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PROVIDING SUPPLEMENTAL CONTENT, SERVICES AND APPLICATIONS RESPECTIVE OF A VIDEO OBJECT WITHIN A VIDEO CONTENT TO THE VIEWER OF THE VIDEO CONTENT

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FIELD OF THE DISCLOSED TECHNIQUE

The disclosed technique relates to providing supplemental content, services and applications to a viewer of a video content, in general, and to methods and systems for providing supplemental content services, and applications respective of a video object within the video content to the viewer of the video content, in particular.

BACKGROUND OF THE DISCLOSED TECHNIQUE

Video stream is a sequence of still images (i.e., frames) representing scenes in motion. The video stream is accompanied by a corresponding (i.e., synchronized) audio stream. It is noted that the audio stream can include a plurality of channels. For example the audio stream includes the soundtrack of a movie and the sounds of the scenes and characters. The video stream and the corresponding audio stream are defined herein below as video content. Broadcasting is the distribution of video content to a client premises via transmission media, such as cables, satellite, terrestrial transmitters and the like.

Reference is now made to Figure 1, which is a schematic illustration of a system, generally referenced 10, for broadcasting video content to a client premises as known in the art. Broadcasting system 10 includes a content channel 12, a control and signaling channel 14 (control channel 14), a multiplexer 16, a broadcasting system 18, a Set Top Box (STB) 20 and a display 22. Content channel 12, control 14, multiplexer 16, and broadcasting system 18 are positioned at a central site away from

the client premises. Set Top Box (STB) 20 and display 22 are positioned within the client premises. Multiplexer 16 is coupled with content channel 12 and with control channel 14. Broadcasting system 18 is coupled between multiplexer 16 and STB 20. STB 20 is further coupled with display 22.

Content channel 12 provides video content (i.e., video stream and corresponding audio stream) such as a television show, a movie, a sports events and the like. Content channel receives the video content from a content provider, such as television networks (e.g., HBO), movie studios (e.g., MGM), and the like. It is noted that the video content can include advertisements in bended therein (i.e., linear advertising).

Control channel 14 provides control and signaling data respective of the content of content channel 12. The control and signaling data includes all data required for enabling broadcast transmission and playback of the respective content. For example, control and signalling data relates to the video content reception, provides video features (such as fast forward, rewind and pause), and provides additional infromation such an Electronic Program Guide (EPG). Multiplexer 16 receives a plurality of input signals, combines one or more of those signals and directs the combined signal to a selected line (i.e., outputs a combined signal).

Broadcasting system 18 broadcasts data, such as video content and control and signaling data, to a client premises. Broadcasting system 18 can employ satellite broadcast, terrestrial broadcast, cable broadcast, Internet broadcast, cellular broadcast, power line communication broadcast and the like. Broadcasting system 18 includes every unit and module, and performs every operation, which is required for the normal operation of broadcasting transmission. For example, broadcasting system 18 receives data (e.g., video content) to be transmitted. Broadcasting media 18 converts the data into a broadcast signal and

broadcasts the broadcast signal to a client premises. The term "broadcast" as detailed herein below, refers to and includes all the above broadcast related operations.

STB 20 is a processing device for receiving broadcasted data, processing it and accordingly producing video content signal appropriate for displaying via display device 22. It is noted that STB 20 can be any procssing device and is not limited to a set top box. For example, STB 20 can be a personal computer, a data streamer and the like. It is further noted that STB 20 can be embedded within display device 22.

Display device 22 performs playback of a video content (i.e., video and audio streams). Display device 22 can be for example, a cathode ray tube display, an LCD display, a plasma display, LED based display, a projector display. Display device 22 can be 2-dimensional or 3-dimensional display.

During operation of broadcasting system 10, content channel 12 provides video content to multiplexer 16. Control channel 14 provides control and signaling data respective of the video content to multiplexer 16. Multiplexer 16 multiplexes the video content and the respective control and signaling data. Multiplexer 16 provides the combined video-control and signaling data to broadcasting system 18.

Broadcasting system 18 produces a broadcast signal corresponding to the combined content-control and signaling data and broadcasts the broadcast signal to a host of client premises. At each of these client premises, STB 20 receives the broadcast signal. STB 20 processes the broadcast signal and accordingly produces a combined content-control and signaling data. STB 20 de-multiplexes the combined content-control and signaling data into content data and control and signaling data. STB 20 provides the video content to display 22 in accordance with the control and signaling data. Display 22 displays the video content. STB 20 can receive input from a viewer of display 22, such

as to present the EPG on display 22. The viewer employs a viewer input device, such as a remote control.

SUMMARY OF THE PRESENT DISCLOSED TECHNIQUE

It is an object of the disclosed technique to provide a novel method and system for providing supplemental content, services and applications respective of a video object within a video content to the viewer of the video content. In accordance with the disclosed technique, there is thus provided a method for providing supplemental content data respective of a selected video object within a video content to the viewer of the video content. The method includes the procedures of producing a supplemental content object, associating object identification number with a respective video object, transferring the supplemental content object, the tagging file and the video content to a client premises, presenting the video content to the viewer and presenting the supplemental content data to the viewer.

The supplemental content object relates to the video object. The supplemental content object includes the object identification number and a supplemental content data. The object identification number of the supplemental content object is associated with the respective video object within the video content by the tagging file. The supplemental content object is transferred to the client premises through a third data link. The tagging file is transferred to the client premises through a second data link. The video content is transferred to the client premises through a first data link. The supplemental content data is presented to the viewer according to viewer input. It is noted that the video content is not changed during any of the procedures of the method.

In accordance with another embodiment of the disclosed technique, there is thus provided a system for producing a supplemental content object respective of a video object within a video content and transferring the supplemental content object to a client premises. The system includes a video content source and a central content system. The video content source broadcasts the video content to the client

premises through a first data link. The central content system is coupled with the video content source. The video content source provides the video content to the central content system. The central content system includes a tagging producer and a supplemental content producer. The supplemental content producer produces the supplemental content object. The supplemental content object includes at least an object identification number and a supplemental content data. The tagging producer associates the object identification number of the supplemental content object with the respective video object within the video content and produces a tagging file. The tagging producer does not change the video content. The central content system transferring the tagging file to the client premises through a second data link. The central content system transferring the supplemental content object to the client premises through a third data link.

In accordance with a further embodiment of the disclosed technique there is thus provided a system for providing to a viewer of a video content supplemental content data respective of a selected video object within the video content. The system includes a local content managing system, a display device and a viewer interface. The local content managing system receives the video content, a tagging file and the supplemental content objects through a first data link, a second data link and a third data link, respectively. The supplemental content object includes at least an object identification number and the supplemental content data. The display device is coupled with the local content managing system. The display device receives the video content from the local content managing system. The display device presents the video content to the viewer. The viewer interface is coupled with the local content management system. The viewer interface enables the viewer to interact with the local content management system. The local content

management system presents the supplemental content data to the viewer according to input of the viewer.

BRIEF DESCRIPTION OF THE DRAWINGS

The disclosed technique will be understood and appreciated more fully from the following detailed description taken in conjunction with the drawings in which:

Figure 1 is a schematic illustration of a system, for broadcasting video content to a client premises as known in the art;

Figure 2 is a schematic illustration of a system, for producing supplemental content objects respective of video objects within a video content, constructed and operative in accordance with an embodiment of the disclosed technique;

Figure 3 is a schematic illustration of a system, for providing supplemental content object respective of a video object within a video content to a viewer of the video content, constructed and operative in accordance with another embodiment of the disclosed technique;

Figure 4 is a schematic illustration of a system, for producing supplemental content object respective of a video object within a video content, transferring the supplemental content object to client premises and providing the supplemental content data of the supplemental content object to a viewer of the video content, constructed and operative in accordance with a further embodiment of the disclosed technique;

Figure 5 is a schematic illustration of a system, for producing supplemental content object respective of a video object within a video content, transferring the supplemental content object to client premises and providing the supplemental content data of the supplemental content object to a viewer of the video content, constructed and operative in accordance with another embodiment of the disclosed technique;

Figure 6A is a schematic illustration of a video content frame, including a plurality of video objects, constructed and operative in accordance with a further embodiment of the disclosed technique;

Figure 6B is a schematic illustration of the video frame of Figure 6A, including an indication that supplemental content is available;

Figure 6C is a schematic illustration of the video frame of Figure 6A, including indications of video object for which supplemental content is available;

Figure 6D is a schematic illustration of the video frame of Figure 6A, including the supplemental content for a selected video object;

Figure 7 is a schematic illustration of a method for providing supplemental content respective of a video object within a video content to the viewer of the video content, operative in accordance with another embodiment of the disclosed technique; and

Figure 8 is which is a schematic illustration of a method for providing supplemental content respective of a video object within a video content to the viewer of the video content, operative in accordance with a further embodiment of the disclosed technique.

DETAILED DESCRIPTION OF THE EMBODIMENTS

The disclosed technique overcomes the disadvantages of the prior art by producing supplemental content object and associating the supplemental content object with respective video object within a video content without changing the video content. Then the video content and the supplemental content object are transferred to the client premises. Next, a viewer is presented with the video content and is indicated that supplemental content is available for the video content. According to viewer input, the viewer is presented with the supplemental content data.

The term "video object" as detailed herein below, relates to an object presented within a video content. The video object can be presented visually, auditory or both visually and auditory. That is, the video object can relate to an object of the video stream, an object of one of the audio streams, or a combination thereof. The term video object and the term original content object are employed interchangeably herein below.

The video object can relate to a visual object included in the video content itself, such as a character, a topographical feature, a product, and the like. Alternatively, the video object can relate to portions of the video content, such as a frame or a portion of a frame, a plurality of frames, a scene, a segment of the audio stream, and the like. Some examples of video objects which can be presented in the video content are a consumer product (e.g., shirt or car), a geographical place (e.g., lake or street), a manmade place (e.g., a building or bridge), a person, a work of art, a company, a song, and the like.

The term "supplemental content object" as detailed herein below, relates to data object which corresponds to a video object and supplements the video object with data and content. The supplemental content object includes at least an object identification number data field (object ID) and a supplemental content data field. The object ID is a

unique number assigned to each supplemental content object, which enables unambiguous identification of the supplemental content object.

The supplemental content data of the supplemental content object includes content which is related to the video object and which augments the experience of viewing the video content. The supplemental content can be visual (i.e., stills or video), auditory, a combination thereof, textual, a URL linking to additional supplemental content, and the like. In case of visual supplemental content, the supplemental content can be two-dimensional or three-dimensional. The supplemental content data can further relate to services and applications corresponding to the video object.

Listed herein are a few examples of supplemental content data. The supplemental content data can relate to shopping of a consumer product video object. That is, the viewer is offered the chance to purchase the consumer product presented as a video object or is directed to shops selling this consumer product. Alternatively, the viewer receives any information that may increase the chance of him purchasing the product, such as a link to a website, a shop phone number, a shop name or a shop address. The supplemental content data can relate to commercial activities other than shopping a consumer product, such as booking a flight, making reservations at a restaurant, booking an activity (e.g., flying a balloon), renting a car, and the like. The supplemental content data can relate to prize lotteries offered by the broadcaster for luring viewers. For example, the 10,000 viewer to click a pre-determined video object wins a prize. The supplemental content data can relate to information relating to the video object, such as the history of a building, biographical data of a person (e.g., an actor, a character, a singer performing a song in the soundtrack, and the like), technical specification of a consumer product, and the like. The supplemental content data can add entertainment value to the video content by providing, for example, a

puzzle relating to the video object or a video clip and the full version of songs in the soundtrack. The supplemental content data can relate to adaptation of the video content to certain audiences. The supplemental content data can provide subtitles for the video content or a portion thereof in a selected language. The supplemental content data can provide sign language interpretation of the verbal content of the video content. The supplemental content data can provide dubbing of the video content in different languages.

The supplemental content object may include additional data fields (i.e., in addition to the object ID and the supplemental content data), such as the name, the category and the digital signature of the video object, and the vendor supplying the product or the manufacturer of the product corresponding to the video object. The category of the video object relates to the type of video object (e.g., kitchen appliances, clothing artifacts, furniture, buildings, historical figures, characters or songs). The digital signature of the video object is data produced by employing audio and image processing techniques which enables audio and image processing systems to identify the object within the video content.

The term “video coordinates” as detailed herein below relates to the location of the video object within the video content. The video coordinates of the video object mark the location of the video object in a unique and unambiguous manner. The video coordinates include a timing coordinate and position coordinates. The timing coordinate details the timing of the appearance of the video object, such as the frame number or the elapsed time. For example, the video object appears on the 72nd frame or appears 3 minutes, 14 seconds and 143 milliseconds from the beginning of the video content. The position coordinates detail the position in which the video object appears. For example, in case of a visual video object, the position coordinates can be the XY two-dimensional coordinates of the video object in the frame. In case of an

auditory original content object (i.e., video object), the position coordinates can be the audio channel of the audio stream in which the video object appears. The position coordinates of the video object can relate to a single point within the video object (e.g., the center of mass of the video object), a plurality of points within the video object or to the borders of the video object.

Reference is now made to Figure 2, which is a schematic illustration of a system, generally referenced 100, for producing supplemental content objects respective of video objects within a video content and for producing tagging information for associating the supplemental content objects with the respective video objects constructed and operative in accordance with an embodiment of the disclosed technique. Supplemental content producing system 100 includes a video content source 102, a central supplemental content system 104, a central database 106, a control and signaling data source 108, a multiplexer 110 and a broadcasting system 112. Central supplemental content system 104 includes a tagging producer 116 and a supplemental content producer 118.

It is noted that, supplemental content producing system 100 can be dispersed over different sites, as detailed in Figure 2 by dotted vertical lines. In particular, video content source 102 is positioned at a content provider site (e.g., television network studios). Central supplemental content system 104 and central database 106 are typically positioned at a supplemental content service provider site. Control and signaling data source 108, multiplexer 110 and broadcasting system 112 are typically positioned at a broadcaster site (e.g., a cable company). Alternatively, at least one of tagging producer 116 and supplemental content producer 118 is an independent processing device and is not a module of central content system 104. Further alternatively, each of database 106, tagging

producer 116 and supplemental content producer 118, can be positioned at the content provider site, the broadcaster site or any other site.

Video content source 102 is coupled with central content system 104 and with multiplexer 110. Central content system 104 is further coupled with central database 106, control and signaling data source 108 and with a network 114. Multiplexer 110 is further coupled with control and signaling data source 108 and with broadcasting media.

In the case that each of tagging producer 116 and supplemental content producer 118 is an independent processing device, tagging producer 116 is coupled with video content source 102 and with supplemental content producer 118. Tagging producer 116 is further coupled with either control and signaling source 108 or network 114. Supplemental content producer 118 is coupled with database 106 and with network 114. It is noted that the inter-coupling between different elements of system 100 is determined according to the functionality and the interaction of each element with each of the other elements, as detailed herein below as well as communications architecture (e.g., direct couplings vs. BUS).

Video content source 102 provides video content (i.e., video stream and corresponding audio stream) such as a television show, a movie, a sports events and the like. Control and signaling data source 108 provides control and signaling data respective of the content of content source 102. Multiplexer 110 receives a plurality of input signals, combines one or more of those signals and directs the combined signal to a selected line (i.e., outputs a combined signal). Broadcasting system 112 broadcasts data, such as video content and control and signaling data, to a client premises.

Central content system 104 provides supplemental content respective of a video object (not shown) within the video content (not shown) of video content source 102 and produces a tagging file

associating between a supplemental content object and a respective video object in the video content.

As mentioned above, central content system 104 includes supplemental content producer 118 and tagging producer 116. Supplemental content producer 118 is a processing device or an application or module within central content system 104, for producing a supplemental content object including at least a supplemental content data field and an object ID.

Tagging producer 116 is a processing device or an application or module within central content system 104, for producing a tagging file associating a video object within a video content with a respective object ID. Alternatively, tagging producer 116 enables a human operator (not shown) to manually produce the tagging file through an operator interface of tagging producer 116 (not shown).

Central database 106 is a data storage device. Network 114 is any network capable of transferring data from central content system 104 to the client premises. Network 114 can be either wireline or wireless network. For example, network 114 can be the internet, the broadcasting media, a cellular network, and the like.

Supplemental content producing system 100 operates as follows. Supplemental content producer 118 of central content system 104 produces a supplemental content object (not shown) respective of a video object (not shown) within a video content (not shown). As detailed herein above, the supplemental content object includes at least the object ID and the supplemental content data. The supplemental content object can include additional data respective of the video object, such as the name, the category, and the digital signature of the video object, and the vendor supplying the product corresponding to the video object. The supplemental content data of the supplemental content object includes

content data which is related to the video object and which augments the experience of viewing the video content.

Central content system 104 can receive content data for the supplemental content data of the supplemental content object from external sources such as commercial companies, a broadcaster (e.g., cable company), a content provider (e.g., TV network), an educational institute, a governmental agency, private persons (i.e., viewers content) and the like. Central content system 104 stores the supplemental content object in central database 106.

Central content system 104 receives the video content from video content source 102. Tagging producer 116 reviews the video content. Tagging producer 116 locates the video object respective of the supplemental content object, within the video content as detailed herein below in the following paragraphs detailing the video content review. Tagging producer 116 produces a tagging file. The tagging file associates between the video coordinates of the video object and the Object ID of the supplemental content object.

Tagging producer 116 can review the video content in a manual manner, an automatic manner, a semi-automatic manner or any combination thereof. Manual reviewing of the video content is performed by a human operator (not shown). The operator locates the video object within the video content by viewing the video content (i.e., viewing the video stream or the frames of the video stream and listening to the audio stream). The operator marks the video object for tagging producer 116. Tagging producer determines the video coordinates (i.e., the location of the video object within the video content) of the video object according to the marking of the operator. Tagging producer 116 produces a tagging file associating the marked video object with the object ID of the respective supplemental content object.

Automatic reviewing of the video content is performed by Tagging producer 116. Tagging producer 116 locates the video object within the video content by employing audio and image processing techniques. Tagging producer 116 employs a digital signature of the video object for identifying the video object within the video content and determines the video coordinates of the video object within the video content. Tagging producer 116 produces a tagging file associating the marked video object with the object ID of the respective supplemental content object.

Semi-automatic reviewing of the video content is a combination of manual review and automatic review. For example, the operator locates the video object in a single frame and marks the video object for tagging producer 116. Accordingly, tagging producer 116 locates the video object throughout the video content by employing audio and image processing techniques. According to another example, tagging producer 116 locates the video object and the operator approves or rejects the suggested location of the video object.

It is noted that the video object can appear in the video content more than a single time. For example, the video object is a shirt worn by two characters in the same scene or worn by the same character in two scenes. Tagging producer 116 can locate all appearances of the video object within the video content. Tagging producer 116 determines the video coordinates of each appearance of the video object within the video content. Tagging producer 116 associates each appearance of the video object within the video content with the object ID of the respective supplemental content object. Tagging producer 116 produces a tagging file which associates each supplemental content object with the video coordinates of each appearance of the respective video object. Alternatively, central content system 104 stores the video coordinates of

each appearance of the respective video object in the supplemental content object.

Table 1, herein below is an example of such tagging file:

Object identification number	Video coordinates of respective video object
001	Frame 248, X=45, Y=11
	Frame 249, X=44, Y=12
	Elapsed time 02:49.000, X=39, Y=40
034	Frame 10, X=55, Y=15

Table 1

Table 2 is an alternative example of the tagging file:

Object ID	Start Time	End Time	X coordinate	Y coordinate
12	2:49.250	2:50.430	44	12

Table 2

Note that additional column may be added to table 2, such as tag type (e.g., icon or circle), tag radius, tag serial number in a selected frame. Further note that time difference between the start time and the end time may be used as an input for pricing content object (i.e., the appearance time of the video object is employed for pricing advertisers of supplemental content data respective of the video object).

Alternatively, tagging producer 116 locates potential video objects within the video content. The potential video objects are video objects which do not correspond to an existing supplemental content object. Central content system 104 produces respective supplemental content objects for the potential video objects. Then, central content system 104 contacts relevant external sources for receiving supplemental content data for the supplemental content object respective of the potential video object. For example, tagging producer 116 determines

that a hotel appearing in a movie is a potential video object. Central content system 104 contacts the hotel management, the architect of the building of the hotel, airlines companies having flights to the country in which the hotel is located, and the like, for receiving supplemental content data relating to the hotel. In accordance with yet another alternative, tagging producer 116 determines potential video objects, produces respective supplemental content objects and then retrieves supplemental content data from a designated database (e.g., a database of advertised products – not shown).

During review of the video content, tagging producer 116 produces statistical information relating to the video object, such as the number of appearances of the video object within the video content, the aggregate time of the video object appearances, the size of each of the appearances of the video object. The statistical information relating to the video object can be employed, for example, for charging advertisers providing commercial supplemental content data respective of the video object. Tagging producer 116 stores the statistical information relating to the video object in central database 106.

It is noted that tagging producer 116 does not alter the video content in any way. The video content is merely reviewed by tagging producer 116. In particular, tagging producer 116 does not add to the video content, subtract from the video content, or modify the video content.

Central content system 104 (i.e., supplemental content producer 118) provides the supplemental content object to the client premises through network 114. Central content system (i.e., tagging producer 116) 104 provides the tagging file, associating each supplemental content object with the video coordinates of each appearance of the respective video object, to the client premises. For example, central content system 104 provides the tagging file to control and signaling data source 108.

Control and signaling data source 108 provides the control and signaling data and the tagging file to multiplexer 110. Video content source 102 further provides the video content to multiplexer 110.

Multiplexer 110 combines the control and signaling data with the tagging file and provides the combined signal to broadcasting media 112. Broadcasting media 112 broadcasts the combined signal to the client premises. Alternatively, central content system 104 provides the tagging file to the client premises through network 114.

It is noted that central content system 104 can provide different supplemental content objects to different client premises according to the preferences of the viewers in each client premises, according to the geographic location of each client premises, according to the personal characteristics of the viewer, according to commercial considerations, according to the decision of an operator of system 100, and the like.

Reference is now made to Figure 3, which is a schematic illustration of a system, generally referenced 150, for providing supplemental content object respective of a video object within a video content to a viewer of the video content, constructed and operative in accordance with another embodiment of the disclosed technique. Supplemental content providing system 150 includes a broadcast receiver 152, a Set Top Box (STB) 156, a local unit of a supplemental content system (local content system) 158, a local database 160, a display device 162 and a viewer interface 164. STB 156 includes a de-multiplexer 166, a video content source 168 and a control and signaling data source 170. Alternatively, local content system 158, local database 160 or both are a module or a function within STB 156. Further alternatively, De-multiplexer 166 is external to STB 156.

STB 156 is coupled with a broadcasting receiver 152, local content system 158, display device 162 and viewer interface 164. Local content system 158 is further coupled with a network 154 and with local

database 160. De-multiplexer 166 is coupled with video content source 168 and with control and signaling data source 170.

Broadcasting receiver 152 receives the broadcasted signals broadcasted by broadcasting system 112 of Figure 2, such as a satellite dish, a cable box, an antenna, and the like. STB 156 is a processing device for receiving broadcasted data, processing it and accordingly producing video content signal appropriate for displaying via display device 162. It is noted that STB 156 can be any procssing device and is not limited to a set top box.

Local content system 158 provides supplemental content object respective of a video object within the video content to STB 156 for presenting the supplemental content object to the viewer. Local database 160 is a data storage device. Display device 162 is a display device capable of presenting the video content and the supplemental content objects to the viewer, such as a television set (e.g., CRT, LCD, plasma). Viewer interface 164 is a device which enables a viewer of the video content to interact with STB 156, such as remote control, a pointing device and the like.

De-multiplexer 166 is a device which receives at least one input signal and outputs different portions of that input signal through a plurality of output lines. Video content source 168 and control and signaling data source 170 are substantially similar to video content source 102 and control and signaling data source 108 of Figure 2.

Supplemental content providing system 150 operates as follows. Local content system 158 receives supplemental content object respective of a video object from network 154. Local content system 158 stores the supplemental content object in local database 160. The volume of the supplemental content object can be substantial and as a result, the download time thereof can be long. For example, the download time of the supplemental content object can range between a few milliseconds to

a few days, depending on the volume of the supplemental content object and the bandwidth of the connection between network 154 and local content system 158. Therefore, local content system 158 can receive the supplemental content object respective of a video object of a specific video content prior to the arrival of the video content to STB 154. For example, the supplemental content object for a video object within a specific television show is received a couple of days or a couple of hours prior to the airing time of that television show. The supplemental content object is stored in local database 160 until the respective video content is viewed by the viewer. In case the viewer records the video content, for example, by employing a digital video recorder, the supplemental content object is stored in association with the respective video content until the video content is deleted.

STB 156 receives the broadcasted combined signal combining video content with control and signaling data and with the tagging file (e.g., the combined signal of Figure 2) from broadcasting receiver 152. De-multiplexer 166 provides the video content to video content source 168. Multiplexer 166 provides the control and signaling data to control and signaling data source 170. STB 156 provides the tagging file to local content system 158. The tagging file enables local content system 158 to associate each video object with the respective supplemental content object, according to the coordinates of the video object and the object ID of the supplemental content object.

STB 156 further provides local content system 158 with information required for associating a video object selected by the viewer with respective supplemental content object, such as the frame number of the selected video object or the time elapsed from the beginning of the video program or from a time stamp, to the appearance of the video object.

Local content system 158 provides the supplemental content object to STB 156. STB 156 combines the content streams from supplemental local system 158 and Video content 168. STB 156 presents the combined signal of the video content and the supplemental content data of the respective supplemental content objects, to the viewer through display device 162. STB 156 presents the video content through display device 162. STB 156 presents to the viewer an indication that supplemental content is available. According to viewer input, STB 156 presents to the viewer an indication of each video object, for which there is an available respective supplemental content object. According to viewer input, STB 156 presents to the viewer supplemental content data of a supplemental content object. It is noted that, the supplemental content data can be presented as an overlay transparent layer over the video content. It is further noted that, in case of an auditory supplemental content data, at least one of the audio streams of the video content can be attenuated by STB 156. In this manner, the audio content data of the supplemental content object does not interfere with the audio signals of the video content.

Local content system 158 stores statistical information relating to the activities (i.e., selections and the actions) of the viewer in local database 160. For example, the statistical information includes the supplemental content objects respective of the video objects selected by the viewer, the activity of the viewer with relation to the supplemental content objects (e.g., the view purchased a shirt), and the like. Local content system 158 can provide the statistical information to a central content system (e.g., central content system 104 of Figure 2) for statistical analysis. The statistical analysis can be employed for determining appropriate supplemental content objects for the viewer. Local content system 158 further stores the statistical information in local database 160, for the future reference of the viewer.

Reference is now made to Figure 4, which is a schematic illustration of a system, generally referenced 200, for producing supplemental content object respective of a video object within a video content, transferring the supplemental content object to client premises and providing the supplemental content data of the supplemental content object to a viewer of the video content, constructed and operative in accordance with a further embodiment of the disclosed technique. Supplemental content object system 200 includes a video content source 202, central content management system 204, a local content management system 212, a display device 214 and a viewer interface 216. Video content source 202 is coupled with central content system 204. Video content source 202 is further coupled with local content system 212 via a first data link 206. Central content system 204 is coupled with local content system 214 via second data link 208 and via third data link 210. Local content system 212 is further coupled with display device 214 and with viewer interface 216.

Central content system 204 produces supplemental content objects respective of video objects and produces a tagging file for associating each of the supplemental content objects with the respective video object. Each of first data link 206, second data link 208 and third data link 210 is a medium for transferring data to the client premises. The data link can be wireline network, wireless network, broadcasting media and the like. For example, first data link 206 is a cable network of a cable company, second data link 208 is a cellular network and third data link 210 is the internet. Another example, first data link 206 is a terrestrial broadcast media, second data link 208 is a power line communication network and third data link 210 is the cable network of a telephony company.

Local content system 212 is a processing system for receiving a supplemental content object, receiving video content, and presenting to

the viewer the video content and the supplemental content data of the supplemental content object. Display device 214 and viewer interface 216 are substantially similar to display device 162 and viewer interface 164 of Figure 3, respectively.

Central content system 204 produces supplemental content object respective of a video object within a video content. Central content system 204 receives the video content including the video object from video content source 202. Central content system 204 reviews the video content and locates the video object within the video content. For example, central content system 204 locates the video object within the video content according to the digital signature of the video object which is included in the supplemental content object. Central content system 204 associates the supplemental content object with the video object, according to the video coordinates of the video object. For example, central content system 204 produces a tagging file associating the video coordinates of the video object with the object ID of the respective supplemental content object.

Central content system 204 provides the supplemental content object to the client premises through third data link 210. Central content system 204 provides the tagging file to the client premises through second data link 208. Video content source 202 provides the video content to the client premises through first data link 206.

Local content system 212 receives the supplemental content object through third data link 210. Local content system 212 receives the tagging file (i.e., or any other data associating the supplemental content object with the respective video object) through second channel 208. Local content system 212 receives the video content through first data link 206. Local content system 212 associates each video object with its respective supplemental content object according to the tagging file and according to the video coordinates of the video object.

It is noted that the first data link, the second data link and the third data link or any combination thereof could be the same channel. For example, local content system 212 receives the video content from a first data link and receives both the tagging file and the supplemental content object from a second data link. According to another example, local content system 212 receives all of the video content, the tagging file and the supplemental content object from a first data link. In accordance with yet another example, local content system 212 receives the supplemental content object and the tagging file as files on the first data link, which is a broadcast channel. That is, the supplemental content object and the tagging file are transferred in a manner similar to subtitles.

Local content system 212 presents to the viewer the video content through display device 214. Local content system 212 presents to the viewer an indication that supplemental content is available for a video object of the video content. According to viewer input, local content system 212 presents to the viewer an indication of the video object, for which supplemental content is available. According to viewer input, local content system 212 presents to the viewer the supplemental content data of the supplemental content object.

Reference is now made to Figure 5, which is a schematic illustration of a system, generally referenced 250, for producing supplemental content object respective of a video object within a video content, producing a tagging file, transferring the supplemental content object and the tagging file to client premises and providing the supplemental content data of the supplemental content object to a viewer of the video content, constructed and operative in accordance with another embodiment of the disclosed technique. Supplemental content system 250 includes a video content source 252, a central content system 254, an STB 260, a local content system 262, a local database 264, a display device 266 and a viewer interface 268.

Video content source 252 is coupled with STB 260 through a first data link 256. Central content system 254 is coupled with local content system 262 through a second data link 258. STB 260 is further coupled with local content system 262, display device 266 and with viewer interface 268. Local content system 262 is further coupled local database 264. Alternatively, viewer interface 268 is coupled with local content system 262 and not with STB 260.

Central content system 254 produces supplemental content object respective of a video object. Central content system 254 provides the supplemental content object to local content system 262 through second data link 258. Video content source 252 provides a video content to STB 260 through first data link 256. STB 260 provides the video content to local content system 262.

Local content system 262 reviews the video content and locates the video object respective of the supplemental content object according to the digital signature of the video object. Local content system 262 determines the video coordinates of each appearance of the video object. Local content system 262 associates the supplemental content object with the video object (e.g., produces a tagging file). Local content system 262 provides the supplemental content object to STB 260.

STB 260 presents to the viewer the video content through display device 266. STB 260 indicates to the viewer that supplemental content is available. According to viewer input, local content system 262 instructs STB 260 to present to the viewer indication of the video object respective of the supplemental content object. According to viewer input, local content system 262 provides STB 260 with the supplemental content data of the supplemental content object, for presenting to the viewer.

It is noted that in the examples set forth in Figures 2, 3 and 4, the local content system received the tagging file from a central content system (i.e., offline tagging or predetermined tagging). In the example set

forth in Figure 5, the local content system reviews the video content and produces the tagging file (i.e., online tagging). Therefore, the local content system of Figure 5, requires more processing resources than the local content systems of Figures 2, 3 and 4.

Reference is now made to Figures 6A, 6B, 6C and 6D. Figure 6A is a schematic illustration of a video content frame, generally reference 300A, including a plurality of video objects, constructed and operative in accordance with a further embodiment of the disclosed technique. Figure 6B is a schematic illustration of the video frame of Figure 6A, including an indication that supplemental content is available. Figure 6C is a schematic illustration of the video frame of Figure 6A, including indications of video object for which supplemental content is available. Figure 6D is a schematic illustration of the video frame of Figure 6A, including the supplemental content for a selected video object.

With reference to Figure 6A, a video content source (e.g., video content source 102 of Figure 2) provides a video content to a central content system (e.g., central content system 104 of Figure 2). The central content system reviews the video content and locates a video object therein. Video frame 300A of the video content includes four video objects 302, 304, 306 and 308. Each video object can have any number of appearances in the video content (e.g., several appearances in the same frame or in different frames). In the example set forth in Figure 6A, video objects 302-308 are visual video objects within frame 300A. Alternatively, an original content object (i.e., video object) can be the whole frame, a plurality of frames (e.g., a scene), a segment of the audio stream (e.g., a song from the sound track, an object or a person mentioned by one of the characters), and the like.

The central content system locates each video object and determines the video coordinates of each appearance of the video object. The central content system identifies the video object within the video

content by employing image processing techniques and according to the digital signature of the video object.

In accordance with a first example, the video coordinates of video object 304 correspond to the video coordinates of point 310 which is located at the centroid (i.e., geometric center) of video object 304. That is the video coordinates of centroid 310 of video object 304 represent the video coordinates of video object 304. For example, the video coordinates of centroid 310 are frame number $F_{number}=F_{310}$, $X=X_{310}$, $Y=Y_{310}$.

In accordance with a second example, the video coordinates of video object 308 correspond to the video coordinates of point 314 which is located at the centroid of a minimum bounding circle 312 bounding video object 308. That is the video coordinates of centroid 314 of minimum bounding circle 312 bounding video object 308 represent the video coordinates of video object 308. For example, the video coordinates of centroid 314 are frame number $F_{number}=F_{314}$, $X=X_{314}$, $Y=Y_{314}$. Alternatively, the video coordinates of a video object correspond to the video coordinates of any point of plurality of points, such as the centroid of a maximum bound circle, the vertices of a bounding polygon, the point of the video object having the highest Y value, and the like.

With reference to Figure 6B, frame 300B further includes indication 316 that supplemental content is available for at least one video object. An STB provides the video content, including frame 300B, to a display device for presenting to a viewer (e.g., STB 156 and display device 162 of Figure 3). The STB receives supplemental content objects and tagging file from a local content system (e.g., local content system 158 of Figure 3). The STB presents to the viewer indication 316 for indicating to the viewer that supplemental content is available for the video content.

In the example set forth in Figure 6B, supplemental content indication 316 is in the shape of a small icon of the letter “i” appearing on the top right corner of frame 300B. Alternatively, supplemental content indication 316 can take the form of any icon, appearing anywhere in frame 350. Further alternatively, supplemental content indication 316 can take the form of a different visual or auditory indication. For example, supplemental content indication 316 can take the form of flickering frame, shimmering frame, changing of frame colors to black and white, verbal notification, auditory signal, and the like.

Supplemental content indication 316 can appear at the beginning of the video content playback or according to the appearance of video objects respective of available supplemental content objects (e.g., at the time of appearance of such video objects or a short time, such as a few seconds, before that). Supplemental content indication 316 can remain on screen for the entire duration of the video content playback, appear only once or appear every time a video object respective of available supplemental content object appears on screen. Supplemental content indication 316 can appear throughout the playback of the video content and change its visual appearance (e.g., color or shape) when a video object respective of available supplemental content object appears on screen. The viewer of the video content can set the format of presenting supplemental content indication 316.

The viewer can choose whether to receive indications of video objects, which are associated with available respective supplemental content objects (i.e., supplemented video objects). The viewer can choose whether to receive indications of all these supplemented video objects or only a portion of these video objects (e.g., according to the category of the video object). In case the viewer chooses to receive indications of supplemented video objects, the STB presents to the viewer indications of supplemented video objects.

With reference to Figure 6C, frame 300C further includes indications of supplemented video objects (i.e., video objects respective of available supplemental content objects). Object 302 is surrounded by a border 318 for indicating object 302 is associated with an available respective supplemental content object (i.e., object 302 is a supplemented video object). Border 318 can be of any color and size, can be full or dotted, can be flickering, and the like. The viewer of the video content can set the format of presenting border 318.

Object 304 is shaded for indicating that it is a supplemented video object. The shading of object 304 can be of any size and color, and can further change colors and sizes, flicker and the like. The viewer of the video content can set the format of presenting the shading of supplemented video object 304.

A label 320 at the bottom right corner of frame 300C indicates that object 306 is a supplemented video object. Indication label 320 can appear anywhere on the screen. Indication label 320 can be of any size, color and font. Indication label 320 can flicker. Indication label 320 can be transparent or opaque. The viewer of the video content can set the format of presenting indication label 320. Indication label 322, appearing on object 308, indicates that video object 308 is a supplemented video object. Alternatively, the viewer of the video content can set the format of the indications for indicating a supplemented video object. The supplemented video object indications can be any visual or auditory signal enabling the viewer to determine which video objects are associated with respective supplemental content objects.

The viewer can select a supplemented video object for receiving the supplemental content data of the respective supplemental content object. The viewer selects the supplemented video object by employing a viewer interface.

The viewer can choose to receive the supplemental content data immediately or at a later time (e.g., after the video content playback is over). The viewer can choose whether to pause the playback of the video content or not during presentation of the supplemental content data. Alternatively, the viewer can configure the system such that the viewer can choose to view the supplemental content data for all the supplemented video objects in the video content, all the supplemented video objects in a portion of the video content (e.g., a scene), all the supplemented video objects of a selected category, and the like. With reference to Figure 6D, frame 300D further includes supplemental content data 324 associated with supplemented video object 304.

Reference is now made to Figure 7, which is a schematic illustration of a method for providing supplemental content respective of a video object within a video content to the viewer of the video content, operative in accordance with another embodiment of the disclosed technique.

In procedure 350, content data respective of a video object within a video content is received. The content data can be received from the content provider providing the video content (e.g., a television network), the content broadcaster broadcasting the video content (e.g., a cable company), a commercial company related to the product associated with the video object (e.g., a beverages company, an airline company), a government agency, an educational institute, and the like. With reference to Figure 2, central content system 104 receives content data respective of a video object within the video content.

In procedure 352, a supplemental content object respective of the video object is produced. The supplemental content object include at least a supplemental content data field and an object identification number (i.e., object ID). The supplemental content data field of the supplemental content object includes the received content data. The object ID is a

unique number assigned to each supplemental content object, which enables unambiguous identification of the supplemental content object. The supplemental content object can include additional data fields, such as the name, a category, and a digital signature of the video object, and the vendor providing the product or service associated with the video object. With reference to Figure 2, central content system 104 (i.e., supplemental content producer 118) produces a supplemental content object respective of the video object.

In procedure 354, the object ID of the supplemental content object is associated with the respective video object and a tagging file is produced. The video content is reviewed and the video object respective of the supplemental content object is located. The video content is reviewed at the supplemental content service provider site (i.e., at a central site away from the client premises).

The video content can be reviewed automatically, manually, semi-manually, and the like. The video coordinates of each appearance of the video object are determined. A tagging file, associating each appearance of the video object within the video content with the object ID of the respective supplemental content object, is produced.

It is noted that the video content remains unchanged and is only reviewed. It is noted that the operation of associating the supplemental content objects with respective video objects and producing a tagging file is also referred to as tagging operation. In case the tagging is performed at a central site prior to transferring the video content and the supplemental content objects to the client premises it is referred to as predetermined tagging or offline tagging.

With reference to Figure 2, central content system 104 (i.e., tagging producer 116) reviews the video content and locates the video object within the video content. Central content system 104 determines the video coordinates of each appearance of the video object within the

video content. Central content system 104 produces a tagging file associating the video object with the object ID of the respective supplemental content object.

In procedure 356, the supplemental content object is transferred to the client premises through a third data link. The third data link can be any data link as detailed herein above. The supplemental content object can be transferred to the client premises simultaneously with the respective video content and tagging file or prior thereto. The supplemental content objects to be transferred to the client premises can be chosen according to the viewer preferences, the geographic location of the client premises, or according to the determinations of the operator of the supplemental content providing system. With reference to Figure 2, central content system transfers the supplemental content object to the client premises through network 114.

In procedure 358, the tagging file is transferred to the client premises through a second data link. The second data link can be any data link as detailed herein above. The tagging file can be transferred to the client premises simultaneously with the respective video content or prior thereto. With reference to Figure 2, central content system 102 provides the tagging file to control and signaling data source 108. Control and signaling data source 108 provides the tagging file to multiplexer 110. Multiplexer 110 provides a combined signal including the tagging file to broadcasting media 112. Broadcasting media 112 broadcasts the tagging file to the client premises.

In procedure 360, the video content is transferred to the client premises through a first data link. The first data link can be any data link as detailed herein above. It is noted that the video content is transferred to the client premises unchanged, as it is received from the content provider. With reference to Figure 2, video content source 102 provides the video content to multiplexer 110. Multiplexer 110 provides a combined

signal including the video content to broadcasting media 112. broadcasting media 112 broadcasts the video content to the client premises. It is noted that procedures 356, 358 and 360 can be performed simultaneously.

In procedure 362, the video content is presented to the viewer. The video content is received at the client premises by an STB. The STB provides the video content to a display device for presenting the video content to the viewer. With reference to Figure 3, STB 156 receives the video content from broadcasting receiver 152. STB 156 presents the video content to the viewer through display device 162.

In procedure 364, the viewer is indicated that supplemental content is available for the video content. The supplemental content indication is visual, auditory or both. The format of the supplemental content indication (e.g., small icon on the corner of the frame) is determined by the viewer. With reference to Figure 3 and 6B, STB 156 presents to the viewer supplemental content indication 316.

The viewer can choose whether to enable indications of supplemented video objects, or not. In case the viewer wishes to receive indications of supplemented video objects, the method proceeds to procedure 366, otherwise the methods ceases. In procedure 366, according to viewer input, supplemental video objects are indicated to the viewer.

The viewer input is entered through a viewer interface (e.g., a remote controller). The viewer can select to receive an indication of each supplemented video object or only a portion of the supplemented video objects. For example, the viewer is indicated about supplemented video object of a selected category or supplemented video objects of a selected portion of the video content, such as a scene. The format of the supplemented video object indication can be determined by the viewer (e.g., shading of a supplemented video object). With reference to Figures

3 and 6C, STB 156 presents to the viewer indication that object 304 is a supplemented video object which is associated with available respective supplemental content object.

In procedure 368, according to viewer input, supplemental content data is presented to the viewer. The supplemental content data is taken from the supplemental content data field of the supplemental content object respective of the video object selected by the viewer. The viewer enters his input by employing the viewer interface.

For example, the viewer selects an on screen supplemented video object. The coordinates of the user selection are determined (e.g., the frame and the position within the frame). The tagging file is employed for determining the supplemental content object respective of the selected video object. Supplemental content data from the supplemental content data field of the respective supplemental content object is presented to the viewer. Alternatively, the viewer can choose to receive supplemental content relating to each video object in the video content, in a selected portion of the video content, in a selected category, and the like.

With reference to Figures 3 and 6D, STB 156 receives the viewer selection of supplemented video object 304. STB 156 provides the viewer selection to local content system 158. Local content system 158 associates selected video object 304 with its respective supplemental content object according to the tagging file. Local content system 158 provides supplemental content data 324 of the respective supplemental content object to STB 156. STB 156 presents supplemental content data 324 to the viewer through display device 162.

In procedure 370, viewer activity records are produced and stored. Viewer activity records relate to the activities of the viewer which are related to the supplemental content. For example, viewer activity records include all video content which is associated with supplemental content viewed by the viewer, the selected video objects, the actions of

the viewer with relation to the supplemental content (e.g., the viewer purchased a product corresponding to a video object), and the like. Every action of the viewer recorded in the activity records can be accompanied with respective metadata such as the time of the viewer activity, and the like. The viewer activity records are stored for future reference both by the viewer and by a central data collection system. With reference to Figure 3, STB 156 provides local content system 158 with data respective of each action of the viewer. Local content system 158 stores the viewer activity data as viewer activity records.

In procedure 372, the viewer activity records are transferred to a central data collection system. The central data collection system analyses the viewer activity records for commercial purposes (e.g., offering products to the viewer according to his past purchases). With reference to Figures 2 and 3, central content system 104 operates as a central data collection system. Central content system 104 receives viewer activity records from local content system 158, through network 114. Central content system 104 analyses the viewer activity records.

Alternatively, with reference to procedures 354, 356, 358 and 360, only a portion of the video content is reviewed and each appearance of the video object within the video object reviewed section is located according to the object ID. The video content is reviewed at the supplemental content service provider site (i.e., at a central site away from the client premises). A partial tagging file corresponding to the reviewed video content portion is produced. The reviewed video content section, the supplemental content object and the corresponding partial tagging file are transferred to the client premises. In this manner the tagging operation can be performed for live broadcast by adding a short delay to the broadcasted content.

For example in case of a delay of ten seconds, the next ten seconds of the video content (i.e., buffered video content) are reviewed

and a partial tagging file for the buffered video content is produced. The buffered video content and the corresponding partial tagging file are transferred to the client premises. The supplemental content object can be transferred to the client premises simultaneously with the video content section and the partial tagging file or prior thereto. The method continues at the client premises in procedure 362.

Reference is now made to Figure 8, which is which is a schematic illustration of a method for providing supplemental content respective of a video object within a video content to the viewer of the video content, operative in accordance with a further embodiment of the disclosed technique.

Procedures 400 and 402 are substantially similar to procedures 350 and 352 of Figure 7, respectively. Content data is received and accordingly supplemental content objects are produced. In procedures 404 and 406, the video content and the supplemental content objects are transferred to the client premises through a first data link and a second data link, respectively. It is noted, that as opposed to the method of Figure 7, the video content is not reviewed and the supplemental content objects are not associated with respective video objects, before the video content and the supplemental content objects are transferred to the client premises.

In procedure 408, the supplemental content object is associated with the respective video object and a tagging file is produced. As detailed above, the operation of associating the supplemental content object with the respective video object is referred to as tagging. In case the tagging operation is performed at the client premises after transfer of the video content and the supplemental content objects thereto, the tagging is referred to as online tagging. It is noted that online tagging requires more processing resources from the local content system than

the amount of resources required when the tagging file is received from the central content system.

A local content system positioned at the client premises receives the supplemental content object and the video content. The local content system reviews the video content and locates each appearance of the video object respective of the supplemental content object. The local content system determines the video coordinates of each appearance of the video content within the video content and produces a tagging file associating the object ID of the supplemental content object with each of the appearances of the video object within the video content.

With reference to Figure 3, local content system 158 receives the supplemental content system and the supplemental content object. Local content system 158 reviews the video content and locates each appearance of the video object within the video content. Local content system 158 produces a tagging file associating the object ID of the supplemental content object with each of the appearances of the video object.

Procedures 410 to 420 are substantially similar to procedures 362 to 372 of Figure 7, respectively. The video content is presented to the viewer. An indication that supplemental content is available for the video content is presented to the viewer. According to viewer input indications of supplemented content objects are presented to the viewer. According to viewer input supplemental content data is presented to the viewer. Viewer activity records are produced, stored and transferred to a central data collection system for analysis.

Alternatively, procedure 410 is performed after procedures 404 and 406, such that the video content is presented to the viewer prior to the tagging operation. The viewer views the playback of the video content and can select any video object within the video content by employing a viewer interface. The STB receives the viewer selection and determines

the video coordinates of the viewer selection. The STB provides the video coordinates of the viewer selection to the local content system. The local content system reviews the video content and determines whether the video coordinates selected by the viewer correspond to an available supplemental content object. In case the viewer selection corresponds to an available supplemental content object, the local content system provides the STB with respective supplemental content data. The STB presents to the viewer the supplemental content data. In case the viewer selection does not correspond to an available supplemental content object, the STB presents to the viewer an appropriate message. The tagging operation described herein above, of receiving viewer selection and determining whether it corresponds with an available supplemental content object is referred to as on-demand tagging.

It will be appreciated by persons skilled in the art that the disclosed technique is not limited to what has been particularly shown and described hereinabove. Rather the scope of the disclosed technique is defined only by the claims, which follow.

CLAIMS

1. Method for providing supplemental content data respective of a selected video object within a video content to the viewer of the video content, the method comprising the following procedures:

producing a supplemental content object respective of the video object, said supplemental content object including an object identification number and a supplemental content data;

associating object identification number of said supplemental content object with a respective video object within the video content and producing a tagging file, said video content is not changed during said procedure of associating and producing a tagging file;

transferring said supplemental content object to a client premises through a third data link;

transferring said tagging file to said client premises through a second data link;

transferring said video content to said client premises through a first data link;

presenting said video content to said viewer; and

according to input of said viewer, presenting to said viewer said supplemental content data.

2. System for producing a supplemental content object respective of a video object within a video content and transferring the supplemental content object to a client premises, the system comprising:

a video content source for providing said video content, said video content source broadcasting said video content to said client premises through a first data link; and

a central content system coupled with said video content source, said central content system including a tagging producer and a supplemental content producer, said supplemental content

producer producing said supplemental content object, said supplemental content object including at least an object identification number and a supplemental content data, said tagging producer associating said object identification number of said supplemental content object with said respective video object within said video content and producing a tagging file, said tagging producer does not change said video content, said central content system transferring said tagging file to said client premises through a second data link, said central content system transferring said supplemental content object to said client premises through a third data link.

3. System for providing to a viewer of a video content supplemental content data respective of a selected video object within the video content, the system comprising:

a local content managing system, said local content managing system receiving said video content through a first data link, receiving a tagging file associating a supplemental content object with said respective video object through a second data link and receiving said supplemental content object through third data link, said supplemental content object including at least an object identification number and said supplemental content data;

a display device coupled with said local content managing system, said display device receiving said video content from said local content managing system, said display device presenting to said viewer said video content; and

a viewer interface coupled with said local content management system for enabling said viewer to interact with said local content management system;

wherein said local content management system presenting said supplemental content data to said viewer according to input of said viewer.

ABSTRACT

Method for providing supplemental content data respective of a selected video object within a video content to the viewer of the video content, the method includes the procedures of producing a supplemental content object, associating object identification number with a respective video object, transferring the supplemental content object, the tagging file and the video content to a client premises, presenting the video content to the viewer and presenting the supplemental content data to the viewer, the supplemental content object relates to the video object, the supplemental content object includes the object identification number and a supplemental content data, the object identification number of the supplemental content object is associated with the respective video object within the video content by the tagging file, the supplemental content object is transferred to the client premises through a third data link, the tagging file is transferred to the client premises through a second data link, the video content is transferred to the client premises through a first data link, the supplemental content data is presented to the viewer according to viewer input.

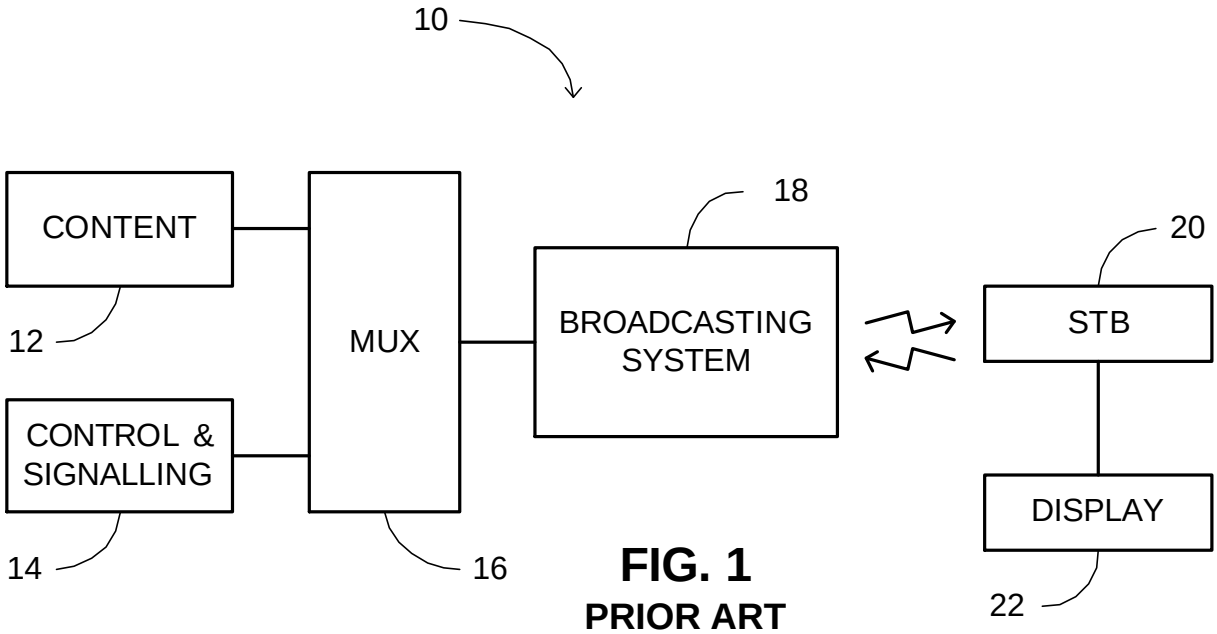

FIG. 1
PRIOR ART

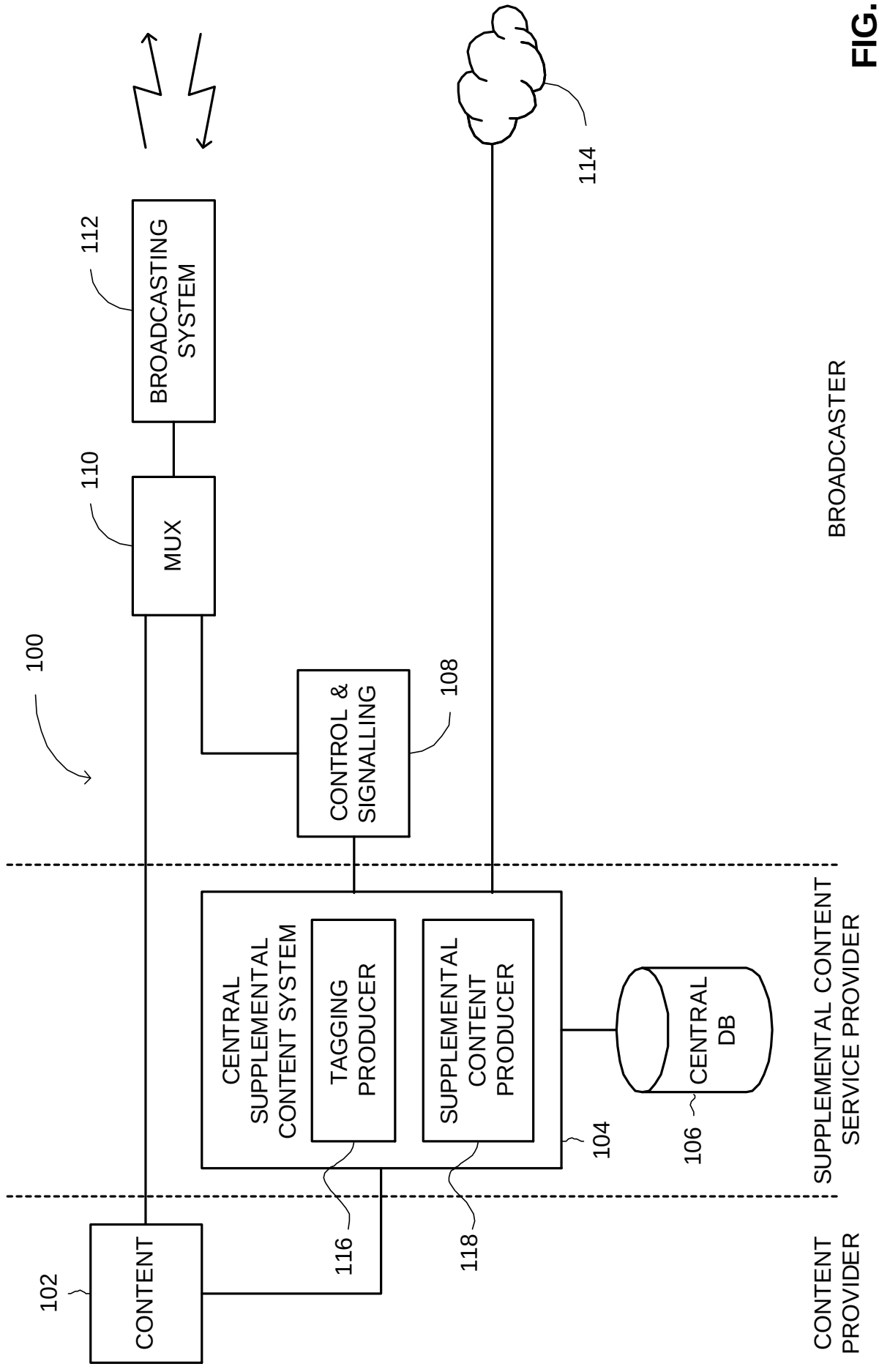
BROADCASTING SYSTEM
112
MUX
110
100
CONTROL & SIGNALLING
108
114
BROADCASTER
CENTRAL SUPPLEMENTAL CONTENT SYSTEM
TAGGING PRODUCER
SUPPLEMENTAL CONTENT PRODUCER
CENTRAL DB
104
106
SUPPLEMENTAL CONTENT SERVICE PROVIDER
CONTENT
102
116
118
CONTENT PROVIDER

FIG. 2

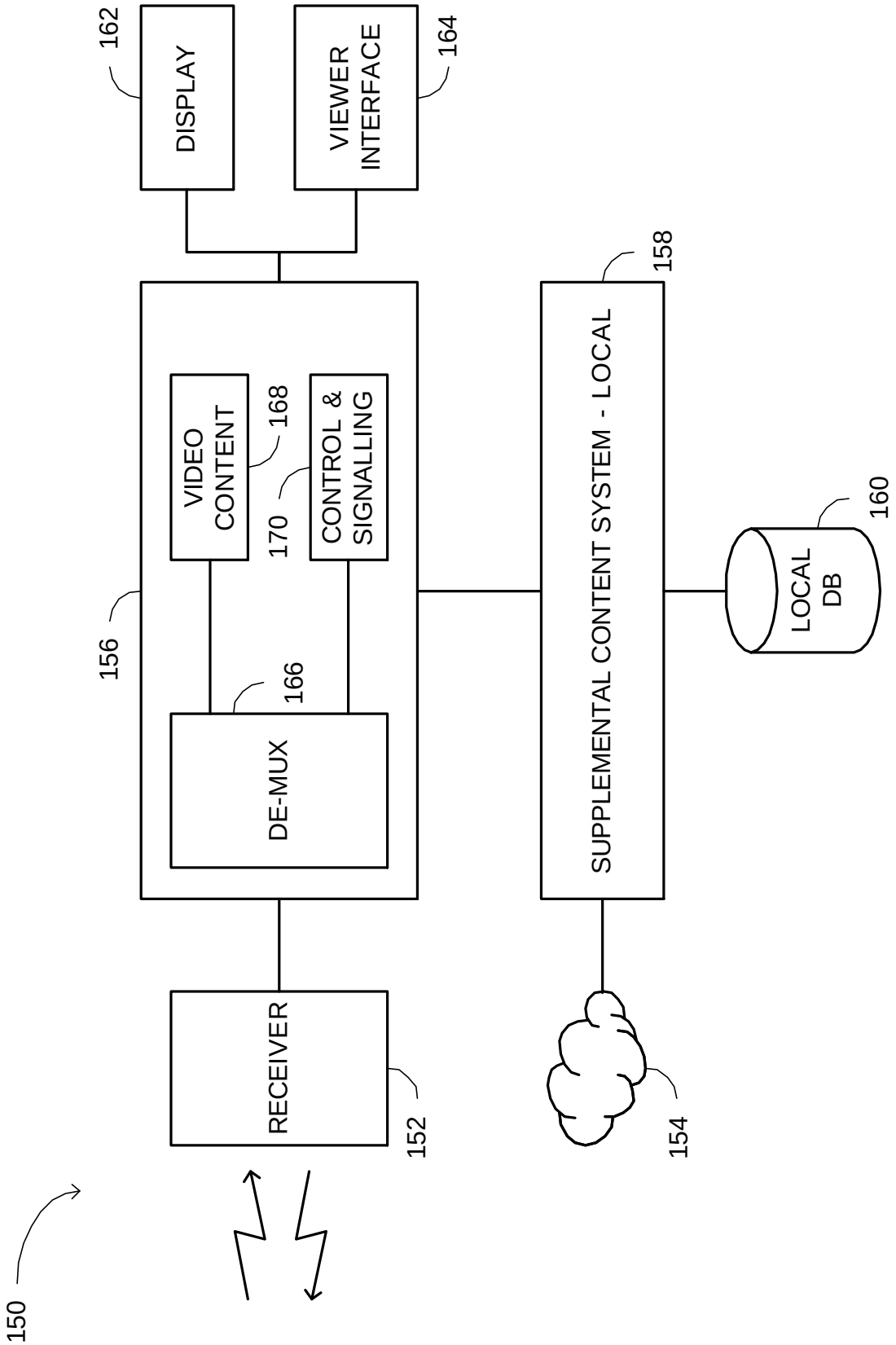
150
RECEIVER
152
DE-MUX
166
VIDEO CONTENT
168
CONTROL & SIGNALLING
170
156
DISPLAY
162
VIEWER INTERFACE
164
SUPPLEMENTAL CONTENT SYSTEM - LOCAL
158
154
LOCAL DB
160

FIG. 3

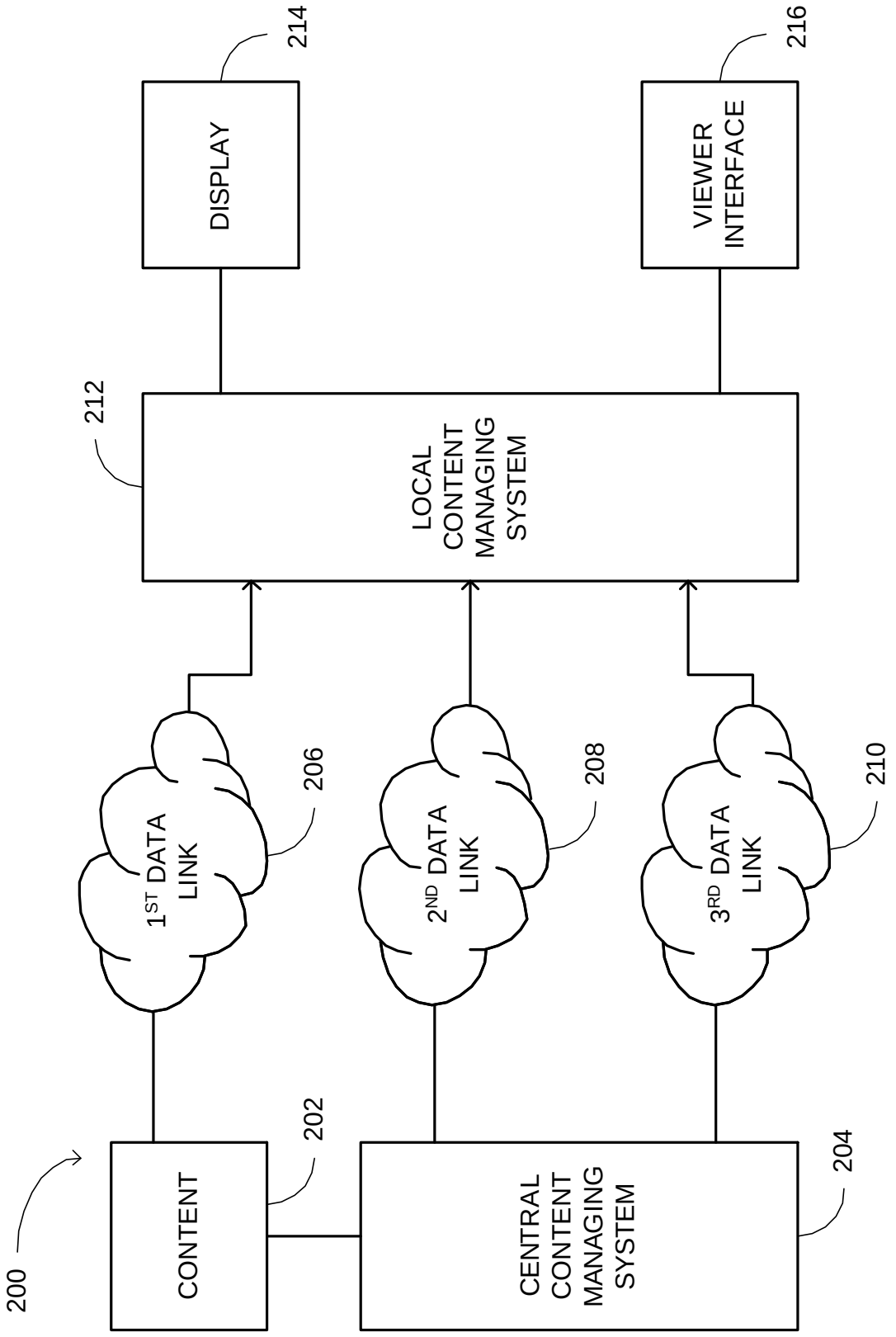
200
CONTENT
202
CENTRAL CONTENT MANAGING SYSTEM
204
1ST DATA LINK
206
2ND DATA LINK
208
3RD DATA LINK
210
LOCAL CONTENT MANAGING SYSTEM
212
DISPLAY
214
VIEWER INTERFACE
216

FIG. 4

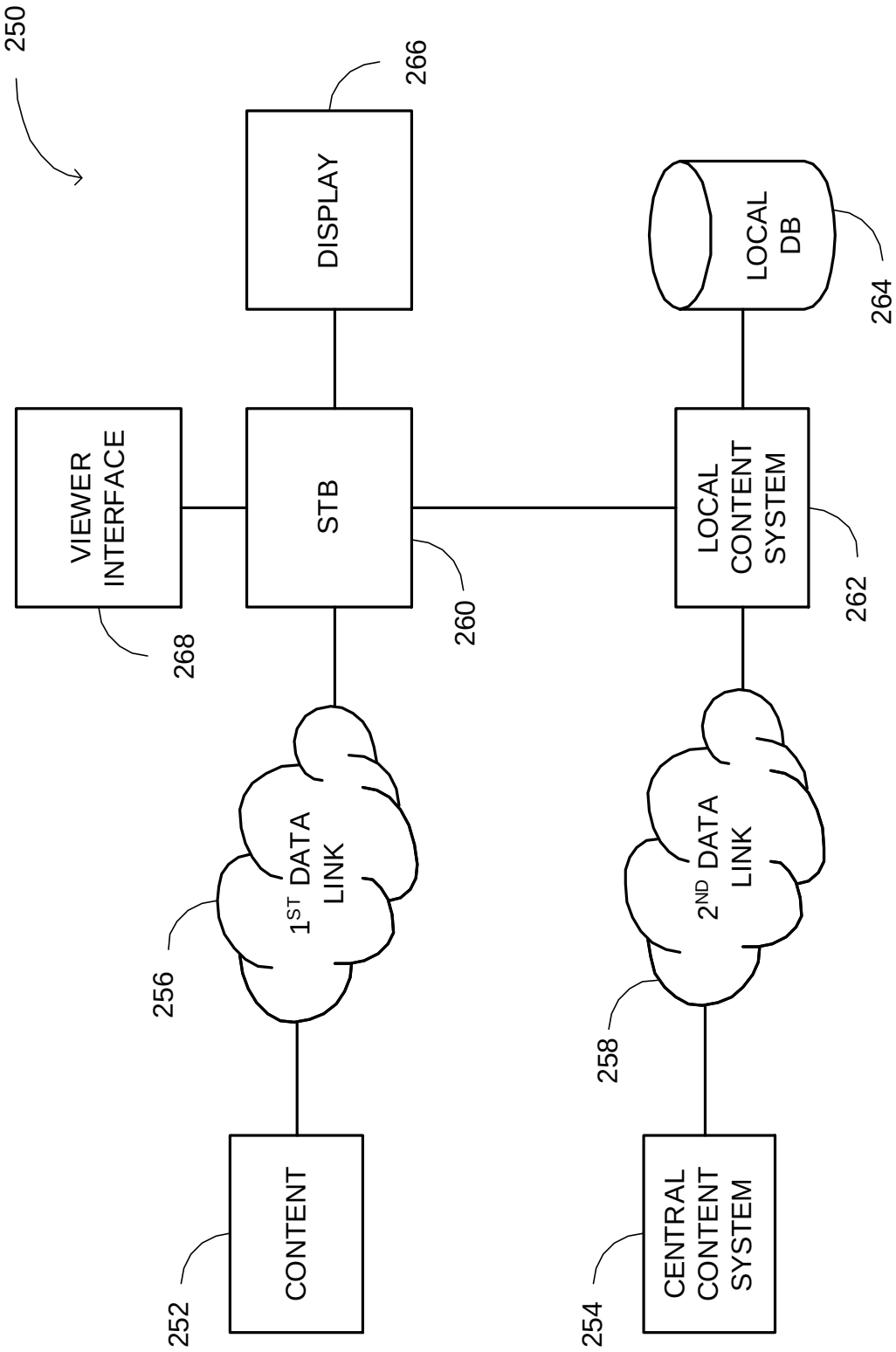
250
DISPLAY
266
LOCAL DB
264
VIEWER INTERFACE
STB
LOCAL CONTENT SYSTEM
268
260
262
1ST DATA LINK
2ND DATA LINK
256
258
CONTENT
CENTRAL CONTENT SYSTEM
252
254

FIG. 5

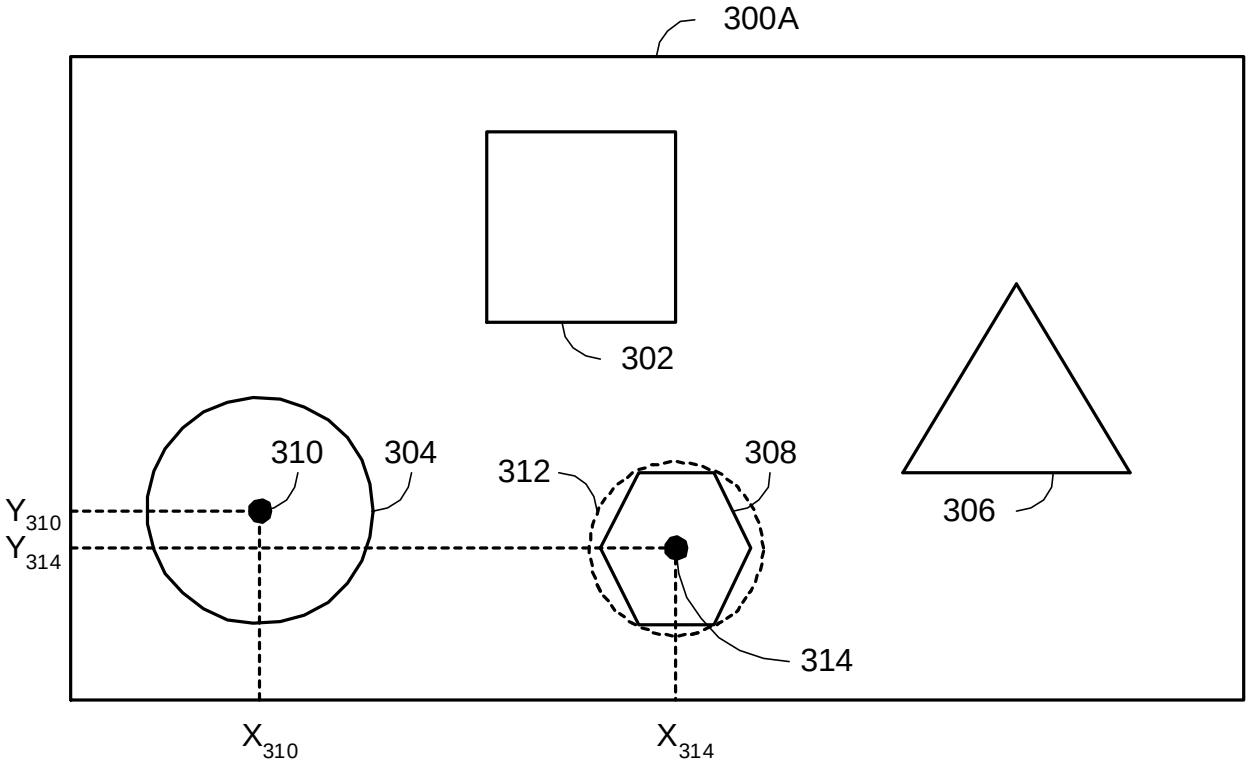
300A
302
310
304
312
308
306
Y_{310}
Y_{314}
314
X_{310}
X_{314}

FIG. 6A

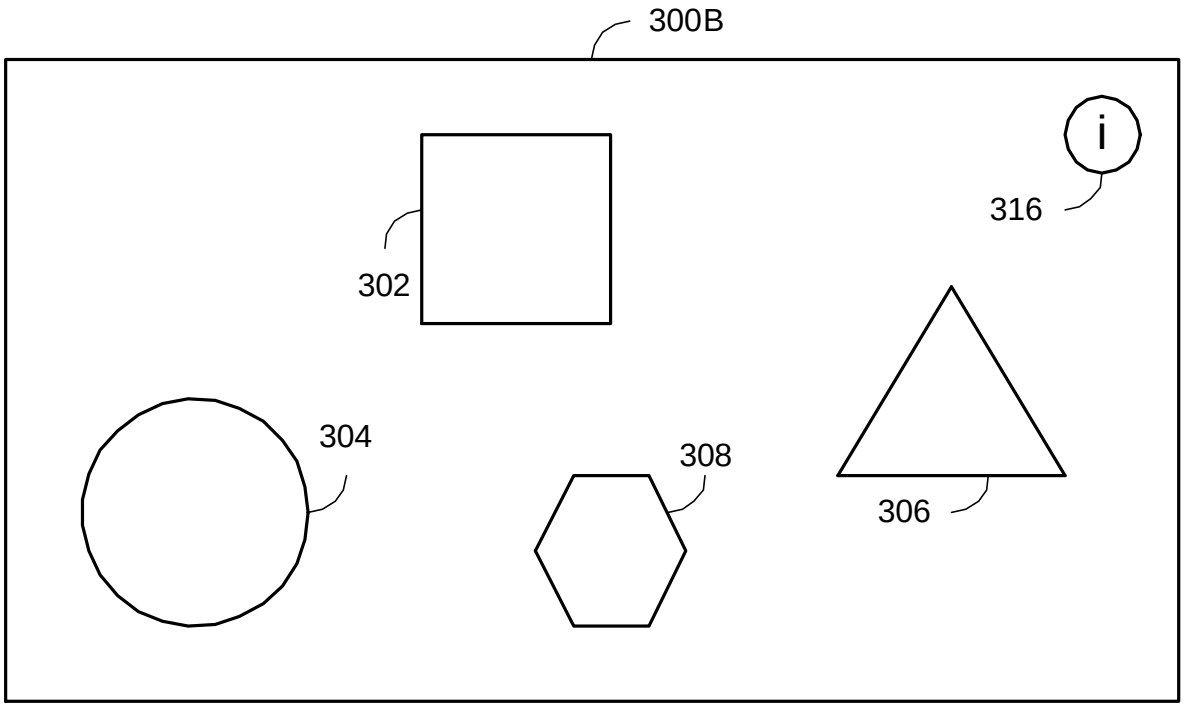
300B
i
316
302
304
308
306

FIG. 6B

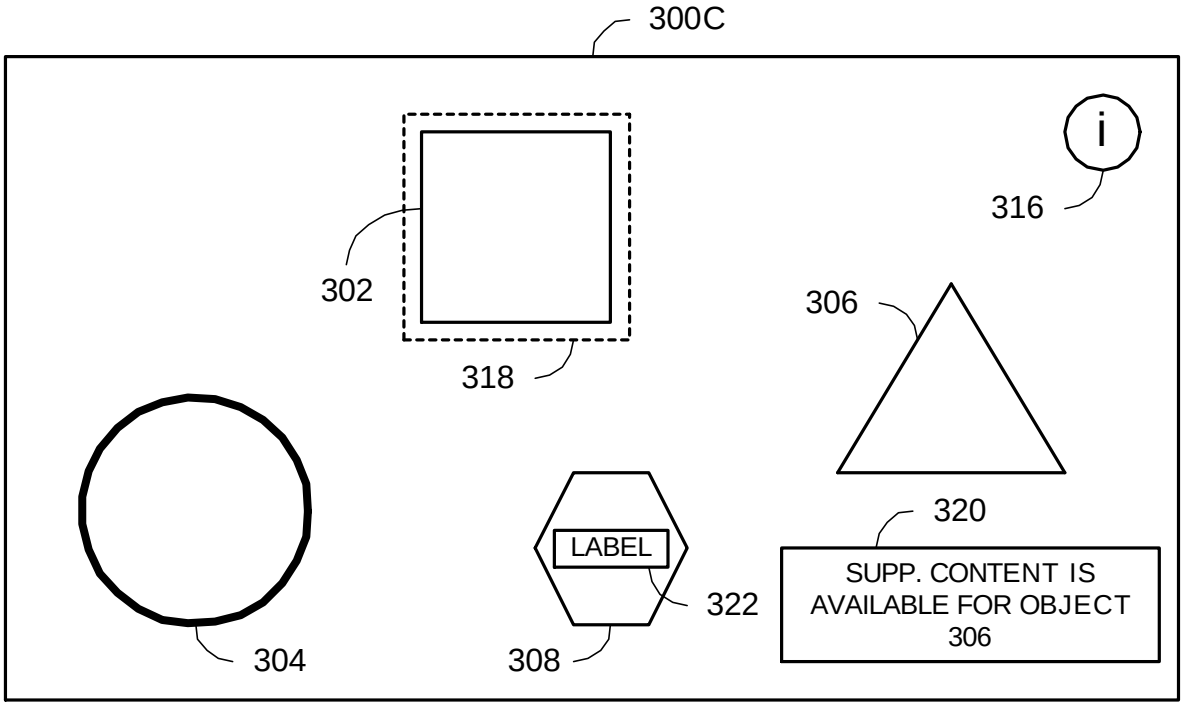
300C
i
316
302
318
306
304
LABEL
322
320
SUPP. CONTENT IS AVAILABLE FOR OBJECT 306
308

FIG. 6C

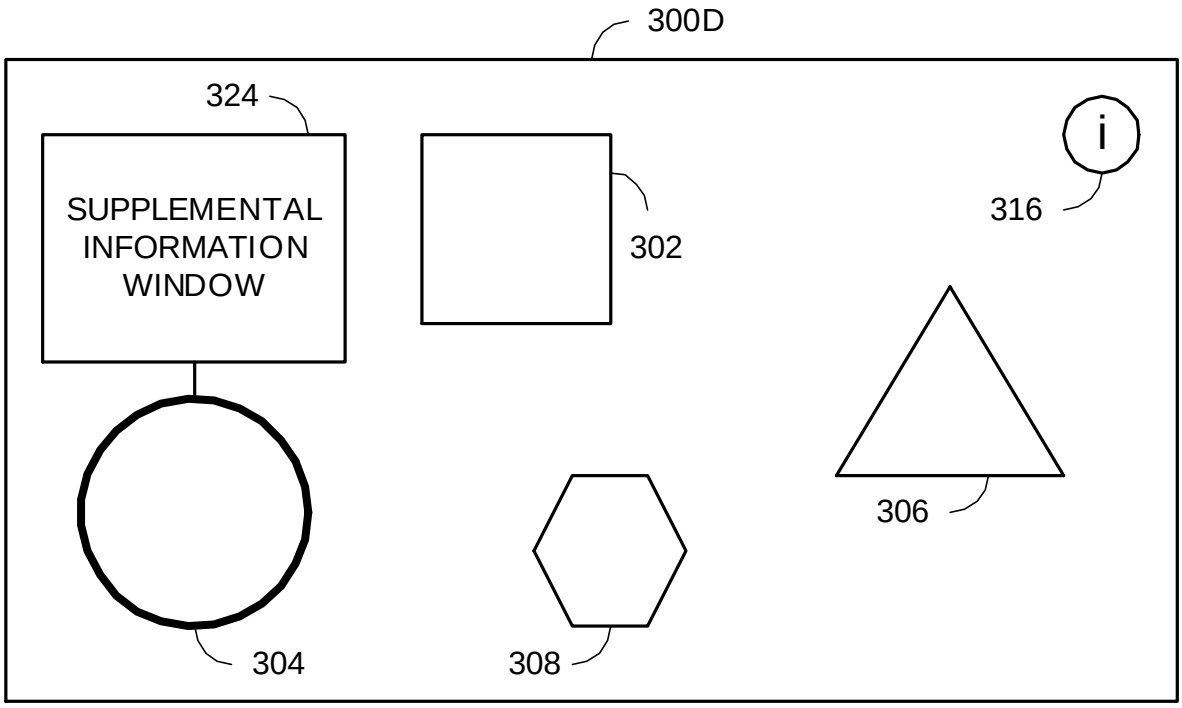
300D
324
SUPPLEMENTAL INFORMATION WINDOW
302
i
316
306
304
308

FIG. 6D

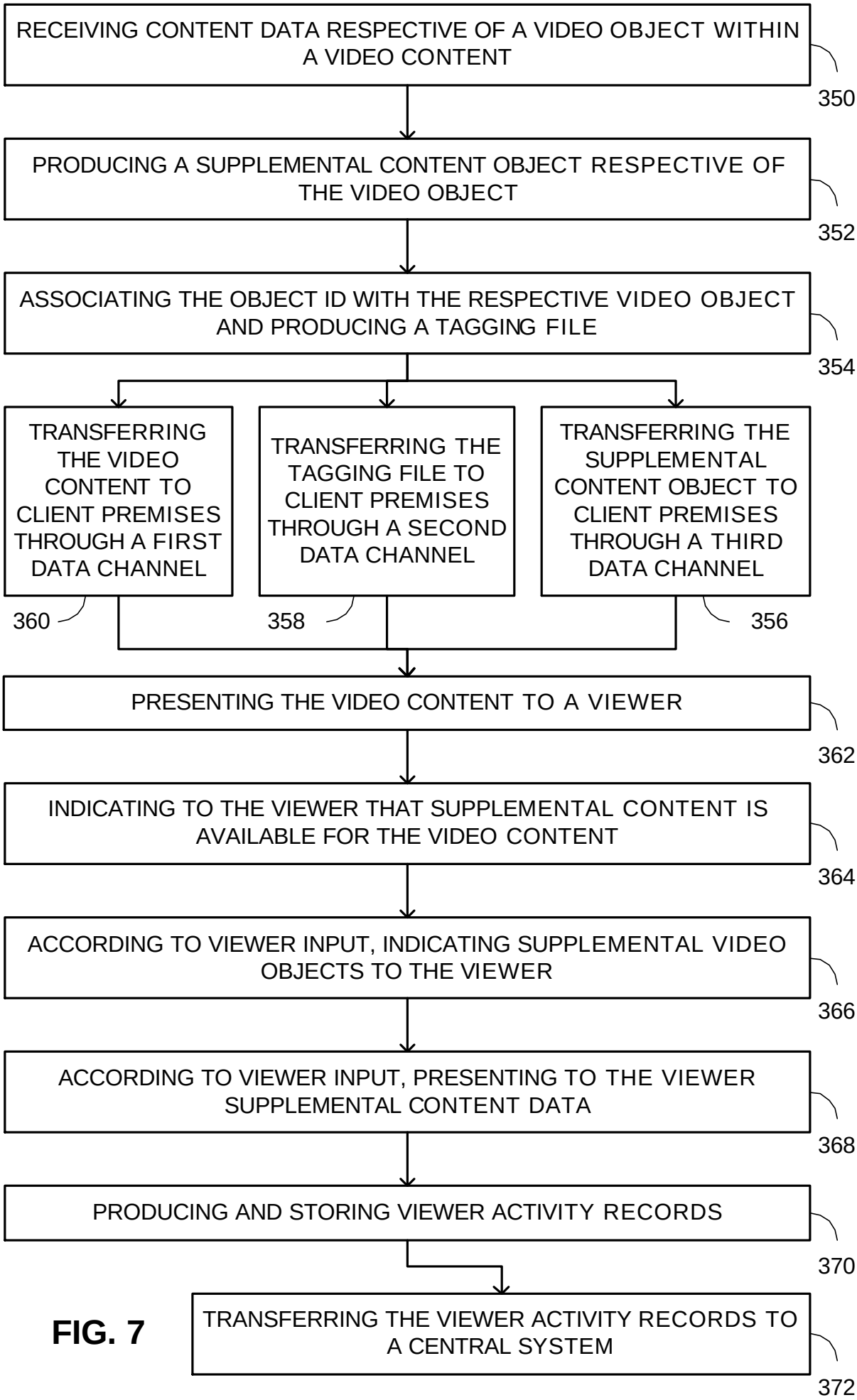
RECEIVING CONTENT DATA RESPECTIVE OF A VIDEO OBJECT WITHIN A VIDEO CONTENT
350
PRODUCING A SUPPLEMENTAL CONTENT OBJECT RESPECTIVE OF THE VIDEO OBJECT
352
ASSOCIATING THE OBJECT ID WITH THE RESPECTIVE VIDEO OBJECT AND PRODUCING A TAGGING FILE
354
TRANSFERRING THE VIDEO CONTENT TO CLIENT PREMISES THROUGH A FIRST DATA CHANNEL
360
TRANSFERRING THE TAGGING FILE TO CLIENT PREMISES THROUGH A SECOND DATA CHANNEL
358
TRANSFERRING THE SUPPLEMENTAL CONTENT OBJECT TO CLIENT PREMISES THROUGH A THIRD DATA CHANNEL
356
PRESENTING THE VIDEO CONTENT TO A VIEWER
362
INDICATING TO THE VIEWER THAT SUPPLEMENTAL CONTENT IS AVAILABLE FOR THE VIDEO CONTENT
364
ACCORDING TO VIEWER INPUT, INDICATING SUPPLEMENTAL VIDEO OBJECTS TO THE VIEWER
366
ACCORDING TO VIEWER INPUT, PRESENTING TO THE VIEWER SUPPLEMENTAL CONTENT DATA
368
PRODUCING AND STORING VIEWER ACTIVITY RECORDS
370
TRANSFERRING THE VIEWER ACTIVITY RECORDS TO A CENTRAL SYSTEM
372

FIG. 7

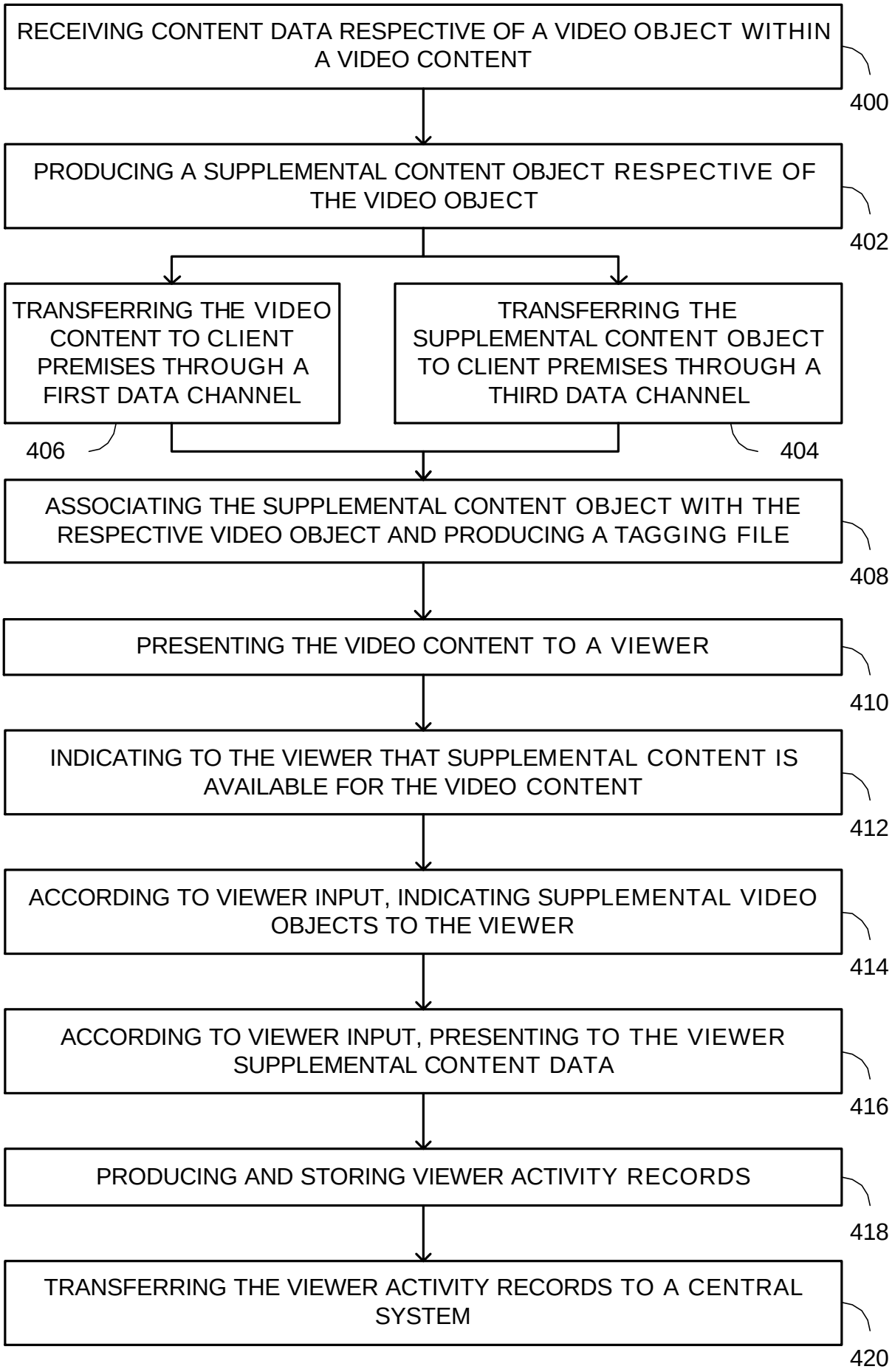
RECEIVING CONTENT DATA RESPECTIVE OF A VIDEO OBJECT WITHIN A VIDEO CONTENT
400
PRODUCING A SUPPLEMENTAL CONTENT OBJECT RESPECTIVE OF THE VIDEO OBJECT
402
TRANSFERRING THE VIDEO CONTENT TO CLIENT PREMISES THROUGH A FIRST DATA CHANNEL
406
TRANSFERRING THE SUPPLEMENTAL CONTENT OBJECT TO CLIENT PREMISES THROUGH A THIRD DATA CHANNEL
404
ASSOCIATING THE SUPPLEMENTAL CONTENT OBJECT WITH THE RESPECTIVE VIDEO OBJECT AND PRODUCING A TAGGING FILE
408
PRESENTING THE VIDEO CONTENT TO A VIEWER
410
INDICATING TO THE VIEWER THAT SUPPLEMENTAL CONTENT IS AVAILABLE FOR THE VIDEO CONTENT
412
ACCORDING TO VIEWER INPUT, INDICATING SUPPLEMENTAL VIDEO OBJECTS TO THE VIEWER
414
ACCORDING TO VIEWER INPUT, PRESENTING TO THE VIEWER SUPPLEMENTAL CONTENT DATA
416
PRODUCING AND STORING VIEWER ACTIVITY RECORDS
418
TRANSFERRING THE VIEWER ACTIVITY RECORDS TO A CENTRAL SYSTEM
420

FIG. 8