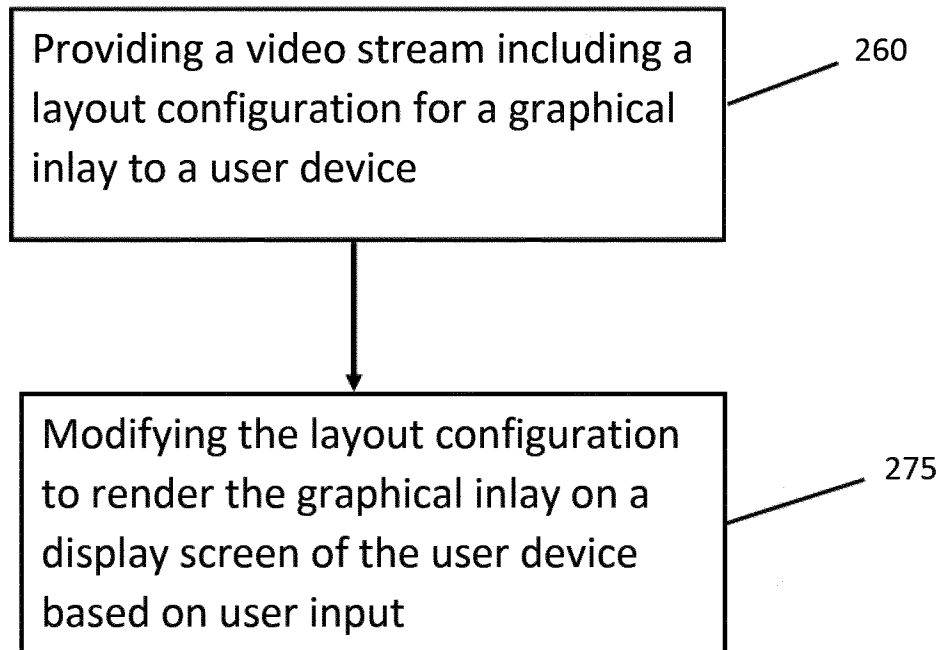
250

FIG. 3

4/9

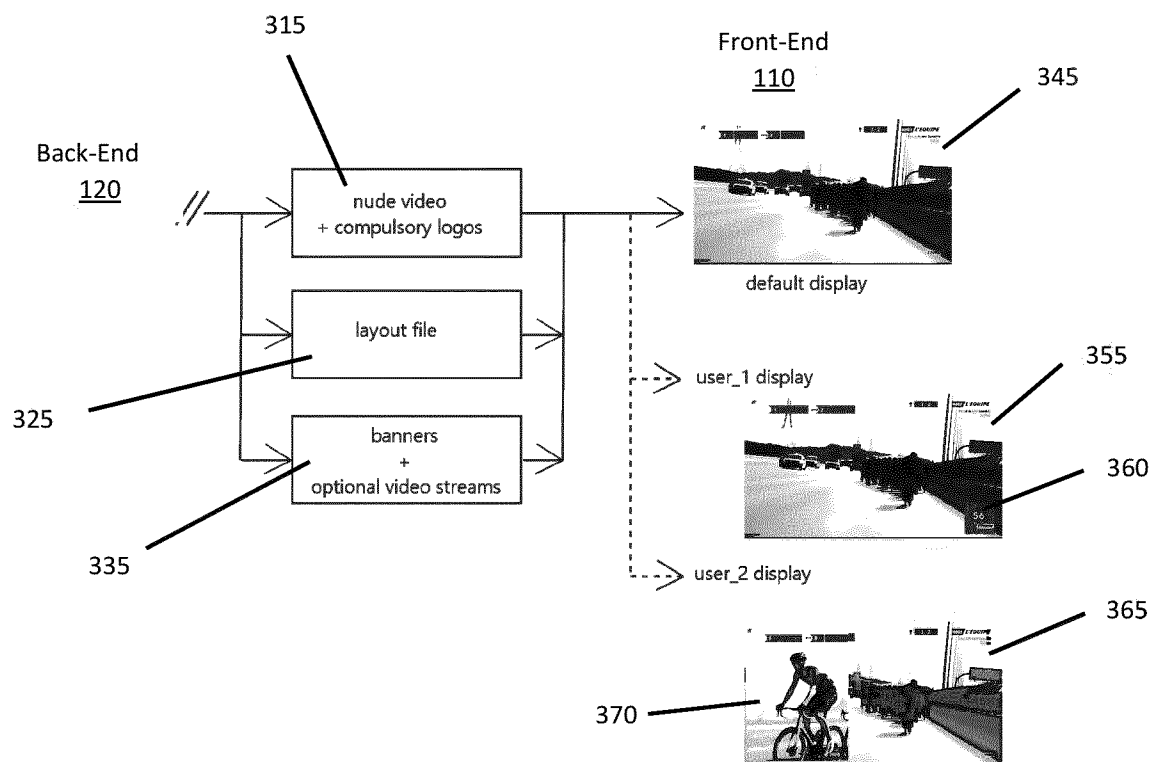


FIG. 4

5/9

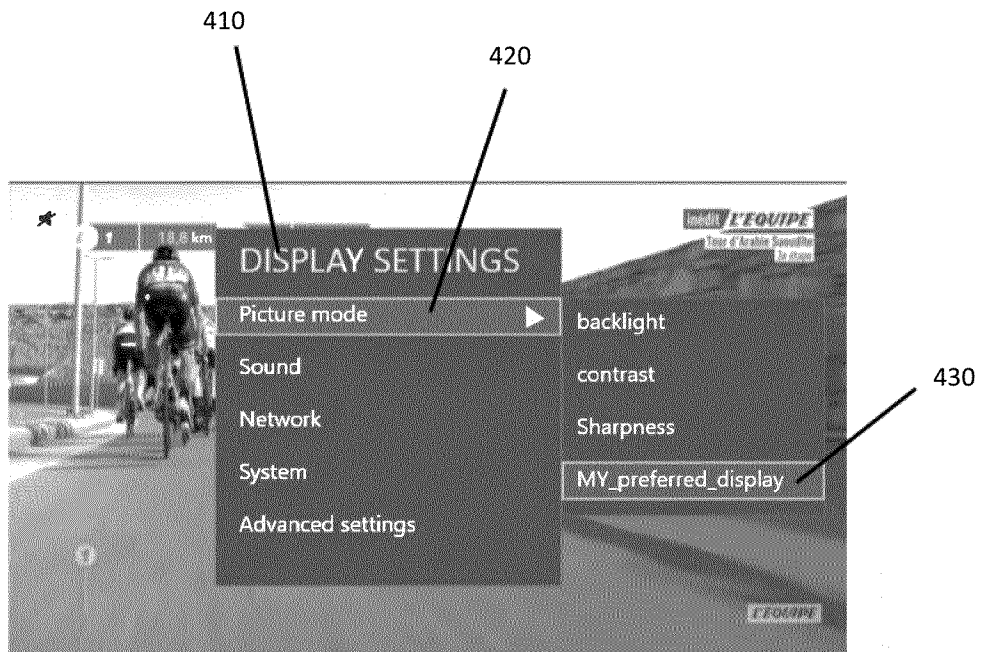


FIG. 5

6/9

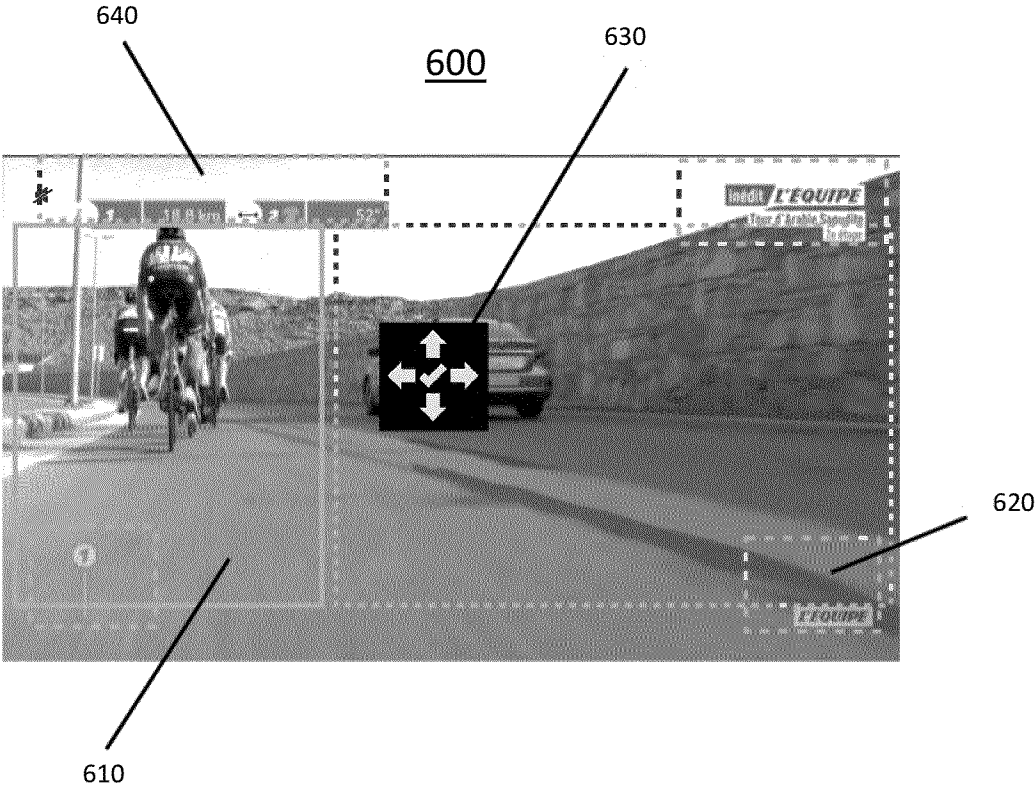


FIG. 6

7/9

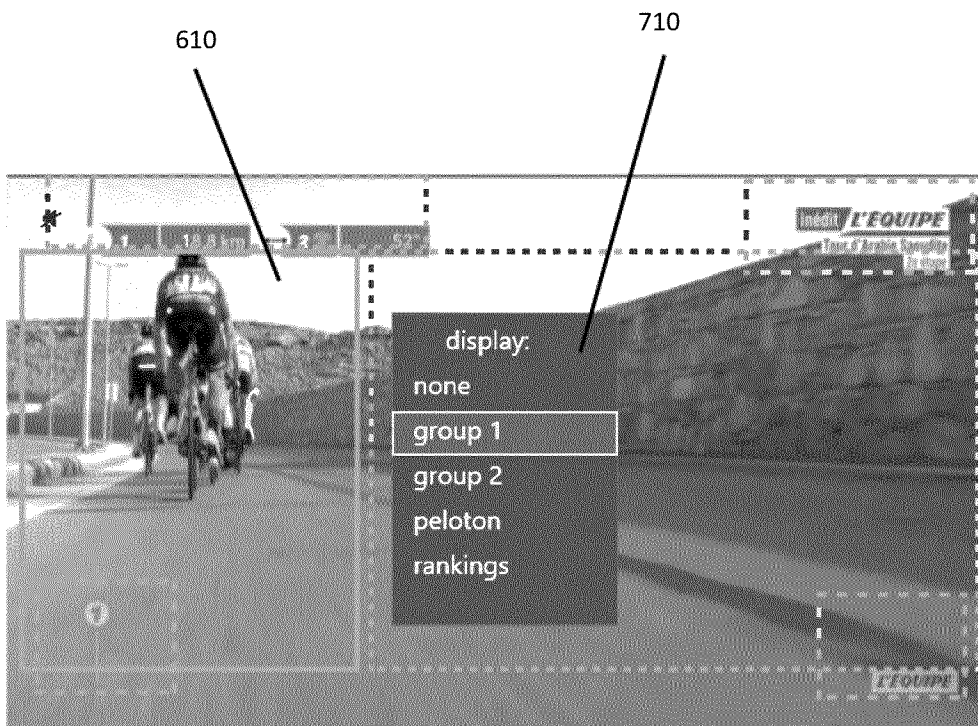


FIG. 7

8/9

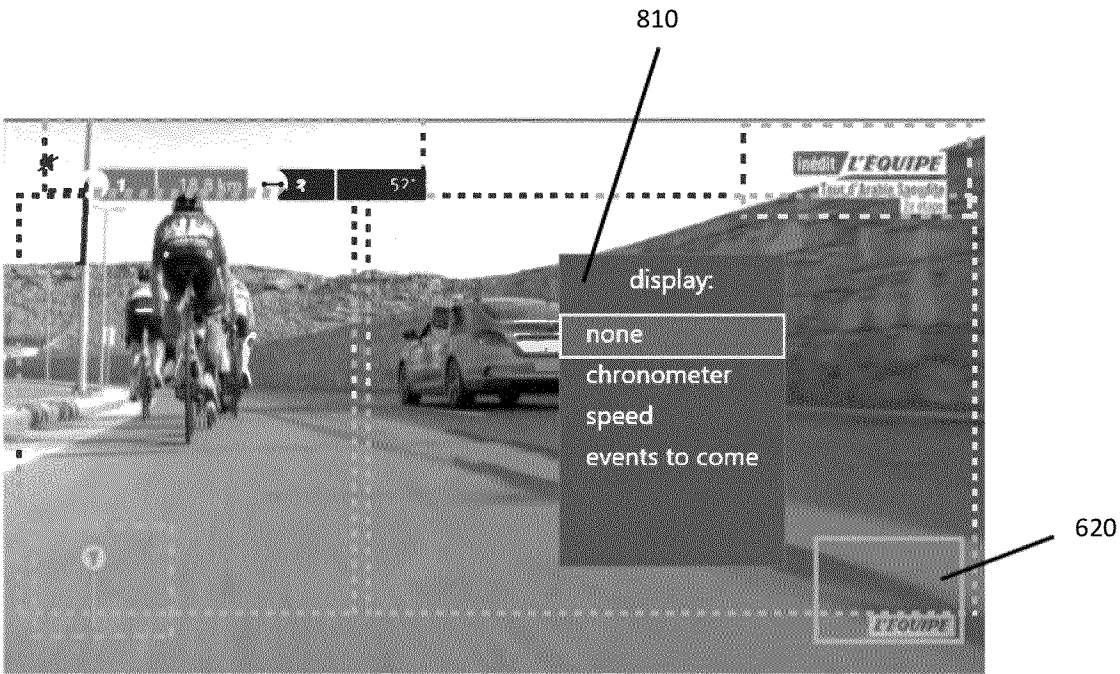


FIG. 8

9/9

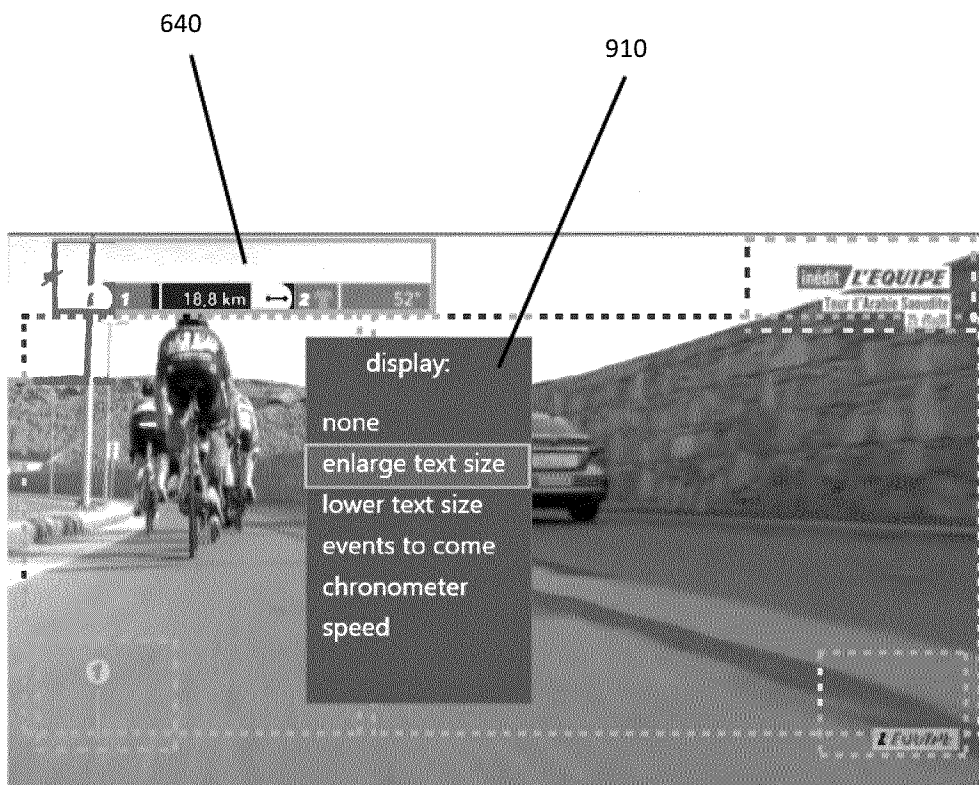


FIG. 9

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2021/079799

A. CLASSIFICATION OF SUBJECT MATTER INV. H04N21/431 H04N21/45 G06F3/0482 G09G5/14 G09G5/373 G09G5/377 G09G5/38 H04N5/45 H04N21/422 H04N21/435 H04N21/84		
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 G06F G09G		
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 7 788 690 B2 (CANON KK [JP]) 31 August 2010 (2010-08-31) column 4, line 1 - column 25, line 32 figures 1-3, 12, 22-25 -----	1-4, 6-12
X	WO 2008/020426 A1 (NDS LTD [GB]; LANSDOWN-BRIDGE ELLIOTT [GB] ET AL.) 21 February 2008 (2008-02-21) page 3, line 1 - page 29, line 29 page 45, line 23 - page 46, line 19 figure 11 -----	1, 2, 5, 12
☐ Further documents are listed in the continuation of Box C. ☒ 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 "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance;; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance;; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 25 January 2022		Date of mailing of the international search report 10/02/2022
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Etienne, Christophe

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2021/079799

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 7788690	B2	31-08-2010	EP 1018840 A2	12-07-2000
			US 2006282865 A1	14-12-2006
			US 2006282874 A1	14-12-2006

WO 2008020426	A1	21-02-2008	NONE	
