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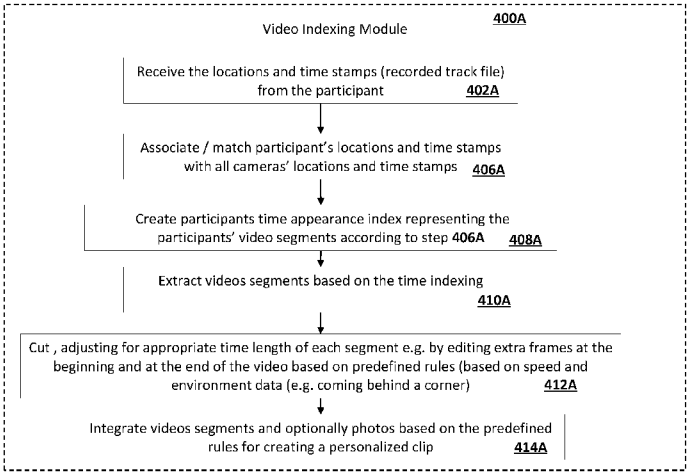

Fig. 10

(57) Abstract: A method of analyzing and presenting at least one video of a user in a comprehensive personal clip of the user's participation in an event, the method comprises providing users of the event with an identification sign, the identification sign comprises at least one unique two-dimensional (2D) barcode pattern and at least one predesigned common pattern; creating a lookup table of users' IDs, each user's ID being associated with the user's unique 2D barcode pattern; receiving at least one video of the event; extracting sample frames from the at least one video of the event in an initial predetermined rate; detecting and identifying at least one unique 2D barcode pattern in the sample frames and creating a time appearance index representing at least one user's at least one video segment, according to the at least one identified unique 2D barcode pattern; editing at least one of the at least one video segment that features at least one of the users based on the time appearance index; and integrating the at least one video segment into a comprehensive personal clip.

WO 2017/089968 A1

METHOD AND SYSTEM FOR CREATING A COMPREHENSIVE PERSONAL VIDEO CLIP

FIELD OF THE INVENTION

[0001] The present invention relates to the field of video clips creation and more specifically to creating a comprehensive personal clip of a user participating in an event.

CROSS-REFERENCE TO RELATED PATENT APPLICATIONS

[0002] This patent application claims priority from and is related to U.S. Provisional Patent Application Serial Number 62/259,154, filed 24/11/2015, this U.S. Provisional Patent Application incorporated by reference in its entirety herein.

BACKGROUND

[0003] Large events such as sports events are often filmed in order to be documented and replayed. As technology develops, users or participants such as runners are searching for an easy and automatic way to receive their photos and videos. Existing systems often demand a great deal of effort from the photographers capturing/filming the event, the user who wishes to receive his photos/ video clips and/or expensive and cumbersome equipment such as personal timing chips and heavy chip detectors in order to do the task.

[0004] There is a need for a system and method enabling to capture and/or film a large number of participants, automatically analyze and extract photos and videos of each participant and automatically generate a personalized comprehensive video clip and/or a photo album for each participant whilst enabling photographers of the event the freedom to capture/film anywhere in the event area and unchaining them from standing only near the heavy traditional chip detectors.

SUMMARY OF THE INVENTION

[0005] According to an aspect of the invention, there is provided a method of analyzing and presenting at least one video of a user in a comprehensive personal clip of the user's participation in an event, the method comprises: providing users of the event with an identification sign, the identification sign comprises at least one unique two-dimensional (2D) barcode pattern and at least one predesigned common pattern; creating a lookup table of users' IDs, each user's ID being associated with the user's unique 2D barcode pattern; receiving at least one video of the event; extracting sample frames from the at least one video of the event in an initial predetermined rate; detecting and identifying at least one unique 2D barcode pattern in the sample frames and creating a time appearance index representing at least one user's at least one video segment, according to the at least one identified unique 2D barcode pattern; editing at least one of the at least one video segment that features at least one of the users; and integrating the at least one video segment into a comprehensive personal clip; wherein the steps of creating, extracting, detecting and identifying, editing and integrating are performed by at least one processor unit.

[0006] The unique 2D barcode pattern may comprise a unique combination of pixels for each of the users participating in the event.

[0007] The predesigned common pattern may comprise a bright frame and a dark frame.

[0008] The predesigned common pattern may comprise orientation marks.

[0009] The orientation marks may comprise a top right white pixel, a top left white pixel, a bottom left white pixel and a bottom right black pixel.

[0010] The editing may comprises adding at least one extra frame at at least one of the beginning and end of at least one of the at least one video segment.

[0011] The editing may comprise cutting at least one frame from at least one of the beginning and end of at least one of the at least one video segment.

[0012] The editing may comprise enlarging a determined area of at least one of the at least one video segment.

[0013] The comprehensive personal clip may comprises a template.

[0014] The template may comprise at least one generic video and at least one placeholder.

[0015] The integration of the at least one video segment may comprises integrating the at least one video segment into the at least one placeholder.

[0016] The editing may comprise finding a frame where background pixels appear the least and wherein the integrating may comprise integrating the frame and frames spanning the placeholder before and after the frame.

[0017] The editing may comprise finding a frame where the unique 2D barcode pattern appears the largest and wherein the integrating may comprise integrating the frame and frames spanning the placeholder before and after the frame.

[0018] The integrating may comprise integrating at least one of the user's social network user name and photo, photos from the event, speed and area map.

[0019] The predetermined rate may be changed.

[0020] The predetermined rate may be lowered if in the step of detecting and identifying no identification sign has been detected in at least five consecutive sample frames.

[0021] The creation of a time appearance index may comprise determining whether a frame belongs to an existing video segment or should be part of a new video segment.

[0022] The method may further comprise calculating a user's speed based on the sizes of the user's unique 2D barcode pattern in at least two consecutive detected frames.

[0023] According to another aspect of the present invention, there is provided a method of analyzing and presenting at least one video of a user in a comprehensive personal clip of the user's participation in an event, the method comprises: providing by the user a file comprising at least locations and time stamps; matching the user's locations and time stamps with locations and time stamps of at least one camera filming the event; creating a time appearance index representing at least one user's at least one video segment according to the user's locations and time stamps and the at least one camera's locations and time stamps; editing at least one of the at least one video segment that features the user; and integrating the at least one

video segment into a comprehensive personal clip; wherein the steps of associating, creating, editing and integrating are performed by at least one processor unit.

[0024] The editing may comprise adding at least one extra frame at at least one of the beginning and end of at least one of the at least one video segment.

[0025] The editing may comprise cutting at least one frame from at least one of the beginning and end of at least one of the at least one video segment.

[0026] The comprehensive personal clip may comprise a template.

[0027] The template may comprise at least one generic video and at least one placeholder.

[0028] The integration of the at least one video segment may comprise integrating the at least one video segment into the at least one placeholder.

[0029] The integrating may comprise integrating at least one of the user's social network user name and photo, photos from the event, speed and area map.

[0030] According to another aspect of the present invention, there is provided a method of analyzing and presenting at least one video of a user in a comprehensive personal clip of the user's participation in an event, the method comprises: extracting sample frames from at least one video of the event in an initial predetermined rate; retrieving known photos of the participant and analyzing the participant 's face characteristics; using face detection and recognition, detecting and associating each participant's at least one detected frame with his ID/name; creating a time appearance index representing at least one user's at least one video segment; editing at least one video segment that features the user; and integrating the at least one video segment into a comprehensive personal clip; wherein the steps of associating, creating, editing and integrating are performed by at least one processor unit.

[0031] The editing may comprise adding at least one extra frame at at least one of the beginning and end of at least one of the at least one video segment.

[0032] The editing may comprise cutting at least one frame from at least one of the beginning and end of at least one of the at least one video segment.

[0033] The comprehensive personal clip may comprise a template.

[0034] The template may comprise at least one generic video and at least one placeholder.

[0035] The integration of the at least one video segment may comprise integrating the at least one video segment into the at least one placeholder.

[0036] The integrating may comprise integrating at least one of the user's social network user name and photo, photos from the event, speed and area map.

[0037] The detecting and associating may comprise comparing photos of participants to video frames.

[0038] The method may further comprise: presenting the user with at least one of the retrieved photos; and asking the user to identify himself in the at least one of the retrieved photos.

BRIEF DESCRIPTION OF THE DRAWINGS

[0039] For better understanding of the invention and to show how the same may be carried into effect, reference will now be made, purely by way of example, to the accompanying drawings.

[0040] With specific reference now to the drawings in detail, it is stressed that the particulars shown are by way of example and for purposes of illustrative discussion of the preferred embodiments of the present invention only, and are presented in the cause of providing what is believed to be the most useful and readily understood description of the principles and conceptual aspects of the invention. In this regard, no attempt is made to show structural details of the invention in more detail than is necessary for a fundamental understanding of the invention, the description taken with the drawings making apparent to those skilled in the art how the several forms of the invention may be embodied in practice. In the accompanying drawings:

[0041] **Fig. 1** is a block diagram illustrating a system for identification of participants in events, according to some embodiments of the invention;

[0042] **Fig. 2** is a flow chart , illustrating the operational steps of the 2D barcode pattern generator module, according to some embodiments of the invention;

[0043] **Fig. 3** is a flow chart illustrating the operational steps of the sign identification module, according to some embodiments of the invention;

[0044] **Fig. 4** is a flow chart illustrating the operational steps of the 2D barcode pattern reader module, according to some embodiments of the invention;

[0045] **Fig. 5** is a flow chart illustrating the operational steps of the photo organizing module, according to some embodiments of the invention;

[0046] **Fig. 6** is a flow chart illustrating the operational steps of the video indexing module, according to some embodiments of the invention;

[0047] **Fig. 7** is an illustration of an exemplary identification sign, according to some embodiments of the invention;

[0048] **Fig. 8** is an illustration of an exemplary time appearance index table, according to some embodiments of the invention;

[0049] **Fig. 9** is a flow chart illustrating the operational steps of an additional or alternative photo organizing module processing, according to some embodiments of the invention;

[0050] **Fig. 10** is a flow chart illustrating the operational steps of an additional or alternative Video editing module processing, according to some embodiments of the invention;

[0051] **Fig. 11** is a flow chart illustrating the operational steps of an additional or alternative Photo organizing module processing, according to some embodiments of the invention;

[0052] **Fig. 12** is a flow chart illustrating the operational steps of an additional or alternative Video editing module processing, according to some embodiments of the invention; and

[0053] **Fig. 13** is an illustration of an exemplary face detection and recognition sample pattern.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0054] Before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of the components set forth in the following description or illustrated in the drawings. The invention is applicable to other embodiments or of being practiced or carried out in various ways.

Also, it is to be understood that the phraseology and terminology employed herein is for the purpose of description and should not be regarded as limiting.

[0055] The present invention provides a system and method for analyzing and creating videos of participants in a comprehensive personal clip of the user's participation in an event. According to embodiments of the invention, participants have an identification sign which includes at least one two-dimensional (2D) barcode pattern and at least one predesigned common pattern enabling to pinpoint the identification sign of the participant appearing in the videos. Each participant is associated with a barcode in a lookup table of participants' IDs in order for the system to be able to recognize his video segments. Upon request for a clip, the system creates a video clip of the user (participant) participating in the event.

[0056] The present invention provides an identification sign having a frame of a first color such as a white frame, a background of a different color such as a black background (common pattern) and a two dimensional (2D) barcode pattern of a color that is different than that of the background such as white. The 2D barcode pattern is unique to each participant of the event. The terms 2D barcode pattern or unique 2D barcode pattern may be shortly referred to in this document as "barcode pattern" or simply as "pattern". It will be appreciated that the present invention is not limited to a 2D barcode pattern and any barcode, QR code, data matrix, code, pattern, etc. may be used. The barcode pattern of each participant is formed from a combination of blocks (pixels) printed in large scale having a small number of large pixels, so it can be identified in photos and videos taken from a long distance.

[0057] The present invention provides a solution for identifying participants in large events e.g. sports events, by providing each participant with a printed sign e.g. printed over a wearable object worn by the participant, such as a shirt, a neck badge, a hat, a bike helmet, etc. for identifying the particular participant. Photos and videos of the event are gathered or received in real time and processed in a designated computer device for detecting the identification sign worn by each of the participants in photos or videos of the sports event. The barcode of the participant(s) is identified from those photos or videos in real time or after the event, where each specific participant is identified by identifying the 2D barcode pattern of each identified identification

sign of each participant. The identification is done by comparing the identified barcode pattern with a predefined database associating each specific 2D barcode pattern with a specific participant. This means that the identification process may include two steps: a first step of identifying the identification sign within the image or video of the event and a second step of identifying the unique 2D barcode sign within the identification sign for ultimately identifying the participant within the image/video.

[0058] It will be appreciated that the identification process is not limited to include two steps. According to embodiments of the invention, the identification sign and the unique 2D barcode pattern may be identified together.

[0059] **Fig. 1** is a block diagram illustrating a system for identification of participants in events, according to some embodiments of the invention. The system includes an identification and editing server **10** in association with cameras **20** photographing or filming the area of the event and with at least one web site and/or application **30**. The identification and editing server **10** comprises at least one processor for performing the method of the present invention. In this example, each participant **5** of the event wears an object **40** such as a shirt, a hat, a neck badge, a bike helmet, a shirt sticker, etc. having the identification sign **45** printed thereover or attached thereto. Each identification sign **45** of each participant **5** includes a unique 2D barcode pattern for the specific participant **5**. The identification server **10** receives and scans photos and/or video images received from one or more of cameras **20** capturing or filming the event and identifies the participants **5** in each received photo or video. Each participant wears a wearable object **40** which includes one or more identical identification signs **45**. The identification sign **45** is associated with a specific participant identity using a look up table (e.g. in a designated database) **500**. The identification server **10** comprises a sign identification module **100** for identifying at least one identification sign appearing in each received image or frame, a barcode pattern reader module **200** for reading the barcode pattern in each identified identification sign in each image or frame; a 2D barcode pattern generator module **250** for generating barcode pattern**s** to the specifi**c** participants of each specific event using predefined generation rules for minimizing identification errors. The

server **10** further comprises a photo organizing module **300** and a video indexing module **400**. The photo organizing module **300** may be configured to associate images of each participant according to the 2D barcode pattern thereof that was identified using the lookup table **500** and optionally organize the photos in an album or a social network page e.g. a Facebook™ page. The Video indexing module **400** edits video segments out of the received event's videos, for each participant, based on the barcode pattern identification.

[0060] It will be appreciated that the camera(s) of the present invention may be places anywhere in the event, in any weather condition, fixed or in motion and is (are) not dependent on any other expensive and cumbersome electronic equipment such as traditional ground mounted or overhead timing chip detectors.

[0061] **Fig. 2** is a flow chart illustrating the operational steps of the 2D barcode pattern generator module **250**, according to some embodiments of the invention. The process carried out by the 2D barcode pattern generator module comprises the following steps: Creating common pattern identifier for each identification sign, for example creating two frames, an outer frame of white cells and inner frame of black cells which surround/enclose the 2D barcode pattern (step **252**); creating event Unique 2D barcode pattern (e.g. 5 by 5) for each participant based on a set of pre-defined rules that optionally ensure that each barcode pattern is not only unique, but also created to minimize identification error with any other barcode pattern in the set of barcode patterns for the specific event (step **254**), defining orientation markers on the corners of the identification sign as part of the common pattern (step **256**), for example, all the identification signs of a specific event include a top right white pixel, a top left white pixel, a bottom left white pixel and a bottom right black pixel such as presented for example in Fig, 7; and implementing an error correction code such as Hamming Error code (https://en.wikipedia.org/wiki/Hamming_code) (ste**p 259**) intended to identify an identification sign which was not captured properly. The identification sign comprises a bright frame, a dark frame and a bright inner 2D barcode pattern, for example, a white frame, a black frame and an inner 2D barcode pattern. The barcode pattern is printed in large scale with low resolution (e.g. 2X2 –

9X9 cm) so it can be identified in a photo or video image by the server modules even when taken (filmed or captured) from great distance.

[0062] **Fig. 3** is a flow chart illustrating the operational steps of the sign identification module **100**, according to some embodiments of the invention. This process includes the following steps: identifying sign common pattern (step **102**); optionally, geometrically transforming identified sign to a quadrilateral shape (For example, http://www.aforgenet.com/framework/docs/html/7039a71d-a87d-47ef-7907-ad873118e374.htm), this is required when the identification sign is captured at an angle causing the identification sign to have a non quadrilateral shape (step **104**); sign validation ensuring this sign is in the specific known format designed for the local two dimensional barcode (step **106**), identifying orientation and correcting according to predefined rules e.g. black cell at the bottom right corner (step **108**), binarizing the barcode by transforming any pixel in the identified barcode to white or black, for example, using http://www.aforgenet.com/framework/features/adaptive_binarization.html (step **110**) or by, for example, calculating a histogram and selecting threshold accordingly, etc. and then determining for each of the pixels (e.g. 25) whether it is white or black; at the end of this process determining whether the two dimensional barcode pattern was identified and assigning a rating of the identification based on quality parameters assigned to the specific identification sign and barcode pattern thereof (step **112**), such as blurriness, focus, sharpness, etc. It will be appreciated that at least some of the steps may be performed in a different order.

[0063] **Fig. 4** is a flow chart illustrating the operational steps of the 2D barcode pattern reader module **200**, according to some embodiments of the invention. This process includes the following steps: sampling the captured image or video frame, or a pre-defined number of areas within the image or frame to identify binary code (step **202**), validating of the barcode by an error correction algorithm e.g. Hamming Error code (step **204**), and checking the lookup table **500** for associating user ID (step **206**).

[0064] **Fig. 5** is a flow chart illustrating the operational steps of the photo organizing module **300**, according to some embodiments of the invention. This process includes the following steps: acquiring from all the cameras all

images in which the identification sign(s) was(were) identified (step **302)**; associating the identified 2D barcode pattern(s) thereof with user ID/name according to the look up table **500** (step **306**); upon user request acquiring images by associating two dimensional barcode pattern to participant ID using the lookup table (step **307**); optionally autocorrecting and cropping images (step **308**); editing each image collection by filtering images based on predefined filtering rules e.g. by using the identified detection quality parameters of the 2D barcode pattern (step **310**); organizing images according to pre-defined design rules (e.g. overlay, brightness, contrast, etc.) and branding each image using a premade photo watermark (step **312**) and optionally creating a personal photo album on a social network page such as Facebook™ (step **314**).

[0065] **Fig. 6** is a flow chart illustrating the operational steps of the video indexing module **400** according to some embodiments of the invention. This process includes the following steps: acquiring sample frames in a defined interval from the cameras' videos (step **402**), detecting and reading the 2D barcode pattern of at least one identification sign in each frame of the sample (step **404)** (see **Fig 3** and **4**); associating and matching the two dimensional barcode pattern with user/participant ID/name using the lookup table (step **406**), creating participants time appearance index representing the participants' video segments according to identified barcode patterns (step **408**) (see in **Fig. 8** is an example of the indexing); Upon request of a user (participant) to create his video clip, extracting video segments based on the index (step **410**); cutting and adjusting for appropriate time length for each segment by adding extra frames at the beginning and the end of the video based on predefined timing rules, considering speed of the participant and environment characteristics, such as participant appearing behind the corner (**412**) (this is required in some cases, when the person may appear in the video before the two dimensional barcode pattern was identified and may keep appearing after the barcode pattern was no longer identified) e.g. the barcode is somehow blocked from the camera's view; and integrating video segments and optionally photos/images based on the predefined rules to create a personalized edited clip (step **414**).

[0066] According to embodiments of the invention, the system may be configured to decide whether a detected frame belongs to an existing video segment or whether to start a new video segment based on a predetermined number of framed in which the user does not appear.

[0067] According to embodiments of the invention, when a participant wishes for the system to create his clip, he may register using Facebook™ by providing the identification number (**46** of **Fig. 1**) associated with his barcode. The system locates the user's video segments and integrates them in a video clip template. The video clip template may be prepared for each event or may be intended to allow modification as necessary. Each template may comprise generic parts which appear in each user's video clip and at least one "placeholder" (empty part) for the system to integrate the user's personal video segment(s) into. The generic parts are video clips in which the user does not necessarily appear. According to embodiments of the invention, the "placeholder" size may be fixed or dynamic. The system makes smart automatic decisions as per how to fit the user's video segments into the placeholder(s). For example, if the "placeholder" length is nine seconds and the user's video segment length is e.g. six seconds, the system may pad the extra three seconds with another video segment of the user or with a generic content. In another case where the "placeholder" length is e.g. nine seconds and the user's video segment length is e.g. fifteen seconds, the system may, for example:

[0068] Cut the first six seconds of the segment;

[0069] Cut the last six seconds of the segment;

[0070] Find the frame within the segment where the user's barcode appears the largest and use the frames spanning four and a half seconds before and after it;

[0071] Find the frame where background e.g. the sky's pixels appear the least, namely, the user's body is the biggest, thus covering part of the sky's pixels, and use the frames spanning four and a half seconds before and after this frame;

[0072] Use the nine consecutive seconds having the highest detection score, etc.

[0073] In a case where a face detection and recognition process is being used as described below, find the frame where the user's face is in best position e.g. a frame where the user is smiling, his eyes are wide open, etc. and use the frames spanning four and a half seconds before and after this frame.

[0074] According to embodiments of the invention, the system holds information regarding the chronological order of the segments in order to avoid cases where the video clip is created using a later segment before an earlier one.

[0075] According to embodiments of the invention, the system may enlarge a determined area of the video segment in order to zoom in on the user appearing in this area.

[0076] According to embodiments of the invention, the system may also integrate into the video clip the user's name and photo fetched from the user's Facebook™ page, photos of the user from the event, speed and area map.

[0077] According to embodiments of the invention, the system may calculate a user's speed based on the sizes of the user's unique 2D barcode pattern in at least two consecutive detected images and/or frames.

[0078] In the process of creating each video segment, the system samples the cameras' videos every predetermined time period, e.g. 1 second. According to embodiments of the invention, the system may automatically change the sampling rate. For example, if the system does not recognize any barcode in a number of frames (e.g. 5 frames), it may lower the sampling rate (e.g. every 2 seconds) and so on. When the system recognizes a barcode in the frame it may return to its original sampling rate.

[0079] According to embodiments of the invention, instead of or in addition to the sign identification module **100**, the barcode pattern reader module **200** and the 2D barcode pattern generator **250**, the system may use, for the process of recognizing the participants, a file provided by the participant who wishes for the system to create his video clip. This file may be generated by a designated application such as, for example, RunKeeper™ (https://runkeeper.com/) and includes the participant's chronological locations and time stamps (e.g. Runner_1.gpx). Once the participant provides this file to the system, the photo organization module **300A** and the video indexing

module **400A** may use this file for recognizing the participant instead or in addition to the recognition using his barcode.

[0080] **Fig. 9** is a flow chart illustrating the operational steps of an additional or alternative photo organizing module **300A** according to some embodiments of the invention. This process includes the following steps: receiving locations and time stamps file(s) from the participant (**302A**); Acquiring all the images from all cameras of the participant according to his locations and time stamps and the cameras' locations and time stamps (**304A**); optionally autocorrecting and cropping images (step **306A**); editing each images collection by filtering images based on predefined filtering rules (step **308A**); organizing images according to pre-defined design rules and branding each image using a premade photo watermark (step **310A**) and optionally creating a personal photo album on a social network page such as Facebook™ (step **312A**).

[0081] **Fig. 10** is a flow chart illustrating the operational steps of an additional or alternative video indexing module **400A** according to some embodiments of the invention. This process includes the following steps: receiving from the participant the locations and time stamps file (**402A**); Associating/Matching the participant's locations and time stamps with the cameras' locations and time stamps (**406A**); creating participants time appearance index representing the participants' video segments according to step **406A** (step **408A**) (see in **Fig. 8** is an example of the indexing); extracting video segments based on the index (step **410A**); cutting and adjusting for appropriate time length for each segment by adding extra frames at the beginning and the end of the video based on predefined timing rules, considering speed of the participant and environment characteristics, such as participant appearing behind the corner (**412A**); and integrating video segments and optionally photos/images based on the predefined rules to create a personalized edited clip (step **414A**).

[0082] It will be appreciated that the event may be captured and/or filmed by at least one camera.

[0083] As mentioned before, when a participant wishes for the system to create his clip, he may register using Facebook™ by providing the identification number (**46** of **Fig. 1**) associated with his barcode and, according to embodiments of the invention, provide his locations and time

stamps file. The system locates the user's video segments and integrates them in a video clip template. The video clip template may be prepared for each event or may be intended to allow modification as necessary. Each template may comprise generic parts which appear in each user's video clip and at least one "placeholder" for the system to integrate the user's video segment(s) into. The generic parts are video clip in which the user does not necessarily appear. According to embodiments of the invention, the "placeholder" size may be dynamic. In case where the "placeholder" size is fixed, the system may edit the user's video segments to fill the "placeholder". For example, if the "placeholder" length is nine seconds and the user's video segment length is e.g. six seconds, the system may pad the extra three seconds with another video segment of the user or with a generic content. In another case where the "placeholder" length is e.g. nine seconds and the user's video segment length is e.g. fifteen seconds, the system may, for example:

[0084] Cut the first six seconds of the segment;

[0085] Cut the last six seconds of the segment;

[0086] Find the frame where e.g. the sky's pixels appear the least, namely, the user's body is the biggest, thus covering part of the sky's pixels, and use the frames spanning four and a half seconds before and after this frame, etc.

[0087] According to embodiments of the invention, the system holds information regarding the chronological order of the segments in order to avoid cases where the video clip is created using a later frame before an earlier one.

[0088] According to embodiments of the invention, the system may also integrate into the video clip the user's name and photo fetched from the user's Facebook™ page, photos of the user from the event, speed and area map.

[0089] **Fig. 7** is an illustration of an exemplary identification sign, according to some embodiments of the invention. The identification sign includes, for example, a white frame **702** and a black background **704** surrounding the 2D barcode pattern **706**, which enables to detect the barcode pattern and therefore the participant associated therewith, when capturing the image from a great distance.

[0090] **Fig. 8** is an illustration of an exemplary time appearance index table, according to some embodiments of the invention. This table includes for each participant ID ,the starting time in which the participants first appeared, in any video segment, the end time of the last appearance of the user and his geographical location at each video segment.

[0091] According to embodiments of the invention, instead of or in addition to the sign identification module **100**, the barcode pattern reader module **200** and the 2D barcode pattern generator **250**, the system may use, for the process of recognizing the participants, a face detection and recognition process. According to embodiments of the invention, the system may scan participants' photos, such as for example by extracting the participant's images from his Facebook™ accounts in order to learn and analyze participants' characteristics (e.g. face ratios and/or patterns such as presented in **Fig. 13**). The photo organization module **300B** (of **Fig. 11**) and the video indexing module **400B** (of **Fig. 12**) may use these photos and patterns for recognizing participants using face detection and recognition process instead or in addition to the recognition using barcodes.

[0092] **Fig. 11** is a flow chart illustrating the operational steps of an additional or alternative photo organizing module **300B**, according to some embodiments of the invention. This process includes the following steps: acquiring all images from all the cameras (step **302B)**; retrieving known participant photos (e.g. from Facebook™) and learning and analyzing participants' characteristics (e.g. face ratios and/or patterns such as presented in **Fig. 13**) required for face detection and recognition (step **304B**); using face detection and recognition, detecting and associating each participant's photos with his ID/name (step **306B**), optionally autocorrecting and cropping images (step **308B**); editing each image collection by filtering images based on predefined filtering rules (step **310B**); organizing images according to pre-defined design rules and branding each image using a premade photo watermark (step **312B**) and optionally creating a personal photo album on a social network page such as Facebook™ (step **314B**).

[0093] **Fig. 12** is a flow chart illustrating the operational steps of an additional or alternative video indexing module **400B** according to some embodiments of the invention. This process includes the following steps:

acquiring sample frames in a defined interval from the cameras' videos (step **402B**); retrieving known participant photos (e.g. from Facebook™) learning and analyzing participants' characteristics (e.g. face ratios and/or patterns such as presented in **Fig. 13**) required for face detection and recognition (step **403B**); using face detection and recognition, detecting and associating each participant's photos with his ID/name (step **404B)**; creating participants time appearance index representing the participants' video segments (step **408B**) (see in **Fig. 8** is an example of the indexing); upon request of a user (participant) to create his video clip, extracting video segments based on the time index (step **410B**); cutting and adjusting for appropriate time length for each segment by adding extra frames at the beginning and the end of the video based on predefined timing rules (**412B**); and integrating video segments and optionally photos/images based on the predefined rules to create a personalized edited clip (step **414B**).

[0094] According to embodiments of the invention, in the step of learning and analyzing participants' characteristics, the system may present the user with at least one retrieved photo of himself and ask him to identify himself in this (these) photo(s).

[0095] It will be appreciated that the photo album and the video clip do not have to be created only upon request. The system may create the photo albums and/or the video clips of all or at least part of the participants in advance.

[0096] **Fig. 13** is an illustration of an exemplary face detection and recognition sample pattern.

[0097] It will be appreciated that the system of the present invention refers to recognizing and creating video clips for participants but is not limited to only recognizing and creating video clips for participants. The system may also be configured to recognize and create video clips for vehicles, motorcycles, boats or any other moving object.

[0098] It will be appreciated by persons skilled in the art that the present invention is not limited to what has been particularly shown and described hereinabove. Rather the scope of the present invention is defined by the appended claims and includes combinations and sub-combinations of the various features described hereinabove as well as variations and

modifications thereof which would occur to persons skilled in the art upon reading the foregoing description.

CLAIMS

1. A method of analyzing and presenting at least one video of a user in a comprehensive personal clip of said user's participation in an event, said method comprises:
   - providing users of said event with an identification sign, said identification sign comprises at least one unique two-dimensional (2D) barcode pattern and at least one predesigned common pattern;
   - creating a lookup table of users' IDs, each user's ID being associated with said user's unique 2D barcode pattern;
   - receiving at least one video of said event;
   - extracting sample frames from said at least one video of said event in an initial predetermined rate;
   - detecting and identifying at least one unique 2D barcode pattern in said sample frames and creating a time appearance index representing at least one user's at least one video segment, according to said at least one identified unique 2D barcode pattern;
   - editing at least one of said at least one video segment that features at least one of said users; and
   - integrating said at least one video segment into a comprehensive personal clip;

   wherein the steps of creating, extracting, detecting and identifying, editing and integrating are performed by at least one processor unit.
2. The method of claim 1, wherein said unique 2D barcode pattern comprises a unique combination of pixels for each of said users participating in said event.
3. The method of claim 1, wherein said predesigned common pattern comprises a bright frame and a dark frame.
4. The method of claim 1, wherein said predesigned common pattern comprises orientation marks.
5. The method of claim 4, wherein said orientation marks comprise a top right white pixel, a top left white pixel, a bottom left white pixel and a bottom right black pixel.

6. The method of claim 1, wherein said editing comprises adding at least one extra frame at at least one of the beginning and end of at least one of said at least one video segment.
7. The method of claim 1, wherein said editing comprises cutting at least one frame from at least one of the beginning and end of at least one of said at least one video segment.
8. The method of claim 1, wherein said editing comprises enlarging a determined area of at least one of said at least one video segment.
9. The method of claim 1, wherein said comprehensive personal clip comprises a template.
10. The method of claim 9, wherein said template comprises at least one generic video and at least one placeholder.
11. The method of claim 10, wherein said integrating said at least one video segment comprises integrating said at least one video segment into said at least one placeholder.
12. The method of claim 11, wherein said editing comprises finding a frame where background pixels appear the least and wherein said integrating comprises integrating said frame and frames spanning said placeholder before and after said frame.
13. The method of claim 11, wherein said editing comprises finding a frame where said unique 2D barcode pattern appears the largest and wherein said integrating comprises integrating said frame and frames spanning said placeholder before and after said frame.
14. The method of claim 1, wherein said integrating comprises integrating at least one of said user's social network user name and photo, photos from said event, speed and area map.
15. The method of claim 1, wherein said predetermined rate may be changed.
16. The method of claim 1, wherein said predetermined rate may be lowered if in the step of detecting and identifying no identification sign has been detected in at least five consecutive sample frames.
17. The method of claim 1, wherein said creating a time appearance index comprises determining whether a frame belongs to an existing video segment or should be part of a new video segment.

18. The method of claim 1, further comprising:

calculating a user's speed based on the sizes of said user's unique 2D barcode pattern in at least two consecutive detected frames.

19. A method of analyzing and presenting at least one video of a user in a comprehensive personal clip of said user's participation in an event, said method comprises:
    - providing by said user a file comprising at least locations and time stamps;
    - matching said user's locations and time stamps with locations and time stamps of at least one camera filming said event;
    - creating a time appearance index representing at least one user's at least one video segment according to said user's locations and time stamps and said at least one camera's locations and time stamps;
    - editing at least one of said at least one video segment that features said user; and
    - integrating said at least one video segment into a comprehensive personal clip;

    wherein the steps of associating, creating, editing and integrating are performed by at least one processor unit.

20. The method of claim 19, wherein said editing comprises adding at least one extra frame at at least one of the beginning and end of at least one of said at least one video segment.

21. The method of claim 19, wherein said editing comprises cutting at least one frame from at least one of the beginning and end of at least one of said at least one video segment.

22. The method of claim 19, wherein said comprehensive personal clip comprises a template.

23. The method of claim 22, wherein said template comprises at least one generic video and at least one placeholder.

24. The method of claim 23, wherein said integrating said at least one video segment comprises integrating said at least one video segment into said at least one placeholder.

25. The method of claim 19, wherein said integrating comprises integrating at least one of said user's social network user name and photo, photos from said event, speed and area map.
26. A method of analyzing and presenting at least one video of a user in a comprehensive personal clip of said user's participation in an event, said method comprises:
    - extracting sample frames from at least one video of said event in an initial predetermined rate;
    - retrieving known photos of said participant and analyzing said participant 's face characteristics;
    - using face detection and recognition, detecting and associating each participant's at least one detected frame with his ID/name;
    - creating a time appearance index representing at least one user's at least one video segment;
    - editing at least one video segment that features said user; and
    - integrating said at least one video segment into a comprehensive personal clip;

    wherein the steps of associating, creating, editing and integrating are performed by at least one processor unit.
27. The method of claim 26, wherein said editing comprises adding at least one extra frame at at least one of the beginning and end of at least one of said at least one video segment.
28. The method of claim 26, wherein said editing comprises cutting at least one frame from at least one of the beginning and end of at least one of said at least one video segment.
29. The method of claim 26, wherein said comprehensive personal clip comprises a template.
30. The method of claim 29, wherein said template comprises at least one generic video and at least one placeholder.
31. The method of claim 30, wherein said integrating said at least one video segment comprises integrating said at least one video segment into said at least one placeholder.

32. The method of claim 26, wherein said integrating comprises integrating at least one of said user's social network user name and photo, photos from said event, speed and area map.

33. The method of claim 26, wherein said detecting and associating comprises comparing photos of participants to video frames.

34. The method of claim 26, further comprising:

presenting said user with at least one of said retrieved photos; and

asking said user to identify himself in said at least one of said retrieved photos.

AMENDED CLAIMS
received by the International Bureau on 05.05.2017

CLAIMS

1. A method of analyzing and presenting at least one video of a user in a comprehensive personal clip of said user's participation in an event, wherein said comprehensive personal clip comprises a template comprising at least one generic video and at least one placeholder; said method comprises:
   - providing each user of said event with an identification sign,;
   - creating a lookup table of users' IDs, each user's ID being associated with said user's identification sign;
   - receiving at least one video of said event;
   - extracting sample frames from said at least one video of said event in an initial predetermined rate;
   - detecting and identifying at least one identification sign in said sample frames and creating a time appearance index representing at least one user's at least one video segment, according to said at least one identified identification sign;
   - editing at least one of said at least one video segment that features at least one of said users and background pixels;
     wherein said editing comprises one of:
       finding a frame where said background pixels appear the least; and
       finding a frame where said identification sign appears the largest; and
   - integrating said at least one edited video segment into a comprehensive personal clip; wherein said integrating comprises integrating said found frame and frames spanning at least one of said at least one placeholder before and after said found frame;
     wherein the steps of creating, extracting, detecting and identifying, editing and integrating are performed by at least one processor unit.
2. The method of claim 1, wherein said identification sign comprises one of barcode, QR code, data matrix, code and pattern.

3. The method of claim 1, wherein said identification sign comprises at least one unique two-dimensional (2D) barcode pattern and at least one predesigned common pattern.
4. The method of claim 3, wherein said unique 2D barcode pattern comprises a unique combination of pixels for each of said users participating in said event.
5. The method of claim 3, wherein said predesigned common pattern comprises a bright frame and a dark frame.
6. The method of claim 3, wherein said predesigned common pattern comprises orientation marks.
7. The method of claim 6, wherein said orientation marks comprise a top right white pixel, a top left white pixel, a bottom left white pixel and a bottom right black pixel.
8. The method of claim 1, wherein said editing comprises adding at least one extra frame at at least one of the beginning and end of at least one of said at least one video segment.
9. The method of claim 1, wherein said editing comprises cutting at least one frame from at least one of the beginning and end of at least one of said at least one video segment.
10. The method of claim 1, wherein said editing comprises enlarging a determined area of at least one of said at least one video segment.
11. The method of claim 1, further comprising integrating at least one of said at least one video segment into at least one of said at least one placeholder.
12. The method of claim 1, further comprising integrating at least one of said user's social network user name and photo, photos from said event, speed and area map.
13. The method of claim 1, wherein said predetermined rate may be changed.
14. The method of claim 1, wherein said predetermined rate may be lowered if in the step of detecting and identifying no identification sign has been detected in at least five consecutive sample frames.

15. The method of claim 1, wherein said creating a time appearance index comprises determining whether a frame belongs to an existing video segment or should be part of a new video segment.
16. The method of claim 1, further comprising:

calculating a user's speed based on the sizes of said user's identification sign in at least two consecutive detected frames.

17. A method of analyzing and presenting at least one video of a user in a comprehensive personal clip of said user's participation in an event, wherein said comprehensive personal clip comprises a template comprising at least one generic video and at least one placeholder; said method comprises:
    - providing by said user a file comprising at least locations and time stamps;
    - matching said user's locations and time stamps with locations and time stamps of at least one camera filming said event;
    - creating a time appearance index representing at least one user's at least one video segment according to said user's locations and time stamps and said at least one camera's locations and time stamps;
    - editing at least one of said at least one video segment that features said user and background pixels;
      wherein said editing comprises finding a frame where said background pixels appear the least; and
    - integrating said at least one edited video segment into a comprehensive personal clip; wherein said integrating comprises integrating said found frame and frames spanning at least one of said at least one placeholder before and after said found frame;

    wherein the steps of associating, creating, editing and integrating are performed by at least one processor unit.
18. The method of claim 17, wherein said editing comprises adding at least one extra frame at at least one of the beginning and end of at least one of said at least one video segment.
19. The method of claim 17, wherein said editing comprises cutting at least one frame from at least one of the beginning and end of at least one of said at least one video segment.

20. The method of claim 17, further comprising integrating at least one of said at least one video segment into at least one of said at least one placeholder.
21. The method of claim 17, further comprising integrating at least one of said user's social network user name and photo, photos from said event, speed and area map.
22. A method of analyzing and presenting at least one video of a user in a comprehensive personal clip of said user's participation in an event, wherein said comprehensive personal clip comprises a template comprising at least one generic video and at least one placeholder; said method comprises:
    - extracting sample frames from at least one video of said event in an initial predetermined rate;
    - retrieving known photos of a user and analyzing said user's face characteristics;
    - using face detection and recognition, detecting said user in at least one frame and associating said at least one frame with said user's ID/name;
    - creating a time appearance index representing said user's at least one video segment;
    - editing at least one video segment that features said user and background pixels;
      wherein said editing comprises one of:
        finding a frame where said background pixels appear the least; and
        finding a frame in which one of: said user is smiling and said user's eyes are wide open; and
    - integrating said at least one edited video segment into a comprehensive personal clip; wherein said integrating comprises integrating said found frame and frames spanning at least one of said at least one placeholder before and after said found frame;

    wherein the steps of associating, creating, editing and integrating are performed by at least one processor unit.

23. The method of claim 22, wherein said editing comprises adding at least one extra frame at at least one of the beginning and end of at least one of said at least one video segment.
24. The method of claim 22, wherein said editing comprises cutting at least one frame from at least one of the beginning and end of at least one of said at least one video segment.
25. The method of claim 22, further comprising integrating at least one of said at least one video segment into at least one of said at least one placeholder.
26. The method of claim 22, further comprising integrating at least one of said user's social network user name and photo, photos from said event, speed and area map.
27. The method of claim 22, wherein said detecting and associating comprises comparing photos of users to video frames.
28. The method of claim 22, further comprising:

presenting said user with at least one of said retrieved photos; and

asking said user to identify himself in said at least one of said retrieved photos.

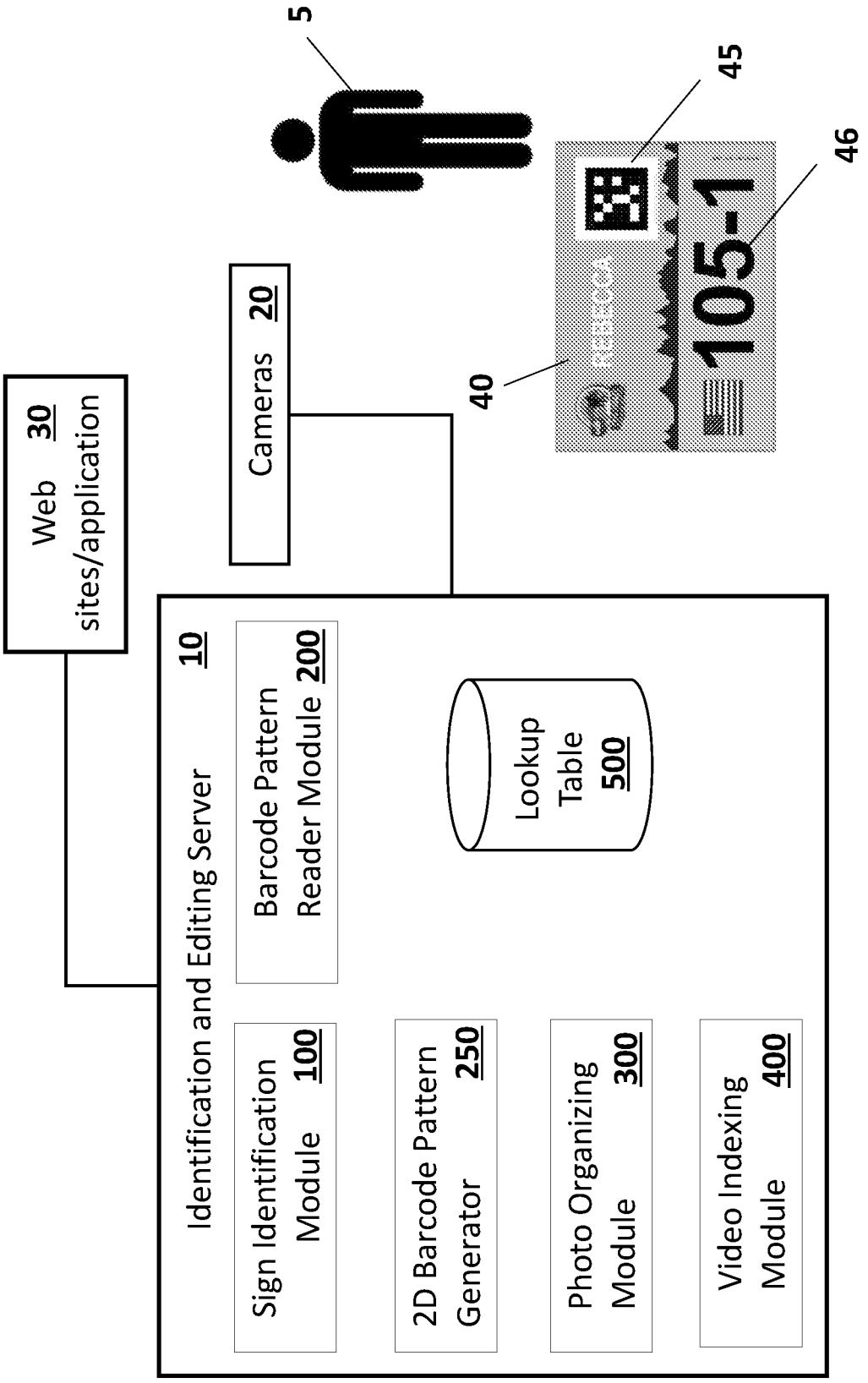
5
45
46
40
105-1
Cameras 20
Web 30 sites/application
Identification and Editing Server 10
Barcode Pattern Reader Module 200
Lookup Table 500
Sign Identification Module 100
2D Barcode Pattern Generator 250
Photo Organizing Module 300
Video Indexing Module 400

Fig. 1

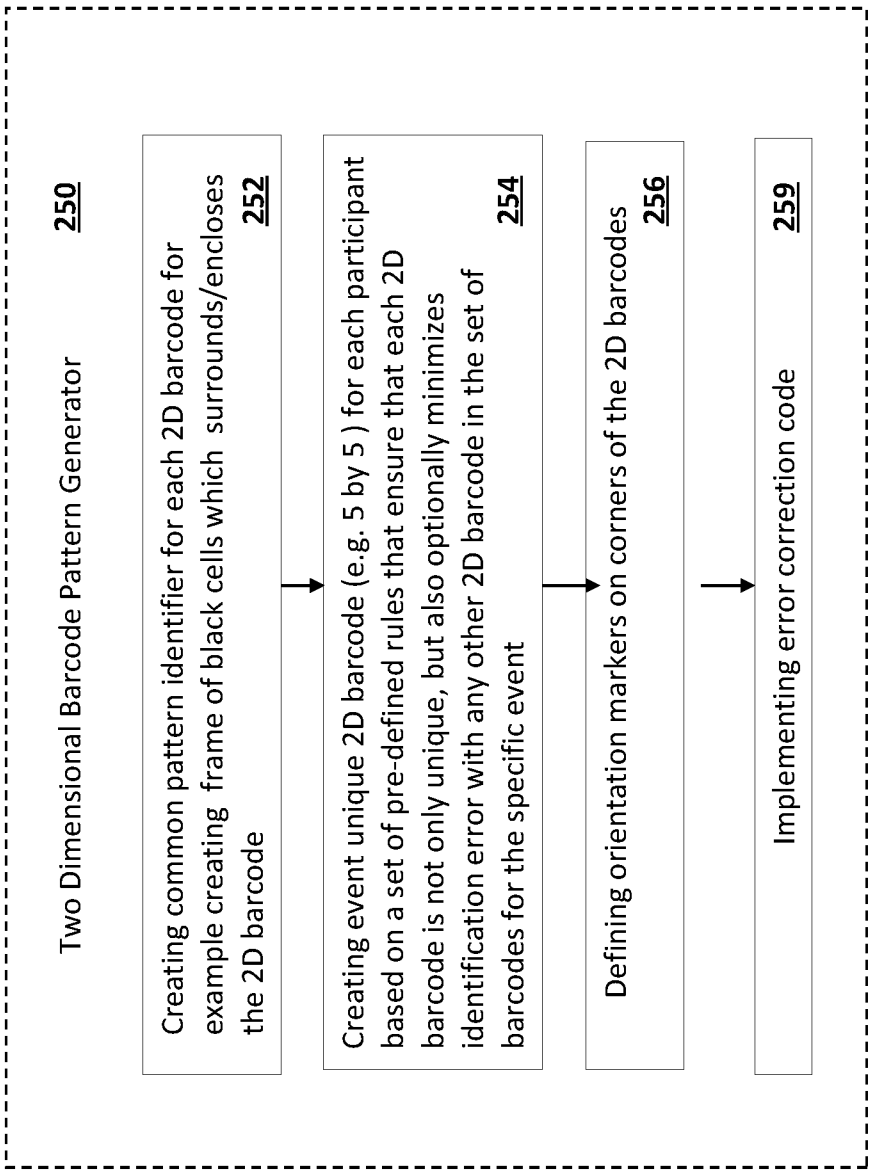
Two Dimensional Barcode Pattern Generator 250
Creating common pattern identifier for each 2D barcode for example creating frame of black cells which surrounds/encloses the 2D barcode 252
Creating event unique 2D barcode (e.g. 5 by 5) for each participant based on a set of pre-defined rules that ensure that each 2D barcode is not only unique, but also optionally minimizes identification error with any other 2D barcode in the set of barcodes for the specific event 254
Defining orientation markers on corners of the 2D barcodes 256
Implementing error correction code 259

Fig. 2

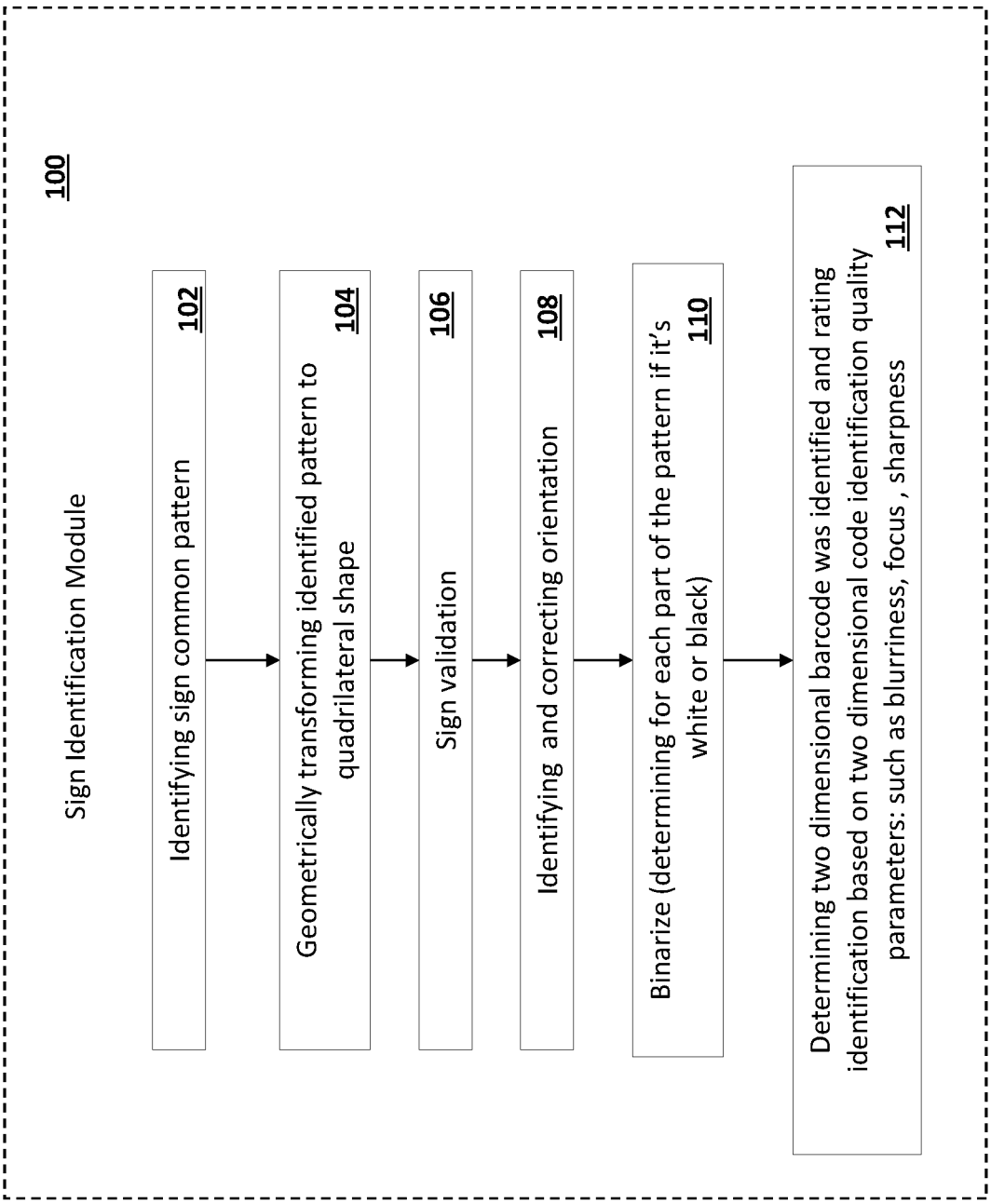
100
Sign Identification Module
Identifying sign common pattern 102
Geometrically transforming identified pattern to quadrilateral shape 104
Sign validation 106
Identifying and correcting orientation 108
Binarize (determining for each part of the pattern if it's white or black) 110
Determining two dimensional barcode was identified and rating identification based on two dimensional code identification quality parameters: such as blurriness, focus , sharpness 112

Fig. 3

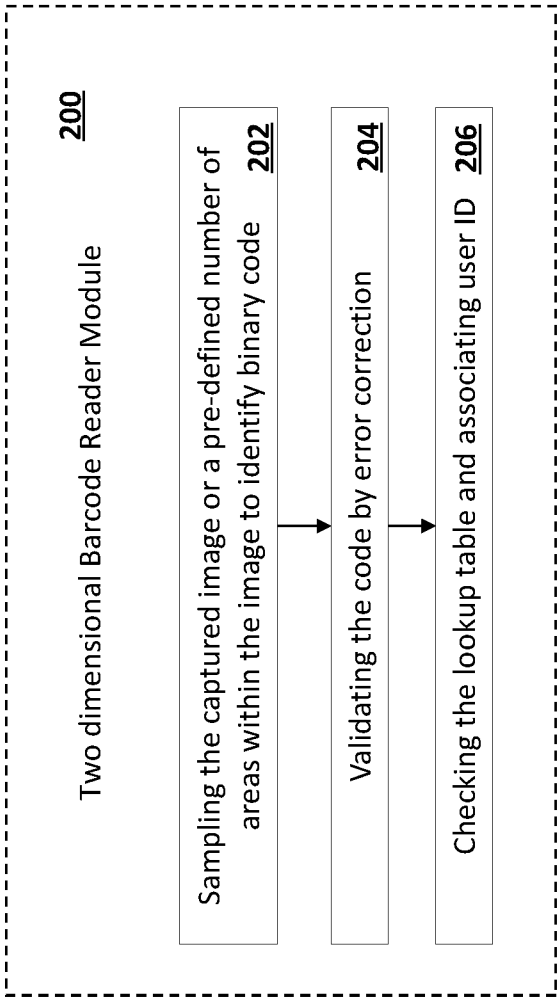
Two dimensional Barcode Reader Module
200
Sampling the captured image or a pre-defined number of areas within the image to identify binary code
202
Validating the code by error correction
204
Checking the lookup table and associating user ID
206

Fig. 4

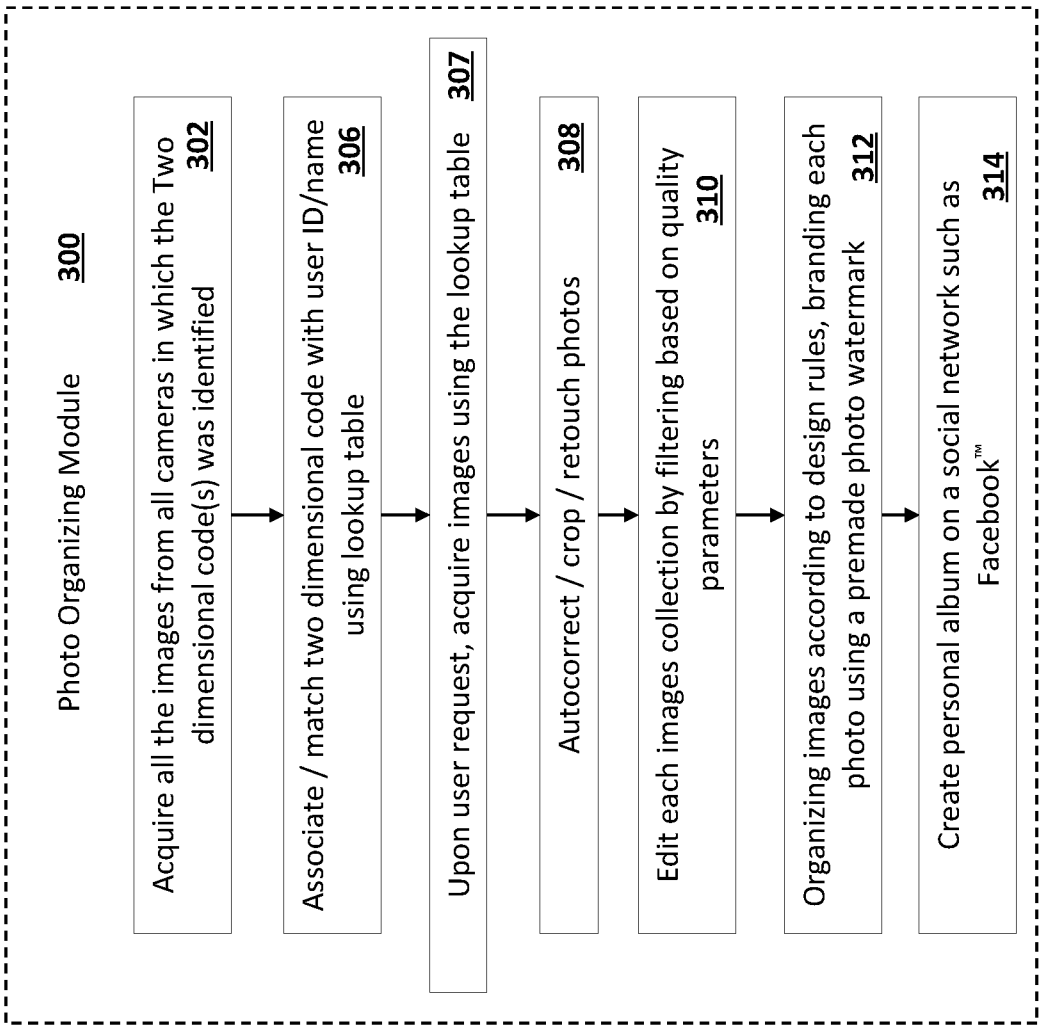
Photo Organizing Module 300
Acquire all the images from all cameras in which the Two dimensional code(s) was identified 302
Associate / match two dimensional code with user ID/name using lookup table 306
Upon user request, acquire images using the lookup table 307
Autocorrect / crop / retouch photos 308
Edit each images collection by filtering based on quality parameters 310
Organizing images according to design rules, branding each photo using a premade photo watermark 312
Create personal album on a social network such as Facebook™ 314

Fig. 5

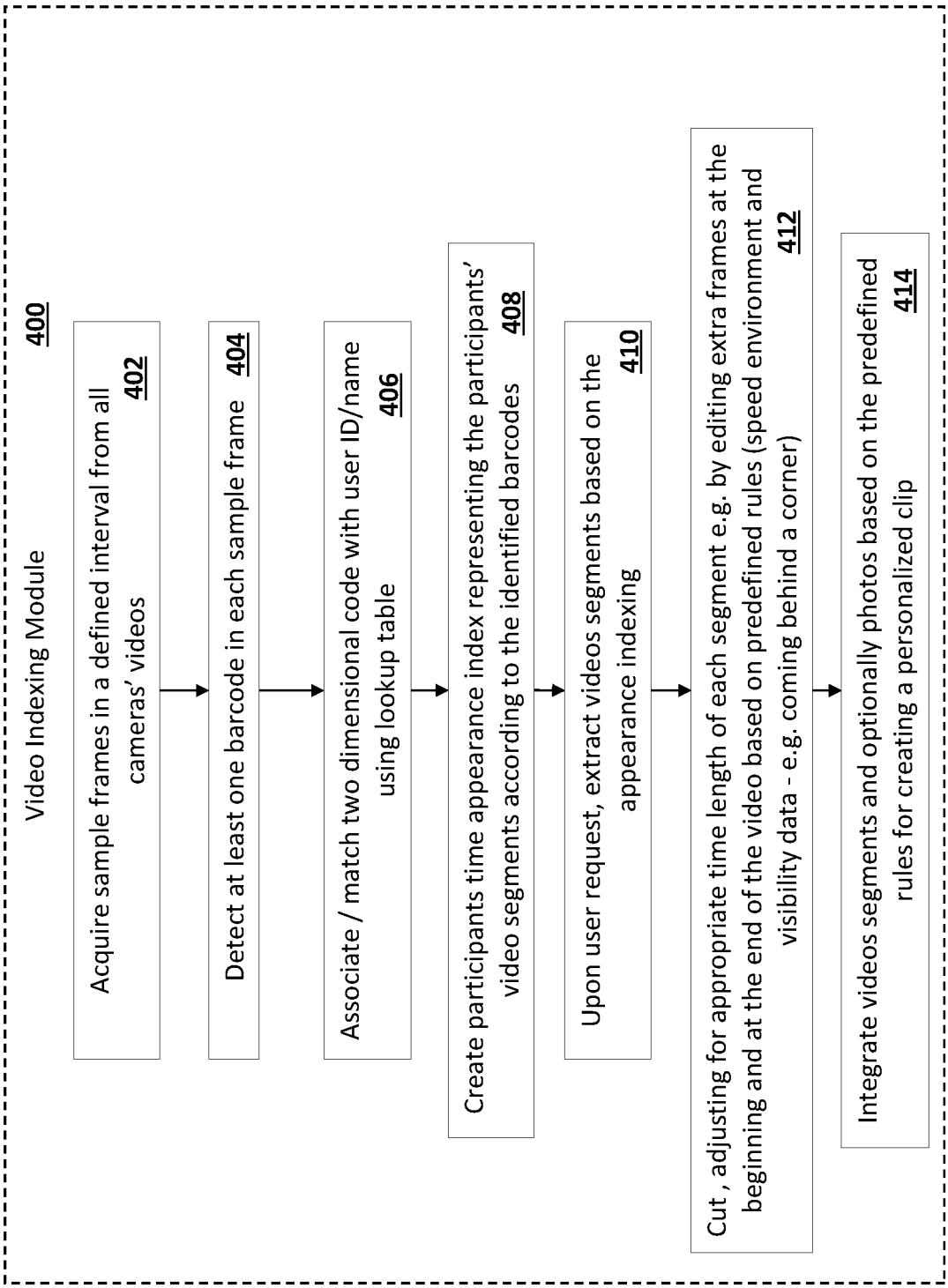
Video Indexing Module 400
Acquire sample frames in a defined interval from all cameras' videos 402
Detect at least one barcode in each sample frame 404
Associate / match two dimensional code with user ID/name using lookup table 406
Create participants time appearance index representing the participants' video segments according to the identified barcodes 408
Upon user request, extract videos segments based on the appearance indexing 410
Cut , adjusting for appropriate time length of each segment e.g. by editing extra frames at the beginning and at the end of the video based on predefined rules (speed environment and visibility data - e.g. coming behind a corner) 412
Integrate videos segments and optionally photos based on the predefined rules for creating a personalized clip 414

Fig. 6

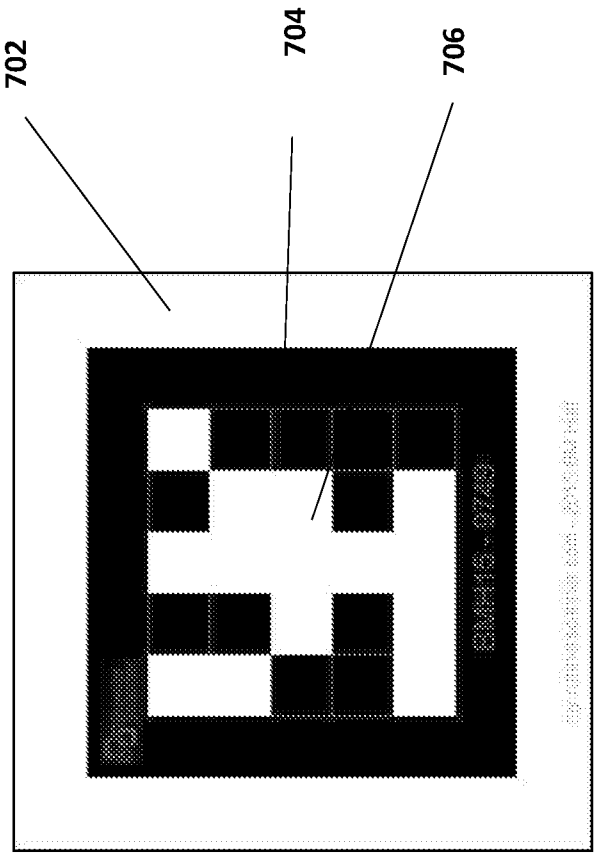

Fig. 7

Participant ID	Video ID	Starting second	End second	Lat/Long/Alt
12345	1234	1000	1025	23.45678/34.5 6789/100
23456	2345	2000	2022	12.45678/56.5 6789/200

Fig. 8

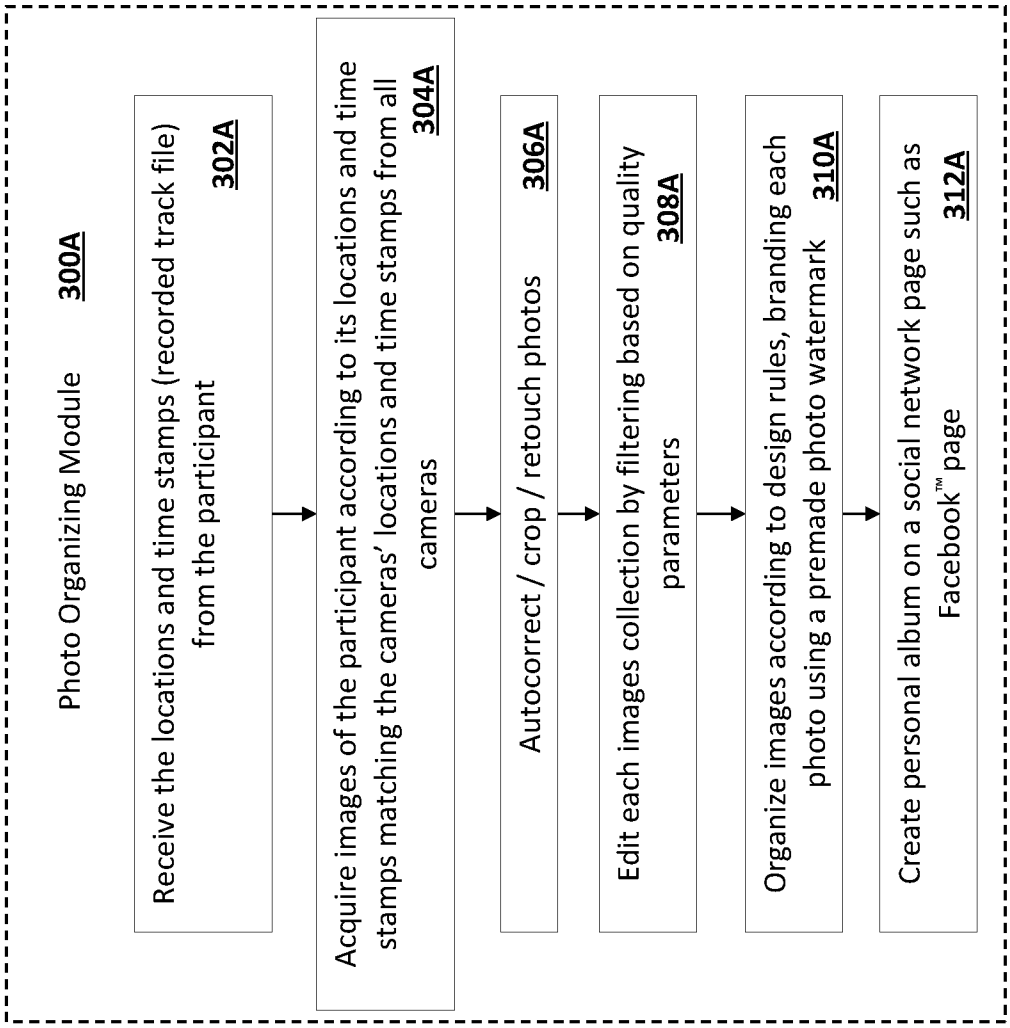
Photo Organizing Module 300A
Receive the locations and time stamps (recorded track file) from the participant 302A
Acquire images of the participant according to its locations and time stamps matching the cameras' locations and time stamps from all cameras 304A
Autocorrect / crop / retouch photos 306A
Edit each images collection by filtering based on quality parameters 308A
Organize images according to design rules, branding each photo using a premade photo watermark 310A
Create personal album on a social network page such as Facebook™ page 312A

Fig. 9

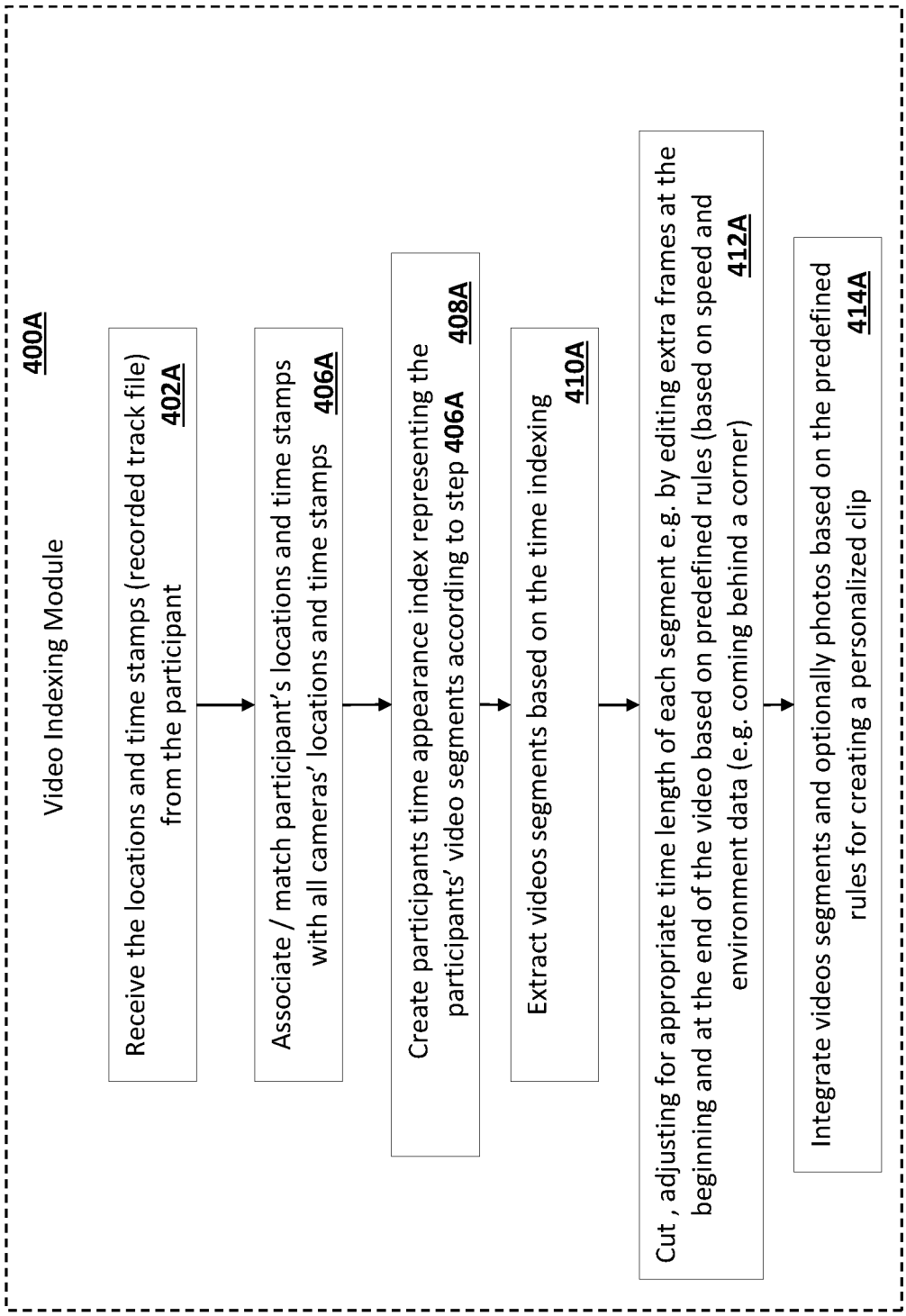
Video Indexing Module 400A
Receive the locations and time stamps (recorded track file) from the participant 402A
Associate / match participant's locations and time stamps with all cameras' locations and time stamps 406A
Create participants time appearance index representing the participants' video segments according to step 406A 408A
Extract videos segments based on the time indexing 410A
Cut , adjusting for appropriate time length of each segment e.g. by editing extra frames at the beginning and at the end of the video based on predefined rules (based on speed and environment data (e.g. coming behind a corner) 412A
Integrate videos segments and optionally photos based on the predefined rules for creating a personalized clip 414A

Fig. 10

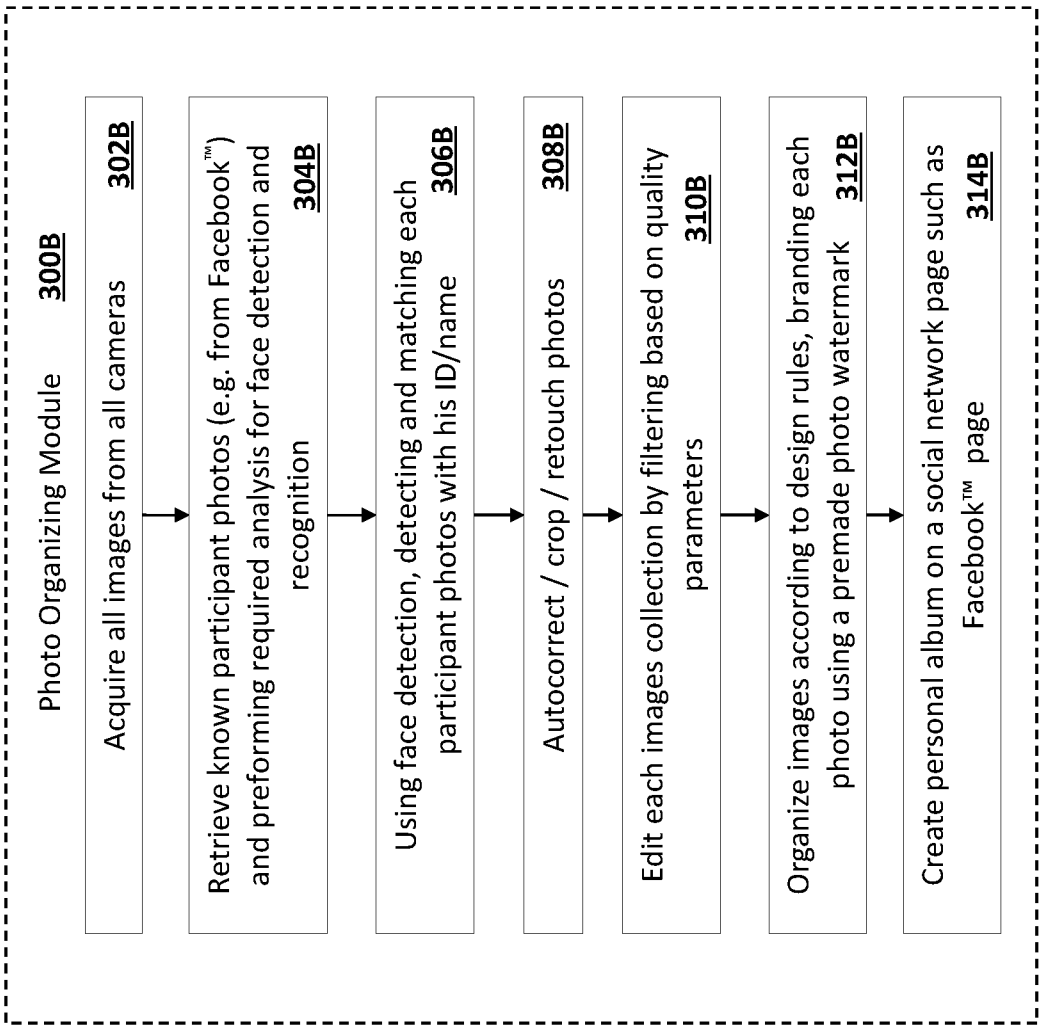
Photo Organizing Module 300B
Acquire all images from all cameras 302B
Retrieve known participant photos (e.g. from Facebook™) and preforming required analysis for face detection and recognition 304B
Using face detection, detecting and matching each participant photos with his ID/name 306B
Autocorrect / crop / retouch photos 308B
Edit each images collection by filtering based on quality parameters 310B
Organize images according to design rules, branding each photo using a premade photo watermark 312B
Create personal album on a social network page such as Facebook™ page 314B

Fig. 11

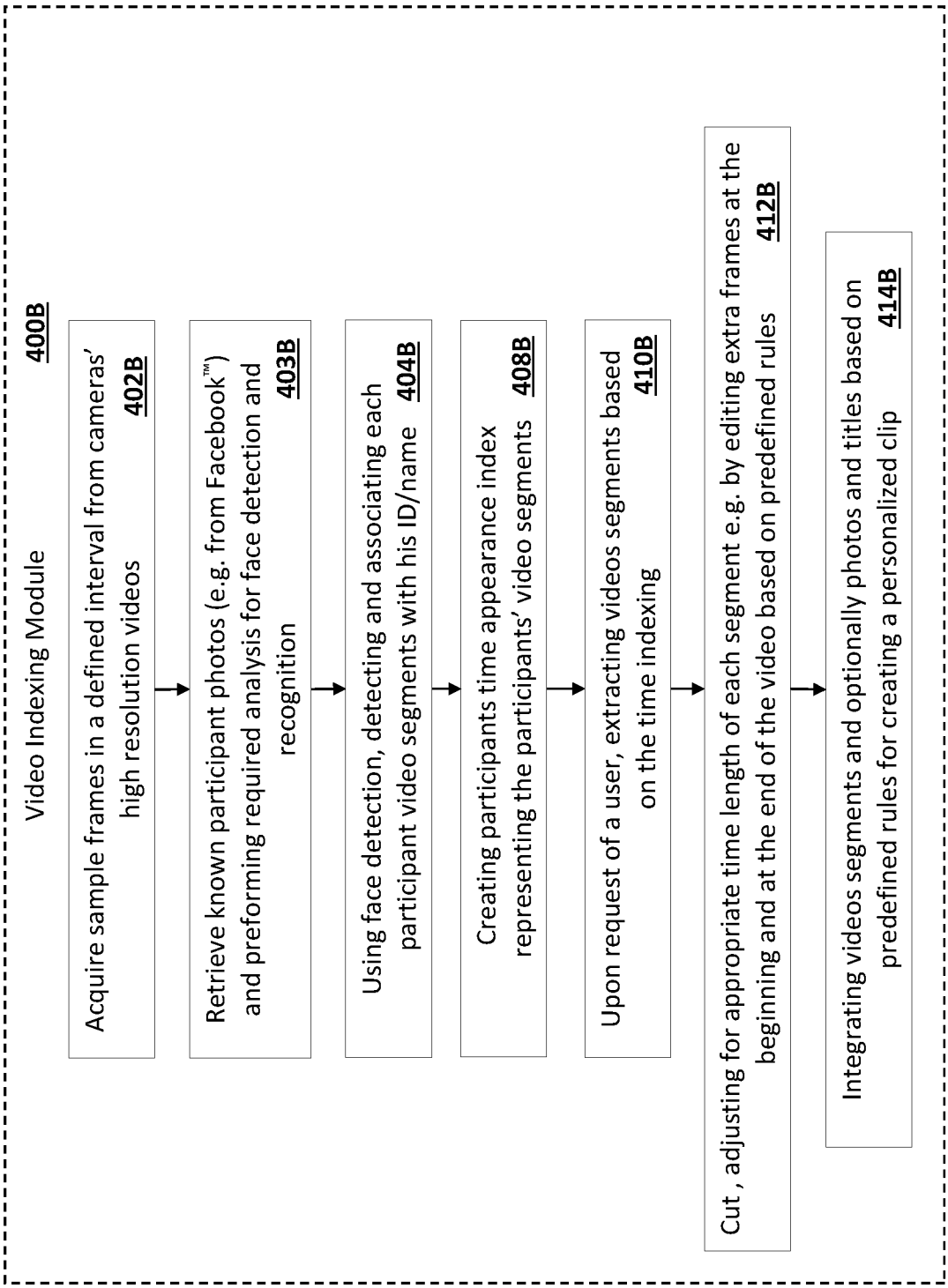
Video Indexing Module 400B
Acquire sample frames in a defined interval from cameras' high resolution videos 402B
Retrieve known participant photos (e.g. from Facebook™) and preforming required analysis for face detection and recognition 403B
Using face detection, detecting and associating each participant video segments with his ID/name 404B
Creating participants time appearance index representing the participants' video segments 408B
Upon request of a user, extracting videos segments based on the time indexing 410B
Cut , adjusting for appropriate time length of each segment e.g. by editing extra frames at the beginning and at the end of the video based on predefined rules 412B
Integrating videos segments and optionally photos and titles based on predefined rules for creating a personalized clip 414B

Fig. 12

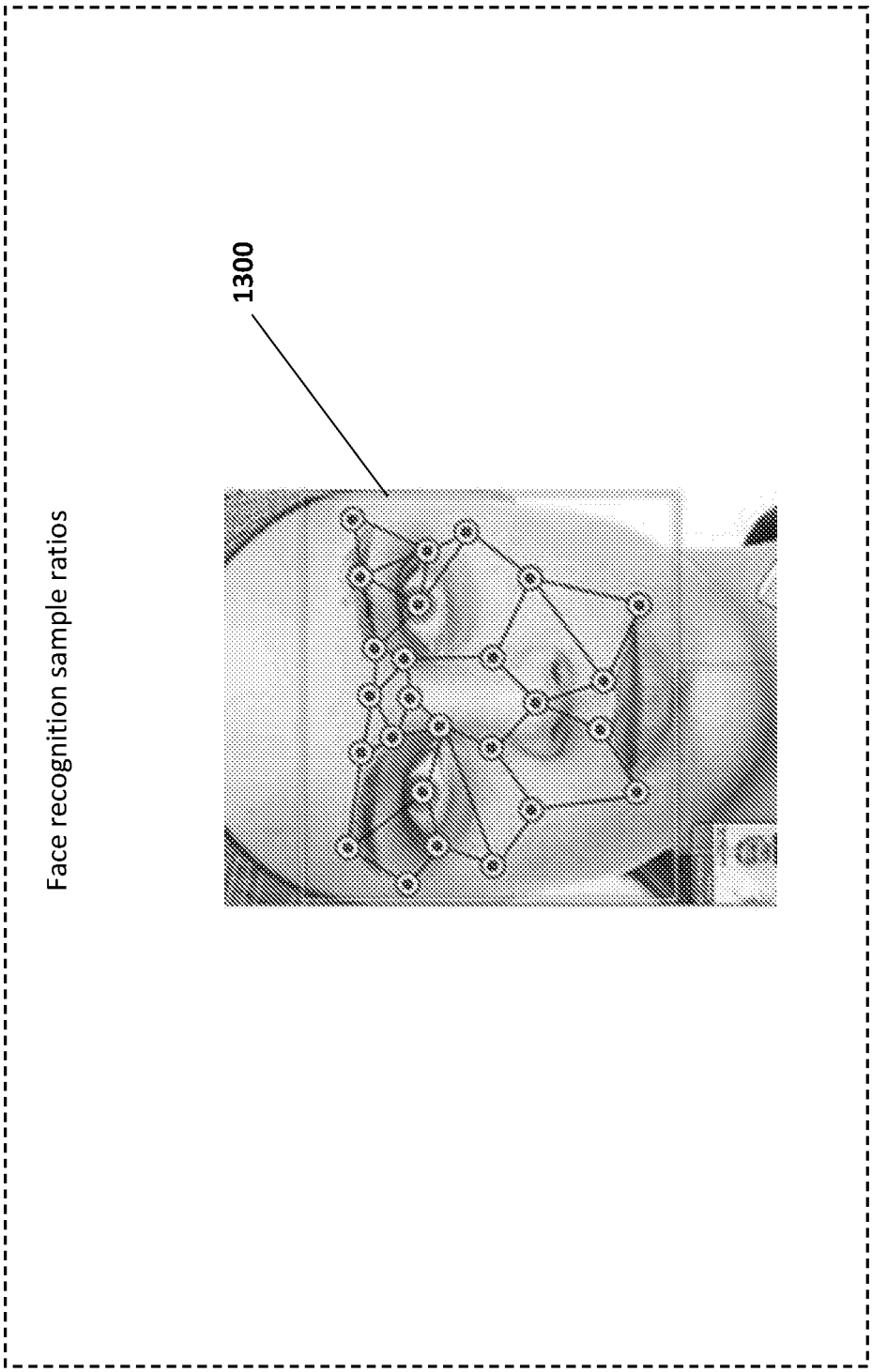

Fig. 13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2016/057059

A. CLASSIFICATION OF SUBJECT MATTER

IPC (2017.01) G06K 9/62, H04N 5/93, H04N 9/00, G11B 27/00, G06F 1/16, G06K 9/00, G11B 27/022

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)

IPC (2017.01) G06K 9/62, H04N 5/93, H04N 9/00, G11B 27/00, G06F 1/16, G06K 9/00, G11B 27/022

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)

Databases consulted: Esp@cenet, Google Patents, Google Scholar, FamPat database
Search terms used: clip video timestamp appearance index recognition face personalized clip edit event sport

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2013238709 A1 MARTIN FRANCISCO J.[US] 12 Sep 2013 (2013/09/12) The whole document	1-18,25-34
Y	US 2013039545 A1 KOVTUN et al. 14 Feb 2013 (2013/02/14) The whole document	1-34
Y	US 2012162436 A1 CORDELL et al. 28 Jun 2012 (2012/06/28) The whole document	19-25
A	US 2009317051 A1 MILLINGTON DANIEL K. [US] 24 Dec 2009 (2009/12/24) The whole document	19-25
A	US 2012060095 A1 KLAPPERT WALTER R. [US] 08 Mar 2012 (2012/03/08) The whole document	1-34

☐ 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	Date of mailing of the international search report
07 Mar 2017	07 Mar 2017

Name and mailing address of the ISA:	Authorized officer
Israel Patent Office Technology Park, Bldg.5, Malcha, Jerusalem, 9695101, Israel Facsimile No. 972-2-5651616	PLACHINTA Ekaterina Telephone No. 972-2-5651740

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB2016/057059

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See extra sheet.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☒ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/IB2016/057059

Patent document cited search report	Publication date	Patent family member(s)	Publication Date
US 2013238709 A1	12 Sep 2013	US 2013238709 A1	12 Sep 2013
		US 2010191827 A1	29 Jul 2010
		US 7800646 B2	21 Sep 2010
		US 2010158315 A1	24 Jun 2010
		US 7876352 B2	25 Jan 2011
		US 2011251972 A1	13 Oct 2011
		US 8442922 B2	14 May 2013
		US 2013236290 A1	12 Sep 2013
		WO 2010075430 A1	01 Jul 2010
US 2013039545 A1	14 Feb 2013	US 2013039545 A1	14 Feb 2013
		US 8457368 B2	04 Jun 2013
		JP 2011504673 A	10 Feb 2011
		US 2009141988 A1	04 Jun 2009
		US 8315430 B2	20 Nov 2012
		WO 2009061420 A1	14 May 2009
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		US 9443556 B2	13 Sep 2016
		EP 2449485 A1	09 May 2012
		GB 0911393 D0	12 Aug 2009
		GB 0916408 D0	28 Oct 2009
		GB 0920342 D0	06 Jan 2010
		WO 2011001180 A1	06 Jan 2011
US 2009317051 A1	24 Dec 2009	US 2009317051 A1	24 Dec 2009
US 2012060095 A1	08 Mar 2012	US 2012060095 A1	08 Mar 2012
		US 2012059953 A1	08 Mar 2012
		US 8296456 B2	23 Oct 2012
		US 2012057850 A1	08 Mar 2012

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/IB2016/057059

Patent document cited search report	Publication date	Patent family member(s)	Publication Date
		WO 2012030584 A2	08 Mar 2012
		WO 2012030584 A3	07 Jun 2012

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet):

* This International Searching Authority found multiple inventions in this international application, as follows:

Invention/s 1	analyzing and presenting at least one video of a user in a comprehensive personal clip of said user's participation in an event by face recognition based on providing users of said event with an identification sign, providing users of said event with an identification sign, said identification sign comprises at least one unique two-dimensional (2D) barcode pattern and at least one predesigned common pattern.	Claim/s 1-18
Invention/s 2	analyzing and presenting at least one video of a user in a comprehensive personal clip of said user's participation in an event by face recognition based on providing by said user a file comprising at least locations and time stamps.	Claim/s 19-25
Invention/s 3	analyzing and presenting at least one video of a user in a comprehensive personal clip of said user's participation in an event by face recognition based on known photos of said participant.	Claim/s 26-34