IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

MONUMENT PEAK VENTURES, LLC, Plaintiff, V. HITACHI KOKUSAI ELECTRIC INC. Defendant.	§ § § § § § § § § §	Civil Action No. 2:20-cv-00098-JRG-RSP JURY TRIAL DEMANDED

SECOND AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff, Monument Peak Ventures, LLC ("MPV" or "Plaintiff"), by and through its undersigned counsel, respectfully submits this Second Amended Complaint against the above-named Defendant, as follows:

NATURE OF THE ACTION

1. This is a patent infringement action to stop Defendant's infringement of United States Patent Nos. 6,396,599 (the "'599 patent"); 8,643,746 (the "'746 patent"); 8,665,345 (the "'345 patent"); and 9,013,604 (the "'604 patent") (collectively, the "Patents-in-Suit").

THE PARTIES

2. Plaintiff, Monument Peak Ventures, LLC, is a Texas Limited Liability Company with an office and place business in Plano, Texas.

3. On information and belief, Defendant, Hitachi Kokusai Electric, Inc. ("Kokusai") is an entity organized and existing under the laws of Japan with its principal place of business at Hitachi Atago Bldg.6F, 2-15-12, Nishi-shimbashi, Minato-ku,Tokyo 105-8039, Japan.

JURISDICTION AND VENUE

4. This Court has subject matter jurisdiction over MPV's claims for patent infringement pursuant to the 28 U.S.C. §§ 1331 and 1338(a).

5. Upon information and belief, this Court has personal jurisdiction over Defendant in this action, including because it has committed acts within this State giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over Defendant would not offend traditional notions of fair play and substantial justice. Including individually and/or by and through affiliates, Defendant has committed acts of patent infringement and has regularly and systematically conducted and solicited business in this District, including via affiliates, by and through at least the sales and offers for sale of Defendant's products and/or services in this District.

6. Venue is proper in this District under 28 U.S.C. §§ 1391(b) and 1400(b) at least because Defendant is a foreign corporation for which venue is proper at least under 28 U.S.C. § 1391(c)(3).

NATURE OF THE ACTION

7. This is a civil action for infringement under the patent laws of the United States, 35 U.S.C. § 271 et seq.

8. MPV owns all right, title and interest in the "Patents-in-Suit", including all rights to sue and collect damages for past, present and future infringement thereof.

9. MPV alleges that Kokusai directly and indirectly has infringed and/or continues to infringe the Patents-in-Suit by, *inter alia*, making, using, offering for sale, selling, importing, using (including in connection with internal uses and/or demonstrations) and/or inducing such actions, including in connection with providing the infringing products and instructions/specifications for their use. MPV seeks damages and other relief for Kokusai's infringement of the Patents-in-Suit.

10. MPV has made infringement information available to Kokusai through a data room that included a full list of all patents owned by MPV and evidence of use presentations detailing certain of Kokusai's infringement.

11. Kokusai has had actual and/or constructive notice of the infringements alleged herein, including as noted herein.

THE '599, '746, '345 AND '604 PATENTS COME FROM THE ICONIC KODAK PATENT PORTFOLIO

12. The '599, '746, '345 and '604 patents claim inventions born from the ingenuity of the Eastman Kodak Company ("Kodak"), an iconic American imaging technology company that dates back to the late 1800s. The first model of a Kodak camera was released in 1888.

13. In 1935 Kodak introduced "Kodachrome," a color reversal stock for movie and slide film. In 1963 Kodak introduced the Instamatic camera; an easy-to-load point-and-shoot camera.

14. By 1976 Kodak was responsible for 90% of the photographic film and 85% of the cameras sold in the United States.

15. At the peak of its domination of the camera industry, Kodak invented the first self-contained digital camera in 1975.

16. By 1986 Kodak had created the first megapixel sensor that was capable of recording 1,400,000 pixels. While innovating in the digital imaging space Kodak developed an immense patent portfolio and extensively licensed its technology in the space. For example, in 2010, Kodak received $838,000,000 in patent licensing. As part of a reorganization of its business, Kodak sold many of its patents to some of the biggest names in technology that included Google, Facebook, Amazon, Microsoft, Samsung, Adobe Systems, HTC and others for $525,000,000.

17. While scores of digital imaging companies have paid to license the Kodak patent portfolio owned by MPV, Kokusai has refused to do so without justification.

THE CLAIMS OF THE '746, '604 AND '345 PATENTS ARE DIRECTED TO PATENTABLE SUBJECT MATTER

18. The DECLARATION OF DR. JOSE LUIS MELENDEZ at Exhibit 1 hereto is

incorporated herein by reference as if fully set forth herein. The matters asserted in said Declaration are asserted herein as well.

19. The DECLARATION FRANK RAZAVI, a named inventor on the '746, '604 and '345 patents, at Exhibit 2 hereto is incorporated herein by reference as if fully set forth herein. The matters asserted in said Declaration are asserted herein as well.

THE CLAIMS OF THE '599 PATENT ARE DIRECTED TO PATENTABLE SUBJECT MATTER

20. As noted above, the DECLARATION OF DR. JOSE LUIS MELENDEZ at Exhibit 1 hereto is incorporated herein by reference as if fully set forth herein. As noted above, the matters asserted in said Declaration are asserted herein as well.

21. The DECLARATION OF JOHN R. FREDLUND, a named inventor of the '599 patent, at Exhibit 3 hereto is incorporated herein by reference as if fully set forth herein. The matters asserted in said Declaration are asserted herein as well.

OVERVIEW OF THE '746, '604 AND '345 PATENTS

22. Application No. 13/110,056, filed on May 18, 2011, issued as the '746 patent. Application No. 14/141,642, filed on Dec. 27, 2013, and which issued as U.S. Patent No. 9,013,604, is a continuation of the '746 patent. The '746 and '604 patents share a common title, which is "Video Summary Including a Particular Person," abstract and specification.

23. Application No. 13/110,085, filed on May 18, 2011, issued as the '345 patent, which is entitled, "Video Summary of a Feature of Interest." The specification of the '345 patent is near substantively the same as the shared specification of the '746 and '604 patents. Ex. 1 (Melendez Decl.), ¶ 23. For ease of reference, most specification references herein will be to the '604 specification.

24. In May 2011, managing digital video content could be a difficult task. '604 patent, column 1, lines 27-28 ('604/1:27-28); Ex. 1, ¶ 24. Determining if a specific event is contained in

a given video often required viewing the entire video. '604/1:24-25; Ex. 1, ¶ 24. For a lengthy video, a user may prefer to be able to get a quick particular summary of the video without having to view the video in its entirety. '604/1:25-28; Ex. 1, ¶ 24.

25. Digital videos also presented practical problems from a sharing perspective due to size. '604/1:29-32; Ex. 1, ¶ 25. Even when compressed, the amount of data generated could make it impractical to share even relatively short videos. '604/1:32-34; Ex. 1, ¶ 25.

26. Video editing software could be used to manually summarize a video into a shorter version after the video had been taken (i.e., post-processing), that could be shared more easily. '604/1:35-35; Ex. 1, ¶ 26. However, such manual video editing would be a lengthy, laborious process not producing an immediate result, and many users were not interested or skilled in manual editing. '604/1:37-38; Ex. 1, ¶ 26.

27. Automatic video summarization algorithms existed as well. '604/1:39; Ex. 1, ¶ 27. These solutions started with a captured, stored video file as input (i.e. post-processing), and analyzed the video to determine a video summary. '604/1:39-40; Ex. 1, ¶ 27. Inventor Frank Razavi, Dr. Melendez, an expert in the field, and a POSITA would refer to these solutions as post-processing solutions, which were the state of the art at the time of the patented invention. Ex. 1, ¶ 27; Ex. 2 (Razavi Decl.), ¶ 4. Automatic video summarization algorithms were very complex, however, as it was necessary to furthermore decode the video to perform the analysis required to determine the video summary. '604/1:39-41; Ex. 1, ¶ 27. Thus it was not possible to have an immediate or real time view video summary corresponding to a just-captured video since that would have been the earliest point at which the post-processing could have even begun. '604/1:59-61; Ex. 1, ¶ 27. This shortcoming made it difficult to facilitate quick review and sharing of captured videos. '604/1:61-62; Ex. 1, ¶ 27.

28. When creating a video summary, it can be desirable to have a specific feature within

the summary. '604/2:63-64; Ex. 1, ¶ 28. The video summary is created to contain some or all of the video content in which a feature is present. '604/2:64-66; Ex. 1, ¶ 28. Examples of such features can include particular people, pets, events, locations, activities or objects. '604/1:66-67; Ex. 1, ¶ 28. Manually creating such a tailored video summary was a tedious process. '604/2:1-2; Ex. 1, ¶ 28. Using post processing to generate such a tailored video summary prevented the ability to quickly review and share video summaries. '604/2:3-5; Ex. 1, ¶ 28.

29. Thus, mere conventional use of known computerized processes, namely post-processing processes as opposed to processes capable of being performed in real time as the video was being captured, was insufficient whether manually or automatically performed. Ex. 1, ¶ 29.

30. The claimed inventions of the '604 and '746 patents have advantages including that they allow analysis of the video frames at the time of their capture to determine a subset of video frames containing a particular person, thereby eliminating the need to wait for and conduct post-processing. '604/2:45-49; Ex. 1, ¶ 31.

31. In some embodiments, the video summary is encoded in a digital video file using metadata without needing to encode the video summary as a separate file. '604/2:56-58; Ex. 1, ¶ 32.

32. The claimed inventions of the '345 patent have advantages including that they allow analysis of the video frames at the time of their capture to determine a subset of video frames containing a feature of interest, thereby eliminating the need to wait for and conduct post-processing. '345/2:45-53 Ex. 1, ¶ 34.

33. The claimed inventions have the additional advantage that they allow storage of a representation of the video summary in storage memory without the need for first capturing the entire video and then creating a summary during post-processing. '345/2:52-63; Ex. 1, ¶ 35. This allows a video summary to be generated and viewed, for example on a digital capture device, with

minimal computing and delay. '345/2:52-63; Ex. 1, ¶ 35.

34. In some embodiments, the video summary is encoded in a digital video file using metadata without needing to encode the video summary as a separate file. '345/2:64-66; Ex. 1, ¶ 36.

35. Including as noted in the incorporated Melendez Declaration, the patent specification teaches specifically how the technology improvement of the digital video camera system is achieved. Ex. 1, ¶ 42. Among other innovations, the inventions of the '604, 746 and '345 patents are able to make use of two distinct digital video paths, where the path used in generating and storing the digital video file (205-220-225-230-235) is separate from that generating the summary (205-240-245-250) which is not human viewable (at 240) but rather algorithmically scanned for contained matches. Ex. 1, ¶ 42. The disclosed algorithms are not looking for matching frames to reference frames, but rather identifying frames containing digital signatures corresponding to persons (facial recognition algorithm) or features (feature recognition algorithm). *Id.* Thus the inventions detail how the improved digital video camera system can be realized and how its functionality can be accomplished. *Id.* The patent claims recite how to implement the improved digital video system. *Id.* Furthermore, the claims require a non-conventional and non-generic arrangement of circuitry in order to allow for a parallel and separate processing path dedicated to algorithmically searching for person and/or feature matches to create and store a video summary from "the captured image frames" while separately a digital video file of the video is generated and stored. *Id.* Thus, the patents describe an application specific order of steps of differing paths and a component set that is not of a generic or conventional arrangement. *Id.*

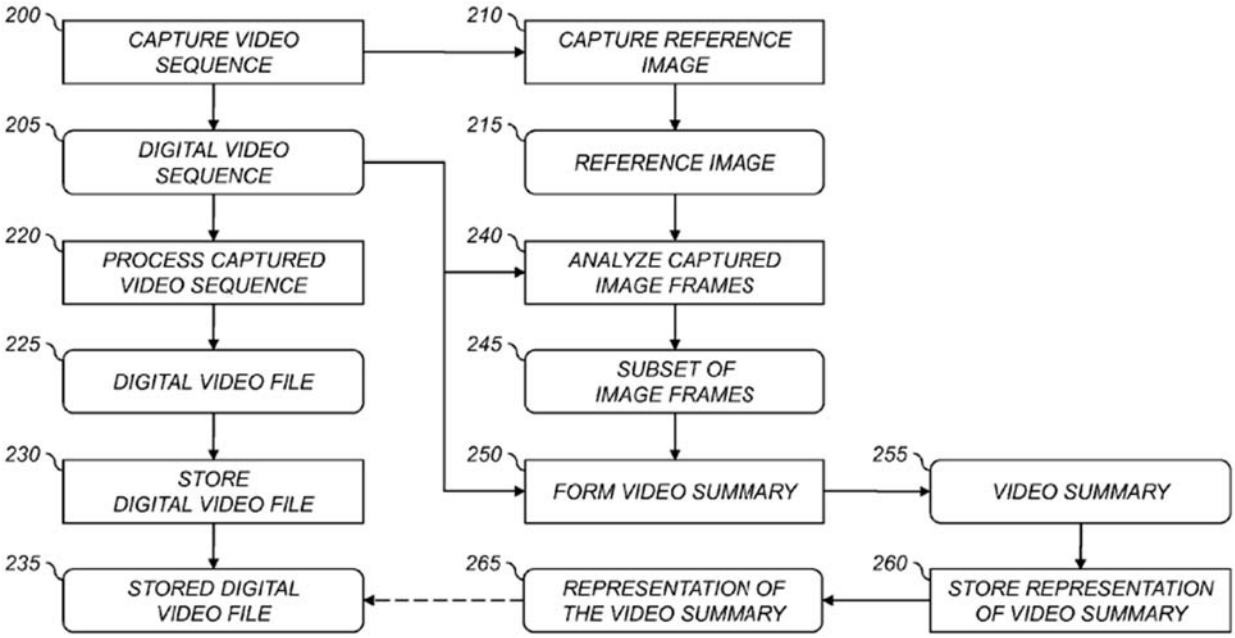


Figure 2 of '746, '345', '604

In exemplary Figure 2, the steps are performed in a relative order. (see above graphic and below labeled limitations)

Exemplary Claim of the '746/'604 Patent Family, Claim 6 of '746:

A ***digital video camera*** comprising:

an image sensor configured to capture digital images;

a data processing system;

a storage memory; and

a program memory communicatively connected to the data processing system and storing instructions configured to cause the data processing system to implement a method comprising:

[215 for path 2] ***designating a reference image***, wherein the reference image ***contains a particular person***;

[200 for path 1 & 2] ***capturing a video sequence of a scene*** using the image sensor, the video sequence including a time sequence of image frames;

[240 for path 2] ***analyzing the captured image frames*** using a person recognition algorithm to identify a subset of the image frames that contain the particular person;

[250 for path 2] ***forming a video summary*** including fewer than all of the image frames in the captured video sequence, wherein the video summary includes at least part of the identified subset of image frames containing the particular person;

[230 for path 1] storing the captured video sequence in the storage memory; and

[260 for path 2] storing the video summary in the storage memory as a separate summary digital video file,

> **[260 commences prior to 230 completing]** wherein the summary digital video file is ***at least partially formed concurrently*** with the digital video file.

Ex. 1, ¶ 42.

36. Including as set forth in the Melendez Declaration, even if post-processing was used to create the video summary, the post-processing would be faster and more efficient, i.e., it would require less processing and memory, than conventional post-processing techniques. Ex. 1, ¶ 47.

37. Including as set forth in the Melendez Declaration, even if the video summary is created at the end of the video rather than in real time, it would require less processing and memory, than conventional post-processing techniques. Ex. 1, ¶ 55.

OVERVIEW OF PROSECUTION OF THE '746, '604 AND '345 PATENTS

38. During prosecution of the '345 patent, on February 27, 2013, the patent examiner rejected then pending claims 1-3, 6-14, and 16-20 under 35 U.S.C. 102(e) as being anticipated by U.S. Published Patent Application No. 2011/0085778 to Iwase, et al. Ex. 1, ¶ 60. The examiner also rejected claims 4 and 5 under 35 U.S.C. 103(a) as being unpatentable over Iwase in view of U.S. Published Patent Application No. 2005/0237390 to Mittal, et al. *Id. See* Ex. 4 (Iwase). Ex. 1, ¶ 60. The examiner also rejected claim 15 under 35 U.S.C. 103(a) as being unpatentable over Iwase in view of U.S. Patent No. 8,330,849 to Ishii. *Id.*

39. On May 20, 2013, the patentee amended the claims and argued why the cited combinations did not render the claims, as amended, unpatentable. Ex. 1, ¶ 61.

40. On July 16, 2013, the examiner issued a final rejection rejecting then pending claims 1-3, 6-8, 10-11, and 16-25 under 35 U.S.C. 103(a) as being unpatentable over Iwase in view of Momosaki, US 2010/0104146. Ex. 1, ¶ 62. The examiner also rejected claims 4 and 5 under 35 U.S.C. 103(a) as being unpatentable over since Iwase in view of Momosaki, as applied to claim 1 above, and further in view of Mittal. *Id.* Claim 15 was rejected under 35 U.S.C. 103(a) as being

unpatentable over Iwase in view of Momosaki, as applied to claim 1, and further in view of Ishii. *Id.*

41. On September 6, 2013, the applicant traversed the rejections. The applicant also added new claims 26 and 27, which depended upon independent claims 20 and 23, respectively, and which had elements similar to claim 7. Ex. 1, ¶ 63. On October 21, 2013, the examiner issued a notice of allowance. *Id.*

42. During prosecution of the ’746 patent, on February 27, 2013, the patent examiner rejected then pending claims 1-3, 5-11, and 13-18 under 35 U.S.C. 102(e) as being anticipated by Iwase. Ex. 1, ¶ 64. The examiner also rejected claim 4 under 35 U.S.C. 103(a) as being unpatentable over Iwase in view of U.S. Published Patent Application No. 2008/0192129 to Walker, *et al*. *Id.* The examiner also rejected claim 4 under 35 U.S.C. 103(a) as being unpatentable over Iwase in view of Ishii. *Id.* On May 17, 2013, the patentee amended the claims and argued why the cited combinations did not render the claims, as amended, unpatentable. *Id.* On May 23, 2013, the applicant and examiner had an interview in which a further amendment was discussed and agreed upon. *Id.* On August 27, 2012, the applicant submitted a request for continued examination (“RCE”). *Id.* With the RCE, then pending claims 1, 18 and 22 were amended and claim 25 was added. *Id.* On October 3, 2013, the examiner issued a notice of allowance. *Id.*

43. During prosecution of the ’604 patent, on May 5, 2014, the patent examiner rejected then pending claims 1-3, 5-10, 12-16, and 18-20 under 35 U.S.C. 102(e) as being anticipated by Iwase. Ex. 1, ¶ 65. The examiner also rejected claims 4, 11 and 17 under 35 U.S.C. 103(a) as being unpatentable over Iwase in view of U.S. Published Patent Application No. 2008/0122943 to Itoh. *Id.*

44. On August 13, 2014, the applicant traversed the rejections. Ex. 1, ¶ 66. Among other things, the applicant correctly pointed out that Iwase is directed to "provid[ing] an index ...

to a section of a video image ... while the video image is captured." Iwase, Paragraphs [0008], [0050], [0094], [0095], [0102], and [0103]). *Id.* As correctly noted by the applicant, the sections of Iwase cited by the Examiner merely disclose that an "imaging device 10 ... has functions of capturing and recording video images," and that an "index setting unit 236 generates index information ... and stores the associated index information in the memory." *Id.* Further, paragraph [0079] of Iwase states that the "index information is time information representing a predetermined time period including an arbitrary time point which is designated by the user while the video image is captured and recorded (during the recording time period)," and paragraph [0095] states that "the index information includ[es] the time information (for example, a time representing the start point and the last point of the index section, a time code, or a time or a number of frames from the beginning of the video image) representing the set index section." *Id.*

45. On October 8, 2014, the examiner issued an office action stating in part that "Applicant's arguments … with respect to the 35 U.S.C. 102 and 103 rejections have been fully considered and are persuasive." Ex. 1, ¶ 67. On December 2, 2014, the applicant filed a terminal disclaimer and requested issuance of the then pending claims. *Id.*

46. Thus, during prosecution of the '746, '604 and '305 patents, the primary prior art reference was Iwase. Ex. 1, ¶ 68. However, the conventional Iwase's limitations, among others, are noted above and in the applicant's office action response. *Id.*

THE '746 CLAIMS ARE NOT DIRECTED TO AN ABSTRACT IDEA

47. The '746 claims neither describe nor claim a concept nor a generic computerized system. Ex. 1, ¶ 69. Instead the '746 claims address, among other things, a persistent problem unique to digital video camera systems at the time of the invention whereby the capturing of videos created large video files that were difficult for camera users to make effective use of and manage. '746/1:36-41; Ex. 1, ¶ 69. The patented invention enables a substantial improvement in digital

video camera systems including their functionality and utility. Ex. 1, ¶ 69. Prior to the invention, the length of a video, for example, a 3 hour wedding, limited the utility of the digital video camera system and its corresponding digital video file consisting of, for example, 324,000-648,000 frames. *Id.* Shortening the video to a desired subset of content required post-capture editing through either (1) laborious and costly human editing of the stored digital video file having characteristic editing times a multiple of the duration of the material to be edited, or (2) automatic video summaries taking, "a captured video as input, and analyz[ing] the saved video file to determine a video summary. '746/1:42-62 Ex. 1, ¶ 69. Prior art digital video cameras thus could not compile summaries comprising user pre-specified persons or features of interest during capture nor provide for immediate viewing of video summaries at capture. '746/1:63-2:2 Ex. 1, ¶ 69.

48. The '746 patented invention provides for digital video camera systems that create an inventive new class of video summary in inventive new ways, whereby, for example, the electronic circuitry of the special purpose digital video camera system comprises designating a reference image digitally and algorithmically identifying image frames that contain the particular person or contain the feature of interest and desired characteristic. '746/3:28-33; Ex. 1, ¶ 70. The invention and its sequence of steps cannot be performed by human mental steps or otherwise, including since a human editor could not manipulate video images at frame rates of, "30 or 60 frames per second," during the capture process. Ex. 1, ¶ 70.

THE '746 CLAIMS ARE DIRECTED TO INNOVATIVE, INTEGRATED PHYSICAL SYSTEMS

49. None of the elements that comprise the claimed device are abstract, as all of the digital video camera system including an image sensor, processing system, memory, digital image, reference image, video sequence, image frames, recognition algorithm, video summary, and digital video file are physical or tangible things known to a POSITA in light of the specification; and in view of the technological solutions and unconventionality noted below. Ex. 1, ¶ 71. Furthermore,

the claims neither are directed to nor do they claim a general purpose computerized system or the use of one. Ex. 1, ¶ 73.

50. Claim 6 of the '746 patent is exemplary. Ex. 1, ¶ 74. A POSITA would understand that the language of the '746 claims is not directed merely to a method of analyzing individual frames of a video to identify frames containing a particular person or feature of interest, and then compiling those frames into a video thereby creating a summary of the original video. *Id.* Rather, they comprise the aspects noted a below which provided inventive, technological solutions to the problems faced by the inventors. *Id.* None of the elements that comprise the claimed device are abstract, as all of the digital video camera system including an image sensor, processing system, memory, digital image, reference image, video sequence, image frames, recognition algorithm, video summary, and digital video file are physical or tangible things known to a POSITA in light of the specification; and in view of the technological solutions and unconventionality noted below. *Id.*

THE '746 CLAIMED INVENTIONS COULD NOT BE DONE MANUALLY OR IN ONE'S HEAD

51. Including as noted in the Melendez Declaration, the claimed solutions could not be done manually during video capture, nor can they be performed in person's head. Ex. 1, ¶ 75.

THE '746 CLAIMED INVENTIONS PROVIDE TECHNOLOGICAL SOLUTIONS TO TECHNOLOGICAL PROBLEMS

52. Technical problems addressed by the '746 patent include the latency inherent in post-processing methods, additional processing required when working with files as inputs instead of sequences including video file decompression for post processing, and the additional storage required for keeping frames not of interest. Ex. 1, ¶ 76.

53. Technical solutions by the '746 claimed inventions to technical problems faced include a reference image that may be designated prior to or independent of the video being taken,

formation and generation of a summary video concurrently or in real time, including as opposed to conventional post-processing; separate and parallel image processing paths, discarding of frames not of interest, for faster and more efficient processing and conserving storage resources; and creation of summary video by applying the referencing during the video capture process, including as opposed to conventional post-processing. Ex. 1, ¶ 77.

THE '746 CLAIMED INVENTIONS PROVIDE UNCONVENTIONAL SOLUTIONS

54. As noted above, what was conventional at the time comprised post-processing which consumed lots of time, processing and storage. Ex. 1, ¶ 78; Ex. 2, ¶¶ 5-6. The state of the art did not include using metadata generated in real time to construct a real time video summary. Ex. 1, ¶ 78; Ex. 2, ¶ 7. The only automated processes that occurred in real time during video capture involved eliminating low quality or resolution, which had nothing to do with creating video summaries with desired features. Ex. 1, ¶ 78; Ex. 2, ¶ 7.

55. Unconventional solutions provided by the '746 claimed inventions include each of designation of a reference image prior to taking of video, creation of a corresponding summary video file with frames matching a reference image concurrently or in real time, separate and parallel image processing paths, the ability to save only what is needed for a video summary of matching images without user intervention, and creation of summary video of the pre-determined person of interest by applying the referencing throughout the whole video capture process. Ex. 1, ¶ 79. It was unconventional to enable making a video summary using metadata without the need to decode a video. Ex. 1, ¶ 79; Ex. 2, ¶ 6.

THE '746 CLAIMED INVENTIONS PROVIDE SUBSTANTIAL BENEFITS

56. The digital video camera systems of the '746 patent provide the benefits of processing image summaries without human intervention during video capture such that the video summaries of the frames including the predetermined person of interest may be available

immediately upon completion of the taking of the digital video and storing of its corresponding file. Ex. 1, ¶ 80; Ex. 2, ¶ 8. The digital video camera systems of the '746 patent conserve processing resources, save processing time and use storage memory efficiently thus providing a better summary more efficiently and expeditiously than possible through conventional means including those in the prior art. Ex. 1, ¶ 80; Ex. 2, ¶ 8.

THE '746 CLAIMED INVENTIONS PROVIDE INVENTIVE SOLUTIONS

57. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further in consideration of the '746 patent specification, the prosecution history and cited prior art, "designating a reference image, wherein the reference image contains a particular person" prior to a video sequence being for purposes of finding matching frames in the video sequence in real time is an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 81.

58. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further in consideration of the '746 patent specification, the prosecution history and cited prior art, "designating a reference image, wherein the reference image contains a particular person" for purposes of forming a video summary including fewer than all of the image frames in a video sequence to be captured, wherein the video summary includes at least part of the identified subset of image frames containing the particular person" is an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 82.

59. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further consideration of the '746 patent specification, the prosecution history and cited prior art, "analyzing the captured image frames

using a person recognition algorithm to identify a subset of the image frames that contain the particular person," including without using post-processing and using a pre-determined reference image, is an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 83.

60. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further in consideration of the '746 patent specification, the prosecution history and cited prior art, "analyzing the captured image frames using a person recognition algorithm to identify a subset of the image frames that contain the particular person" concurrently with a video sequence being taken is an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 84.

61. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further consideration of the '746 patent specification, the prosecution history and cited prior art, "wherein the summary digital video file is at least partially formed concurrently with the digital video file" is an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 85.

62. As noted by expert Dr. Melendez and inventor Razavi, the avoidance of the need for post-processing was unconventional and inventive. Ex. 1, ¶ 86; Razavi Decl., ¶ 9. Further, the use of metadata to create a summary without the need to decompress a video and do a frame by frame analysis was inventive. Ex. 1, ¶ 86; Razavi Decl., ¶ 9.

63. It should further be noted that "concurrently" in '746 Patent claim 6 (and in certain other noted places) relates to the storage of the video summary partially overlapping with the prior step. Ex. 1, ¶ 87. In other words, while '746 Patent claim 1 requires storing the captured video

sequence in the storage memory commence prior to storing the video summary, dependent claim 6 furthermore clarifies that storing the video summary may commence before the storing of the captured video sequence has completed. *Id.*

THE '345 CLAIMS ARE NOT DIRECTED TO ABSTRACT IDEAS

64. The '345 claims neither describe nor claim a concept or a generic computerized system. Ex. 1, ¶ 88. Instead the '345 claims address, among other things, a persistent problem unique to digital video cameras at the time of the invention whereby the capturing of videos created large video files that were difficult for camera users to make effective use of and manage. '345/1:36-41; Ex. 1, ¶ 88. The patented invention enables a substantial improvement in digital video cameras including their functionality and utility. Prior to the invention, the length of a video, for example, a 3 hour wedding, limited the utility of the digital video camera and its corresponding digital video file consisting of 324,000-648,000 frames. *Id.* Shortening the video to a desired subset of content required post-capture editing through either (1) laborious and costly human editing of the stored digital video file having characteristic editing times a multiple of the duration of the material to be edited, or (2) automatic video summaries taking, "a captured video as input, and analyz[ing] the saved video file to determine a video summary. '345/1:42-62; Ex. 1, ¶ 88. Prior art digital video cameras thus could not compile summaries comprising user pre-specified persons or features of interest during capture nor provide for immediate viewing of video summaries at capture. '345/1:63-2:2; Ex. 1, ¶ 88.

65. The '345 patented invention provides for digital video cameras that create an inventive new class of video summary in inventive new ways, whereby the electronic circuitry of the special purpose digital video camera comprises designating a reference image digitally and algorithmically identifying image frames that contain the particular person or contain the feature of interest and desired characteristic. '345/3:28-33; Ex. 1, ¶ 89. The invention and its sequence of

steps cannot be performed by human mental steps or otherwise given that a human editor could not manipulate video images at frame rates of, "30 or 60 frames per second," during the capture process. Ex. 1, ¶ 89.

THE '345 CLAIMS ARE DIRECTED TO INNOVATIVE, INTEGRATED PHYSICAL SYSTEMS

66. None of the elements that comprise the claimed device are abstract, as all of the digital video camera system including an image sensor, optical system, processing system, memory, digital image, reference data, video sequence, image frames, recognition algorithm, video summary, and digital video file are physical or tangible things known to a POSITA in light of the specification; and in view of the technological solutions and unconventionality noted below. Ex. 1, ¶ 90. Furthermore, the '345 claims neither are directed to nor do they claim a general purpose computerized system or the use of one. Ex. 1, ¶ 92.

67. A POSITA would understand that the language of the '345 claims is not directed merely to a method of analyzing individual frames of a video to identify frames containing a particular person or feature of interest, and then compiling those frames into a video thereby creating a summary of the original video. Ex. 1, ¶93. Rather, they comprise the aspects noted a below which provided inventive, technological solutions to the problems faced by the inventors. *Id.* None of the elements that comprise the claimed device are abstract, as all of the digital video camera system including an image sensor, optical system, processing system, memory, digital image, reference data, video sequence, image frames, recognition algorithm, video summary, and digital video file are physical or tangible things known to a POSITA in light of the specification; and in view of the technological solutions and unconventionality noted below. *Id.*

THE '345 CLAIMED INVENTIONS COULD NOT BE DONE MANUALLY OR IN ONE'S HEAD

68. Including as noted in the Melendez Declaration, the claimed solutions could not be

done manually during video capture, nor can they be performed in person's head. Ex. 1, ¶ 94.

THE '345 CLAIMED INVENTIONS PROVIDE TECHNOLOGICAL SOLUTIONS TO TECHNOLOGICAL PROBLEMS

69. Technical problems addressed by the '345 patent include the latency inherent in post-processing methods, additional processing required when working with files as inputs instead of sequences including video file decompression for post processing, and the additional storage required for keeping frames not of interest. Ex. 1, ¶ 95.

70. Technical solutions by the '345 claimed inventions to technical problems faced include a reference image that may be designated prior to or independent of the video being taken, formation and/or generation of a summary video concurrently with the video being taken, separate and parallel image processing paths, discarding of frames not of interest for faster and more efficient processing and conserving storage resources; and creation of summary video by applying the referencing during the video capture process, including as opposed to conventional post-processing. Ex. 1, ¶ 96.

THE '345 CLAIMED INVENTIONS PROVIDE UNCONVENTIONAL SOLUTIONS

71. As noted above, what was conventional at the time comprised post-processing which consumed lots of time, processing and storage. Ex. 1, ¶ 97; Ex. 2, ¶¶ 5-6. The state of the art did not include using metadata generated in real time to construct a real time video summary. Ex. 1, ¶ 97; Ex. 2, ¶ 7. The only automated processes that occurred in real time during video capture involved eliminating low quality or resolution, which had nothing to do with creating video summaries with desired features. Ex. 1, ¶ 97; Ex. 2, ¶ 7.

72. Unconventional solutions provided by the '345 claimed inventions include designation of a reference image prior to taking of video, creation of a corresponding summary video file concurrently having only a feature of interest concurrently or in real time, separate and parallel image processing paths, the ability to save only what is needed for a video summary of

matching images without user intervention, and creation of summary video of the pre-determined feature by applying the referencing throughout the whole video capture process. Ex. 1, ¶ 98. It was unconventional to enable making a video summary using metadata without the need to decode a video. Ex. 1, ¶ 98; Ex. 2, ¶ 6.

THE '345 CLAIMED INVENTIONS PROVIDE SUBSTANTIAL BENEFITS

73. The digital video camera system of the '345 patent provides the benefits of processing image summaries without human intervention during video capture such that the video summaries of the frames including the predetermined feature of interest may be available immediately upon completion of the taking of the digital video and storing of its corresponding file. Ex. 1, ¶ 99; Ex. 2, ¶ 8. The digital video camera systems of the '345 patent conserve processing resources, save processing time and use storage memory efficiently thus providing a better summary more efficiently and expeditiously than possible through conventional means including those in the prior art. Ex. 1, ¶ 99; Ex. 2, ¶ 8.

THE '345 CLAIMED INVENTIONS PROVIDE INVENTIVE SOLUTIONS

74. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further in consideration of the '345 patent specification, the prosecution history and cited prior art, "specify reference data separate from a reference in the captured video sequence, wherein the reference data indicates a feature of interest, and wherein the reference data includes information specifying a desired characteristic of the image frames" prior to a video sequence being taken is an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 100.

75. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further in consideration of the '345 patent

specification, the prosecution history and cited prior art, "specify reference data separate from a reference in the captured video sequence, wherein the reference data indicates a feature of interest, and wherein the reference data includes information specifying a desired characteristic of the image frames" for purposes of forming a video summary including at least part of the identified subset of image frames containing the feature of interest and having the desired characteristic is an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 101.

76. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further in consideration of the '345 patent specification, the prosecution history and cited prior art, "analyze image frames using a feature recognition algorithm to identify a subset of the image frames that contain the feature of interest and have the desired characteristic" using a pre-determined reference image is an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 102.

77. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further in consideration of the '345 patent specification, the prosecution history and cited prior art, "analyze image frames using a feature recognition algorithm to identify a subset of the image frames that contain the feature of interest and have the desired characteristic" concurrently with a video sequence being taken is an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 103.

78. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further in consideration of the '345 patent specification, the prosecution history and cited prior art, "wherein the representation of the video

summary is a summary digital video file separate from the captured video sequence" is an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 104.

79. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further in consideration of the '345 patent specification, the prosecution history and cited prior art, "wherein the summary digital video file is at least partially formed concurrently with a digital video file formed from the captured video sequence" is an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 105.

80. As noted by expert Dr. Melendez and inventor Razavi, the avoidance of the need for post-processing was unconventional and inventive. Ex. 1, ¶ 106; Ex. 2, ¶ 9. Further, the use of metadata to create a summary without the need to decompress a video and do a frame by frame analysis was inventive. Ex. 1, ¶ 106; Ex. 2, ¶ 9.

THE '604 PATENT IS NOT DIRECTED TO AN ABSTRACT IDEA

81. The '604 claims neither describe nor claim a concept or a generic computerized system. Instead the '604 claims address, among other things, a persistent problem unique to digital video cameras at the time of the invention whereby the capturing of videos created large video files that were difficult for camera users to make effective use of and manage. '604/1:36-41; Ex. 1, ¶ 107. The patented invention enables a substantial improvement in digital video cameras including their functionality and utility. Ex. 1, ¶ 107. Prior to the invention, the length of a video, for example, a 3 hour wedding, limited the utility of the digital video camera and its corresponding digital video file consisting of 324,000-648,000 frames. *Id.* Shortening the video to a desired subset of content required post-capture editing through either (1) laborious and costly human editing of the stored digital video file having characteristic editing times a multiple of the duration

of the material to be edited, or (2) automatic video summaries taking, "a captured video as input, and analyz[ing] the saved video file to determine a video summary. '604/1:42-62; Ex. 1, ¶ 107. Prior art digital video cameras thus could not compile summaries comprising user pre-specified persons or features of interest during capture nor provide for immediate viewing of video summaries at capture. '604/1:63-2:2 Ex. 1, ¶ 107.

82. The patented invention provides for digital video cameras that create an inventive new class of video summary in inventive new ways, whereby the electronic circuitry of the special purpose digital video camera comprises designating a reference image digitally and algorithmically identifying image frames that contain the particular person or contain the feature of interest and desired characteristic. '746 3:28-33; Ex. 1, ¶ 108. The invention and its sequence of steps cannot be performed by human mental steps or otherwise given that a human editor could not manipulate video images at frame rates of, "30 or 60 frames per second," during the capture process. *Id.*

THE '604 CLAIMS ARE DIRECTED TO INNOVATIVE, INTEGRATED PHYSICAL SYSTEMS

83. None of the elements that comprise the claimed device are abstract, as all of the digital video camera apparatus including a processing system, image processor, memory, reference image, image frames, facial recognition algorithm, video summary, and digital video file are physical or tangible things known to a POSITA in light of the specification; and in view of the technological solutions and unconventionality noted below. Ex. 1, ¶ 109. Indeed, the '604 patent specification includes an exemplary listing of the parts of the claimed apparatus together with supporting systems and steps. '604/14:31-15:25; Ex. 1, ¶ 109. Furthermore, the claims neither are directed to nor do they claim a general purpose computerized system or the use of one. Ex. 1, ¶ 111.

84. Claim 9 of the '604 patent is exemplary. A POSITA would understand that the

language of the '604 claims is not directed merely to a method of analyzing individual frames of a video to identify frames containing a particular person or feature of interest, and then compiling those frames into a video thereby creating a summary of the original video. Rather, they comprise the aspects noted a below which provided inventive, technological solutions to the problems faced by the inventors. . Ex. 1, ¶ 112. None of the elements that comprise the claimed device are abstract, as all of the digital video camera apparatus including a processing system, image processor, memory, reference image, image frames, facial recognition algorithm, video summary, and digital video file are physical or tangible things known to a POSITA in light of the specification; and in view of the technological solutions and unconventionality noted below. *Id.*

THE '604 CLAIMED INVENTIONS COULD NOT BE DONE MANUALLY OR IN ONE'S HEAD

85. Including as noted by expert Dr. Melendez, the claimed solutions could not be done manually during video capture, nor can they be performed in person's head. . Ex. 1, ¶ 113.

THE '604 CLAIMED INVENTIONS PROVIDE TECHNOLOGICAL SOLUTIONS TO TECHNOLOGICAL PROBLEMS

86. Technical problems addressed by the '604 patent include the latency inherent in post-processing methods, additional processing required when working with files as inputs instead of sequences including video file decompression for post processing, and the additional storage required for keeping frames not of interest. Ex. 1, ¶ 114.

87. Technical solutions by the '604 claimed inventions to technical problems faced include a reference image that may be designated prior to or independent of the video being taken, formation and/or generation of a summary video concurrently or in real time, separate and parallel image processing paths, discarding of frames not of interest for efficient storage, and creation of summary video by applying the referencing throughout the whole video capture process, including as opposed to conventional post-processing. Ex. 1, ¶ 115.

THE '604 CLAIMED INVENTIONS PROVIDE UNCONVENTIONAL SOLUTIONS

88. As noted above, what was conventional at the time comprised post-processing which consumed lots of time, processing and storage. Ex. 1, ¶ 116; Ex 2, ¶¶ 5-6. The state of the art did not include using metadata generated in real time to construct a real time video summary. Ex. 1, ¶ 116; Ex 2, ¶ 7. The only automated processes that occurred in real time during video capture involved eliminating low quality or resolution, which had nothing to do with creating video summaries with desired features. Ex. 1, ¶ 116; Ex 2, ¶ 7.

89. Unconventional solutions provided by the '604 claimed inventions include designation of a reference image prior to taking of video, creation of a corresponding summary video file concurrently having only a person of interest, separate and parallel image processing paths, ability to save only what is need without user intervention, and creation of summary video of the pre-determined person of interest by applying the referencing throughout the video capture process. It was unconventional to enable making a video summary using metadata without the need to decode a video. Ex. 1, ¶ 117; Ex 2, ¶ 6.

THE '604 CLAIMED INVENTIONS PROVIDE SUBSTANTIAL BENEFITS

90. The digital video cameras of the '604 patent provide the benefits of processing image summaries without human intervention during video capture such that the video summaries of the frames including the predetermined person of interest may be available immediately upon completion of the taking of the digital video and storing of its corresponding file. Ex. 1, ¶ 118; Ex 2, ¶ 8. The digital video cameras of the '604 patent conserve processing resources, save processing time and use storage memory efficiently thus providing a better summary more efficiently and expeditiously than possible through conventional means including those in the prior art. Ex. 1, ¶ 118; Ex 2, ¶ 8.

THE '604 CLAIMED INVENTIONS PROVIDE INVENTIVE SOLUTIONS

91. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further in consideration of the '604 patent specification, the prosecution history and cited prior art, "receive a designation with respect to a reference image, wherein the reference image contains a particular person" prior to a video sequence being taken is an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 119.

92. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further in consideration of the '604 patent specification, the prosecution history and cited prior art, "analyze, using the processor, image frames to identify a subset of the image frames that contain the particular person" using a pre-determined reference image is an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 120.

93. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further in consideration of the '604 patent specification, the prosecution history and cited prior art, "analyze, using the processor, image frames to identify a subset of the image frames that contain the particular person" concurrently with a video sequence being taken is an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 121.

94. Consistent with the above discussion, including the problems solved that had been faced by conventional post-processing solutions, and further in consideration of the '604 patent specification, the prosecution history and cited prior art, "form a summary including fewer than all of the image frames, wherein the summary includes at least part of the identified subset of image frames containing the particular person" concurrently with a video sequence being taken is

an inventive technological solution, including in view of the benefits and unconventional solution this involves and contributes to. Ex. 1, ¶ 122.

95. As noted by expert Melendez inventor Razavi, the avoidance of the need for post-processing was unconventional and inventive. Ex. 1, ¶ 123; Ex. 2, ¶ 9. Further, the use of metadata to create a summary without the need to decompress a video and do a frame by frame analysis was inventive. Ex. 1, ¶ 123; Ex. 2, ¶ 9.

OVERVIEW OF THE '599 PATENT

96. U.S. Patent Appl. No.: 09/216,900, filed on December 1, 1998, issued as the '599 patent on May 28, 2002. Ex. 1, ¶ 124. As noted by expert Dr. Melendez and inventor Randy Fredlund, in December 1998, the state of the photographic art was primarily film systems and chemical processing systems for film. Ex. 1, ¶ 124; Ex. 3, ¶ 3. Commercially viable digital image capture and image processing was still in its infancy at that point. Ex. 1, ¶ 124; Ex. 3, ¶ 3.

97. Color negative/positive photographic systems in use in 1998 were designed to produce pleasing prints for most of the people in a target population. '599/1:15-17; Ex. 1, ¶ 125. The print appearance included both pleasing tones and color reproduction to produce colorful prints with good contrast, and particularly excellent skin tone reproduction for some. '599/1:17-20; Ex. 1, ¶ 125. Typically, existing photo systems were designed to be optimized for a particular skin type and preference, for example, Caucasian, Oriental, Asian, Indian, and/or Black. '599/1:20-22. Photographic film, paper, and printer sets-ups were generally designed for providing pleasing color for a particular market segment. '599/1:22-25; Ex. 1, ¶ 125.

98. As noted by expert Dr. Melendez and inventor Randy Fredlund, at the time, a single film system needed to please as many people as possible. Ex. 1, ¶ 126; Ex. 3, ¶ 3. Film images of Caucasian or Northern European and Asian skin types tended to render well. Ex. 1, ¶ 126; Ex. 3, ¶ 3. However, darker skin types tended to fall into the toe of the sensitometry curve and were not

rendered as well. Ex. 1, ¶ 126; Ex. 3, ¶ 3. As noted in the '599 specification, in photographs of an individual of a first skin tone type with a system designed for a second skin tone type, the skin tones of the first skin tone type would appear undesirable. '599/1:25-28; Ex. 1, ¶ 126. For example, in a system designed for Caucasians, individuals having a darker skin tone would result in the darker skin tones appearing compressed. '599/1:28-31; Ex. 1, ¶ 126. This often resulted in the facial features being lost in an overly dark representation. '599/1:31-32; Ex. 1, ¶ 126. Getting both lighter and darker skin tones in the same shot to render well was particularly challenging. Ex. 1, ¶ 126; Ex. 3, ¶ 3.

99. In December 1998 it was possible, but not really feasible, to design a photographic system that was optimized for dark-tone skin tone reproduction. '599/1:33-34; Ex. 1, ¶ 127. This could have been done by adjusting the photographic film, paper, and/or printer set-ups. '599/1:34-36; Ex. 1, ¶ 127. However, this kind of system would not produce optimum light-tone skin tone reproductions. '599/1:36-37; ; Ex. 1, ¶ 127; Ex. 3, ¶ 4. Solving the problem in this manner would still result in the inability of a single system to produce pleasing skin tone reproduction, regardless of the lightness of the skin tones in the scene. '599/1:37-41; Ex. 1, ¶ 127. Marketing two different films would increase marketing and inventory costs, and potentially lead to confusion in the customer's mind about the circumstances for use of the different systems. '599/1:41-44; Ex. 1, ¶ 127.

100. With photo systems known in December 1998, the only option available for improving the reproduction of skin tones, which the systems were not designed for, was to adjust the print density and color balance during printing. '599/1:45-48; Ex. 1, ¶ 128. Neither of these adjustments produced preferred prints because they altered the reproduction of portions of the scene that were not skin tones. '599/1:48-50.

101. Thus, there was a need to provide an economical photographic system that could

be adjusted to compensate for different skin tones in accordance with customer preferences without concern as to the tone characteristics of the originating film or providing a plurality of different film types, each being directed to a different skin type. '599/1:64-2:2; Ex. 1, ¶ 129. There was also a need to provide a system wherein the customer and/or photo lab could select manually or automatically the desired skin tone characteristics. '599/2:2-5.

102. Referring to FIG. 1, there is illustrated a photographic printing system 10 made in accordance with a described embodiment. '599/3:1-3 Ex. 1, ¶ 130. In the particular embodiment illustrated, system 10 includes a digital minilab printer 12, CPU/computer 16 is provided for allowing entry of data to printer 12 and for controlling operation of the minilab printer 12, and digital scanner 22. '599/3:3-23; Ex. 1, ¶ 130.

103. A computer algorithm provided in computer 16 first identifies if skin tones are present in the image file obtained by scanner 22. '599/3:36-38; Ex. 1, ¶ 131. This is accomplished by determining the colorimetric values of the image pixels scanned by scanner 22. '599/3:38-40; Ex. 1, ¶ 131. Colorimetry is the measurement of color. '599/3:40-41; Ex. 1, ¶ 131. A set of colorimetric parameters for an object, based on measured colorimetric parameters, can quantify the color of the object as it appears to the average observer under a specific set of viewing conditions. '599/3:41-44; Ex. 1, ¶ 131. Techniques described in another former Kodak patent, U.S. Pat. No. 5,528,339, can be used to identify the colorimetric values of the images suitable for use with the '599 invention. '599/3:45-47; Ex. 1, ¶ 131. Predetermined colorimetric values may be set for each of the desired skin types, for example, Caucasian, Oriental, Asian, Indian, and/or Black. '599/3:50-52; Ex. 1, ¶ 131. This results in selectively identifying portions of the image obtained by the scanner 22. '599/3:52-53; Ex. 1, ¶ 131.

104. Having determined that a particular portion is of a particular flesh tone, the next step is to modify the flesh tone to a particular hue and/or color. '599/3:53-56; Ex. 1, ¶ 132.

Innovatively, only the identified portions of the image are then modified to preselected colorimetric values. '599/3:63-64; Ex. 1, ¶ 132. The selected preferences may be preprogrammed into the algorithm or entered by the photofinishing lab operator or consumer. '599/3:64-4:11; Ex. 1, ¶ 133. The algorithm modifies the respective portions of the digital image file in accordance with the selected preference. ; Ex. 1, ¶ 132. The modified image is then sent to the printer for printing onto the photosensitive media. '599/4:1-2; Ex. 1, ¶ 132. The algorithm may select the only available single alternative reproduction adjustment, such as a dark-toned skin tone adjustment. '599/4:3-6; Ex. 1, ¶ 132. Or the algorithm may select among a set of available alternative reproduction adjustments, such as by race and lightness range, based on customer option or the identity or darkness of skin tones in the captured scene. '599/4:6-10; Ex. 1, ¶ 132. The available adjustments may include a customer-specified custom option created as a profile. '599/4:10-12; Ex. 1, ¶ 132.

105. When the algorithm alters the default skin tone reproduction, the adjustment may consist of a print density or color balance bias, or more preferred, the application of a matrix or 3D table of parameters to the digital capture image. '599/4:13-17; Ex. 1, ¶ 133. An innovative 3D table of parameters is preferred because it allows skin tones to be altered without altering the remaining colors in the image. '599/4:17-19; Ex. 1, ¶ 133. It is also possible to alter the color reproduction of the skin tones within the scene by applying a matrix only if the pixel value is a skin tone. '599/4:19-22; Ex. 1, ¶ 133.

106. The preferred adjustment will often consist of an innovative reduction in skin tone colorfulness and a reduction in the contrast of the reproduction in color region of the skin tones. '599/4:23-25 Ex. 1, ¶ 134.

107. Referring to FIG. 2, there is illustrated a portion of a negative film 30 having an image scene 32 printed thereon. '599/4:31-33; Ex. 1, ¶ 135. The film 30 is placed in scanner and

a digital record file of the image scene 32 is obtained and sent to computer 16. '599/4:40-42; Ex. 1, ¶ 135. A colorimetric analysis of the image data is accomplished by the prestored algorithm in the computer and the flesh tones, as defined by predetermined colorimetric parameters, are identified. '599/4:42-45; Ex. 1, ¶ 135. Once having identified portions of the image that are flesh tones, all such identified flesh tone areas of the scene image are modified in accordance with selected skin tone characteristics. '599/4:45-48; Ex. 1, ¶ 135.

108. The described embodiment and claimed invention provide prints that are pleasing to the customer regardless of the lightness of skin tones in the photographed scene. '599/4:62-64; Ex. 1, ¶ 136. The described embodiment avoids the need of providing separate film types throughout the world to accommodate local preferences. '599/4:64-5:5; Ex. 1, ¶ 136. Additionally, the described embodiment modifies only the area containing flesh tones, thereby maintaining the overall color integrity of the remaining portion of the image. '599/5:5-8; Ex. 1, ¶ 136. The described embodiment also provides the ability to change more than one different flesh tone in a scene to a preferred preference. '599/5:8-10; Ex. 1, ¶ 136.

STATE OF THE ART AT THE TIME OF THE '599 INVENTION

109. Thus, as noted above, renderings of digital images involving persons suffered from colorimetric realism errors where a subject person's skin color deviated from the nominal design target for a given photo system. '599/1:20-32; Ex. 1, ¶ 137. Skin tone rendering improvement may have involved print density and color balance adjustments but such fell short due to resulting changes in scene rendering portions unrelated to skin features. '599/1:45-60; Ex. 1, ¶ 137. As noted by inventor Fredlund, the state of the art for photographic rendering were digital mini-labs, such as the Gretag Imaging Masterlab 740 Digital with Kodak Digital Printer referenced in column 3, which could make a print onto photographic paper from a digital record of photographic film. '599/3:4-8; Ex. 1, ¶ 137.

OVERVIEW OF PROSECUTION OF THE '599 PATENT

110. On November 29, 2001, the patent examiner rejected claims l-16 and 19 under 35 U.S:C. 102(e) as being anticipated by U.S. Patent No. 6,293,284 to Rigg. Ex. 1, ¶ 138. The examiner also rejected claims l7 and 18 under 35 U.S.C. 103(a) as being unpatentable over Rigg in view of U.S. Patent No. 6,278,533 to Takemoto. *Id.* In its November 29, 2001 response, the applicant noted that the main cited reference, Rigg, had a filing date that postdated the applicants. Further, the word "selected" was added to independent claims 1 and 14 by agreement with the examiner. *Id.* Thereafter the examiner issued a notice of allowability. *Id.*

THE '599 CLAIMS ARE NOT DIRECTED TO AN ABSTRACT IDEA

111. The '599 claims neither describe nor claim a concept or a generic computerized system. Ex. 1, ¶ 139. Instead the '599 claims address, among other things, limitations in the displayed rendering quality of diverse skin tones. *Id.* The patented invention uses digital image processing and enables spatially non-uniform adjustments within a digital imaging rendering process for skin tone optimization based upon colorimetric assessments followed by select colorimetric realignments to specified targets. *Id.* Prior to the invention, the rendering processes could only be optimized for a given skin tone at the expense of others, and were otherwise film and display dependent. *Id.* The patented invention provides for improved accuracy within a common display including diverse skin tones without the need to customize film and/or display systems for specific skin tones. *Id.*

THE '599 CLAIMS ARE DIRECTED TO A NOVEL, INTEGRATED PHYSICAL DEVICE

112. None of the elements that comprise the claimed device are abstract, as all of the digital imaging apparatus including its colorimetric analyzer, digital image file, and colorimetric parameters are physical or tangible things known to a POSITA in light of the specification; and in view of the technological solutions and unconventionality noted below. Ex. 1, ¶ 140.

113. A POSITA would understand that the language of claim 1 is not directed merely to analyzing and modifying a digital image file. Ex. 1, ¶ 141. Rather, the '599 claims comprise the aspects noted a below which provided inventive, technological solutions to the problems faced by the inventors. *Id.*

THE '599 CLAIMED INVENTIONS COULD NOT BE DONE MANUALLY OR IN ONE'S HEAD

114. As noted by expert Dr. Melendez and inventor Fredlund, at the time of the invention, it would have been impossible for a human to accomplish the results achieved by the claimed invention of selective colorimetric parameter image revisions. Ex. 1, ¶ 145; Ex. 3, ¶ 11.

115. As noted by expert Dr. Melendez. the claimed solutions could not be done manually, nor could they be performed in a person's head. Ex. 1, ¶ 146. This limitation is in part because humans cannot objectively determine colorimetric parameters or distinguish colors absolutely. *Id.* Instead, humans perceive colors differently and in relation to other colors. For example, the graphic below shows just 6 different skin tone related colors (Adapted from: https://www.urbancompany.com/blog/beauty/how-to-identify-skin-undertones-for-indian-skin/). *Id.* When shown side-by-side a human may be able to distinguish that Warm Beige is a different color than Natural, or that Natural is a different color than Warm Ivory. *Id.* However, when viewed independently, unlabeled, and adjacent to other colors and lightings, a human cannot reliability determine the correct color, nor colorimetric parameters which a POSITA would understand to include specific ranges of base color combinations. *Id.* Additionally, the rendering of photorealistic images involves millions of pixels each of which may have one colorimetric value of sixteen million or more possible colors. *Id.*

THE '599 CLAIMED INVENTIONS PROVIDE TECHNOLOGICAL SOLUTIONS TO TECHNOLOGICAL PROBLEMS

116. Technical problems addressed by the '599 patent include the need at the time of the

invention for a rendering system for digital images that could compensate for differing skin tones within a digital image of a scene independently of the capture type used, to yield renderings having improved colorimetric accuracy. '599/1:64-2:5; Ex. 1, ¶ 147. As noted by inventor Fredlund, if one attempted to tweak a system with global changes to improve the presentation of darker skin tones, as would have been conventional at the time, that would be apt to destroy the balance which allows for representation of lighter skin tones in the expected fashion. Ex. 1, ¶ 147.

117. Technical solutions by the '599 claimed inventions to technical problems faced include providing for a technological solution to the problem of colorimetric skin tone realism errors of captured and rendered real scenes independent of the capture or display media by making specific and selected colorimetric parameter translation adjustments to specific portions of the digital image file representing the original image based on predetermined skin tone colorimetric parameters. Ex. 1, ¶ 148; '599 3:36-52. See claims 1, 14. Further, a technical solution is provided by the automated solutions of claims 5 and 14. Ex. 1, ¶ 148.

THE '599 CLAIMED INVENTIONS PROVIDE UNCONVENTIONAL SOLUTIONS

118. The conventional solution for improving the rendering for dark skin tones would be to make a global change to the film or the chemicals or printing parameters used for processing and printing. Ex. 1, ¶ 149; Ex. 3, ¶¶ 5-6, 12; '599 Patent 1:20-25. However, this would lead to unacceptable results for lighter skin tone rendition. Ex. 1, ¶ 149; Ex. 3, ¶¶ 5-6. It was not practical to have different films, or different processing solutions, or printing parameters, for customers with different skin tones. Ex. 1, ¶ 149; Ex. 3, ¶ 5. Further, no global solution would be suitable for photos having people with both darker and lighter skin tones. Ex. 1, ¶ 149; Ex. 3, ¶ 5. Thus, conventional solutions and conventional wisdom provided no real solutions to the problem faced. Ex. 1, ¶ 149; Ex. 3, ¶¶ 5-6.

119. Innovatively, the '599 Patent took an unconventional approach allowing for the use

of a generic film type and generic rendering system for all display types, by selectively decreasing the accuracy of the digital image file data of the scene image in areas corresponding to determined skin tones such that the displayed result would have increased perceived accuracy in those regions independent of the original image capture system or selected display type for the rendering. Ex. 1, ¶ 150.

120. It was unconventional to effect the colorimetric parameter and renditions of only those parts of images that fell within ranges, as opposed to doing so globally or spatially. Ex. 1, ¶ 151; Ex. 3, ¶ 10. For example, the inventors were not looking for particular objects such as a face; rather, we were looking for ranges of color. Ex. 1, ¶ 151; Ex. 3, ¶ 10. One benefit of the remapping techniques was that different tones in the same face could be remapped differently and more gradually, thus achieving even better results than might be achieved with global or spatial solutions. Ex. 1, ¶ 151; Ex. 3, ¶ 10. Further, the remapping could be further improved, either by users of digital-processing-enabled mini-labs or kiosks, or by Kodak, without having to make global changes to film, chemicals, or film processing techniques. Ex. 1, ¶ 151; Ex. 3, ¶ 10.

121. Further, expert Dr. Melendez and inventor Fredlund have noted that facial recognition would not solve the problem to be solved, because if a system changed the color values for someone's face, those might not match other body parts in the picture. Ex. 1, ¶ 152. The claimed invention of making color changes captures all portions of the image for which colorimetric parameters should be changes to improve the rendition of the image. *Id.*

THE '599 CLAIMED INVENTIONS PROVIDE SUBSTANTIAL BENEFITS

122. As noted above, the '599 Patent provides for a technological solution to the problem of colorimetric skin tone realism errors in real scenes independent of the capture or display media by making specific colorimetric parameter translation adjustments to specific portions of the digital image file representing the original image based on skin tone. Ex. 1, ¶ 153; '599/3:36-52.

This solution provides benefits to a broader base of diverse customers who will appear as they would expect to appear in displayed images, and to providers of original capture systems and associated media, as well as providers of display media who benefit through simplified logistics and reduced costs by not having to provide and manage customer specific media solutions. Ex. 1, ¶ 153. This solution also provided for substantial benefits over conventional solutions, including benefits with achieving truer rendition of darker skin tones, including when mixed with lighter skin tones. Ex. 1, ¶ 153; Ex. 3, ¶ 12.

THE '599 CLAIMED INVENTIONS PROVIDE INVENTIVE SOLUTIONS

123. As noted above, '599 Patent took an unconventional approach leading to improved skin tone representations of persons by innovatively making specific and selected colorimetric adjustments to only portions of the digital imaging file representation of the original image rather than relying on application specific image capture processes or application specific image display media. Ex. 1, ¶ 154; Ex. 3, ¶ 12.

THE CLAIMS OF THE '345, '746, '604, AND '599 DO NOT UNREASONABLY PREEMPT THEIR FIELDS

124. Hitachi Kokusai contends that the '345 patent, '746 patent, and '604 patent claim the abstract idea of, "analyzing video image files for a particular reference image (i.e. a person) and collecting those image frames in a summary," implemented by generic computer elements that provide no inventive concept. Instead, the '345 patent, '746 patent, and '604 patent claim highly specific combinations of a digital video camera including an image sensor, processing system, memory, digital image, reference image, video sequence, image frames, recognition algorithm, video summary, and/or digital video file where infringement of the patent claims can be readily avoided while still practicing the alleged abstract idea proposed by Hitachi Kokusai, given that the patent claims do not read on the alleged abstract idea. Ex. 1, ¶ 155. Indeed the claims of these patents do not analyze video image files as in the prior art but instead analyze image frames of a

video sequence as discussed extensively herein above. *Id.*

125. Hitachi Kokusai contends that the '599 patent claims the abstract idea of, "(1) analyzing a digital image file, and (2) modifying that image file," implemented by generic computer elements that provide no inventive concept. Instead, the '599 patent claims highly specific combinations the digital imaging apparatus including its colorimetric analyzer, digital image file, and colorimetric parameters where infringement of the patent claims can be readily avoided while still practicing the alleged abstract idea proposed by Defendants. Ex. 1, ¶ 156.

126. For example "(1) analyzing a digital image file, and (2) modifying that image file," may be practiced outside of the limited scope of the patent claims at least by: a) Not using predetermined colorimetric parameters; b) Determining problematic subject color values only "on-the-fly"; c) Determining target second color values only "on-the-fly"; d) Using image data originating from the original source rather than from the digital image file; e) Altering image capture parameters based only on image subject type; and/or f) Using only reference images for digitally imaged subjects. Ex. 1, ¶ 157.

COUNT 1 – INFRINGEMENT OF U.S. PATENT NO. 6,396,599

127. The application for U.S. Patent No. 6,396,599 (the "'599 patent") was filed on December 21, 1998, and the patent issued on May 28, 2002.

128. At the time of the '599 application, there was a need to provide an economical photographic system that could be adjusted to compensate for different skin tones in accordance with customer preferences without concern as to the tone characteristics of the originating film or providing a plurality of different film types, each being directed to a different skin type. There was also a need to provide a system wherein the customer and/or photo lab could select manually or automatically the desired skin tone characteristics. The '599 inventions provided methods for eliminating and/or minimizing the problems of the prior art, and which could improve images

provided on conventional photosensitive media, or in digital format.

129. The foregoing noted shortcoming and other shortcomings in conventional prior art were solved by the unconventional and inventive methods of the '599 claimed inventions, which comprise analyzing a digital image and modifying a colorimetric parameter within a portion of the image. Juxtaposing the '599 claimed inventions against the inferior, conventional state of the art illustrates in part the unconventionality and inventiveness of the '599 claimed inventions.

130. Claim 1 of the '599 patent covers: "A method of modifying images, comprising the steps of: a) analyzing a digital image file of an image so as to identify at least one predetermined colorimetric parameter; and b) modifying that portion of said image having said at least one predetermined colorimetric parameter to a selected second predetermined colorimetric parameter so as to produce a modified digital image."

131. At least claim 1 of the '599 patent has been infringed by Kokusai, including under 35 U.S.C. §271(a), at least by using cameras with skin tone masking such as the Z-HD6000 camera (the "'599 Infringing Instrumentalities"). Without limitation, sale, importation and/or use of the '599 Infringing Instrumentalities comprises and/or induces the steps noted below.

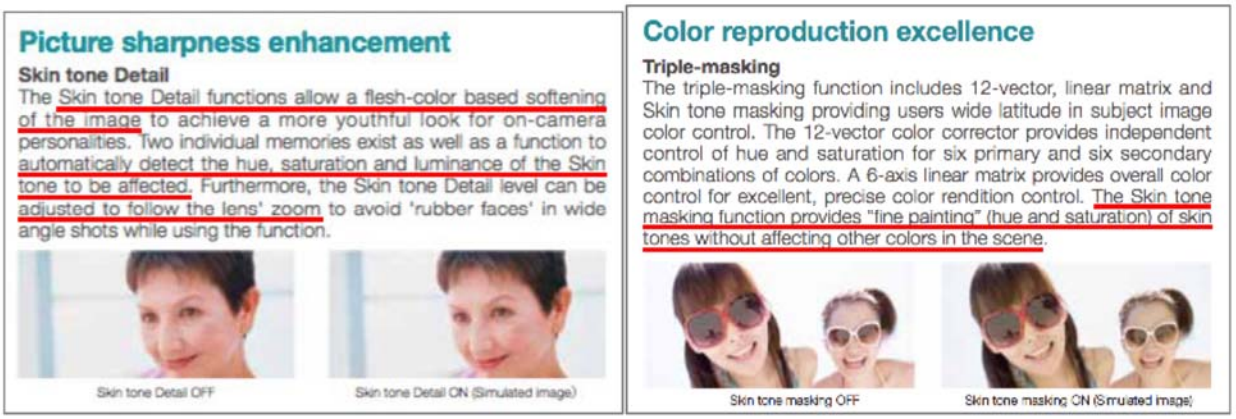
132. To the extent that the preamble is limiting, the '599 Infringing Instrumentalities comprise a method of modifying images. Without limitation, *see, e.g.*, https:// https://www.hitachikokusai.us/BroadcastandProfessionalCameras/Z-HD6000.html :

High Performance HD Production Camera

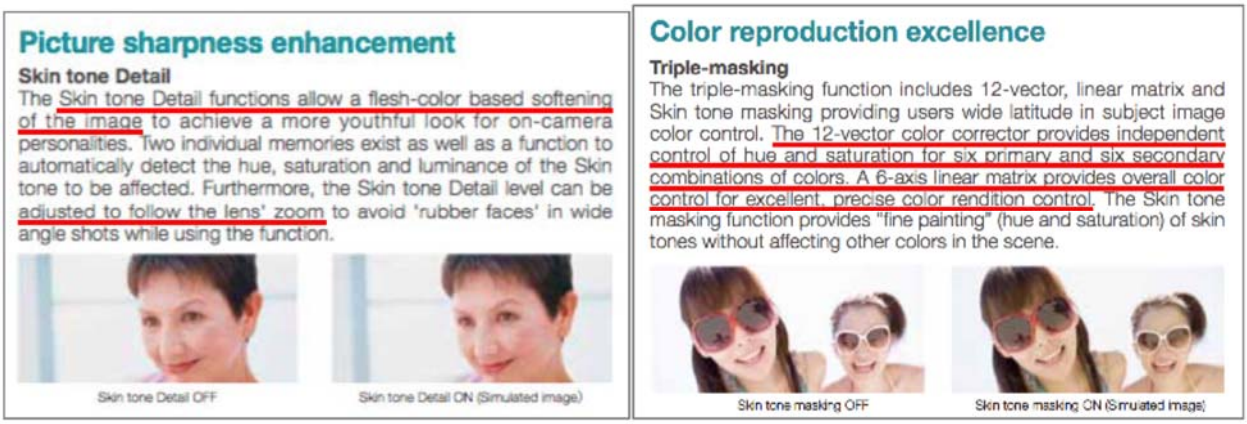
HITACHI's Z-HD6000 is our lowest cost, full 1920 X 1080 HDTV camera system. Utilizing HITACHI's latest generation 2.6 mega-pixel 2/3" MOS image sensors, it retains all the popular functions and features of the existing camera line. Advanced specifications include F12 standard sensitivity with over 60dB of video headroom and Real-time Lens Aberration Correction (RLAC). Its lightweight, two-piece dockable camera body offers maximum re-configuration ability with a choice of compact digital fiber transmission system or Hitachi's patented digital Triax system. The Z-HD6000 includes Triple-masking functions, linear matrix and Skin Tone masking providing users with wide latitude in image color control.

133. The '599 Infringing Instrumentalities comprise analyzing a digital image file of an

image so as to identify at least one predetermined colorimetric parameter, for example, at least hue. Without limitation, *see, e.g.*, https:// https://www.hitachikokusai.us/idc/groups/hitachi kokusai/documents/supportingdocumentpdf/poc_021190.pdf :



134. The '599 Infringing Instrumentalities comprise modifying, e.g., adjusting, controlling and/or softening, that portion of said image having said at least one predetermined colorimetric parameter, for example, at least hue, to a selected second predetermined colorimetric parameter for example, at least a modified hue, so as to produce a modified digital image. Without limitation, *see, e.g.*, https:// https://www.hitachikokusai.us/idc/groups/hitachikokusai/documents/ supportingdocumentpdf/ poc_021190.pdf :



135. Kokusai's acts of infringement of the '599 patent have caused damage to MPV, and MPV is entitled to recover damages sustained as a result of Kokusai's wrongful acts in an amount subject to proof at trial.

COUNT 2 – INFRINGEMENT OF U.S. PATENT NO. 8,643,746

136. The application for U.S. Patent No. 8,643,746 (the "'746 patent") was filed on May 18, 2011, and the patent issued on February 4, 2014.

137. At the time of the '746 application, managing digital video content could be a difficult task. Videos were often represented visually with a thumbnail image of the first frame of the video. This may not provide much insight into the content of the video. Determining if a specific event is contained in a given video often required viewing the entire video. For a lengthy video, a user may prefer to be able to get a quick summary of the video without having to view the video in its entirety.

138. Digital videos also presented practical problems from a sharing perspective. Many digital capture devices recorded video at 30 or 60 frames per second, at spatial resolutions as high as 1920x1080 pixels. Even when compressed, the amount of data generated could make it impractical to share even relatively short videos.

139. Video editing software could be used to manually summarize a video into a shorter version that can be shared more easily. Manual video editing could be a lengthy, laborious process, however, and many users were not interested in manual editing.

140. Automatic video summarization algorithms existed as well. However, they were very complex, however, as it was necessary to decode the video to perform the analysis required to determine the video summary. Thus it was not possible on a digital capture device to immediately view a video summary corresponding to a just-captured video. This shortcoming made it difficult to facilitate quick review and sharing of captured videos.

141. When creating a video summary, it was often desirable to have a specific feature within the summary. The video summary was created to contain some or all of the video content in which a feature is present. Examples of such features can include people, pets, events, locations,

activities or objects. Manually creating such a tailored video summary could be a tedious process. Using desktop software to generate such a tailored video summary prevented the ability to quickly review and share video summaries.

142. It was thus desirable to provide systems and methods for computing a video summary in a digital capture device. In particular, it was desirable to provide solutions that allow a video summary to be generated on a digital capture device with minimal delay at the completion of video capture. Also, it would be desirable to provide a video summary that contains a user-specified feature.

143. During prosecution of the ’746 patent, the primary prior art reference, and the benchmark for conventional prior art, was U.S. Published Patent Application No. 2011/0085778 to Iwase, *et al*. However, Iwase only discloses a single video image to which the index information functions as an index to be added to the exciting scene or the favorite scene in the video image. Among other things, Iwase does not disclose, using a data processor to automatically analyze image frames using a person recognition algorithm to identify a subset of the image frames that contain a particular person in a reference image; forming a video summary including fewer than all of the image frames in the video sequence, wherein the video summary includes at least part of the identified subset of image frames containing the particular person; storing the received video sequence in a storage memory; or storing the video summary in the storage memory as a separate summary digital video file.

144. The foregoing noted shortcoming and other shortcomings in conventional prior art were solved by the unconventional and inventive methods of the ‘746 claimed inventions, which comprise using a data processor to automatically analyze the image frames using a person recognition algorithm to identify a subset of the image frames that contain the particular person; forming a video summary including fewer than all of the image frames in the video sequence, and

storing the video summary in the storage memory as a separate summary digital video file.

145. Juxtaposing the '746 claimed inventions against the inferior, conventional state of the art illustrates in part the unconventionality and inventiveness of the '746 claimed inventions.

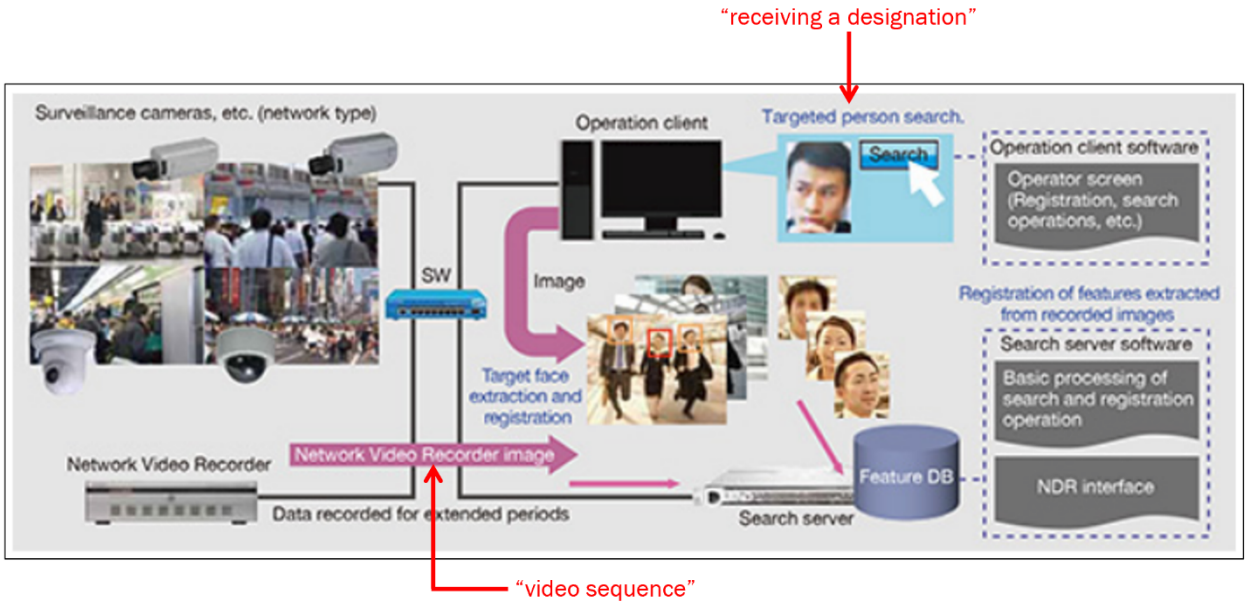
146. Claim 16 of the '746 patent covers: "[a] method comprising: receiving a video sequence including a time sequence of image frames; receiving a designation with respect to a reference image, wherein the reference image contains a particular person; using a data processor to automatically analyze the image frames using a person recognition algorithm to identify a subset of the image frames that contain the particular person; forming a video summary including fewer than all of the image frames in the video sequence, wherein the video summary includes at least part of the identified subset of image frames containing the particular person; storing the received video sequence in a storage memory; and storing the video summary in the storage memory as a separate summary digital video file."

147. At least claim 16 of the '746 patent is infringed by Kokusai, including under 35 U.S.C. §271(a)-(b), at least by methods comprising the use of Kokusai's camera systems using Similar Face Search and/or Live Face Matching technology (the "'746 Infringing Instrumentalities"), and/or by inducement of the use of the '746 Infringing Instrumentalities. Without limitation, sale, importation and/or use of the '746 Infringing Instrumentalities has comprised and/or has previously induced the steps noted below.

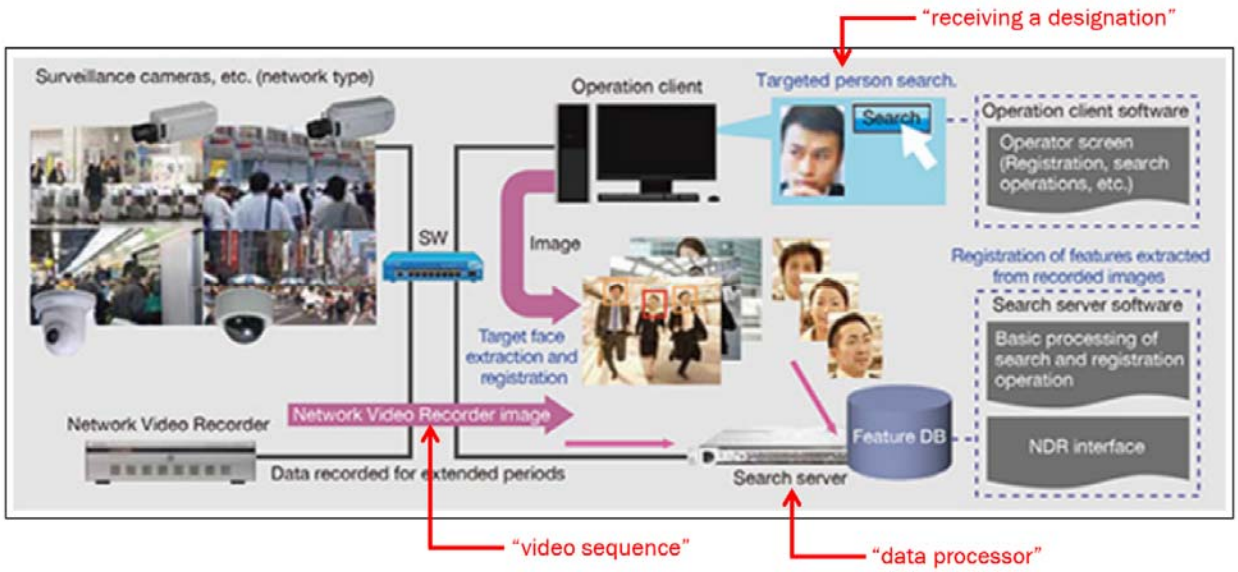
148. The '746 Infringing Instrumentalities comprise receiving a video sequence including a time sequence of image frames (e.g., recorded video). Without limitation, *see, e.g.*: http://www.hitachi-kokusai.co.jp/global/en/products/camera/network/sfs/index.html

149. The '746 Infringing Instrumentalities comprise receiving a designation with respect to a reference image (*e.g.*, an image), wherein the reference image contains a particular person (*e.g.*, a person of interest). Without limitation, *see, e.g.*, http://www.hitachi-

kokusai.co.jp/global/en/products/camera/network/sfs/index.htmlnd, and



150. The '746 Infringing Instrumentalities comprise using a data processor (e.g., a search-engine) to automatically analyze the image frames using a person recognition algorithm (*e.g.*, a face detection algorithm) to identify a subset of the image frames that contain the particular person (see above). Without limitation, *see*, *e.g.*: http://www.hitachi-kokusai.co.jp/global/en/products/camera/network/sfs/index.html:



151. The '746 Infringing Instrumentalities comprise forming a video summary (*e.g.*,

videos represented by thumbnails) including fewer than all of the image frames in the video sequence, wherein the video summary includes at least part of the identified subset of image frames containing the particular person (see above). Without limitation, *see, e.g.*, http://www.hitachi-kokusai.co.jp/global/en/products/camera/network/sfs/index.html:

	Name	Description
1	Live/Rec. video panel	Displays live or recorded video from a registered camera and video from an external movie file.
2	Search image panel	Displays a search target image (search key image). Allows a user to select or de-select the face of a targeted person.
3	Search result panel	Displays video thumbnails of the search results

152. The '746 Infringing Instrumentalities comprise storing the received video sequence in a storage memory; and storing the video summary (see above) in the storage memory as a separate summary digital video file. Without limitation, see, e.g., http://www.hitachi-kokusai.co.jp/global/en/products/camera/network/sfs/index.html.

153. Kokusai's acts of infringement of the '746 patent have been willful and intentional under the standard of *Halo*. Kokusai was made aware of its infringement of the '746 patent, including via an infringement chart, at least in July 2019. Kokusai's infringement has been and remains clear, unmistakable and inexcusable. On information and belief, Kokusai knew or should have known of its clear, unmistakable and inexcusable infringing conduct at least as early as July 2019.

154. Including based upon the facts set forth above, MPV believes and contends that Kokusai's knowing and intentional pre-suit and post-suit continuance of its unjustified, clear, and inexcusable infringement of the '746 patent since receiving notice (see above) of its infringement

of the ‘746 patent, is willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful and flagrant, and that it constitutes egregious misconduct worthy of a finding of willful infringement. Accordingly, since at least July 2019, Kokusai has willfully infringed the ’746 patent.

155. Further, since at least July 2019, Kokusai has actively induced the direct infringement of customers and/or end users, including by providing the ‘746 Infringing Instrumentalities and instructions/specifications for their use, and including with the intent that such direct infringement occur.

156. The ‘746 Infringing Instrumentalities clearly meet the asserted claim limitations in their normal and expected usage. On information and belief, normal and expected usage of the ‘746 Infringing Instrumentalities by customers and/or end users satisfies the claim limitations for direct infringement. Further, at minimum, the provision of products clearly capable of such infringing usage and/or provision of instructions/specifications for such infringing usage constitutes inducement of directly infringing usage.

157. Further, as noted above, Kokusai made aware of infringement of the ‘746 patent through use of the ‘746 Infringing Instrumentalities, including via an infringement chart, at least in July 2019. Such direct and induced infringement has been and remains clear, unmistakable and inexcusable. On information and belief, Kokusai knew or should have known of the clear, unmistakable and inexcusable direct and induced infringing conduct at least as early as July 2019. Thus, on information and belief, Kokusai has, since at least July 2019, specifically intended to induce direct infringement by customers and/or end users.

158. Kokusai’s acts of direct, indirect and willful infringement of the ‘746 patent have caused damage to MPV, and MPV is entitled to recover damages sustained as a result of Kokusai’s wrongful acts in an amount subject to proof at trial.

COUNT 3 – INFRINGEMENT OF U.S. PATENT NO. 8,665,345

159. The application for U.S. Patent No. 8,665,345 (the "'345 patent) was filed on May 18, 2011, and the patent issued on March 2, 2014.

160. At the time of the '345 invention, managing digital video content could be a difficult task. Videos were often represented visually with a thumbnail image of the first frame of the video. This may not provide much insight into the content of the video. Determining if a specific event is contained in a given video often required viewing the entire video. For a lengthy video, users would prefer a quick summary without having to view the video in its entirety. Digital videos could also present practical problems from a sharing perspective, because, even when compressed, the amount of data generated could make it impractical to share even relatively short videos.

161. At the time of the '345 invention, video editing software could be used to manually summarize a video into a shorter version that can be shared more easily. However, manual video editing could be a lengthy, laborious process, and many users are not interested in manual editing. Automatic video summarization algorithms also existed, but they were very complex, as it was necessary to decode the video to perform the analysis required to determine the video summary. Thus, it was not possible on a digital capture device to immediately view a video summary corresponding to a just captured video. This shortcoming in particular made it difficult to facilitate quick review and sharing of captured videos.

162. Further, at the time of the '345 invention, manually creating a tailored video summary in which a feature, for example a person, was present could be a tedious process.

163. It was thus beneficial to provide systems and methods for computing a video summary. In particular, it was beneficial to automatically analyze image frames in a video sequence using a feature recognition algorithm to identify a subset of the image frames that contain

a feature of interest and have a desired characteristic, and to form a video summary including at least part of the identified subset of image frames containing the feature of interest and having the desired characteristic.

164. During prosecution of the ’345 patent, the primary prior art reference, and the benchmark for conventional prior art, was U.S. Published Patent Application No. 2011/0085778 to Iwase, *et al*. However, the Patent Examiner acknowledged that Iwase did not disclose "reference data separate from a reference in the captured video sequence" that is used to "form a video summary ... containing the feature of interest." Further, even the cited combination of Iwase and U.S. Published Patent Application No. 2010/0104146 to Momosaki did not disclose, among other things, reference data including information specifying a “desired characteristic” of the image frames or a video summary including fewer than all of the image frames in the captured video sequence, wherein the video summary includes at least part of the identified subset of image frames containing the feature of interest and having the “desired characteristic.”

165. Juxtaposing the ‘345 claimed inventions against the inferior, conventional state of the art represented by Iwase and Momosaki, illustrates in part the unconventionality and inventiveness of the ‘345 claimed inventions.

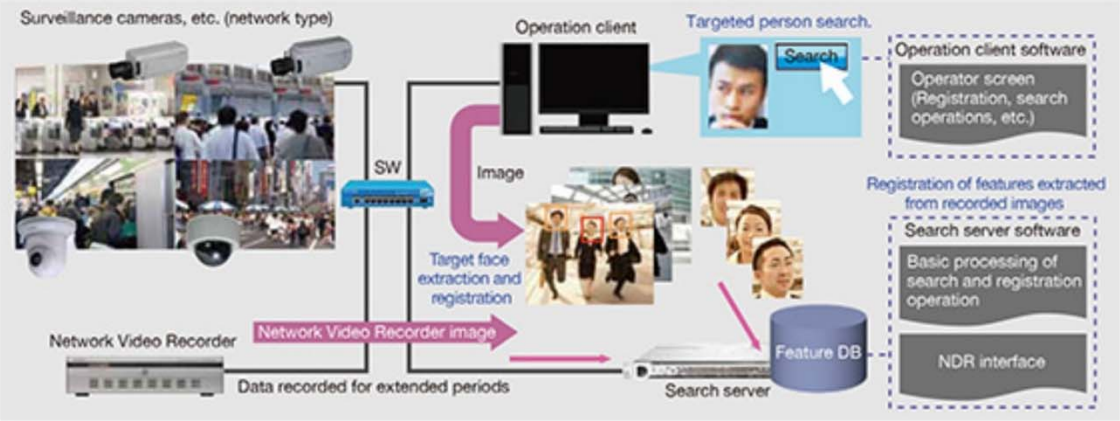
166. The inventive features of ‘345 claimed inventions have multiple inventive advantages over conventional prior art, including with respect to overcoming the shortcomings noted above.

167. Claim 16 of the ‘345 patent covers a “method comprising: receiving a video sequence including a time sequence of image frames; specifying reference data separate from a reference in the received video sequence, wherein the reference data indicates a feature of interest, and wherein the reference data includes information specifying a desired characteristic of the image frames; using a data processor to automatically analyze the image frames using a feature

recognition algorithm to identify a subset of the image frames that contain the feature of interest and have the desired characteristic; forming a video summary including fewer than all of the image frames in the video sequence, wherein the video summary includes at least part of the identified subset of image frames containing the feature of interest and having the desired characteristic; and storing a representation of the video summary in a processor-accessible storage memory."

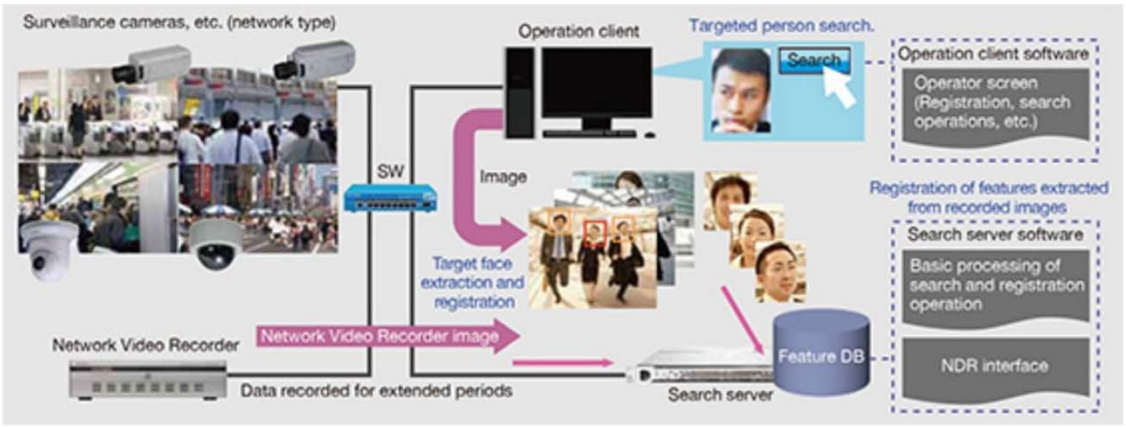
168. At least claim 16 of the '345 patent is infringed by Kokusai, including under 3 35 U.S.C. §271(a)-(b), by methods comprising the use of Similar Face Search technology and/or Live Face Matching (the "'345 Infringing Instrumentalities"), and/or by inducement of the use of the "'345 Infringing Instrumentalities. Without limitation, sale, importation and/or use of the '345 Infringing Instrumentalities comprises and/or induces the steps noted below.

169. The ''345 Infringing Instrumentalities comprise receiving a video sequence including a time sequence of image frames. Without limitation, *see, e.g.*: http://www.hitachi-kokusai.co.jp/global/en/products/camera/network/sfs/index.html:

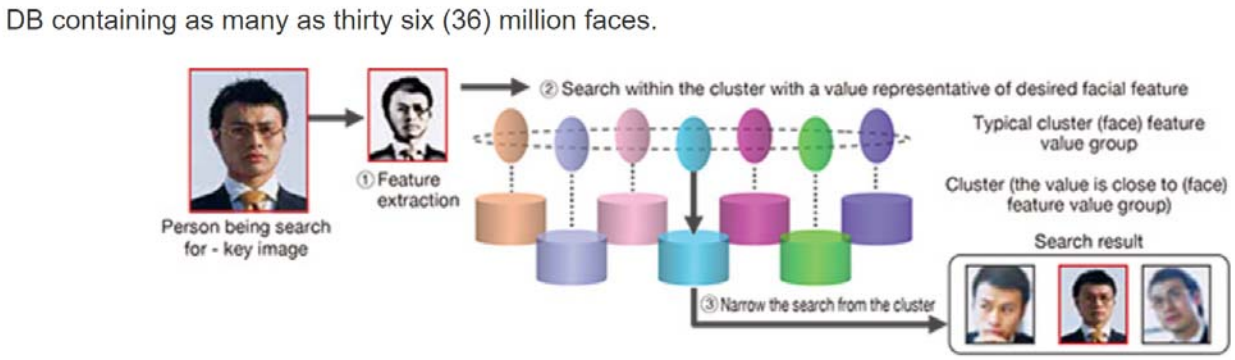


170. The ''345 Infringing Instrumentalities comprise specifying reference data (e.g., a request) separate from a reference in the received video sequence, wherein the reference data indicates a feature of interest (*e.g.*, the face of a person of interest), and wherein the reference data includes information specifying a desired characteristic (e.g., information indicative of the face of a person of interest) of the image frames. Without limitation, *see, e.g.*: http://www.hitachi-

kokusai.co.jp/global/en/products/camera/network/sfs/index.html:



171. The ‘‘345 Infringing Instrumentalities comprise using a data processor to automatically analyze the image frames using a feature recognition algorithm to identify a subset of the image frames that contain the feature of interest (see above) and have the desired characteristic (see above). Without limitation, *see, e.g.* http://www.hitachi-kokusai.co.jp/global/en/products/camera/network/sfs/index.html and



172. The ‘‘345 Infringing Instrumentalities comprise forming a video summary including fewer than all of the image frames in the video sequence (*e.g.*, a short sequence of video frames), wherein the video summary includes at least part of the identified subset of image frames containing the feature of interest and having the desired characteristic; and storing a representation of the video summary in a processor-accessible storage memory. Without limitation, *see, e.g.* http://www.hitachi-kokusai.co.jp/global/en/products/camera/network/sfs/index.html:

	Name	Description
1	Live/Rec. video panel	Displays live or recorded video from a registered camera and video from an external movie file.
2	Search image panel	Displays a search target image (search key image). Allows a user to select or de-select the face of a targeted person.
3	Search result panel	Displays video thumbnails of the search results

"video summary"

173. Kokusai's acts of infringement of the '345 patent have been willful and intentional under the standard of *Halo*. Kokusai was made aware of its infringement of the '345 patent, including via an infringement chart, at least in July 2019. Kokusai's infringement has been and remains clear, unmistakable and inexcusable. On information and belief, Kokusai knew or should have known of its clear, unmistakable and inexcusable infringing conduct at least as early as July 2019.

174. Including based upon the facts set forth above, MPV believes and contends that Kokusai's knowing and intentional pre-suit and post-suit continuance of its unjustified, clear, and inexcusable infringement of the '345 patent since receiving notice (see above) of its infringement of the '345 patent, is willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful and flagrant, and that it constitutes egregious misconduct worthy of a finding of willful infringement. Accordingly, since at least July 2019, Kokusai has willfully infringed the '345 patent.

175. Further, since at least July 2019, Kokusai has actively induced the direct infringement of customers and/or end users, including by providing the '345 Infringing Instrumentalities and instructions/specifications for their use, and including with the intent that such direct infringement occur.

176. The '345 Infringing Instrumentalities clearly meet the asserted claim limitations in

their normal and expected usage. On information and belief, normal and expected usage of the '345 Infringing Instrumentalities by customers and/or end users satisfies the claim limitations for direct infringement. Further, at minimum, the provision of products clearly capable of such infringing usage and/or provision of instructions/specifications for such infringing usage constitutes inducement of directly infringing usage.

177. Further, as noted above, Kokusai was made aware of infringement of the '345 patent through use of the '345 Infringing Instrumentalities, including via an infringement chart, at least in July 2019. Such direct and induced infringement has been and remains clear, unmistakable and inexcusable. On information and belief, Kokusai knew or should have known of the clear, unmistakable and inexcusable direct and induced infringing conduct at least as early as July 2019. Thus, on information and belief, Kokusai has, since at least July 2019, specifically intended to induce direct infringement by customers and/or end users.

178. Kokusai's acts of direct, indirect and willful infringement of the '345 patent have caused damage to MPV, and MPV is entitled to recover damages sustained as a result of Kokusai's wrongful acts in an amount subject to proof at trial.

COUNT 4 – INFRINGEMENT OF U.S. PATENT NO. 9,013,604

179. The application for U.S. Patent No. 9,013,604 (the "'604 patent") was filed on December 27, 2013, and the patent issued on April 21, 2015. This application is also a continuation of Continuation of application No. 13/110,056, filed on May 18, 2011, which is now the '746 patent noted above.

180. At the time of the '604 priority application, managing digital video content could be a difficult task. Videos were often represented visually with a thumbnail image of the first frame of the video. This may not provide much insight into the content of the video. Determining if a specific event is contained in a given video often required viewing the entire video. For a lengthy

video, a user may prefer to be able to get a quick summary of the video without having to view the video in its entirety.

181. Digital videos also presented practical problems from a sharing perspective. Many digital capture devices recorded video at 30 or 60 frames per second, at spatial resolutions as high as 1920x1080 pixels. Even when compressed, the amount of data generated could make it impractical to share even relatively short videos.

182. Video editing software could be used to manually summarize a video into a shorter version that can be shared more easily. Manual video editing could be a lengthy, laborious process, however, and many users were not interested in manual editing.

183. Automatic video summarization algorithms existed as well. However, they were very complex, however, as it was necessary to decode the video to perform the analysis required to determine the video summary. Thus it was not possible on a digital capture device to immediately view a video summary corresponding to a just-captured video. This shortcoming made it difficult to facilitate quick review and sharing of captured videos.

184. When creating a video summary, it was often desirable to have a specific feature within the summary. The video summary was created to contain some or all of the video content in which a feature is present. Examples of such features can include people, pets, events, locations, activities or objects. Manually creating such a tailored video summary could be a tedious process. Using desktop software to generate such a tailored video summary prevented the ability to quickly review and share video summaries.

185. It was thus desirable to provide systems and methods for computing a video summary in a digital capture device. In particular, it was desirable to provide solutions that allow a video summary to be generated on a digital capture device with minimal delay at the completion of video capture. Also, it would be desirable to provide a video summary that contains a user-

specified feature.

186. During prosecution of the parent ’604 patent, the primary prior art reference, and the benchmark for conventional prior art, was U.S. Published Patent Application No. 2011/0085778 to Iwase, *et al*. However, Iwase only discloses a single video image to which the index information functions as an index to be added to the exciting scene or the favorite scene in the video image. Among other things, Iwase does not disclose receiving a designation regarding a reference image containing a particular person, analyzing image frames to identify a subset of the image frames that contain the particular person, and forming/storing a summary including at least part of the identified subset of image frames containing the particular person.

187. The foregoing noted shortcoming and other shortcomings in conventional prior art were solved by the unconventional and inventive methods of the ‘604 claimed inventions, which comprise receiving a designation regarding a reference image containing a particular person, analyzing image frames to identify a subset of the image frames that contain the particular person, and forming/storing a summary including at least part of the identified subset of image frames containing the particular person.

188. Juxtaposing the ‘604 claimed inventions against the inferior, conventional state of the art illustrates in part the unconventionality and inventiveness of the ‘604 claimed inventions.

189. The inventive features of ‘604 claimed inventions have multiple inventive advantages over conventional prior art, including with respect to overcoming the shortcomings noted above.

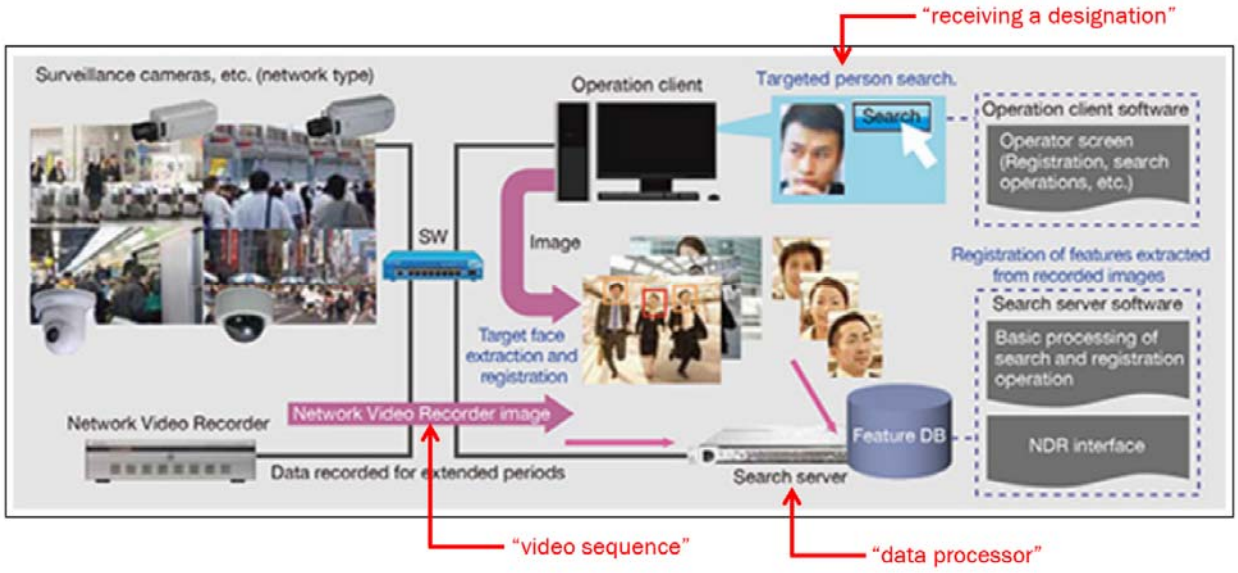
190. Claim 1 of the ‘604 patent covers: “[a] method comprising: receiving a designation regarding a reference image, wherein the reference image contains a particular person; analyzing, using a processing system, image frames to identify a subset of the image frames that contain the particular person; forming, using the processing system, a summary including fewer than all of the

image frames, wherein the summary includes at least part of the identified subset of image frames containing the particular person; and storing the summary in storage memory as a separate summary file."

191. At least claim 1 of the '604 patent is infringed by Kokusai, including under 35 U.S.C. §271(a)-(b), at least by using Similar Face Search technology and/or Live Face Matching technology (the "'604 Infringing Instrumentalities"), and/or by inducing the use of the 604 Infringing Instrumentalities. Without limitation, sale, importation and/or use of the '604 Infringing Instrumentalities has comprised and/or has previously induced the steps noted below.

192. The '604 Infringing Instrumentalities comprise receiving a designation regarding a reference image (*e.g.*, receiving a request including an image), wherein the reference image contains a particular person (*e.g.*, a person of interest). Without limitation, *see*, *e.g.*, http://www.hitachi-kokusai.co.jp/global/en/products/camera/network/sfs/index.html; http://www.hitachi.us/products/for-government/security-products.

193. The '604 Infringing Instrumentalities comprise analyzing, using a processing system (e.g., a processor), image frames to identify a subset of the image frames (i.e., those frames in the video) that contain the particular person. Without limitation, *see*, *e.g.*, http://www.hitachi-kokusai.co.jp/global/en/products/camera/network/sfs/index.html:



194. The '604 Infringing Instrumentalities comprise forming, using the processing system, a summary including fewer than all of the image frames (*e.g.*, extracting a short sequence of video frames), wherein the summary includes at least part of the identified subset of image frames including the particular person (e.g., includes a short sequence of those frames containing the person of interest). Without limitation, *see, e.g.*, http://www.hitachi-kokusai.co.jp/global/en/products/camera/network/sfs/index.html:

	Name	Description
1	Live/Rec. video panel	Displays live or recorded video from a registered camera and video from an external movie file.
2	Search image panel	Displays a search target image (search key image). Allows a user to select or de-select the face of a targeted person.
3	Search result panel	Displays video thumbnails of the search results

195. The '604 Infringing Instrumentalities comprise storing the summary in storage memory (*e.g.*, a database) as a separate summary file. Without limitation, *see, e.g.*,

http://www.hitachi-kokusai.co.jp/global/en/products/camera/network/sfs/index.html.

196. Kokusai's acts of infringement of the '604 patent have been willful and intentional under the standard of *Halo*. Kokusai was made aware of its infringement of the '604 patent, including via an infringement chart, at least in July 2019. Kokusai's infringement has been and remains clear, unmistakable and inexcusable. On information and belief, Kokusai knew or should have known of its clear, unmistakable and inexcusable infringing conduct at least as early as July 2019.

197. Including based upon the facts set forth above, MPV believes and contends that Kokusai's knowing and intentional pre-suit and post-suit continuance of its unjustified, clear, and inexcusable infringement of the '604 patent since receiving notice (see above) of its infringement of the '604 patent, is willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful and flagrant, and that it constitutes egregious misconduct worthy of a finding of willful infringement. Accordingly, since at least July 2019, Kokusai has willfully infringed the '604 patent.

198. Further, since at least July 2019, Kokusai has actively induced the direct infringement of customers and/or end users, including by providing the '604 Infringing Instrumentalities and instructions/specifications for their use, and including with the intent that such direct infringement occur.

199. The '604 Infringing Instrumentalities clearly meet the asserted claim limitations in their normal and expected usage. On information and belief, normal and expected usage of the '604 Infringing Instrumentalities by customers and/or end users satisfies the claim limitations for direct infringement. Further, at minimum, the provision of products clearly capable of such infringing usage and/or provision of instructions/specifications for such infringing usage constitutes inducement of directly infringing usage.

200. Further, as noted above, Kokusai was made aware of infringement of the '604

patent through use of the '604 Infringing Instrumentalities, including via an infringement chart, at least in July 2019. Such direct and induced infringement has been and remains clear, unmistakable and inexcusable. On information and belief, Kokusai knew or should have known of the clear, unmistakable and inexcusable direct and induced infringing conduct at least as early as July 2019. Thus, on information and belief, Kokusai has, since at least July 2019, specifically intended to induce direct infringement by customers and/or end users.

201. Kokusai's acts of direct, indirect and willful infringement of the '604 patent have caused damage to MPV, and MPV is entitled to recover damages sustained as a result of Kokusai's wrongful acts in an amount subject to proof at trial.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff hereby respectfully requests that this Court enter judgment in favor of Plaintiff and against Defendant Kokusai, and that the Court grant Plaintiff the following relief:

A. An adjudication that one or more claims of the Patents-in-Suit has been directly and/or indirectly infringed by Defendant as noted above;

B. An award to Plaintiff of damages adequate to compensate Plaintiff for Defendant's past infringement, together with pre-judgment and post-judgment interest, and any continuing or future infringement through the date such judgment is entered, including interest, costs, expenses, and an accounting of all infringing acts including, but not limited to, those acts not presented at trial;

C. A grant of preliminary and permanent injunction pursuant to 35 U.S.C. § 283, enjoining Defendant and all persons, including their officers, directors, agents, servants, affiliates, employees, divisions, branches, subsidiaries, parents, and all others acting in active concert or participation therewith, from making, using, offering to sell, or selling in the United

States or importing into the United States any methods, systems, or computer readable media that directly or indirectly infringe any claim of the Patents-in-Suit, or any methods, systems, or computer readable media that are colorably different;

D. That this Court declare this to be an exceptional case and award Plaintiff reasonable attorneys' fees and costs in accordance with 35 U.S.C. § 285; and

E. A judgment and order requiring Defendant to pay Plaintiff its damages, costs, expenses, fees, and prejudgment and post-judgment interest for Defendant's infringement of the Patents-in-Suit as provided under 35 U.S.C. §§ 284 and/or 285; and

F. Any and all further relief for which Plaintiff may show itself justly entitled that this Court deems just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Plaintiff hereby respectfully requests a trial by jury of any issues so triable by right.

November 30, 2020

Respectfully submitted,

/s/ *John J. Edmonds*

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CERTIFICATE OF SERVICE

I hereby certify that all counsel of record who are deemed to have consented to electronic service are being served with a copy of this document via the Court's CM/ECF system per Local Rule CV-5(a)(3). Any other counsel of record will be served by electronic mail, facsimile transmission and/or first class mail on this same date.

November 30, 2020

/s/ *John J. Edmonds*
John J. Edmonds