DECLARATION OF NABIL J. SARHAN, PH.D.,
UNDER 37 C.F.R. § 42.100 REGARDING
U.S. PATENT NOS. 7,593,034; 8,692,882; 9,485,471; AND 9,912,914

Declaration

I declare that all statements made herein on my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Date: July 22, 2024 By: _____

Nabil J. Sarhan, Ph.D.

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I, Nabil Sarhan, do hereby declare:

1. I am making this declaration at the request of Motorola Solutions, Inc. ("Motorola") and Watchguard Video, Inc. ("Watchguard") in the matter of the *Inter Partes* Reviews ("IPRs") of U.S. Patent Nos. 7,593,034 (the '034 patent); 8,692,882 (the '882 patent); 9,485,471 (the '471 patent); and 9,912,914 (the '914 patent).

2. I am being compensated for my work in this matter at my standard hourly rate of $390 for such consulting services. My compensation in no way depends on the outcome of this proceeding.

I. Qualifications

1. My qualifications generally are set forth in my *curriculum vitae*, which is submitted as Appendix A. All appendices cited herein are found in Exhibit 1041.

2. I received my Ph.D. and M.S. degrees in Computer Science and Engineering from the Pennsylvania State University (Penn State) in 2003 and a B.S. degree in Electrical Engineering from Jordan University of Science and Technology in 1995. Both my M.S. thesis and Ph.D. dissertation considered the design of computer systems for supporting multimedia. In particular, my Ph.D. dissertation dealt with the design of high-bandwidth I/O systems for multimedia applications, specifically video streaming. In this dissertation, titled "On the design of scalable and high-performance multimedia servers", I proposed new methods to design multimedia systems in a way that maximizes the number of users that can stream videos at the same time.

3. I am an Associate Professor of Electrical and Computer Engineering (ECE) at Wayne State University and the Director of Wayne State Computer Systems and Deep Learning Research Laboratory, formerly known as the Multimedia Systems and Networking Lab Research Lab. I am the Coordinator of the Interdisciplinary College of Engineering M.S. in AI Program and the Director of the Hardware and System Track. I served as the Graduate Program Director of Electrical and Computer Engineering and the Chair of the College of Engineering Faculty Assembly. I also served as the Director of the Wayne State Multimedia Computing and Networking Research Laboratory in the ECE department for approximately fifteen years. I am chairing the Computer Engineering Area in the ECE department, and I regularly teach undergraduate and graduate courses in computer architecture and computer networks and supervise Ph.D. and M.S. students.

4. I have been regularly teaching the senior-level Computer Architecture course (previously called Computer Organization and Design) since 2003. The course covers microprocessor design, memory hierarchy, and I/O. I have also been teaching the Computer Networks and Network Programming course, which includes coverage of all network layers (including the physical layer) and different network protocols. Additionally, I taught multiple times the Advanced Computer Architecture course, which focuses on the design of parallel computer systems and covers microprocessor design, memory hierarchy, and I/O. I have recently developed a new mandatory course titled “Object-Oriented Programming for Electrical and Computer Engineering” and

led the efforts to modernize the Introduction to Microcomputers course and lab by using ARM-based microcontrollers and the instruction set. Additionally, I taught the following advanced graduate courses: Scalable and Secure Internet Services and Architectures, Special Topics on Multimedia, Special Topics on Multimedia Networking, and Special Topics on Multimedia Systems and Networks. Furthermore, I taught the following undergraduate courses: "Microcomputer Systems and Programming", and "Microprocessor Interfacing Lab".

5. I am an internationally recognized expert on computer systems, particularly those for multimedia applications.

6. I supervised eight Ph.D. dissertations and four master theses related to computer systems. Seven of these Ph.D. dissertations and all four M.S. theses were focused on multimedia systems, with research areas including video streaming and automated video surveillance. Additionally, I am currently supervising three Ph.D. dissertations in computer systems. Furthermore, I served on 25 other Ph.D. dissertation committees and 10 other M.S. thesis committees.

7. I authored more than 55 refereed papers, including those in top journals and conferences in various areas including computer systems, multimedia, networking, deep learning, and I/O. I was awarded (with a collaborator) a grant from the National Science Foundation (NSF) to develop a reconfigurable hardware accelerator chip and system for deep learning and artificial intelligence. The project includes the design of inference-engine chips that are interconnected through PCI Express to build a scalable

system supporting large neural models. Three of my other research projects were also sponsored by the NSF. One of these projects was on video streaming while another was on the design of a video camera security system, specifically an automated video surveillance system, for automatic detection of threats, utilizing cross-layer optimization. Another NSF-sponsored project was on reconfigurable high-performance cluster computing and medical engineering applications. Other research projects were sponsored by Silicon Mechanics and Sun Microsystems. These projects include "High Performance Computing Cluster" and "Sun's Center of Excellence in Open Source Computing and Applications". I published a book chapter: "Streaming Multimedia", The Handbook of Computer Networks, John Wiley & Sons, Inc., November 2007.

8. I am the named inventor on U.S. Patent No. 9,313,463 related to the design of automated video surveillance systems. The system optimally controls a plurality of security cameras to achieve the best threat detection accuracy.

9. I served as the Chair of *the Interest Group on Media Streaming* of the Institute of Electrical and Electronics Engineering (IEEE) Multimedia Communication Technical Committee and as the Co-Director of the IEEE Multimedia Communication Technical Committee Review Board. I have been an Editor of the ERTI journal since 2017. I served as an Associate Editor of the IEEE Transactions on Circuits and Systems for Video Technology. I served as a Guest Editor and Reviewer for prestigious journals and magazines. I have been involved in the organization of numerous international

conferences in various capacities, including General Chair, Chair, Technical Program Committee Co-Chair, Publicity Chair, Track Chair, Session Chair, and Technical Program Committee Member. For example, I served as Co-Chair of the Technical Program Committee of ACM SIGMM Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV) in 2018. I participated as a Panelist in major international conferences.

10. I served as a Panelist for the National Science Foundation and the National Institute of Health and as a Site Review Panelist for the Natural Sciences and Engineering Research Council of Canada.

11. I have been extensively involved in internal and international educational reform, review, and accreditation activities. I also served as an external expert in reviewing and reforming computer science and computer engineering programs and courses. I served as the chair of more than 20 international panels and as a member of seven international panels for the review and accreditation of institutions and undergraduate and graduate programs, including "electrical engineering", "electrical and computer engineering", "software engineering", "computer and network engineering", "computer science", and "information technology". I am also a Program Evaluator for ABET Accreditation Board for Engineering and Technology.

12. I received the IEEE SEM Outstanding Professional of the Year Award, the Wayne State University President's Award for Excellence in Teaching, and the

College of Engineering Excellence in Teaching Award. I was elevated to a Senior Member of the Institute of Electrical and Electronics Engineering (IEEE) in 2016.

13. I have recently been inducted into the *WSU Academy of Teachers* for having "a significant impact on the WSU undergraduate learning experience", practicing "innovative pedagogy", and demonstrating "instructional excellence."

II. Relevant Legal Standards

14. I have been asked to provide my opinion as to whether the claims of the '034, '882, '471, and '914 patents would have been obvious to a person of ordinary skill in the art at the time of the invention, in view of the prior art.

15. I am an engineer by training and profession. The opinions I am expressing in this declaration involve the application of my knowledge and experience to the evaluation of certain prior art with respect to the '034, '882, '471, and '914 patents. My formal knowledge of patent law is no different than that of any lay person. Therefore, I have requested the attorneys from Jones Day, who represent Motorola and Watchguard, to provide me with guidance as to the applicable patent law in this matter. The paragraphs below express my understanding of how I must apply current principles related to patent validity to my analysis.

16. It is my understanding that in determining whether a patent claim is obvious in view of the prior art, the Patent Office must apply the *Phillips* standard to construe the claim by giving the claim its plain and ordinary meaning, consistent with the specification and prosecution history. For the purposes of this review, I have

construed each claim term in accordance with its plain and ordinary meaning under the *Phillips* standard, unless otherwise indicated.

17. It is my understanding that a claim is unpatentable under 35 U.S.C. § 103 if the claimed subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time of the invention. I understand that a person of ordinary skill in the art is a person with a level of experience, education, or training generally possessed by those individuals who work in the area or field of the invention at the time of the invention. A person of ordinary skill is also a person of ordinary creativity that can use common sense to solve problems. I also understand that an obviousness analysis takes into account the scope and content of the prior art, the differences between the claimed subject matter and the prior art, and the level of ordinary skill in the art at the time of the invention.

18. In determining the scope and content of the prior art, it is my understanding that a reference is considered analogous prior art if it falls within the field of the inventor's endeavor. In addition, a reference is analogous prior art if it is reasonably pertinent to the particular problem with which the inventor was involved. A reference is reasonably pertinent if it logically would have commended itself to an inventor's attention in considering his problem. If a reference relates to the same problem as the claimed invention, that supports use of the reference as prior art in an obviousness analysis.

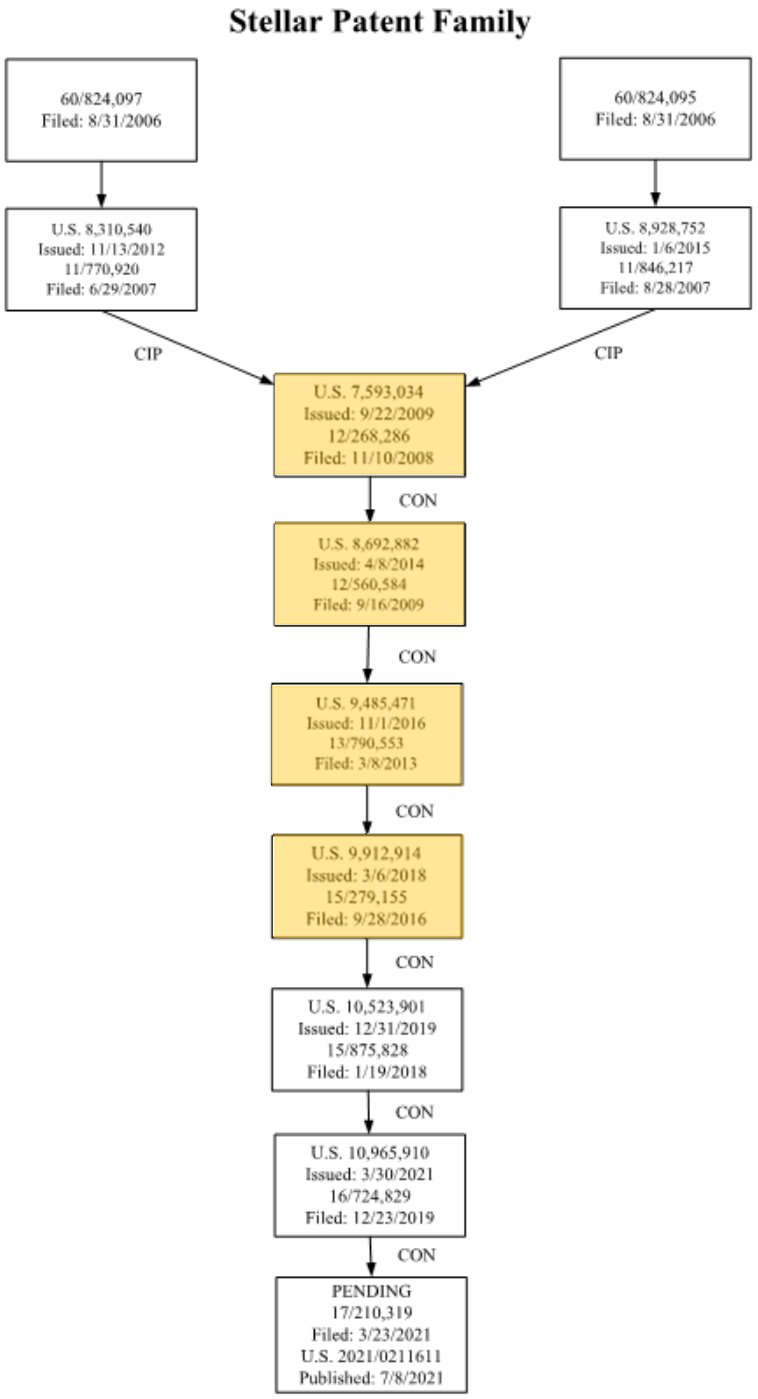
19. To assess the differences between prior art and the claimed subject matter, it is my understanding that 35 U.S.C. § 103 requires the claimed invention to be considered as a whole. This "as a whole" assessment requires showing that one of ordinary skill in the art at the time of invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the elements from the prior art and combined them in the claimed manner.

20. It is my further understanding that the Supreme Court has recognized several rationales for combining references or modifying a reference to show obviousness of claimed subject matter. Some of these rationales include: combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; a predictable use of prior art elements according to their established functions; applying a known technique to a known device (method or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; and some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill in the art to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention. As part of an obviousness analysis, I understand that I am to consider whether a reason existed at the relevant time that would have motivated a person of ordinary skill in the art in the relevant field to combine the known elements in the way the claimed invention does. The reason could come from the prior art, the background

knowledge of one of ordinary skill in the art, the nature of the problem to be solved, market demand, or common sense, for instance.

III. Person Of Ordinary Skill In The Art

21. It is my understanding that when interpreting the claims of the ’034, ’882, ’471, and ’914 patents, I must do so based on the perspective of one of ordinary skill in the art (a “POSITA”) as of the relevant priority date. I understand that the ’034, ’882, ’471, and ’914 patents are part of a patent family assigned to the Patent Owner:



22. As indicated above, it is my understanding that the ’034, ’882, ’471, and ’914 patents are related to each other as continuation applications, meaning that these patents share a common specification. The earliest-filed of these four patent applications was the application for the ’034 patent filed on November 10, 2008. As

indicated above, it is my understanding that the ’034 patent claims priority as a continuation-in-part to two (2) previous applications filed in 2007: (i) App. No. 11/770,920 (the ’920 application), filed June 29, 2007, issued as U.S. Patent No. 8,310,540, and (ii) App. No. 11/846,217 (the ’217 application), filed August 28, 2007, issued as U.S. Patent No. 8,928,752. The ’920 application claims priority to U.S. Provisional App. No. 60/824,097, filed on August 31, 2006. The ’217 application claims priority to U.S. Provisional App. No. 60/824,095, filed on August 31, 2006.

23. For the purposes of this IPR proceeding, I have been asked to apply June 29, 2007, as the priority date for the challenged claims of the ’034, ’882, ’471, and ’914 patents.

24. In my opinion, a person of ordinary skill in the art for the ’034, ’882, ’471, and ’914 patents as of June 29, 2007 would have been a person having at least a Bachelor’s Degree in electrical engineering, computer science, or computer engineering, or undergraduate training in an equivalent field and at least two years of relevant experience in electronics technology. Additional graduate education could substitute for professional experience, and significant work experience could substitute for formal education.

25. Further, I note that my opinion on the level of skill of the POSITA is the same for the other, later priority dates to which the ’034, ’882, ’471, and ’914 patents could potentially be entitled: the August 28, 2007 filing date of the ’217 application, and the November 10, 2008 filing date of the ’034 patent application. On all of these

dates, it is my opinion that the POSITA would have been a person having at least a Bachelor's Degree in electrical engineering, computer science, or computer engineering, or undergraduate training in an equivalent field and at least two years of relevant experience in electronics technology. Additional graduate education could substitute for professional experience, and significant work experience could substitute for formal education.

26. As described in detail above in the "Qualifications" section, my own training and experience exceeded that of one of ordinary skill in the art at the assumed priority date of June 29, 2007.

IV. Technology Background

A. Introduction

27. The '034, '882, '471, and '914 patents are directed generally to "video camera recording technology" (*see*, *e.g.*, '034 patent at 1:19-20), and more specifically to systems and apparatuses that "continuously record[] imaged data from a camera into a circular buffer in a local memory." *Id.* at Abstract. "The circular buffer is preferably organized into a series of memory segments that loops back on itself." *Id.* at 2:21-24. Receipt of a "record signal" causes "a segment of the circular buffer to be write-protected to prevent that segment from being overwritten during the next recording loop." *Id.* at Abstract, 4:34-37. "Part of the write-protected portion could be a pre-recorded subset that is recorded before the signal is received, while part of the write-protected portion could be a post-recorded subset that is recorded after the signal is

received." *Id.* at 2:38-41. In embodiments, "the entire circular buffer is treated and stored as a single file," and "the write-protected portions are preferably stored as separate files in the [circular buffer]. *Id.* at 2:45-48, 6:3-7. Further, in embodiments, write-protected portions are "sent to a remote memory via a wireless connection to free up local memory for future recording sessions." *Id.* at Abstract.

28. As I explain in the sections that follow, all of these concepts described in the '034, '882, '471, and '914 patents were known in the art at the time of the purported invention. I reach this conclusion based on Applicant's own admissions and the prior-art teachings described below. More specifically, I provide below a summary of the state of the art as understood as of the assumed priority date for the '034, '882, '471, and '914 patents for the general subject matter of these patents. The information discussed below informed the background knowledge of a person of ordinary skill in the art at the time the '034, '882, '471, and '914 patents were filed, which I understand may be relevant in determining whether and how to combine references to achieve the claimed inventions.

B. State Of The Art And Admitted Prior Art

29. In the patents of the Stellar patent family, the inventors made admissions regarding the state of the art and admitted prior art. I note some of these admissions in the sections that follow. Applicant also made admissions in prosecuting the patents of the Stellar family, and these are likewise detailed below.

1. Admissions In The Stellar Patents

a) The ’920 Application (U.S. Patent No. 8,310,540)

30. The ’540 patent specification states that “[t]he field of the invention is in digital recording.” ’540 patent at 1:9. Before describing the alleged invention, the ’540 patent specification provides a description of the admitted state of the prior art in the following “BACKGROUND”:

> Conventional camcorders use a variety of disk formats such as digital video cassettes, mini-DV cassettes and DVD-R discs that offer a limited amount of memory to store data. One of the major shortcomings of the existing camcorder technology is that the memory runs out too soon. How many times does one hear, “I have no tape left” while recording? Once a portion of the memory has been recorded, there is less memory available for further recording. Then when the memory is full, users have to return to their home/work computer or media station to transfer the recorded data from the camera to free up the memory. This creates inconvenience and inflexibility for recording on the go.
>
> One solution is the technology of loop recording in which the camera is constantly recording. When it reaches the end of the memory it records from the beginning, erasing the earliest recorded data. Such technology is often employed with surveillance cameras for long and continuous recording without much or any supervision. However, the problem with such loop recording is that it will not distinguish or differentiate any data that is of importance. The user then will have to transfer the interested data to another storage media by stopping the recording and storing the

interested data onto another medium, or risk having the interested data be recorded over during loop recording.

Many surveillance recordings employ larger memory units to solve this problem. This then creates unnecessary long recordings that are not relevant or present any interest to the user. The portions of the interested data not only take up available memory for further recording but the entire loop has to be reviewed in order to select the most relevant portion. Again, this creates inconvenience and inflexibility for recording on the go.

Furthermore, users of the surveillance camera are not able to edit a given potion on the fly without stopping and replaying the image. The user must focus his or her attention on the viewfinder or display screen to keep the subject properly framed. This seriously hinders the operator's live enjoyment of the event being recorded since their attention is on the recording device and is not immersed in the sights and sounds of the event.

Id. at 1:13-52. The '540 patent alleges "there is still a need for a camera that provides better recording and editing functions." *Id*. at 1:53-54.

b) The '217 Application (U.S. Patent No. 8,928,752)

31. The '752 patent specification states that "[t]he field of the invention is surveillance cameras." '752 patent at 1:9. Before describing the alleged invention, the '752 patent specification provides a description of the admitted state of the prior art in the following "BACKGROUND":

It is often desirable to record an unexpected event (automobile accident, baseball hit, quick kiss, facial expression, etc.), but by the time someone

pulls out a camera and focuses on the target, the moment is gone. This problem has long been addressed in the surveillance industry by recording continuously for long periods of time. It is not unusual, for example, for banks or other secure facilities to capture and maintain day after day of surveillance tapes. The downside, of course, is that continuous recordings are costly in terms of equipment, storage, bulkiness, and so forth. Moreover, continuous recording is especially unsuitable for small recording devices such as those carried on eyeglasses.

U.S. Pat. No. 6,163,338 to Johnson et al. (December 2000) focused on the problem of filming automobile accidents. Instead of trying to record millions of frames over long periods of time, Johnson tried to solve the problem by continuously storing the most recent images in a small looping (circular) memory. Upon actuation of a trigger, the system protects the most recently used portion of the memory, and overwrites an older portion. Thus, upon receiving a trigger signal from an accident, a 30 second memory might end up storing 20 seconds before and 10 seconds after the accident.

A looping memory of a device according to Johnson is depicted in prior art FIG. 1. There a small looping memory 11 records frames or other data from a data stream "A". Each character initiates a small time period, perhaps five seconds, with the "|" character designating the current writing position. When the memory finishes writing to the last position, it returns to the first position and over-writes previously stored data. Upon receipt of a start signal (such as by actuation of a trigger), the memory continues looping for some period of time (corresponding to perhaps a third of the

memory capacity), and then stops recording altogether. The recorded memory is protected until it is offloaded or reset.

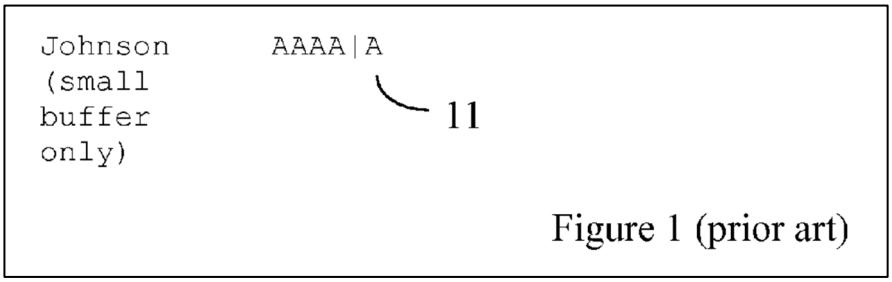
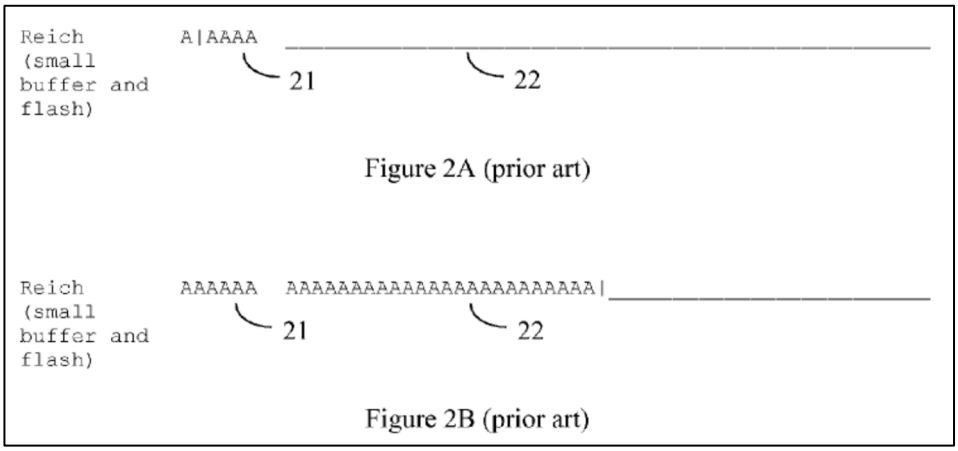


Figure 1 (prior art)

US 2004/0033058 to Reich et al. (publ. February 2004) contemplates an improvement that tries to solve that problem by using two different memories, a small (900 frame) looping buffer and a larger flash memory. In Reich, the trigger signal (record button) causes the buffer to be completely filled, and then additional images to be written to the flash memory until a stop button is pushed.

The Reich system is depicted in prior art FIGS. 2A-2B. In FIG. 2A, a small looping buffer 21 records data from data stream "A", with the current position marked with "|". The "_" character is used to initiate memory that has not been used, or has been used but has been marked for overwriting. In FIG. 2B, a start signal has been received, and the system responded by filling the buffer, and then starting to fill a flash memory 22. Regardless of whether the flash memory is eventually filled, both the buffer 21 and the flash memory 22 are effectively locked (protected) upon receipt of a stop signal.



Id. at 1:13-2:4; FIGS. 1, 2A-2B.

32. The ’752 specification further describes the purported problem with the prior art Johnson and Reich references as follows:

> From FIGS. 1 and 2A-2B, one can readily appreciate that both Johnson and Reich can accommodate only a single time period. A user cannot record a second event without overwriting or offloading the stored data from a first event. In addition, both Johnson and Reich still contemplate that the looping portion memory should be very small, perhaps 30 seconds or less. Such devices are completely inadequate for storing long pre-start signal images, such as a five or ten minute period prior to a trigger signal.

Id. at 2:5-13.

33. The ’752 patent specification alleges that “there is still a need for improvements in cameras and other surveillance devices that allow recordation of multiple events without overwriting or offloading, and that can include lengthy portions of data streams prior to start signal events.” 2:14-17.

c) The ’034, ’882, ’471, And ’914 Patents

34. The ’034 patent specification (and the ’882, ’471, and ’914 patents, continuations to the ’034 patent) states that “[t]he field of the invention is video camera recording technology.” ’034 patent at 1:19-20. Before describing the alleged invention, the ’752 patent specification provides a description of the admitted state of the prior art in the following “BACKGROUND”:

> Conventional camcorders use a variety of storage formats including digital video cassettes, mini-DV cassettes, or DVD-R discs that offer a limited amount of memory to store data. One of the major shortcomings of the existing camcorder technology is that the memory runs out too soon. Once a portion of the memory has been recorded, there is less memory available for further recording. Then when the memory is full, users have to return to their home/work computer or media station to transfer the recorded data from the camera to free up the memory. This creates inconvenience and inflexibility for recording on the go.
>
> WO 2006/044476 to Vanman describes an electronic camera mounted to a police vehicle with a circular buffer that is constantly recording. When the camera reaches the end of the memory it records from the beginning of memory, erasing the earliest recorded data. Such technology is often employed with surveillance cameras for long and continuous recording with little or no supervision. However, Vanman does not distinguish or differentiate any data that is of importance. To save data in the buffer, the user of the Vanman device needs to transfer important portions of the buffer wirelessly to a central office or physically to a DVD disc, or else risk having the interesting data be recorded over during loop recording.

> Such transfers are processor intensive and may not be possible when the central office is out of range or an empty DVD disc is unavailable.

Id. at 1:24-41. The ’034 patent specification alleges, however, that:

> Vanman does not distinguish or differentiate any data that is of importance. To save data in the buffer, the user of the Vanman device needs to transfer important portions of the buffer wirelessly to a central office or physically to a DVD disc, or else risk having the interesting data be recorded over during loop recording. Such transfers are processor intensive and may not be possible when the central office is out of range or an empty DVD disc is unavailable.

Id. at 1:41-49. The ’034 patent specification further describes the admitted state of the prior art as follows:

> EP 1064783 to Mann describes a camera mountable to a pair of eyeglasses that continuously saves recorded images to a circular buffer in a computer on the user’s waist. When a user wants to save a piece of recorded video, the user must stop recording and offload the data at another location before the user can record again. Mann also discusses streaming the images directly to a wireless memory that may have a larger capacity; however, this means that the camera does not work in the absence of a wireless connection.
>
> U.S. Pat. No. 5,523,799 to Hattori et al. also describes storing data in a memory having an archival portion. However, Hattori fails to address sending data to a remote memory.

Id. at 1:56-67.

35. The ’034 patent specification alleges that “there is still a need for a recording camera that provides better recording and editing functions.” *Id*. at 2:1-2.

2. Admissions In The Stellar Patents’ File Histories

36. During the prosecution of U.S. Patent Application No. 12/268,286, the applicant made additional admissions regarding the state of the art and certain prior art references. In an Accelerated Examination Support Document submitted to the USPTO on November 10, 2008, the applicant identified “the references most closely related” as WO 2006/044476 (Vanman), EP 1,064,783 (Mann), and US 5,523,799 (Hattori). EX1013, 84-93. The applicant provided tables admitting that these prior art references disclosed many of the claim limitations (*id.*):

The Limitation that is disclosed	WO 6,044,476 to Vanman	EP 1,064,783 to Mann	US 5,523,799 to Hattori
1	x	x	x
2	x	x	x
3	x	x	X
4		x	x
5	x		
6	x	x	x
7			x
8	x	x	x
9			
10	x	x	
11	x	x	
12	x		
13	x		
14	x	x	
15	x		

Limitation 1 - a surveillance apparatus

Limitation 2 - a camera that has an image capturing component that captures images

Limitation 3 - a camera that has a converting component that converts the images into at least one data stream

Limitation 4 - a local memory functionally connected to the camera

Limitation 5 - a wireless transmitter functionally connected to the local memory

Limitation 6 - a recording facility that continuously records the data stream into available portions of a circular buffer in the local memory

Limitation 7 - a protecting facility that responds to a signal to record by designating a segment of the circular buffer as a write-protected portion

Limitation 8 - a pre-recorded subset of the segment is recorded before the signal is received

Limitation 9 - a sending facility that uses the transmitter to wirelessly transmit the write-protected portion to a remote memory

Claim 2. The apparatus of claim 1, wherein the pre-recorded subset is at least 5 seconds long.

Limitation 10 - the pre-recorded subset is at least 5 seconds long

Claim 3. The apparatus of claim 1, wherein the recorded segment is at least 10 seconds long.

Limitation 11 - the recorded segment is at least 10 seconds long

Claim 4. The apparatus of claim 1, further comprising a sensor that automatically initiates the signal to record, wherein the sensor operates upon content in at least one of the images captured from the camera.

Limitation 12 - a sensor that automatically initiates the signal to record

Limitation 13 - the sensor operates upon content in at least one of the images captured from the camera

Claim 5. The apparatus of claim 1, further comprising an interface through which a human can initiate the signal.

Limitation 14 - an interface through which a human can initiate the signal

Claim 6. The apparatus of claim 1, further comprising an interface through which a human can designate a length of time of at least one of the pre-recorded subset and the post-recorded segment.

Limitation 15 - an interface through which a human can designate a length of time of the pre-recorded subset

The Limitation that is disclosed	WO 6,044,476 to Vanman	EP 1,064,783 to Mann	US 5,523,799 to Hattori
16	x		
17			
18			
19			
20	x	x	
21		x	
22			
23	x	x	x
24	x	x	x
25	x	x	x
26			x
27	x	x	x
28			
29			
30			
31			
32	x		
33	x	x	
34			
35	x		x
36			
37			
38			
39			

Limitation 16 - an interface through which a human can designate a size of the post-recorded segment

Claim 7. The apparatus of claim 1, wherein the remote memory is located on a mobile phone.

Limitation 17 - the remote memory is located on a mobile phone

Claim 8. The apparatus of claim 1, wherein a mobile phone receives the recorded segment from the wireless transmitter and forwards the recorded segment to the remote memory.

Limitation 18 - a mobile phone receives the recorded segment from the wireless transmitter

Limitation 19 - a mobile phone forwards the recorded segment to the remote memory

Claim 9. The system of claim 1, further comprising a mount for the camera.

Limitation 20 - a mount for the camera

Claim 10. The system of claim 9, wherein the mount is a pair of wearable glasses.

Limitation 21 - the mount is a pair of wearable glasses

Claim 11. The system of claim 1, further comprising an electronic index that references addresses of the write-protected portion.

Limitation 22 - an electronic index that references addresses of the write-protected portion

Claim 12. A method of processing imaged data from a camera, comprising the following steps:

receiving a stream of the imaged data;

recording the stream into available portions of a circular buffer;

responding to a signal by write-protecting a newly recorded portion of the buffer, wherein a subset of the newly recorded portion is recorded before the signal is received

indexing write protected portions of the buffer during the step of recording; and

wirelessly transmitting at least one of the write-protected portions of the circular buffer to a remote memory.

Limitation 23 - a method of processing imaged data from a camera

Limitation 24 - receiving a stream of the imaged data

Limitation 25 - recording the stream into available portions of a circular buffer

Limitation 26 - responding to a signal by write-protecting a newly recorded portion of the buffer

Limitation 27 - a subset of the newly recorded portion is recorded before the signal is received

Limitation 28 - indexing write protected portions of the buffer during the step of recording

Limitation 29 - wirelessly transmitting at least one of the write-protected portions of the circular buffer to a remote memory

The Limitation that is disclosed	WO 6,044,476 to Vanman	EP 1,064,783 to Mann	US 5,523,799 to Hattori
16	x		
17			
18			
19			
20	x	x	
21		x	
22			
23	x	x	x
24	x	x	x
25	x	x	x
26			x
27	x	x	x
28			
29			
30			
31			
32	x		
33	x	x	
34			
35	x		x
36			
37			
38			
39			

Claim 13. The method of claim 12, further comprising storing the write-protected portions as separate files.

Limitation 30 - storing the write-protected portions as separate files

Claim 14. The method of claim 12, further comprising recording the stream into physically dis-contiguous parts of the circular buffer.

Limitation 31 - recording the stream into physically dis-contiguous parts of the circular buffer

Claim 15. The method of claim 12, wherein the signal to save a recording comprises a signal tc start recording and a signal to stop recording.

Limitation 32 - the signal to save a recording comprises a signal to start recording and a signal to stop recording

Claim 16. The method of claim 12, further comprising receiving the signal to save a recording through at least one of a manually operated switch and an audio signal.

Limitation 33 - receiving the signal to save a recording through a manually operated switch

Limitation 34 - receiving the signal to save a recording through an audio signal

Claim 17. The method of claim 12, further comprising configuring the size of the pre-recorded subset.

Limitation 35 - configuring the size of the pre-recorded subset

Claim 18. The method of claim 12, further comprising removing write-protection from a transmitted write-protected portion after transmission.

Limitation 36 - removing write-protection from a transmitted write-protected portion after transmission

Claim 19. The method of claim 12, further comprising sending a warning to a user before the newly recorded portion of the buffer is fully recorded.

Limitation 37 - sending a warning to a user before the newly recorded portion of the buffer is fully recorded

Claim 20. The method of claim 19, further comprising extending a length of the newly recorded portion in response to at least one of a manually operated switch and an audio signal.

Limitation 38 - extending a length of the newly recorded portion in response to a manually operated switch

Limitation 39 - extending a length of the newly recorded portion in response to an audio signal

a) Applicant's Admissions Regarding WO 2006/044476 (Vanman)

37. The applicant described WO 2006/044476 (Vanman) as follows (EX1014, 93-94):

> Vanman teaches a video camera mounted on a police car that continuously records data to a circular buffer on a hard drive, and that can then retroactively save video streams by writing those video streams from the hard drive to a DVD. Vanman also teaches attaching a wireless Ethernet device to the microcontroller to wirelessly transmit encoded audio and video to a central office. Vanman, however, does not teach designating a segment of the circular buffer as a write-protected portion. The entire hard drive is being written to at all times, segments of the circular buffer could be easily overwritten before a video stream is saved to a DVD or a central office.

38. The applicant admitted that WO 2006/044476 (Vanman) discloses many of the claim limitations (*id.*, 94-100):

Claim Limitation	**WO 2006/044476 (Vanman)**
Limitation 1 - a surveillance apparatus	**Satisfied.** Vanman teaches a system that records video and audio. (*See* para [0024])
Limitation 2 - a camera that has an image capturing component that captures images	**Satisfied.** Vanman teaches a system that captures images from a video camera and processes the signal to create a digital video signal. (*See* para [0024])
Limitation 3 - a camera that has a converting component that converts the images into at least one data stream	**Satisfied.** Vanman teaches a system that captures images from a video camera and processes the signal to create a digital video signal. (*See* para [0024])

Claim Limitation	WO 2006/044476 (Vanman)
Limitation 5 - a wireless transmitter functionally connected to the local memory	**Satisfied.** Vanman teaches a wireless Ethernet interface functionally connected to the hard drive. (*See* para [0034] and corresponding Figure 1, elements 80 and 145)
Limitation 6 - a recording facility that continuously records the data stream into available portions of a circular buffer in the local memory	**Satisfied.** Vanman teaches a recording facility that continuously records the data stream into available portions of a circular buffer in the local memory. The entire hard drive of Vanman is an "available portion" that is continuously overwritten. (*See* para [0058])
Limitation 8 - a pre-recorded subset of the segment is recorded before the signal is received	**Satisfied.** Vanman teaches responding to an event by selecting a data stream that was recorded ten minutes prior to the event start point. (*See* para [0040])
Limitation 10 - the pre-recorded subset is at least 5 seconds long	**Satisfied.** Vanman teaches responding to an event by selecting a data stream that was archived ten minutes prior to the event start point. (*See* para [0040])
Limitation 11 - the recorded segment is at least 10 seconds long	**Satisfied.** Vanman teaches responding to an event by selecting a data stream that was archived ten minutes prior to the event start point. (*See* para [0040])
Limitation 12 - a sensor that automatically initiates the signal to record	**Satisfied.** Vanman teaches automatically initiating the signal to record through an event trigger. (*See* para [0039], [0051])
Limitation 13 - the sensor operates upon content in at least one of the images captured from the camera	**Satisfied.** Vanman teaches automatically initiating the signal to record through external emergency lights that are probably captured by the video camera on the squad car. (*See* para [0024], [0051])
Limitation 14 - an interface through which a human can initiate the signal	**Satisfied.** Vanman teaches initiating the signal to record by an operator pressing a RECORD key on a control panel. (*See* para [0051])
Limitation 15 - an interface through which a human can designate a length of time of the pre-recorded subset	**Satisfied.** Vanman teaches a setting in a user-interface menu that can be used to determine how much of the video data stream to include

Claim Limitation	WO 2006/044476 (Vanman)
	before and after the event markers. (*See* para [0052])
Limitation 16 - an interface through which a human can designate a length of time of the post-recorded segment	**Satisfied.** Vanman teaches a setting in a user-interface menu that can be used to determine how much of the video data stream to include before and after the event markers. (*See* para [0052])
Limitation 20 - a mount for the camera	**Satisfied.** Vanman teaches that the camera is mounted on a vehicle. (*See* para [0002][0004], [0065])
Limitation 23 - a method of processing imaged data from a camera	**Satisfied.** Vanman teaches encoding and decoding imaged data from the camera. (*See* para [0024]-[0029])
Limitation 24 - receiving a stream of the imaged data	**Satisfied.** Vanman teaches receiving a data stream of the imaged data. (*See* para [0024] - [0029])
Limitation 25 - recording the stream into available portions of a circular buffer	**Satisfied.** Vanman teaches recording the stream into available portions of a circular buffer. The entire hard drive of Vanman is an "available portion" that is continuously overwritten. (*See* para [0058])
Limitation 27 - a subset of the newly recorded portion is recorded before the signal is received	**Satisfied.** Vanman teaches archiving a data stream that was recorded ten minutes prior to the event start point. (*See* para [0040])
Limitation 32 - the signal to save a recording comprises a signal to start recording and a signal to stop recording	**Satisfied.** Vanman teaches record triggers that act as signals to save a recording with an event to start recording an event to stop recording. (*See* para [0040], [0043], [0054])
Limitation 33 - receiving the signal to save a recording through a manually operated switch	**Satisfied.** Vanman teaches receiving a signal to save a recording through an operator pressing a RECORD key on a control panel. (*See* para [0052])
Limitation 35 - configuring the size of the pre-recorded subset	**Satisfied.** Vanman teaches configuring how much of the video data stream to include before and after the event markers. (*See* para [0052])

b) Applicant's Admissions Regarding EP 1,064,783 (Mann)

39. The applicant described EP 1,064,783 (Mann) as follows (EX1015, 100):

> Mann teaches a portable electronic camera system that is wearable on the body, specifically eyeglasses. The camera has a memory with a circular buffer that is constantly recording, and a user can record data recorded 5 minutes in the past by activating a chording keyboard on the user's belt. The camera can also wirelessly transmit data to a television or a computer device. Mann, however, fails to teach protecting segments of the circular buffer or overwriting only unprotected segments of the circular buffer. When the record function is activated, the camera must either wirelessly transmit the data, or the buffer will be overwritten. Additionally, it appears that the system of Mann has a memory that is wirelessly connected to the camera instead of locally attached to the camera.

40. The applicant admitted that EP 1,064,783 (Mann) discloses many of the claim limitations (*id.*, 100-106):

Claim Limitation	EP 1,064,783 (Mann)
Limitation 1 - a surveillance apparatus	**Satisfied.** Mann teaches a wearable camera. (*See* para [0015], [0017], [0049])
Limitation 2 - a camera that has an image capturing component that captures images	**Satisfied.** Mann teaches recording images and processing digital signals, which implicitly teaches capturing those images with an image capturing component. (*See* para [0015], [0017], [0051]-[0052])
Limitation 3 - a camera that captures images and converts the images into a data stream	**Satisfied.** Mann teaches recording images and processing digital signals, which implicitly teaches converting those images into a data stream. (*See* para [0015], [0017], [0051]-[0052])

Claim Limitation	EP 1,064,783 (Mann)
Limitation 4 - a local memory functionally connected to the camera	**Satisfied.** Mann teaches a storage device on a computer that is functionally connected to the camera. (*See* para [0058], [0065], [0077])
Limitation 6 - a recording facility that continuously records the data stream into available portions of a circular buffer in the local memory	**Satisfied.** Mann teaches a recording facility that continuously records a data stream from the camera into available portions of a circular buffer in the storage device. (*See* para [0058], [0065])
Limitation 8 - a pre-recorded subset of the segment is recorded before the signal is received	**Satisfied.** Mann teaches that the recorded segment contains a recording starting from 5 minutes prior to the time the record button was pressed. (*See* para [0065])
Limitation 10 - the pre-recorded subset is at least 5 seconds long	**Satisfied.** Mann teaches that the pre-recorded subset is 5 minutes long. (*See* para [0065])
Limitation 11 - the recorded segment is at least 10 seconds long	**Satisfied.** Mann teaches Mann teaches that the pre-recorded subset is 5 minutes long. (*See* para [0065])
Limitation 14 - an interface through which a human can initiate the signal	**Satisfied.** Mann teaches an Emacs interface through which a human can initiate the signal to record. (*See* para [0063]-[0065])
Limitation 20 - a mount for the camera	**Satisfied.** Mann teaches that the camera could be mounted on a pair of eyeglasses. (*See* para [0007], [0039], [0047], [0056]-[0060], [0098] and corresponding Figures 1 and 6)
Limitation 21 - the mount is a pair of wearable glasses	**Satisfied.** Mann teaches that the camera could be mounted on a pair of eyeglasses. (*See* para [0007], [0039], [0047], [0056]-[0060], [0098] and corresponding Figures 1 and 6)
Limitation 23 - a method of processing imaged data from a camera	**Satisfied.** Mann teaches recording images and processing digital signals from a camera. (*See* para [0015], [0017], [0051]-[0052])
Limitation 24 - receiving a stream of the imaged data	**Satisfied.** Mann teaches recording images and processing digital signals, which implicitly teaches converting those images into a data stream. (*See* para [0015], [0017], [0051]-[0052])

Claim Limitation	EP 1,064,783 (Mann)
Limitation 25 - recording the stream into available portions of a circular buffer	**Satisfied.** Mann teaches recording the data stream into available portions of a circular buffer. The entire memory of Mann seems to be the circular buffer. (*See* para [0017], [0058], [0065])
Limitation 27 - a subset of the newly recorded portion is recorded before the signal is received	**Satisfied.** Mann teaches that the recorded portion was recorded 5 minutes before the signal to record is received. (*See* para [0065])
Limitation 33 - receiving the signal to save a recording through a manually operated switch	**Satisfied.** Mann teaches that the signal to save a recording is received through a chording keyboard worn on the wearer's waist. (*See* para [0064])

c) Applicant's Admissions Regarding US 5,523,799 (Hattori)

41. The applicant described US 5,523,799 (Hattori) as follows (EX1016, 106):

> Hattori teaches an image memory apparatus that continuously writes new images into a circular buffer. A user can write-protect parts of the circular buffer that has been previously recorded to prevent the device from overwriting those portions of the buffer. Hattori, however, does not teach that there is a wireless transmitter that transmits write-protected portions to a remote memory.

42. The applicant admitted that US 5,523,799 (Hattori) discloses many of the claim limitations; in the applicant's own words (*id.*, 106-112):

Claim Limitation	US 5,523,799 (Hattori)
Limitation 1 - a surveillance apparatus	**Satisfied.** Hattori teaches an apparatus that records images. (*See* C2/L8-50)
Limitation 2 - a camera that has an image capturing component that captures images	**Satisfied.** Hattori teaches a camera that captures images and converts the analog

Claim Limitation	US 5,523,799 (Hattori)
	stream into a digital stream. (*See* C3/L21-31)
Limitation 3 - a camera that has a converting component that converts the images into at least one data stream	**Satisfied.** Hattori teaches a camera that captures images and converts the analog stream into a digital stream. (*See* C3/L21-31)
Limitation 4 - a local memory functionally connected to the camera	**Satisfied.** Hattori teaches a multi-port random access memory functionally connected to the camera. (*See* C3/L26-28 and corresponding Figure 2, element 12)
Limitation 6 - a recording facility that continuously records the data stream into available portions of a circular buffer in the local memory	**Satisfied.** Hattori teaches a recording facility that continuously records the data stream into available portions of a ring memory in the memory. (*See* C3/L57-C4/L11, and corresponding Figures 1 and 2)
Limitation 7 - a protecting facility that responds to a signal to record by designating a segment of the circular buffer as a write-protected portion	**Satisfied.** Hattori teaches a protecting facility that responds to a signal to record by designating a recorded segment of the ring memory as a write-protected portion. (*See* C3/L62-C4/L2)
Limitation 8 - a pre-recorded subset of the segment is recorded before the signal is received	**Satisfied.** Hattori teaches that the segment is recorded before the signal to record is received. (*See* C3/L62-C4/L2)
Limitation 23 - a method of processing imaged data from a camera	**Satisfied.** Hattori teaches a method of processing imaged data from a camera. (*See* C2/L8-50)
Limitation 24 - receiving a stream of the imaged data	**Satisfied.** Hattori teaches receiving a stream of the imaged data. (*See* C3/L21-31)
Limitation 25 - recording the stream into available portions of a circular buffer	**Satisfied.** Hattori teaches recording the data stream into available portions of a ring memory. (*See* C3/L57-C4/L11, and corresponding Figures 1 and 2)
Limitation 26 - responding to a signal by write-protecting a newly recorded portion of the buffer	**Satisfied.** Hattori teaches responding to a signal to protect data by write-

Claim Limitation	US 5,523,799 (Hattori)
	protecting a previously recorded portion of the ring memory. (*See* C3/L62-C4/L2)
Limitation 27 - a subset of the newly recorded portion is recorded before the signal is received	**Satisfied.** Hattori teaches that the protected segment is recorded before the signal to record is received. (*See* C3/L62-C4/L2)
Limitation 35 - configuring the size of the pre-recorded subset	**Satisfied.** Hattori teaches that the size of the memory address area for the ring memory can be arbitrarily set. (*See* C4/L1-2)

d) Other Admissions Made By The Inventors During Prosecution Of The Stellar Patents

43. During the prosecution of U.S. Patent Application No. 12/268,286, the applicant further described the invention being claimed as follows (EX1013, 112):

> The current invention is directed to a method and apparatus for continuously recording image information so that a user can both save recorded segments in the circular buffer and also offload the recorded segments wirelessly to a second memory. This dual utility is very important because while it's preferable to wirelessly offload recorded segments to a second memory location, it's not always feasible to do so when wireless connections are sporadic and inconsistent in certain areas. Therefore, it is very important that when a wireless connection is unavailable that the user of the camera can prevent certain portions of the circular buffer from being overwritten.

44. The applicant further admitted during the prosecution of U.S. Patent Application No. 12/268,286 that a host of claim features and limitations were "not separately patentable" (*id.*, 89-92):

Claim 2 limits the surveillance apparatus of claim 1 to further comprise having a pre-recorded subset that is at least 5 seconds long. This claim is considered to be not separately patentable beyond the limitations contained in the parent claim.

Claim 3 limits the surveillance apparatus of claim 1 to further comprise having a pre-recorded subset that is at least 10 seconds long. This claim is considered to be not separately patentable beyond the limitations contained in the parent claim.

Claim 4 limits the surveillance apparatus of claim 1 to further comprise a sensor that automatically initiates the signal to record that triggers based upon content in one or more images captured from the camera. This claim is considered to be not separately patentable beyond the limitations contained in the parent claim.

Claim 5 limits the surveillance apparatus of claim 1 to further comprise an interface through which a human can initiate the signal. This claim is considered to be not separately patentable beyond the limitations contained in the parent claim.

Claim 6 limits the surveillance apparatus of claim 1 to further comprise an interface through which a person can designate how long either the pre-recorded section is, or the post-recorded segment is. This claim is considered to be not separately patentable beyond the limitations contained in the parent claim.

Claim 9 limits the surveillance apparatus of claim 1 to further comprise a mount for the camera. This claim is considered to be not separately patentable beyond the limitations contained in the parent claim.

Claim 10 limits the surveillance apparatus of claim 9 to further comprise that the mount is a pair of wearable glasses. This claim is considered to be not separately patentable beyond the limitations contained in the parent claim.

Claim 15 limits the method of claim 12 to further comprise that the signal comprises a signal to start recording and a signal to stop recording. This claim is considered to be not separately patentable beyond the limitations contained in the parent claim.

Claim 16 limits the method of claim 12 to further comprise receiving the signal to save a recording through at least one of a manually operated switch and an audio signal. This claim is considered to be not separately patentable beyond the limitations contained in the parent claim.

Claim 17 limits the method of claim 12 to further comprise configuring the size of the pre-recorded subset. This claim is considered to be not separately patentable beyond the limitations contained in the parent claim.

3. Pre-Event Recording Or Record-After-The-Fact Was Well Known In The Art

45. Prior to the alleged invention, it was known in the art to use a ring or circular buffer to record pre-event data such as shown in the following exemplary references:

U.S. 5,996,023 ("Winter") (EX1005), issued November 30, 1999:

The parent patent application discloses an additional strategy, referred to as pre-alarm buffering, which also promotes efficient use of limited

signal storage capacity. The basic concept is that the respective video streams generated by some or all of the cameras connected to the recorder are not usually selected for permanent storage. Instead, a ring buffer is provided to record the signal streams at a given (perhaps shared) field rate for a limited period of time, say one minute. If a significant event is detected, such as tripping of an alarm sensor, actuation of an alarm condition by a human operator, or detection of a predetermined characteristic of an incoming image stream by machine analysis of the image stream, then the video signal stream in the ring buffer, which would normally have been overwritten, is preserved for permanent storage. Pre-alarm buffering represents a desirable compromise which avoids devoting permanent storage capacity to large quantities of uninteresting information, while increasing the likelihood that significant information will be permanently recorded. The present application is concerned with techniques for efficiently managing pre-alarm buffering operations.

Winter at 1:50-2:4.

According to a first aspect of the invention, there is provided a video data storage apparatus, including a plurality of video cameras, each generating a respective stream of video signals; conversion circuitry, connected to the plurality of video signals, for selectively converting the streams of video signals into respective streams of video data signals; a circular data buffer for selectively storing ones of the streams of video data signals subject to overwriting by more current video data signals; a main data store for selectively storing ones of the streams of video signals and for writing the video data signals in the main data store to a removable archive recording medium; a detection circuit for detecting an alarm

condition; and a control circuit for selecting between a first process and a second process different from the first process, on the basis of the alarm condition detected by the detection circuit, the first and second processes both being processes for transferring a stream of video data signals from the circular data buffer to the main data store. According to this aspect of the invention, the circular data buffer and the main data store may respectively include first and second portions of a hard disk drive. Moreover, the first process may include reading the stream of video data signals to be transferred from the circular data buffer and rewriting that stream of video data signals to the main data store, and the second process may include designating the first portion of the hard disk to be a portion of the main data store.

Id. at 2:12-38.

U.S. 2003/0151663 ("Lorenzetti"), attached as Appendix B, published August 14, 2003:

An in-car video apparatus and method is provided where a real time (i.e., "live") continuous video stream supplied by a vehicle-mounted camera is processed for storage in a memory in a time-sequential manner for a pre-set time interval to create a time-delayed video stream. Upon activation by a law enforcement officer (which occurs at an arbitrary reference time), a vehicle-mounted recording device records the time-delayed video stream to create a video recording of the events captured by the video camera. Because the time-delayed video stream is recorded rather than the real time video stream, the start time of the video recording precedes the reference time by the pre-set time interval. The

> invention thus provides an ability to record an event after it has already occurred.

Lorenzetti at [0009].

> The invention provides many advantages. By buffering the real time video and audio streams to create the time-delayed video and audio stream, the officer has a period of time equal to the pre-set time interval to react to a witnessed event, such as a traffic infraction, and activate the video recorder. For example, if the time-delay is six seconds, then the officer is provided with up to six seconds in which to activate the video recorder and still be able to record the witnessed event on videotape. Accordingly, the invention provides a complete record of a police-citizen encounter, including the initial incident, event or behavior that captured the officer's attention in the first place. The odds that evidence supporting probable cause is contained in the videotaped record are thus greatly enhanced.

Lorenzetti at [0012].

46. Furthermore, "the big selling point for digital video is a feature with the mundane name of 'pre-event recording.'" Special Report: The Patrol Video Project, LAW and ORDER, July 2004 at 2 (EX1007).

> Here's your scenario: you are sitting at a traffic light, car in drive and brain in neutral, when the light changes to green for traffic in your lane. You start to move forward when Maladroit Leadfoot blows through the intersection two seconds behind the red light, giving you the one finger salute as he passes by. You shift the lightbar into Christmas Time, go after and catch Maladroit, but wouldn't it be grand if his performance in

the intersection was available for the traffic court judge to see? Well, on reviewing the recording that was initiated when you turned on the lightbar, for example, you find that it begins with 20 seconds or so of dull intersection-watching, when Mr. Leadfoot makes his breathtaking entrance, and your brief pursuit and stop follows. How can this be?

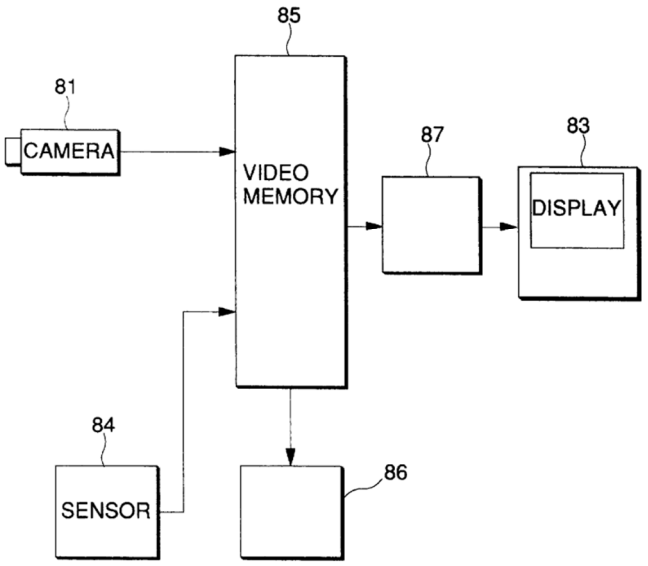
Most of the new digital patrol video systems are in a passive recording mode whenever there is power to the system. The recording is captured by a solid-state memory chip with a capacity of anywhere from 10 seconds to five minutes, depending on the system setting and the manufacturer. This means the last 10 seconds to five minutes is always available to the system.

When the officer puts the system into record mode, the contents of that memory device are dumped to the recording medium, and everything else that follows is appended to the end of that sequence. Thus, any recording made by the officer will actually start 10 to 600 seconds before he commands the system to record. The sudden lane change of the DUI, the suicidal pedestrian who walks out in front of you, the idiot who blows through the red light are all recorded for introduction in court. It's a beautiful thing.

Id.

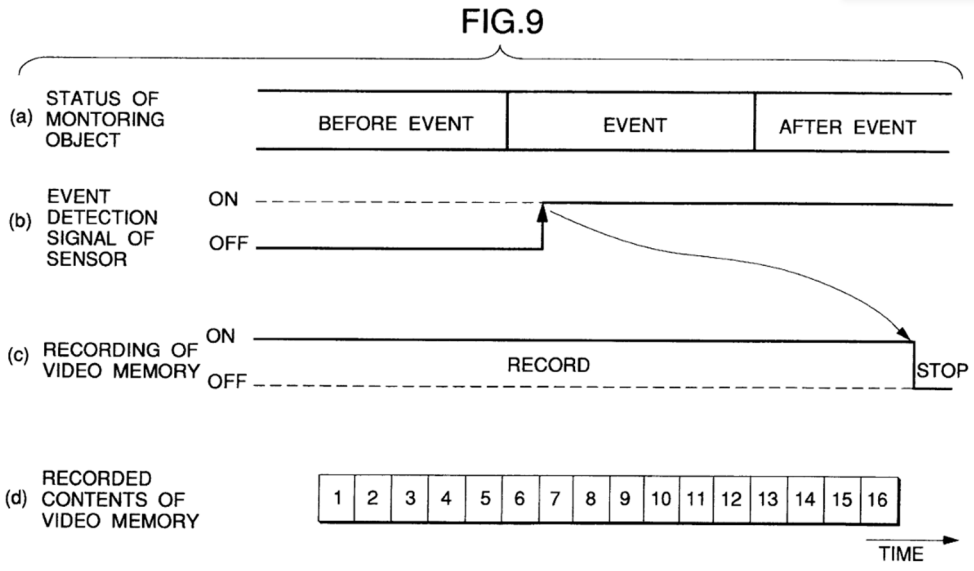
47. Further, U.S. 6,167,186 ("Kawasaki") (EX1008) explains that "FIG. 8 is a block diagram of a video recording device disclosed in JP-A-2-132599." Kawasaki at 1:29-30. "FIG. 9 is a timing chart of the operation of the device." Kawasaki at 1:30-31.

FIG.8



Id. at Fig. 8.

FIG.9



Id. at Fig. 9. "In this video recording device, a video image inputted from a camera is recorded in a video memory 85 and the recording of the video memory 85 is stopped at a timing responding to an input from a sensor 84, and the video image before and after the sensor 84 produces an event detecting signal that can be displayed." *Id*. at 1:31-36.

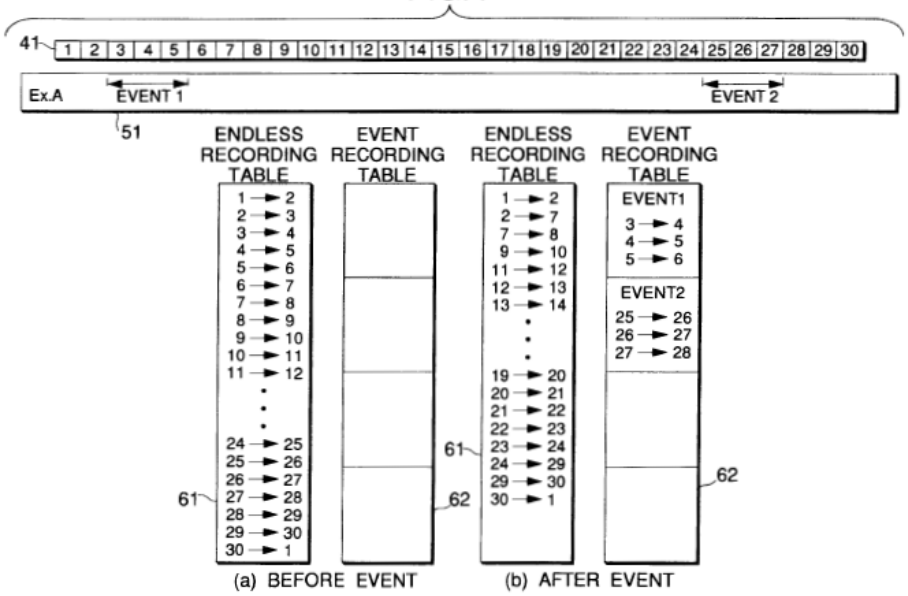
"However, since the recording is stopped in response to the signal from the sensor, when the next events occur successively, the video image before and after the event cannot be stored." *Id*. at 36-39. "Although the device disclosed in JP-A-2-132599 can review the status before and after the event, it cannot deal with another subsequent event since it stops recording during the period." *Id*. at 1:59-62. "The [Kawasaki] invention has been accomplished to solve the above problem and intends to provide a device which can always record the video image inputted in real time and reproduce the image recorded last without stopping the recording." *Id*. at 1:65-2:2. It further discloses "a system which can preserve the video image (recorded event image) before and after the event recorded in the video recording device has occurred, as historical record of video information for a long time." *Id*. at 2:6. Specifically, "[i]n the video recording device, the successive recording control unit records the video data from the temporary memory unit in endless recording mode and in accordance with an external event signal, it excludes a recording area correlated with the event signal from the area subjected to the endless recording so that it is managed as an event recording area." *Id*. at 2:15-21.

> Now referring to FIG. 4. an explanation will be given of a method of the processes of recording and reproducing in the successive recording control unit 6. Reference numeral 41 shows the state where the successive recording unit 5 is divided into a plurality of blocks (30 blocks in this example) labeled block numbers (pointers), respectively. Reference numeral 51 denotes a time zone of events which have occurred during the successive recording. The successive recording control unit 6

includes an endless recording table 61 and an event recording table 62, and manages the numbers of the blocks on which the digital video image is to be recorded as shown in part (a) of FIG. 4. The notation "1-2" in the part (a) represents that the recording block successive to block No. 1 is block No. 2. By provision of such a recording table, the blocks are overwritten in order from the block with an older record.

Id. at 4:30-45.

FIG.4



Id. at Fig. 4. "Next, an explanation will be given of the operation when the successive recording control unit 6 receives an event signal from the event signal inputting unit 7." *Id*. at 4:39-48. "Now it is assumed that the event signal is inputted while the recording is made at the position of block No. 4." *Id*. at 4:48- 50. "In this case, the video image from block No. 3 with a previously recorded image to block No. 6 with a video image after the event will be managed as an event video image." *Id*. at 4:50-53.

> Since the present invention always executes the recording in a manner of endless recording, the video image inclusive of the video image prior to inputting of the event signal can be managed as an event video image. Thus, event No. 1 will be managed on the event recording table as shown in part (b) of FIG. 4. Event No. 2 will be managed similarly. Now if only the event recording table is updated as it is, the event video images are overwritten to disappear at a period of endless recording. For this reason, the endless recording table must be also modified. As shown in the part (b), notation "2-7" represents that the block Nos. 3, 4, 5 and 6 are excluded from the loop of the endless recording. Likewise, notation "24-29" saves the event video image of event No. 2 from the endless recording. In this way, in the endless recording area, the recording area correlated with the event signal will not be thereafter used as an endless recording and not overwritten so that the event video image will be held for a longer period than the endless recording period.

Id. at 4:53-5:4. "Since the event video image when an event occurs needs not to be transferred to a separate area, the access time in the successive recording unit can be efficiently used so that the event video image can be reproduced with a sufficient allowance." *Id*. at 7:4-9.

48. Additionally, U.S. 7,804,426 ("Etcheson"), attached as Appendix C, disclosed a "System and method for selective review of event data" including "pre-event data":

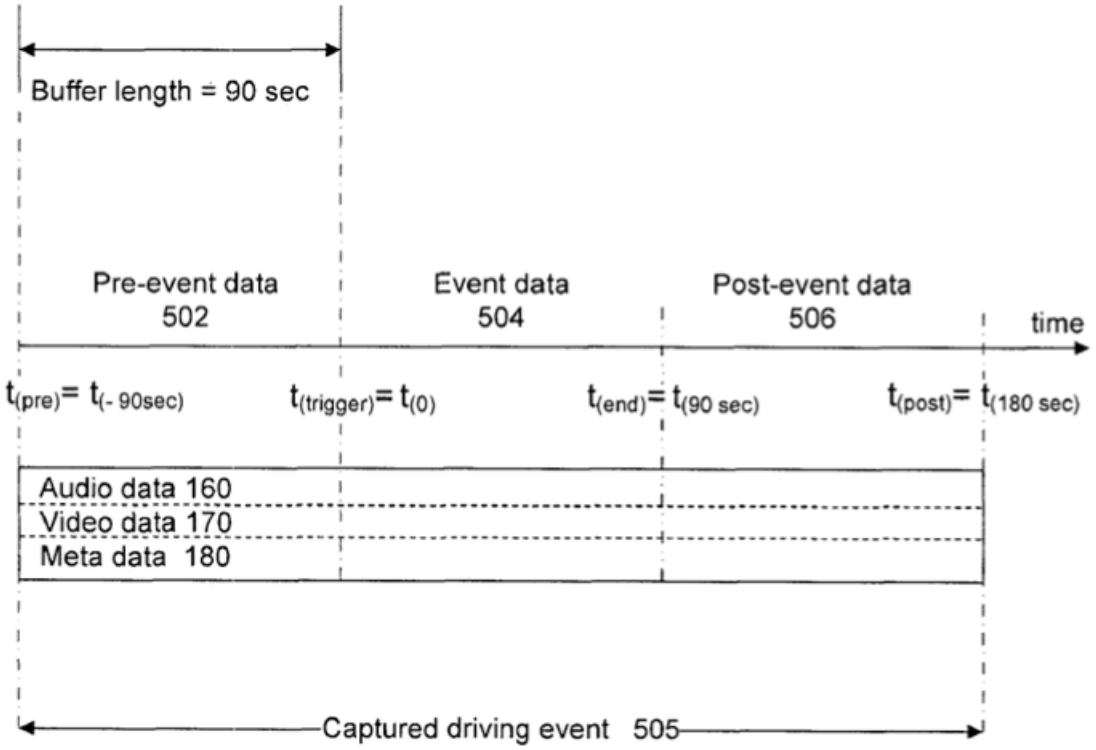
> Systems and methods for computer assisted cueing and selective reviewing of driving data in order to save time in the data review process

are provided. The method allows identifying essential portions of the data, selecting the essential portions, reviewing the selected data and retrieving additional data leading to the event if necessary. At least one event capture device continuously captures data into a buffer. The data are sent to an event detector communicatively coupled to the event capture device only when the event detector requests them. After receiving the data, the event detector selects and indexes a pre-event portion, during-event portion and post-event portion, combines the portions of captured data into a single driving event record and sends the driving event record to the evaluation server. From the server, the driving event record is sent to the analysis station for review and analysis.

Abstract.

In one embodiment, the event detector is configured to create metadata tags, and use those tags to index the beginning and the end of the pre-event data, event data and post-event data. For example, the beginning of the pre-event data can be indexed with a pre-event time tag set to the beginning of the pre-event data, whereas the end of the pre-event data can be indexed with a trigger time tag set to the end of the pre-event data. Similarly, the beginning of the event data can be indexed with the trigger time tag set to the beginning of the event data, whereas the end of the event data can be indexed with an end time tag set to the end of the event data. Correspondingly, the beginning of a post-event data can be indexed with the end time tag set to the beginning of the event data, whereas the end of the post-event data can be indexed with a post-event time tag set to the end of the post-event data.

Id. at 5:49-63.



In the embodiment illustrated in FIG. 4, a captured driving event or driving event record 505 comprises three consecutive buffers of collected data. Each buffer is indexed using metadata tags and then concatenated to form the event 505. More specifically, the pre-event data 502 was collected during a period of time which started at a "pre time" (indicated as $t_{(pre)}$) and ended at the trigger time (indicated as $t_{(trigger)}$). Similarly, the event data 504 was collected during a period of time which started at the trigger time (indicated as $t_{(trigger)}$) and ended at an "end time" (indicated as $t_{(end)}$). Correspondingly, the post-event data 506 was collected during a period of time which started at the end time (indicated as $t_{(end)}$) of the event data and ended at a "post time" (indicated as $t_{(post)}$). Then, the pre-event data 502 was concatenated with the event data 504 and with the event data 506.

Id. at 6:1-15.

49. As another example, U.S. 2006/0077256 to Silvernail ("Silvernail '256) discloses a "High Resolution Pre-Event Record System" that uses a circular buffer to record pre-event data:

> The High Resolution Pre-Event Record system is an innovative means for collecting audio, video, and meta-data in a mobile vehicle platform and continuously recording this information stream to a high-capacity storage device at different levels of data resolution based upon the status of a trigger event. The occurrence of a trigger event will cause the system to store higher resolution data to an on-board high-capacity storage device prepended by a configurable amount of high resolution data previously recorded into a pre-event data buffer. The data stream may later be downloaded to an external storage device for future review and analysis.

Silvernail '256 at Abstract.

> Simultaneously, a high-resolution data information stream is being recorded from Camera 1 201 through data encoding means within a DSP 100 and into a circular buffer of configurable length, called the Pre-event buffer 310. The length of the buffer may be set to store between 1 and n number of seconds (n is typically between 30 and 180) of data information stream files based upon the needs of the user. This guarantees that only a fixed amount of storage in the HCS 300 will be consumed by the larger data information stream files generated by high-resolution recording. When the end of the data buffer 310 is reached, the data information stream files are written to the beginning of the buffer 310 once again, overwriting the previous data information stream files and progressing through the buffer 310 once again in circular fashion.

Id. at [0024].

50. U.S. 2007/0035632 to Silvernail ("Silvernail '632) is entitled "Mobile Digital Video Recording System" and likewise discloses a circular buffer for recording pre-event data:

> In normal mode, the low-resolution integrated data stream is saved to the on-board high-capacity storage device in non-erasable data files, and the high-resolution integrated data stream is saved to a portion of the high-capacity storage device that has been constructed as a ring buffer with a configurable storage limit. The storage limit may be set to hold between 1 and 180 seconds of continuous recording of the high-resolution integrated data stream. At the end of the configurable storage limit, the data stored at the beginning of the buffer is overwritten with the most current data from the integrated data stream. This process continues with the most current data overwriting the next position in the buffer such that the buffer always contains the most recent recording of the integrated data stream. This circular buffer therefore contains the most recent 1 to 180 seconds of the high-resolution integrated data stream.

Silvernail '632 at [0010].

51. Prior to the alleged invention, it was known in the art to use a record after-the-fact feature such as the following exemplary references:

U.S. 2002/0131768, published September 19, 2002 ("Gammenthaler 1"), attached as Appendix D, and U.S. 2004/0201765 ("Gammenthaler 2"), attached as Appendix E, published October 14, 2004:

> However, the embodiment of FIG. 2 has the additional capability to record after-the-fact events which the officer may have missed because the record mode was not on when the event occurred. This is provided by the use of a hard disk 60 which stores all compressed video and audio data output by the compression process or the optional anti-tampering circuit at all times regardless of whether tape recording mode is on or off. This system also has the ability to record data from either of two-different video cameras, one of which may be wireless, and either of which may be selected and the ability to record audio from either of two different microphones, one of which may be wireless, and either of which may be selected.

Gammenthaler 1 at [0046]; *see also* Gammenthaler 2 at [0045]; U.S. 7,190,882, filed March 19, 2001.

> All the data on line 100 is continuously recorded on a 15 gigabyte hard drive 60 which is used as a FIFO memory. Data can be archived off the hard disk 60 to the digital video tape recorder 52 via bus 102. After the fact recording to tape can be accomplished using the system controller. If an officer wants to record to tape all the events that happened in the last 10 minutes or starting from some particular time of day he remembers to be before a significant event, he can give a command via control panel 20 to the system controller 54. Part of the data continuously recorded on hard disk 60 is time of day data supplied by clock 104 and/or a frame count signal.

Gammenthaler 1 at [0055]; *see also* Gammenthaler 2 at [0054].

> The system controller 55 can be controlled in this embodiment by the officer via control panel 20 to send a command to the hard disk 51 to cause it to playback all recorded data starting from a specific frame number or a specific time of day or going back from the present time by a specified number of minutes on output 57 to be archived by tape recorder 52. The hard disk then finds the appropriate data in any way and outputs it on line 57. In some embodiments, the hard disk has a cache memory in which frame number and time of data data are recorded along with the track and sector or block number on the hard disk where the corresponding video, audio and status data for that frame number and/or time of day were recorded. This provides an after-the-fact recording capability in case the officer did not have the in-car video system in record mode when some significant event happened. In alternative embodiments, since the hard disk 51 is used as a FIFO and will be overwritten when it reaches its capacity, the system controller can be programmed to automatically cause the digital video tape recorder to record all data on line 53 when the hard disk reaches capacity.

Gammenthaler 1 at [0060]; *see also* Gammenthaler 2 at [0059].

52. Additionally, U.S. 6,389,340 ("Rayner"), attached as Appendix I, issued May 14, 2002 discloses using a loop buffer to capture pre-event data:

> Under control of CPU 34, digital signals representing the video imagery are stored in dynamic random-access memory (DRAM) 38 that is configured as a continuous-loop buffer. CPU 34 or associated address counter circuitry defines the continuous-loop scheme by employing wrap around memory addressing, in which the highest memory location in a predetermined addressing sequence is adjacent or next to the lowest.

> Incoming digitized data signals are written to memory locations in DRAM 38 in accordance with the addressing sequence until all allocated locations have been written to, at which time the data signals stored at the next location in the sequence are overwritten with further incoming data signals.

Rayner at 4:9-21.

> CPU 34 monitors the digitized signals representing the acceleration data to which G-force sensors 40 and 42 are responsive. If CPU 34 determines that the acceleration data exceed a predetermined threshold that is believed to be indicative of a collision or other event that would warrant investigation, it copies data from the buffer memory to a more permanent non-volatile memory 56, such as Flash memory. Memories 38 and 56 thus together define a two-tier system, in which the first tier records data in a continuous-loop fashion, and the second tier provides more permanent storage for data in the first tier in response to a triggering event. Data stored in memory 56 in accordance with this scheme are not overwritten unless the entire system is reset by an operator. Preferably, device 10 includes security measures to prevent inadvertent or unauthorized resetting, such as placing the button (not shown) or other sole means for resetting device 10 inside enclosure 18 or in another relatively inaccessible location.
>
> Although in the illustrated embodiment a change in acceleration data that exceeds a predetermined threshold is defined as the triggering event that causes CPU 34 to terminate data acquisition and copy the contents of DRAM 38 to memory 56, in other embodiments a change in any other monitored sensor signal can similarly be defined as the triggering event.

> Also, although data acquisition can be terminated upon occurrence of the triggering event, in other embodiments data acquisition may continue after occurrence of the triggering event for some predetermined time interval. Thus, so long as a sufficient amount of pre-event data are retained and not overwritten, additional frames of video data or other sensor data can be gathered during and after the collision and stored in memory 56 following the pre-event data.

Id. at 4:57 – 5:22.

53. U.S. 6,421,080 ("Lambert"), attached as Appendix J, issued July 16, 2002 discloses reusing cache memory to capture pre-event data and marking data for preservation:

> The image data stored in the temporary memory just prior to detection of a triggering event qualifies as pre-event activity, and will be copied to the long-term memory along with contemporaneously or post-event image data to advantageously provide an image record of events occurring just prior to a triggering event in combination with those generated after the triggering event. This allows the image recording arrangement of the present invention to reduce the amount of image data which needs to be stored without compromising the potential usefulness of the stored image record.

Lambert at 4:41-51.

> Referring now to FIG. 3, as indicated at block 202, system 12 automatically reuses the cache memory when storing data into the cache if the list of dynamic frames has become full. More specifically, system 12 is programmed to reuse the cache by overwriting the oldest dynamic

frame with a new image file when the cache is full. As shown in block 204, the last image stored in the cache is tagged to indicate that the image has not yet been copied to disk, and has not yet been marked for storage. Then, at block 206, a determination is made as to whether any ongoing enabled or triggering events use the camera that the generated the latest image. If so, the image is tagged "marked for storage" at block 208. Otherwise, the process proceeds to block 210 and determines on an image by image basis whether there are currently any images stored in the cache that have been "marked for storage" but not yet stored to disk. If such an image is found, the image is then copied or written to disk, and the image file in the cache is tagged as "stored" as denoted at block 212.

Id. at 5:18-36.

54. U.S. 6,088,635 ("Cox"), attached as Appendix K, issued July 11, 2000, discloses using RAM memory to capture pre- and post-event data:

The operation of the monitoring unit 400 is similar to the monitoring unit 100 with a few exceptions. The video information obtained by the camera 420 is digitized and continuously stored in RAM of the PC 410. A certain portion of the PC's RAM will be allocated to continuous video storage and information will be continuously stored (and written over previously stored video information). The PC 410 will detect activity from the horn and brake sensor 440 and 442 and lock down (terminate) the storage of incoming video information after a predetermined period of time set by a timer in the PC 410. This is similar to the VCR lock down operation described above, except that the PC can do this digitally in order to capture video information for a predetermined period of time associated with a railroad crossing (potential accident) event. Consequently, the

> RAM of the PC 410 will contain the video information of the scene for a period of time before, during and after the activity which necessitated the blowing of the horn and application of the railroad vehicle brakes.

Cox at 5:4-22.

55. U.S. 2004/0252193 ("Higgins"), attached as Appendix L, published December 16, 2004, discloses a video capture buffer (e.g., RAM, RAM-disk, tape, and so on) used to record data before and after events occur:

> A system for monitoring and reporting incidences of traffic violations at a traffic location is disclosed. The system comprises one or more digital still cameras and one or more digital video cameras system deployed at a traffic location. The camera system is coupled to a data processing system, which comprises an image processor for compiling vehicle and scene images produced by the digital camera system, a verification process for verifying the validity of the vehicle images, an image processing system for identifying driver information from the vehicle images, and a notification process for transmitting potential violation information to one or more law enforcement agencies. The video camera system is configured to record footage both before and after the offense is detected. The video camera system includes a non-stop video capture buffer that records the preceding few seconds of violation. The buffer holds a number of seconds of video data in memory. When an offense is detected, a timer is started. At the end of the timer period a video clip of the current buffer contents is recorded. The resulting video clip is incorporated with the conventional evidence set comprising the digital still images of the offense with the identifying data of the car and driver.

Higgins at Abstract.

> FIG. 14 is a block diagram that illustrates the main components of video camera system 122. In system 1400, video camera 1402 is a digital video camera that produces video data in PAL, NTSC or other format, which can then be processed to produce streaming video in compressed form such as MPEG, MPEG2, Quicktime, AVI, or similar formats. In one embodiment, the video camera shoots non-stop video footage of the location. The digital video data is stored in a buffer 1404, which can be any type of memory (e.g., RAM, RAM-disk, tape, and so on) that is sufficient to hold at least a portion of the video footage shot by the camera. A detection system 1406 is coupled to the video camera 1402. Upon detection of an offense, a timer 1408 is started. The timer is programmed to stop after a predetermined period of time. At the end of the timer period a clip or "snapshot" of the buffer contents is taken by video clip recorder 1410. The video clip recorder takes the video clip recorded by the video camera for the time period of the timer plus a period of time prior to detection of the offense. The buffer and video clip recorder are used to provide a clip of the offense plus moments immediately before and after the offense. Thus, in order to catch, for example, six seconds prior and six seconds after an offense is detected, the buffer 1404 holds at least twelve seconds of footage in memory. When an offense is detected, the system starts a six second timer, at the end of which it takes a video clip of the current buffer contents and stores it to a persistent memory, such as hard drive 1412. This storage (hard drive) can also be used to store the still images of the offense. Thus, the resulting video record can be incorporated with the conventional evidence set provided by the still cameras.

Id. at [0090].

> FIG. 15 is a flowchart illustrating the steps of capturing a video clip of a detected offense, according to one embodiment of the present invention. In step 1502, the video camera 1402 records a non-stop loop of video of the monitored location. This video data is buffered in buffer 1404, step 1504. The detection system 1406 detects a traffic offense, step 1506. The detection of an offense triggers a timer 1408 to start for a set period of time, step 1508. After the timer period, the timer stops, step 1510. In step 1512, the video clip recorder 1410 captures and clips from the buffer a video clip running from a set time prior to the offense to the end of the timer period. The video clip is then stored in a memory, such as hard drive 1412, and associated with the still camera data of the offense, step 1514.

Id. at [0091].

56. US 2004/0150717 ("Page"), attached as Appendix M, published August 5, 2004, discloses a memory buffer that is used to record pre-event data:

> A digital video surveillance system for a law enforcement vehicle comprises a video camera mounted on the law enforcement vehicle and positioned to view an incident. A memory buffer records video signals from the video camera. A controller generates record and playback signals to record and to display the video signals. A digital video recorder is responsive to the record signal to record the video signals from the memory buffer on an optical medium and to the playback signal to reproduce video signals recorded on the optical medium. A vault encloses the digital video recorder. A battery provides backup power to

the digital video surveillance system. The optical medium may be a DVD disk. A watermark may be included with the digital recording.

Page at Abstract.

> The digital video surveillance system of the present invention includes a video server in a law enforcement vehicle which allows recording to various digital optical media including DVD RAM disks. Recording to these media in a moving vehicle and in all-weather conditions is possible by shock-mounting the drives and providing environmental assistance for heating and cooling a lockable protective enclosure in which the drives are encased. This system includes a memory buffer that is recording at all times. When the recorder is activated, the memory buffer contents, including video and audio, will be recorded onto the DVD RAM disk. This ensures that the activity occurring just prior to the activation of the system is recorded as well. The system further provides a method to capture or receive snapshots and output them to or receive them from a wireless transmitter such as a cellular modem for missing persons or suspect identification, for example. Forward-facing and interior cameras are mounted inside an overhead console to reduce the obstruction to the driver and to eliminate the chance of interfering with a passenger side air bag.

Id. at [0005].

> The video server board 46 includes from 4 to 512 megabytes of RAM, which is used as a history buffer. The system constantly stores information from the cameras and audio input in the RAM on the video server board 46 which stores seventeen to thirty seconds of video history for a 4 Mb history buffer and up to three minutes or more for a 512 Mb

> history buffer depending on the resolution of the video recorded, for example. The history buffer is a circular FIFO buffer which allows events to be recorded that occurred prior to the system receiving the record command. When the record function is activated, the history buffer prior to activation is transferred to the DVD RAM drive to record the incident up to the point when the record signal was received. Data in the history buffer is transferred to the DVD RAM disk at a data rate of approximately 2.7 Mb per second. If the history buffer is full when recording starts, this transfer occurs in approximately three minutes, for a 512 Mb history buffer. Thereafter, video and audio data is collected in the history buffer before being transferred to the DVD RAM disk in packets. When the stop recording command is received, the final five to six seconds of data in the history buffer is transferred to the DVD disk and recording on the disk is stopped. Data continues to accumulate in the history buffer after recording stops.

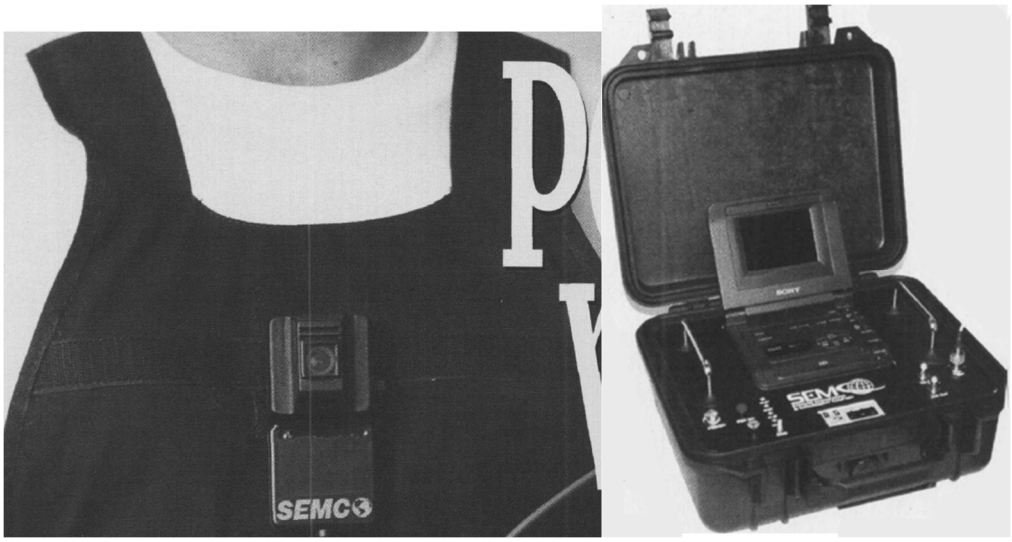
Id. at [0046].

4. Body-Worn Cameras Were Known In The Art

57. Prior to the alleged invention, it was known in the art to use a body-worn camera in conjunction with an in-car video system. For example, the CopCam by Semco Corporation included a body-worn camera that is worn at chest level. POLICE VIDEO Up Close and Personal, LAW and ORDER, August 1999 ("Police Video") at 1-2, attached as Appendix N. "CopCam…uses technology developed in military applications. *Id*. at 1. "Semco brought the system to law enforcement with the idea of recording not just a car-mounted view but also what the officer was seeing." *Id*. "[T]he

in-car video system is actually a combination of two separate video systems that interact with each other." Sheriff Baca Introduces In-Car Video System and "Cop-Cam," County Digest (Country of Los Angeles), March 2000 ("Cop-Cam") at 7, attached as Appendix O. "The first is the 'Car-Cam' system, in which the video camera is mounted in the patrol vehicle, taping the incident through the front windshield." *Id*. "The second is the 'CopCam' system, in which the video camera is mounted on the deputy's chest, videotaping the incident from the deputy's viewpoint." *Id*. "When activated, this system has the ability to tape incidents as they happen, regardless of where they occur in relation to the patrol car." *Id*.

58. "[Sgt. Craig Carter, Escondido, CA Police Department] explained, 'The unit we have has a camera in the car and a camera on the lapel of the officer. The officer can switch between the cameras. The result is, you use the system more often than if it was just in the car. For instance, in a domestic violence situation, you can go into a house and transmit back to the car'" Police Video at 1. "The camera lens is now attached to the lapel of the shirt, and there's a vest with transmitter and battery worn under the shirt." *Id*.



Id. at 1-2.

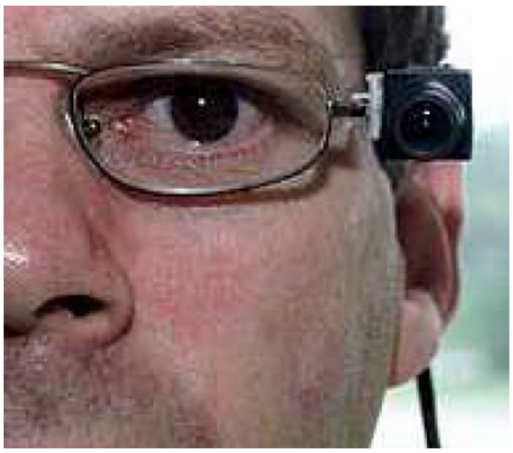
> Here's how the new system could work in a real world example. An officer spots a car being operated in an erratic manner. The in-car camera starts to record the driver's actions. As the car stops, the officer taps a button to activate the auto-zoom feature. The unit zooms in, focuses on the vehicle's license plate, and then zooms back out to record the full scene as the officer approaches. … At the driver's window, the officer can choose to activate his body camera. If he does so, the recording unit in the patrol car automatically switches to receive the signal of the camera worn by the officer. The camera, worn at roughly chest level, records a clear picture of the faces of vehicle occupants as well as the interior of the car.
>
> Let's assume that the officer obtains consent from the driver to search the car (all recorded on tape) and, as a result, finds a hand gun under the front seat which turns out to be stolen.
>
> ***

> The value of this type of information is obvious. "I had a case where I had a consensual search but the suspect later recanted in court" Carter said. "When you can show it on video, it really helps. The same thing applies to traffic tickets. Once I'm at the window, I have a picture of the driver's face and I have a recording of anything he says."

Id. at 2. "If we go into a house looking for a suspect, as in the service of a search warrant, that's different and the videotape can be invaluable." *Id*. at 3.

59. Another example is the Deja View Camwear Model 100. Deja View Camwear Model 100, CARPE'04, October 15, 2004, Attached as Appendix P. The Camera 100 is a wearable, hands-free camcorder used to capture and save events. *Id.* at 1. The small size of the camcorder allows for "easy attachment to eyeglasses or the bill of a hat." *Id.* at 1. The Camwear Model 100 has an "always-on scanning feature feeds a continuous video stream into the control unit. Although users may not have been ready for the action that had just taken place, they can still capture up to 30 seconds of the previous action by hitting the 'record' button after-the-fact!" *Id.* at 1.





Id. at 2.

5. Various Memory Options For Storing Events Were Known In The Art

60. US 2005/0088521 ("Blanco 2"), attached as Appendix Q, published April 28, 2005, discloses that prior systems included:

> Vehicle-mounted surveillance systems, also termed in-car video systems, are seeing increased use in the security industry and law enforcement community as an effective means to provide an indisputable video and audio record of encounters involving officers and citizens. In these systems, a video camera is typically mounted on the police car's dashboard or windshield and is generally arranged to have a field of view of the area to the immediate front of the car. The field of view approximately corresponds to what an officer would see when seated in the car's front seat.
>
> The video camera is operably coupled to a video recorder, such as a video cassette recorder ("VCR") or digital video recorder ("DVR"), mounted in the police car, often in the trunk. A video recording may be started manually by the officer, or in some systems, the video recording is started automatically when, for example, the officer activates the police car's emergency systems (such as overhead lights and/or sirens), or when a vehicle speed-measuring radar unit is operated.

Blanco 2 at [0002]-[0003].

> While current in-car video systems perform very well in many applications, recording media currently used with in-car video systems, including analog video tape and digital storage media like hard disk drives, are bulky and may present storage and other logistical issues in

> managing the recording media. The size of recording media and associated video recorders can present space utilization issues in some vehicle models as well.

Id. at [0007]. The video resolution contributes to the file size as "[l]arge resolutions greatly inflate the size of the file that contains their information." Special Report: The Patrol Video Project, LAW and ORDER, July 2004 (EX1007) at 22. Video resolutions of 320x240 pixels and 640x480 pixels were known in art in the context of in-car mobile video recorders. *Id.* at 5, 17. "A 640x480 image contains four times as many pixels as a 320x240 image." *Id.* at 22.

61. Blanco 2 described the benefit of using solid state memory devices such as Flash:

> An inventive system and method is provided by an in-car video system that uses a type of electrically erasable programmable read-only memory known as flash memory to store video of an incident or event. In an illustrative embodiment of the invention, a digital video recorder and video camera are fixably mounted in a vehicle such as a police cruiser. An event of interest is captured by a camera and the resulting video stream is converted into a form that writable to a flash memory. The video recorder writes the video to flash memory to thereby store a record of the event on the flash memory as a storage medium.

Id. at Abstract. "The type of flash memory preferentially used in the illustrative embodiment of the invention is known as a CompactFlash card." *Id.* at [0011].

> Advantageously, the invention creates a robust in-car video system having a large amount of video storage combined with enhanced system packaging that is enabled through the very small form factor of the flash memory. Since flash memory is a solid state device using no moving parts, (i.e., the memory relies on the use of electronics instead of mechanical systems) it is inherently reliable.

Id. at [0012].

> Flash memory may endure extreme temperatures and retains data even without a continuously applied power source. Users may easily insert and remove flash memory from the video recorder and store additional flash memory card in the vehicle in a small amount of space. Because of its extremely small size, flash memory provides efficient and dense storage and is ideal as a removable media for archiving video recordings in a storage area away from the vehicle. The use of flash memory as the recording media may also help to reduce the costs of maintaining in-car video systems because relatively fragile and complex VCRs and DVRs are eliminated from the inventive in-car video system.

Id. at [0013].

> Particular advantage may be realized in many applications of the invention by using "flash memory" which is a special type of EEPROM that can be erased and reprogrammed in blocks instead of one byte at a time. This feature makes flash memory generally "faster" than other types of non-volatile memories. In accordance with the invention, flash memory is well suited to in-car video system applications as a result of this fast speed at which data can be stored and accessed.

Id. at [0021].

6. Wireless Transmission Of Files To A Remote Memory Was Known In The Art

62. Prior to the alleged invention, it was known to have a wireless transmitter functionally coupled to a local memory used to transmit files to a remote memory. As an example, the '034 patent characterizes WO 2006/044476 to Vanman as disclosing that in order to "save data in the buffer, the user of the Vanman device needs to transfer important portions of the buffer wirelessly to a central office or physically to a DVD disc." '034 patent at 1:35-45. Additionally, a person of ordinary skill in the art would have known, for example, that wireless transmission of important data allows for preservation of the data while freeing up memory on the device for subsequent recordings. It also allows for summoning immediate assistance to the scene of an incident. Furthermore, particularly in law enforcement applications, it is desirable for evidence preservation to remove human interaction from the transfer of data from a recorder to a central evidence repository.

63. U.S. Pat. No. 8,350,907 ("Blanco"), attached as Appendix R, "is related generally to surveillance systems, and more particularly to a method of storing digital video captured by an in-car video system." Blanco at 1:6-8. "Referring to FIG. 1, which provides a simplified block diagram of a first method of long term video storage, a large digital storage medium 110 (for example, a hard disk drive having storage capacity of greater than 50 gigabytes) is utilized in a vehicle 120, such as a police

cruiser, to record and store many hours of video." *Id*. at 3:45-50. "The occurrence of external triggers or incidents markers such as the emergency Lights, Siren, Car door opening, etc., that may be part of the video record, may also be searched in some applications of the invention." *Id*. at 4:37-40.

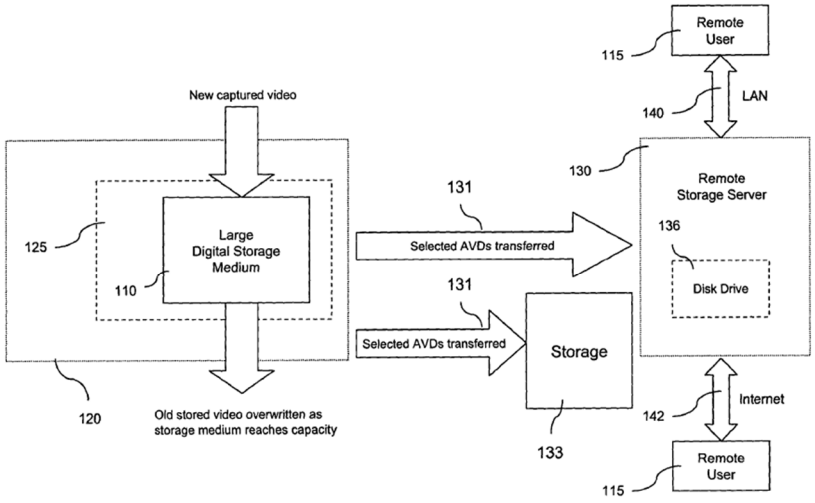


FIG 1

Id. at Fig. 1. "Typically, the large digital storage medium 110 would be incorporated into an in-car video system, designated by reference number 125 in FIG. 1 which typically includes a DVR, camera, microphone, control unit and monitor (not shown in FIG. 1)." *Id*. at 3:50-54. "Once the large digital storage medium 110 reaches its maximum capacity, the oldest video is erased (i.e., overwritten) and its space is taken by the newest video as shown in FIG. 1." *Id*. at 3:57-60. "[S]elected video recordings, for example those designated as being of interest or of other importance, may be transferred to conventional storage media…(collectively designated by reference numeral 131 in FIG. 1)." *Id*. at 3:62-64. Figure 3 depicts that "the removable media

may be replaced with a wireless link, enabled for example, through the use of a wireless transmitter 310 as shown." *Id*. at 4:41-44.

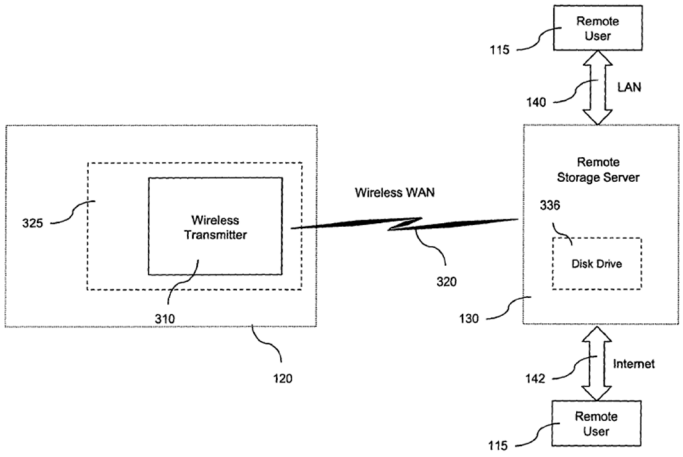


FIG 3

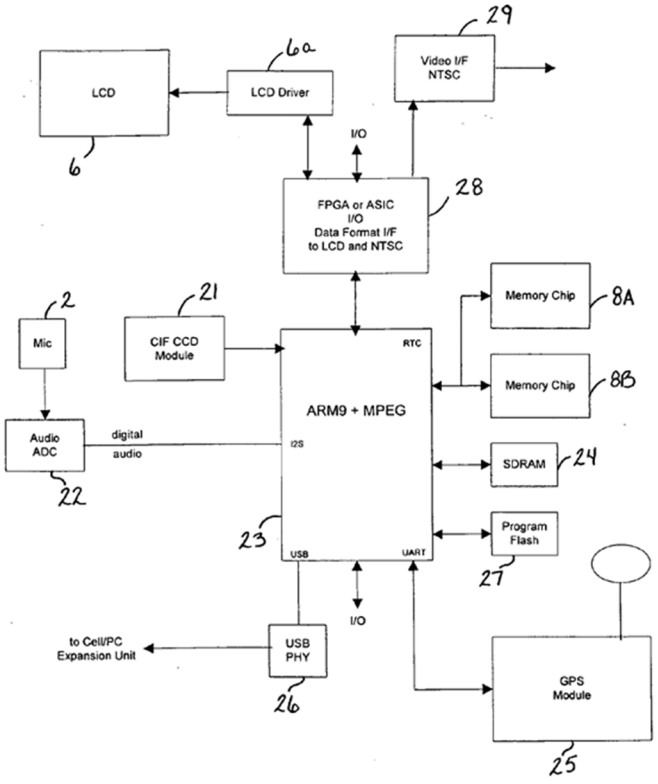
Id. at Fig. 3. "The video data is transferred to a storage server 130 coupled to the WAN." *Id*. at 4:46-47. "The third method [Fig. 3] described above is often the most advantageous in many applications." *Id*. at 4:50-51. "It often requires the least amount of interaction from the officer which can be desirable from the viewpoint of training reduction and enhanced evidence preservation." *Id*. at 4:51-54. Therefore, it was known to have a wireless transmitter functionally coupled to a local memory used to transmit files to a remote memory.

64. U.S. Pub. No. 2004/0008255 ("Lewellen") (EX1019) is another example of wireless transmission of files to a remote memory.

65. U.S. Pub. No. 2005/0078195 ("Van Wagner"), attached as Appendix U, discloses "a mobile recording device including: a flexible camera head for capturing video stream data in real time, a microphone for capturing audio data in real time, a

circular buffer for continuously storing the video stream data and the audio data; and a wireless transceiver for transmitting the video and audio data in real time to a remote location." Van Wagner at [0009]; Figs. 2, 4B.

FIG. 2



Van Wagner at Fig. 2. "The wireless card slot utilizes existing wireless technologies, like PCcard cellular modems and 802.11 cards, to transmit video and audio as a data stream to a remote monitoring facility." *Id*. at [0092]. "In one embodiment, the cellular capability is provided via an expansion module pluggable to the main unit." *Id*. at [0071]; Fig. 3. "In this embodiment, the MPEG stream is received from the main unit via a USB interface 31 (or other interface) by the expansion module, as shown in FIG.

3." *Id*. Therefore, it was known to have a wireless transmitter functionally coupled to a local memory used to transmit files to a remote memory.

66. U.S. Pat. No. 6,995,668 ("Junqua"), attached as Appendix V, discloses "a wearable, computerized apparatus for use with law enforcement has an evidence collector adapted to collect evidentiary information of a type collected according to law enforcement procedures and useful for identification of a suspect." 1:36-40. "A wireless communications link communicates the evidentiary information and the safety information to a centralized component of a distributed communications system to assist in identifying suspects and dispatching assistance." *Id*. at 1:42-46. "A vehicular component having an on-site camera can receive data from the wearable, computerized component via a wireless connection, automatically activate the camera at times of stress and/or distress, and forward collected information off-site to a centralized, dispatch facility via a wireless connection. *Id*. at 1:42-52-58.

> Another way that apparatus 10 can communicate with other components of the system is by using a mid-range wireless link, such as radio wave. This mid-range wireless link can be used to communicate with a vehicular component of the system, such as a police car 40 or motorcycle 42. Thus, suspect biometric data, sensed officer reactions, stimuli, scanned input, text input, voice input and/or sounds and images from various on-site cameras 44A–C can be communicated to and from various on-site components of the distributed communications system.

Junqua at 3:12-21; Fig. 2.

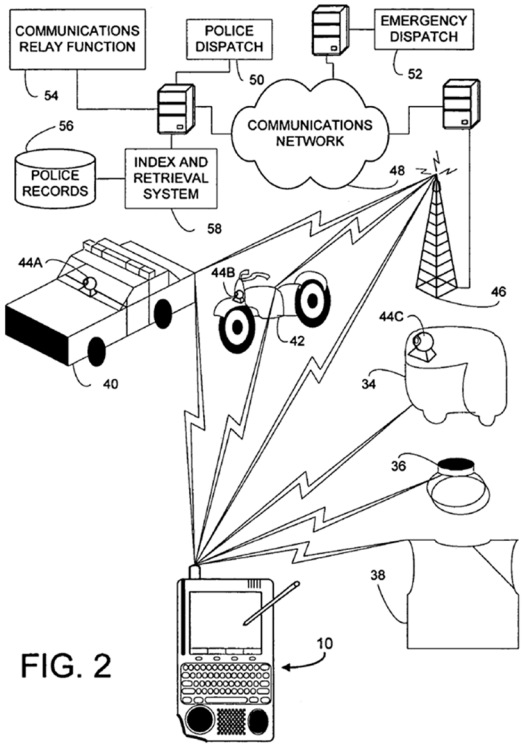


FIG. 2

Junqua at Fig. 2. Therefore, it was known to have a wireless transmitter functionally coupled to a local memory used to transmit files to a remote memory.

67. U.S. Pub. No. 2001/0005217 ("Hamilton"), attached as Appendix W, discloses a "device for remote information download and transfer for downloading a secure, permanent record of criminal activity and/or accident evidence relating to a vehicle for evidentiary purposes which may be … saved directly onto the downloading device. Hamilton at Abstract. Hamilton "contemplates an off-board downloading device for accessing information on a Recording System and for viewing and/or transferring that information to an off site location." Hamilton at [0101]. Hamilton further discloses "the information recorded from certain monitors and transducers located on the Recording System can be downloaded by the interface 18 from hard drive

34 located on the Recording System and superimposed on recorded video information also downloaded from hard drive 34 located on the Recording System." Hamilton at [0030]. "In a preferred aspect, the remote downloading device has at least one transceiver for accessing, downloading, and remotely transmitting information to an off site location, such as a base station, a hospital, an insurance company, law enforcement, a rescue vehicle, or the like." Hamilton at [0015]. "The transceiver receives signals from a remote unit, such as a Recording System, which allows the device to transmit recorded and/or stored information directly from the safe box or hard drive located on the Recording System to an off site location and/or instantaneously as it is generated." *Id*. Hamilton further discloses that the "transceiver 40 can comprise a direct satellite uplink, RF radio, modem, cell phone, or the like." Hamilton at [0026].

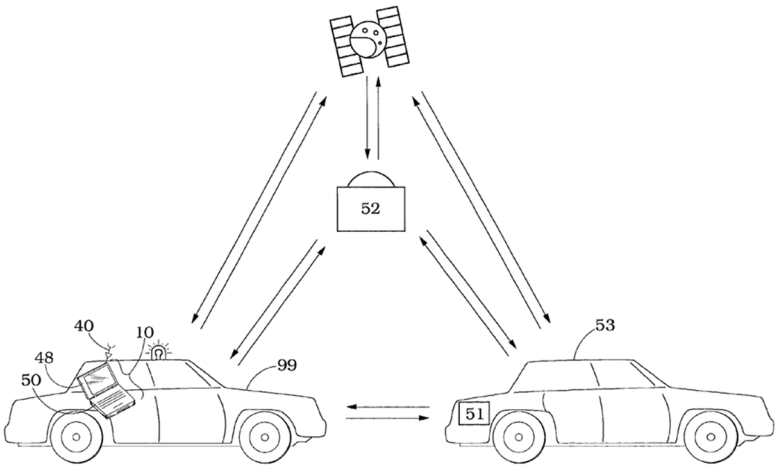


FIG. 2

Hamilton at Fig. 2. In Fig. 2, "the download device 10 is implemented in a form that is similar to that of a laptop computer with a visual display monitor 48 and keyboard 50." Hamilton at [0031]. "The download device 10 may be self-contained with, for example,

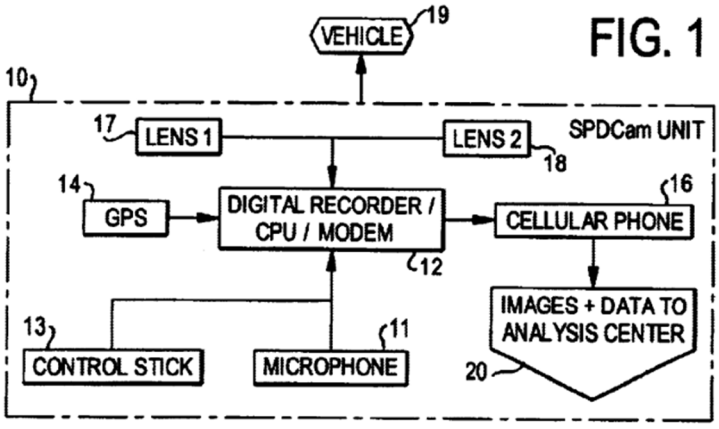
a phone jack and/or a modem hooked to a mobile phone or SET for direct satellite transmission via transceiver 40." *Id*. "In the depicted embodiment, the Recording System 51 is located in a vehicle 53, and the download device 10 is located remotely from the Recording Systems 51 such as, for example, in a police cruiser 99." *Id*. Therefore, it was known to have a wireless transmitter functionally coupled to a local memory used to transmit files to a remote memory.

68. PCT Pub. No. WO2004/036926 ("Pearlson"), attached as Appendix X, discloses "methods and systems for acquiring, storing, and distributing video and telemetry." Pearlson at 1:28-29. "One embodiment is a recording and transmission system comprising: a recorder mountable in a police vehicle configured to record video and meta-data synchronized with the video, wherein the recorded video includes a plurality of segments having fixed lengths, the recorder including a wireless transmitter configured to wirelessly transmit the recorded video segments and meta-data, wherein the meta-data includes: data related to vehicle status; subjective time information; objective time information; serial data." Pearlson at 2:1-6. "One embodiment of the recorder 100 provides event-based recording that enables users to activate a recording session by either pressing a button or activating another device used as an event trigger such as a vehicle light bar, or an alarm contact or other sensor." Pearlson at 10:3-9. "In one example embodiment, a ring buffer in a recorder, such as recorder 100, captures video, audio and data until an instruction or trigger to start the recording process occurs." Pearlson at 8:18-21.

69. "The system includes a mobile video/audio data recorder 100 which records high quality video/audio and serial data telemetry while simultaneously transmitting specially formatted live video/audio and information to personnel using a variety of reception devices or terminals." Pearlson at 7:3-7; Fig. 1. For example, access to and display of videos and meta-data can be provided using a standard browser…and a standard media player…executing on a personal or server computer, personal digital assistant, cell phone, and the like, thereby lowering the client cost and easing maintenance. Pearlson at 5:14-18. Pearlson further discloses that "the frame rate, bit rate and resolution for transmission can be selected based on the wired or wireless network and the receiving terminal." Pearlson at 7:23-24. "For example, some devices, such as palm-held personal digital assistants (PDAs) and hybrid cell phones may have limited display resolution and processor power." Pearlson at 7:24-26. "In applications where such devices are used to view the video, such as by remote field personnel performing surveillance, the recorder l00 maintains compatibility with the target device by optionally formatting video specifically for the target device." Pearlson at 7:26-29. Therefore, it was known to have a wireless transmitter functionally coupled to a local memory used to transmit files to a remote memory.

70. U.S. Pat. No. 6,690,294 ("Zierden"), attached as Appendix Y, discloses "a method for capturing images of a vehicle and/or vehicle operator suspected of a traffic violation, determining the time and geographic location of the suspected violation, transmitting the images and other data to an analysis center, issuing citations to violators

and deriving revenue therefrom." Zierden at 1:17-23. "The SPDCam system comprises a color digital imaging device (SPDCam device) connected to a global positioning satellite (GPS) system and a cellular telephone network." *Id*. at 3:31-33. "Referring now to the detail in the drawings, FIG. 1 is a block diagram of a digital imaging device (SPDCam device) 10 for capturing the image of a target vehicle 19 that is suspected of violating a traffic law." *Id*. at 4:11-15.



Id. at Fig. 1. "The SPDCam device 10 comprises two cameras, identified as lenses 17 and 18…." *Id*. at 4:15-16.

> In operation, the lenses 17 and 18 constantly record images, with the most recent time period, e.g., 120 seconds, of images being retained in the computer memory at any given time. As new images are acquired, older ones are erased. When a target vehicle is identified, the system operator activates an 'Event' on the SPDCam device 10 to begin collecting data for the target vehicle. When the 'Event' is initiated, the prior 120 seconds of images are permanently stored, and subsequent images of the target vehicle are continuously captured and stored in the computer memory until the operator 'Ends' the event. GPS data and the

entirety of the audio recording is retained from the start of the event to the end thereof, and stored with the images.

Id. at 5:8-20. "[S]witches may be provided for selecting between the video mode and the photographic mode of operation." *Id*. at 5:24-25.

71. "The computer 12 processes, stores, and transmits the images and the geographic and audio data to an analysis center 20 via a cellular telephone 16." *Id*. at 4:24-26. For example, "[a]n 'Event' key permanently stores the most recent 120 seconds of images while continuing to record until an 'End/Store' key is pressed to stop the recording of the images." *Id* at 5:30-33. "All the images are stored in the memory of the computer 12." *Id*. at 5:33-34. "A 'Submit' key activates the cellular telephone 16 connected to the computer 12 which transmits the images and other collected data to the analysis center 20." *Id*. at 5:39-42. Therefore, it was known to have a wireless transmitter functionally coupled to a local memory used to transmit files to a remote memory.

72. U.S. Pat. No. 6,831,556 ("Boykin"), attached as Appendix Z, discloses "[a] surveillance system includes a device for capturing video, audio, and data information." Boykin at Abstract. "The device is provided in a first location, such as a vehicle." *Id*. "A server is provided for integrating and storing the captured information in the vehicle." *Id*. "The captured data is stored in onboard hard drives, or other storage facilities, such as flash memory, solid state memory, etc." *Id*. at 1:50-53. "The server may be a mobile server which is capable of transmitting the captured

information from the vehicle to a second location, such as a building." *Id*. at Abstract. Boykin discloses that "data is digitally captured and processed from any one or all of the cameras for integration and storage in the mobile server 200 (see FIG. 2) of the CMDIS unit 150." *Id*. at 3:14-17.

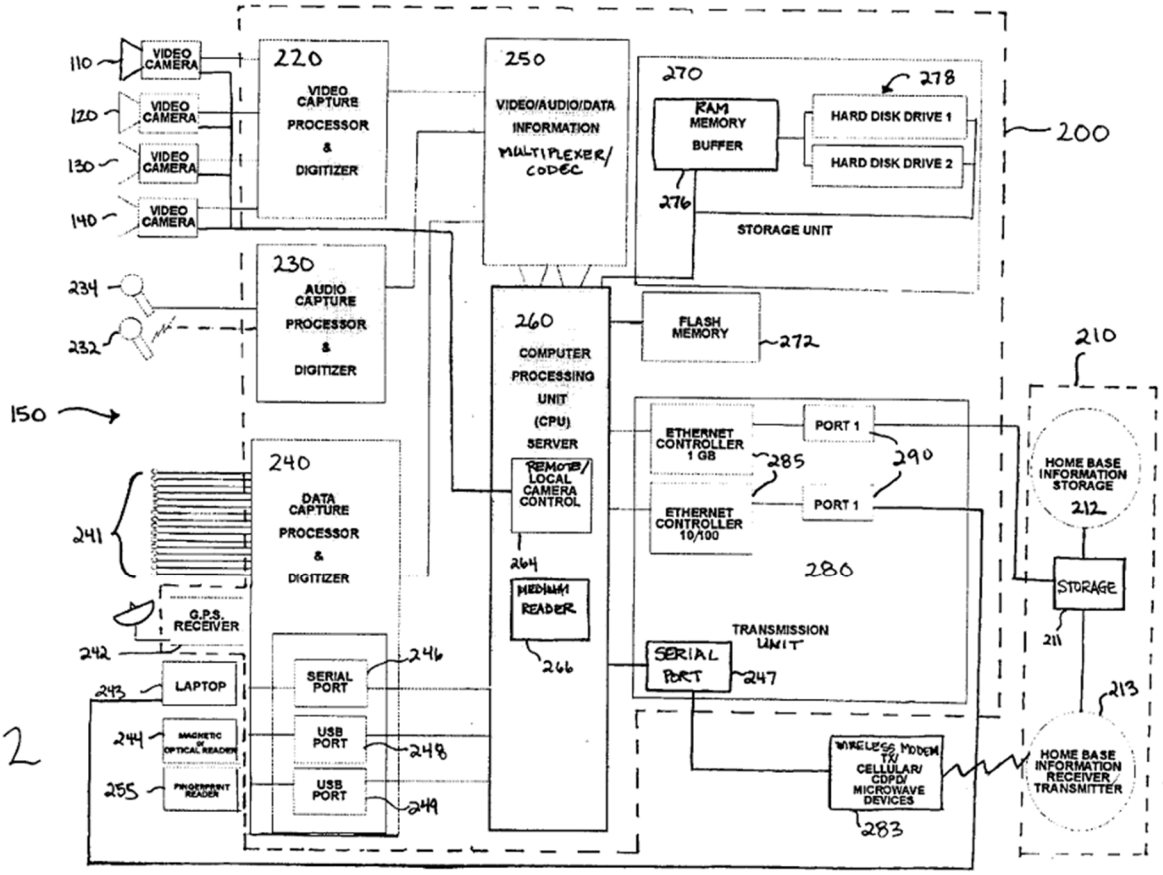


FIG. 2

Id. at Fig. 2.

73. "More specifically, the processor CPU 260 commands the RAM memory buffer 276 to transmit the stored information to the permanent storage memory, e.g., the hard drive 278, upon the triggering of a particular event." *Id*. at 5:15-18. "Such an event may include, but is not limited to, the activation of a siren on the police car 100, the removal of a gun from its gun rack, sudden acceleration of the vehicle, etc." *Id*. at

5:18-21. "All of the information which was recorded during the specified time and saved to the RAM memory buffer 276 is then digitally saved to the permanent storage memory, e.g., one of the two onboard hard disk drives 278." *Id*. at 5:21-25. "Thus, the surveillance system records an event, as well as a specified time before the event." *Id*. at 5:25-26. "The present invention is not limited to the use of hard disk drives." *Id*. at 5:38-39. "Solid state memory or other types of non-volatile, non-rotating memory devices may be substituted for the hard disk drives, e.g., flash, etc." *Id*. at 5:39-41. "The invention may utilize any type of memory buffer, or may be a flash memory, etc." *Id*. at 5:43-44.

74. "During recording and playback of the recorded data, digital coding provides tags for future search parameters." *Id*. at 3:7-8. "For instance, searchable identification code may be embedded in the data which is associated with a particular event." *Id*. at 3:9-10. "Thus, the data can be easily retrieved for evidentiary purposes at a later time without necessitating labor intensive searches of the recorded material." *Id*. at 3:11-13.

75. Boykin further discloses that a "serial port 247 can be connected to receiving/transmitting device 283 (one of a variety of wireless modem, cellular, satellite, and microwave devices) that sends radio signals back to the home base or precinct 210." *Id*. at 4:13-17. For example, "[w]hen the vehicle 100 returns to the home base 210, it is connected via a high-speed, high-capacity Ethernet controller 285 (such as a 3COM 1 GB controller) to the home base server 211 via port 290 and the digitally

stored video/audio/ related information (i.e., data stream) is data dumped to a home base master storage repository 212." *Id*. at 6:4-9. "The data can be dumped through copper wire, wireless transmission, fiber optics, laser or other means." *Id*. at 6:9-11. "With current systems, at the end of a shift the officer is required to remove all videotapes and turn them into a storage facility." *Id*. at 8:5-7. "However, with the present invention, the digitally stored material is data dumped via various download devices including wireless transfer, without human contact." *Id* at 8:7-10. Therefore, it was known to have a wireless transmitter functionally coupled to a local memory used to transmit files to a remote memory.

76. "The Patrol Video Project," LAW and ORDER, July 2004 article describes the Ranger digital video recorder for patrol cars from Sequent. Special Report: The Patrol Video Project at 10-12. "Sequent's system records digital video data onto a dedicated computer and hard drive located in the vehicle's trunk." *Id*. at 10.



Id. at 11.

> They park the cars in their motor pool lot, and a 2.4 GHz Wi-Fi access point (one of three at Riverside PD) senses the presence of the car. The system queries the car's server to see if there is video data to offload, and if the data is present, the files are downloaded wirelessly to an assembly server located in a room adjacent to the motor pool. If the download is interrupted by the car moving out of range again, it just resumes when the car comes back again.
>
> Once the video files have been transferred and verified, the assembly server tells the mobile unit to delete the files from its hard drive.
>
> ---
>
> Sgt. Jim Walters at Riverside PD maintains that the process is smooth and requires no intervention by the officer, and that it has yet to lose any video.

Id. "Sequent is routinely transferring an hour of video from cars to the server, wirelessly, in under five minutes." *Id*. at 12. Therefore, as of at least July 2004, it was known to have a wireless transmitter functionally coupled to a local memory used to transmit files to a remote memory.

77. U.S. Pat. Pub. No. 2002/0191952 ("Fiore") (EX1009) is another example of wireless transmission of files to a remote memory.

78. Silvernail '256 and Silvernail '632 likewise disclose use wireless transmission of files to a remote memory:

> Moving saved data files from the on-board HCS 300 to an exterior High-capacity storage 970 is accomplished when the mass transit vehicle stops at a facility equipped with a Transitcam Video Management Server

(TVMS) and high-capacity storage equipment. This transfer is accomplished in one of two methods; (1) physically removing the on-board HCS 300 from the mass transit vehicle or (2) transmitting the saved data files from the on-board HCS 300 to the TVMS over wired or wireless data communication means.

Silvernail ’256 at [0029]; *see also id.* at [0031].

> The IMVDR communicates stored data files to an external high-capacity storage and retrieval server through wired or wireless communication channels. In wired mode, a user may attach an Ethernet cable to an Ethernet port integrated into the front or rear panel of the IMVDR or, optionally, retrieve the removable on-board high-capacity storage device. If an Ethernet connection is established, data files are transmitted from the on-board high-capacity storage device to the external server, which then saves the files to the high-capacity storage device on the external server. If the removable on-board high-capacity storage device is removed it is then docked with the external server and the files downloaded into the high-capacity storage device on the external server. In wireless mode, the IMDVR establishes a network communication path with an external server through the use of an integral wireless modem. Once the wireless communication path is established, data files are transmitted from the on-board high-capacity storage device to the external server, which then saves the files to the high-capacity storage device on the external server.

Silvernail ’632 at [0013]. Therefore, it was known to have a wireless transmitter functionally coupled to a local memory used to transmit files to a remote memory.

7. Remote Memory On Mobile Phone Was Known In The Art

79. Prior to the alleged invention, it was known to transmit data from a local memory to a remote memory located on a mobile phone. For example, wireless transmission of important data allows for preservation of the data while freeing up memory on the device for subsequent recordings. It also allows for summoning immediate assistance to the scene of an incident. And transmitting events to a mobile phone would allow further transmission of events through a cellular network, which was readily available at the time, to a central repository for permanent storage and evidence preservation.

80. Prior to the alleged invention, phones were advanced enough to allow storage of video content and were used for a variety of purposes including surveillance applications. A published paper in 2006 by Bing-Fei WU et al., "A Practical Home Security System via Mobile Phones" ("WU"), from the Proceedings of the 5th WSEAS International Conference on Telecommunications and Informatics, Istanbul, Turkey, May 27-29, 2006 (pages 299-304), attached as Appendix AA, stated the following: "Since mobile phones have become prevailing, while house and property security demands are continually increasing, the integration of the mobile phone and a surveillance system becomes more meaningful so that people can know the security of their properties anytime, anywhere. Mobile phones are at present, quite ubiquitous and increasingly sophisticated. A mobile phone can not only be treated as a communication unit, but as a camera, a web browser, a music box, a game platform, or even a wireless

remote controller, since so many services are provided on a mobile phone. Corcoran et al. proposed a photography service which offered the possibility to access and manipulate uploaded pictures directly by Wireless Application Protocol (WAP) or iMode services via mobile phone [7]. They also presented a combined battery-charger and picture upload unit to solve the two-hour talk-time limitation of a fully charged mobile phone in their investigation. Nikolova et al. developed a gateway to enable the control of consumer electronics devices connected to the home network from a mobile phone. The gateway intermediates are wired between the home network and a wireless communication network using Home Audio Video interoperability (HAVi) and WAP specification, respectively [8], named HAVi-WAP UI. Recently, a video clip system [9] has developed a way to transfer the video stream to a mobile phone through Ethernet from PCs." WU at 1.

81. "This manuscript addresses the design and implementation of a practical home security system (PHSS). This system realizes its mobile surveillance via mobile phones by the planted Java applet. The challenge is that PHSS works independently under the existing Internet Service Providers (ISP) and telecoms. End-users can monitor their home and properties anywhere and anytime on the screen of their mobile phone. Furthermore, PHSS can be also applied to vehicle surveillance without the restrictions of ISPs. This system has been completed and verified in houses and vehicles." *Id.* at Abstract. "Since more and more mobile phones support Java programming, the J2ME Java version is addressed for developing applications on mobile devices. But the API

of J2ME is not as complete as that of J2SE. There are still many restrictions in developing the Java program. The socket programming is used to establish the connection between ESS and the mobile phone. The server-push method is applied in the data transmission between them. That is, the mobile phone will not download the files until the server is ready for the downloading. Figure 6 shows the state chart of this method and Fig. 7 is the processing flowchart of this program on a mobile phone." *Id.* at 4. "Users can download the continuous real-time images to their mobile phones from ESS anywhere if this Java applet has been embedded in their mobile phones." *Id.* at 4. "The actual average bandwidth of GPRS is approximately 8K to 10K bits per second for the downloading data transmission rate. The QCIF JPEG image size is approximately 1K Bytes so that the mobile phone can download the compressed image data from ESS display the decoded JPEG image in three seconds per image by our developed Java applet." *Id.* at 5.

82. Phones were also used to provide Internet connectivity. For example, a research paper in 2003 by S.C. Hui et al., "Remote Video Monitoring Over the WWW" ("Hui"), from the Multimedia Tools and Applications, 21, 173–195, 2003, Kluwer Academic Publishers, The Netherlands, attached as Appendix BB, stated the following: "Recently, the Internet has provided an intermediate transmission medium to support remote video monitoring. A number of Internet-based remote monitoring systems such as DigiEye [28], TeleEye Pro [26], Digital Surveillance [13] and Vision-Based Traffic Surveillance System [20] have been developed and marketed. These systems can

connect to the Internet through a phone line or Local Area Network (LAN), and provide multiple remote monitoring functions such as live video viewing, digital video recording and motion detection. Compared with traditional monitoring systems, the Internet-based monitoring systems have some obvious advantages." Hui at 1.

83. During the prosecution of U.S. Patent Application No. 12/268,286, the Office Action Summary for Applications Under Accelerated Examination clarified that "Patel teaches 'the mobile computing device can also be a personal digital assistant (PDA), a digital camera, a pager, a video telephone, a cellular telephone, a hand held computer, a hand held data capture device, etc. Accordingly, each imaging engine is optimized for use in specific applications, such as reading optical codes, video teleconferencing, capturing biometric and other images, taking digital still snapshots, and capturing a sequence of digital images continuously or over a period of time (time lapse). Other applications and features include creating and transmitting video e-mail, performing video surveillance, and previewing and storing images'. And, therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Vanman and Hattori by using the mobile device as a cellular phone for receiving and storing video images. Doing so would help to clear up memory spaces and for securing an important data." EX1013, 266-267.

84. U.S. Pub. No. 2001/0005217 ("Hamilton") discloses a "device for remote information download and transfer for downloading a secure, permanent record of criminal activity and/or accident evidence relating to a vehicle for evidentiary purposes

which may be … saved directly onto the downloading device. Hamilton at Abstract. Hamilton "contemplates an off-board downloading device for accessing information on a Recording System and for viewing and/or transferring that information to an off site location." Hamilton at [0101]. Hamilton further discloses "the information recorded from certain monitors and transducers located on the Recording System can be downloaded by the interface 18 from hard drive 34 located on the Recording System and superimposed on recorded video information also downloaded from hard drive 34 located on the Recording System." Hamilton at [0030]. "In a preferred aspect, the remote downloading device has at least one transceiver for accessing, downloading, and remotely transmitting information to an off site location, such as a base station, a hospital, an insurance company, law enforcement, a rescue vehicle, or the like." Hamilton at [0015]. "The transceiver receives signals from a remote unit, such as a Recording System, which allows the device to transmit recorded and/or stored information directly from the safe box or hard drive located on the Recording System to an off site location and/or instantaneously as it is generated." *Id*. Hamilton further discloses that the "transceiver 40 can comprise a direct satellite uplink, RF radio, modem, cell phone, or the like." Hamilton at [0026].

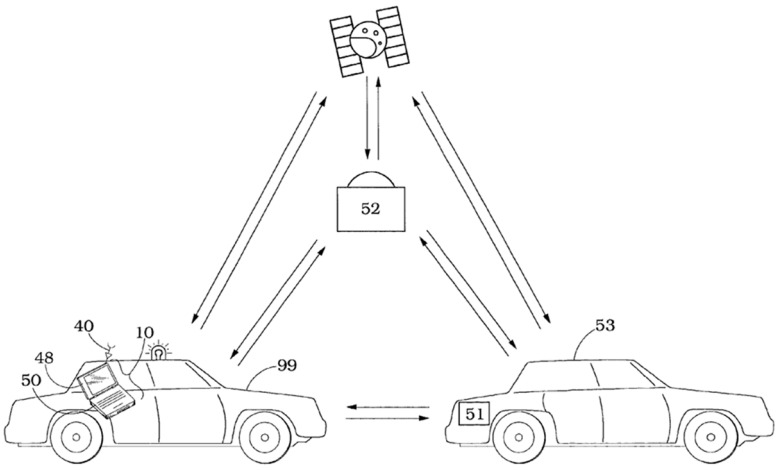


FIG. 2

Hamilton at Fig. 2. In Fig. 2, "the download device 10 is implemented in a form that is similar to that of a laptop computer with a visual display monitor 48 and keyboard 50." Hamilton at [0031]. "The download device 10 may be self-contained with, for example, a phone jack and/or a modem hooked to a mobile phone or SET for direct satellite transmission via transceiver 40." *Id*. "In the depicted embodiment, the Recording System 51 is located in a vehicle 53, and the download device 10 is located remotely from the Recording Systems 51 such as, for example, in a police cruiser 99." *Id*. Therefore it was known to transmit data from a local memory to a remote memory located on a mobile phone.

85. PCT Pub. No. WO2004/036926 ("Pearlson") discloses "methods and systems for acquiring, storing, and distributing video and telemetry." Pearlson at 1:28-29. "One embodiment is a recording and transmission system comprising: a recorder mountable in a police vehicle configured to record video and meta-data synchronized with the video, wherein the recorded video includes a plurality of segments having fixed

lengths, the recorder including a wireless transmitter configured to wirelessly transmit the recorded video segments and meta-data, wherein the meta-data includes: data related to vehicle status; subjective time information; objective time information; serial data." Pearlson at 2:1-6. "One embodiment of the recorder 100 provides event-based recording that enables users to activate a recording session by either pressing a button or activating another device used as an event trigger such as a vehicle light bar, or an alarm contact or other sensor." Pearlson at 10:3-9. "In one example embodiment, a ring buffer in a recorder, such as recorder 100, captures video, audio and data until an instruction or trigger to start the recording process occurs." Pearlson at 8:18-21.

86. "The system includes a mobile video/audio data recorder 100 which records high quality video/audio and serial data telemetry while simultaneously transmitting specially formatted live video/audio and information to personnel using a variety of reception devices or terminals." Pearlson at 7:3-7. For example, access to and display of videos and meta-data can be provided using a standard browser…and a standard media player…executing on a personal or server computer, personal digital assistant, cell phone, and the like, thereby lowering the client cost and easing maintenance. Pearlson at 5:14-18. Pearlson further discloses that "the frame rate, bit rate and resolution for transmission can be selected based on the wired or wireless network and the receiving terminal." Pearlson at 7:23-24. "For example, some devices, such as palm-held personal digital assistants (PDAs) and hybrid cell phones may have limited display resolution and processor power." Pearlson at 7:24-26. "In applications

where such devices are used to view the video, such as by remote field personnel performing surveillance, the recorder 100 maintains compatibility with the target device by optionally formatting video specifically for the target device." Pearlson at 7:26-29. Therefore it was known to transmit data from a local memory to a remote memory located on a mobile phone.

87. U.S. Pat. No. 6,995,668 ("Junqua") discloses "a wearable, computerized apparatus for use with law enforcement has an evidence collector adapted to collect evidentiary information of a type collected according to law enforcement procedures and useful for identification of a suspect." 1:36-40. "A wireless communications link communicates the evidentiary information and the safety information to a centralized component of a distributed communications system to assist in identifying suspects and dispatching assistance." *Id*. at 1:42-46. "A vehicular component having an on-site camera can receive data from the wearable, computerized component via a wireless connection, automatically activate the camera at times of stress and/or distress, and forward collected information off-site to a centralized, dispatch facility via a wireless connection. *Id*. at 1:52-58. "Also, a two-way, wireless link 32 is capable of transmitting and receiving data in at least one of many possible ways." *Id*. at 2:62-64.

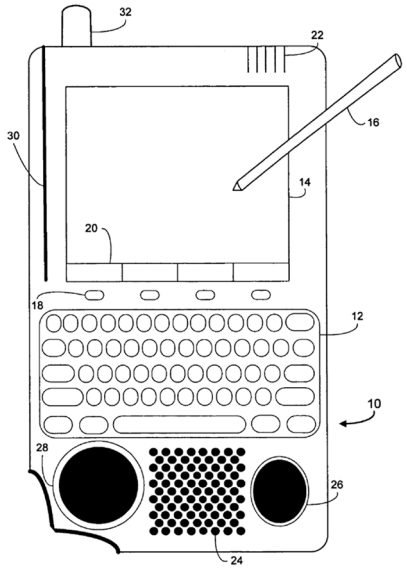


FIG. 1

Id. at Fig. 1. "The distributed communications system of FIG. 2 demonstrates many of the ways apparatus 10 can communicate with other components of the system." *Id*. at 2:64-67.

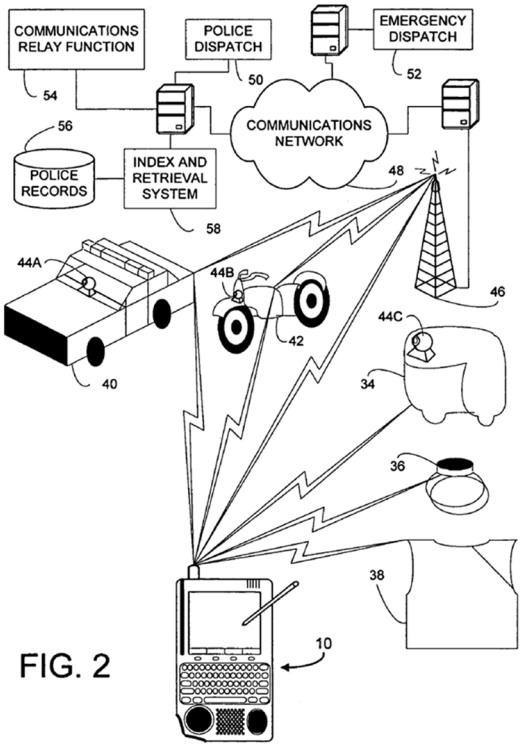


FIG. 2

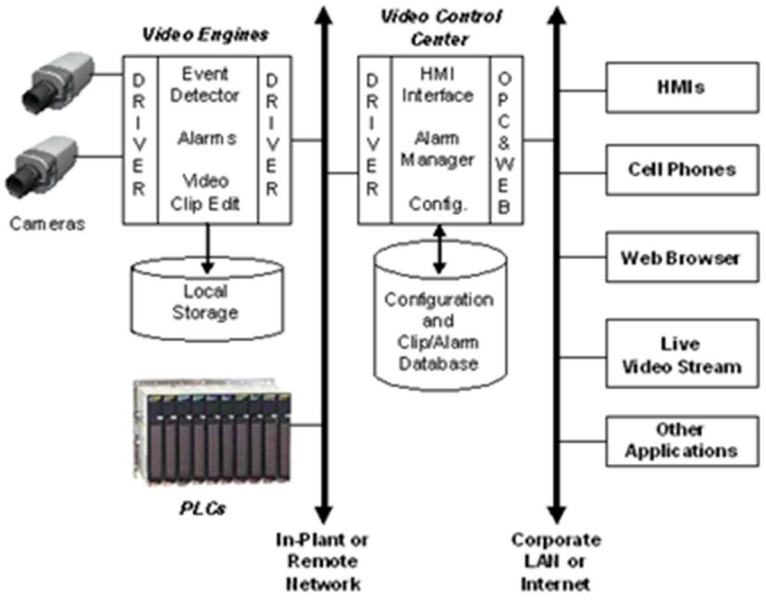
Junqua at Fig. 2.

> Another way that apparatus 10 can communicate with other components of the system is by using a mid-range wireless link, such as radio wave. This mid-range wireless link can be used to communicate with a vehicular component of the system, such as a police car 40 or motorcycle 42. Thus, suspect biometric data, sensed officer reactions, stimuli, scanned input, text input, voice input and/or sounds and images from various on-site cameras 44A–C can be communicated to and from various on-site components of the distributed communications system.

Junqua at 3:12-21; Fig. 2. "Still another way that apparatus 10 can communicate with other components of the system is by using a long-range communication link, such as shortwave radio and/or cell phone technology, to communicate off-site via a communications tower 46 and adjacent network 48." Junqua at 3:23-26. Therefore it was known to transmit data from a local memory to a remote memory located on a mobile phone.

88. Lewellen is another example of remote memory on a mobile phone.

89. Video Process Monitoring, Steve Rubin, automation.com, February 3, 2003, attached as Appendix CC, describes a video monitoring solution. Video Process Monitoring at 3. "Figure 3: Diagram shows how cameras transmit data over standard industrial networks to a video processor. The video processor stores the data in a relational database and makes images available to an HMI/SCADA system, DCS, PLC, process historians, web browsers, cellphones and PDAs." *Id*. at 10.



Id.

> Today, there are two primary ways to monitor a process: in person, by walking around the plant, or from a control room via an HMI screen. But there is a third way: Watching the process via camera monitors that put images directly on the HMI screen (Figure 1) or onto a cell phone or PDA. That way, you don't have to wonder what's happening at the process unit. You can see it.

Id. at 2-3. "The video "snapshot" can be stored on disk, along with batch production data, as a visual record." *Id*. at 3.

> A camera image can be used to help diagnose problems in the field. Wouldn't it be nice to be able to actually see what the process is doing without having to walk out to a distillation column in a Texas summer?

Id. "A video system can be configured to watch equipment and take video snapshots when certain conditions occur—such as that intermittent problem." *Id*. at 5.

> With proper configuration, a "before" and "after" clip can be generated to help troubleshoot the cause of the problem. In other words, the camera watches the process continuously, and stores video images internally; when an alarm condition occurs, it can transmit a video snapshot of the unit for, say, five minutes before the alarm occurred, and then continue transmitting real-time images for as long as necessary. All the images can be stored for playback and analyzed as many times as necessary.

Id. "Essentially, the software asks for video images to be transmitted over the factory network only when it needs the data—such as when an alarm occurs or a step occurs in a batch procedure." *Id*. at 7.

> The software converts a computer into a comprehensive digital videorecorder (DVR) that:
>
> - Continuously collects and archives high-resolution video from a multitude of cameras
>
> - Automatically edits the video stream into before-and-after "clips" when an "event" occurs
>
> - Sends that video clip, along with an alarm message, to the HMI or SCADA system for further handling by the user
>
> ***
>
> - Communicates efficiently over almost any network provided, from gigabit fiber networks, to mid-speed wireless and wired systems, all the way down to 9600 baud wireless and telephone lines.

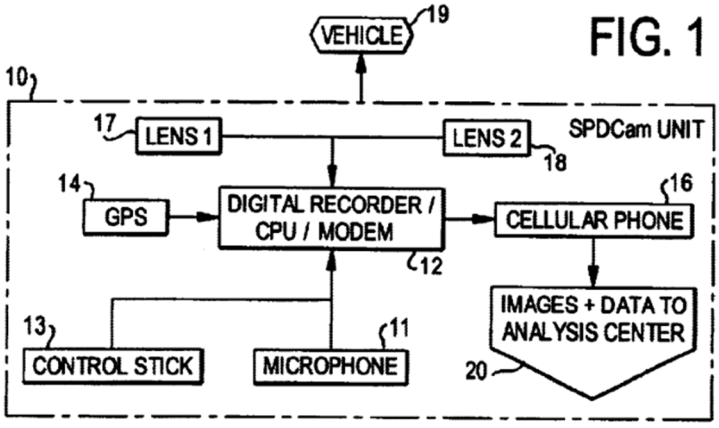
- Newer industrial video monitoring systems have all these features.

Id. at 7-8. "A key need is to edit the videos down to the clips that are important, and store those compressed clips in a way that makes them easy to retrieve." *Id*. at 8. "A relational database serves this need well, especially in manufacturing and process control applications." *Id*.

90. "Video images can also be transmitted to cell phones or PDAs, so that engineers can diagnose problems from home in the middle of the night. Oran engineer can stand next to the process unit, watch the recorded video snapshot of a problem, and try to figure out what really happened. Because the video data is available as an historical record, images and process data can be sent to an outside expert for an analysis." *Id*. at 9. Therefore it was known to transmit data from a local memory to a remote memory located on a mobile phone.

91. U.S. Pat. No. 6,690,294 ("Zierden") discloses "a method for capturing images of a vehicle and/or vehicle operator suspected of a traffic violation, determining the time and geographic location of the suspected violation, transmitting the images and other data to an analysis center, issuing citations to violators and deriving revenue therefrom." Zierden at 1:17-23. "The SPDCam system comprises a color digital imaging device (SPDCam device) connected to a global positioning satellite (GPS) system and a cellular telephone network." *Id*. at 3:31-33. "Referring now to the detail in the drawings, FIG. 1 is a block diagram of a digital imaging device (SPDCam device)

10 for capturing the image of a target vehicle 19 that is suspected of violating a traffic law." *Id*. at 4:11-15.



Id. at Fig. 1. "The SPDCam device 10 comprises two cameras, identified as lenses 17 and 18…." *Id*. at 4: 15-16.

> In operation, the lenses 17 and 18 constantly record images, with the most recent time period, e.g., 120 Seconds, of images being retained in the computer memory at any given time. As new images are acquired, older ones are erased. When a target vehicle is identified, the system operator activates an 'Event' on the SPDCam device 10 to begin collecting data for the target vehicle. When the 'Event' is initiated, the prior 120 seconds of images are permanently stored, and subsequent images of the target vehicle are continuously captured and stored in the computer memory until the operator 'Ends' the event. GPS data and the entirety of the audio recording is retained from the start of the event to the end thereof, and stored with the images.

Id. at 5:8-20. "[S]witches may be provided for selecting between the video mode and the photographic mode of operation." *Id*. at 5:24-25.

92. "The computer 12 processes, stores, and transmits the images and the geographic and audio data to an analysis center 20 via a cellular telephone 16." *Id*. at 4:24-26. For example, "[a]n 'Event' key permanently stores the most recent 120 seconds of images while continuing to record until an 'End/Store' key is pressed to stop the recording of the images." *Id* at 5:30-33. "All the images are stored in the memory of the computer 12." *Id*. at 5:33-34. "A 'Submit' key activates the cellular telephone 16 connected to the computer 12 which transmits the images and other collected data to the analysis center 20." *Id*. at 5:39-42. Therefore it was known to transmit data from a local memory to a remote memory located on a mobile phone.

8. Treating A Circular Buffer As A Single File Was Known In The Art

93. Prior to the alleged invention, it was known to treat a circular buffer as a single file. For example, utilizing multiple files can be more time consuming than using a single file. Using a single file format has been found to be well-suited for implementing a circular storage buffer and for storing video data. U.S. Pub. No. 2002/0191952 ("Fiore," EX1009) at [0064]. For example, a single "memory mapped file…has a memory mapped architecture that combines the access speed of the RAM memory with large storage capacity of a disk file." Fiore at [0065]. "The memory mapped architecture allows the playback from the circular storage buffer to be independent from recording into the buffer so that such recording is uninterrupted by the playback." *Id*. "Because the circular storage buffer is implemented via a memory

mapped file 110 which is preferably a single contiguous disk file, reads and writes to adjacent virtual memory locations are insured to be physically adjacent on the disk drive. In this manner, the circular storage buffer cannot become fragmented on the disk drive" *Id.* at [0071].

94. As the patents of the Stellar patent family recognize, it was known to continuously store images in a looping (circular) memory, and upon receiving a trigger signal, protect a portion of the memory. *See e.g.*, '752 patent at 1:35-46. During prosecution of the '034 patent, the application admitted that having "a recording facility that continuously records the data stream into available portions of a circular buffer in the local memory" was known and disclosed by Vanman (WO 6,044,476). '034 File History, Accelerated Examination Support Document at 11-12. Specifically, the applicant stated that "Vanman teaches a recording facility that continuously records the data stream into available portions of a circular buffer in the local memory." *Id*. at 12.

95. Fiore is another example of treating a circular buffer as a single file.

96. U.S. Pat. No. 6,578,070 ("Weaver"), attached as Appendix DD, discloses "[a] method and system for storing a continuous feed of video." Weaver at Abstract. "According to one aspect of the invention, the continuous feed is encoded in a digital video format to produce a digital data stream." *Id*. "A series of content files is created by repeatedly performing the steps of (1) storing the digital data stream in a current file, and (2) establishing a new file as the current file when the current file satisfies a predetermined condition." *Id*. "If the series of content files satisfy a particular deletion

criteria, then a particular content file that satisfies a particular deletion criteria is deleted." *Id*. "In certain aspects, tag information that indicates information about frames contained in the digital data stream is generated." *Id*. "The tag information is used to identify a location in the digital data stream that corresponds to the relative time." *Id*. "The digital data stream is then transmitted to the client beginning at the location in the digital data stream that corresponds to the relative time." *Id*.

> In order to have continuous buffer of data, for instance the last 24 hours of Lifetime, Television for Women, older content needs to be deleted along with the corresponding tags. Various approaches may be used to implement such a continuous buffer. With respect to the content data, the simplest approach to implement a continuous buffer is to create a single file large enough to hold 24 hours of footage. The file is then treated as a circular buffer. Specifically, after the creation of the initial 24 hour file, the MDS server 110 would establish the beginning of the file as the current "insertion point". The MDS server 110 would then store new content data over the old data at the insertion point, and move the insertion point to the end of the new data. When the insertion point hits the end of the file, it wraps around again to the beginning of the file.

Id. at 17:9-25.

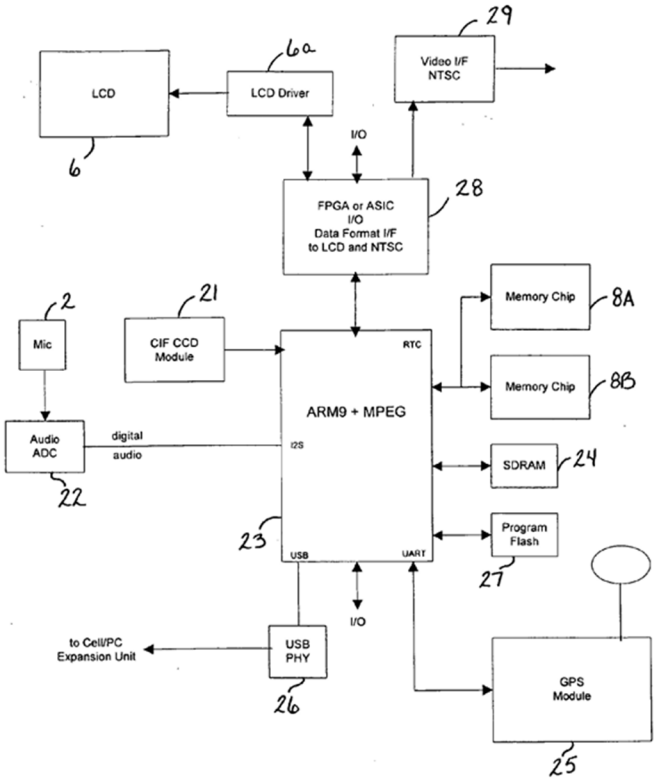
> FIG. 4 illustrates an alternative, more flexible approach to buffering a predetermined amount of an infinite video feed. Referring to FIG. 4, the content data is stored in a group of smaller files 402-414. Each of the smaller files stores a subset of the buffered content data. In the illustrated embodiment, each of files 402-412 store two hours worth of content. File

> 414 currently stores one hour of content. The current insertion point is at the end of file 414. When file 414 reaches two hours of content, file 414 will be closed and a new content file will be created. As content files age, the older content files are deleted to free up disk space for new files. During playback, files are joined together seamlessly by the video pump as the content data is sent to the client.

Id. at 17:37-49. Therefore, it was known to treat a circular buffer as a single file.

97. U.S. Pub. No. 2005/0078195 ("Van Wagner") states "[t]he present invention provides an improved method and system for a personal mobile digital recording system (MDRS) to capture activities of, for example, a law enforcement officer." Van Wagner at [0005]. Specifically, "a mobile recording device including: a flexible camera head for capturing video stream data in real time, a microphone for capturing audio data in real time, a circular buffer for continuously storing the video stream data and the audio data; and a wireless transceiver for transmitting the video and audio data in real time to a remote location." Van Wagner at [0009]; Figs. 2, 4B.

FIG. 2

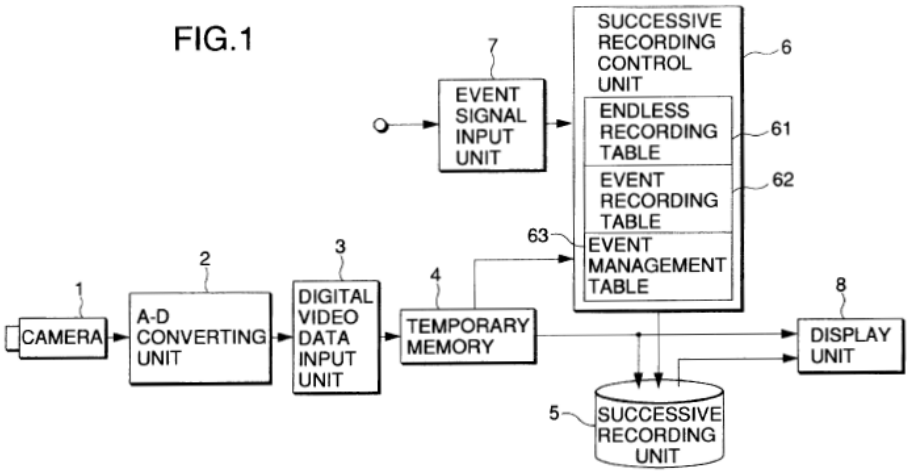


Van Wagner at Fig. 2. "In one embodiment, the single replaceable memory module includes a single image file configured as a circular buffer." *Id*. at [0084]. "The single replaceable memory module is then operated as a circular buffer, in which the video, audio, and other data is being continuously recorded in the single replaceable memory module in a circular manner." *Id*. "In one embodiment, video, audio, date and time, GPS overlay channel, electronic compass bearing channel, and biometric data overlay channel are encoded in an MPEG data stream." *Id*. at [0035]. "The MPEG data stream is written and saved on replaceable memory modules." *Id*. "In one embodiment, the image files created on the SD memory card are named according to the following format: YYMMDDHHMI.mp4 (YY=Year, MM=Month, DD=Day, HH=Hour,

MI=Minute)." *Id*. at [0084]. Therefore, it was known to treat a circular buffer as a single file.

98. U.S. Patent No. 7,158,167 ("Yerazunis") (EX1017) is another example of treating a circular buffer as a single file.

99. U.S. Patent No. 6,167,186 ("Kawasaki") discloses "a video recording device for recording a digitized video image inputted from a camera into a digital storage memory, and more particularly to a video recording device which is capable of retroactively reproducing a video image (event video image) generated when any event occurs while it records a video image monitored in real time." Kawasaki at 1:8-14.



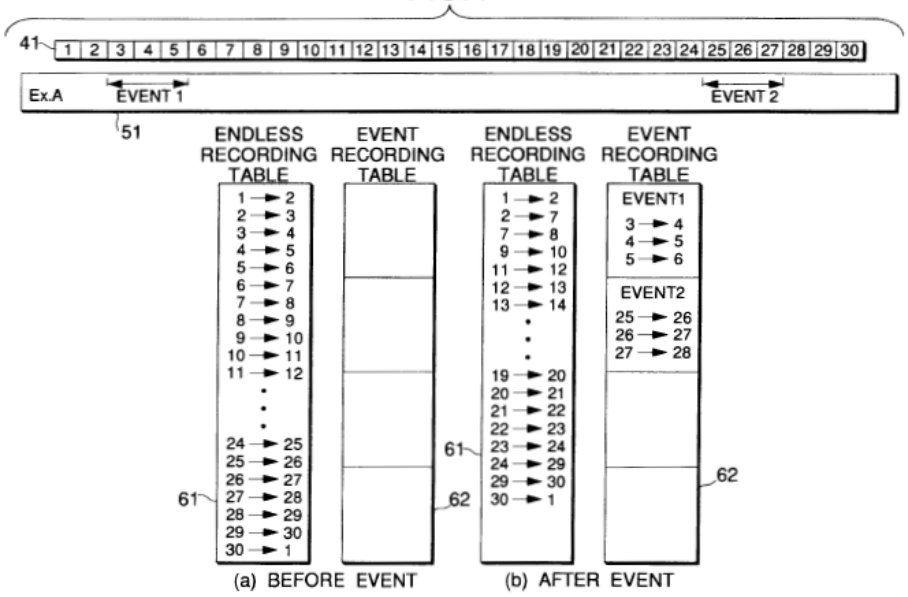
Id. at Fig. 1.

> Now referring to FIG. 4. an explanation will be given of a method of the processes of recording and reproducing in the successive recording control unit 6. Reference numeral 41 shows the state where the successive recording unit 5 is divided into a plurality of blocks (30 blocks in this example) labeled block numbers (pointers), respectively. Reference numeral 51 denotes a time zone of events which have occurred

during the successive recording. The successive recording control unit 6 includes an endless recording table 61 and an event recording table 62, and manages the numbers of the blocks on which the digital video image is to be recorded as shown in part (a) of FIG. 4. The notation "1-2" in the part (a) represents that the recording block successive to block No. 1 is block No. 2. By provision of such a recording table, the blocks are overwritten in order from the block with an older record.

Id. at 4:30-45.

FIG.4



Id. at Fig. 4. "Next, an explanation will be given of the operation when the successive recording control unit 6 receives an event signal from the event signal inputting unit 7." *Id*. at 4:39-48. "Now it is assumed that the event signal is inputted while the recording is made at the position of block No. 4." *Id*. at 4:48- 50. "In this case, the video image from block No. 3 with a previously recorded image to block No. 6 with a video image after the event will be managed as an event video image." *Id*. at 4:50-53.

> Since the present invention always executes the recording in a manner of endless recording, the video image inclusive of the video image prior to inputting of the event signal can be managed as an event video image. Thus, event No. 1 will be managed on the event recording table as shown in part (b) of FIG. 4. Event No. 2 will be managed similarly. Now if only the event recording table is updated as it is, the event video images are overwritten to disappear at a period of endless recording. For this reason, the endless recording table must be also modified. As shown in the part (b), notation "2-7" represents that the block Nos. 3, 4, 5 and 6 are excluded from the loop of the endless recording. Likewise, notation "24-29" saves the event video image of event No. 2 from the endless recording. In this way, in the endless recording area, the recording area correlated with the event signal will not be thereafter used as an endless recording and not overwritten so that the event video image will be held for a longer period than the endless recording period.

Id. at 4:53-5:4. "Since the event video image when an event occurs needs not to be transferred to a separate area, the access time in the successive recording unit can be efficiently used so that the event video image can be reproduced with a sufficient allowance." *Id*. at 7:4-9. Therefore, it was known to treat a circular buffer as a single file.

9. Indexing Write-Protected Portions As A Second, Distinct File In The Circular Buffer Was Known In The Art

100. Prior to the alleged invention, it was known to index write-protected portions of a circular buffer as a second, distinct file in the circular buffer. For example, Indexing write-protected portions as distinct files within the circular buffer improves

access time to the recorded events. Specifically, "since the event video image when an event occurs needs not to be transferred to a separate area, the access time in the successive recording unit can be efficiently used so that the event video image can be reproduced with a sufficient allowance." Kawasaki at 7:4-9. Similarly, "it is often desirable for the user of the event recording and playback device to quickly view or otherwise access the stored data for a segment of time monitored, and to quickly move on to another segment of time monitored." Fiore at [0010]. "Having to retrieve one or more of the plurality of files that are stored in the intermediate storage location, and/or to compile a plurality of files is cumbersome and time consuming." *Id*. "More specifically, as the operator retrieves and/or compiles the files stored in the intermediate storage location, the resources of the processor and the bus of the computer become occupied and likelihood of delays in executing instructions to record and store the data into the intermediate storage location increases thereby resulting in the increased likelihood of dropped frames." *Id*. at [0014]. Using a circular buffer and marking event data as a second file within the circular buffer provides a solution to the above identified problem. Fiore at [0022], [0065] – [0068].

101. Fiore is another example of indexing write-protected portions as a second, distinct file in the circular buffer.

102. U.S. Pat. No. 6,578,070 ("Weaver") discloses "[a] method and system for storing a continuous feed of video." Weaver at Abstract. "According to one aspect of the invention, the continuous feed is encoded in a digital video format to produce a

digital data stream." *Id*. "A series of content files is created by repeatedly performing the steps of (1) storing the digital data stream in a current file, and (2) establishing a new file as the current file when the current file satisfies a predetermined condition." *Id*. "If the series of content files satisfy a particular deletion criteria, then a particular content file that satisfies a particular deletion criteria is deleted." *Id*. "In certain aspects, tag information that indicates information about frames contained in the digital data stream is generated." *Id*. "The tag information is used to identify a location in the digital data stream that corresponds to the relative time." *Id*. "The digital data stream is then transmitted to the client beginning at the location in the digital data stream that corresponds to the relative time." *Id*.

> In order to have continuous buffer of data, for instance the last 24 hours of Lifetime, Television for Women, older content needs to be deleted along with the corresponding tags. Various approaches may be used to implement such a continuous buffer. With respect to the content data, the simplest approach to implement a continuous buffer is to create a single file large enough to hold 24 hours of footage. The file is then treated as a circular buffer. Specifically, after the creation of the initial 24 hour file, the MDS server 110 would establish the beginning of the file as the current "insertion point". The MDS server 110 would then store new content data over the old data at the insertion point, and move the insertion point to the end of the new data. When the insertion point hits the end of the file, it wraps around again to the beginning of the file.

Id. at 17:9-25.

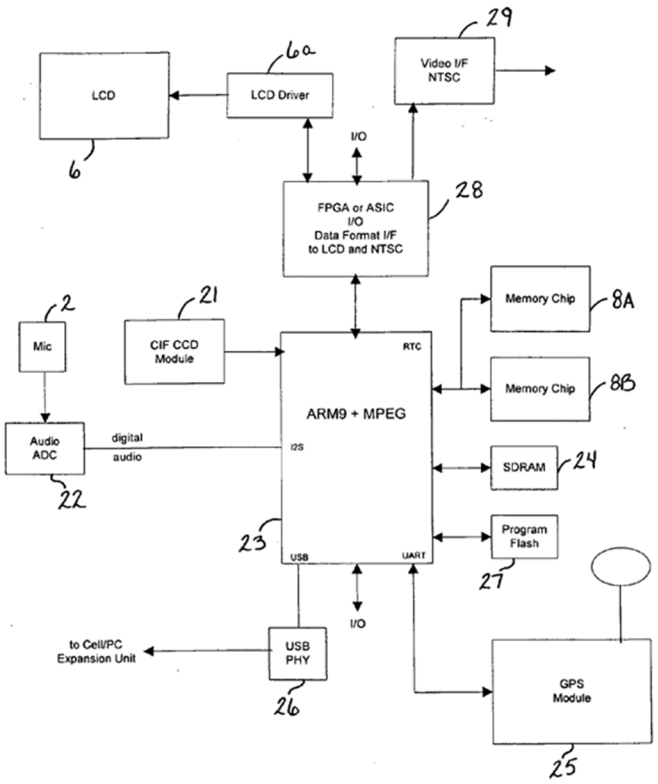
> FIG. 4 illustrates an alternative, more flexible approach to buffering a predetermined amount of an infinite video feed. Referring to FIG. 4, the content data is stored in a group of smaller files 402-414. Each of the smaller files stores a subset of the buffered content data. In the illustrated embodiment, each of files 402-412 store two hours worth of content. File 414 currently stores one hour of content. The current insertion point is at the end of file 414. When file 414 reaches two hours of content, file 414 will be closed and a new content file will be created. As content files age, the older content files are deleted to free up disk space for new files. During playback, files are joined together seamlessly by the video pump as the content data is sent to the client.

Id. at 17:37-49. "According to another feature of the invention, a series of content files is created by repeatedly performing the steps of (1) storing the digital data stream in a current file; (2) generating and storing tag information separate from the digital video stream that indicates information about frames contained in the digital data stream; and (3) establishing a new file as the current file when the current file satisfies a predetermined condition. If the series of content files satisfy a particular deletion condition, then a particular content file that satisfies a particular deletion criteria is deleted. *Id*. at 3:40-50. Therefore, it was known to treat a circular buffer as a single file and to index write-protected portions of a circular buffer as a second, distinct file in the circular buffer.

103. U.S. Pub. No. 2005/0078195 ("Van Wagner") states "[t]he present invention provides an improved method and system for a personal mobile digital

recording system (MDRS) to capture activities of, for example, a law enforcement officer." Van Wagner at [0005]. Specifically, "a mobile recording device including: a flexible camera head for capturing video stream data in real time, a microphone for capturing audio data in real time, a circular buffer for continuously storing the video stream data and the audio data; and a wireless transceiver for transmitting the video and audio data in real time to a remote location." Van Wagner at [0009]; Figs. 2, 4B.

FIG. 2

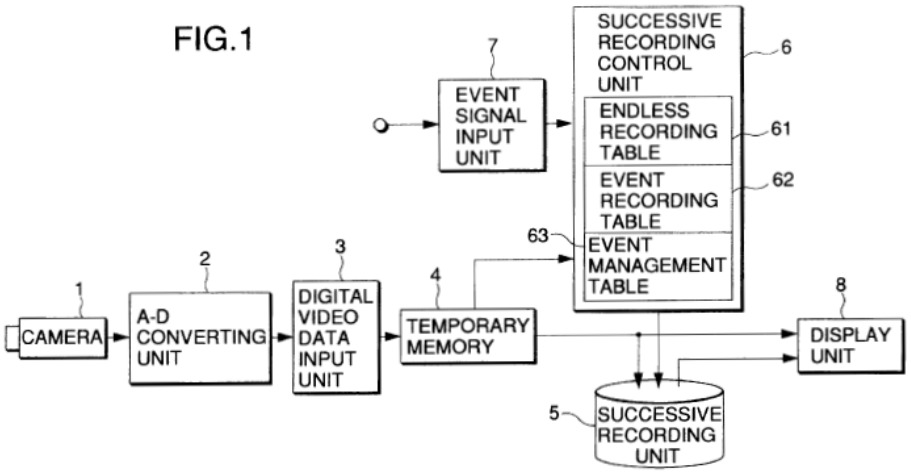


Van Wagner at Fig. 2. "In one embodiment, the single replaceable memory module includes a single image file configured as a circular buffer." *Id*. at [0084]. "The single replaceable memory module is then operated as a circular buffer, in which the video, audio, and other data is being continuously recorded in the single replaceable memory

module in a circular manner." *Id*. "In one embodiment, video, audio, date and time, GPS overlay channel, electronic compass bearing channel, and biometric data overlay channel are encoded in an MPEG data stream." *Id*. at [0035]. "The MPEG data stream is written and saved on replaceable memory modules." *Id*. "In one embodiment, the image files created on the SD memory card are named according to the following format: YYMMDDHHMI.mp4 (YY=Year, MM=Month, DD=Day, HH=Hour, MI=Minute)." *Id*. at [0084]. Therefore, it was known to treat a circular buffer as a single file and to save data as a second, distinct file in the circular buffer.

104. Yerazunis is another example of indexing write-protected portions as a second, distinct file in the circular buffer.

105. U.S. Patent No. 6,167,186 ("Kawasaki") discloses "a video recording device for recording a digitized video image inputted from a camera into a digital storage memory, and more particularly to a video recording device which is capable of retroactively reproducing a video image (event video image) generated when any event occurs while it records a video image monitored in real time." Kawasaki at 1:8-14.

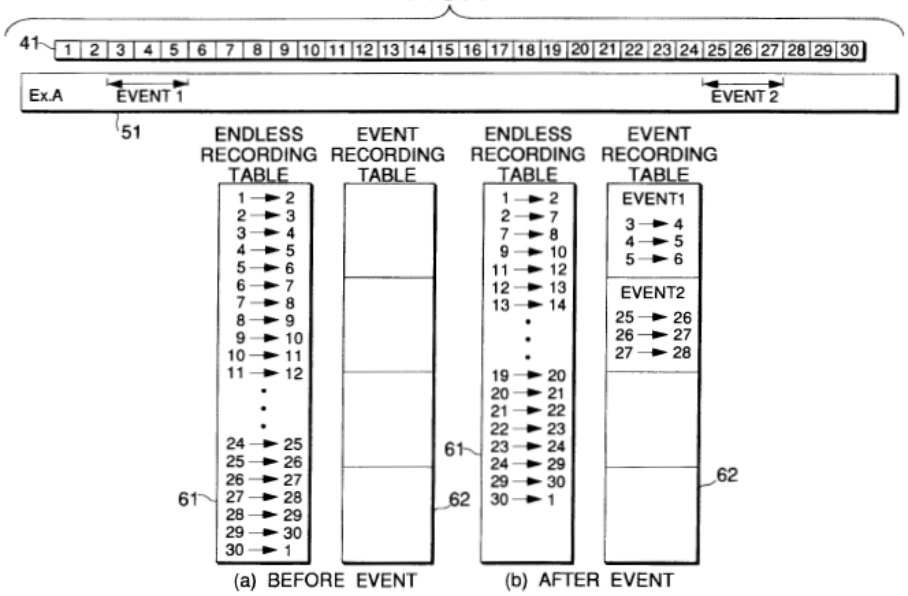


Id. at Fig. 1.

> Now referring to FIG. 4. an explanation will be given of a method of the processes of recording and reproducing in the successive recording control unit 6. Reference numeral 41 shows the state where the successive recording unit 5 is divided into a plurality of blocks (30 blocks in this example) labeled block numbers (pointers), respectively. Reference numeral 51 denotes a time zone of events which have occurred during the successive recording. The successive recording control unit 6 includes an endless recording table 61 and an event recording table 62, and manages the numbers of the blocks on which the digital video image is to be recorded as shown in part (a) of FIG. 4. The notation "1-2" in the part (a) represents that the recording block successive to block No. 1 is block No. 2. By provision of such a recording table, the blocks are overwritten in order from the block with an older record.

Id. at 4:30-45.

FIG.4



Id. at Fig. 4. "Next, an explanation will be given of the operation when the successive recording control unit 6 receives an event signal from the event signal inputting unit 7." *Id*. at 4:39-48. "Now it is assumed that the event signal is inputted while the recording is made at the position of block No. 4." *Id*. at 4:48- 50. "In this case, the video image from block No. 3 with a previously recorded image to block No. 6 with a video image after the event will be managed as an event video image." *Id*. at 4:50-53.

> Since the present invention always executes the recording in a manner of endless recording, the video image inclusive of the video image prior to inputting of the event signal can be managed as an event video image. Thus, event No. 1 will be managed on the event recording table as shown in part (b) of FIG. 4. Event No. 2 will be managed similarly. Now if only the event recording table is updated as it is, the event video images are overwritten to disappear at a period of endless recording. For this reason, the endless recording table must be also modified. As shown in the part (b), notation "2-7" represents that the block Nos. 3, 4, 5 and 6 are

> excluded from the loop of the endless recording. Likewise, notation "24-29" saves the event video image of event No. 2 from the endless recording. In this way, in the endless recording area, the recording area correlated with the event signal will not be thereafter used as an endless recording and not overwritten so that the event video image will be held for a longer period than the endless recording period.

Id. at 4:53-5:4. "Since the event video image when an event occurs needs not to be transferred to a separate area, the access time in the successive recording unit can be efficiently used so that the event video image can be reproduced with a sufficient allowance." *Id*. at 7:4-9.

106. "Moreover, in the video recording device according to the present invention, the successive recording control unit monitors the recording capacity of the endless recording area from which the event recording area is excluded, and when the recording capacity is short for the recording period of the endless recording, it restores the event recording areas as endless recording areas successively in order of older setting or lower priority." *Id.* at 2:32-39. "Still further, the video recording device according to the present invention further comprises a long-term storage unit, and in that the recording contents of the event recording area is transferred to the long-term storage unit so that the event recording area is restored as an endless recording area." *Id.* at 2:40-44. Therefore, it was known to treat a circular buffer as a single file and to index write-protected portions of a circular buffer as a second, distinct file in the circular buffer.

107. U.S. Pat. No. 7,747,143 ("DeKeyser"), attached as Appendix FF, discloses a "high performance digital video recorder." DeKeyser at Abstract. "The recorder also requires at least one hard disk drive and audio and video input analog signals (from a source such as video camera or broadcast media) as well as a suitable monitor for receiving output audio and video analog signals." *Id*. "Novel features of the preferred embodiment include use of an index table for disk addresses of recorded frames, a multi-port memory controller in the form of a field programmable gate array (FPGA), loop recording using dual channels, and dynamic JPEG compression compensation." *Id*.

> Certain applications benefit from the ability to record continuously. In surveillance, for example, it is useful to record until an alarm occurs, then to stop some time after the alarm. The recorder has captured time before, during, and after the alarm, which can be useful in determining the cause of the alarm. There is a need to provide support for such a loop recording mode.

Id. 1:54-60.

> Index Table
>
> During recording, individual frames of video are compressed and stored sequentially into contiguous regions of unused disk space, called "Available Records". A particular recording of a continuous sequence of video frames, called a "clip", may span many Available Records across many individual disk drives, up to the total amount of disk space available (see FIG. 2)

Id. at 3:58-64.

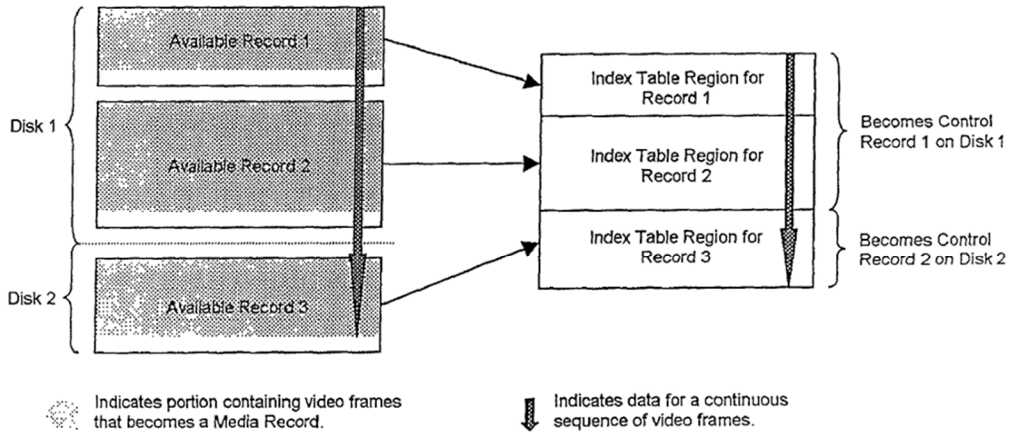


FIG. 2

Id. at Fig. 2. "The region used to store video frames within an Available Record becomes a "Media Record" (see FIG. 2)." *Id*. at 4:18-19. "The invention's firmware supports a 'loop record' mode where the recorder first fills available space, then continues recording by overwriting the oldest video." *Id*. at 2:38-40. "The invention manages and allocates disk space by maintaining in memory a directory of records on disk." *Id*. at 5:51-52.

> As mentioned previously, after a recording is completed, the disk record directory also contains the following for each resulting Control Record and Media Record in the clip:
>
> > The unique clip identification number (Clip ID) for the clip.
> >
> > The Sequence Number of the disk record within the clip.
>
> The disk record directory thus provides the information the recording process needs to seamlessly record sequential video frames in proper order to disk across multiple Available Records. It also provides the

information the recording process needs to "loop" video frame recording when it reaches the end of available disk space and overwrite previously recorded video frames in a continuous manner.

Id. at 6:20-33.

6. The method of recording of claim 5, further comprising protecting the first compressed frame from being overwritten by a third variable sized compressed frame via writing the third compressed frame at a memory location corresponding to at least one of the memory addresses of the first selected regions other than the first frame address.

Id. at Claim 6.

8. A method of storing and playing back a video recording having 1 though n variable length video frames, where n is at least 9 comprising: storing each of the n video frames in n different memory locations, respectively; using a random access frame index to store pointers to each of the n memory locations; using the frame index to obtain a frame address referencing one of the n different memory location; and using the frame address to directly locate, access, decompress, and playback any individual ones of the n video frames out of sequence within a single frame latency time while playing back any one of the other video frames.

Id. at Claim 8. Therefore, it was known to treat a circular buffer as a single file and to index write-protected portions of a circular buffer as a second, distinct file in the circular buffer.

108. U.S. Pat. No. US 2007/0071395 A1 ("Boone"), attached as Appendix GG, discloses a "method for video recording includes producing a first video data by an

image sensor in a video recording device, storing the first video data in a temporary memory buffer in the video recording device, selecting at least a portion of the first video data in a semi-permanent data storage, and copying the selected portion of the first video data from the temporary memory buffer to the semi-permanent data storage in the video recording device." Boone at Abstract. "The temporary memory buffer can include a circular buffer that allows the recording system to write the most recent portion of the first video data over the oldest portion of the first video data in the temporary memory buffer. The video recording device can further include a user interface that allows a user to select at least a portion of the first video data to be copied to the semi-permanent data storage. The temporary memory buffer can include a data pointer configured to indicate the current recording location in which the next video data is to be written in the temporary memory buffer." *Id.* at [007]. "The disclosed system and methods include the following advantages. The disclosed system and methods allow a photographer to not miss scenes or moments worth recording. The disclosed system and methods provide a video camcorder a novel 'temporary recording mode' in addition to the conventional 'idle mode' and 'record mode.' The 'temporary recording mode' allows scenes to be continually recorded in a temporary memory buffer without storing the video data in semi-permanent data storage on the camcorder. The disclosed system and methods allow historical scenes captured in the 'temporary recording mode' to be reviewed by the photographer. The photographer can make decision after the recording of the scenes whether the recorded video data is worth

storing on the semi-permanent data storage such as a magnetic tape, DVD-R, CD-R. Only noteworthy scenes can be selectively recorded in the semi-permanent data storage while uninteresting scenes can be discarded. The disclosed system and methods allow interesting scenes to be recorded without filling up the memories in the video recording system with uninteresting video data. The disclosed system and methods are compatible with a variety of digital camcorders including those that use the MiniDV format as well as HD." *Id.* at [0008]. Therefore, it was known to treat a circular buffer as a single file and to index write-protected portions of a circular buffer as a second, distinct file in the circular buffer.

109. U.S. Pat. No. US 6,421,080 ("Lambert") discloses an "image recording System and method for use with a surveillance system having at least two cameras provides true pre-event recording for multiple input sources to improve video on demand storage control. More specifically, an image recording subsystem is connected to the cameras for receiving generated video images, and storing the received images in a temporary Storage device having a Storage capacity large enough to store video images generated over a predetermined period of time. The image recording subsystem is arranged to continuously record video images into the temporary storage device such as a cache memory, and in response to the occurrence of a triggering event, subsequently record the temporarily stored video images into a long-term storage device for later retrieval. The image recording system is arranged to determine the occurrence of overlapping triggering events, and automatically "rewind" the sequential

long term storage process so that any images associated with an earlier triggering event but occurring in time after a later triggering event that have already been stored to long term storage are properly reordered to occur after any earlier occurring images associated with the later triggering event." Lambert at ABSTRACT. Therefore, it was known to treat to index write-protected portions of a circular buffer as a second, distinct file in the circular buffer.

110. US Pub. No. US 2007/0132773 A1 ("Plante 2"), attached as Appendix HH, discloses "vehicle event recorder systems are arranged with three stage memories and special mechanism to manage those memories including transfer of data there between. Namely, a managed loop memory receives data from a video camera in real-time and continuously overwrites expired data implicitly determined no longer useful. Data in a managed loop memory is only passed to a more stable memory, a high capacity buffer memory, in response to an event having occurred. An event trigger produces a signal, which causes data transfer between the managed loop memory and an on-board, high-capacity buffer memory. The high-capacity buffer memory is suitable for storing video series associated with a plurality of events. Finally, a permanent data store is arranged to receive data from the high-capacity buffer memory whenever the system returns and falls within a predetermined proximity of a download station." Plante 2 at Abstract.

111. "Unlike common video systems arranged to capture continuous video, vehicle recorder systems are primarily designed to capture certain particular events

occurring over very short time periods. For example, in vehicle recorder systems, it is not useful to produce a continuous video record of scenes and events around the vehicle throughout its service day. Rather, only particular events associated with certain vehicle use are of interest. For example, those events associated with vehicle abuse. Further, traffic accidents and other forms of vehicle misuse yield occasions where it is desirable to have a brief video record of the circumstance(s) which led to and resulted from such misuse or accident. Thus the video recorder systems of this disclosure are characterized in that they are intended to capture short video sequences rather than video sequences over extended period of time. This detail has direct implications with regard to choice of memory arrangements. In this case, it is useful to arrange a first memory in a managed loop configuration whereby video is collected in real-time but constantly overwritten with later captured video data. Only when an important event occurs is data preserved by transfer to a high capacity buffer memory." *Id*. at [0039].

112. "As it is desirable in a vehicle recorder system that devices be very small and compact in size, certain memories which cannot be easily implemented as compact systems are not appropriate for vehicle event recorders. In example, large disk drive arrays, which have huge capacity and great redundancy, are memory systems not appropriate for these vehicle event recorder systems. However, memory systems commonly know as 'flash' type memory are highly useful. A flash type memory can be useful to hold video data associated with a plurality of discrete video events. Thus in preferred versions, a flash type memory buffer is coupled to managed loop memory

such that each time an event occurs, data in managed loop memory is transferred to the flash memory. Flash memory having a high-capacity is operable for storing video data associated with many events." *Id.* at [0040]. "Finally, attention is directed to the nature of communications connectivity associated with a vehicle which includes computing systems. Since vehicles are not readily suited to be plugged into wired computer network systems, it is useful to implement special consideration when configuring a memory strategy for vehicle event recorders. Thus, an on-board memory may have a special relationship with a remote network memory. These two memories may be coupled to each other only at specific times, for example, when a vehicle has returned to a download station." *Id.* at [0041]. "With reference to FIG. 2, a traffic accident between two automobiles car 21 and car 22 equipped with a vehicle event recorder system 24 having accelerometers 25 arranged as an event trigger. When a collision 23 occurs, the accelerometer initiates a data transfer between managed loop memory and a buffer memory to preserve video data collected immediately before and after the traffic accident. In similar fashion, car 26 equipped with a vehicle event recorder and accelerometer type event trigger illustrates that video of single vehicle accidents are captured as well." *Id.* at [0049]. Therefore, it was known to treat to index write-protected portions of a circular buffer as a second, distinct file in the circular buffer.

V. The Alleged Invention Of The '034, '882, '471, And '914 Patents

113. In the discussion that follows, I cite to portions of the '471 patent's specification in explaining the alleged invention of the '034, '882, '471, and '914

patents. I note that these four patents share a common disclosure, so my discussion applies equally to all four patents.

114. The ’471 patent is directed to an “apparatus, systems, and methods in which a surveillance apparatus processes images by (1) continuously recording a stream of imaged data, (2) write protecting segments of the recorded stream, and (3) sending write protected segments from a local memory to a remote memory using a wireless transmitter.” EX1001 at 2:12-17. Figure 1 of the ’471 patent, reproduced below, illustrates one such system in which a camera 120 is coupled to a belt-worn recorder 160 via a data and power cord 140. Also depicted is a remote memory 170 and a ring-shaped signaling device 150, both of which “cooperate” with the recorder 160. EX1001 at 3:61-64.

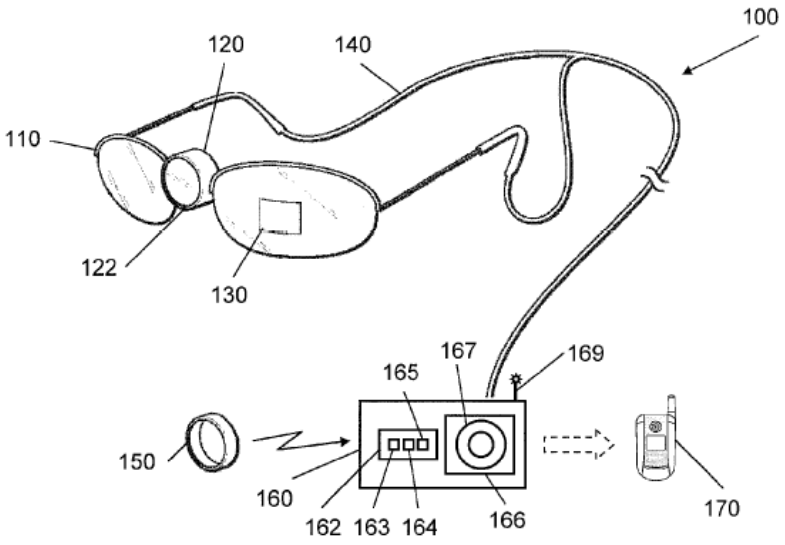


FIG. 1

Recorder 160 is described as “any recording device that records video and/or audio/video data, including conventional recorders,” and “preferably includes a

processor 162 with software or hardware that accomplishes the functions described herein, or one or more physical memories that are collectively referred to herein as memory 166." *Id.* at 4:59-64. "[T]he recorder's electronics are preferably all on a unitary printed circuit board with different functions, or facilities, encoded on a programmable chip or disk." *Id.* at 5:31-35. "While the different facilities are preferably part of a single hardware or software program, the facilities could be split into different components as necessary." *Id.* at 5:41-43.

115. "In preferred embodiments, image data received by recorder 160 is stored in a circular buffer 167 on memory 166." *Id.* at 5:64-67. Figure 3 of the '471 patent shows a "diagram representation of circular buffer 167 [mislabeled in Figure 3 with reference numeral 169] in memory 166, with unprotected segment 320 and write-protected segment 330." *Id.* at 7:39-41. "The recording facility 163 continuously records [a] data stream 310 [from the recorder 160] into circular buffer 167." *Id.* at 7:43-44. "The recording facility 163 records over unprotected segment 320 of circular buffer 167, while skipping over protected segments 330 of circular buffer 167." *Id.* at 7:44-47. "It is contemplated that the portion of the circular buffer that is marked as write-protected data cannot be overwritten once the recorder loops back to the beginning of the media." *Id.* at 7:47-50.

116. "The circular buffer is preferably organized into a series of memory segments that loops back on itself," and receipt of a "record signal" causes "a segment of the circular buffer to be write-protected to prevent that segment from being

overwritten during the next recording loop." EX1001 at Abstract, 2:21-24, 4:34-37. An example of a circular buffer with write-protected segment 330 is shown in Figure 3 of the '471 patent:

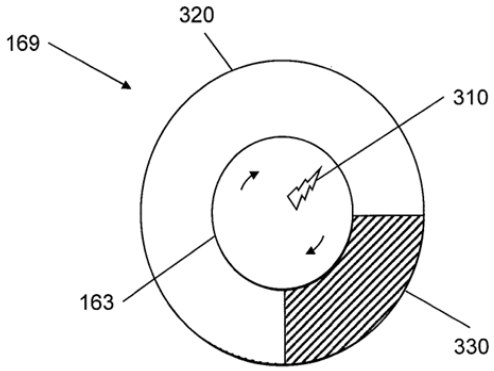


FIG. 3

Id. at Fig. 3.

117. The write-protected segment includes video data from both before and after the record signal, thus helping to ensure that unexpected moments are not missed. *See id*. at 2:38-41. As stated in the Background section of one of the patents to which the '471 patent claims priority, U.S. Patent No. 8,928,752 ("the '752 patent," EX1004), it is "desirable to record an unexpected event (automobile accident, baseball hit, quick kiss, facial expression, etc), but by the time someone pulls out a camera and focuses on the target, the moment is gone." EX1004 at 1:13-16. By using the circular buffer to continuously record video data—thereby capturing pre-event video—and then write protecting a segment containing pre- and post-event video, such unexpected moments can be preserved.

VI. Claim Construction

118. It is my understanding that in determining whether a patent claim is anticipated or obvious in view of the prior art, the Patent Office must construe the claim by giving the claim its plain and ordinary meaning, consistent with the specification and prosecution history. For the purposes of this declaration, I have construed each claim term in accordance with its plain and ordinary meaning except where particular constructions are discussed.

A. "a local memory functionally coupled to the [camera/sensor]"

119. The term "a local memory functionally coupled to the camera" appears in claim 1 of each of the '034 and '882 patents. The term "a local memory functionally coupled to the sensor" appears in claim 1 of the '471 patent. The shared specification of the four challenged patents expressly defines the former term: "As used herein, the term 'a local memory functionally coupled to the camera' means that the memory that is distanced less than 20 cm from the camera, and is coupled to the camera using entirely physical connectors (e.g., wires, pins, conductive paths, etc.)." EX1010, 2:12-21.

120. I understand that in the corresponding district court litigation, the parties have agreed to the following constructions:

Claim Term	Agreed Construction
"a local memory functionally coupled to the camera" '034 patent, claim 1	"a memory that is distanced less than 20 cm from the camera and is coupled to the camera using entirely physical connectors"
"a local memory functionally coupled to the sensor" '471 patent, claim 1	"a memory that is distanced less than 20 cm from the sensor and is coupled to the sensor using entirely physical connectors"

EX1021, 1.

121. The parties' agreed-to constructions are consistent with the express definition of "a local memory functionally coupled to the camera" included in the challenged patents. Accordingly, in the analysis that follows, I apply the parties' agreed-to constructions captured in the table above for the terms "a local memory functionally coupled to the camera" and "a local memory functionally coupled to the sensor."

B. "file"

122. Claims of the challenged patents recite the word "file." For example, independent claim 1 of the '034 patent recites "continuously record[ing] the data stream into available portions of a circular buffer in the local memory as a first *file* using a digital video file format" and "indexing the write-protected portion as a second distinct *file* in the circular buffer."[1] EX1010, 11:53-64. Several other claims of the challenged patents contain similar recitations of "file." For all claims of the '034,

[1] In this declaration, all emphasis is added unless otherwise noted.

’882, ’471, and ’914 patents, the term “file” should be given its plain and ordinary meaning as of June 2007, which was “an identifiable collection of data.”

123. ***Intrinsic Evidence***: The challenged patents describe their purported invention as utilizing a file-based approach for the circular buffer. The patents state the entire circular buffer can be treated as a file. EX1010, 5:66-6:7. The patents further state write-protected portions of the circular buffer can be stored as files within the circular buffer. *Id.*, 2:29-51, 9:18-26. Thus, in Figure 3, the entire circular buffer 167 (mislabeled with reference numeral 169) is treated as a file, and write-protected segment 330 is also treated as a file stored in the circular buffer:

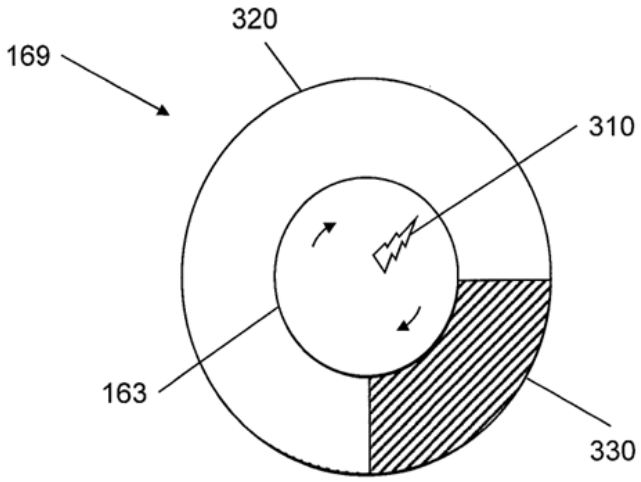


FIG. 3

Id., Fig. 3. In this example, circular buffer 167 and write-protected portion 330 are “files” inasmuch as they comprise identifiable collections of data, although the patent does not describe any particular file type or structure for these files.

124. Figure 4H depicts a "C data stream … saved as a physically dis-contiguous file" (*id.*, 9:18-26):

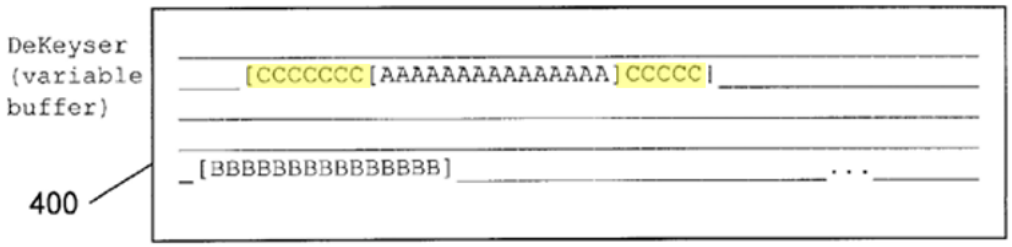


FIG. 4H

Id., Fig. 4H (color added). The file shown collects together the physically dis-contiguous "C" portions to form an identifiable collection of data. Once identified as such, the data making up the file can be used in various ways (*e.g.*, the file can be offloaded to a remote memory or played back). *Id.*, 9:27-37.

125. In sum, the challenged patents use "file" in a manner consistent with its plain and ordinary meaning as of June 2007, *i.e.*, "an identifiable collection of data." The patents do not suggest any particular type of file is required and thus provides no basis for departing from this plain and ordinary meaning.

126. The prosecution histories of the patent family likewise do not compel a narrower construction. During prosecution, Applicant reiterated what was recited in the various pending claims but did not otherwise limit the claimed "files" to any particular types of files. EX1011, 77; EX1013, 285-86.

127. ***Extrinsic Evidence***: General-purpose and technical dictionaries confirm the plain and ordinary meaning of "file" as "an identifiable collection of data." The

American Heritage Dictionary defined "file" as "a collection of related data or program records stored as a unit with a single name" (EX1025, 518), and Merriam-Webster's Collegiate Dictionary defined it as "a collection of related data records (as for a computer)" (EX1026, 467). A technical dictionary, the Wiley Electrical and Electronics Engineering Dictionary, defined "file" as "a collection of information which is stored as a unit." EX1027, 283. Likewise, "Operating Systems" (Third Ed. 2004) by H.M Deitel, P.J. Deitel, and D.R. Choffnes, a well-known, reputable textbook, states that "[m]ost computer users are familiar with the concept of file as a named collection of data that is manipulated as a unit," further confirming a POSITA's understanding of "file" as "an identifiable collection of data." Appx II at 586.

128. In sum, it is my opinion that the term "file" should be interpreted as meaning "an identifiable collection of data" for all claims of the '034, '882, '471, and '914 patents.

VII. Summary Of The Prior Art

A. Yerazunis

129. Yerazunis, EX1017, entitled "Video Recording Device for a Targetable Weapon," was filed September 9, 1998 and issued January 2, 2007. Accordingly, it is my understanding that Yerazunis is prior art to each of the '034, '882, '471, and '914 patents.

130. Yerazunis discloses a "compact video image recording device" for different applications. EX1017, Abstract, 1:21-31, 3:5-10, 9:8-16. In one application,

it is "mounted to a targetable weapon, such as a gun," for "recording video images before and after the firing of the gun." *Id.*, Abstract, 3:9-10, 4:28-30, 8:8-25, 9:60-10:11, 16:4-8, 16:43-17:38 *see also, generally* U.S. 2002/005895 ("Freeman 1") (EX1028) (continuation of Appl. No. 08/906,493, for which Yerazunis is a continuation-in-part); U.S. 7,088,387 ("Freeman 2"), attached as Appendix EE, (issued from Appl. No. 08/906,493).

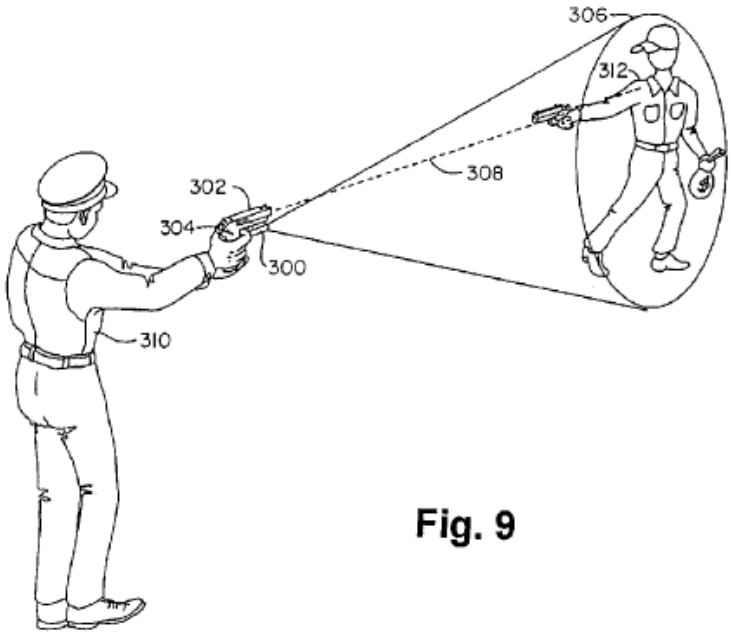


Fig. 9

Id., Fig. 9.

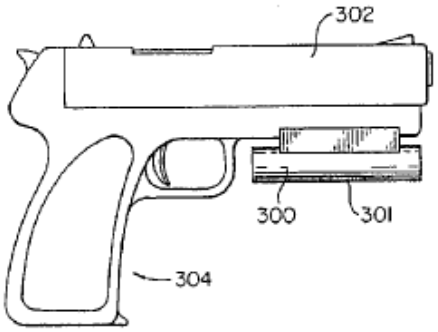


Fig. 10a

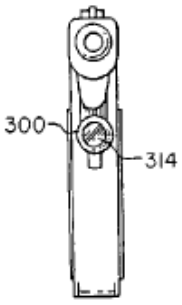
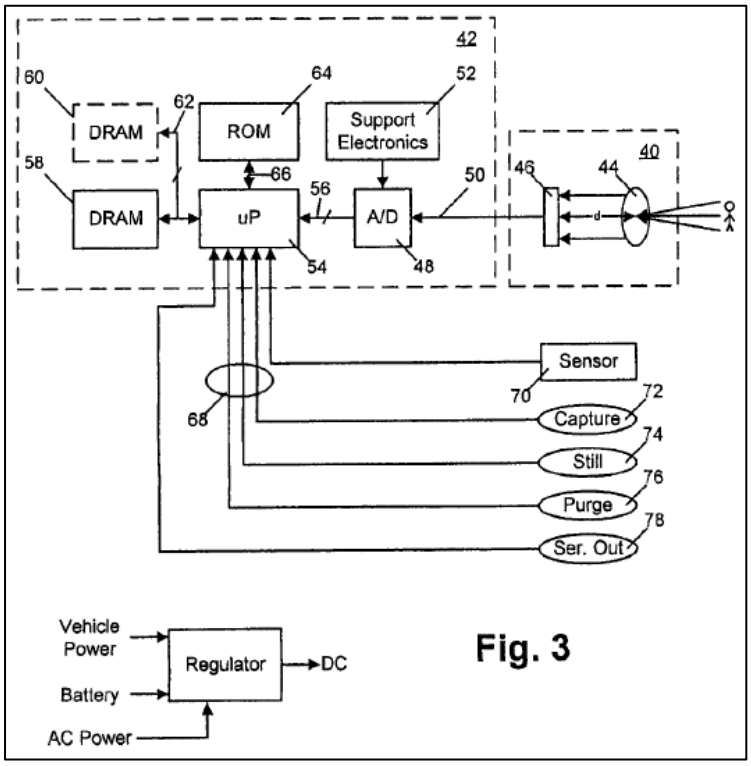


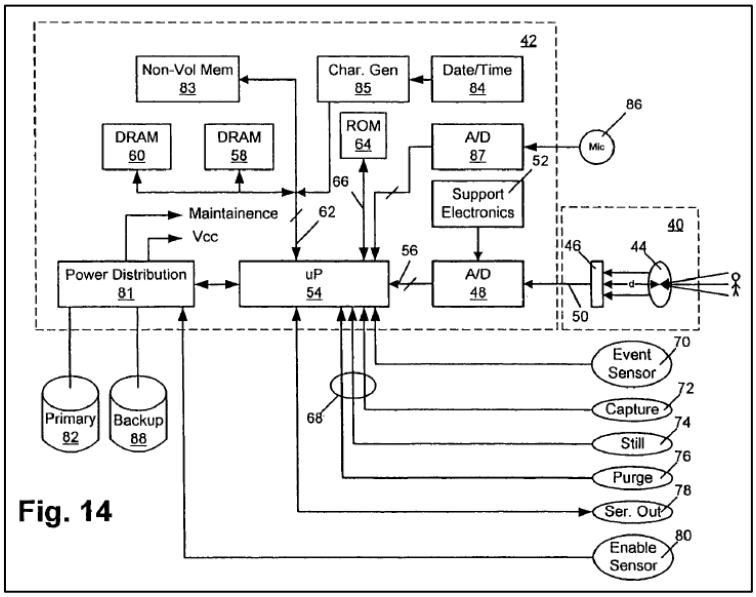
Fig. 10b

Id., Figs. 10a, 10b.

131. Yerazunis's video recording device "records video frames successively in at least one circular buffer memory organized as a continuous loop overwriting the oldest frame within the respective buffer memory with a more recently received frame." *Id.*, 2:19-23. For a gun-mounted application, Yerazunis discloses that a "gun firing signal may be generated upon discharge of the gun," and "specified frame data associated with that firing event both before and after the event is preserved and cannot be overwritten as a result of further use of the gun or subsequent firing events." *Id.*, 3:19-31. "Frame data associated with each subsequent firing event[] is stored within an unused portion of the circular buffer memory." *Id.*, 3:31-33.

132. Figure 3 depicts an "electrical block diagram of the video recording device" (*id.*, 3:55-56), and Figure 14 illustrates "a video recording device in accordance with the present invention for use with a gun" (*id.*, 4:28-30).





Id., Figs. 3, 14; *id.*, 16:4-8 ("[t]he operation of the [Figure 14] recording device is generally in accord with the description provided with respect to FIG. 3"), 17:34-38. These figures and other relevant disclosure of Yerazunis are described in further detail below.

133. Figure 4a depicts a circular memory buffer formed in DRAM (*id.*, 7:9-11), and Figure 4b shows "a semiconductor memory buffer employed in the video recording device of FIG. 3 to implement a circular memory buffer and associated head and tail pointers" (*id.*, 3:60-63).

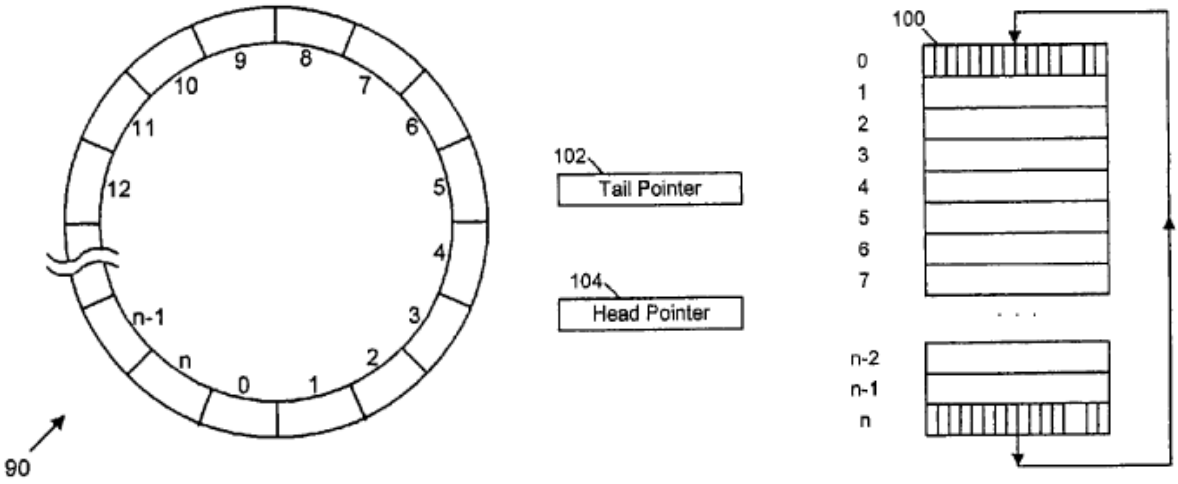


Fig. 4a

Fig. 4b

Thus, following compression, each compressed video frame is stored in the next successive frame buffer location and any frame data continued in such location is overwritten. For example, referring to FIG. 4 a, if the last frame were stored at location 3 of the circular buffer 90, the subsequent video frame would be stored at location 4 of the circular frame buffer. The video recording device, absent receipt of some trigger event from the sensor 54 or activation of other input by the user, continues to store captured frame data in successive locations of the circular buffer, overwriting previously received frame data stored in respective buffer locations with the most recently received frame data.

Id. at 7:11-22; Freeman 1 at [0037]; Freeman 2 at 6:9-20. "The operation of the circular buffer is described with more particularity below and with respect to FIG. 4b." *Id.* at 7:23-24; Freeman 1 at [0038]; Freeman 2 at 6:21-22.

> Associated with the semiconductor memory buffer 58 (and additional buffer memory 60 if such is employed) are a tail pointer 102 and a head pointer 104. The head pointer points to the address of the frame buffer location for storage of the next frame data. Such address is offset in the respective frame to address the respective byte for the frame data being stored. For simplicity, the operation of the buffer is explained with respect to the frame addresses recognizing that plural locations are utilized within the buffer to store the data associated with any given frame.

Id. at 7:33-61; Freeman 1 at [0039] – [0040]; Freeman 2 at 6:31-59.

134. In Figures 3 and 14, the recording device includes camera 40 and video electronics 42. *Id.*, 5:40-42; *id.*, 16:4-8. The device further includes local memory (DRAMs 58, 60) coupled to camera 40 via microprocessor 54. *Id.*, 6:24-26; Freeman 1 at [0033]; Freeman 2 at 5:22-24. Microcontroller 54 has "a number of inputs 68 which permit activation of the video recording device and control of the device by a user." *Id.*, 6:40-42; Freeman 1 at [0034]; Freeman 2 at 5:38-40. Inputs include capture button 72 that causes video data in the local memory's circular buffer to be write-protected. *Id.*, 6:43-44, 7:11-22, 8:8-61, 9:17-26; Freeman 1 at [0034]; Freeman 2 at 5:41-42.

135. Inputs further include event sensor 70 configured to detect gun firings and other events. *Id.*, 8:8-61, 16:43-17:61. Upon event detection, microprocessor 54 preserves video data for the event by write-protecting it in the circular buffer. *Id.*; *see also id.*, 9:34-42; Freeman 1 at [0047]; Freeman 2 at 8:32-36. In embodiments, the microprocessor "tag[s] protected frame locations containing captured still frames and check[s] to determine whether a frame location is protected prior to writing to the frame location." *Id.*, 9:39-42; Freeman 1 at [0047]; Freeman 2 at 8:37-40. In Yerazunis's gun-camera embodiment (Figures 9-14), "recording of data continues [after a gun-firing event] since a subsequent firing event may occur," accomplished by storing pointers "defining the area(s) of the circular buffer memory" to be write-protected in a table. *Id.*, 17:45-61. This "allow[s] later retrieval of the video data pertaining to each firing of the gun." *Id.*; *see also id.*, 17:9-12.

B. Ely

136. Ely, EX1020, entitled "Distributed Video Data Storage in Video Surveillance System," was filed on April 22, 1996, and issued on November 9, 1999. Accordingly, it is my understanding that Ely is prior art to each of the '034, '882, '471, and '914 patents.

137. Figure 2 of Ely, reproduced below, is "a block diagram of a video surveillance system provided in accordance with the present invention." *Id.* at 5:21-22.

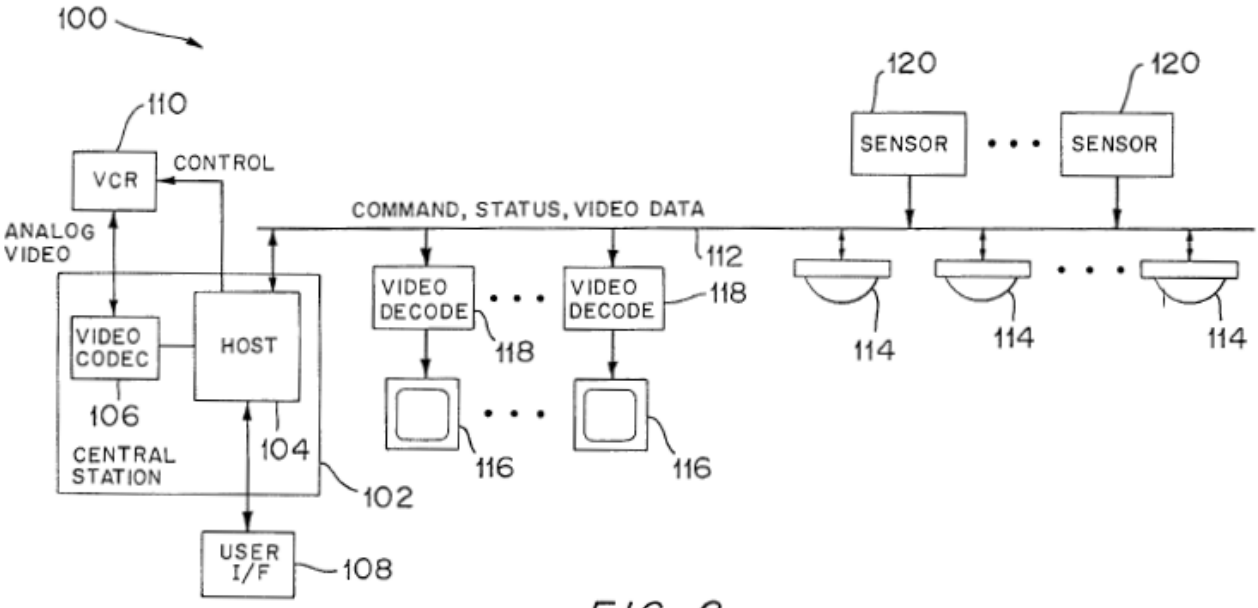


FIG. 2

Id. at Fig. 2. This figure depicts a plurality of camera units 114 and sensor devices 120, the latter of which "are preferably of conventional types that detect, for example, unauthorized opening of doors, windows and display cases and the like and generate alarm signals indicative of these occurrences." *Id.* at 5:46-53. These system components are connected to the host computer 104 at the central station 102 via a network, which in Figure 3 is a local area network (LAN) 112. *Id.*

138. The camera units 114 are described with respect to Figure 3:

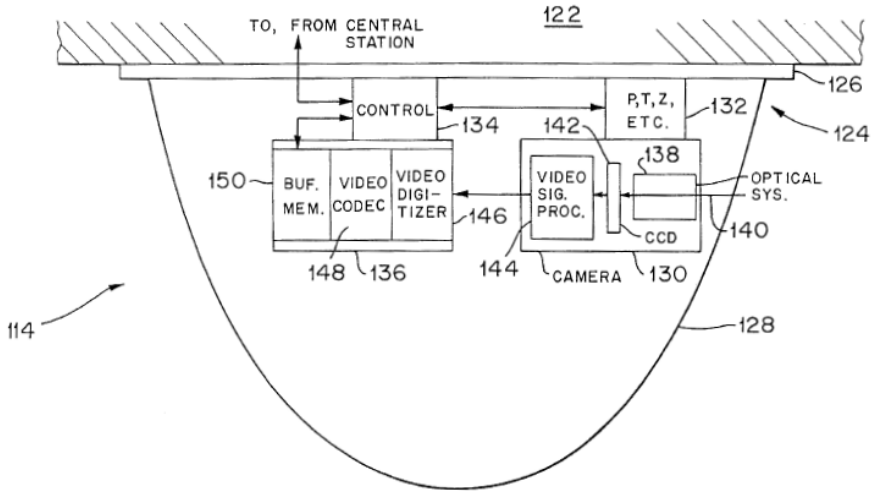


FIG. 3

Id. at Fig. 3. As seen above, the camera unit 114 includes a video camera 130 and memory board 136. *Id.* at 6:17-21, 6:48-51. The memory board 136 includes a memory device 150 that "functions as a buffer for the video signal generated by the camera 130, and is controlled by the control circuit 134." *Id.* at 6:51-53, 6:61-65. Ely states that the buffer is preferably a "ring buffer," in which "currently generated compressed video data is written over the oldest compressed video data that had previously been stored in the memory 150." *Id.* at 7:28-34. A POSITA would have understood the "ring buffer" to mean a "circular buffer" of the type disclosed in the '034 patent.

139. Ely discloses that "over-writing of the oldest data [in the ring buffer] is subject to inhibition in response to alarm commands." *Id.* at 7:34-36. "On such occasions, the live compressed video data is written into a portion of the memory device 150 which does not hold video data that is to be preserved." *Id.* at 7:36-39. "When an alarm command is received, a process (indicated by block 160) is carried out in which

the control circuit 134 protects from over-writing compressed digital video data previously stored in the memory 150, and corresponding to a time interval beginning at a predetermined time prior to receipt of the alarm command, and continuing for a predetermined time after receipt of the alarm command." *Id.* at 7:48-55. The write protecting carried out in response to an alarm command at step 160 is highlighted below:

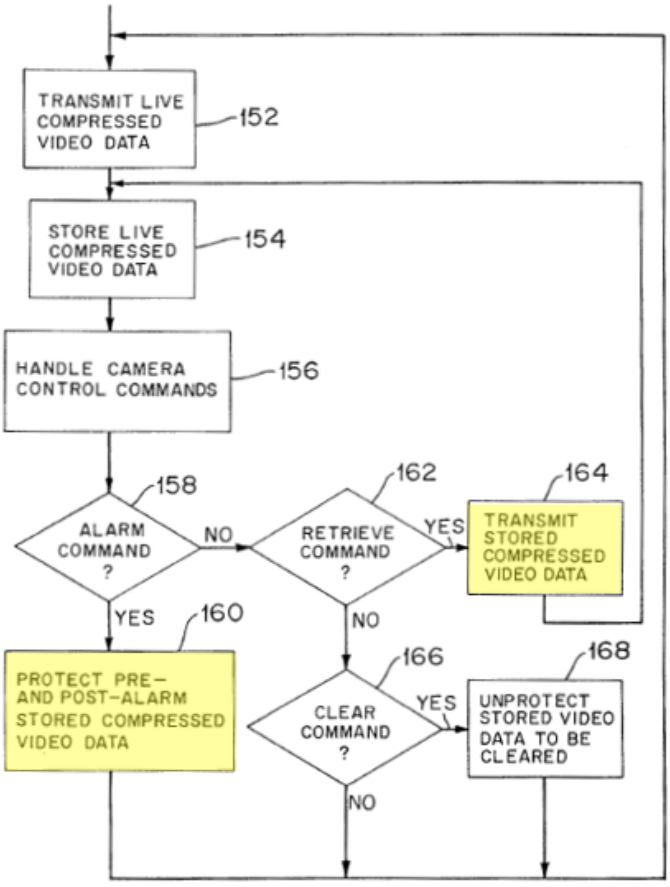


FIG. 4
CAMERA UNIT OPERATION

Id. at Fig. 4 (color added).

140. This figure illustrates "processes carried out by the control circuit 113 under the control of a stored program." *Id.* at 7:12-16. As seen above, if a "retrieve" command is received, then at step 164 (highlighted above) the control circuit 134 causes video data previously stored in the ring buffer of the memory device 150 to be transmitted to a remote central station. *Id.* at 7:56-8:6. "The stored data to be retrieved may be data that was previously protected from over-writing in response to an alarm command, or may be other data that has previously been stored in the buffer memory 150." *Id.* at 7:59-63. "As indicated by decision block 166, the control circuit 134 is also conditioned to receive 'clear' commands, in response to which the control circuit removes a previously protected block of stored video data from protection, thereby permitting 'live' video data to be written over the now-unprotected stored video data." *Id.* at 8:7-12.

C. Fiore

141. Fiore, EX1009, entitled "Data Recording and Playback System and Method," was filed April 9, 2002 and published December 19, 2002. Fiore incorporates by reference and claims priority to U.S. Provisional Application No. 60/282,162, filed April 9, 2001 (EX1030). Accordingly, it is my understanding that Fiore is prior art to each of the '034, '882, '471, and '914 patents.

142. Fiore discloses "data recording and playback systems for monitoring processes or occurrences of events which allows the replay and/or analysis of a time sampled signal." EX1009, [0003]. FIG. 2 shows a schematic illustration of the signal

processor 10 in accordance with one embodiment of the present invention." *Id*. at [0043]. "As can be seen, the signal processor 10 is in communication with monitoring device 6 that provides an input signal data to the signal processor 10 such as a video, audio or other type of signal." *Id*. "The network 4 may be any type of a network such as a local area network, wireless network, wide area network, or the Internet." *Id*. at [0039]. "[I]n the networked embodiment of the present invention as shown in FIGS. 1 to 4, the network allows transfer and access of data utilized and stored by the data recording and playback system of the present invention." *Id*. at [0077]. Fiore's circular storage buffer 15 stores data frames of an input signal from monitoring device 6 (which may be a video camera, *id.*, [0040]):

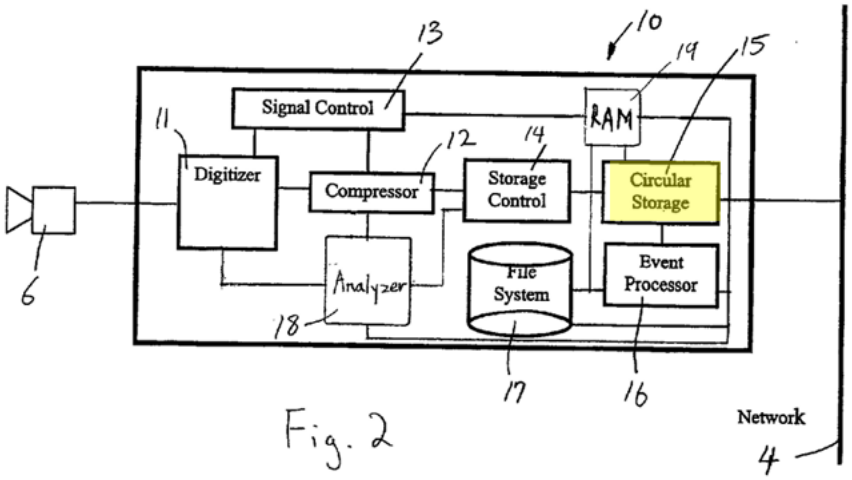


Fig. 2

Id., Fig. 2 (color added); *id.*, [0048]. Circular storage buffer 15 "may be implemented as a reserved area in memory, a disk file, or as a storage in a looped media." *Id.*, [0065]. "The signal processor 10 also includes an event processor 16 that is adapted to extract data frames starting from a data frame that is a predetermined number of data frames

before the external event time provided by the server 20 as described in further detail below, and ending a predetermined number of data frames after the external event time." *Id*. at [0048]. "The extracted data frames are then stored in file system 17 thereby providing a permanent record of the data frames before, during, and after the event prior to the data frames being overwritten in the circular storage buffer 15 by more recent data frames." *Id* "[T]he event processor 16 of the present embodiment is also adapted to mark the input signal data being stored in the circular storage buffer 15 when an event occurs to thereby flag the location of an occurrence of an external event in the circular storage buffer 15, signal to mark the input signal data being provided by the event processor 16." *Id*. "Further in this regard, the event Signals may be initiated manually by the user of the data recording and playback System 10 as well using an input device Such as a keyboard, mouse, etc. So that a particular data frame in the circular Storage device may be manually marked." *Id*. at [0049].

143. Circular storage buffer 15 is implemented as a memory-mapped file. *Id.*, [0047], [0068]. In the context of Fiore, a memory-mapped file is a file "having the same address space as the memory device for storing the input signal data" to allow "the input signal data" to be "swapped between the RAM" and "the file system," "as needed." *Id.*, Abstract, [0047]. "The client circular storage control 32 receives the playback commands provided by the user playback control 31, and receives the signal data from the circular storage buffer 15 of the signal processor 10 or from previously saved event files stored in the file system 17." *Id*. at [0053]. "FIG. 6 shows one

embodiment of a user playback control screen 70 which may be provided to or by the client computers 30 and 30' of FIG. 1 that allows a user to control and interface with the data recording and playback system 2." *Id*. at [0057]. "The playback control screen 70 is provided with a video playback window 71 for graphically displaying the retrieved data frames from the circular buffer 15 or the file system 17 of the signal processor 10." *Id*. "As can also be seen, the slider bar [Fig. 6] is marked by event position indicators 78 …." *Id*. at [0059]; Fig. 6.

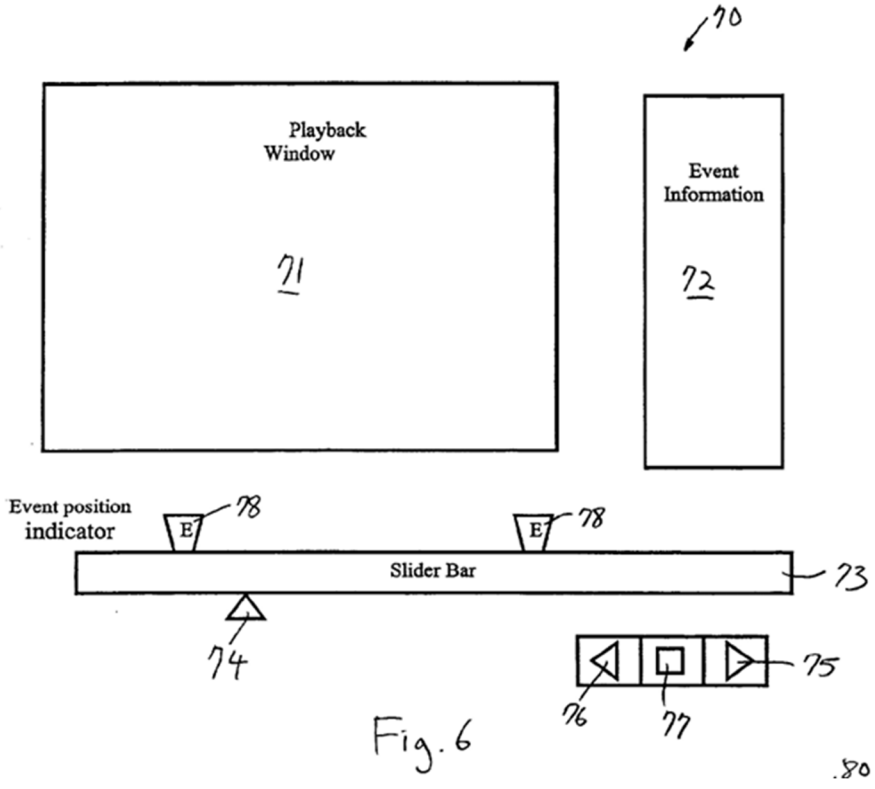


Fig. 6

Id. at Fig. 6. "These event position indicators 78 … mark the position along the slider bar 73 where an event has occurred and is stored in the circular storage buffer 15 of the signal processor 10." *Id*. at [0059]. "The corresponding information may also be

displayed in the event information window 72, the displayed event information serving as embedded links to playback the respective data frames associated to the event." *Id*.

144. "The storage control 14 provided in the signal processor 10 receives the digitized and/or compressed input signal data from the monitoring device 6, and stores the input signal data and the analysis data in the circular storage buffer 15 together with a time stamp for each record." *Id*. at [0047]. "In this regard, the circular storage buffer 15 has two unique positions, the head and tail." *Id*. "The head represents the position in the circular storage buffer 15 having the most recent signal data, and the tail position represents the position in the buffer having the oldest signal data that is leaving the circular storage buffer 15, i.e. being overwritten by the most recent signal data." *Id*. "The circular storage buffer 15 is preferably implemented as a memory mapped file." *Id*.

145. POSITAs recognized the advantages provided by memory-mapped files, including increased input/output (I/O) performance. *Id.*, [0065]. Figure 9 "shows details of a file format in a table 107 suitable for implementing the circular storage buffer 15" (EX1009, [0064]), noting file size and other details of the file:

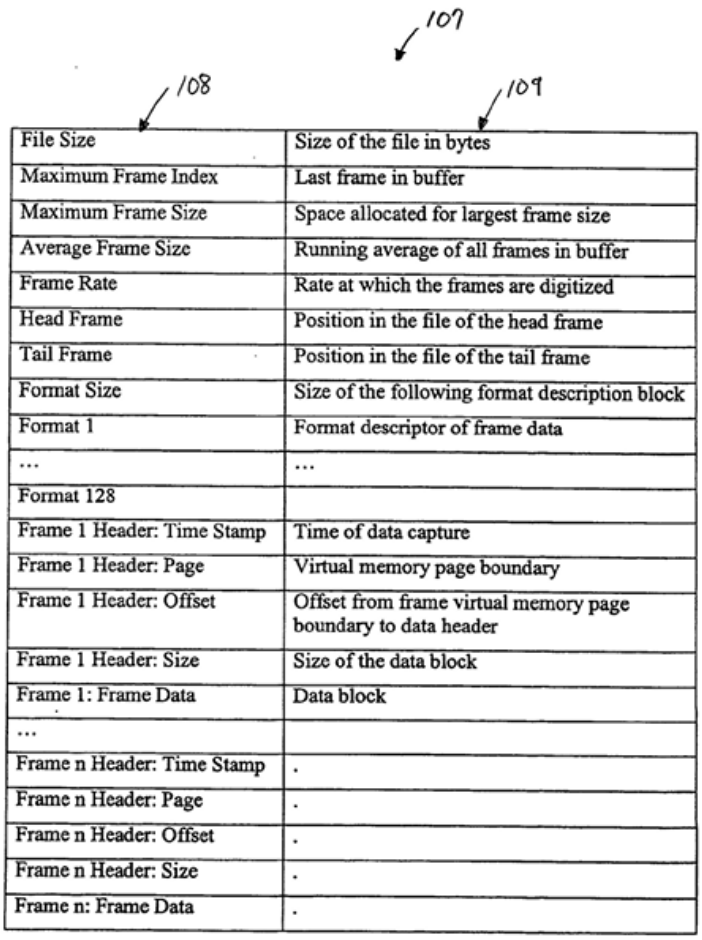


Fig. 9

Id., Fig. 9. "[T]he file format shown in table 107 has been found to be well suited for implementing the circular storage buffer 15 and for storing video data that are made of sequence of frames, each representing an individual image." *Id.* at [0064]. "In addition, the size of the circular storage buffer is fixed and has a fixed size file header that points to the beginning (head) and end (tail) of the circular storage buffer data." *Id.* "Initially, it should be noted that the circular storage buffer may be implemented as a reserved area in memory, a disk file, or as a storage in a looped media." *Id.* at [0065]. "The memory mapped file 110 has a memory mapped architecture that combines the access

speed of the RAM memory with large storage capacity of a disk file." *Id*. "The memory mapped architecture allows the playback from the circular storage buffer to be independent from recording into the buffer so that such recording is uninterrupted by the playback." *Id*. "In particular, the memory mapped file 110 of the circular storage buffer 15 is mapped in the sense that multiple sections of the file 120 stored on disk drives 102 and/or 103 are mapped to specific ranges of addresses within the RAM 19 of the signal processor 10." *Id*. at [0066]. "Such a configuration maximizes access and utilization of the circular storage buffer 15 while minimizing disk latency and performance penalties." *Id*. "Because the circular storage buffer is implemented via a memory mapped file 110 which is preferably a single contiguous disk file, reads and writes to adjacent virtual memory locations are insured to be physically adjacent on the disk drive." *Id*. at [0071]. "In this manner, the circular storage buffer cannot become fragmented on the disk drive.

146. Fiore teaches indexing data frames associated with events as files within circular storage buffer 15. Fiore's Background section describes conventional approaches that do not differentiate event data as files in the circular buffer. EX1009, [0005]-[0006]. In contrast, Fiore describes indexing identifiable collections of data (*i.e.*, files) for respective events in circular storage buffer 15. *Id.*, [0022]-[0023], [0051], [0059], [0060].

147. Specifically, when an external event occurs (as indicated via an event signal generated by a sensor, *id.*, [0041]), time stamps associated with the event are

stored in event database 23, and "the input signal data being stored in the circular storage buffer 15 [is marked] … to thereby flag the location of an occurrence of an external event in the circular storage buffer." *Id.*, [0048], [0050], [0051]. An event processor copies data frames associated with the event—including "frames before, during, and after the event"—to file system 17. *Id.*, [0048], [0051]. The use of files in circular storage buffer 15 for indexing event data enables data to be offloaded to file system 17 for permanent preservation. *Id.*, [0022], [0051].

148. Use of files in circular storage buffer 15 also enables event data to be played back directly from circular storage buffer 15 "without interrupting simultaneous recording of new input signal data into the circular storage buffer." *Id.*, Abstract, [0023], [0057]-[0060], [0065], [0068], [0072], Fig. 6. "FIG. 7 shows an example playback control screen which has been implemented as a computer window screen 80." *Id*. at [006].

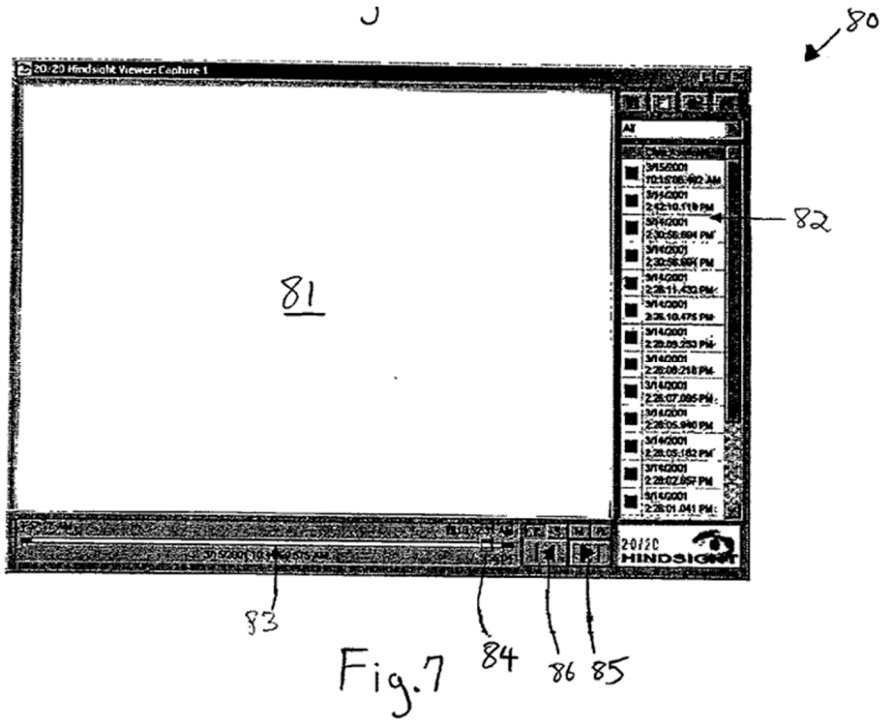


Fig. 7

Id. at Fig. 7. "As can be seen, the window screen 80 is provided with a playback window 81 that displays the reconstructed data frames, and an event information window 82 which lists the events that may be viewed the user, the listed events serving as embedded links to playback the respective data frames associated to the event." *Id*.

149. "One embodiment of the data recording and playback system also includes an event controller that provides an event signal associated to time of an event. An event database is provided for storing event signal data, and an event processor is provided that copies a plurality of data frames stored in the circular storage buffer that have time stamps proximate to the time of the event into additional secondary memory mapped files, each containing a single event, indexed from the event database. An access controller may be provided which is adapted to retrieve the plurality of data frames that have time stamps proximate to the time of the event from the event database, the event

database being provided in at least one hard disk drive of a computer in one embodiment. The access controller may be connected to a network to allow remote access thereof. In such an embodiment, the system may be provided with at least one client device connected to the network, the client device such as a computer being adapted to remotely control the access controller. In this regard, the client device may include a display device for displaying the plurality of data frames copied from the circular storage buffer." *Id.* at [0022]. Therefore, it was known to treat a circular buffer as a single file and to index write-protected portions of a circular buffer as a second, distinct file in the circular buffer.

150. Fiore's December 2002 disclosure of a file-based approach for enabling playback and offloading of data from the circular buffer without interrupting recording of new data to the circular buffer predates by many years the similar description in the '034 patent. EX1010, 9:54-64.

D. Lewellen

151. Lewellen, EX1019, entitled "Vehicle Video System and Method" was filed on July 11, 2002, and published on January 15, 2004. Accordingly, it is my understanding that Lewellen is prior art to each of the '034, '882, '471, and '914 patents.

152. Lewellen describes a "vehicle video system" that "records video information on a digital video recorder that uses digital media such as a hard disk drive." EX1019 at Abstract. Lewellen discloses that "a vehicle video system includes a small camera in the passenger area." *Id*. at [0010].

> The vehicle video system records video information on a digital video recorder that uses digital media such as a hard disk drive, recordable CD (CD-R), rewritable CD (CR-RW), or writable Digital Video Disc (DVD). The vehicle video system includes a local wireless interface, such as a Bluetooth-compatible interface, that automatically connects to a compatible device in the parking area of the vehicle that is coupled to a database. In this manner, the digital video information collected by the vehicle video system is automatically transferred to the database when the vehicle is parked, removing the need for any human intervention for the logging and cataloging of video tapes. The local wireless interface of the vehicle video system also allows other devices, such as a handheld device or a vehicle video system in a different vehicle, to access the stored digital video information.

Id. "Vehicle video system 300 includes a local wireless interface 390." *Id*. at [0031]. "Local wireless interface 390 provides a significant advantage over the prior art vehicle video systems." *Id*. "Devices enabled with Bluetooth wireless technology will be able to: free electronic accessories and peripherals from wired connections" and "exchange files." *Id*. at [0035]. "Products that incorporate a Bluetooth interface are already on the market." *Id*. at [0040]. "Nokia Corp. is selling its Bluetooth 6310 phones in Europe, and are expected to be available in the United States sometime in 2002." *Id*. "Bluetooth wireless technology…provides links between mobile computers, mobile phones, other portable handheld devices, and connectivity to the Internet." *Id*. at 32.

153. "The digital video information collected by the vehicle video system is automatically transferred" via a wireless interface to a "database when the vehicle is parked, removing the need for any human intervention for the logging and cataloging of video tapes." *Id.* Figure 3 of Lewellen depicts a vehicle video system 300 having long-distance and local wireless interfaces (380, 390, respectively):

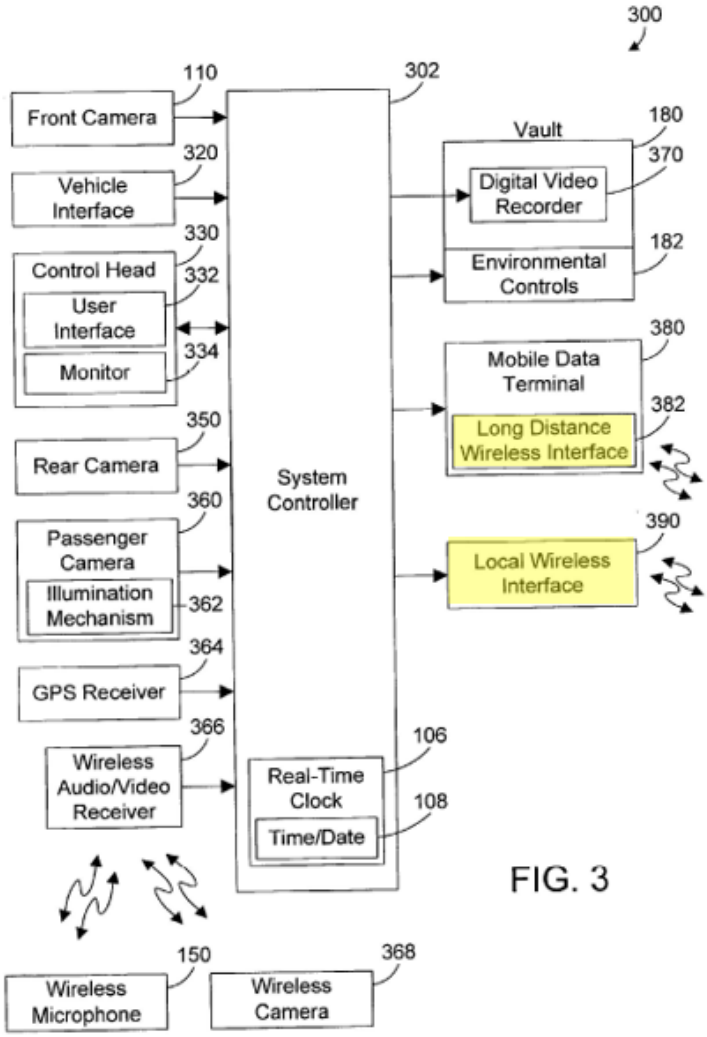


FIG. 3

Id. at Fig. 3 (color added).

154. The long-distance wireless interface 382 enables communication with police headquarters, whereas the local wireless interface 390 enables communication with devices located in the nearer vicinity via short-range wireless communications. *Id.* at [0030]-[0031]. "The local wireless interface of the vehicle video system … allows other devices, such as a handheld device or a vehicle video system in a different vehicle, to access the stored digital video information." *Id.* at Abstract. The local wireless interface 390 may be "a Bluetooth-compatible interface, which can communicate with other Bluetooth-compatible devices," including mobile phones. *Id.* at [0031], [0037], [0041]. Lewellen explains that the "benefit of providing the local wireless interface 390 is that digital information recorded by the digital video recorder 370 may be automatically transmitted and received to and from compatible devices." *Id.* at [0043]. "As shown in FIG. 5, one example of a compatible device is a parking area data transfer mechanism 510." *Id.* "A second example of a compatible device is a portable data transfer mechanism 520." *Id.* "A third example of a compatible device is a vehicle video system 300A in a different vehicle." *Id.* For example, "[i]n response to the upload command, the vehicle video system transmits digital data to the parking area data transfer mechanism (step 860)" including "recorded digital video data." *Id.* at [0049]. "[T]he present invention relieves the law enforcement officer from the chore of handling video tapes." *Id.* at [0045].

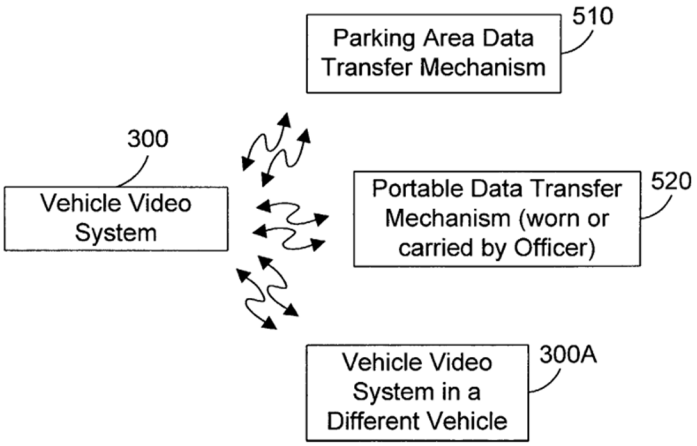


FIG. 5

"Referring back to FIG. 5, a second suitable wireless device that is compatible with the local wireless interface 390 in the vehicle video system 300 is a portable data transfer mechanism 520, which may be worn or carried by a law enforcement officer." *Id*. at [0046]. "Such a portable data transfer mechanism 520 could act in the same manner as the parking area data transfer mechanism 510, exchanging digital information in both directions as needed." *Id*. "Note, however, that the portable nature of the portable data transfer mechanism 520 allows for easily exchanging digital information with the vehicle video system 300 in the field, without having to return to the parking garage." *Id*.

> During the chase, let's assume that the police car is wrecked. If the only data transfer mechanism were in the parking garage, the car would have to be towed to the parking garage to retrieve the digital information recorded by the digital video recorder 370. However, with a portable data transfer mechanism 520 or using a vehicle video system in a different vehicle 300A, the stored digital information in the wrecked

police car can be uploaded to a different device, which can then transfer the data to the central database. We see from this simple example that exchange of digital information in the field is a significant advantage of the preferred embodiments.

Id. at [0047].

E. Mann

155. Mann, EX1015, entitled "Wearable Camera System with Viewfinder Means," was filed on March 25, 1999, and issued on June 4, 2003. Accordingly, it is my understanding that Mann is prior art to each of the '034, '882, '471, and '914 patents.

156. Mann describes a body-worn portable electronic camera system with wearable viewfinder means, particularly as built into eyeglass frames, as illustrated in Figure 1. EX1015 at [0001], [0056].

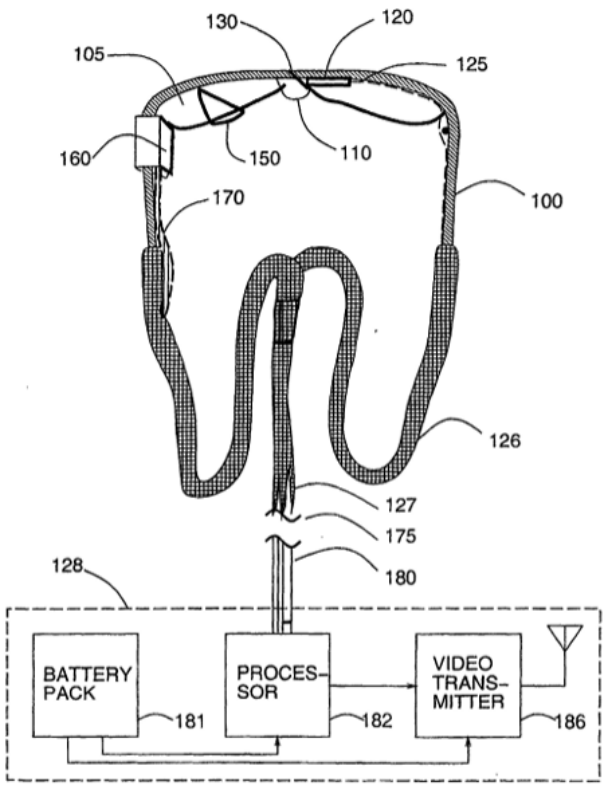


FIG. 1 – FOVEATED EMBODIMENT OF WEARABLE CAMERA SYSTEM

Id. at Fig. 1. This figure depicts eyeglasses with frames 100, lenses 105, cameras 110 and 120, electronic display 160 that acts as a viewfinder screen. *Id.* at [0056]-[0058]. Figure 1 further depicts a belt pack or body-worn pack 128 connected to the eyeglasses via wiring harness 180 and cable harness 127. *Id.*

157. Mann's system includes a "chording keyboard" with letter keys, one of which can be pressed by a user to begin recording via the cameras. *Id.* at [0064]-[0065]. "Recording is typically retroactive, in the sense that the wearable camera system, by default, always records into a 5-minute circular buffer, so that pressing [the letter key] begins recording starting from 5 minutes ago, e.g. starting from 5 minutes before [the letter key] is pressed." *Id.* at [0065].

158. In addition to Mann, wearable cameras including cameras mounted to eyeglasses and using circular buffers to record pre-event data were well-known by June 2007. EX1029.

F. Fiedler

159. Fiedler, EX1037, entitled "Device and Method for Selective Recall and Preservation of Events Prior to Decision to Record the Events," was filed June 20, 2001, published February 27, 2003, and issued October 12, 2004. Accordingly, it is my understanding that Fiedler is prior art to each of the '034, '882, '471, and '914 patents.

160. Fiedler describes a "device process for event-activated recording," wherein events are recorded in an "acquisition buffer" and "[a]ction by the user or triggering system" preserves "all or part of the record of the most recent events recorded in the acquisition buffer." EX1037, Abstract. The event data "is preserved by reserving a portion of the record of events from being overwritten by other events, and/or by transferring the selected portions of the record of events to a predetermined permanent location." *Id.*

161. Fiedler discloses that the "present invention may be applied to sound or video recording" (*id.*, 2:60-61), and that an "area of technology addressed by the present invention is event-activated recording, in which a recording process is initiated on the occurrence of some event that is recognized by some mechanism, algorithm or other automated means," such as "[i]n a security system, audio and/or video recording activated on detection of movement" (*id.*, 1:43-53). Fiedler further discloses that the

"invention may be advantageously embodied in a portable device that clips to a pocket or other article of clothing, as shown in FIG. 11" wherein a "microphone, camera, camera lens, infrared or radio-frequency receiver, or similar device is attached to the clip, exposed to the outside environment." *Id.*, 13:11-16.

162. Fiedler also describes "pressing Capture once may capture the most recent minute, pressing it twice in rapid succession may capture the most recent two minutes, and so on." *Id.* at 9:42-45. The "Capture" button "toggles the capture state of the current block" and "[m]ay be pressed at any time to capture the current block." *Id.*, 9:5-8.

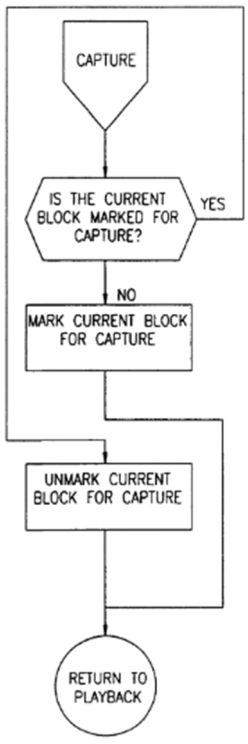
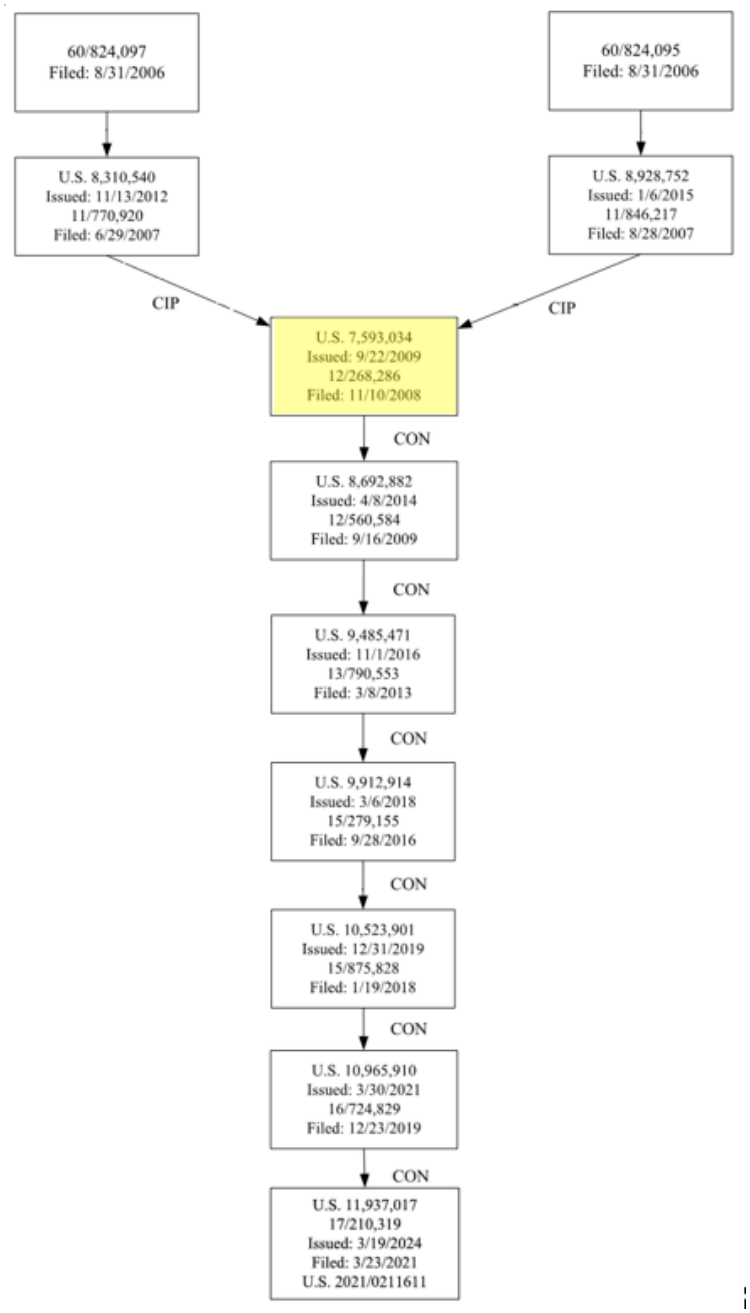


FIG.9

163. Fiedler was neither cited nor applied during prosecution.

VIII. ’034 Patent: Claims 1-20

164. The ’034 patent of the Stellar patent family is highlighted below:



165. The ’034 patent claims priority as a continuation-in-part to U.S. App. No. 11/770,920 (the ’920 application, EX1011), filed on June 29, 2007, and U.S. App. No. 11/846,217 (the ’217 application, EX1012), filed August 28, 2007.

A. Summary Of The '034 Patent File History

166. The '034 patent application (12/268,286) was filed November 10, 2008, along with a "Petition to Make Special Under Accelerated Examination Program." EX1013, 1-3 (petition), 4-251 (application and other materials filed therewith). Under this accelerated examination program, Applicant filed a "support document" identifying the following references as most relevant to the claimed subject matter: WO 2006/044476 ("Vanman," EX1014), European Patent No. 1,064,783 ("Mann," EX1015), and U.S. Patent No. 5,523,799 ("Hattori," EX1016). EX1013 at 92. Applicant's support document also conceded many claim limitations were disclosed in these references (*id.* at 92-112), and many dependent claims recited features "not separately patentable" beyond the limitations in respective parent claims (*id.* at 89-92). Applicant's document also included a "Statement of the Utility" of the purported invention:

> **9(D) Statement of the Utility**
>
> The current invention is directed to a method and apparatus for continuously recording image information so that a user can both save recorded segments in the circular buffer and also offload the recorded segments wirelessly to a second memory. This dual utility is very important because while it's preferable to wirelessly offload recorded segments to a second memory location, it's not always feasible to do so when wireless connections are sporadic and inconsistent in certain areas. Therefore, it is very important that when a wireless connection is unavailable that the user of the camera can prevent certain portions of the circular buffer from being overwritten.

Id., 112.

167. The Office provisionally rejected the as-filed claims on the basis of non-statutory double patenting over then-pending '920 and '217 Applications. *Id.*, 259-64. The claims were also rejected as obvious over Vanman and Hattori. *Id.*, 264-71. Applicant amended the claims to recite, among other things, "a first file using a digital video file format" and "indexing the write-protected portion as a second distinct file in the circular buffer," and argued these limitations were not disclosed in the cited prior art. *Id.*, 281-89. The Office withdrew the prior-art rejections (*id.*, 291-96) and allowed the application after Applicant submitted terminal disclaimers to overcome the double-patenting rejections (*id.*, 299-306, 324-27).

B. Ground 1a: Claims 1-6, 9, And 11-18 Of The '034 Patent Would Have Been Obvious Over Yerazunis Alone Or As Combined With Fiore

1. Motivation To Combine

168. A POSITA would have been motivated to combine Yerazunis and Fiore for multiple reasons.

169. As one example, both references describe similar technologies and solve similar problems. As detailed above, Yerazunis describes a "compact video image recording device" that uses a circular buffer to record video frames continuously, and portions of the circular buffer are write protected upon detection of certain events. *See*, *e.g.*, EX1017 at Abstract, 2:19-23, 3:19-28, 14:45-50, 16:66-17:61. The write-protected portions include frame data that was recorded both before and after the event. *See*, *e.g.*, at 3:28-33, 14:50-61. Fiore similarly discloses a "data recording and playback system"

that uses "a circular storage buffer having a memory mapped file with [the] same address space as the memory device for storing the input signal data." EX1009 at Abstract. In Fiore, "data frames before, during, and after [an] event" are preserved, similar to what is disclosed in Yerazunis. *Id.* at [0048]. Because Yerazunis and Fiore both disclose data recording systems that store data in a circular buffer and preserve data associated with an event—both before and after an event trigger—a POSITA would have been aware of and motivated to combine the two references.

170. As another example, a POSITA would have been motivated to implement Yerazunis's video recording device with Fiore's file-based approach for the circular storage buffer and event data stored therein. Yerazunis describes that segments are "tagged" for write protection (EX1017 at 9:34-46), and that pointers identifying such segments are indexed and "stored in a table" to permit retrieval of event data (*id.* at 17:50-61). Yerazunis discloses that event data corresponding to a gun firing is stored for later playback, including "video frame information generated before and after the discharge of the weapon by the office" so "an evidentiary record may be generated." *Id.* at 14:45-64. And Yerazunis discloses that the "circular buffer memory may be subdivided evenly to accommodate a predetermined number of firings of the gun and an equal number of frames may be stored within the circular buffer memory for each firing." *Id.* at 17:9-12. Because Yerazunis's tagging and use of pointers identify a collection of data for an event in the buffer, and because a POSITA would have understood that selective retrieval of event data necessitates an ability to locate the event

data within the buffer, Yerazunis discloses "indexing the write-protected segment as a file in the buffer," as claimed in the '034 patent.

171. To the extent, however, that a POSITA needed further guidance on ways to implement data or file storage techniques in a circular buffer, the POSITA would have been motivated to turn to Fiore. Fiore provides a fulsome description of its file-based approach, which includes (i) implementing the circular storage buffer 15 as a memory-mapped file, and (ii) indexing event data for events as respective files within the memory-mapped file. *See*, *e.g.*, EX1009 at [0022]-[0023], [0051], [0059], [0060]. Fiore also describes numerous benefits of its file-based approach, including:

> [I]t should be noted that the circular storage buffer may be implemented as a reserved area in memory, a disk file, or as a storage in a looped media…. *The memory mapped file 110 has a memory mapped architecture that combines the access speed of the RAM memory with large storage capacity of a disk file*.

Id. at [0065].

> The above implementation of the circular storage buffer 15 with a memory mapped file 110 has *the advantage of using the same address pointer access as RAM 19 of the signal processor 10 making the indexing of data in the memory mapped file 110 transparent to the circular storage buffer's 15 access objects*…. When the RAM 19 of the signal processor 10 mapped to the memory mapped file 110 has been filled, the file is unmapped and the signal data is cached to the file system 17.

Id. at [0067].

> The memory mapped file implementation of the circular storage buffer is *especially advantageous in that it allows the abstraction of the circular storage buffer to a direct pointer virtual address space thereby avoiding issues of switching between Random Access Memory (RAM) and disk files*. This enables multiple processes mapped in virtual memory space to read from, and write to the same memory, thereby concurrently sharing the circular storage buffer. *Thus, the present system allows the playback from the circular storage buffer without interrupting recording into the circular storage buffer, and significantly reduces the likelihood of dropped frames*.

Id. at [0068]; *see also id.* at [0072] (describing approach as providing "significant performance gains" and allowing "playback from the circular storage buffer without interrupting recording into the circular storage buffer").

172. In view of these exemplary benefits, and other reasons discussed herein, a POSITA implementing Yerazunis would have been motivated to utilize Fiore's teachings regarding (i) the circular storage buffer implemented as a memory mapped file, and (ii) indexing of event data as files within the circular storage buffer. A POSITA would have had a reasonable expectation of success because Fiore provides a detailed disclosure of its file-based approach, and applying those techniques to Yerazunis would have been routine and well within a POSITA's skill.

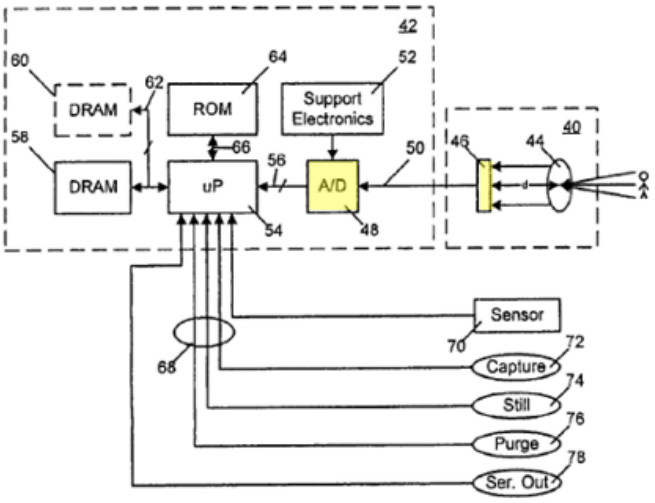
2. Independent Claim 1

a) Preamble: "A surveillance apparatus, comprising:"

173. Yerazunis discloses the preamble of claim 1. Yerazunis discloses "a video recording device" that "is contained within a compactly sized housing" and captures video images for, *e.g.*, security purposes. EX1017, 2:12-14; *see also id.*, 1:17-43.

b) Element 1: a camera having an image capturing component that captures images, and a converting component that converts the images into at least one data stream;

174. Yerazunis discloses this. Yerazunis's image sensor 46 in camera 40 is "operative to provide an output signal representative of a video image which impinges upon the sensor." EX1017, 5:45-49. The output signal is "an analog signal which is coupled to one or more A/D converters" ("ADC 48") that "generate a digital representation of the video image." *Id.*, 2:37-41.



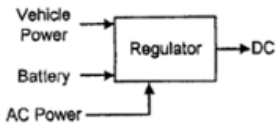


Fig. 3

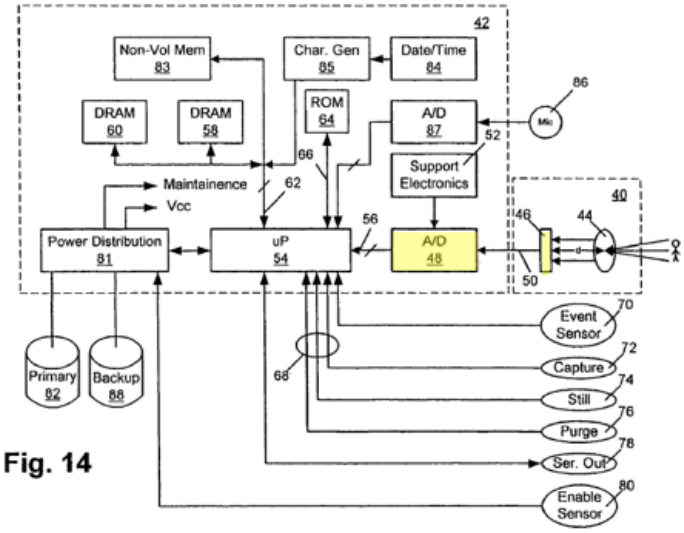


Fig. 14

Id., Figs. 3, 14 (color added).

175. Camera 40 and video electronics 42 disclose the claimed "camera" because they collectively include an image sensor 46 (*i.e.*, an "image capturing component") that captures video images and one or more ADCs 48 (*i.e.*, a "converting component") that generate a digital representation of the video image. At the purported

priority date of the challenged patents (June 2007), the term "camera" was often used to describe systems with imaging components and ADCs, like in Figures 3 and 14.

176. A POSITA would have understood the digital output of Yerazunis's one or more ADCs as "at least one data stream" because the output is a continuous sequence of data. EX1017, 2:33-52, 5:49-67, 6:52-56, 7:23-32; Appx MM at 109.

c) Element 2: a local memory functionally coupled to the camera;

177. Yerazunis discloses this. As explained in Section VI.A, the term "a local memory functionally coupled to the camera" should be construed to mean "a memory that is distanced less than 20 cm from the camera and is coupled to the camera using entirely physical connectors." Yerazunis's video recording device includes video electronics 42 with DRAMs 58, 60, *i.e.*, the "local memory" (EX1017, 5:40-43, 6:24-36):

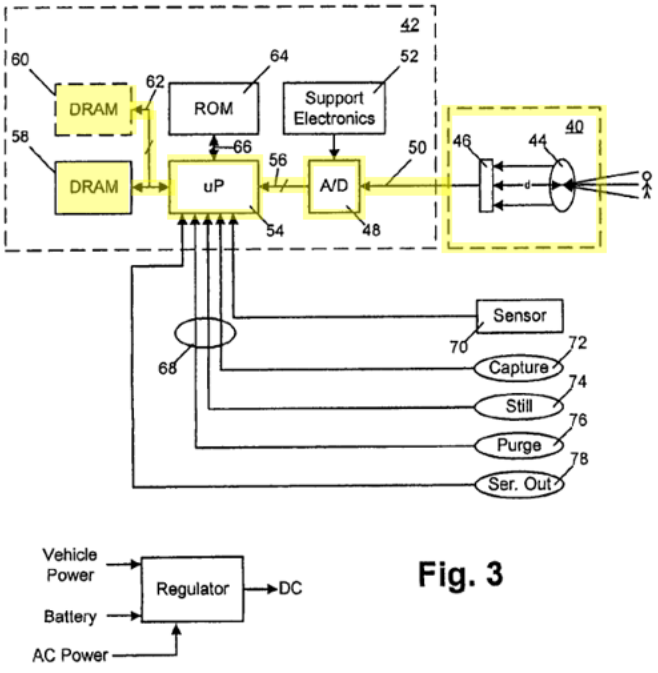


Fig. 3

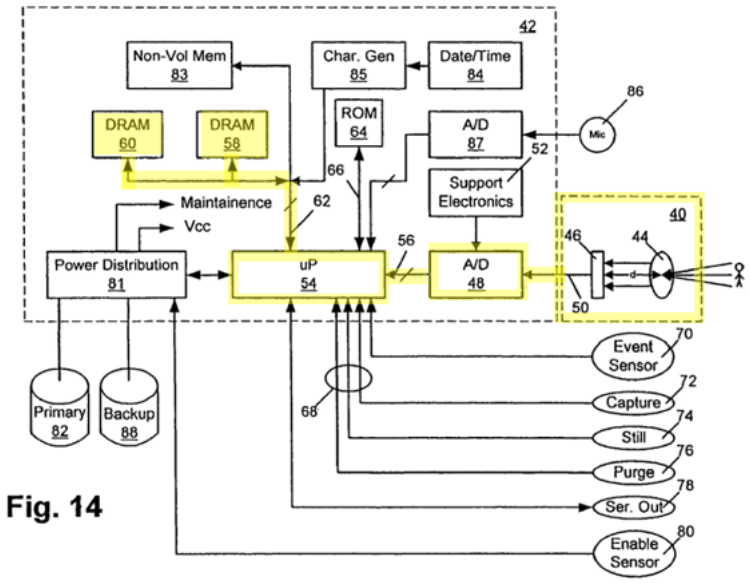


Fig. 14

Id., Figs. 3, 14 (color added).

178. DRAMs 58, 60 are coupled to the claimed camera using entirely physical connectors. Microprocessor 54 and DRAM 58 "may be obtained as a single integrated circuit [IC]" (*id.*, 6:24-29), meaning their connection would be via one or more physical connectors on the IC (*e.g.*, conductive lines and/or vias). DRAM 60 is "coupled to the microprocessor 54 via a bus 62," which is also a physical connector. *Id.*, 6:30-36. Microprocessor 54, in turn, is coupled to ADC 48 "via path 56 which comprises a parallel signal bus," another physical connector. *Id.*, 6:14-23.

179. Finally, ADC 48 is coupled to camera 40 "via a signal path 50" to enable ADC 48 to sample the output of the camera's image sensor 46. *Id.*, 5:40-67. A POSITA would have understood signal path 50 between camera 40 and ADC 48 as using a physical connector. A POSITA would have understood that a non-physical

(*i.e.*, wireless) connection would not have been used between these two components of the video recording device. Moreover, the arrows shown in Figures 3 and 14 would have represented wired connections to a POSITA. Additionally, if the connection between the camera 40 and ADC 48 was intended to be wireless, then a POSITA would have understood that a wireless sender and receiver would have been depicted. Lacking any depiction of such wireless sender and receiver, a POSITA would have understood the connection between the camera 40 and ADC 48 as being physical. Accordingly, DRAMs 58, 60 are coupled to the claimed camera "using entirely physical connectors," as required by the parties' agreed-upon construction.

180. A POSITA would have further understood DRAMs 58, 60 are distanced less than 20 cm from the claimed camera (including image sensor 46 and one or more A/D converters 48). Yerazunis discloses "a video recording device" that "is contained within a compactly sized housing" (EX1017, 2:12-14; Figs. 2a, 2b) and in an embodiment is "mountable to a gun and useful for recording video images before and after the firing of the gun" (*id.*, Abstract). In Figures 10a and 10b, video recording device 300 is mounted below the barrel of gun 302. *Id.*, 15:24-36.

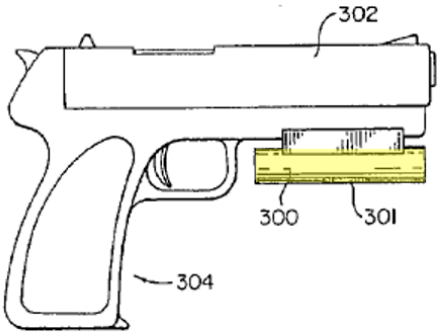


Fig. 10a

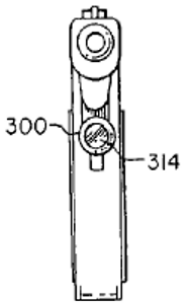


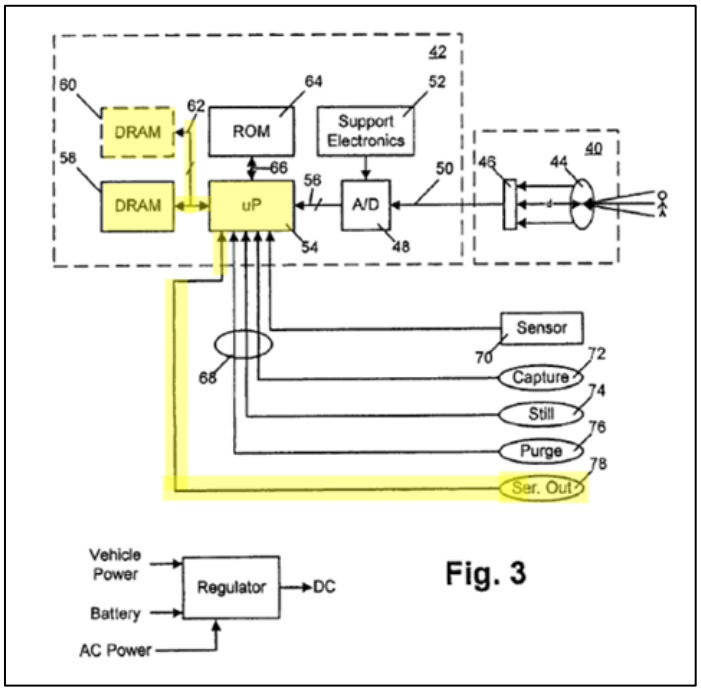
Fig. 10b

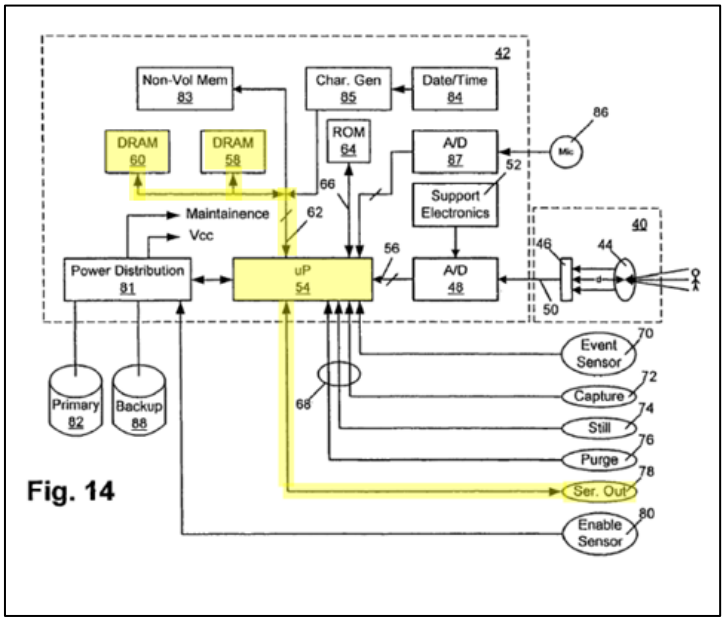
Id., Figs. 10a, 10b (color added). A POSITA would have understood that for the video recording device to be compact and mountable to a gun, it would necessitate that the memory be located near—certainly less than 20 cm from—the camera. In Figure 10a, the entire video recording device (highlighted) is shown attached to a portion of the gun barrel that is less than 20 cm in length. DRAMs 58, 60 and camera 40 contained within the video recording device would therefore necessarily be distanced less than 20 cm apart.

181. Yerazunis therefore discloses "a local memory functionally coupled to the camera," as construed by the parties.

d) Element 3: a wireless transmitter functionally coupled to the local memory;

182. Yerazunis discloses this. Yerazunis's microprocessor 54 includes a serial output channel 78 that is "provided to permit recorded frame data to be downloaded to a computer for viewing." EX1017, 3:1-2, 6:45-51, 18:60-66.





Id., Figs. 3, 14 (color added). Serial output channel 78 "is employed to download captured and stored video images" from the circular buffer of DRAM 58 (*i.e.*, "local memory") "to an external Personal Computer (PC)" (*id.*) or to "a radio transmitter to

transmit RF signals to a base station." EX1017, 9:63-10:3. Yerazunis's radio transmitter (*i.e.*, "wireless transmitter") is therefore "functionally coupled to the local memory."

e) Element 4: a recording facility that continuously records the data stream into available portions of a circular buffer in the local memory as a first file using a digital video file format;

183. Yerazunis alone or combined with Fiore discloses this. Yerazunis's video recording device "records video frames successively in at least one circular buffer memory organized as a continuous loop." EX1017, 2:19-23, 17:9-20, 17:50-59. Camera 40 captures video, and ADC 48 converts that into a digital signal. *Id.*, 5:40-67. The digital signal is provided to microprocessor 54, which "compresses the digitized frame data and stores the compressed frame data in the next sequential location of [a] circular buffer." *Id.*, 2:45-47, 6:24-26, 6:52-7:6, 10:55-67, 17:50-59; *see also id.*, 11:50-14:44, Figs. 6-8.

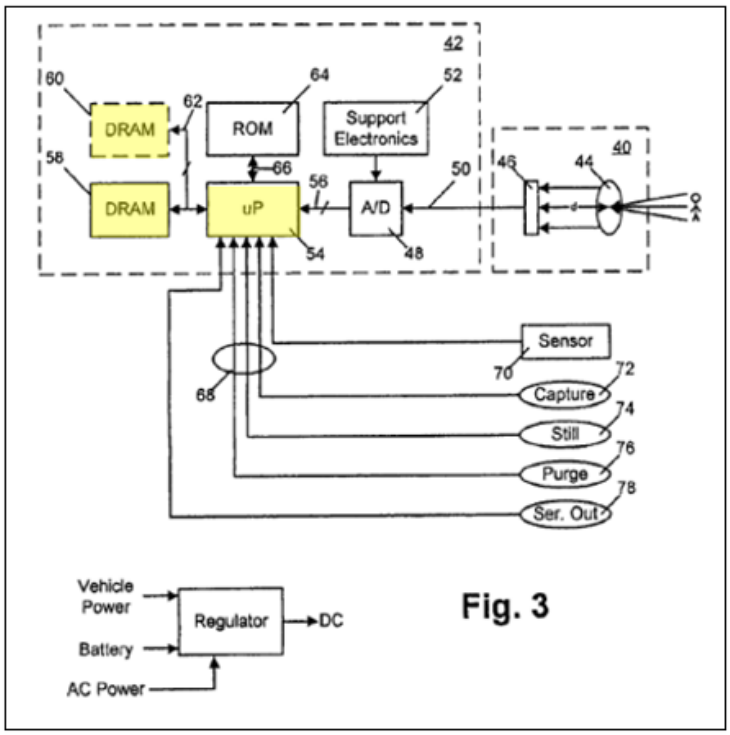


Fig. 3

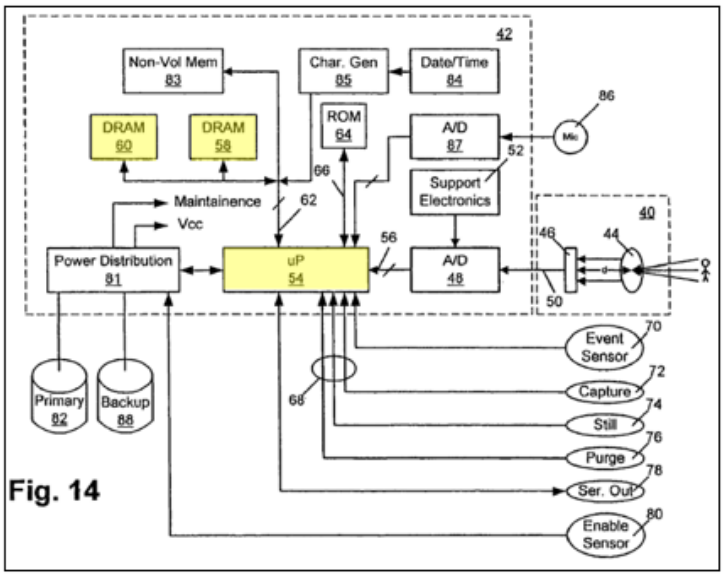


Fig. 14

Id., Figs. 3, 14 (color added to highlight microprocessor 54 (recording facility) and DRAMs 58, 60 (local memory including circular buffer)). A POSITA would have understood the compressed frame data as "using a digital video file format."

184. Yerazunis's circular buffer is depicted in Figures 4A and 4B:

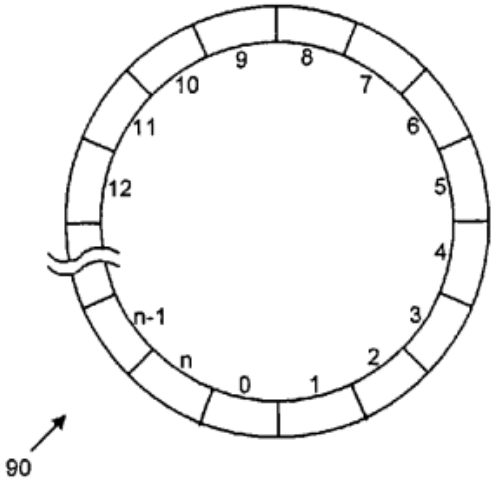


Fig. 4a

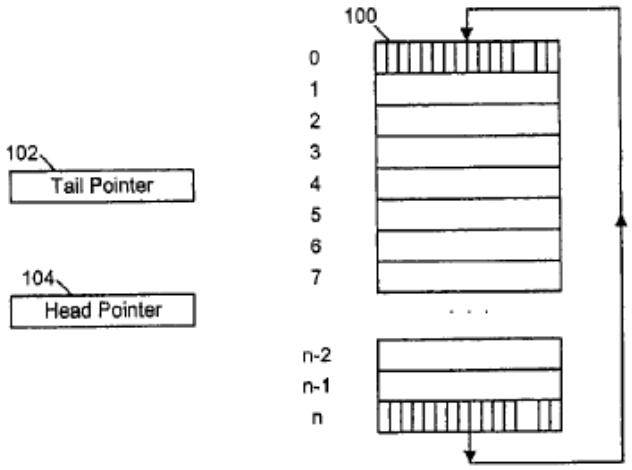


Fig. 4b

EX1017, 3:60-63, 7:9-11.

185. Yerazunis's circular buffer is formed in DRAM 58. *Id.*, 7:7-61, 18:7-12. Thus, microprocessor 54 includes "a recording facility" that "continuously records the data stream into available portions of a circular buffer in the local memory as a first file using a digital video file format." Yerazunis's disclosure is similar to that of the '034 patent: Like Yerazunis, the '034 patent describes a recorder 160 that uses a processor 162 to perform various "facilities" or "functions." EX1010, 4:50-53, 5:20-23, 5:28-30.

186. While Yerazunis does not expressly refer to recording the data stream into the circular buffer "as a file," Yerazunis does disclose that in a gun camera embodiment, "the head pointer 104 and the tail pointer 102 … defining the area(s) of the circular buffer memory, are stored in a table to allow later retrieval of the video data pertaining to each firing of the gun." EX1017, 17:50-56. A POSITA would have found it obvious to record the data stream in the circular buffer "as a file" based on Yerazunis's

disclosure of storing video data corresponding to particular events "in a table" for "later retrieval." And a POSITA would have understood such file-based recording as one of a finite number of identified solutions for recording video data in Yerazunis, evidencing its obviousness. A POSITA would have recognized Yerazunis's video data must be recorded to the circular buffer in some way, and using a file was a well-known approach for doing so. *See* EX1017, 6:1-13, 6:33-36, 7:23-32, 10:37-39, 10:63-67, 11:31-43.

187. To the extent a POSITA wanted further guidance as to particular methods for recording video data as files in Yerazunis's buffer, a POSITA would have been motivated to turn to Fiore. Fiore implements circular storage buffer 15 as a memory-mapped file and describes indexing collections of frame data for respective events as files within the memory-mapped file. EX1009, [0022]-[0023], [0051], [0059], [0060]. Fiore also describes the benefits of its file-based approach, including enabling playback of video data for a specific event from the circular buffer without interrupting simultaneous recording of new video data into the buffer. *Id.*, [0065], [0067], [0068], [0072]. In view of these exemplary benefits and the additional reasons explained in Section VIII.B.1, a POSITA would have been motivated to implement Yerazunis's microcontroller 54 to "record[] the data stream into available portions of a circular buffer … as a first file" in the manner Fiore discloses. In the Yerazunis/Fiore system, the circular buffer implemented as a memory-mapped file discloses the claimed "first file" into which Yerazunis's video data would have been recorded.

f) Element 5: a protecting facility that responds to a signal to record by designating a segment of the circular buffer as a write-protected portion and by indexing the write-protected portion as a second distinct file in the circular buffer, wherein the segment includes a pre-recorded subset recorded before the signal is received and a post-recorded subset to be recorded after the signal is received; and

188. Yerazunis alone or combined with Fiore discloses this.

189. Yerazunis's event sensor 70 generates a "gun firing signal" "upon discharge of the gun." EX1017, 3:20-33, 8:8-25, 14:55-61. Upon detecting the gun-firing signal, microprocessor 54 causes "specified frame data associated with [the] firing event both before and after the event" to be "preserved," such that it "cannot be overwritten as a result of further use of the gun or subsequent firing events." *Id.*, 3:25-38, 8:26-30, 15:9-13. With the specified frame data write-protected, "[f]rame data associated with each subsequent firing event[] is stored within an unused portion of the circular buffer memory." *Id.*, 3:31-33.

190. Yerazunis's protecting facility also "responds to a signal to record the sensor data … by indexing the write-protected segment as a file in the buffer." Yerazunis's tagging, use of pointers to identify a collection of data for write-protection, and storage of such pointers in a table "to allow later retrieval" of video data for gun-firing events (EX1017, 17:45-61) discloses "indexing the write-protected segment as a file in the buffer." A POSITA would have understood that retrieving video data for gun-firing events necessitates an ability to locate the video data within the buffer, such

that Yerazunis necessarily discloses "indexing." Thus, while Yerazunis does not expressly refer to "indexing" write-protected segments as second files in the circular buffer, a POSITA would have understood Yerazunis as describing—or at minimum, rendering obvious—this limitation. *Id.*, 6:1-13, 6:33-36, 7:23-32, 10:37-39, 10:63-67, 11:31-43. Indeed, the existence of Yerazunis's serial output channel 78 (described above for element 3 of the '034 patent) further confirms that Yerazunis's event data is stored as an identifiable collection of data.

191. A POSITA would have recognized the claimed "indexing the write-protected portion as a second distinct file in the circular buffer" as one of a finite number of identified solutions for storing and retrieving data in Yerazunis, further evidencing its obviousness. A POSITA would have recognized that Yerazunis's event data must be stored and retrieved in some way, and indexing such data as a file was a well-known approach for doing so. Storing and retrieving event data using this conventional approach was not innovative but rather a straightforward application of ordinary skill or common sense.

192. To the extent a POSITA wanted further guidance as to particular methods for indexing of event data as files in Yerazunis's buffer, a POSITA would have been motivated to turn to Fiore for at least the reasons above. Fiore discloses a circular storage buffer 15 implemented as a memory-mapped file (EX1009, [0047], [0064]-[0068]), Fig. 9), and identifiable collections of data (*i.e.*, files) for respective events are indexed in the circular storage buffer 15 (*id.*, [0022]-[0023], [0041], [0048], [0050]-

[0051], [0059], [0060]). Fiore also describes numerous benefits of its file-based approach. *Id.*, [0065], [0067], [0068], [0072]. In view of these exemplary benefits and the additional reasons explained in Section VIII.B.1, a POSITA would have been motivated to implement Yerazunis's microcontroller 54 to "respond[] to a signal to record" by "indexing the write-protected portion as a second distinct file in the circular buffer" in the manner Fiore discloses.

193. The second files disclosed or rendered obvious by Yerazunis and/or Fiore are distinct from the "first file" discussed for element 4 above. The "first file" in the Yerazunis/Fiore system may be a memory mapped file that implements the circular buffer, whereas the indexed second file comprises portions of the circular buffer that correspond to video data for a particular event (*e.g.*, a gun-firing event).

g) Element 6: a sending facility that uses the transmitter to wirelessly transmit the second file to a remote memory.

194. Yerazunis discloses this. Microprocessor 54 includes serial output channel 78 (*i.e.*, "sending facility") coupled to "a radio transmitter to transmit RF signals to a base station." EX1017, 9:63:10:3. In the Yerazunis/Fiore system, the write-protected "second files" indexed in the circular buffer would have been wirelessly transmitted to the base station, which a POSITA would have understood as including a "remote memory" for storing such files.

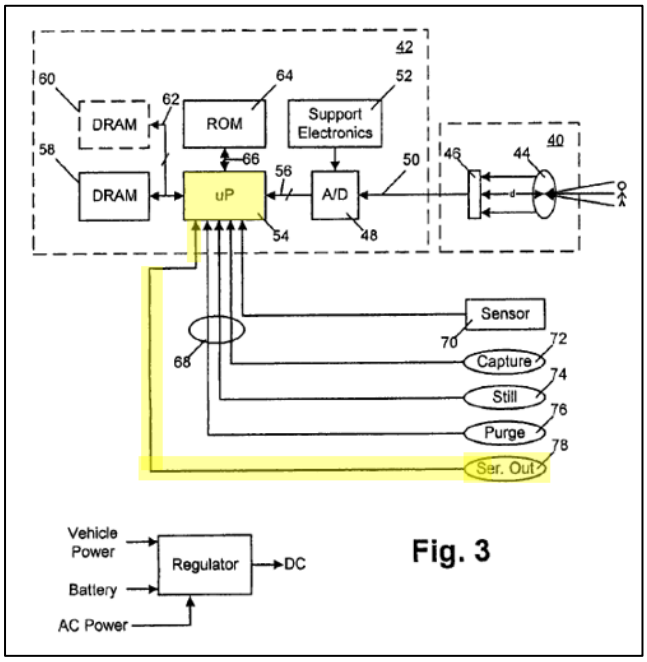


Fig. 3

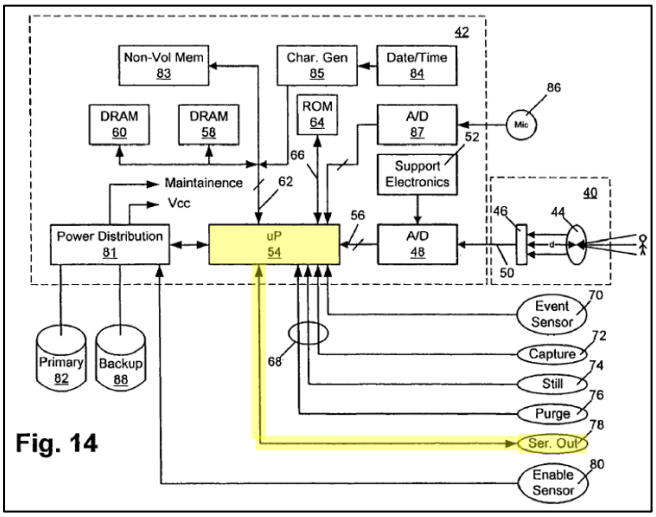


Fig. 14

Id., Figs. 3, 14 (color added).

195. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 1 of the '034 patent.

3. Dependent Claims 2-6, 9, and 11

196. ***Claims 2 and 3:*** Dependent claim 2 depends from claim 1, reciting "wherein the pre-recorded subset is at least 5 seconds long." Dependent claim 3

depends from claim 1, reciting "wherein the segment is at least 10 seconds long." Yerazunis discloses these limitations. In one embodiment, the write-protected segment is approximately 15 seconds long, half being the pre-recorded subset. EX1017, 11:31-43; *see also id.*, 8:43-51 (30-second segment). This discloses the limitations of claims 2 and 3: the approximately 15-second segment "is at least 10 seconds long," and the approximately 7.5-second pre-recorded segment "is at least 5 seconds long."

197. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claims 2 and 3 of the '034 patent.

198. ***Claim 4:*** Dependent claim 4 depends from claim 1, reciting "a sensor that automatically triggers the signal to record upon detecting identified content in at least one of the captured images." Yerazunis discloses this limitation. The reference's video recording device includes the event sensor 70 that:

> provides a trigger output signal in response to a condition which is desired to initiate the capture of the video image or images occurring prior to and following the occurrence of the trigger output signal…. The trigger output signal may [be any] … signal indicative of a specified event.

EX1017 at 8:8-25; *see also id.* at 16:43-65 ("[T]he event sensor 70 is operative to generate a trigger signal in response to the discharge of the gun.").

199. As seen above, Yerazunis's event sensor 70 automatically triggers the signal to record, as claimed. The "signal to record" of claim 4 refers back to the "signal"

of claim 1 that causes the designation of a segment of the circular buffer as being write protected. EX1001 at 12:13-26, 12:33-35 (claim 4 referring to "the signal to record," the antecedent basis of which is "signal" in claim 1). In Yerazunis, when the event sensor 70 detects certain "condition[s]," it provides a trigger output signal that "activate[s] the capture of video images by the present video recording device," thereby causing them to be write-protected. EX1017 at 8:8-25; *see also id.* at 3:25-38, 8:26-30, 15:9-13, 17:45-61. Accordingly, Yerazunis's event sensor 70 discloses the claimed "sensor that automatically triggers the signal to record" because it automatically causes video data to be write protected upon detection of certain conditions.

200. The conditions that automatically trigger the write protecting in Yerazunis include "detecting identified content in at least one of the captured images," as claimed. Specifically, Yerazunis discloses that "[t]riggering events may include" a "signal representing a recognized change in a video image or acoustic signal," "or any other suitable activation signal known in the art." EX1017 at 2:58-64. A POSITA would have understood that recognizing a change in a video image would have involved detecting identified content in the captured images. In particular, a POSITA would have understood that a recognized change in a video image in this context refers to an event that has occurred in a sequence of frames, where such an event caused a change in the video frames over time. By necessity, the ability to recognize a broad range of events entails the ability to detect content in video images. And, a POSITA would have been motivated to implement this triggering event with Yerazunis's gun-mountable

device to, for instance, capture video data when a target is in the gun's sights or when a person falls or blood scatters/flows.

201. As another example, a POSITA would have been motivated to implement this triggering event with Yerazunis's gun-mounted device such that if an officer points the gun at a suspected criminal (e.g., before the officer pulls the gun trigger), the mounted camera system would detect that the suspect has drawn a weapon and begin recording upon such detection. The recording could advantageously be used as evidence/justification for the officer subsequently firing his own weapon. *See* EX1017, 1:32-43. In such cases, recognizing events by identifying important content in video frames would be important. Moreover, Yerazunis is not limited to targetable weapons, as discussed earlier, and thus identifying contents in images provides a general and effective way to recognize important recording events (such as the those in automobile environment discussed in Yerazunis (at Fig. 1 as an example)). Thus, Yerazunis discloses the claimed "sensor that automatically triggers the signal to record upon detecting identified content in at least one of the captured images."

202. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 4 of the '034 patent.

203. ***Claim 5:*** Dependent claim 5 depends from claim 1, reciting "an interface through which a human can initiate a signal." Yerazunis discloses this. The '034 patent describes an "interface" as an input mechanism for receiving user input. EX1010, 2:43-45, 6:8-28, 8:43-54, 8:60-9:13. Yerazunis discloses an input mechanism (*i.e.*, "an

interface") through which a human triggers a write-protecting signal, including "a button actuated by a user." EX1017, 2:58-64; *see also id.*, 9:17-18 (describing "capture button 72, which serves as a user activatable trigger event"), Fig. 14 (depicting capture button 72). Pushing this button provides a trigger signal to central control processor 54. *Id.*, 9:19-22.

204. Yerazunis's "video recording device may be interfaced directly to the trigger of the gun" such that "the trigger is employed to generate a switching action or signal which is used to indicate a trigger event." *Id.*, 16:59-62. The trigger is "an interface through which a human can initiate a signal" for reasons similar to the capture button.

205. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 5 of the '034 patent.

206. ***Claim 6:*** Dependent claim 6 depends from claim 1, reciting "an interface through which a human can designate a length of time of at least one of the pre-recorded subset, the post-recorded subset, and the segment." Yerazunis discloses this. Yerazunis teaches "the number of frames that are recorded before and after [a trigger event] are a matter of design choice." EX1017, 8:51-55; *see also id.*, 6:11-13, 10:42-46, 11:31-43, 12:38-42. Because a human can set the number of frames recorded before and after a trigger event by "design choice," Yerazunis necessarily discloses the "interface" of claim 6.

207. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 6 of the ’034 patent.

208. ***Claim 9:*** Dependent claim 9 depends from claim 1, reciting “a mount for the camera.” Yerazunis discloses this. Yerazunis’s compact video image recording device with camera “is mountable to a gun.” *Id.*, Abstract; *see also id.*, 3:9-17, 14:45-50, 15:24-30, 15:37-38, 15:56-57.

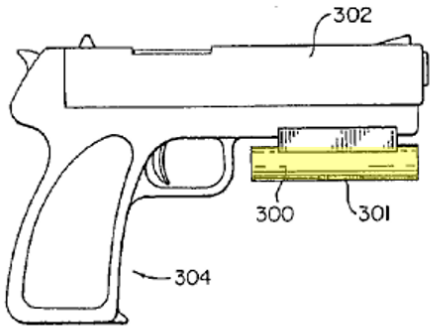


Fig. 10a

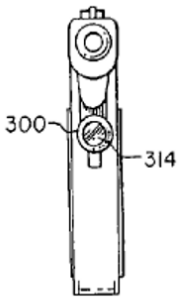


Fig. 10b

Id., Figs. 10a, 10b; *see also id.*, Figs. 2a, 2b, 9, 11a, 11b, 12a, 12b, 13; 3:45-54.

209. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 9 of the ’034 patent.

210. ***Claim 11:*** Dependent claim 11 depends from claim 1, reciting “an electronic index that provides a directory to the first and the second files within the circular buffer.” Yerazunis alone or combined with Fiore discloses this. Yerazunis’s write-protection includes storing pointers that define areas of the circular buffer not to be overwritten, thus providing an electronic index to the write-protected segments “to allow later retrieval.” EX1017, 17:45-61. Yerazunis therefore discloses this limitation.

211. To the extent a POSITA wanted further guidance as to particular methods for indexing of event data as files in Yerazunis's buffer, a POSITA would have been motivated to turn to Fiore. As explained in Section VII.C above, Fiore implements circular storage buffer 15 as a memory-mapped file and describes indexing collections of frame data for respective events as "second files" within a "first file" (*i.e.*, the memory-mapped file that implements the circular buffer). EX1009, [0022]-[0023], [0051], [0059], [0060]. A POSITA would have been motivated to employ Fiore's indexing of video data as second files for at least the reasons stated in Section VIII.B.1.

212. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 11 of the '034 patent.

4. Independent Claim 12

213. Independent claim 12 of the '034 patent is a method claim with limitations similar to those of previously addressed independent claim 1 directed to a surveillance apparatus. EX1038 (chart comparing limitations of claims 1 and 12).

a) Preamble: A method of processing imaged data from a camera, comprising the following steps:

214. Yerazunis discloses the preamble of claim 12. Yerazunis discloses a "method of operation of the video recording device" illustrated in Figure 5, below (EX1017, 10:55-11:30):

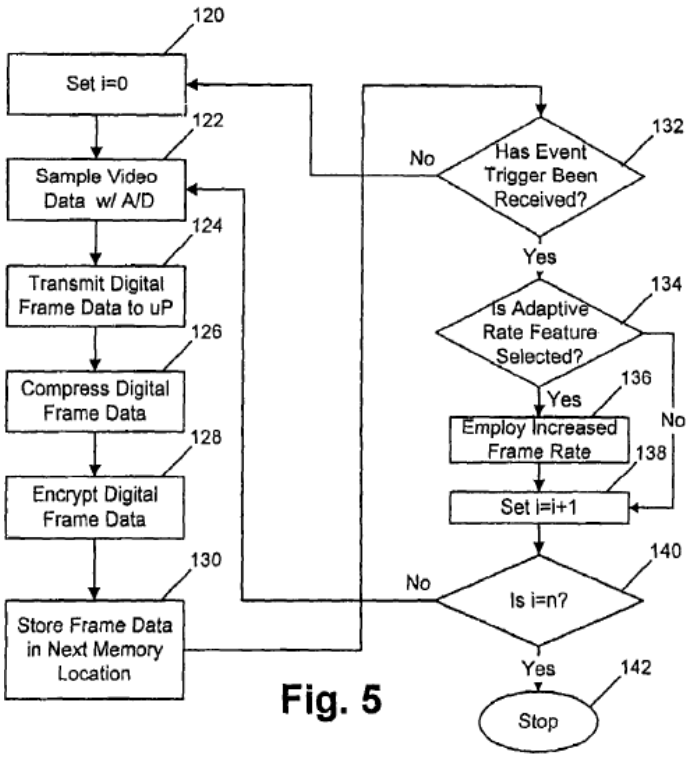


Fig. 5

215. The steps illustrated constitute "processing imaged data." In Yerazunis's gun-camera embodiment, "the operation of the recording device is generally in accord with the description" above. *Id.*, 16:4-8, 17:45-61.

b) Element 1: receiving a stream of the imaged data;

216. Yerazunis discloses this for at least the reasons discussed above for claim 1, element 1 of the '034 patent. EX1038. Yerazunis discloses a camera having an image capturing component (*i.e.*, CCD 46) and a converting component (*i.e.*, ADC 48).

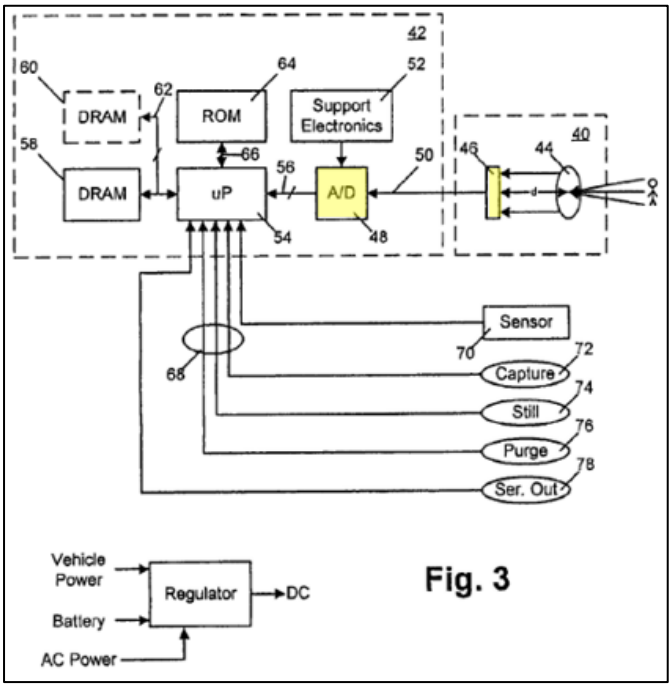


Fig. 3

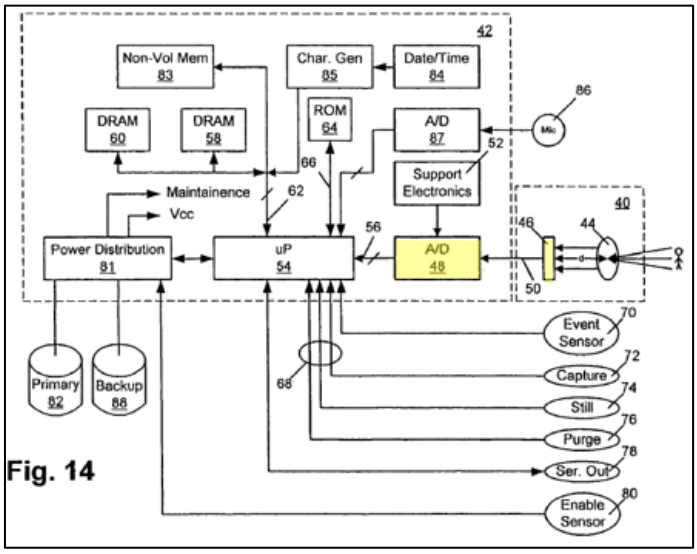


Fig. 14

The data stream created by CCD 46 and ADC 48 is "a stream of … imaged data." As explained above, the digital output of Yerazunis's one or more ADCs 48 is "at least one data stream" because the output is a continuous sequence of data. EX1017, 2:33-52, 5:49-67, 6:52-56, 7:23-32; Appx MM at 109. Further, it is a stream of "imaged data" because it contains image data from the camera in digital form. As shown in the

flowchart of Yerazunis's Figure 5, the digital image data is received at least by microprocessor 54 in steps 122 and 124. EX1017, 10:55-63.

c) Element 2: recording the stream into available portions of a circular buffer as a first file using a digital video file format;

217. Yerazunis alone or combined with Fiore discloses this for at least the reasons discussed for claim 1, element 4 of the '034 patent. EX1038. Yerazunis's microprocessor 54 "compresses the digitized frame data and stores the compressed frame data in the next sequential location of [a] circular buffer" of the local memory (*i.e.*, DRAMs 58, 60). EX1017, 2:45-47, 6:24-26, 6:52-7:6, 10:55-67, 17:50-59; *see also id.*, 11:50-14:44, Figs. 6-8.

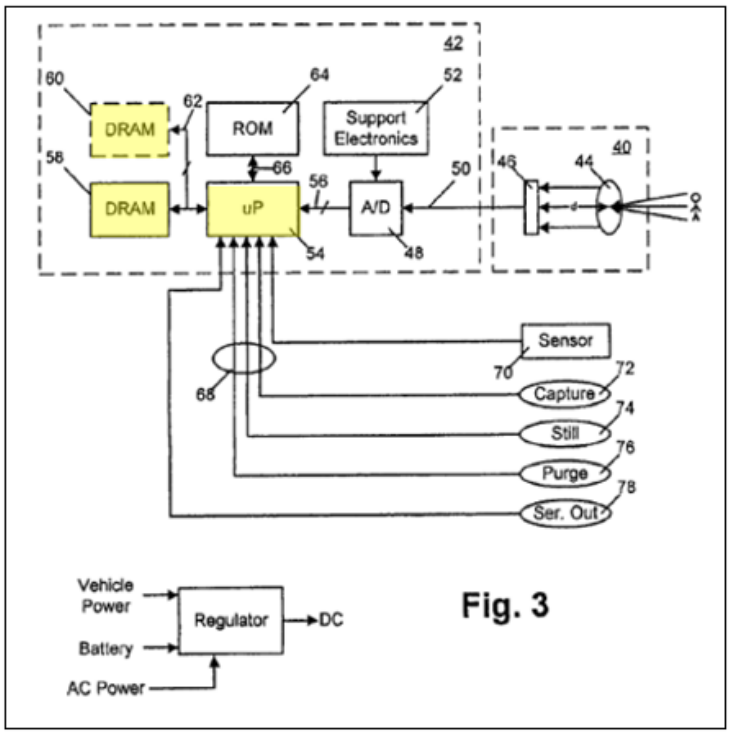


Fig. 3

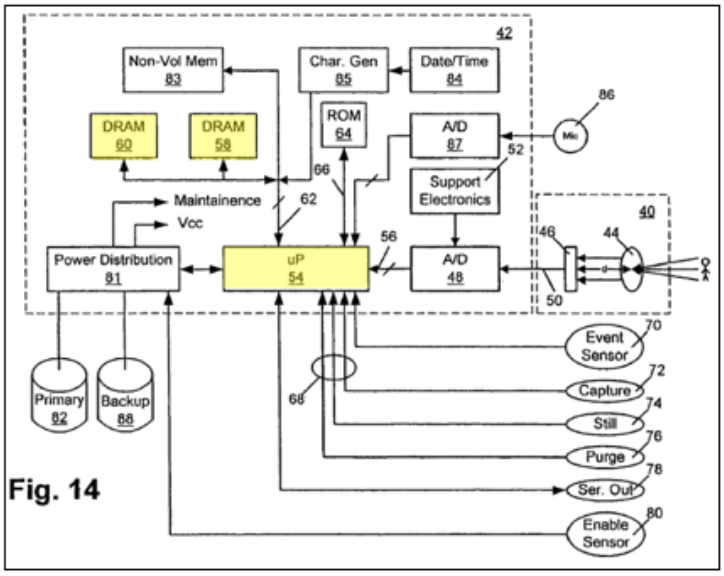


Fig. 14

See also id., Fig. 5 (steps 126 and 130), 10:63-11:6.

d) Element 3: responding to a signal by write-protecting a segment that includes a newly recorded portion of the buffer, wherein the newly recorded portion is recorded before the signal is received, and includes a post-recorded portion to be recorded after the signal is received;

218. Yerazunis discloses this. As explained above for claim 1, element 5 of the '034 patent, Yerazunis's microcontroller 54 includes a "protecting facility" to perform the claimed function. A POSITA would have understood that the segment of the circular buffer to be write-protected must "include[] a newly recorded portion of the buffer" because frame data not "newly recorded" would be overwritten once recording loops back to where that frame data is stored. *See* EX1017, 2:19-23, 2:45-57, 17:9-20, 17:50-59.

e) Element 4: indexing write protected portions of the buffer as separate, distinct files during the step of recording; and

219. Yerazunis alone or combined with Fiore discloses this. As explained above for claim 1, element 5 of the '034 patent, Yerazunis's protecting facility performs the claimed "indexing." This includes indexing of multiple gun-firing events. EX1017, 16:66-17:61. To the extent a POSITA wanted further guidance as to particular methods for indexing of event data as files in Yerazunis's buffer, a POSITA would have been motivated to turn to Fiore for at least the reasons explained above for claim 1, element 5 of the '034 patent and in Section VIII.B.1.

f) Element 5: wirelessly transmitting at least one of the distinct files from the write-protected portions of the circular buffer to a remote memory.

220. Yerazunis discloses this for at least the reasons discussed above for claim 1, elements 3 and 6 of the '034 patent. EX1038.

221. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 12 of the '034 patent.

5. Dependent Claims 13-18

222. ***Claim 13:*** Dependent claim 13 depends from claim 12, reciting "storing the distinct files from the write-protected portions as the distinct, separate files in the remote memory." This would have been obvious in view of Yerazunis. A POSITA would have understood that a file stored in local memory would be maintained as a file once offloaded to the remote memory, and that it would have been obvious to

implement Yerazunis (alone or in combination with Fiore) in this manner. *Id.* Yerazunis specifically discloses offloading video images to a remote memory so that a user can view them (*see, e.g.*, EX1017, 3:1-2, 6:45-47, 9:60-65), and a POSITA would have understood this to mean storing as distinct, separate files in the remote memory.

223. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 13 of the '034 patent.

224. ***Claim 14:*** Dependent claim 14 depends from claim 12, reciting "recording the stream as the first file into physically dis-contiguous parts of the circular buffer." Yerazunis discloses this. Since frame data associated with a firing event cannot be overwritten, Yerazunis's video recording device necessarily records to physically dis-continuous parts of the circular buffer, as the overwriting process skips preserved event data. EX1017, 3:19-33; *see also* Figs 6-8 (illustrating the non-sequential nature of recording); *accord* EX1010, 9:18-26, Fig. 4H.

225. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 14 of the '034 patent.

226. ***Claim 15:*** Dependent claim 15 depends from claim 12, reciting "wherein the signal to save a recording comprises a signal to start recording and a signal to stop recording." Yerazunis discloses this. As explained above for claim 1, element 5, and claim 12, element 3 of the '034 patent, Yerazunis's video recording device responds to a signal to save a recording by write protecting specified frame data in the circular buffer. EX1017, 3:20-38, 8:8-30, 14:55-61, 15:9-13. Yerazunis's "signal to save a

recording" comprises "a signal to start recording and a signal to stop recording," as recited in claim 15. Yerazunis's "signal to save" tells the video recording device when to (i) "start recording," *i.e.*, upon detection of the signal, EX1017, 3:25-38, 8:26-30, 15:9-13, and (ii) "stop recording," *i.e.*, when a predetermined number of frames subsequent to the trigger event have been write protected, *id.*, 2:53-64, 4:35-56, 8:26-61, 11:27-30, 12:14-17, 13:3-17, 16:66-17:38. Yerazunis thus discloses the limitations added in claim 15.

227. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 15 of the '034 patent.

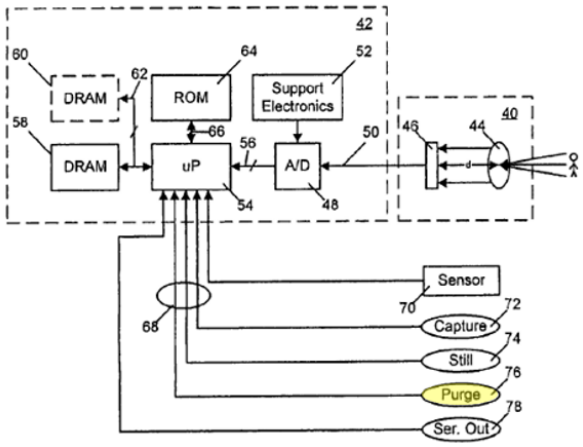
228. ***Claim 16:*** Dependent claim 16 depends from claim 12, reciting "receiving the signal to save a recording through at least one of a manually operated switch and an audio signal." Yerazunis discloses this. Yerazunis's "event sensor 70 is operative to generate a trigger signal in response to the discharge of the gun," and may comprise a microphone "operative to detect the sound associated with the firing of the gun" (*i.e.*, audio signal). EX1017, 16:43-55.

229. Yerazunis also discloses the "interface through which a human can initiate a signal" of claim 5, teaching a "capture button 72 which serves as a user activatable trigger event" (*id.*, 9:17-18; *see also id.*, 2:58-64) and a gun trigger "directly interfaced to" Yerazunis's video recording device such that the trigger (*i.e.*, manually operated switch) triggers the signal to write-protect video data (*id.*, 16:59-62).

230. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 16 of the ’034 patent.

231. ***Claim 17:*** Dependent claim 17 depends from claim 12, reciting “configuring the size of the pre-recorded subset.” Yerazunis discloses this for at least the reasons provided above for claim 6 of the ’034 patent. It is my opinion that Yerazunis alone or combined with Fiore therefore renders obvious claim 17.

232. ***Claim 18:*** Dependent claim 18 depends from claim 12, reciting “removing write-protection from a transmitted write-protected portion after transmission of its corresponding distinct file.” Yerazunis discloses this. Yerazunis discloses purge button 76 electronically coupled to microprocessor 54. EX1017, 9:47-48. Pressing the purge button, “the contents of the circular buffer and any still images that have been captured are erased. Thus, in the event that a user captures images which, for any reason, such user does not desire to retain, they may be erased.” *Id.*, 9:48-53. Accordingly, write-protection is removed from a write-protected portion of the circular buffer. It would have been obvious that one reason the “user does not desire to retain” captured images is that the images have been offloaded, as disclosed by Yerazunis and discussed for claim 1.



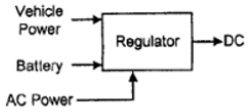


Fig. 3

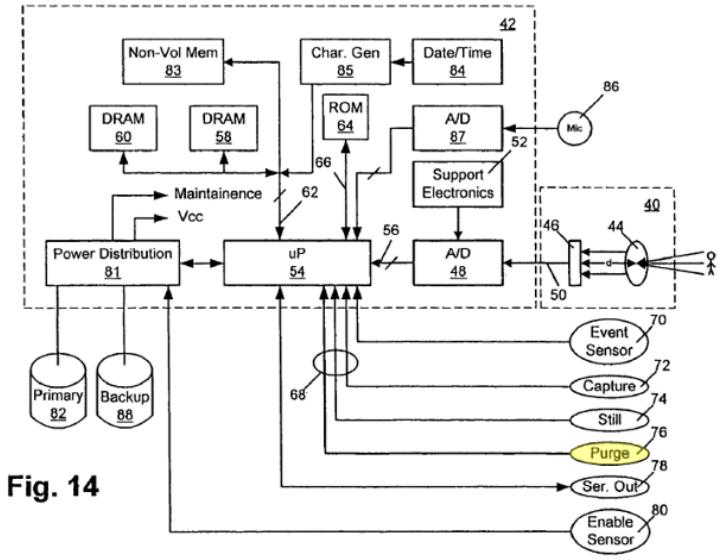


Fig. 14

EX1017, Figs. 3, 14 (color added); *id.*, 19:30-34.

233. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 18 of the ’034 patent.

C. Ground 1b: Claims 7 And 8 Of The '034 Patent Would Have Been Obvious Over Yerazunis Alone Or As Combined With Fiore, In Further View Of Lewellen

1. Motivation To Combine

234. A POSITA would have been motivated to combine Lewellen with the Yerazunis/Fiore system described above. All three references disclose video recording systems, and Yerazunis and Lewellen in particular disclose video recording systems specifically for law enforcement applications. *See*, *e.g.*, EX1017 (Yerazunis) at 1:32-43, 9:60-10:11; EX1019 (Lewellen) at [0002]-[0009], [0024]-[0026], [0042]. Accordingly, a POSITA would have been aware of and motivated to combine these references.

235. In particular, a POSITA would have been motivated to implement Yerazunis's video recording device with Lewellen's local wireless interface 390. In an embodiment, Yerazunis describes using a radio transmitter, "such as found in a police cruiser," to "transmit RF signals to a base station for viewing." EX1017 at 9:63-10:3. Likewise, Yerazunis describes a serial output channel permitting recorded data to be read out of memory and downloaded to a computer for viewing or cleared. *Id.* at 3:1-4, 6:45-51, 9:60-63, 18:60-66. A POSITA would recognize, however, that RF transmitters or serial outputs may not be available at all times. For example, when a police officer is using Yerazunis's gun-camera out in the field, away from his police cruiser or a computer, the police officer would not be able to offload critical video

evidence for safe storage on another device. The police officer would also not able to free up space in the buffer for preserving additional video evidence in the buffer.

236. For these reasons and others discussed herein, a POSITA would have been motivated to implement Yerazunis's video recording device with the local wireless interface 390 of Lewellen. Lewellen's local wireless interface 390 provided "a significant advantage over the prior art vehicle video systems":

> The vehicle video system includes a local wireless interface, such as a Bluetooth-compatible interface, that automatically connects to a compatible device … that is coupled to a database. In this manner, *the digital video information collected by the vehicle video system is automatically transferred to the database when the vehicle is parked, removing the need for any human intervention for the logging and cataloging of video tapes*. The local wireless interface of the vehicle video system also allows other devices, such as a handheld device or a vehicle video system in a different vehicle, to access the stored digital video information.

EX1019 at Abstract.

> Vehicle video system 300 includes a local wireless interface 390. *Local wireless interface 390 provides a significant advantage over the prior art vehicle video systems*. Local wireless interface 390 provides a means of communicating via short-range wireless communications. In the preferred embodiments, local wireless interface 390 is a Bluetooth-compatible interface, which can communicate with other Bluetooth-compatible devices over a typical range of 100 meters (330 feet).

Id. at [0031].

> Local wireless interface 390 … is short range, *low power, and very inexpensive*. It is anticipated that Bluetooth-compatible interfaces will be available in chipsets that will sell in the $5 range in quantity. The local wireless interface 390 is thus a low-power, short range wireless interface that is very inexpensive.

Id. at [0042].

> The *benefit of providing the local wireless interface 390* is that digital information recorded by the digital video recorder 370 may be automatically transmitted and received to and from compatible devices.

Id. at [0043]; *see also id.* at [0045] ("local wireless interface 390 … allows the operation of the vehicle video system 300 to be much simpler than the prior art method").

237. In view of these example advantages, a POSITA would have been motivated to implement Yerazunis's video recording device with Lewellen's local wireless interface 390. A POSITA would have also been motivated to use the interface 390 to automatically transmit a file in the Yerazunis/Fiore video recording device to a mobile phone, with the mobile phone then automatically forwarding the file to a remote memory, as disclosed in Lewellen. EX1019 at [0010], [0031], [0037], [0041]. Bluetooth-compatible mobile phones were ubiquitous as of June 2007 and carried by many police officers on a daily basis. A POSITA would have recognized that using these mobile phones to offload files from the video recording device for subsequent forwarding to a remote memory would have been a simple and low-cost method for

preserving important video. Lewellen expressly recognizes the significant advantages of Bluetooth technology, including that it is "very inexpensive." EX1019 at [0032], [0034], [0042]. Further, Lewellen's techniques for preserving video would have advantageously been available whenever a mobile phone is within range of the video recording system, including when a police officer is not in the vicinity of a police cruiser's radio transmitter or a computer.

238. A POSITA would have had a reasonable expectation of success in implementing the Yerazunis/Fiore video recording device with the local wireless interface 390 and related techniques described in Lewellen. Bluetooth-compatible interfaces were well-known and commercially available as of June 2007, and the addition of such an interface in the Yerazunis/Fiore video recording system would have been routine and well within a POSITA's skill. In my opinion, this combination is merely a combination of familiar elements according to known methods to yield predictable results, further showing its obviousness.

2. Dependent Claims 7 and 8

239. ***Claim 7:*** Dependent claim 7 depends from claim 1, reciting "wherein the remote memory is located on a mobile phone." Lewellen discloses this. Lewellen's local wireless interface 390 wirelessly transmits data to Bluetooth-compatible devices, including mobile phones. EX1019, [0022], [0031], [0042]-[0048]. A POSITA would have been motivated to incorporate Lewellen's interface 390 into the Yerazunis/Fiore system for the reasons above.

240. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore, in further view of Lewellen, renders obvious claim 7 of the '034 patent.

241. ***Claim 8:*** Dependent claim 8 depends from claim 1, reciting "wherein a mobile phone automatically receives the second file from the wireless transmitter and automatically forwards the second file to the remote memory." Lewellen discloses this. Local wireless interface 390 enables access to the local memory by nearby devices, including Bluetooth-compatible mobile phones. EX1019, Abstract, [0031], [0037], [0041]. Lewellen's vehicle video system automatically transmits digital video to a "compatible device … that is coupled to a database," and the compatible device then "automatically transfer[s]" the video "to the database" (*i.e.*, a remote memory). *Id.*, Abstract, [0010]; *see also id.*, [0043].

242. In the Yerazunis/Fiore system, files are stored in local memory (*e.g.*, DRAM 58), and adding Lewellen's interface 390 would have advantageously enabled access to local memory using mobile phones. A POSITA would have been motivated to implement the Yerazunis/Fiore video recording system with these features for the reasons in Section VIII.C.1.

243. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore, in further view of Lewellen, renders obvious claim 8 of the '034 patent.

D. Ground 1c: Claim 10 Of The '034 Patent Would Have Been Obvious Over Yerazunis Alone Or As Combined With Fiore, In Further View Of Mann

1. Motivation to Combine

244. POSITA would have been motivated to combine Mann with Yerazunis and Fiore. Yerazunis describes a "compact video image recording device," which is "mountable to a gun" or mounted within a vehicle. EX1017 at Abstract, 4:35-39. Like Yerazunis, Mann discloses a compact, mountable camera system: Mann describes a body-worn portable electronic camera system with wearable viewfinder means, particularly as built into eyeglass frames. EX1015 at [0001], [0056]. Because all three of Yerazunis, Fiore, and Mann disclose video recording systems—and Yerazunis and Mann in particular disclose compact, mountable systems—a POSITA would have been aware of and motivated to combine these references. Mann also describes why a POSITA would have been motivated to implement the Yerazunis/Fiore system in an eyeglasses-mounted apparatus. Among other reasons, Mann's wearable viewfinder system advantageously "allows the user to record a portion of his or her eye's visual field of view." EX1015 at [0044].

2. Dependent Claim 10

245. Dependent claim 10 depends from claim 9, reciting "wherein the mount is a pair of wearable glasses." Mann discloses this. Mann describes a body-worn portable camera system with wearable viewfinder, built into eyeglass frames 100 with lenses 105 and cameras 110 and 120. EX1015, [0001], [0056]-[0058], Fig. 1.

246. In addition to Mann, wearable cameras including cameras mounted to eyeglasses and using circular buffers to record pre-event data were well-known. EX1029.

247. A POSITA would have been motivated to combine Mann with Yerazunis and Fiore. Because Yerazunis, Fiore, and Mann all disclose video recording systems—and Yerazunis and Mann disclose compact, mountable systems—a POSITA would have been aware of and motivated to combine these references. Mann also describes why a POSITA would have been motivated to implement the Yerazunis/Fiore system in an eyeglasses-mounted apparatus. Among other reasons, Mann's wearable viewfinder system advantageously "allows the user to record a portion of his or her eye's visual field of view." EX1015, [0044].

248. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore, in further view of Mann, renders obvious claim 10 of the '034 patent.

E. Ground 1d: Claims 19 And 20 Of The '034 Patent Would Have Been Obvious Over Yerazunis Alone Or As Combined With Fiore, In Further View Of Fiedler

1. Motivation To Combine

249. A POSITA would have been motivated to use the teachings of Fiedler in the Yerzunis/Fiore system. These references all disclose video recording systems for security, law enforcement, or surveillance operations, and Yerazunis and Fiedler both disclose compact, hand-held embodiments. A POSITA therefore would have been aware of and motivated to combine these references. Additional motivations for this

combination and a POSITA's reasonable expectation of success are detailed below for the specific features of claims 19 and 20.

2. Dependent Claims 19 and 20

250. Dependent claim 19 depends from claim 12, reciting "sending a warning to a user before the write protected segment of the circular buffer is fully recorded." Dependent claim 20 depends from claim 19, reciting "extending a length of the write protected segment of the circular buffer in response to at least one of a manually operated switch and an audio signal." Yerazunis alone or combined with Fiore, in further view of Fiedler discloses these limitations.

251. Claim 19: These limitations would have been obvious in view of Yerazunis. Yerazunis discloses the recording process "continues as each trigger event occurs until the buffer memory is full." EX1017, 17:50-61. A POSITA would have been motivated to implement the Yerazunis/Fiore system with a warning to inform the user when the buffer is nearly full. In any case, such limitations are obvious in view of Fiedler, describing a device that "continues to capture data until either the capture button is pressed again or a sufficient pause has been detected. (*The device may sound an audible warning at that point, giving the user a choice whether to continue capturing*.)." EX1037, 9:46-53. The combination merely combines familiar elements according to known methods to yield predictable results. This combination would have been obvious to a POSITA.

252. Claim 20: Yerazunis states: "Since multiple firings of the gun are possible, it is conceivable that the gun may be refired within the post trigger event time period that the video recording device is still recording as a consequence of a prior firing." EX1017, 17:38-42. "In such event, the recording time may be extended so as to terminate another post event time period after the last such firing." *Id.*, 17:42-44. The sound of the gun refiring, detected by event sensor 70, discloses the claimed "audio signal."

253. Yerazunis also discloses (i) the length of the write-protected segment is a matter of design choice, and (ii) the length of the segment can be extended. EX1017, 8:26-61, 16:66-17:44. It would have been obvious to utilize a manually operated switch or audio signal to extend the length of the segment in view of Yerazunis's disclosure. Moreover, such limitations would have been obvious in further view of Fiedler. Fiedler describes "pressing Capture once may capture the most recent minute, pressing it twice in rapid succession may capture the most recent two minutes, and so on." EX1037, 9:42-45. And a POSITA would have generally known that a user could control and extend the length of recording in a circular buffer. For example, US 7,348,895 to Lagassey describes that a length of recording time "can be programmed or adjusted remotely from [a] monitoring center 45 if there is a need to shorten or extend the time of recording." EX1035, 28:48-56.

254. A POSITA would have recognized the advantages of extending a length of a write-protected segment in response to manually operated switch or audio signal in

the Yerazunis/Fiore system. Yerazunis states an objective of its video recording device is to create an evidentiary record (EX1017, 15:61-64), and a POSITA would have understood extending a length of a write-protected segment in the Yerazunis/Fiore system would have been advantageous at least to ensure important video evidence can be preserved, *e.g.*, when the important video data is captured when write-protection would otherwise end.

255. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore, in further view of Fiedler, renders obvious claims 19 and 20 of the '034 patent.

F. Ground 2a: Claims 1-9 And 11-18 Of The '034 Patent Would Have Been Obvious Over Ely Alone Or As Combined With Fiore, In Further View Of Lewellen

1. Motivation To Combine

256. A POSITA would have been motivated to combine Ely, Fiore, and Lewellen for multiple reasons.

257. ***Ely/Fiore***: A POSITA would have been motivated to combine Ely and Fiore for multiple reasons.

258. As one example, both references describe similar technologies and solve similar problems. As detailed above, Ely describes a surveillance system that uses a ring buffer (*i.e.*, a circular buffer) to continuously record a video signal generated by a camera 130, and portions of the ring buffer are write protected in response to an alarm command. Ex 1020 at 6:51-53, 6:61-65, 7:28-39. The write-protected portions include video data recorded both before and after the alarm command. *Id.* at 7:48-55. Fiore

similarly discloses a "data recording and playback system" that uses "a circular storage buffer having a memory mapped file with same address space as the memory device for storing the input signal data." EX1009 at Abstract. In Fiore, "data frames before, during, and after [an] event" are preserved, similar to what is disclosed in Yerazunis. *Id.* at [0048]. Because Ely and Fiore both disclose data recording systems that store data in a circular buffer and preserve data associated with an event (or alarm)—both before and after the event—a POSITA would have been aware of and motivated to combine the two references.

259. As another example, a POSITA would have been motivated to implement Ely's video surveillance system with Fiore's file-based approach for the circular storage buffer and event data stored therein. Ely discloses that a write-protected portion of the ring buffer can be retrieved and used in various ways (*see*, *e.g.*, EX1020 at 7:56-8:6, 10:17-23), such that a POSITA would have understood the write-protected portion as being indexed as a file (*i.e.*, an identifiable collection of data) in the ring buffer. To the extent, however, that a POSITA needed further guidance on ways to implement data or file storage techniques in a circular buffer, the POSITA would have been motivated to turn to Fiore. Fiore's file-based approach includes (i) implementing a circular storage buffer as a memory-mapped file, and (ii) indexing event data for events as respective files within the memory-mapped file. *See*, *e.g.*, EX1009 at [0022]-[0023], [0051], [0059], [0060]. As detailed in Section VIII.B.1 above, Fiore also describes numerous benefits of its file-based approach. *See*, *e.g.*, *id.* at [0065], [0067], [0068], [0072].

260. In view of these exemplary benefits, and other reasons discussed herein, a POSITA implementing Ely would have been motivated to utilize Fiore's teachings on the circular storage buffer implemented as a memory-mapped file and the indexing of event data as files within the circular storage buffer. A POSITA would have had a reasonable expectation of success because Fiore provides a detailed disclosure of its file-based approach, and applying those techniques to Ely's surveillance system would have been routine and well within a POSITA's skill.

261. ***Ely/Fiore/Lewellen***: A POSITA would have been motivated to combine these references with Lewellen. All three disclose video recording systems, such that a POSITA would have been aware of and motivated to combine them. A POSITA would have recognized the advantages of modifying the Ely/Fiore system to implement Lewellen's local wireless interface for transmitting alarm data preserved with the file-based circular buffer approach of the Ely/Fiore system. Ely describes a "data communication network" to transmit "command and status data between the system central station and the video cameras," which "may be provided with sufficient capacity to handle transmission of compressed video data buffered or currently generated at the video camera units, in which case separate video signal transmission cabling can be dispensed with." EX1020, 4:63-5:9. Ely discloses it is an "object of the invention to provide a video surveillance system which requires less cabling than conventional systems." *Id.*, 2:52-54.

262. Lewellen's local wireless interface is low power and very inexpensive. EX1019, [0042]. "The benefit of providing the local wireless interface 390 is that digital information recorded by the digital video recorder 370 may be automatically transmitted and received to and from compatible devices. *Id.*, [0043]. In view of these advantages, a POSITA would have been motivated to implement the Ely/Fiore system with Lewellen's wireless interface 390 to further reduce the amount of cabling required, *i.e.*, by enabling wireless—rather than wired—transmission of signals and data.

263. Moreover, before the priority date of the '471 patent, there were significant efforts to switch from wired cameras to wireless cameras and from LANs to wireless LANs for ease of deployment of cameras, more versatile coverage, and better scalability. *See*, *e.g.*, Appx LL, "Wireless Video Surveillance: A Survey" by Y. Ye, S. Ci, A. K. Katsaggelos, Y. Liu and Y. Qian, in IEEE Access, vol. 1, pp. 646-660, 2013, doi: 10.1109/ACCESS.2013.2282613 (downloaded from https://www.researchgate .net/publication/270767766, last accessed July 20, 2024), and Appx JJ (printed from https://www.securitymagazine.com/articles/77987-videosurveillance-wireless-mesh-networks-1, last accessed July 19, 2024). For example, the NetEye security camera had a wireless feature in the 1990s. Appx KK (printed from https://www.deepsentinel.com/blogs/home-security/history-of-surveillance-cameras/, last accessed July 19, 2024). A POSITA at the alleged priority date of the '471 patent would have recognized this trend and the benefits associated with wireless transmission.

264. A POSITA would have also been motivated to use Lewellen's interface 390 to automatically transmit a file in the Ely/Fiore video recording device to a mobile phone, with the mobile phone then automatically forwarding the file to a remote memory, as detailed in Section VIII.C.1. EX1019, [0010], [0031], [0037], [0041]. Lewellen's techniques for preserving video would have advantageously been available whenever a mobile phone is within range of the video recording system, enabling a security professional to view or preserve recorded video when the professional is not in the vicinity of the DVTR, VCR, or host computer.

265. A POSITA would have had a reasonable expectation of success in implementing the Ely/Fiore system with Lewellen's interface 390 and related techniques Lewellen describes. Local wireless interfaces (including Bluetooth-compatible interfaces) were well-known and commercially available, and adding this interface in the Ely/Fiore system would have been routine and well within a POSITA's skill.

2. Independent Claim 1

a) Preamble: A surveillance apparatus, comprising:

266. Ely discloses the preamble of claim 1. Ely discloses a "video surveillance system" including a central control station and video cameras each mounted inside a dome housing unit." EX1020, Abstract.

b) Element 1: a camera having an image capturing component that captures images, and a converting component that converts the images into at least one data stream;

267. Ely discloses this. In camera 130, an "image formed by the optical system 138 is converted into an electrical signal at CCD 142 [(*i.e.*, "an image capturing component that captures images")] and the resulting signal is subjected to conventional analog signal processing at video signal processing circuit 144." *Id.*, 6:21-28. Camera 130 is coupled to memory board 136 including video digitizer circuit 146 (with processing circuit 144, "a converting component"). *Id.*, 6:48-61. At the purported priority date of the challenged patents (June 2007), the term "camera" was often used to describe systems with imaging components and digitizers, like in Figure 3.

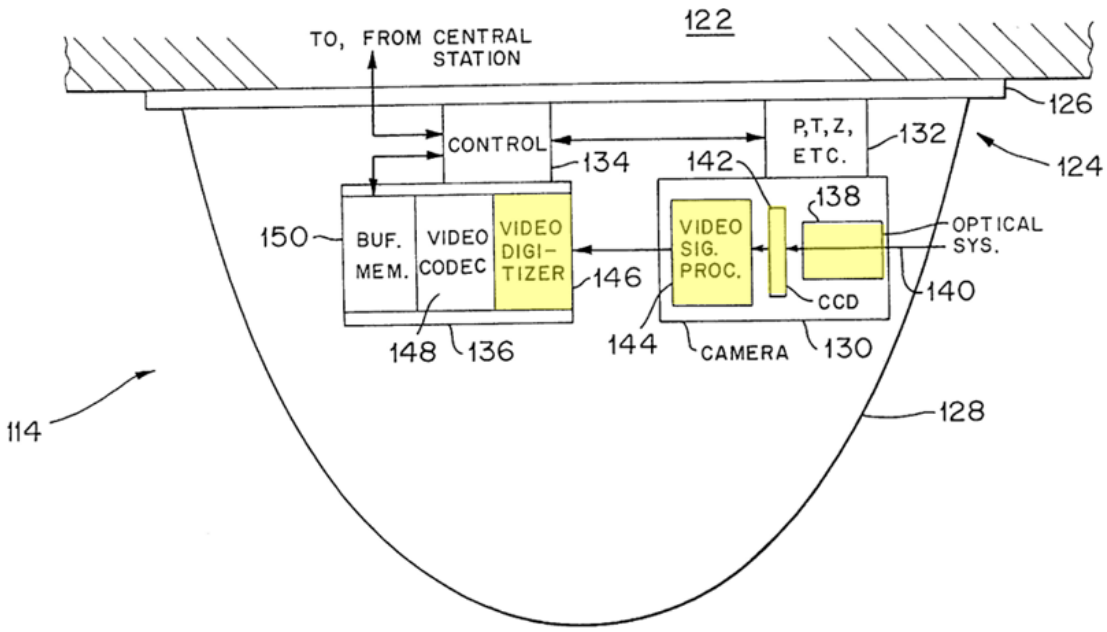


FIG. 3

EX1020, Fig. 3 (color added).

268. A POSITA would have understood the digital output of digitizer 146 as "at least one data stream" because the output is a continuous sequence of data. EX1020, 3:56-67, 4:49-56, 6:48-7:11; Appx MM at 109 (downloaded from https://dl.acm.org /doi/pdf/10.5555/976440.976456, last accessed July 21, 2024).

c) Element 2: a local memory functionally coupled to the camera;

269. Ely discloses this. Memory board 136 includes memory device 150, *i.e.*, "local memory" (EX1020, 6:17-21, 6:48-53, 6:61-65):

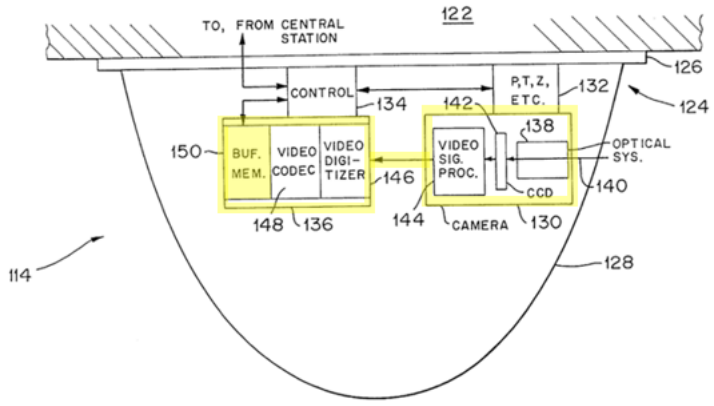


FIG. 3

Id., Fig. 3 (color added).

270. A POSITA would have understood that memory device 150 is coupled to camera 130 using entirely physical connectors. Camera 130 is coupled to memory board 136, which is configured "to receive an analog video signal output from the camera 130 and to digitize, compress and store the video signal" in memory device 150. EX1020, 6:48-65. A POSITA would have understood the coupling between camera 130 and memory device 150 as using only physical connectors. The arrow shown

between components 130 and 150 in Figure 3 of Ely would have represented a wired connection to a POSITA. Additionally, if the connection between the camera 130 and memory device 150 was intended to be wireless, then a POSITA would have understood that a wireless sender and receiver would have been depicted. Lacking any depiction of such wireless sender and receiver, a POSITA would have understood the connection between the camera 130 and memory device 150 as being physical. Accordingly, memory device 150 is coupled to camera 130 "using entirely physical connectors," as required by the parties' agreed upon construction.

271. A POSITA would have further understood that memory device 150 is distanced less than 20 cm from the camera 130. *Id*. Ely discloses that the memory device is "provided adjacent to the camera." EX1020, 4:17-25, 6:61-63. A POSITA would have understood that memory device 150, located adjacent to the camera within the housing of the "dome unit," as in Figure 3, is located near (less than 20 cm from) the camera.

d) Element 3: a wireless transmitter functionally coupled to the local memory;

272. Ely discloses that alarm data stored in memory device 150 (*i.e.*, "local memory") can be transmitted to a remote memory. EX1020, 9:51-58, 10:24-47. To the extent Ely does not disclose a "wireless transmitter functionally coupled to the local memory" to achieve such transmissions, Lewellen does. Lewellen's local wireless interface 390 wirelessly transmits data to Bluetooth-compatible devices, including

mobile phones. EX1019, [0022], [0031], [0042]-[0048]. A POSITA would have been motivated to implement the Ely/Fiore system with Lewellen's interface 390 for at least the reasons above. In this system, the interface 390 would have been functionally coupled to the memory device 150 (*i.e.*, "local memory") to advantageously enable wireless offloading of write-protected files stored in the memory's buffer to a remote memory.

e) Element 4: a recording facility that continuously records the data stream into available portions of a circular buffer in the local memory as a first file using a digital video file format;

273. Ely alone or combined with Fiore discloses this. Ely's surveillance system includes a "video data buffer memory, storing compressed video data generated by the camera," which "is mounted with each camera in the respective dome unit." EX1020, Abstract. Memory device 150 "functions as a buffer for the video signal generated by the camera 130, and is controlled by the control circuit 134." *Id.*, 6:61-65. "[M]emory 150 serves as a "ring buffer," in which "currently generated compressed video data is written over the oldest compressed video data that had previously been stored in the memory 150." *Id.*, 7:28-34. A POSITA would have understood the compressed video data as "using a digital video file format," and further understood Ely's "ring buffer" to mean a "circular buffer" of the type disclosed in the '034 patent.

274. Ely discloses that the camera system responds to an "alarm command by protecting buffered video data which corresponds to a predetermined pre- and post-

alarm time period" and the "protected data is then available for subsequent retrieval, display, and permanent recording" EX1020, 10:11-15. In Ely, "[a]fter the compressed video data stored at one of the camera units has been protected pursuant to an alarm command, the data (which will sometimes be referred to as 'alarm data') can be selectively retrieved in response to user instruction either for display (block 180) or directly for taperecording (block 182)." *Id.*, 10:15-23. A POSITA would have found it obvious to record the data stream ("alarm data") in Ely's ring buffer "as a file" based on Ely's disclosure of storing the alarm data for subsequent, selective "retrieval, display, and permanent recording." Further, while Ely never expressly refers to recording the data stream into the circular buffer "as a file," a POSITA would have understood such file-based recording as one of a finite number of identified solutions for recording video data in Ely, evidencing its obviousness. A POSITA would have recognized Ely's video data must be recorded to the circular buffer in some way, and using a file was a well-known approach for doing so. EX1020, 6:61-65, 7:28-34, 10:17-23.

275. To the extent a POSITA wanted further guidance as to particular methods for recording video data as files in Ely's ring buffer, a POSITA would have been motivated to turn to Fiore. As explained in Section VII.C, Fiore implements circular storage buffer 15 as a memory-mapped file and describes indexing collections of frame data for respective events as files within the memory-mapped file. EX1009, [0022]-[0023], [0051], [0059], [0060]. Fiore also describes the benefits of its file-based

approach, including enabling playback of video data for a specific event from the circular buffer without interrupting simultaneous recording of new video data into the buffer. *Id.*, [0065], [0067], [0068], [0072]. In view of these exemplary benefits and the additional reasons explained in Section VIII.F.1, a POSITA would have been motivated to implement Ely's control circuit 134 to "record[] the data stream into available portions of a circular buffer … as a first file" in the manner Fiore discloses. In the Ely/Fiore/Lewellen system, the circular buffer implemented as a memory-mapped file discloses the claimed "first file" into which Ely's video data would have been recorded.

f) Element 5: a protecting facility that responds to a signal to record by designating a segment of the circular buffer as a write-protected portion and by indexing the write-protected portion as a second distinct file in the circular buffer, wherein the segment includes a pre-recorded subset recorded before the signal is received and a post-recorded subset to be recorded after the signal is received; and

276. Ely alone or combined with Fiore discloses this element. First, Ely states: "When an alarm command is received," the "control circuit 134 protects from over-writing compressed digital video data previously stored in the memory 150." EX1020, 7:48-55. The write-protected video data "correspond[s] to a time interval beginning at a predetermined time prior to receipt of the alarm command, and continu[es] for a predetermined time after receipt of the alarm command." *Id.*; *see also id.*, 10:11-15.

277. Second, Ely states: "After the compressed video data stored at one of the camera units has been protected pursuant to an alarm command, the data (which will

sometimes be referred to as 'alarm data') can be selectively retrieved in response to user instruction," either for display or tape-recording. EX1020, 10:17-23. While Ely never expressly refers to alarm data as a "file," a POSITA would have understood that selectively retrieving alarm data associated with an alarm command necessitates an ability to locate alarm data within the buffer. A POSITA would have therefore understood Ely necessarily discloses—or at minimum, renders obvious—"indexing." Ely's alarm data must be stored in the buffer in some way, and a POSITA would have understood that indexing data as files was a well-known approach for doing so, further evidencing the obviousness of this limitation.

278. To the extent a POSITA wanted further guidance on the indexing of alarm data as files in Ely's ring buffer, a POSITA would have been motivated to turn to Fiore for at least the reasons above. As explained in Section VII.C, Fiore discloses a circular storage buffer 15 implemented as a memory-mapped file (EX1009, [0047], [0064]-[0068]), Fig. 9), and identifiable collections of data (*i.e.*, files) for respective events are indexed in the circular storage buffer 15 (*id.*, [0022]-[0023], [0041], [0048], [0050]-[0051], [0059], [0060]). Fiore also describes numerous benefits of its file-based approach. *Id.*, [0065], [0067], [0068], [0072]. In view of these exemplary benefits and the additional reasons explained in Section VIII.F.1, a POSITA would have been motivated to implement Ely's control circuit 134 to "respond[] to a signal to record" by "indexing the write-protected portion as a second distinct file in the circular buffer" in the manner Fiore discloses.

279. The second files Ely and/or Fiore disclose or render obvious are distinct from the "first file" discussed for element 4 above. The "first file" in the Ely/Fiore/Lewellen system may be the memory mapped file that implements the circular buffer, whereas the indexed second file would comprise portions of the circular buffer that correspond to video data for a particular event (*e.g.*, alarm data).

g) Element 6: a sending facility that uses the transmitter to wirelessly transmit the second file to a remote memory.

280. Ely discloses transmitting alarm data from its local memory (*i.e.*, memory device 150) to a remote memory. EX1020, 9:51-58, 10:24-47. To the extent Ely does not disclose "wirelessly transmit[ting]" alarm data to a remote memory, Lewellen does. Lewellen's local wireless interface 390 wirelessly transmits data to Bluetooth-compatible devices. EX1019, [0022], [0031], [0042]-[0048]. A POSITA would have been motivated to implement the Ely/Fiore system with Lewellen's interface 390 for at least the reasons above, including to wirelessly transmit the write-protected "second files" indexed in the circular buffer to a Bluetooth-compatible device, which a POSITA would have understood to include a "remote memory" for storing such files.

281. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, renders obvious claim 1 of the '034 patent.

3. Dependent Claims 2-9, 11

282. ***Claims 2 and 3:*** Ely discloses the limitations added in dependent claims 2 and 3. In one embodiment, the buffer has a storage capacity of "thirty minutes of video

signals," and "each alarm command initiates protection of buffered video signals corresponding to a ten minute period (say five minutes prior to the alarm and five minutes after)." EX1020, 10:60-65. This discloses the limitations of claims 2 and 3 because the five-minute pre-recorded segment "is at least 5 seconds long" and the ten-minute segment "is at least 10 seconds long."

283. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, renders obvious claims 2 and 3 of the '034 patent.

284. ***Claim 4:*** Ely discloses the limitations added in dependent claim 4. Sensors 120 "are preferably of conventional types that detect, for example, unauthorized opening of doors, windows and display cases and the like and generate alarm signals indicative of these occurrences," and "may also include conventional motion and/or heat sensing devices." EX1020, 5:50-55.

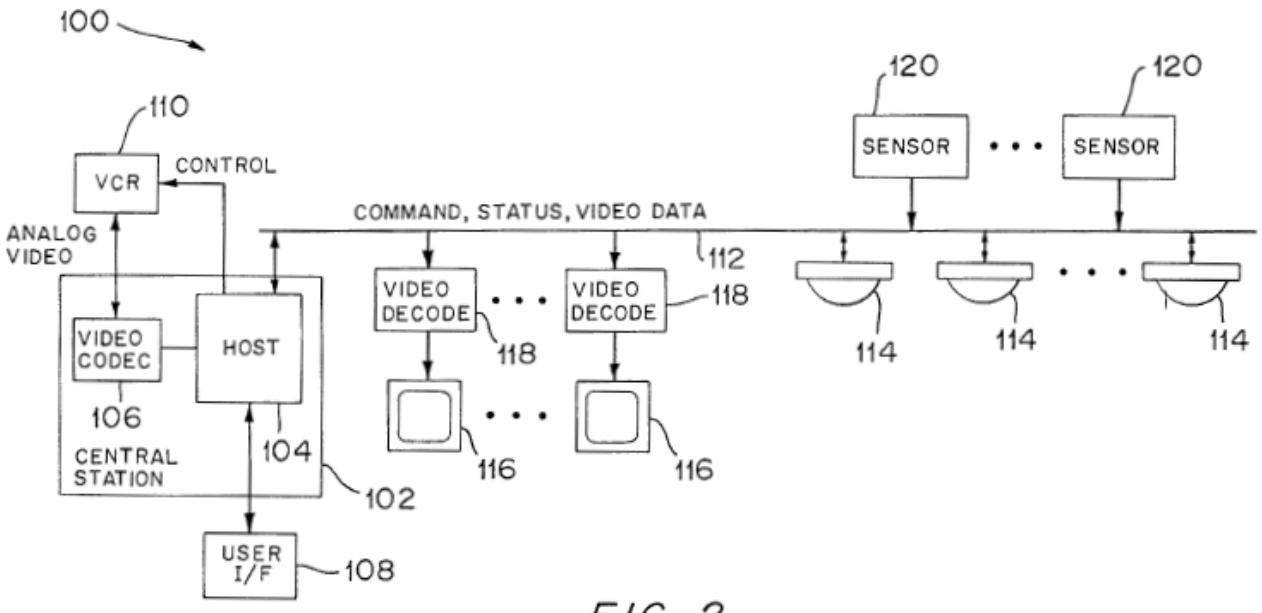


FIG. 2

285. Further, "an alarm condition can be detected by machine analysis of the content of live video signals generated by one or more of the camera units." *Id.*, 11:42-47. Thus, Ely discloses the claimed "sensor."

286. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, renders obvious claim 4 of the '034 patent.

287. ***Claim 5:*** Ely discloses the limitations added in dependent claim 5. Ely teaches "an alarm condition can be generated by a system operator via the user interface" (EX1020, 11:42-47) and describes the user interface as responding to inputs from common computer peripherals (*e.g.*, a mouse, keyboard) and a "TOUCHTRACKER" control module (*id.*, 5:60-6:3).

288. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, renders obvious claim 5 of the '034 patent.

289. ***Claim 6:*** Ely discloses the limitations added in dependent claim 6. As explained above for claim 1 of the '034 patent, when an alarm command is received, Ely's surveillance system protects from overwriting video data previously stored in the memory that "correspond[s] to a time interval beginning at a predetermined time prior to receipt of the alarm command, and continuing for a predetermined time after receipt of the alarm command." EX1020, 7:45-55; *see also id.*, 10:10-23. Ely thus discloses the pre-alarm and post-alarm intervals are predetermined. *See also id.*, 10:60-65. For a human to "predetermine" amounts of time to be protected before and after the alarm command, Ely necessarily discloses the "interface" of claim 6.

290. Ely further discloses a user interface 108 for users to provide instructions, depicted in Figure 2 (EX1020, 5:60-64, 8:16-27):

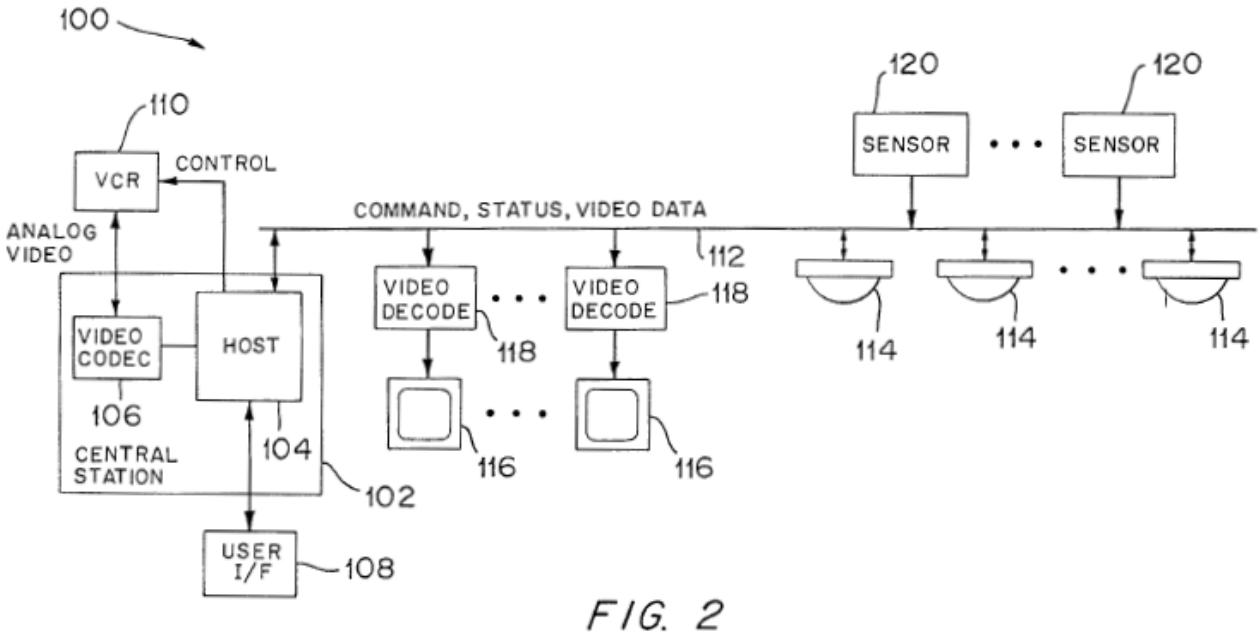


FIG. 2

Id., Fig. 2.

291. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, renders obvious claim 6 of the '034 patent.

292. ***Claim 7:*** Ely discloses transmitting alarm data from its local memory (*i.e.*, memory device 150) to a remote memory. EX1020, 9:51-58, 10:24-47. To the extent Ely does not disclose the remote memory being "located on a mobile phone," Lewellen does for at least the reasons provided in Ground 1b. A POSITA would have been motivated to implement the Ely/Fiore system with Lewellen's local wireless interface for the reasons above in Section VIII.F.1. Indeed, a POSITA would have found it obvious to use Lewellen's teachings of a Bluetooth-compatible mobile phone in the context of Ely's surveillance system using dome-mounted cameras. *Id.* This

combination would have advantageously enabled, for example, a security guard patrolling a casino or warehouse to receive video data from a dome-mounted camera onto his mobile phone for viewing, rather than just sending the video data to a central office or remote station. *Id.* The security guard could conveniently view the video data from his phone (*e.g.*, while he is patrolling) without needing to be present in the central office or remote station. *Id.* For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, therefore renders obvious claim 7 of the '034 patent.

293. ***Claim 8:*** Ely discloses transmitting alarm data from its local memory (*i.e.*, memory device 150) to a remote memory. EX1020, 9:51-58, 10:24-47. To the extent Ely does not disclose a mobile phone receiving the alarm data automatically and then automatically forwarding the alarm data to the remote memory, Lewellen does for at least the reasons provided in Ground 1b. A POSITA would have been motivated to implement the Ely/Fiore system with Lewellen's teaching of a mobile phone that automatically receives video data and automatically forwards it to a remote memory for at least the reasons above in Section VIII.C.1. For example, doing so would have relieved the aforementioned security guard from having to manually request the video data and then forward it to remote memory for permanent storage, and a POSITA would have recognized the benefits of eliminating these manual steps. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, therefore renders obvious claim 8.

294. ***Claim 9:*** Ely discloses the limitations added in dependent claim 9. "Each camera unit may be *mounted* at a ceiling 122 or at another appropriate location, and includes a housing 124 constituted, at least in part, by a base portion 126 and a dome portion 128." EX1020, 6:7-15.

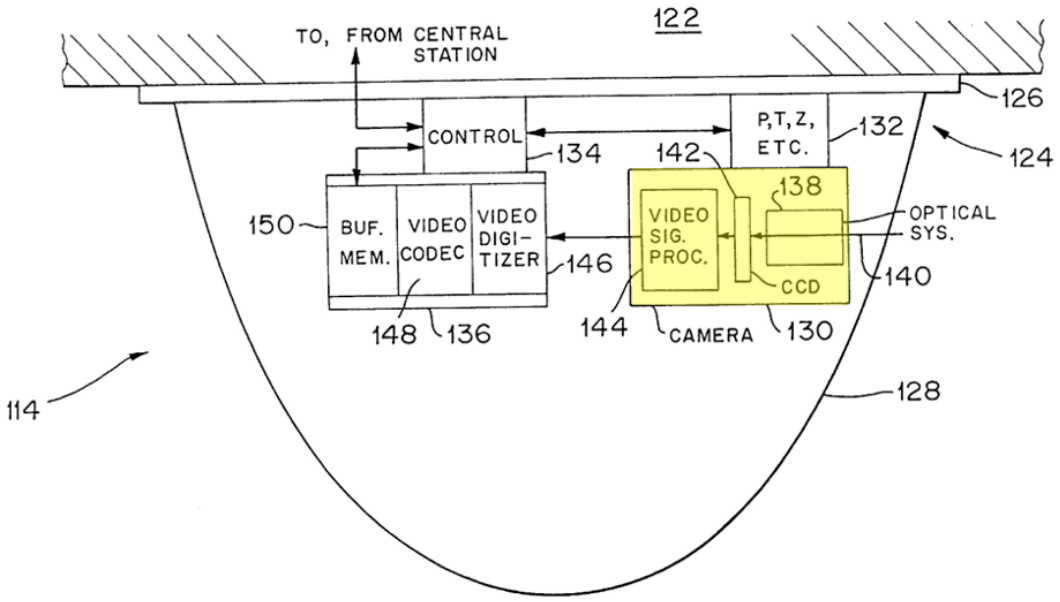


FIG. 3

Id., Fig. 3.

295. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, renders obvious claim 9 of the '034 patent.

296. ***Claim 11:*** Ely discloses the limitations added in dependent claim 11. Alarm data "can be selectively retrieved in response to user instruction," either for display or tape-recording. EX1020, 10:17-23. A POSITA would have understood that selective retrieval of alarm data from the buffer necessitates an ability to locate alarm

data within the buffer, such that Ely necessarily discloses "an electronic index that provides a directory to the first and the second files within the circular buffer."

297. To the extent a POSITA wanted further guidance as to particular methods for indexing of alarm data as files in Ely's buffer, a POSITA would have been motivated to turn to Fiore. Fiore implements circular storage buffer 15 as a memory-mapped file and describes indexing collections of alarm data as "second files" within a "first file" (*i.e.*, the memory-mapped file that implements the circular buffer). *See*, *e.g.*, EX1009, [0022]-[0023], [0051], [0059], [0060]. A POSITA would have been motivated to employ Fiore's indexing of alarm data as second files to achieve this ability for the reasons stated in Section VIII.F.1.

298. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, renders obvious claim 11 of the '034 patent.

4. Independent Claim 12

a) Preamble: A method of processing imaged data from a camera, comprising the following steps:

299. Ely discloses the preamble of claim 12. Ely discloses "operation of the camera unit 114" illustrated in Figure 4, comprising "processing imaged data from a camera" (EX1020, 7:12-8:15):

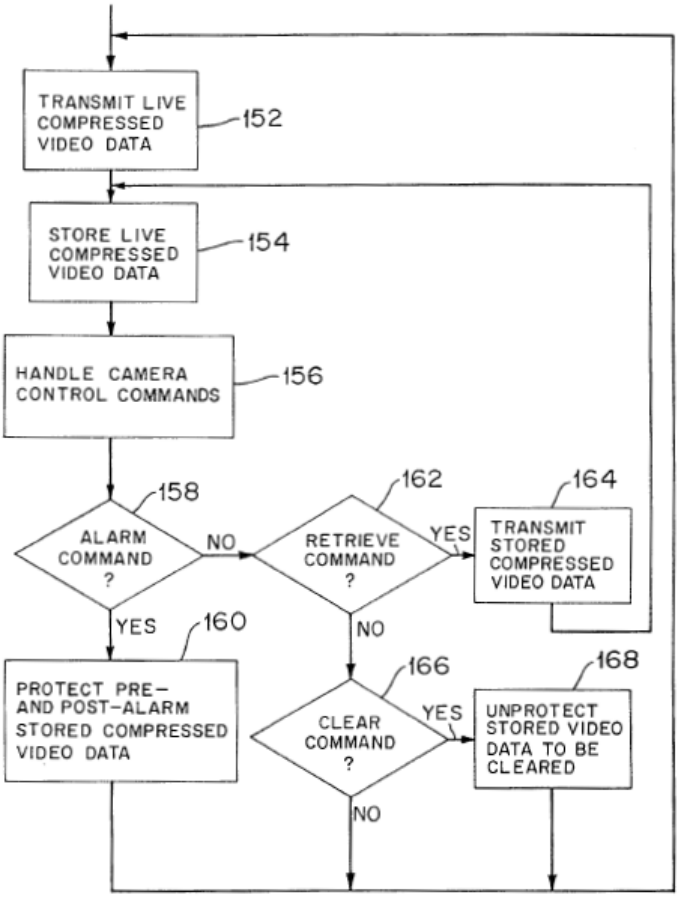


FIG. 4
CAMERA UNIT OPERATION

b) Element 1: receiving a stream of the imaged data;

300. Ely discloses this for at least the reasons discussed above for claim 1, element 1 of the ’034 patent. EX1038. Ely discloses a camera having an image-capturing component (*i.e.*, CCD 142) and a converting component (*i.e.*, video signal processing circuit 144 and video digitizer circuit 146).

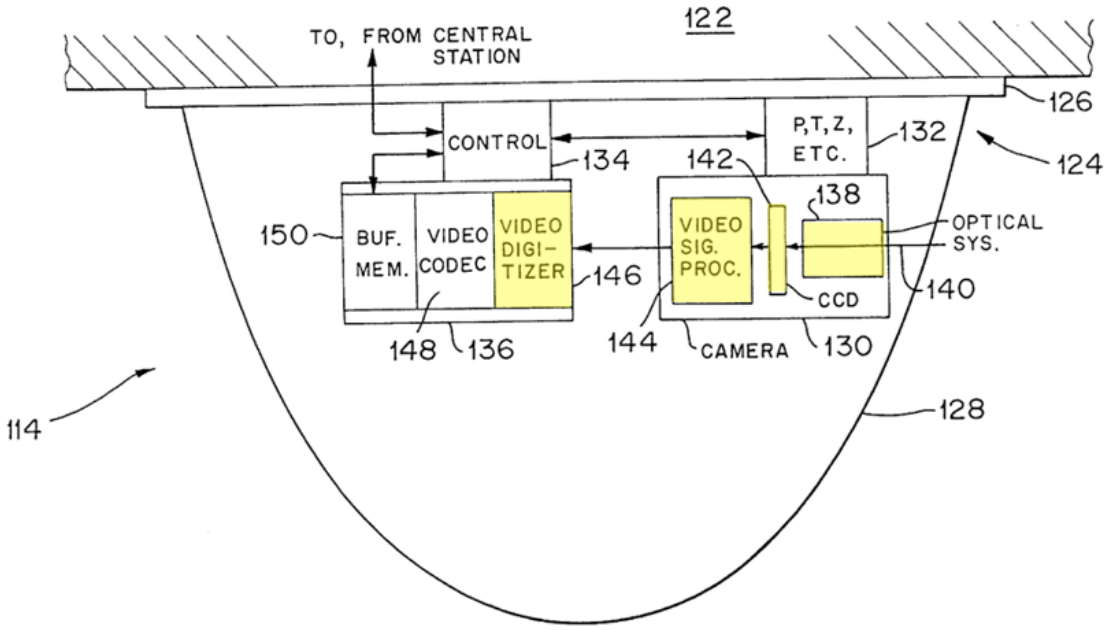


FIG. 3

As explained above, the digital output of digitizer 146 is "at least one data stream" because it is a continuous sequence of data. EX1020, 3:56-67, 4:49-56, 6:48-7:11; Appx MM at 109. The digital data stream output by the video digitizer circuit 146 contains "imaged data" because it includes image data from the camera in digital form. This stream of imaged data is received at least by Ely's video data coding/decoding circuit 148. *Id.*; EX1020, 6:48-7:11, 7:18-39.

c) Element 2: recording the stream into available portions of a circular buffer as a first file using a digital video file format;

301. Ely alone or combined with Fiore discloses this element for at least the reasons discussed for claim 1, element 4 of the '034 patent. EX1038.

d) Element 3: responding to a signal by write-protecting a segment that includes a newly recorded portion of the buffer, wherein the newly recorded portion is recorded before the signal is received, and includes a post-recorded portion to be recorded after the signal is received;

302. Ely discloses this. As explained above for claim 1, element 5 of the '034 patent, Ely's control circuit 134 includes a "protecting facility" that performs the claimed write protecting. A POSITA would have understood that the segment of the circular buffer to write-protect must "include[] a newly recorded portion of the buffer" because frame data not "newly recorded" would be overwritten once recording loops back. *See* EX1020, 7:48-55, 10:11-15.

e) Element 4: indexing write protected portions of the buffer as separate, distinct files during the step of recording; and

303. Ely alone or combined with Fiore discloses this for at least the reasons discussed for claim 1, element 5 of the '034 patent. EX1038.

f) Element 5: wirelessly transmitting at least one of the distinct files from the write-protected portions of the circular buffer to a remote memory.

304. Lewellen discloses this for at least the reasons discussed for claim 1, elements 3 and 6 of the '034 patent. EX1038.

305. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, renders obvious claim 12 of the '034 patent.

5. Dependent Claims 13-18

306. ***Claim 13:*** The limitations added in dependent claim 13 would have been obvious in view of Ely. A POSITA would have understood that a file stored in local memory would be maintained as a file once offloaded to the remote memory and that it would have been obvious to implement Ely (alone or in combination with Fiore) in this manner. *Id.* Ely specifically discloses offloading of video data to remote memory for later retrieval and playback (*see, e.g.*, EX1020, Abstract, 3:29-36, 4:63-5:3, 9:31-50, 9:51-58, 10:24-47), and a POSITA would have understood this to mean storing as distinct, separate files in the remote memory.

307. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, renders obvious claim 13 of the ’034 patent.

308. ***Claim 14:*** Ely discloses the limitations added in dependent claim 14. Since alarm data cannot be overwritten, Ely’s video recording device necessarily records to physically dis-contiguous parts of the circular buffer, as the overwriting process skips alarm data. EX1020, 7:34-39.

309. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, renders obvious claim 14 of the ’034 patent.

310. ***Claim 15:*** Ely discloses the limitations added in dependent claim 15. As explained above for claim 1, element 5, and claim 12, element 3 of the ’034 patent, Ely’s system responds to an alarm command (*i.e.*, the claimed “signal to save a recording”) by write protecting specified digital video data in the ring buffer. EX1020,

7:48-55, 10:11-15. Ely's alarm command comprises "a signal to start recording and a signal to stop recording," as recited in claim 15. Ely's alarm command tells the video recording device when to (i) "start recording," *i.e.*, upon receipt of the alarm command, and (ii) "stop recording," *i.e.*, when a predetermined amount of time after receipt of the alarm command has passed. EX1020, 7:48-55, 10:11-23. Ely thus discloses the limitations added in claim 15.

311. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, renders obvious claim 15 of the '034 patent.

312. ***Claim 16:*** Ely discloses the limitations added in dependent claim 16. Ely discloses the "interface through which a human can initiate a signal" of claim 5, teaching that a user generates an alarm condition through inputs to the interface from peripherals and a "TOUCHTRACKER" control module. EX1020, 11:42-47, 5:60-6:3. Thus, Ely discloses "receiving the signal to save a recording through at least … a manually operated switch."

313. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, renders obvious claim 16 of the '034 patent.

314. ***Claim 17:*** Ely discloses the limitations added in dependent claim 17 for at least the reasons provided above for claim 6 of the '034 patent. Ely alone or combined with Fiore, in further view of Lewellen, therefore renders obvious claim 17 of the '034 patent.

315. ***Claim 18:*** Ely discloses the limitations added in dependent claim 18. Control circuit 134 responds to "clear" commands by removing a block of stored video data from protection, thereby permitting "live" video data to be written over the now-unprotected video data. EX1020, 8:7-12. The clear command may be sent after write-protected alarm data is transmitted and retrieved. *Id.*, 10:24-43, 10:51-55.

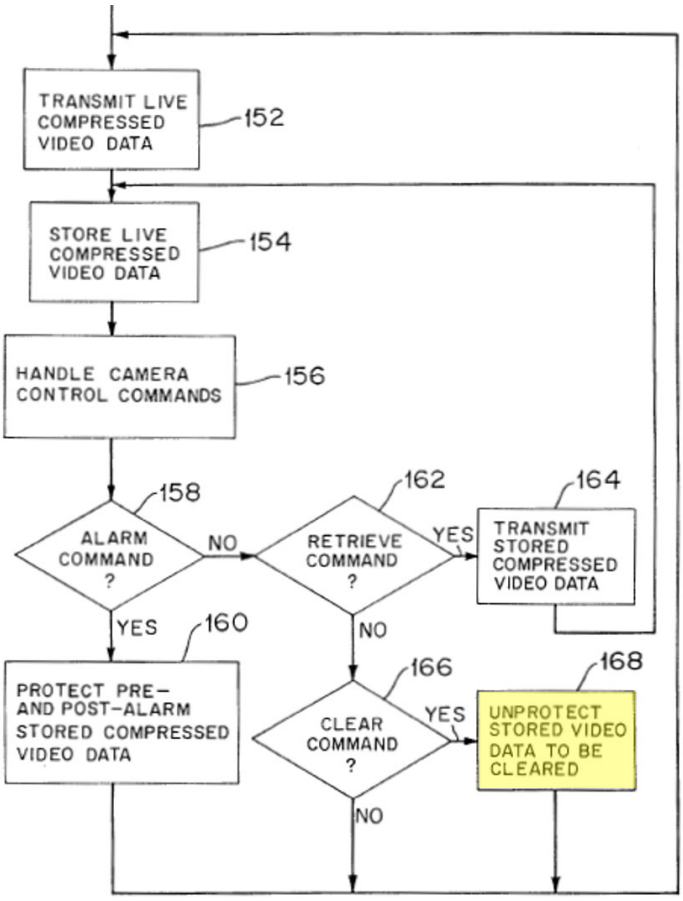


FIG. 4
CAMERA UNIT OPERATION

Id., Fig. 4 (color added); *see also id.*, Fig. 5B (block 190).

316. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, renders obvious claim 18 of the '034 patent.

G. Ground 2b: Claim 10 Of The '034 Patent Would Have Been Obvious Over Ely Alone Or As Combined With Fiore, In Further View Of Lewellen And Mann

317. Mann discloses the limitations added in dependent claim 10 for at least the reasons discussed above for Ground 1c of the '034 patent. A POSITA would have been motivated to combine Mann with Ely/Fiore/Lewellen. Ely discloses a "video surveillance system" with "an improved capability for storage of video signals." EX1020, 2:34-36. Like Ely, Mann discloses a camera system used for, *e.g.*, surveillance or public safety. EX1015, [0041]-[0042]. Because Ely, Fiore, Lewellen and Mann all disclose video recording systems, a POSITA would have been aware of and motivated to combine these references.

318. Mann also describes why a POSITA would be motivated to implement the Ely/Fiore/Lewellen surveillance system (or one or more components of the surveillance system, such as components of camera unit 114) in an eyeglasses-mounted apparatus: For instance, Mann teaches that, "[a]lthough there are a growing number of video surveillance cameras installed in the environment allegedly for 'public safety', there have been recent questions as to the true benefit of such centralized surveillance infrastructures," noting that such systems can be abused by their owners, whereas an eyeglasses-based application places the system at the wearer's control. EX1015, [0041]. Mann's wearable viewfinder system "allows images to be captured in a natural manner, without giving an unusual appearance to others (such as a potential assailant)." *Id.*, [0042]. Mann's wearable viewfinder also "allows the user to record a portion of

his or her eye's visual field of view" where, "the device will tend to cause the wearer to want to place the recording zone over tope of whatever is most interesting in [a] scene." *Id.*, [0044]. A POSITA would have been motivated to implement the Ely/Fiore/Lewellen surveillance system and/or components thereof (*e.g.*, components of camera unit 114) in an eyeglasses-mounted apparatus, to give the wearer more control over what is recorded and how recorded data may be used.

H. Ground 2c: Claims 19 And 20 Of The '034 Patent Would Have Been Obvious Over Ely Alone Or As Combined With Fiore, In Further View Of Lewellen And Fiedler

1. Motivation to Combine

319. A POSITA would have been motivated to use the teachings of Fiedler in the Ely/Fiore/Lewellen system. All of these references disclose video recording systems for security, law enforcement, or surveillance operations, and Ely and Fiedler specifically disclose recording systems with user controls for operation and playback. A POSITA therefore would have been aware of and motivated to combine these references. Additional motivations for this combination and a POSITA's reasonable expectation of success are detailed below with respect to the specific features of claims 19 and 20.

2. Dependent Claims 19 and 20

320. Ely alone or combined with Fiore, in further view of Lewellen and Fiedler, renders obvious the limitations added in dependent claims 19 and 20.

321. Claim 19: These limitations would have been obvious in view of Ely. As one "camera buffer management practice," Ely's camera unit "send[s] a message to the central station when a predetermined portion of the camera unit's buffer memory has been utilized for protected storage" (*i.e.*, "warning to a user before the write-protected segment of the circular buffer is fully recorded"); then, the central station may "direct retrieval of the alarm data from the buffers and clearing from the buffer of the retrieved data." EX1020, 10:56-11:8. Moreover, the limitations added in claim 19 are obvious in view of Fiedler, which discloses the claimed "warning." *See* Ground 1d for the '034 patent above. The addition of Fiedler's warning to the Ely/Fiore/Lewellen system merely combines familiar elements according to known methods to yield predictable results.

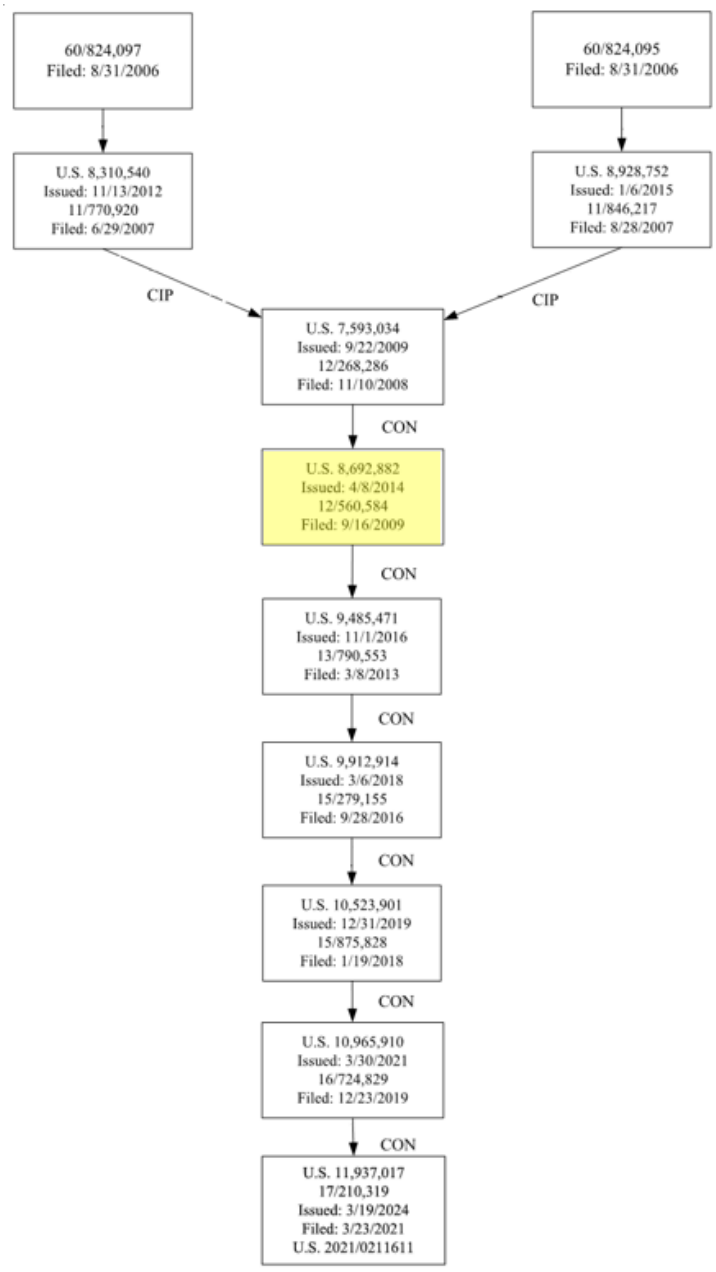
322. Claim 20: Ely discloses that the respective lengths of video data protected before and after an alarm command are predetermined. EX1020, 7:45-55, 10:10-23, 10:60-65. Ely also discloses a user interface 108 for providing instructions input by users of the system. *Id.*, 5:60-64, 8:16-27, Fig. 2. It would have been obvious to utilize a manually operated switch or audio signal to extend the length of the write-protected segment in view of Ely's disclosure. Moreover, such limitations would have been obvious in further view of Fiedler. Fiedler discloses the limitations added in dependent claim 20 for at least the reasons provided above in Ground 1d. And a POSITA would have generally known that a user could control and extend the length of recording in a circular buffer. For example, US 7,348,895 to Lagassey describes that a length of

recording time "can be programmed or adjusted remotely from [a] monitoring center 45 if there is a need to shorten or extend the time of recording." EX1035, 28:48-56. A POSITA would have recognized the advantages of extending a length of a write-protected segment in response to a manually operated switch or audio signal in the Ely/Fiore/Lewellen system, *e.g.*, to ensure that important alarm data can be preserved, when write protection would otherwise end.

323. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen and Fiedler, therefore renders obvious claims 19 and 20 of the '034 patent.

IX. '882 Patent: Claims 1-22

324. The '882 patent of the Stellar patent family is highlighted below:



325. As seen above, the ’882 patent claims priority back to U.S. Patent No. 7,593,034 (the ’034 patent, EX1010), filed November 10, 2008, as a continuation application. EX1033 at 1:3-17. The ’034 patent, in turn, claims priority as a continuation-in-part to U.S. App. No. 11/770,920 (the ’920 application, EX1011), filed

on June 29, 2007, and U.S. App. No. 11/846,217 (the '217 application, EX1012), filed August 28, 2007.

A. Summary Of The '882 Patent File History

326. Application No. US 12/560,584, which eventually issued as the '882 patent, was filed on September 16, 2009, with 22 claims. EX1039, 1-36. The Office initially rejected all claims on the basis of non-statutory double patenting over the '034 patent and other commonly-owned patents. *Id.*, 182-88. The Office noted, however, that claims 1-22 would be allowable if the non-statutory double patenting objections were overcome. *Id.*, 186.

327. Applicant submitted terminal disclaimers (*id.*, 195-200, 208-11), and the examiner then allowed claims 1-22. *Id.*, 215-21.

B. Ground 1a: Claims 1-6, 9, 11-18, 21, And 22 Of The '882 Patent Would Have Been Obvious Over Yerazunis Alone Or As Combined With Fiore

1. Motivation To Combine

328. A POSITA would have been motivated to combine Yerazunis and Fiore with a reasonable expectation of success for the reasons provided above in Section VIII.B.1.

2. Independent Claims 1 and 12

329. Independent claim 1 of the '882 patent is directed to a surveillance apparatus, and independent claim 12 is a method claim with similar limitations. EX1040 (chart numbering each element of claims 1 and 12 and comparing similar

elements side-by-side). In view of these similarities, I address claims 1 and 12 of the '882 patent together.[2]

a) Preamble: A surveillance apparatus comprising:

330. Yerazunis discloses the preambles of claims 1 and 12. EX1040. For claim 1, Yerazunis discloses "a video recording device" that "is contained within a compactly sized housing" and captures video images for, *e.g.*, security purposes. EX1017, 2:12-14; *see also id.*, 1:17-43. Yerazunis therefore discloses a "surveillance apparatus."

331. For claim 12, Yerazunis discloses a "method of operation of the video recording device" illustrated in Figure 5 below (EX1017, 10:55-11:30):

[2] In the headings that follow, the elements of claim 1 are reproduced. Differences between the language of claims 1 and 12 are addressed in the discussion for each element.

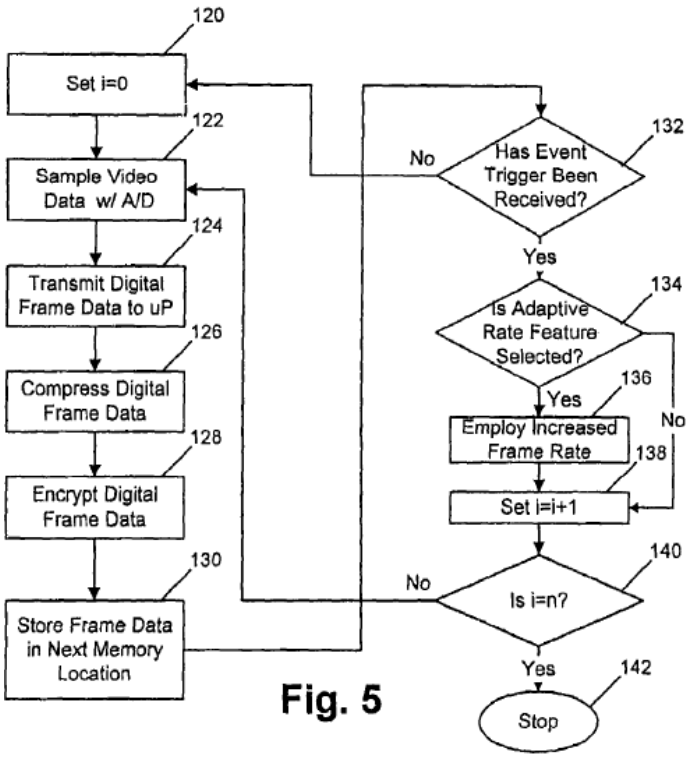


Fig. 5

332. The steps illustrated constitute "processing imaged data." *See* EX1017, 16:4-8, 17:45-61. Yerazunis thus discloses "[a] method of processing imaged data from a camera."

b) Element 1: a camera having an image capturing component that captures image data;

333. Yerazunis discloses element 1 for each of claims 1 and 12. EX1040. For claim 1, Yerazunis's image sensor 46 in camera 40 is "operative to provide an output signal representative of a video image which impinges upon the sensor." EX1017, 5:45-49. The output signal is "an analog signal which is coupled to one or more A/D converters" ("ADC 48") that "generate a digital representation of the video image." *Id.*, 2:37-41.

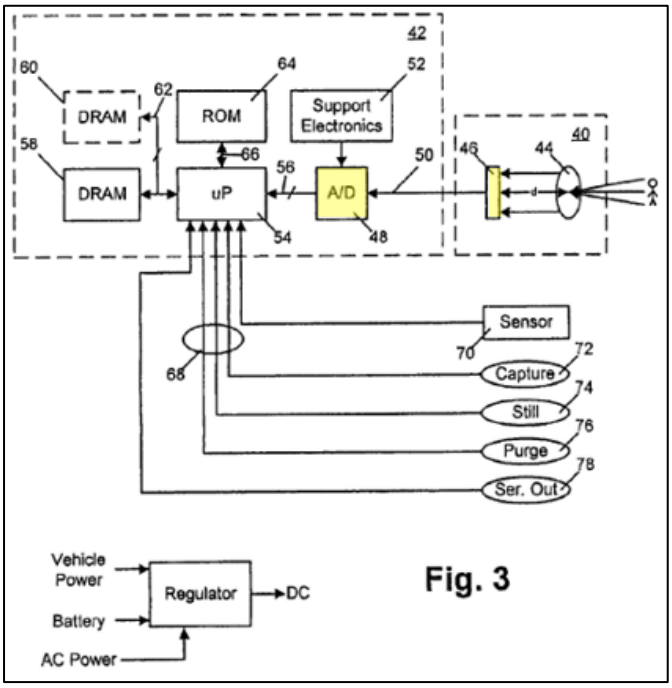


Fig. 3

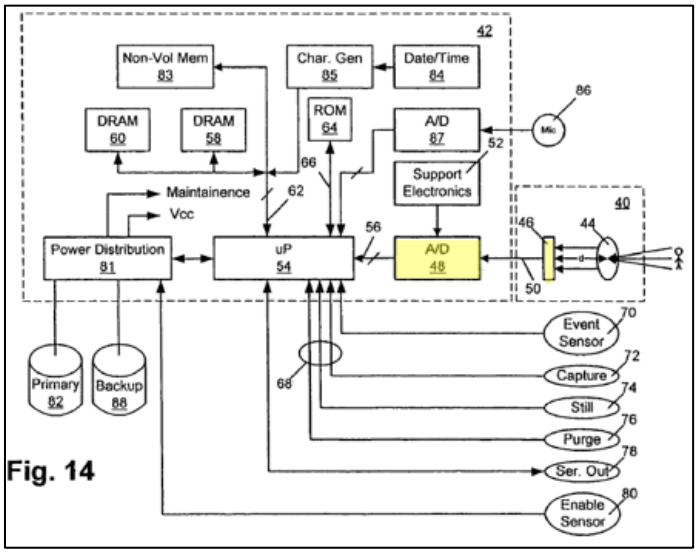


Fig. 14

Id., Figs. 3, 14 (color added).

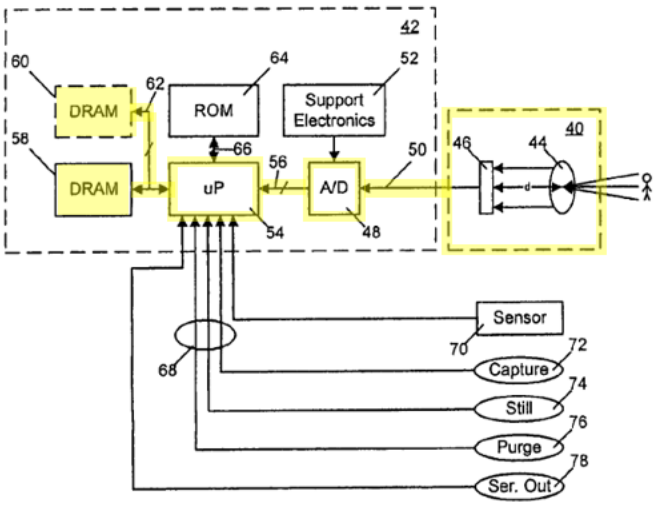
334. Camera 40 and video electronics 42 disclose the claimed "camera" because they collectively include an image sensor 46 (*i.e.*, an "image capturing component") that captures image data and one or more ADCs 48 that generate a digital representation of the image data. At the purported priority date of the challenged

patents (June 2007), the term "camera" was often used to describe systems with imaging components and ADCs, like in Figures 3 and 14.

335. For element 1 of claim 12, the image data output by the one or more ADCs 48 is "video data" because it contains video frames in digital form. EX1017, 5:60-67, 6:52-55, 7:26-32. The digital video data is received at least by microprocessor 54. EX1017, 10:55-63, Fig. 5.

c) Element 2: a local memory functionally coupled to the camera;

336. Yerazunis discloses element 2 of claim 1. EX1040. As explained in Section VI.A, the term "a local memory functionally coupled to the camera" should be construed to mean "a memory that is distanced less than 20 cm from the camera and is coupled to the camera using entirely physical connectors." Yerazunis's video recording device includes video electronics 42 with DRAMs 58, 60, *i.e.*, the "local memory" (EX1017, 5:40-43, 6:24-36):



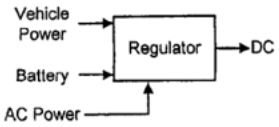


Fig. 3

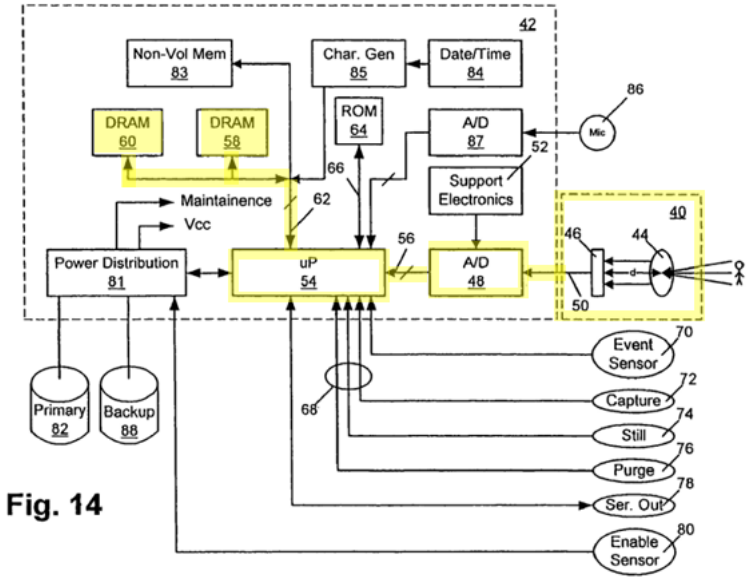


Fig. 14

Id., Figs. 3, 14 (color added).

337. DRAMs 58, 60 are coupled to the claimed camera using entirely physical connectors. Microprocessor 54 and DRAM 58 "may be obtained as a single integrated circuit [IC]" (*id.*, 6:24-29), meaning their connection would be via one or more physical

connectors on the IC (*e.g.*, conductive lines and/or vias). DRAM 60 is "coupled to the microprocessor 54 via a bus 62," which is also a physical connector. *Id.*, 6:30-36. Microprocessor 54, in turn, is coupled to ADC 48 "via path 56 which comprises a parallel signal bus," another physical connector. *Id.*, 6:14-23.

338. Finally, ADC 48 is coupled to camera 40 "via a signal path 50" to enable ADC 48 to sample the output of the camera's image sensor 46. *Id.*, 5:40-67. A POSITA would have understood signal path 50 between camera 40 and ADC 48 as using a physical connector. A POSITA would have understood that a non-physical (*i.e.*, wireless) connection would not have been used between these two components of the video recording device. Moreover, the arrows shown in Figures 3 and 14 would have represented wired connections to a POSITA. Additionally, if the connection between the camera 40 and ADC 48 was intended to be wireless, then a POSITA would have understood that a wireless sender and receiver would have been depicted. Lacking any depiction of such wireless sender and receiver, a POSITA would have understood the connection between the camera 40 and ADC 48 as being physical. Accordingly, DRAMs 58, 60 are coupled to the claimed camera "using entirely physical connectors," as required by the parties' agreed-upon construction.

339. A POSITA would have further understood DRAMs 58, 60 are distanced less than 20 cm from the claimed camera (including image sensor 46 and one or more A/D converters 48). Yerazunis discloses "a video recording device" that "is contained within a compactly sized housing" (EX1017, 2:12-14; Figs. 2a, 2b) and in an

embodiment is "mountable to a gun and useful for recording video images before and after the firing of the gun" (*id.*, Abstract). In Figures 10a and 10b, video recording device 300 is mounted below the barrel of gun 302. *Id.*, 15:24-36.

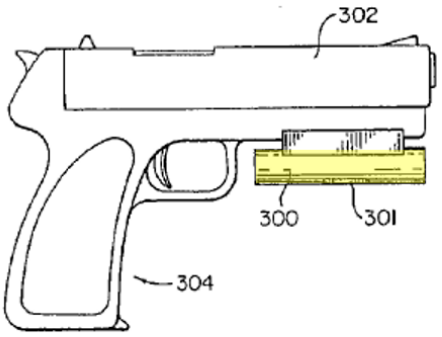


Fig. 10a

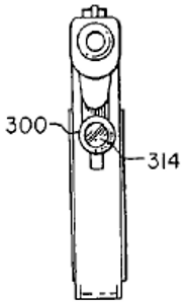


Fig. 10b

Id., Figs. 10a, 10b (color added). A POSITA would have understood that for the video recording device to be compact and mountable to a gun, it would necessitate that the memory be located near—certainly less than 20 cm from—the camera. In Figure 10a, the entire video recording device (highlighted) is shown attached to a portion of the gun barrel that is less than 20 cm in length. DRAMs 58, 60 and camera 40 contained within the video recording device would therefore necessarily be distanced less than 20 cm apart.

340. Yerazunis therefore discloses "a local memory functionally coupled to the camera," as construed by the parties.

d) Element 3: a recording facility that records the image data into available portions of a circular buffer in the local memory as a first file using a digital video file format;

341. Yerazunis alone or combined with Fiore discloses element 3 of claim 1, and element 2 of claim 12. EX1040. Yerazunis's video recording device "records video frames successively in at least one circular buffer memory organized as a continuous loop." EX1017, 2:19-23, 17:9-20, 17:50-59. Camera 40 captures video, and ADC 48 converts that into a digital signal. *Id.*, 5:40-67. The digital signal is provided to microprocessor 54, which "compresses the digitized frame data and stores the compressed frame data in the next sequential location of [a] circular buffer." *Id.*, 2:45-47, 6:24-26, 6:52-7:6, 10:55-67, 17:50-59; *see also id.*, 11:50-14:44, Figs. 6-8.

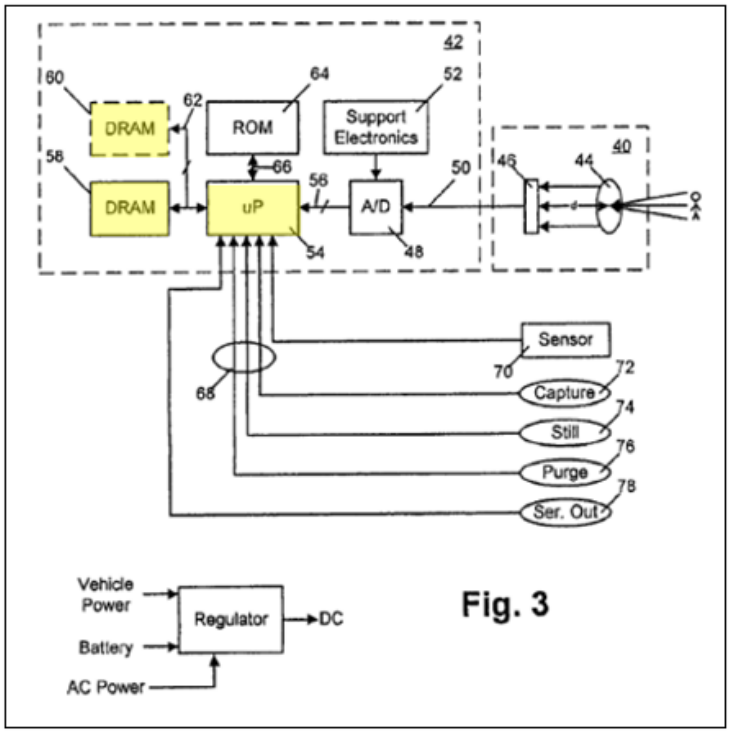


Fig. 3

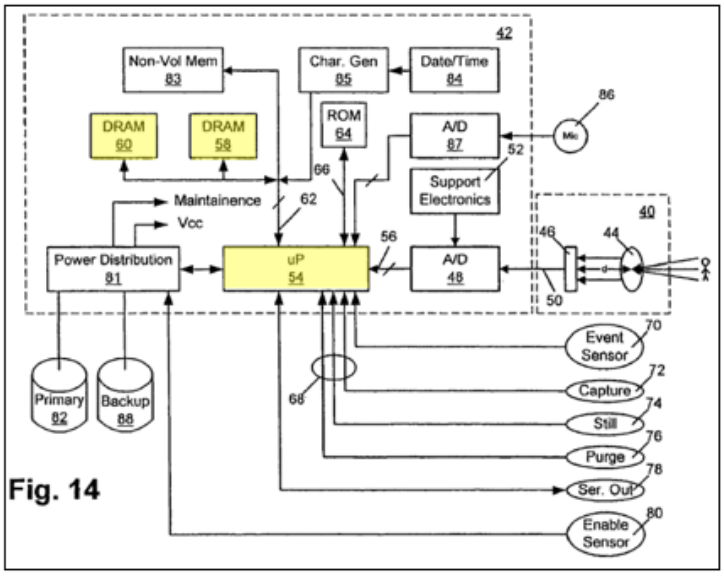


Fig. 14

Id., Figs. 3, 14 (color added to highlight microprocessor 54 (recording facility) and DRAMs 58, 60 (local memory including circular buffer)). A POSITA would have understood the compressed frame data as "using a digital video file format."

342. Yerazunis's circular buffer is depicted in Figures 4A and 4B:

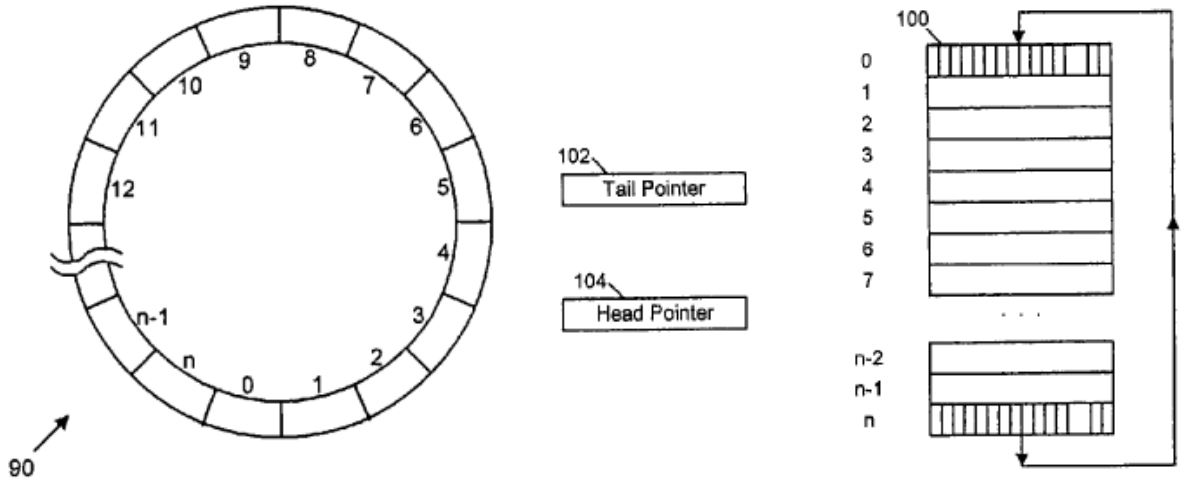


Fig. 4a

Fig. 4b

EX1017, 3:60-63, 7:9-11.

343. Yerazunis's circular buffer is formed in DRAM 58. *Id.*, 7:7-61, 18:7-12. Thus, microprocessor 54 includes "a recording facility" that "records the image data into available portions of a circular buffer in the local memory as a first file using a digital video file format." Yerazunis's disclosure is similar to that of the '882 patent: Like Yerazunis, the '882 patent describes a recorder 160 that uses a processor 162 to perform various "facilities" or "functions." EX1010, 4:50-53, 5:20-23, 5:28-30.

344. While Yerazunis does not expressly refer to recording the image data into the circular buffer "as a first file," Yerazunis does disclose that in a gun camera embodiment, "the head pointer 104 and the tail pointer 102 … defining the area(s) of the circular buffer memory, are stored in a table to allow later retrieval of the video data pertaining to each firing of the gun." EX1017, 17:50-56. A POSITA would have found it obvious to record the image data in the circular buffer "as a first file" based on Yerazunis's disclosure of storing video data corresponding to particular events "in a table" for "later retrieval." And a POSITA would have understood such file-based recording as one of a finite number of identified solutions for recording image data in Yerazunis, evidencing its obviousness. A POSITA would have recognized Yerazunis's image data must be recorded to the circular buffer in some way, and using a file was a well-known approach for doing so. *See* EX1017, 6:1-13, 6:33-36, 7:23-32, 10:37-39, 10:63-67, 11:31-43.

345. To the extent a POSITA wanted further guidance as to particular methods for recording image data as files in Yerazunis's buffer, a POSITA would have been

motivated to turn to Fiore. Fiore implements circular storage buffer 15 as a memory-mapped file and describes indexing collections of frame data for respective events as files within the memory-mapped file. EX1009, [0022]-[0023], [0051], [0059], [0060]. Fiore also describes the benefits of its file-based approach, including enabling playback of video data for a specific event from the circular buffer without interrupting simultaneous recording of new video data into the buffer. *Id.*, [0065], [0067], [0068], [0072]. In view of these exemplary benefits and the additional reasons explained in Section VIII.B.1, a POSITA would have been motivated to implement Yerazunis's microcontroller 54 to "record[] the image data into available portions of a circular buffer … as a first file" in the manner Fiore discloses. In the Yerazunis/Fiore system, the circular buffer implemented as a memory-mapped file discloses the claimed "first file" into which Yerazunis's image data would have been recorded.

e) Element 4: a protecting facility that responds to a signal to record the image data by designating a segment of the circular buffer as a write-protected portion and by indexing the write-protected portion as a second file in the circular buffer, wherein the segment includes a pre-recorded subset recorded before the signal is received and a post-recorded subset to be recorded after the signal is received; and

346. Yerazunis alone or combined with Fiore discloses element 4 of claim 1, and elements 3 and 4 of claim 12. EX1040.

347. For element 4 of claim 1, Yerazunis's event sensor 70 generates a "gun firing signal" "upon discharge of the gun." EX1017, 3:20-33, 8:8-25, 14:55-61. Upon

detecting the gun-firing signal, microprocessor 54 causes "specified frame data associated with [the] firing event both before and after the event" to be "preserved," such that it "cannot be overwritten as a result of further use of the gun or subsequent firing events." *Id.*, 3:25-38, 8:26-30, 15:9-13. With the specified frame data write-protected, "[f]rame data associated with each subsequent firing event[] is stored within an unused portion of the circular buffer memory." *Id.*, 3:31-33.

348. Yerazunis's protecting facility also "responds to a signal to record the image data … by indexing the write-protected portion as a second file in the circular buffer." Yerazunis's tagging, use of pointers to identify a collection of data for write-protection, and storage of such pointers in a table "to allow later retrieval" of video data for gun-firing events (EX1017, 17:45-61) discloses "indexing the write-protected portion as a second file in the circular buffer." A POSITA would have understood that retrieving video data for gun-firing events necessitates an ability to locate the video data within the buffer, such that Yerazunis necessarily discloses "indexing." Thus, while Yerazunis does not expressly refer to "indexing" write-protected segments as second files in the circular buffer, a POSITA would have understood Yerazunis as describing—or at minimum, rendering obvious—this limitation. *Id.*, 6:1-13, 6:33-36, 7:23-32, 10:37-39, 10:63-67, 11:31-43.

349. A POSITA would have recognized the claimed "indexing the write-protected portion as a second file in the circular buffer" as one of a finite number of identified solutions for storing and retrieving data in Yerazunis, further evidencing its

obviousness. A POSITA would have recognized that Yerazunis's event data must be stored and retrieved in some way, and indexing such data as a file was a well-known approach for doing so. Storing and retrieving event data using this conventional approach was not innovative but rather a straightforward application of ordinary skill or common sense.

350. To the extent a POSITA wanted further guidance as to particular methods for indexing of event data as files in Yerazunis's buffer, a POSITA would have been motivated to turn to Fiore for at least the reasons in Section VIII.B.1 above. Fiore discloses a circular storage buffer 15 implemented as a memory-mapped file (EX1009, [0047], [0064]-[0068]), Fig. 9), and identifiable collections of data (*i.e.*, files) for respective events are indexed in the circular storage buffer 15 (*id.*, [0022]-[0023], [0041], [0048], [0050]-[0051], [0059], [0060]). Fiore also describes numerous benefits of its file-based approach. *Id.*, [0065], [0067], [0068], [0072]. In view of these exemplary benefits and the additional reasons explained in Section VIII.B.1, a POSITA would have been motivated to implement Yerazunis's microcontroller 54 to "respond[] to a signal to record" by "indexing the write-protected portion as a second file in the circular buffer" in the manner Fiore discloses.

351. Yerazunis alone or combined with Fiore discloses elements 3 and 4 of claim 12 for the same reasons. EX1040. A POSITA would have also understood that the segment of the circular buffer to be write-protected must "include[] a newly recorded portion of the buffer" because frame data not "newly recorded" would be

overwritten once recording loops back to where that frame data is stored. EX1017, 2:19-23, 2:45-57, 17:9-20, 17:50-59.

352. Further, the indexing in Yerazunis alone and in the combined Yerazunis/Fiore system occurs "during the step of recording," as required by claim 12. When Yerazunis's video recording device is used with a gun, "recording of data continues [during and after a first firing event] since a subsequent firing event may occur." EX1017, 17:45-50. This is achieved by indexing:

> To accommodate this objective, after the conclusion of data storage associated with one firing event, the head pointer 104 and the tail pointer 102 (or pointers in the event multiple buffer groups are employed as discussed above) defining the area(s) of the circular buffer memory, are stored in a table to allow later retrieval of the video data pertaining to each firing of the gun. The head and the tail pointers are then reset to allow continued recording into another portion of the circular buffer memory without overwriting the previously stored and preserved data. This process continues as each trigger event occurs until the buffer memory is full.

Id. at 17:45-61; *see also id.*, 2:19-23, 4:45-49, 7:7-61, 9:34-38. Yerazunis's indexing thus occurs during recording.

353. Finally, the second files disclosed or rendered obvious by Yerazunis and/or Fiore are distinct from the "first file" discussed for element 3 above. The "first file" in the Yerazunis/Fiore system may be a memory mapped file that implements the

circular buffer, whereas the indexed second file comprises portions of the circular buffer that correspond to video data for a particular event (*e.g.*, a gun-firing event).

f) Element 5: wherein the local memory is configured to allow access to at least one of the files.

354. Yerazunis discloses element 5 of claim 1, and element 5 of claim 12. EX1040. Yerazunis's microprocessor 54 includes a serial output channel 78 that is "provided to permit recorded frame data to be downloaded to a computer for viewing." EX1017, 3:1-2, 6:45-51, 18:60-66.

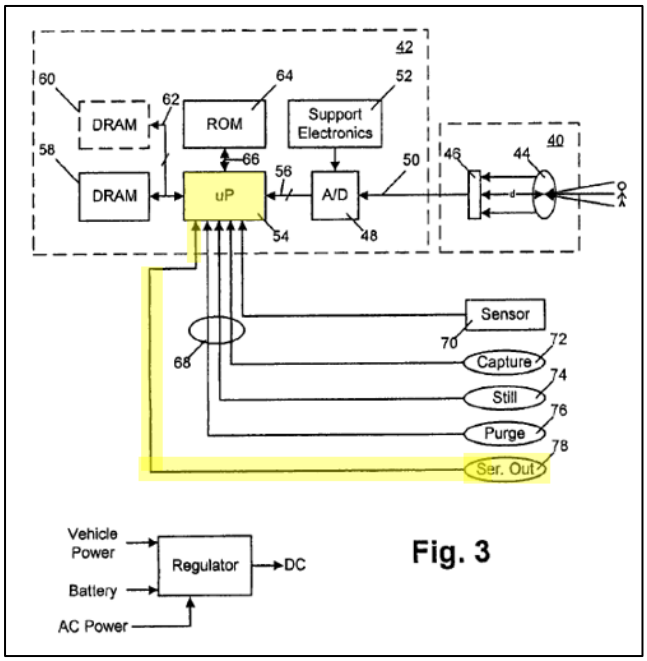
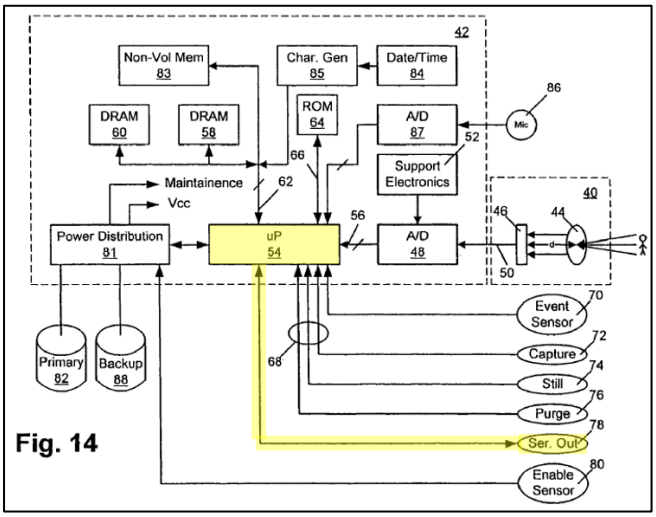


Fig. 3



Id., Figs. 3, 14 (color added).

355. The microprocessor's serial output channel 78 (or other appropriate data transfer link, *id.*, 3:3-4, 18:64-66) "is employed to download captured and stored video images" from the circular buffer of DRAM 58 "to an external Personal Computer (PC)" (*id.*), or to "a radio transmitter to transmit RF signals to a base station." EX1017, 9:63-10:3. Yerazunis therefore discloses that DRAM 58 (*i.e.*, local memory) is configured to allow access to at least one of the files stored therein. Such access is provided to at least the serial output channel 78 and the PC and radio transmitter coupled to the channel 78.

356. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claims 1 and 12 of the '882 patent.

3. Dependent Claims 2-6, 9, 11, 13-18, 21-22

357. ***Claims 2 and 21:*** Dependent claim 2 depends from claim 1 and recites "a sending facility configured to transmit the second file from the local memory to a

remote memory." Dependent claim 21 depends from claim 12 and recites "wherein the step of providing access to the at least one of the distinct files includes transmitting the at least one of the distinct files for storage in a remote memory." Yerazunis discloses these limitations. The microprocessor 54 includes the claimed "sending facility configured to transmit the file from the local memory to a remote memory." As detailed above, Yerazunis's video recording device stores second files containing recorded frame data in the circular buffer of DRAM 58. The microprocessor 54 with serial output channel 78 transmits write-protected second files stored in the DRAM 58 (*i.e.*, "local memory," as claimed) to an external computer or base station, which a POSITA would have understood as having "remote memory" for storing such files. The microprocessor 54 therefore includes the claimed "sending facility."

358. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claims 2 and 21 of the '882 patent.

359. ***Claims 3 and 22:*** Dependent claim 3 depends from claim 2 and recites "wherein the seconding facility comprises a wireless transmitter."[3] Dependent claim 22 depends from claim 21 and recites "wherein the step of transmitting includes wirelessly transmitting the at least one of the distinct files." Yerazunis discloses these limitations. As explained above for claim 2 of the '882 patent, Yerazunis's

[3] Claim 3 refers to "the seconding facility," but this appears to be a typographical error. For purposes of this declaration, I assume the claim is referring to the "sending facility" of claim 2, from which claim 3 depends.

microprocessor 54 includes a serial output channel 78 that couples to "a radio transmitter to transmit RF signals to a base station." EX1017, 3:1-2, 6:45-51, 9:63-10:3, 18:60-66, Figs. 3, 14. A POSITA would have recognized that Yerazunis's radio transmitter is a "wireless transmitter," as claimed.

360. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claims 3 and 22 of the '882 patent.

361. ***Claim 4:*** Dependent claim 4 depends from claim 1, reciting "a sensor that automatically triggers the signal to record upon detecting identified content in at least one of the captured images." Yerazunis discloses this limitation. The reference's video recording device includes the event sensor 70 that:

> provides a trigger output signal in response to a condition which is desired to initiate the capture of the video image or images occurring prior to and following the occurrence of the trigger output signal…. The trigger output signal may [be any] … signal indicative of a specified event.

EX1017 at 8:8-25; *see also id.* at 16:43-65 ("[T]he event sensor 70 is operative to generate a trigger signal in response to the discharge of the gun.").

362. As seen above, Yerazunis's event sensor 70 automatically triggers the signal to record, as claimed. The "signal to record" of claim 4 refers back to the "signal" of claim 1 that causes the designation of a segment of the circular buffer as being write protected. EX1001 at 12:13-26, 12:33-35 (claim 4 referring to "the signal to record,"

the antecedent basis of which is "signal" in claim 1). In Yerazunis, when the event sensor 70 detects certain "condition[s]," it provides a trigger output signal that "activate[s] the capture of video images by the present video recording device," thereby causing them to be write-protected. EX1017 at 8:8-25; *see also id.* at 3:25-38, 8:26-30, 15:9-13, 17:45-61. Accordingly, Yerazunis's event sensor 70 discloses the claimed "sensor that automatically triggers the signal to record" because it automatically causes video data to be write protected upon detection of certain conditions.

363. The conditions that automatically trigger the write protecting in Yerazunis include "detecting identified content in at least one of the captured images," as claimed. Specifically, Yerazunis discloses that "[t]riggering events may include" a "signal representing a recognized change in a video image or acoustic signal," "or any other suitable activation signal known in the art." EX1017 at 2:58-64. A POSITA would have understood that recognizing a change in a video image would have involved detecting identified content in the captured images. In particular, a POSITA would have understood that a recognized change in a video image in this context refers to an event that has occurred in a sequence of frames, where such an event caused a change in the video frames over time. By necessity, the ability to recognize a broad range of events entails the ability to detect content in video images. And, a POSITA would have been motivated to implement this triggering event with Yerazunis's gun-mountable device to, for instance, capture video data when a target is in the gun's sights or when a person falls or blood scatters/flows.

364. As another example, a POSITA would have been motivated to implement this triggering event with Yerazunis's gun-mounted device such that if an officer points the gun at a suspected criminal (e.g., before the officer pulls the gun trigger), the mounted camera system would detect that the suspect has drawn a weapon and begin recording upon such detection. The recording could advantageously be used as evidence/justification for the officer subsequently firing his own weapon. *See* EX1017, 1:32-43. In such cases, recognizing events by identifying important content in video frames would be important. Moreover, Yerazunis is not limited to targetable weapons, as discussed earlier, and thus identifying contents in images provides a general and effective way to recognize important recording events (such as the those in automobile environment discussed in Yerazunis (at Fig. 1 as an example)). Thus, Yerazunis discloses the claimed "sensor that automatically triggers the signal to record upon detecting identified content in at least one of the captured images."

365. Yerazunis alone or combined with Fiore renders obvious claim 4 of the '882 patent.

366. ***Claim 5:*** Dependent claim 5 depends from claim 1, reciting "an interface through which a human can initiate a signal." Yerazunis discloses this. The '882 patent describes an "interface" as an input mechanism for receiving user input. EX1033, 2:43-45, 6:8-28, 8:43-54, 8:60-9:13. Yerazunis discloses an input mechanism (*i.e.*, "an interface") through which a human triggers a write-protecting signal, including "a button actuated by a user." EX1017, 2:58-64; *see also id.*, 9:17-18 (describing "capture

button 72, which serves as a user activatable trigger event"), Fig. 14 (depicting capture button 72). Pushing this button provides a trigger signal to central control processor 54. *Id.*, 9:19-22.

367. Yerazunis's "video recording device may be interfaced directly to the trigger of the gun" such that "the trigger is employed to generate a switching action or signal which is used to indicate a trigger event." *Id.*, 16:59-62. The trigger is "an interface through which a human can initiate a signal" for reasons similar to the capture button.

368. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 5 of the '882 patent.

369. ***Claims 6 and 17:*** Dependent claim 6 depends from claim 1, reciting "an interface through which a human can designate a length of time of at least one of the pre-recorded subset, the post-recorded subset, and the segment." Dependent claim 17 depends from claim 12 and similarly recites "configuring the size of the pre-recorded subset." Yerazunis discloses these limitations. Yerazunis teaches "the number of frames that are recorded before and after [a trigger event] are a matter of design choice." EX1017, 8:51-55; *see also id.*, 6:11-13, 10:42-46, 11:31-43, 12:38-42. Because a human can set the number of frames recorded before and after a trigger event by "design choice," Yerazunis necessarily discloses the "interface" of claim 6.

370. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claims 6 and 17 of the '882 patent.

371. ***Claim 9:*** Dependent claim 9 depends from claim 1, reciting "a mount for the camera." Yerazunis discloses this. Yerazunis's compact video image recording device with camera "is mountable to a gun." *Id.*, Abstract; *see also id.*, 3:9-17, 14:45-50, 15:24-30, 15:37-38, 15:56-57.

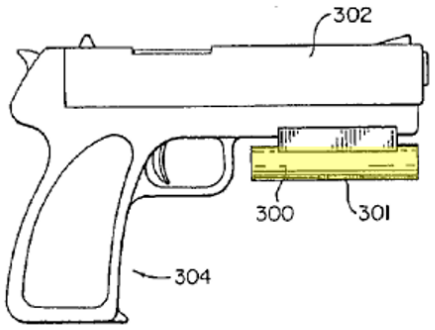


Fig. 10a

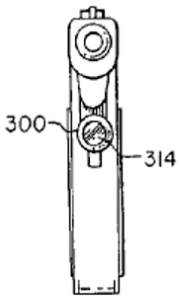


Fig. 10b

Id., Figs. 10a, 10b; *see also id.*, Figs. 2a, 2b, 9, 11a, 11b, 12a, 12b, 13; 3:45-54.

372. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 9 of the '882 patent.

373. ***Claim 11:*** Dependent claim 11 depends from claim 1, reciting "an electronic index that provides a directory to the first and the second files within the circular buffer." Yerazunis alone or combined with Fiore discloses this. Yerazunis's write-protection includes storing pointers that define areas of the circular buffer not to be overwritten, thus providing an electronic index to the write-protected segments "to allow later retrieval." EX1017, 17:45-61. Yerazunis therefore discloses this limitation.

374. To the extent a POSITA wanted further guidance as to particular methods for indexing of event data as files in Yerazunis's buffer, a POSITA would have been

motivated to turn to Fiore. Fiore implements circular storage buffer 15 as a memory-mapped file and describes indexing collections of frame data for respective events as "second files" within a "first file" (*i.e.*, the memory-mapped file that implements the circular buffer). EX1009, [0022]-[0023], [0051], [0059], [0060]. A POSITA would have been motivated to employ Fiore's indexing of video data as second files for the reasons stated in Section VIII.B.1.

375. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 11 of the '882 patent.

376. ***Claim 13:*** Dependent claim 13 depends from claim 12, reciting "storing the distinct files from the write-protected portions as the distinct, separate files in a remote memory." This would have been obvious in view of Yerazunis. A POSITA would have understood that a file stored in local memory would be maintained as a file once offloaded to the remote memory, and that it would have been obvious to implement Yerazunis (alone or in combination with Fiore) in this manner. Yerazunis specifically discloses offloading video images to a remote memory so that a user can view them (*see*, *e.g.*, EX1017, 3:1-2, 6:45-47, 9:60-65), and a POSITA would have understood this to mean storing as distinct, separate files in the remote memory.

377. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 13 of the '882 patent.

378. ***Claim 14:*** Dependent claim 14 depends from claim 12, reciting "recording the video data as the first file into physically dis-contiguous parts of the circular buffer."

Yerazunis discloses this. Since frame data associated with a firing event cannot be overwritten, Yerazunis's video recording device necessarily records to physically discontinuous parts of the circular buffer, as the overwriting process skips preserved event data. EX1017, 3:19-33; *see also* Figs 6-8 (illustrating the non-sequential nature of recording); *accord* EX1010, 9:18-26, Fig. 4H.

379. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 14 of the '882 patent.

380. ***Claim 15:*** Dependent claim 15 depends from claim 12, reciting "wherein the signal to save a recording comprises a signal to start recording and a signal to stop recording." Yerazunis discloses this. As explained above for claim 1, element 5, and claim 12, element 3 of the '882 patent, Yerazunis's video recording device responds to a signal to save a recording by write protecting specified frame data in the circular buffer. EX1017, 3:20-38, 8:8-30, 14:55-61, 15:9-13. Yerazunis's "signal to save a recording" comprises "a signal to start recording and a signal to stop recording," as recited in claim 15. Yerazunis's "signal to save" tells the video recording device when to (i) "start recording," *i.e.*, upon detection of the signal, EX1017, 3:25-38, 8:26-30, 15:9-13, and (ii) "stop recording," *i.e.*, when a predetermined number of frames subsequent to the trigger event have been write protected, *id.*, 2:53-64, 4:35-56, 8:26-61, 11:27-30, 12:14-17, 13:3-17, 16:66-17:38. Yerazunis thus discloses the limitations added in claim 15.

381. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 15 of the '882 patent.

382. ***Claim 16:*** Dependent claim 16 depends from claim 12, reciting "receiving the signal to save a recording through at least one of a manually operated switch and an audio signal." Yerazunis discloses this. Yerazunis's "event sensor 70 is operative to generate a trigger signal in response to the discharge of the gun," and may comprise a microphone "operative to detect the sound associated with the firing of the gun" (*i.e.*, audio signal). EX1017, 16:43-55.

383. Yerazunis also discloses the "interface through which a human can initiate a signal" of claim 5, teaching a "capture button 72 which serves as a user activatable trigger event" (*id.*, 9:17-18; *see also id.*, 2:58-64) and a gun trigger "directly interfaced to" Yerazunis's video recording device such that the trigger (*i.e.*, manually operated switch) triggers the signal to write-protect video data (*id.*, 16:59-62).

384. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 16 of the '882 patent.

385. ***Claim 18:*** Dependent claim 18 depends from claim 12, reciting "removing write-protection from a transmitted write-protected portion after transmission of its corresponding distinct file." Yerazunis discloses this. Yerazunis discloses purge button 76 electronically coupled to microprocessor 54. EX1017, 9:47-48. Pressing the purge button, "the contents of the circular buffer and any still images that have been captured are erased. Thus, in the event that a user captures images which, for any reason, such

user does not desire to retain, they may be erased." *Id.*, 9:48-53. Accordingly, write-protection is removed from a write-protected portion of the circular buffer. It would have been obvious that one reason the "user does not desire to retain" captured images is that the images have been offloaded, as disclosed by Yerazunis and discussed for claim 1.

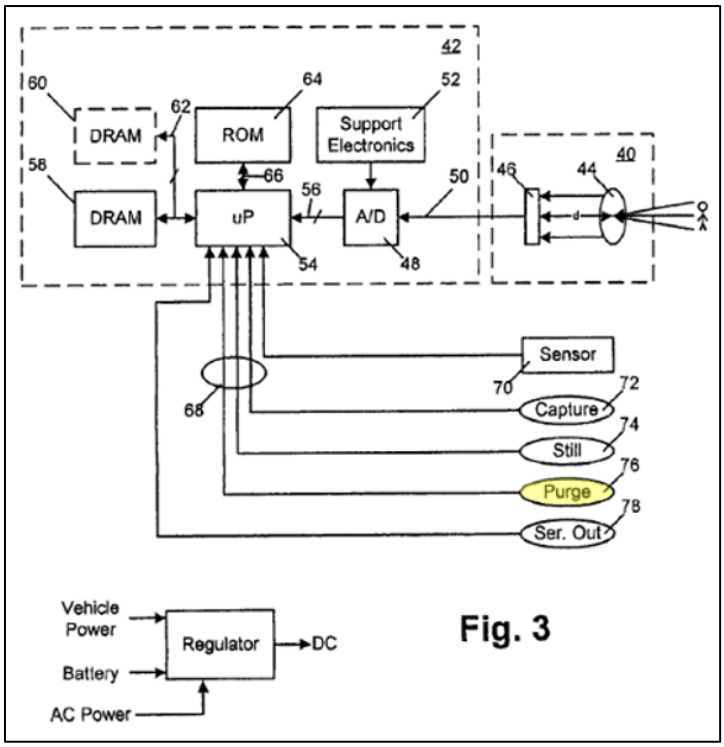
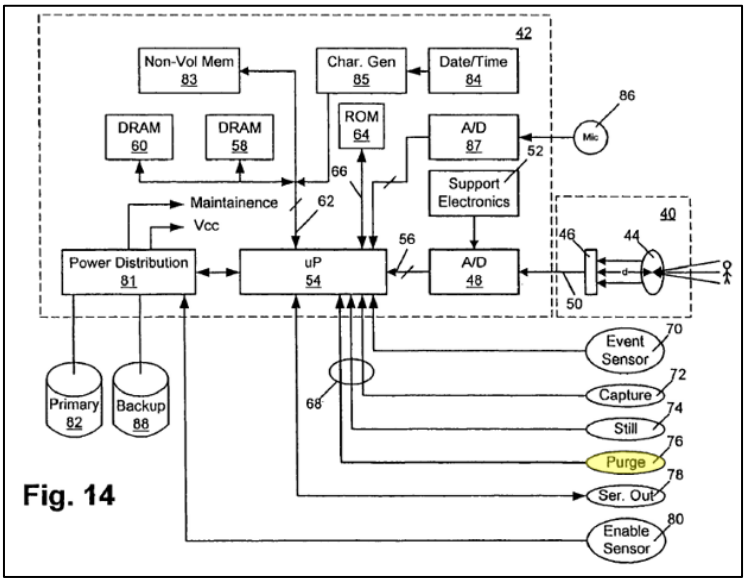


Fig. 3



EX1017, Figs. 3, 14 (color added); *id.*, 19:30-34.

386. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore renders obvious claim 18 of the '882 patent.

C. Ground 1b: Claims 7 And 8 Of The '882 Patent Would Have Been Obvious Over Yerazunis Alone Or As Combined With Fiore, In Further View Of Lewellen

1. Motivation To Combine

387. A POSITA would have been motivated to combine Lewellen with the Yerazunis/Fiore system and had a reasonable expectation of success for at least the reasons stated above in Section VIII.C.1.

2. Dependent Claims 7 and 8

388. ***Claim 7:*** Dependent claim 7 depends from claim 1, reciting "wherein the local memory is configured to provide access to the at least one of the files to a mobile phone." Lewellen discloses this. Lewellen's local wireless interface 390 wirelessly transmits data to Bluetooth-compatible devices, including mobile phones. EX1019,

[0022], [0031], [0042]-[0048]. A POSITA would have been motivated to incorporate Lewellen's interface 390 into the Yerazunis/Fiore system for the reasons in Section VIII.C.1 above.

389. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore, in further view of Lewellen, renders obvious claim 7 of the '882 patent.

390. ***Claim 8:*** Dependent claim 8 depends from claim 1, reciting "wherein a mobile phone automatically receives the second file and automatically forwards the second file to a remote memory." Lewellen discloses this. Local wireless interface 390 enables access to the local memory by nearby devices, including Bluetooth-compatible mobile phones. EX1019, Abstract, [0031], [0037], [0041]. Lewellen's vehicle video system automatically transmits digital video to a "compatible device … that is coupled to a database," and the compatible device then "automatically transfer[s]" the video "to the database" (*i.e.*, a remote memory). *Id.*, Abstract, [0010]; *see also id.*, [0043].

391. In the Yerazunis/Fiore system, files are stored in local memory (*e.g.*, DRAM 58), and adding Lewellen's interface 390 would have advantageously enabled access to local memory using mobile phones. A POSITA would have been motivated to implement the Yerazunis/Fiore video recording system with these features for the reasons in Section VIII.C.1.

392. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore, in further view of Lewellen, renders obvious claim 8 of the '882 patent.

D. Ground 1c: Claim 10 Of The '882 Patent Would Have Been Obvious Over Yerazunis Alone Or As Combined With Fiore, In Further View Of Mann

393. Claim 10 depends from claim 9, reciting "wherein the mount is a pair of wearable glasses." Mann discloses this. Mann describes a body-worn portable camera system with wearable viewfinder, built into eyeglass frames 100 with lenses 105 and cameras 110 and 120. EX1015, [0001], [0056]-[0058], Fig. 1.

394. A POSITA would have been motivated to combine Mann with Yerazunis and Fiore for the reasons stated above in Section VIII.D.1.

395. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore, in further view of Mann, renders obvious claim 10 of the '882 patent.

E. Ground 1d: Claims 19 And 20 Of The '882 Patent Would Have Been Obvious Over Yerazunis Alone Or As Combined With Fiore, In Further View Of Fiedler

1. Motivation To Combine

396. A POSITA would have been motivated to use the teachings of Fiedler in the Yerzunis/Fiore system and had a reasonable expectation of success for at least the reasons stated above in Section VIII.E.1. Additional motivations for this combination and a POSITA's reasonable expectation of success are detailed below for the specific features of claims 19 and 20.

2. Dependent Claims 19 and 20

397. Claim 19 depends from claim 12, reciting "sending a warning to a user before the write protected segment of the circular buffer is fully recorded." Claim 20

depends from claim 19, reciting "extending a length of the write protected segment of the circular buffer in response to at least one of a manually operated switch and an audio signal." Yerazunis alone or combined with Fiore, in further view of Fiedler discloses these limitations.

398. Claim 19: These limitations would have been obvious in view of Yerazunis. Yerazunis discloses the recording process "continues as each trigger event occurs until the buffer memory is full." EX1017, 17:50-61. A POSITA would have been motivated to implement the Yerazunis/Fiore system with a warning to inform the user when the buffer is nearly full. Should the Board disagree, such limitations are obvious in view of Fiedler, which describes a device that "continues to capture data until either the capture button is pressed again or a sufficient pause has been detected. (*The device may sound an audible warning at that point, giving the user a choice whether to continue capturing*.)." EX1037, 9:46-53. The combination merely combines familiar elements according to known methods to yield predictable results.

399. Claim 20: Yerazunis states: "Since multiple firings of the gun are possible, it is conceivable that the gun may be refired within the post trigger event time period that the video recording device is still recording as a consequence of a prior firing." EX1017, 17:38-42. "In such event, the recording time may be extended so as to terminate another post event time period after the last such firing." *Id.*, 17:42-44. The sound of the gun refiring, detected by event sensor 70, discloses the claimed "audio signal."

400. Yerazunis also discloses (i) the length of the write-protected segment is a matter of design choice, and (ii) the length of the segment can be extended. EX1017, 8:26-61, 16:66-17:44. It would have been obvious to utilize a manually operated switch or audio signal to extend the length of the segment in view of Yerazunis's disclosure. Moreover, such limitations would have been obvious in further view of Fiedler. Fiedler describes "pressing Capture once may capture the most recent minute, pressing it twice in rapid succession may capture the most recent two minutes, and so on." EX1037, 9:42-45. And a POSITA would have generally known that a user could control and extend the length of recording in a circular buffer. For example, US 7,348,895 to Lagassey describes that a length of recording time "can be programmed or adjusted remotely from [a] monitoring center 45 if there is a need to shorten or extend the time of recording." EX1035, 28:48-56.

401. A POSITA would have recognized the advantages of extending a length of a write-protected segment in response to manually operated switch or audio signal in the Yerazunis/Fiore system. Yerazunis states an objective of its video recording device is to create an evidentiary record (EX1017, 15:61-64), and a POSITA would have understood extending a length of a write-protected segment in the Yerazunis/Fiore system would have been advantageous at least to ensure important video evidence can be preserved, *e.g.*, when the important video data is captured when write-protection would otherwise end.

402. For these reasons, it is my opinion that Yerazunis alone or combined with Fiore, in further view of Fiedler, renders obvious claims 19 and 20 of the ’882 patent.

F. Ground 2a: Claims 1, 2, 4-6, 9, 11-18, And 21 Of The ’882 Patent Would Have Been Obvious Over Ely Alone Or As Combined With Fiore

1. Motivation To Combine

403. A POSITA would have been motivated to combine Ely and Fiore with a reasonable expectation of success for at least the reasons stated above in Section VIII.F.1.

2. Independent Claims 1 and 12

a) Preamble: A surveillance apparatus comprising:

404. Ely discloses the preambles of claims 1 and 12. EX1040. For claim 1, Ely discloses a “video surveillance system” including a central control station and video cameras each mounted inside a dome housing unit.” EX1020, Abstract. Ely therefore discloses a “surveillance apparatus.”

405. For claim 12, Ely discloses “operation of the camera unit 114” illustrated in Figure 4, which a POSITA would have understood as including “processing imaged data from a camera” (*id.*).

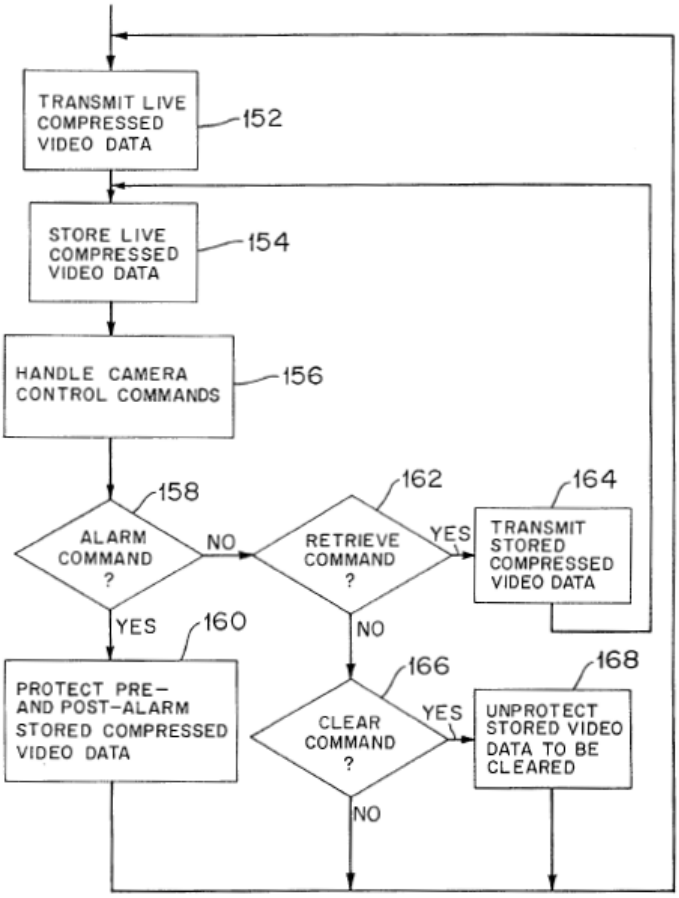


FIG. 4
CAMERA UNIT OPERATION

EX1020, 7:12-8:15.

b) Element 1: a camera having an image capturing component that captures image data;

406. Ely discloses element 1 for each of claims 1 and 12. EX1040. For claim 1, in camera 130, an "image formed by the optical system 138 is converted into an electrical signal at CCD 142 [(*i.e.*, "an image capturing component that captures images")] and the resulting signal is subjected to conventional analog signal processing at video signal processing circuit 144." *Id.*, 6:21-28. Camera 130 is coupled to memory board 136 including video digitizer circuit 146. *Id.*, 6:48-61. At the purported priority

date of the challenged patents (June 2007), the term "camera" was often used to describe systems with imaging components and digitizers, like in Figure 3.

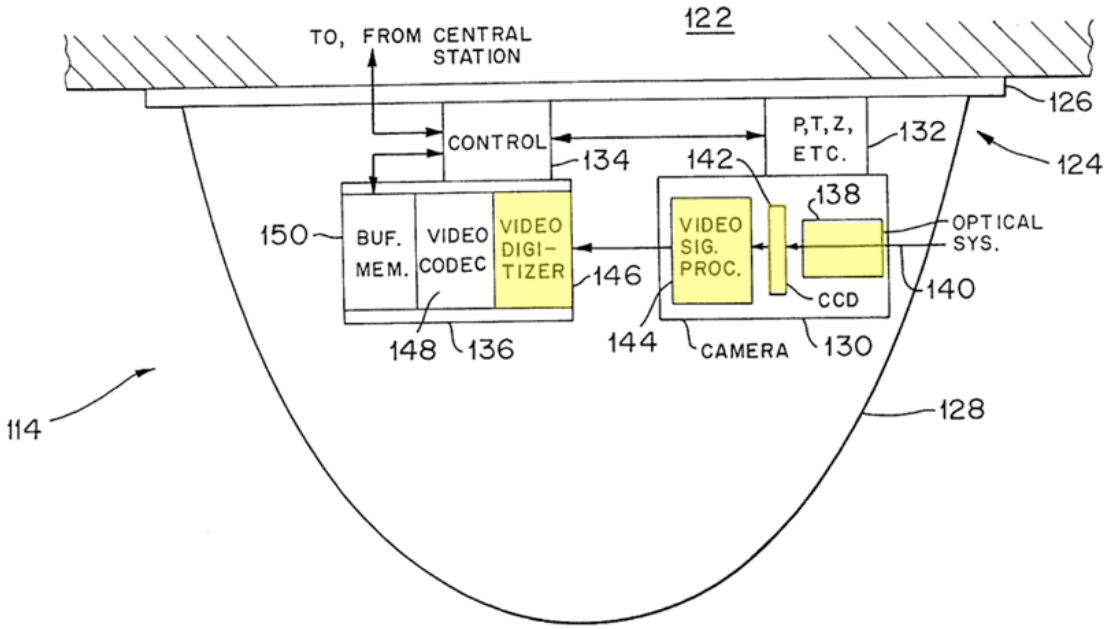


FIG. 3

EX1020, Fig. 3 (color added). A POSITA would have understood the output of video digitizer circuit 146 as being "image data" because the output includes digitized video comprising images. *Id.*, 6:48-7:11.

407. For element 1 of claim 12, the digital image data output by the video digitizer circuit 146 is "video data" because it contains video data from the camera in digital form. This video data is received at least by Ely's video data coding/decoding circuit 148. *Id.*; EX1020, 6:48-7:11, 7:18-39.

c) Element 2: a local memory functionally coupled to the camera;

408. Ely discloses element 2 of claim 1. Memory board 136 includes memory device 150, *i.e.*, "local memory" (EX1020, 6:17-21, 6:48-53, 6:61-65):

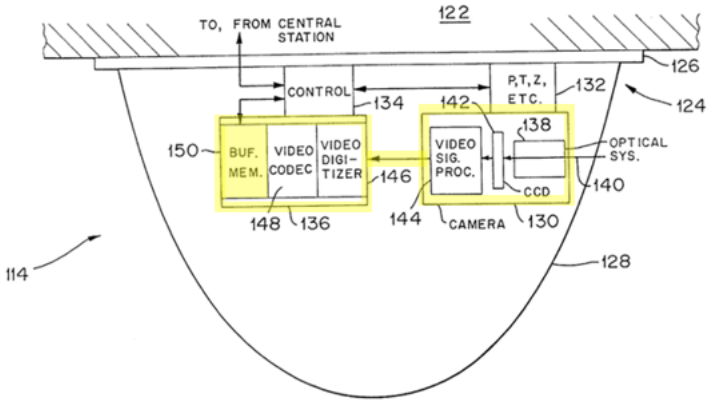


FIG. 3

Id., Fig. 3 (color added).

409. A POSITA would have understood that memory device 150 is coupled to camera 130 using entirely physical connectors. Camera 130 is coupled to memory board 136, which is configured "to receive an analog video signal output from the camera 130 and to digitize, compress and store the video signal" in memory device 150. EX1020, 6:48-65. A POSITA would have understood the coupling between camera 130 and memory device 150 as using only physical connectors. The arrow shown between components 130 and 150 in Figure 3 of Ely would have represented a wired connection to a POSITA. Additionally, if the connection between the camera 130 and memory device 150 was intended to be wireless, then a POSITA would have understood that a wireless sender and receiver would have been depicted. Lacking any

depiction of such wireless sender and receiver, a POSITA would have understood the connection between the camera 130 and memory device 150 as being physical. Accordingly, memory device 150 is coupled to camera 130 "using entirely physical connectors," as required by the parties' agreed upon construction.

410. A POSITA would have further understood that memory device 150 is distanced less than 20 cm from the camera 130. Ely discloses that the memory device is "provided adjacent to the camera." EX1020, 4:17-25, 6:61-63. A POSITA would have understood that memory device 150, located adjacent to the camera within the housing of the "dome unit," as in Figure 3, is located near (less than 20 cm from) the camera.

d) Element 3: a recording facility that records the image data into available portions of a circular buffer in the local memory as a first file using a digital video file format;

411. Ely alone or in combination with Fiore discloses element 3 of claim 1, and element 2 of claim 12. EX1040. Ely's surveillance system includes a "video data buffer memory, storing compressed video data generated by the camera," which "is mounted with each camera in the respective dome unit." EX1020, Abstract. Memory device 150 "functions as a buffer for the video signal generated by the camera 130, and is controlled by the control circuit 134." *Id.*, 6:61-65. "[M]emory 150 serves as a ring buffer," in which "currently generated compressed video data is written over the oldest compressed video data that had previously been stored in the memory 150." *Id.*, 7:28-

34. A POSITA would have understood the compressed video data as "using a digital video file format," and further understood Ely's "ring buffer" to mean a "circular buffer" of the type disclosed in the '882 patent.

412. Ely discloses that the camera system responds to an "alarm command by protecting buffered video data which corresponds to a predetermined pre- and post-alarm time period" and the "protected data is then available for subsequent retrieval, display, and permanent recording" EX1020, 10:11-15. In Ely, "[a]fter the compressed video data stored at one of the camera units has been protected pursuant to an alarm command, the data (which will sometimes be referred to as 'alarm data') can be selectively retrieved in response to user instruction either for display (block 180) or directly for taperecording (block 182)." *Id.*, 10:15-23. A POSITA would have found it obvious to record the image data ("alarm data") in Ely's ring buffer "as a first file" based on Ely's disclosure of storing the alarm data for subsequent, selective "retrieval, display, and permanent recording." Further, while Ely never expressly refers to recording the data stream into the circular buffer "as a first file," a POSITA would have understood such file-based recording as one of a finite number of identified solutions for recording image data in Ely, evidencing its obviousness. A POSITA would have recognized Ely's image data must be recorded to the circular buffer in some way, and using a file was a well-known approach for doing so. EX1020, 6:61-65, 7:28-34, 10:17-23.

413. To the extent a POSITA wanted further guidance as to particular methods for recording image data as files in Ely's ring buffer, a POSITA would have been motivated to turn to Fiore. Fiore implements circular storage buffer 15 as a memory-mapped file and describes indexing collections of frame data for respective events as files within the memory-mapped file. EX1009, [0022]-[0023], [0051], [0059], [0060]. Fiore also describes the benefits of its file-based approach, including enabling playback of video data for a specific event from the circular buffer without interrupting simultaneous recording of new video data into the buffer. *Id.*, [0065], [0067], [0068], [0072]. In view of these exemplary benefits and the additional reasons explained in Section VIII.F.1, a POSITA would have been motivated to implement Ely's control circuit 134 to "record[] the image data into available portions of a circular buffer … as a first file" in the manner Fiore discloses. In the Ely/Fiore system, the circular buffer implemented as a memory-mapped file discloses the claimed "first file" into which Ely's image data would have been recorded.

e) Element 4: a protecting facility that responds to a signal to record the image data by designating a segment of the circular buffer as a write-protected portion and by indexing the write-protected portion as a second file in the circular buffer, wherein the segment includes a pre-recorded subset recorded before the signal is received and a post-recorded subset to be recorded after the signal is received; and

414. Ely alone or combined with Fiore discloses element 4 of claim 1, and elements 3 and 4 of claim 12. EX1040.

415. First, Ely states: "When an alarm command is received," the "control circuit 134 protects from over-writing compressed digital video data previously stored in the memory 150." EX1020, 7:48-55. The write-protected video data "correspond[s] to a time interval beginning at a predetermined time prior to receipt of the alarm command, and continu[es] for a predetermined time after receipt of the alarm command." *Id.*; *see also id.*, 10:11-15.

416. Second, Ely states: "After the compressed video data stored at one of the camera units has been protected pursuant to an alarm command, the data (which will sometimes be referred to as 'alarm data') can be selectively retrieved in response to user instruction," either for display or tape-recording. EX1020, 10:17-23. While Ely never expressly refers to alarm data as a "file," a POSITA would have understood that selectively retrieving alarm data associated with an alarm command necessitates an ability to locate alarm data within the buffer. A POSITA would have therefore understood Ely necessarily discloses—or at minimum, renders obvious—"indexing." Ely's alarm data must be stored in the buffer in some way, and a POSITA would have understood that indexing data as files was a well-known approach for doing so, further evidencing the obviousness of this limitation.

417. To the extent a POSITA wanted further guidance on the indexing of alarm data as files in Ely's ring buffer, a POSITA would have been motivated to turn to Fiore for at least the reasons above. Fiore discloses a circular storage buffer 15 implemented as a memory-mapped file (EX1009, [0047], [0064]-[0068]), Fig. 9), and identifiable

collections of data (*i.e.*, files) for respective events are indexed in the circular storage buffer 15 (*id.*, [0022]-[0023], [0041], [0048], [0050]-[0051], [0059], [0060]). Fiore also describes numerous benefits of its file-based approach. *Id.*, [0065], [0067], [0068], [0072]. In view of these exemplary benefits and the additional reasons explained in Section VIII.F.1, a POSITA would have been motivated to implement Ely's control circuit 134 to "respond[] to a signal to record" by "indexing the write-protected portion as a second file in the circular buffer" in the manner Fiore discloses.

418. Ely alone or combined with Fiore discloses elements 3 and 4 of claim 12 for the same reasons. EX1040. A POSITA would have also understood that the segment of the circular buffer to be write-protected must "include[] a newly recorded portion of the buffer" because frame data not "newly recorded" would be overwritten once recording loops back. EX1020, 7:48-55, 10:11-15.

419. Further, the indexing in Ely alone and in the Ely/Fiore combination occurs "during the step of recording." Ely discloses that its "control circuit 134 is conditioned (as indicated by decision block 162) to receive commands calling for reading-out and transmission to the central station of previously-stored compressed video data." EX1020, 7:56-59. "The transmission of the compressed video data that was read out from the memory 150 may be in place of, or virtually in parallel with, continued transmission of 'live' compressed video data." *Id.*, 7:66-8:2. "Preferably, … transmission of stored compressed video data in response to corresponding retrieval commands does not interrupt ongoing storage of 'live' video data." *Id.*, 8:2-6. A

POSITA would have understood that the selective retrieval and transmission of alarm data without interrupting ongoing storage of "live" video data necessitates that the control circuit 134 be configured to index the alarm data (*i.e.*, the write-protected segment) while continuing to record the video data into the memory.

420. Finally, the second files disclosed or rendered obvious by Ely and/or Fiore are distinct from the "first file" discussed for element 3 above. The "first file" in the Ely/Fiore system may be the memory mapped file that implements the circular buffer, whereas the indexed second file would comprise portions of the circular buffer that correspond to video data for a particular event (*e.g.*, alarm data).

f) Element 5: wherein the local memory is configured to allow access to at least one of the files.

421. Ely discloses element 5 for each of claims 1 and 12. EX1040. Ely discloses that "[d]ata buffered at the dome units may be selectively protected from over-writing in response to alarm signals and then retrieved for display or tape-recording by the central control station." EX1020, Abstract. As illustrated in Figure 5B, below, "[a]fter the alarm data has been retrieved, the user has the option, indicated at block 188, of recording the retrieved alarm data" on a VCR as shown at block 192. *See id.*, 10:24-47. Ely also discloses that a digital video tape recorder (DVTR) may be used instead of the VCR. *Id.*, 9:51-58.

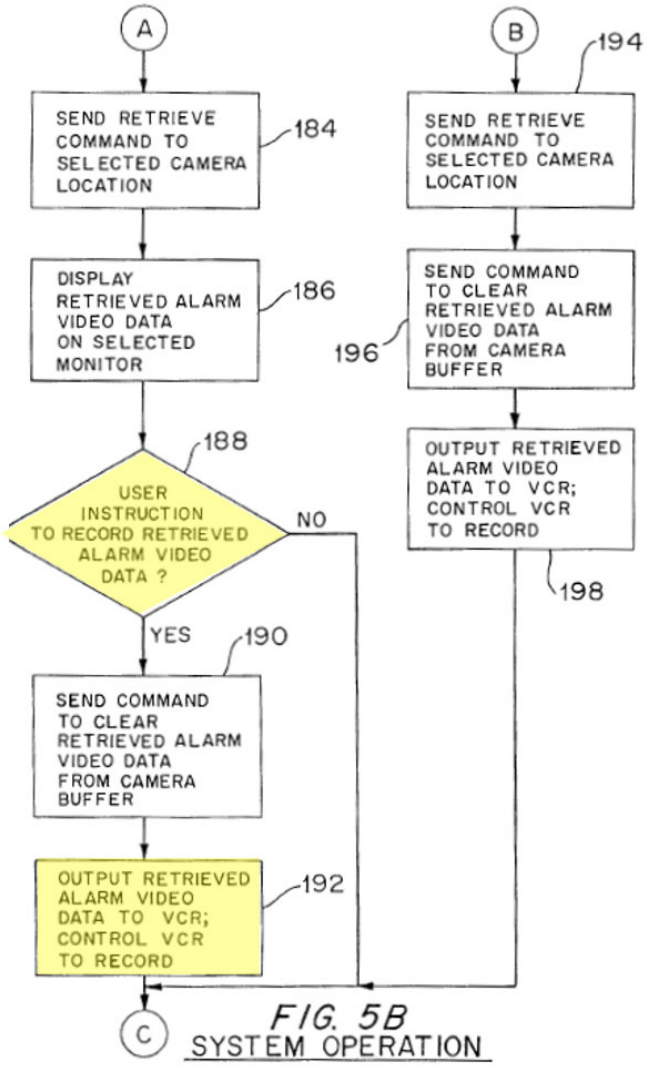


FIG. 5B
SYSTEM OPERATION

422. "If a user indicates that a block of alarm video data is to be displayed, the host 104 sends a retrieve command (via LAN 112) to the selected camera unit 114 (block 184, FIG. 5B). The desired alarm data is then read out from the buffer memory in the designated camera unit and transmitted via the LAN 112." *Id.*, 10:24-30. Ely therefore discloses that memory 150 (*i.e.*, local memory) is configured to allow access to at least one of the files stored therein. Such access is provided to at least the LAN 112 and the DVTR or VCR coupled to the LAN 112.

423. Ely alone or as combined with Fiore renders obvious claims 1 and 12 of the ’882 patent.

3. Dependent Claims 2, 4-6, 9, 11, 13-18, and 22

424. ***Claims 2 and 21:*** Ely discloses the limitations added in dependent claims 2 and 21. As explained above with respect to claim 1 of the ’882 patent, Ely discloses recording alarm data from the memory 150 to a DVTR or VCR at a central command station. EX1020, Abstract, 9:51-58, 10:24-47, Fig. 5B. The DVTR or VCR is a “remote memory,” as claimed. Ely further discloses that a retrieve command causes the alarm data (stored as second files in the buffer of memory 150) to be “read out from the buffer memory in the designated camera unit and transmitted via the LAN 112.” *Id.*, 10:24-30. LAN 112 is a “sending facility configured to transmit the file”.

425. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claims 2 and 21 of the ’882 patent.

426. ***Claim 4:*** Ely discloses the limitations added in dependent claim 4. Sensors 120 “are preferably of conventional types that detect, for example, unauthorized opening of doors, windows and display cases and the like and generate alarm signals indicative of these occurrences,” and “may also include conventional motion and/or heat sensing devices.” EX1020, 5:50-55.

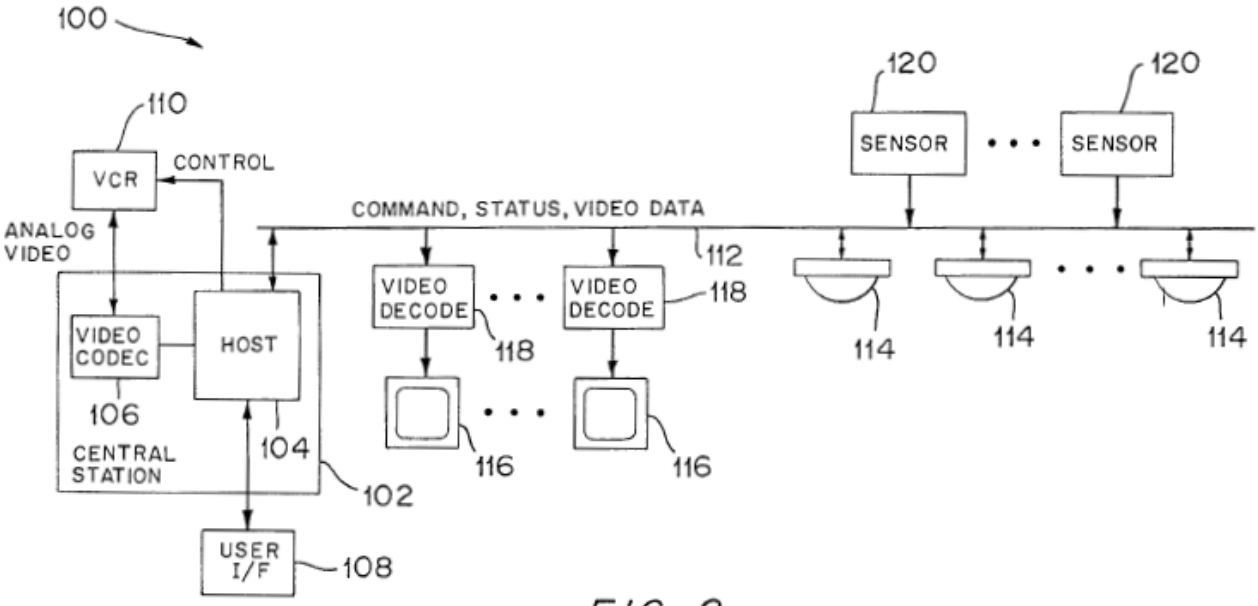


FIG. 2

427. Further, "an alarm condition can be detected by machine analysis of the content of live video signals generated by one or more of the camera units." *Id.*, 11:42-47. Thus, Ely discloses the claimed "sensor."

428. For these reasons, it is my opinion that Ely alone or combined with Fiore renders obvious claim 4 of the '882 patent.

429. ***Claim 5:*** Ely discloses the limitations added in dependent claim 5. Ely teaches "an alarm condition can be generated by a system operator via the user interface" (EX1020, 11:42-47) and describes the user interface as responding to inputs from common computer peripherals (*e.g.*, a mouse, keyboard) and a "TOUCHTRACKER" control module (*id.*, 5:60-6:3).

430. For these reasons, it is my opinion that Ely alone or combined with Fiore renders obvious claim 5 of the '882 patent.

431. ***Claims 6 and 17:*** Ely discloses the limitations added in dependent claims 6 and 17. As explained above for claim 1 of the '882 patent, when an alarm command is received, Ely's surveillance system protects from overwriting video data previously stored in the memory that "correspond[s] to a time interval beginning at a *predetermined time prior to receipt of the alarm command*, and continuing for a *predetermined time after receipt of the alarm command*." EX1020, 7:45-55; *see also id.*, 10:10-23. Ely thus discloses the pre-alarm and post-alarm intervals are predetermined. *See also id.*, 10:60-65. For a human to "predetermine" amounts of time to be protected before and after the alarm command, Ely necessarily discloses the "interface" of claim 6.

432. Ely further discloses a user interface 108 for users to provide instructions, depicted in Figure 2 (EX1020, 5:60-64, 8:16-27):

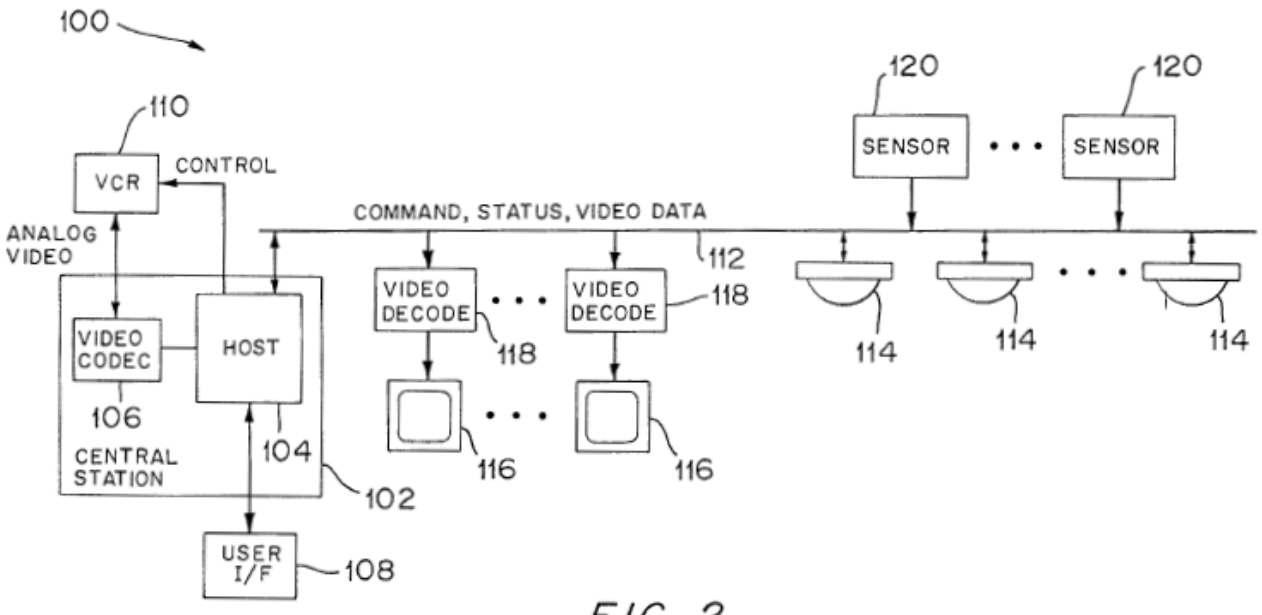


FIG. 2

Id., Fig. 2.

433. For these reasons, it is my opinion that Ely alone or combined with Fiore renders obvious claims 6 and 17 of the ’882 patent.

434. ***Claim 9:*** Ely discloses the limitations added in dependent claim 9. “Each camera unit may be *mounted* at a ceiling 122 or at another appropriate location, and includes a housing 124 constituted, at least in part, by a base portion 126 and a dome portion 128.” EX1020, 6:7-15.

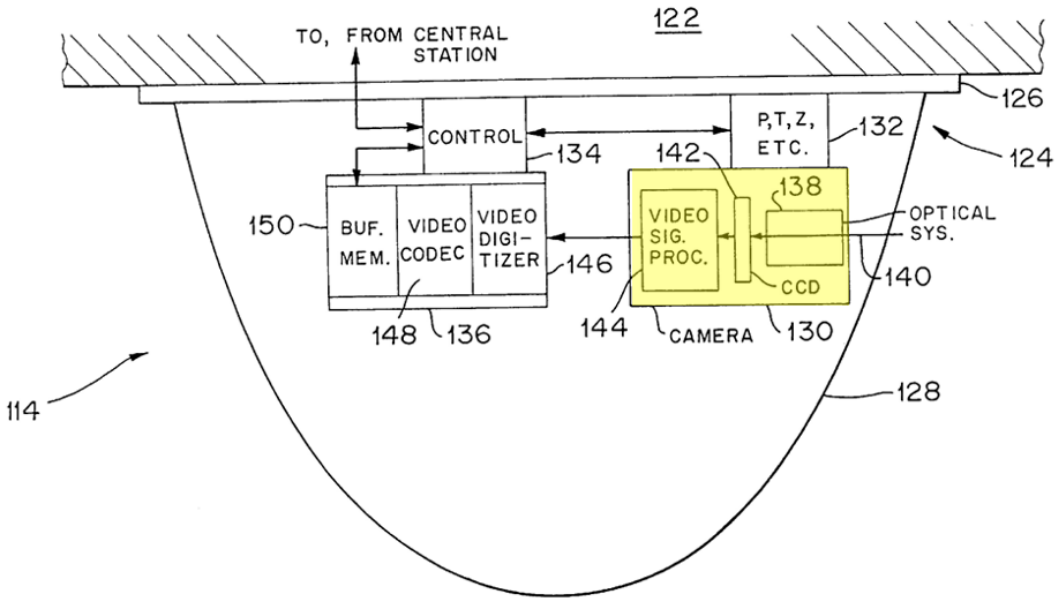


FIG. 3

Id., Fig. 3.

435. For these reasons, it is my opinion that Ely alone or combined with Fiore renders obvious claim 9 of the ’882 patent.

436. ***Claim 11:*** Ely discloses the limitations added in dependent claim 11. Alarm data “can be selectively retrieved in response to user instruction,” either for display or tape-recording. EX1020, 10:17-23. A POSITA would have understood that

selective retrieval of alarm data from the buffer necessitates an ability to locate alarm data within the buffer, such that Ely necessarily discloses "an electronic index that provides a directory to the first and the second files within the circular buffer."

437. To the extent a POSITA wanted further guidance as to particular methods for indexing of alarm data as files in Ely's buffer, a POSITA would have been motivated to turn to Fiore. Fiore implements circular storage buffer 15 as a memory-mapped file and describes indexing collections of alarm data as "second files" within a "first file" (*i.e.*, the memory-mapped file that implements the circular buffer). *See*, *e.g.*, EX1009, [0022]-[0023], [0051], [0059], [0060]. A POSITA would have been motivated to employ Fiore's indexing of alarm data as second files to achieve this ability for the reasons stated in Section VIII.F.1.

438. For these reasons, it is my opinion that Ely alone or combined with Fiore renders obvious claim 11 of the '882 patent.

439. ***Claim 13:*** The limitations added in dependent claim 13 would have been obvious in view of Ely. A POSITA would have understood that a file stored in local memory would be maintained as a file once offloaded to the remote memory, and that it would have been obvious to implement Ely (alone or in combination with Fiore) in this manner. Ely specifically discloses offloading of video data to remote memory for later retrieval and playback (*see*, *e.g.*, EX1020, Abstract, 3:29-36, 4:63-5:3, 9:31-50, 9:51-58, 10:24-47), and a POSITA would have understood this to mean storing as distinct, separate files in the remote memory. *Id.*

440. For these reasons, it is my opinion that Ely alone or combined with Fiore renders obvious claim 13 of the ’882 patent.

441. ***Claim 14:*** Ely discloses the limitations added in dependent claim 14. Since alarm data cannot be overwritten, Ely’s video recording device necessarily records to physically dis-contiguous parts of the circular buffer, as the overwriting process skips alarm data. EX1020, 7:34-39.

442. For these reasons, it is my opinion that Ely alone or combined with Fiore renders obvious claim 14 of the ’882 patent.

443. ***Claim 15:*** Ely discloses the limitations added in dependent claim 15. As explained above for claim 1, element 4, and claim 12, element 3 of the ’882 patent, Ely’s system responds to an alarm command (*i.e.*, the claimed “signal to save a recording”) by write protecting specified digital video data in the ring buffer. EX1020, 7:48-55, 10:11-15. Ely’s alarm command comprises “a signal to start recording and a signal to stop recording,” as recited in claim 15. Ely’s alarm command tells the video recording device when to (i) “start recording,” *i.e.*, upon receipt of the alarm command, and (ii) “stop recording,” *i.e.*, when a predetermined amount of time after receipt of the alarm command has passed. EX1020, 7:48-55, 10:11-23. Ely thus discloses the limitations added in claim 15.

444. For these reasons, it is my opinion that Ely alone or combined with Fiore renders obvious claim 15 of the ’882 patent.

445. ***Claim 16:*** Ely discloses the limitations added in dependent claim 16. Ely discloses the "interface through which a human can initiate a signal" of claim 5, teaching that a user generates an alarm condition through inputs to the interface from peripherals and a "TOUCHTRACKER" control module. EX1020, 11:42-47, 5:60-6:3. Thus, Ely discloses "receiving the signal to save a recording through at least … a manually operated switch."

446. For these reasons, it is my opinion that Ely alone or combined with Fiore renders obvious claim 16 of the '882 patent.

447. ***Claim 18:*** Ely discloses the limitations added in dependent claim 18. Control circuit 134 responds to "clear" commands by removing a block of stored video data from protection, thereby permitting "live" video data to be written over the now-unprotected video data. EX1020, 8:7-12. The clear command may be sent after write-protected alarm data is transmitted and retrieved. *Id.*, 10:24-43, 10:51-55.

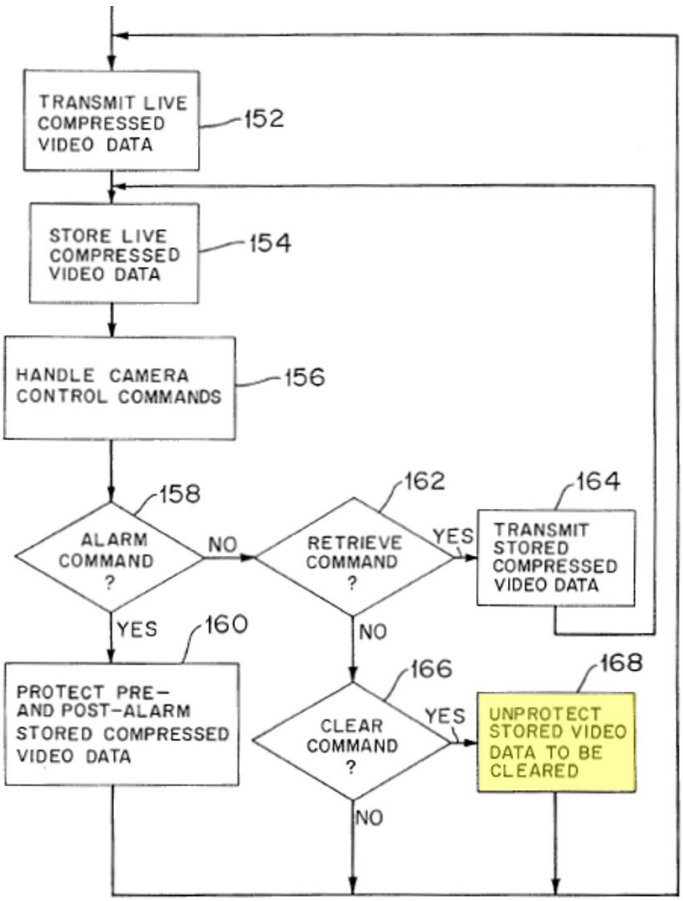


FIG. 4
CAMERA UNIT OPERATION

Id., Fig. 4 (color added); *see also id.*, Fig. 5B (block 190).

448. For these reasons, it is my opinion that Ely alone or combined with Fiore renders obvious claim 18 of the '882 patent.

G. Ground 2b: Claims 3, 7, 8, And 22 Of The '882 Patent Would Have Been Obvious Over Ely Alone Or As Combined With Fiore, In Further View Of Lewellen

1. Motivation To Combine

449. A POSITA would have been motivated to combine Lewellen with Ely alone or Ely as combined with Fiore with a reasonable expectation of success for at least the reasons stated in Section VIII.F.1.

2. Dependent Claims 3, 7, 8 and 22

450. ***Claims 3 and 22:*** Ely discloses that alarm data stored in memory device 150 (*i.e.*, "local memory") can be transmitted to a remote memory. EX1020, 9:51-58, 10:24-47. To the extent Ely does not disclose a "wireless transmitter functionally coupled to the local memory" to achieve such transmissions, Lewellen does. Lewellen's local wireless interface 390 wirelessly transmits data to Bluetooth-compatible devices, including mobile phones. EX1019, [0022], [0031], [0042]-[0048]. A POSITA would have been motivated to implement the Ely/Fiore system with Lewellen's interface 390 for at least the reasons in Section VIII.F.1 above. In this system, the interface 390 would have been functionally coupled to the memory device 150 (*i.e.*, "local memory") to advantageously enable wireless offloading of write-protected files stored in the memory's buffer to a remote memory.

451. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, therefore renders obvious claims 3 and 22 of the '882 patent.

452. ***Claim 7:*** Ely discloses transmitting alarm data from its local memory (*i.e.*, memory device 150) to a remote memory. EX1020, 9:51-58, 10:24-47. To the extent Ely does not disclose providing access to the alarm data to a mobile phone, Lewellen does for at least the reasons provided in Ground 1b. A POSITA would have been motivated to implement the Ely/Fiore system with Lewellen's local wireless interface for the reasons above in Section VIII.F.1. Indeed, a POSITA would have found it

obvious to use Lewellen's teachings of a Bluetooth-compatible mobile phone in the context of Ely's surveillance system using dome-mounted cameras. This combination would have advantageously enabled, for example, a security guard patrolling a casino or warehouse to receive video data from a dome-mounted camera onto his mobile phone for viewing, rather than just sending the video data to a central office or remote station. The security guard could conveniently view the video data from his phone (*e.g.*, while he is patrolling) without needing to be present in the central office or remote station. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Lewellen, therefore renders obvious claim 7 of the '882 patent.

453. ***Claim 8:*** Ely discloses transmitting alarm data from its local memory (*i.e.*, memory device 150) to a remote memory. EX1020, 9:51-58, 10:24-47. To the extent Ely does not disclose a mobile phone receiving the alarm data automatically and then automatically forwarding the alarm data to the remote memory, Lewellen does for at least the reasons provided in Ground 1b. A POSITA would have been motivated to implement the Ely/Fiore system with Lewellen's teaching of a mobile phone that automatically receives video data and automatically forwards it to a remote memory for at least the reasons above in Section VIII.F.1. For example, doing so would have relieved the aforementioned security guard from having to manually request the video data and then forward it to remote memory for permanent storage, and a POSITA would have recognized the benefits of eliminating these manual steps. For these reasons, it is

my opinion that Ely alone or combined with Fiore, in further view of Lewellen, therefore renders obvious claim 8 of the ’882 patent.

H. Ground 2c: Claim 10 Of The ’882 Patent Would Have Been Obvious Over Ely Alone Or As Combined With Fiore, In Further View Of Mann

454. Mann discloses the limitations added in dependent claim 10 for at least the reasons discussed above in Section IX.D. A POSITA would have been motivated to combine Mann with Ely and Fiore for at least the reasons stated in Section VIII.G.

455. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Mann, renders obvious claim 10 of the ’882 patent.

I. Ground 2d: Claims 19 And 20 Of The ’882 Patent Would Have Been Obvious Over Ely Alone Or As Combined With Fiore, In Further View Of Fiedler

1. Motivation To Combine

456. A POSITA would have been motivated to use the teachings of Fiedler in the Ely/Fiore system with a reasonable expectation of success for at least the reasons stated in Section VIII.H.1 above. Additional motivations for this combination and a POSITA’s reasonable expectation of success are detailed below with respect to the specific features of claims 19 and 20 of the ’882 patent.

2. Claims 19 and 20

457. Ely alone or combined with Fiore, in further view of Fiedler, renders obvious the limitations added in dependent claims 19 and 20.

458. Claim 19: These limitations would have been obvious in view of Ely. As one "camera buffer management practice," Ely's camera unit "send[s] a message to the central station when a predetermined portion of the camera unit's buffer memory has been utilized for protected storage" (*i.e.*, "warning to a user before the write-protected segment of the circular buffer is fully recorded"); then, the central station may "direct retrieval of the alarm data from the buffers and clearing from the buffer of the retrieved data." EX1020, 10:56-11:8. Moreover, the limitations added in claim 19 are obvious in view of Fiedler, which discloses the claimed "warning." *See* Ground 1d for the '882 patent above. The addition of Fiedler's warning to the Ely/Fiore system merely combines familiar elements according to known methods to yield predictable results.

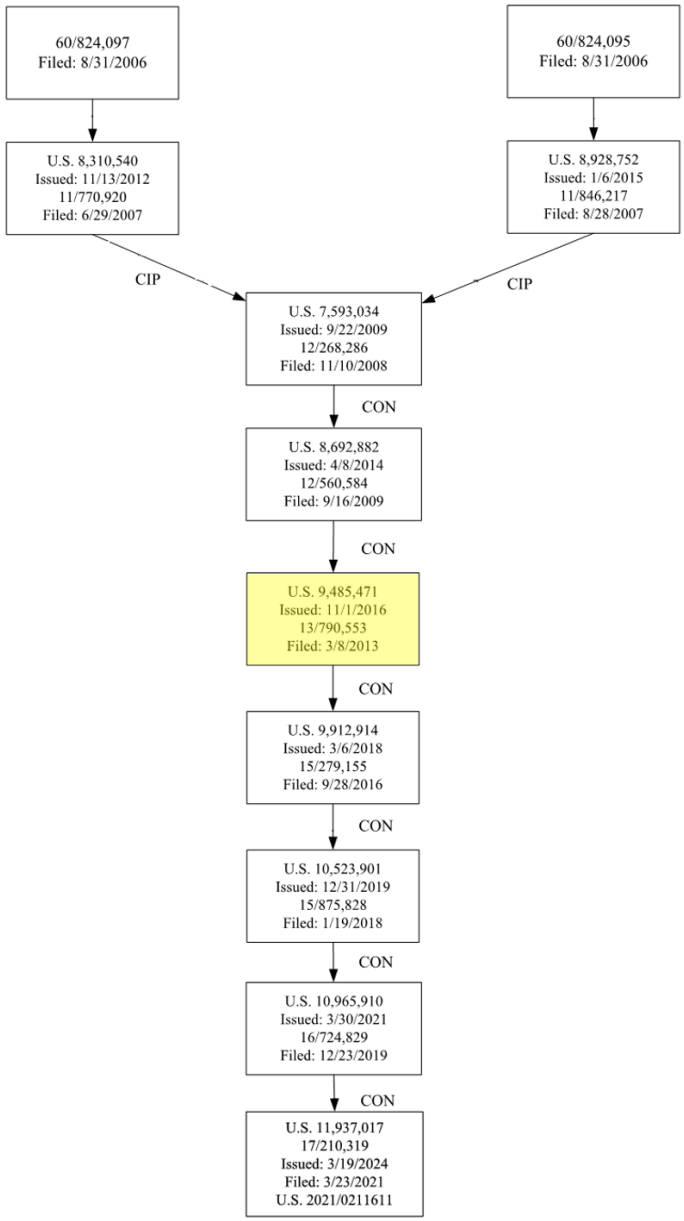
459. Claim 20: Ely discloses that the respective lengths of video data protected before and after an alarm command are predetermined. EX1020, 7:45-55, 10:10-23, 10:60-65. Ely also discloses a user interface 108 for providing instructions input by users of the system. *Id.*, 5:60-64, 8:16-27, Fig. 2. It would have been obvious to utilize a manually operated switch or audio signal to extend the length of the write-protected segment in view of Ely's disclosure. Moreover, such limitations would have been obvious in further view of Fiedler. Fiedler discloses the limitations added in dependent claim 20 for at least the reasons provided above in Ground 1d. And a POSITA would have generally known that a user could control and extend the length of recording in a circular buffer. For example, US 7,348,895 to Lagassey describes that a length of recording time "can be programmed or adjusted remotely from [a] monitoring center

45 if there is a need to shorten or extend the time of recording." EX1035, 28:48-56. A POSITA would have recognized the advantages of extending a length of a write-protected segment in response to a manually operated switch or audio signal in the Ely/Fiore system, *e.g.*, to ensure that important alarm data can be preserved, when write protection would otherwise end.

460. For these reasons, it is my opinion that Ely alone or combined with Fiore, in further view of Fiedler, renders obvious claims 19 and 20 of the '882 patent.

X. '471 Patent: Claims 1-13

461. The '471 patent of the Stellar patent family is highlighted below:



462. As seen above, the ’471 patent claims priority back to U.S. Patent No. 7,593,034 (the ’034 patent, EX1010), filed November 10, 2008, as a continuation application. EX1001 at 1:3-20.

A. Summary Of The ’471 Patent File History

463. Application No. 13/790,553, which eventually issued as the ’471 patent, was filed on March 8, 2013 with 25 claims. EX1002 at 236-260. The Office initially

rejected all claims on the basis of non-statutory double patenting over the '034 patent and other commonly-owned patents. *Id.* at 310-316. The Office noted, however, that claims 1-13 would be allowable if the non-statutory double patenting objections were overcome because the prior art of record allegedly did "not anticipate nor render obviousness a protecting facility that responds to a signal to record the sensor data by designating a segment of the buffer as a write-protected portion and by indexing the write-protected segment as a file in the buffer, wherein the segment includes a pre-recorded subset recorded before the signal is received and a post-recorded subset to be recorded after the signal is received as specified in claim 1." *Id.* at 315. Claims 14-25 were rejected "as being a substantial duplicate of claims 1-13." *Id.* at 332.

464. After a response and a subsequent final rejection, the applicant submitted a terminal disclaimer and canceled claims 14-25. *See id.* at 328-334, 375-384, 396-402. The examiner then allowed claims 1-13. *Id.* at 406-418.

B. Ground 1a: Claims 1, 2, 4-7, 10, 12, And 13 Of The '471 Patent Would Have Been Obvious Over Yerazunis Alone Or As Combined With Fiore

1. Motivation To Combine

465. A POSITA would have been motivated to combine Yerazunis and Fiore with a reasonable expectation of success for at least the reasons stated above in Section VIII.B.1.

2. Claim 1

a) Preamble: An apparatus, comprising:

466. Yerazunis discloses the preamble of claim 1. Yerazunis discloses "a video recording device" that "is contained within a compactly sized housing." EX1017 at 2:12-14. Yerazunis thus discloses "an apparatus."

b) Element 1: a sensor having a data capturing component that captures sensor data;

467. Yerazunis discloses this claim element. Yerazunis's video recording device includes a camera 140 that discloses the claimed "sensor having a data capturing component that captures sensor data":

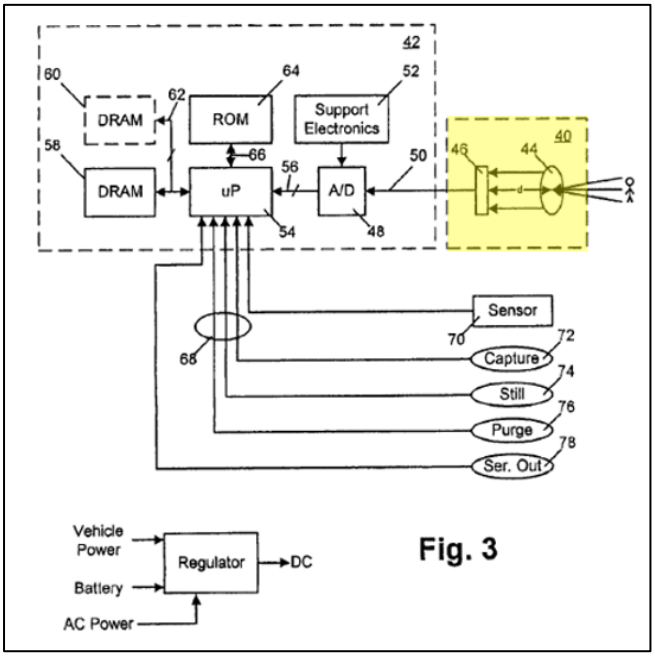


Fig. 3

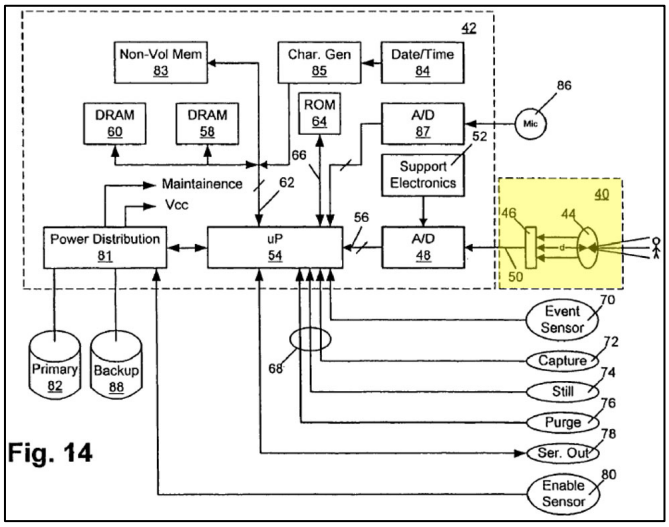


Fig. 14

EX1017 at Figs. 3, 14 (color added); *see also id.* at 2:33-41.

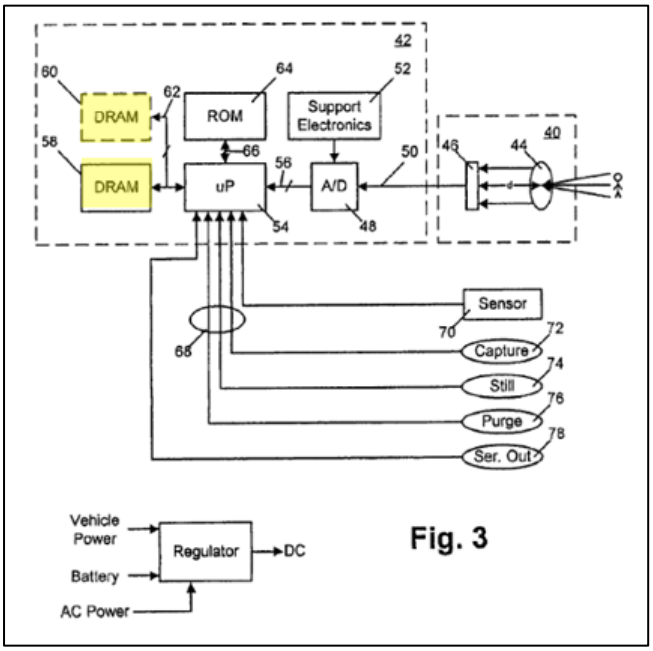
468. The camera 140 is "comprised of a lens 44 which is disposed a predetermined distance d from the surface of an image sensor 46." *Id.* at 5:43-45. "The image sensor 46, as described above, may comprise a [CCD] array, an artificial retina, or any other suitable image sensor operative to provide an output signal representative of a video image which impinges upon the sensor." *Id.* at 5:45-49. The output signal is "an analog signal which is coupled to one or more A/D converters" that "generate a digital representation of the video image." *Id.* at 2:37-41. The camera 140 thus discloses the claimed "sensor" because it has an image sensor 46 (*i.e.*, a "data capturing component," as claimed) that captures video images that impinge on it (*i.e.*, "sensor data," as claimed).

469. Yerazunis's camera 140 also discloses the claimed "sensor having a data capturing component that captures sensor data" because its disclosure is similar to that

of the ’471 patent referring to cameras as being sensing devices. *See*, *e.g.*, EX1001 at 4:10-37.

c) Element 2: a local memory functionally coupled to the sensor;

470. Yerazunis discloses this claim element. As explained in Section VI.A above, the term “a local memory functionally coupled to the sensor” should be construed to mean “a memory that is distanced less than 20 cm from the sensor and is coupled to the sensor using entirely physical connectors.” Yerazunis’s video recording device includes video electronics 42 with DRAMs 58, 60 that disclose the claimed “local memory” (EX1017 at 5:40-43, 6:24-36):



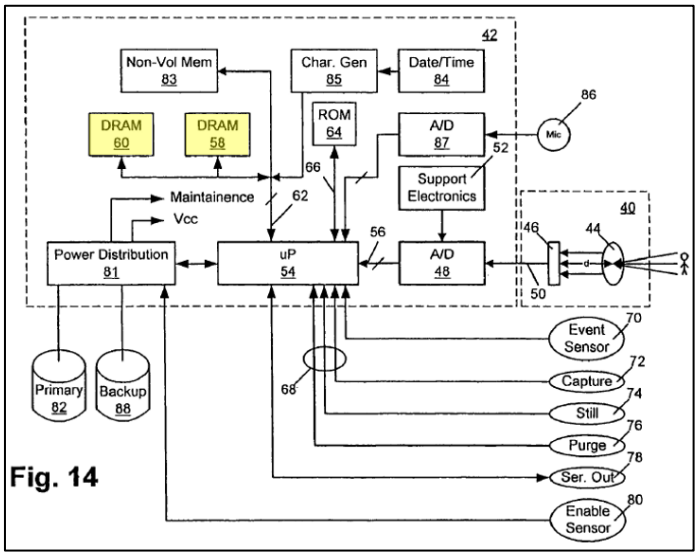


Fig. 14

Id. at Figs. 3, 14 (color added).

471. As seen in the figures above, the DRAMs 58, 60 (*i.e.*, the "local memory") are coupled to the camera 40 (*i.e.*, the "sensor") using entirely physical connectors. Yerazunis discloses that "microprocessor 54 and the DRAM 58 may be obtained as a single integrated circuit [IC]" (*id.* at 6:24-29), meaning that their connection would be via one or more physical connectors on the IC (*e.g.*, conductive lines and/or vias, etc.). Yerazunis further discloses that the DRAM 60 is "coupled to the microprocessor 54 via a bus 62," which is also a physical connector. *Id.* at 6:30-36. The microprocessor 54, in turn, is coupled to analog-to-digital converter (ADC) 48 "via path 56 which comprises a parallel signal bus," another physical connector. *Id.* at 6:14-23.

472. Finally, the ADC 48 is coupled to the camera 40 "via a signal path 50" to enable the ADC 48 to sample the output of the camera's image sensor 46 at predetermined intervals. *Id.* at 5:40-67. A POSITA would have understood the signal path 50 between the camera 40 and ADC 48 as using a physical connector. A POSITA

would have understood that a non-physical (*i.e.*, wireless) connection would not have been used between these two components of the video recording device. Moreover, the arrows shown in Figures 3 and 14 would have represented wired connections to a POSITA. Additionally, if the connection between the camera 40 and ADC 48 was intended to be wireless, then a POSITA would have understood that a wireless sender and receiver would have been depicted. Lacking any depiction of such wireless sender and receiver, a POSITA would have understood the connection between the camera 40 and ADC 48 as being physical. Accordingly, the DRAMs 58, 60 (*i.e.*, the "local memory") are coupled to the camera 40 "using entirely physical connectors," as required by the parties' agreed-upon construction.

473. A POSITA would have further understood that the DRAMs 58, 60 are distanced less than 20 cm from the camera 40 (and image sensor 46 within camera 40). Yerazunis discloses "a video recording device" that "is contained within a compactly sized housing" (EX1017 at 2:12-14; Figs. 2a, 2b) and in an embodiment is "mountable to a gun and useful for recording video images before and after the firing of the gun" (*id.* at Abstract). As illustrated in Figures 10a and 10b, the video recording device 300 is mounted below the barrel of the gun 302 and includes a lens 314 provided at the forward end. *Id.* at 15:24-36.

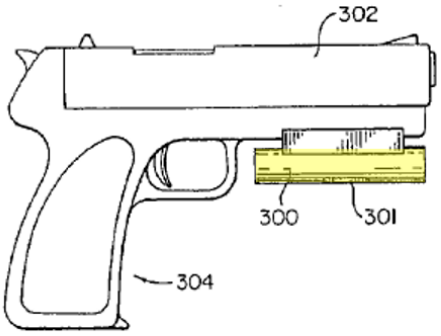


Fig. 10a

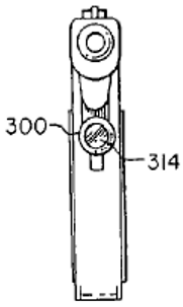


Fig. 10b

Id. at Figs. 10a, 10b (color added). A POSITA would have understood that for the video recording device to be compact and mountable to a gun, it would necessitate that the memory be located near—certainly less than 20 cm from—the camera/sensor. In Figure 10a, for example, the entire video recording device (highlighted in yellow above) is shown attached to a portion of the gun barrel that is less than 20 cm in length. The DRAMs 58, 60 and camera 40 contained within the video recording device would therefore necessarily be distanced less than 20 cm apart in this example.

474. For at least these reasons, Yerazunis discloses "a local memory functionally coupled to the sensor," as construed by the parties to mean "a memory that is distanced less than 20 cm from the camera and is coupled to the camera using entirely physical connectors."

d) Element 3: a recording facility that records the sensor data into available portions of a buffer in the local memory; and;

475. Yerazunis discloses this claim element. Yerazunis's video recording device "records video frames successively in at least one circular buffer memory

organized as a continuous loop overwriting the oldest frame within the respective buffer memory with a more recently received frame." EX1017 at 2:19-23, 17:9-20, 17:50-59. Specifically, Yerazunis's camera 40 captures video, and the aforementioned ADC 48 converts the captured video into a digital signal. *Id.* at 5:40-67. The digital signal is provided to inputs of the microprocessor 54, and the microprocessor 54 "compresses the digitized frame data and stores the compressed frame data in the next sequential location of [a] circular buffer." *Id.* at 2:45-47, 6:24-26, 6:52-7:6, 10:55-67, 17:50-59; *see also id.*, 11:50-14:44, Figs. 6-8.

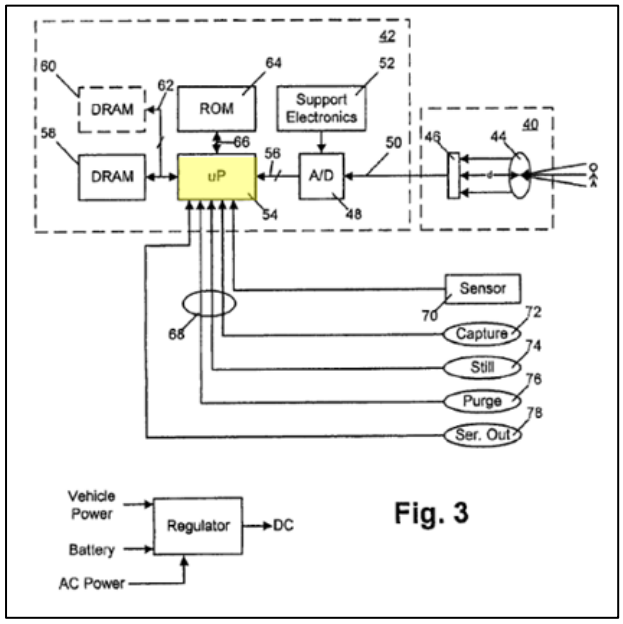


Fig. 3

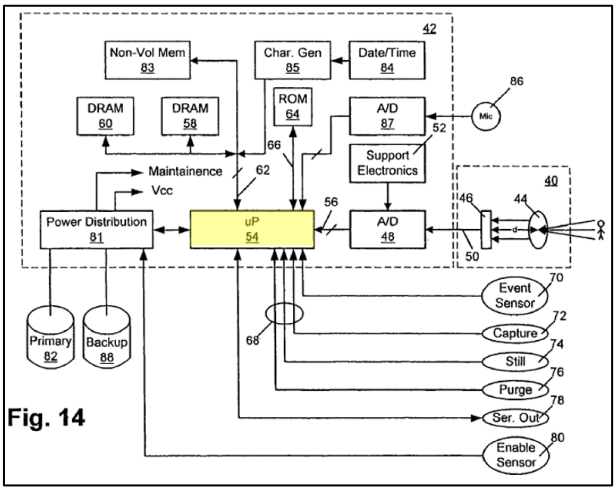


Fig. 14

Id. at Figs. 3, 14 (color added).

476. Yerazunis's circular buffer is formed in the DRAM 58. *Id.* at 7:7-61, 18:7-12. Thus, the microprocessor 54 includes "a recording facility" that "records the sensor data into available portions of a buffer in the local memory," as claimed. Yerazunis's disclosure of the recording facility is similar to that of the '471 patent. Like Yerazunis, the '471 patent describes a recorder 160 that uses a processor 162 to perform various "facilities" or "functions." *See*, *e.g.*, EX1001 at 4:59-63 ("Recorder 160 preferably includes a processor 162 with software or hardware that accomplishes the functions described herein …."), 5:31-41 (the electronics of recorder 160 include "a unitary printed circuit board" with "different functions, or facilities, encoded on a programmable chip or disk"), 5:41-48 ("different facilities" can be "part of a single hardware or software program" or they can be "split into different components").

477. Yerazunis thus discloses the claimed "recording facility that records the sensor data into available portions of a buffer in the local memory."

e) Element 4: a protecting facility that responds to a signal to record the sensor data by designating a segment of the buffer as a write-protected segment and by indexing the write-protected segment as a file in the buffer, wherein the write-protected segment includes a pre-recorded subset recorded before the signal is received and a post-recorded subset to be recorded after the signal is received.

478. Yerazunis alone or as combined with Fiore discloses this claim element.

479. First, Yerazunis's microcontroller 54 includes a "protecting facility that responds to a signal to record the sensor data by designating a segment of the buffer as a write-protected segment[,] … wherein the write-protected segment includes a pre-recorded subset recorded before the signal is received and a post-recorded subset to be recorded after the signal is received," as claimed. Specifically, in Yerazunis's gun-camera embodiment, the event sensor 70 is "responsive to the discharge of [a] gun" and thus generates a "gun firing signal" "upon discharge of the gun." EX1017 at 3:20-33, 8:8-25, 14:55-61. Upon detection of the gun firing signal from the event sensor 70, the microprocessor 54 causes "specified frame data associated with [the] firing event both before and after the event" to be "preserved," such that it "cannot be overwritten as a result of further use of the gun or subsequent firing events." *Id.* at 3:25-38, 8:26-30, 15:9-13. With the specified frame data being write protected, "[f]rame data associated with each subsequent firing event[] is stored within an unused portion of the circular buffer memory." *Id.* at 3:31-33.

480. Yerazunis discloses that the write protecting performed by its microprocessor 54 may include storing pointers that define areas of the circular buffer that are not to be overwritten:

> It is noted that while storage of video frame data terminates in the case of a single trigger event such as in the situation in which the recording device is employed to preserve a record of a car crash, in the present application, recording of data continues since a subsequent firing event may occur. *To accommodate this objective, after the conclusion of data storage associated with one firing event, the head pointer 104 and the tail pointer 102 (or pointers in the event multiple buffer groups are employed as discussed above) defining the area(s) of the circular buffer memory, are stored in a table to allow later retrieval of the video data pertaining to each firing of the gun.* The head and the tail pointers are then reset to allow continued recording into another portion of the circular buffer memory without overwriting the previously stored and preserved data. This process continues as each trigger event occurs until the buffer memory is full.

Id. at 17:45-61.

481. In sum, Yerazunis's microcontroller 54 responds to a "gun firing signal" generated by the event sensor 70 by designating a segment of the buffer—*i.e.*, the portion of the buffer containing video data associated with the firing of a gun—as being write-protected. Further, the write-protected segment includes "frame data associated with [the] firing event both before and after the event." *Id.* at 3:25-38. Yerazunis's microcontroller 54 thus includes the claimed "protecting facility that responds to a

signal to record the sensor data by designating a segment of the buffer as a write-protected segment[,] … wherein the write-protected segment includes a pre-recorded subset recorded before the signal is received and a post-recorded subset to be recorded after the signal is received."

482. Second, Yerazunis's protecting facility "responds to a signal to record the sensor data … by indexing the write-protected segment as a file in the buffer." Yerazunis's tagging, use of pointers to identify a collection of data for write protection, and storage of such pointers in a table "to allow later retrieval" of video data for gun-firing events (EX1017 at 17:45-61) discloses "indexing the write-protected segment as a file in the buffer." A POSITA would have understood that retrieving video data for gun-firing events necessitates an ability to locate the video data within the buffer, such that Yerazunis necessarily discloses the claimed "indexing." Thus, while Yerazunis does not expressly refer to "indexing" write-protected segments as "files," a POSITA would have understood Yerazunis as describing—or at minimum, rendering obvious—this limitation. *Id.*, 6:1-13, 6:33-36, 7:23-32, 10:37-39, 10:63-67, 11:31-43.

483. Indeed, a POSITA would have recognized the claimed "indexing the write-protected segment as a file in the buffer" as being one of a finite number of identified solutions for storing and retrieving data in Yerazunis, further evidencing its obviousness. A POSITA would have recognized that the Yerazunis's event data must be stored and retrieved in some way, and indexing such data as a file was a well-known approach for doing so. Storing and retrieving event data using this conventional

approach was not innovative but rather a straightforward application of ordinary skill or common sense.

484. To the extent, however, that a POSITA wanted further guidance as to particular methods for indexing of event data as files in Yerazunis's buffer, a POSITA would have been motivated to turn to Fiore. As explained in Section VII.C above, Fiore implements its circular storage buffer 15 as a memory-mapped file and describes indexing collections of frame data for respective events as files within the memory-mapped file. *See*, *e.g.*, EX1009 at [0022]-[0023], [0051], [0059], [0060]. Fiore also describes the benefits of its file-based approach, including that it enables playback of video data for a specific event from the circular buffer without interrupting simultaneous recording of new video data into the buffer. *See*, *e.g.*, *id.* at [0065], [0067], [0068], [0072]. In view of these exemplary benefits and the additional reasons explained in Section VIII.B.1 above, a POSITA would have been motivated to implement Yerazunis's microcontroller 54 to "respond[] to a signal to record the sensor data" by "indexing the write-protected segment as a file in the buffer" in the manner disclosed in Fiore. Yerazunis's retrieval of video data for gun-firing events necessitates an ability to locate the video data within the buffer, and a POSITA would have been motivated to employ Fiore's indexing of video data to achieve this ability for the above-noted reasons.

485. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 1 of the '471 patent.

3. Dependent Claims 2, 4-7, 10, 12, and 13

486. ***Claim 2:*** Dependent claim 2 depends from claim 1 and recites "a sending facility configured to transmit the file from the local memory to a remote memory." Yerazunis discloses this limitation. The reference's microprocessor 54 includes a serial output channel 78 that is "provided to permit recorded frame data to be downloaded to a computer for viewing." EX1017 at 3:1-2, 6:45-51, 18:60-66.

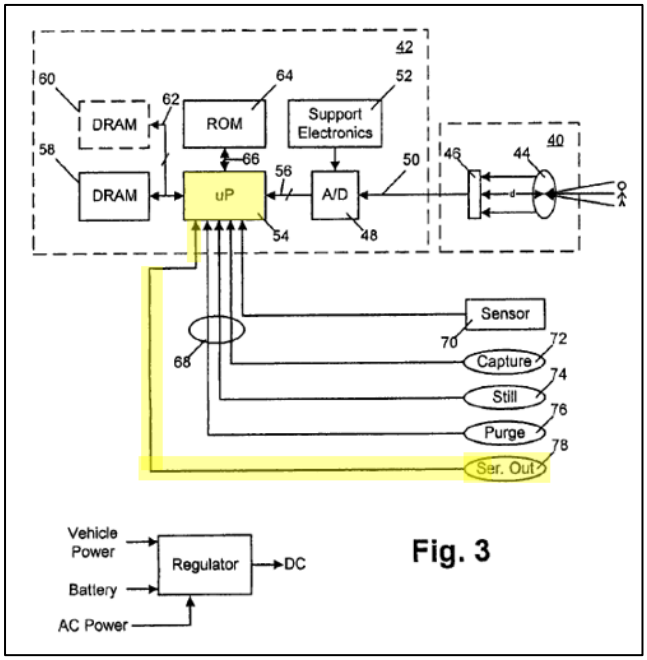


Fig. 3

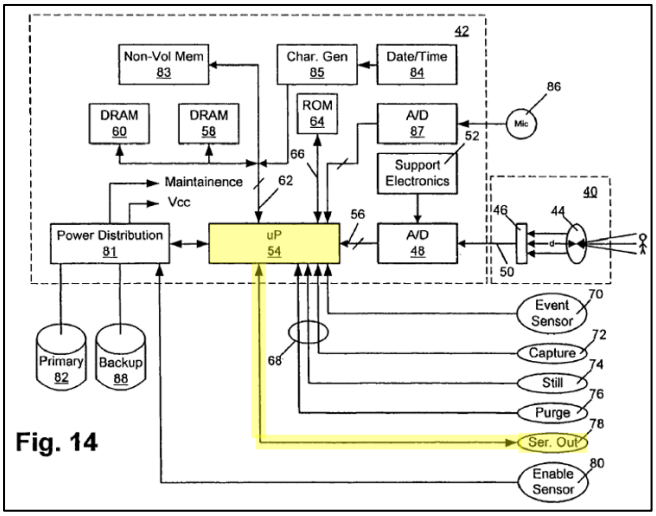


Fig. 14

Id. at Figs. 3, 14 (color added). Although the output channel 78 is a serial output channel, Yerazunis states that "any appropriate data transfer link and protocol may be employed." *Id.* at 3:3-4, 18:64-66.

487. Because the microprocessor's serial output channel 78 (or other appropriate data transfer link) "is employed to download captured and stored video images" from the circular buffer of DRAM 58 "to an external Personal Computer (PC)" (*id.*), the microprocessor 54 includes the claimed "sending facility configured to transmit the file from the local memory to a remote memory." As detailed above, Yerazunis's video recording device stores files containing recorded frame data in the circular buffer of DRAM 58. The microprocessor 54 with serial output channel 78 transmits write-protected files stored in the DRAM 58 (*i.e.*, "local memory," as claimed) to an external computer having "remote memory" for storing such files. The microprocessor 54 therefore includes the claimed "sending facility" of claim 2. Yerazunis's disclosure of the claimed "sending facility" is similar to that of the '471 patent, which likewise describes a recorder 160 with processor 162 for performing various "facilities" or "functions," including the recording, protecting, and sending facilities/functions. EX1001 at 4:59-63, 5:31-48.

488. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 2 of the '471 patent.

489. ***Claim 4:*** Dependent claim 4 depends from claim 1 and recites "a sensor that automatically triggers the signal to record upon detecting identified content in at

least one of the captured images." Yerazunis discloses this limitation. The reference's video recording device includes the event sensor 70 that:

> provides a trigger output signal in response to a condition which is desired to initiate the capture of the video image or images occurring prior to and following the occurrence of the trigger output signal…. The trigger output signal may [be any] … signal indicative of a specified event.

EX1017 at 8:8-25; *see also id.* at 16:43-65 ("[T]he event sensor 70 is operative to generate a trigger signal in response to the discharge of the gun.").

490. As seen above, Yerazunis's event sensor 70 automatically triggers the signal to record, as claimed. The "signal to record" of claim 4 refers back to the "signal" of claim 1 that causes the designation of a segment of the circular buffer as being write protected. EX1001 at 12:13-26, 12:33-35 (claim 4 referring to "the signal to record," the antecedent basis of which is "signal" in claim 1). In Yerazunis, when the event sensor 70 detects certain "condition[s]," it provides a trigger output signal that "activate[s] the capture of video images by the present video recording device," thereby causing them to be write-protected. EX1017 at 8:8-25; *see also id.* at 3:25-38, 8:26-30, 15:9-13, 17:45-61. Accordingly, Yerazunis's event sensor 70 discloses the claimed "sensor that automatically triggers the signal to record" because it automatically causes video data to be write protected upon detection of certain conditions.

491. The conditions that automatically trigger the write protecting in Yerazunis include "detecting identified content in at least one of the captured images," as claimed. Specifically, Yerazunis discloses that "[t]riggering events may include" a "signal representing a recognized change in a video image or acoustic signal," "or any other suitable activation signal known in the art." EX1017 at 2:58-64. A POSITA would have understood that recognizing a change in a video image would have involved detecting identified content in the captured images. In particular, a POSITA would have understood that a recognized change in a video image in this context refers to an event that has occurred in a sequence of frames, where such an event caused a change in the video frames over time. By necessity, the ability to recognize a broad range of events entails the ability to detect content in video images. And, a POSITA would have been motivated to implement this triggering event with Yerazunis's gun-mountable device to, for instance, capture video data when a target is in the gun's sights or when a person falls or blood scatters/flows.

492. As another example, a POSITA would have been motivated to implement this triggering event with Yerazunis's gun-mounted device such that if an officer points the gun at a suspected criminal (e.g., before the officer pulls the gun trigger), the mounted camera system would detect that the suspect has drawn a weapon and begin recording upon such detection. The recording could advantageously be used as evidence/justification for the officer subsequently firing his own weapon. *See* EX1017, 1:32-43. In such cases, recognizing events by identifying important content in video

frames would be important. Moreover, Yerazunis is not limited to targetable weapons, as discussed earlier, and thus identifying contents in images provides a general and effective way to recognize important recording events (such as the those in automobile environment discussed in Yerazunis (at Fig. 1 as an example)). Thus, Yerazunis discloses the claimed "sensor that automatically triggers the signal to record upon detecting identified content in at least one of the captured images."

493. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 4 of the '471 patent.

494. ***Claim 5:*** Dependent claim 5 depends from claim 1 and recites "an interface through which a tactile switch triggers the signal." Yerazunis discloses this limitation. The '471 patent discloses that a button is a type of switch (EX1001 at 8:55-57), and that the term "interface" refers to an input mechanism for receiving user input. *See*, *e.g.*, *id.* at 2:49-51, 6:27-37, 8:55-59, 8:67-9:12. As explained below, Yerazunis discloses an input mechanism (*i.e.*, an interface) through which a tactile button (*i.e.*, a type of switch) triggers a write-protecting signal.

495. Yerazunis discloses that "[t]riggering events may include," among other things, "a button actuated by a user." EX1017 at 2:58-64; *see also id.* at 9:17-18 (describing a "capture button 72 which serves as a user activatable trigger event"), Fig. 14 (depicting capture button 72). When the user pushes this button, "a trigger signal is provided to and detected by the central control processor 54." *Id.* at 9:19-22.

Yerazunis's button is a "tactile" switch because the user touches the button to actuate it. *Id.* at 2:58-64, 9:19-22.

496. Yerazunis further describes a video recording device mountable to a gun, where "the video recording device may be interfaced directly to the trigger of the gun such that the actuation of the trigger is employed to generate a switching action or signal which is used to indicate a trigger event." *Id.* at 16:59-62. The gun trigger is "an interface through which a tactile switch triggers the signal" for reasons similar to those explained above for Yerazunis's capture button: The video recording device is "interfaced directly to the trigger of the gun," such that a switch (*i.e.*, the trigger itself, which has two states, as is characteristic of switches) triggers the signal to write protect video data. *Id.* The trigger is a "tactile" switch because it is actuated by human touch. Yerazunis discloses the claimed "interface through which a tactile switch triggers the signal" for these additional reasons.

497. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 5 of the '471 patent.

498. ***Claim 6:*** Dependent claim 6 depends from claim 1 and recites "an interface through which an audio receiver triggers the signal when an audio command is recognized." Yerazunis discloses this limitation. EX1017 at 8:17-19. For example, in Yerazunis's gun-camera embodiment, "the event sensor 70 is operative to generate a trigger signal in response to the discharge of the gun," and preferably comprises "a microphone, or any other suitable sensor which can detect a characteristic associated

with the firing of the gun." EX1017 at 16:43-43-50. "In the case of a microphone, the event sensor 70 is operative to detect the sound associated with the firing of the gun." *Id.* at 16:52-55. Thus, Yerazunis discloses the claimed "interface through which an audio receiver triggers the signal when an audio command is recognized."

499. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 6 of the '471 patent.

500. ***Claim 7:*** Dependent claim 7 depends from claim 1 and recites "an interface through which a human can designate a length of time of at least one of the pre-recorded subset, the post-recorded subset, and the segment." Yerazunis discloses this limitation. Yerazunis teaches that "the number of frames that are recorded before and after [a trigger event] are a matter of design choice, the only limitation being that the total number of frames to be recorded not exceed the frame capacity of the semiconductor memory." EX1017 at 8:51-55. Likewise, "any number of storage methods may be employed via selective addressing of the semiconductor memory to extend the period of time captured within the semiconductor memory buffer," *id.* at 10:42-46, and "it is possible to achieve storage of a greater number or a smaller number of frames before the trigger event or after the trigger event based upon the specification of the number of data samples that are to be stored within respective groups prior to termination of further data sample storage within the respective group," *id.* at 12:38-42; *see also id.* at 6:11-13. Because a human can set the number of frames recorded before

and after a trigger event by "design choice," Yerazunis necessarily discloses the "interface" of claim 7.

501. Yerazunis also teaches that if the memory will be able to hold 14.9 seconds of video data, and "[i]f the trigger is adjusted so as to provide for approximately one half of the frames to be recorded prior to the trigger event and one half of the frames subsequent to the trigger event, it is evident that only approximately 7.5 seconds of record time is achieved surrounding the event of interest." *Id.* at 11:31-43. Again, because the human can "adjust" the length of time recorded before and after the trigger event, Yerazunis necessarily discloses the claimed "interface through which a human can designate a length of time of at least one of the pre-recorded subset, the post-recorded subset, and the segment."

502. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 7 of the '471 patent.

503. ***Claim 10:*** Dependent claim 10 depends from claim 1 and recites "a mount for the sensor." Yerazunis discloses this limitation. Yerazunis's video recording device is "contained within a compactly sized housing" and includes "[o]ne of more video image sensors" that "are mounted to the housing." EX1017 at 2:12-15. These video image sensors are contained within Yerazunis's camera 40 (*i.e.*, the claimed "sensor"), such that the reference discloses "a mount for the sensor," as claimed. *Id.* at 5:40-45. Further, in Yerazunis's gun-camera embodiment, the compact video image recording

device with camera "is mountable to a gun." *Id.* at Abstract; *see also id.* at 3:9-17, 14:45-50, 15:24-30, 15:37-38, 15:56-57.

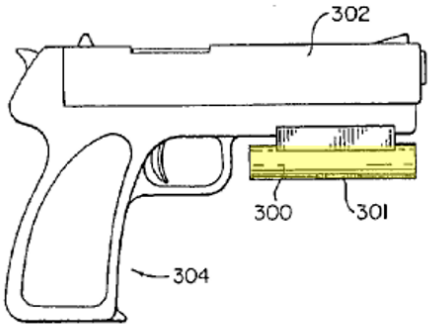


Fig. 10a

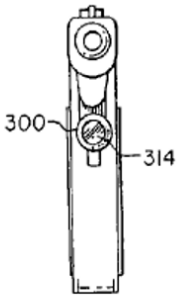


Fig. 10b

Id. at Figs. 10a, 10b; *see also id.* at Figs. 9, 11a, 11b, 12a, 12b, 13.

504. Thus, Yerazunis discloses the claimed "mount for the sensor."

505. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 10 of the '471 patent.

506. ***Claim 12:*** Dependent claim 12 depends from claim 1 and recites "an electronic index that provides a directory to the file within the buffer." Yerazunis alone or in combination with Fiore discloses this limitation. Yerazunis discloses that the write protecting performed by its microprocessor 54 includes storing pointers that define areas of the circular buffer that are not to be overwritten, thus providing an electronic index to the write-protected segments "to allow later retrieval":

> It is noted that while storage of video frame data terminates in the case of a single trigger event such as in the situation in which the recording device is employed to preserve a record of a car crash, in the present application, recording of data continues since a subsequent firing event

> may occur. To accommodate this objective, *after the conclusion of data storage associated with one firing event, the head pointer 104 and the tail pointer 102 (or pointers in the event multiple buffer groups are employed as discussed above) defining the area(s) of the circular buffer memory, are stored in a table to allow later retrieval of the video data pertaining to each firing of the gun*. The head and the tail pointers are then reset to allow continued recording into another portion of the circular buffer memory without overwriting the previously stored and preserved data. This process continues as each trigger event occurs until the buffer memory is full.

EX1017 at 17:45-61. Yerazunis therefore discloses the claimed "electronic index that provides a directory to the file within the buffer."

507. To the extent that a POSITA wanted further guidance as to particular methods for indexing of event data as files in Yerazunis's buffer, a POSITA would have been motivated to turn to Fiore. As explained in Section VII.C above, Fiore implements its circular storage buffer 15 as a memory-mapped file and describes indexing collections of frame data for respective events as files within the memory-mapped file. *See*, *e.g.*, EX1009 at [0022]-[0023], [0051], [0059], [0060]. A POSITA would have understood that Yerazunis's selective retrieval of video data from the buffer necessitates an ability to locate the video data within the buffer, and would have been motivated to employ Fiore's indexing of video data to achieve this ability for the reasons stated above in Sections VIII.B.1. Thus, Yerazunis in view of Fiore renders obvious the claimed "electronic index that provides a directory to the file within the buffer."

508. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 12 of the ’471 patent.

509. ***Claim 13:*** Dependent claim 13 depends from claim 1 and recites “wherein the protecting facility automatically overwrites at least some of the sensor data when the memory capacity is full.” Yerazunis discloses this limitation. Yerazunis’s video recording device “records video frames successively in at least one circular buffer memory organized as a continuous loop overwriting the oldest frame within the respective buffer memory with a more recently received frame.” EX1017 at 2:19-23. This occurs automatically “absent receipt of some trigger event from the sensor 54 or activation of other input by the user.” *Id.* at 7:11-22. And, this is also true of Yerazunis’s gun-mounted devices, which likewise record continuously into the circular buffer memory when, for instance, the gun is unholstered. *Id.* at 15:56-16:3, 18:4-12. Thus, Yerazunis discloses the claimed “protecting facility automatically overwrit[ing] at least some of the sensor data when the memory capacity is full.”

510. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 13 of the ’471 patent.

C. Ground 1b: Claims 3, 8, And 9 Of The '471 Patent Would Have Been Obvious Over Yerazunis Alone Or As Combined With Fiore, In Further View of Lewellen

1. Motivation To Combine

511. A POSITA would have been motivated to combine Lewellen with the Yerazunis/Fiore system with a reasonable expectation of success for at least the reasons stated in Section VIII.C.1 above.

2. Dependent Claims 3, 8, and 9

512. ***Claim 3:*** Dependent claim 3 depends from claim 2 and recites "wherein the sending facility comprises a wireless transmitter." Yerazunis alone or as combined with Fiore, in further view of Lewellen, renders obvious this limitation. Yerazunis discloses that the serial channel 78 (*i.e.*, the "sending facility") can be coupled to "a radio transmitter to transmit RF signals to a base station." EX1017, 9:63:10:3. A POSITA would have recognized that Yerazunis's radio transmitter is a "wireless transmitter," as claimed. Should the Board determine otherwise, Lewellen discloses a local wireless interface 390 that wirelessly transmits data to Bluetooth-compatible devices, including mobile phones. EX1019 at [0022], [0031], [0042]-[0048]. A POSITA would have been motivated to incorporate Lewellen's local wireless interface 390 into the Yerazunis/Fiore system for at least the reasons in section VIII.C.1.

513. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore, in further view of Lewellen, renders obvious claim 3 of the '471 patent.

514. ***Claim 8:*** Dependent claim 8 depends from claim 1 and recites "wherein the local memory is configured to provide access to the file to a mobile phone." Yerazunis alone or as combined with Fiore, in further view of Lewellen, renders obvious this limitation. As explained above in Section VII.D, Lewellen discloses a local wireless interface 390 that "provides a means of communicating via short-range wireless communications." EX1019 at [0031]. The local wireless interface 390 enables access to the local memory to nearby devices, including mobile phones: "The local wireless interface of the vehicle video system … allows other devices, such as a handheld device or a vehicle video system in a different vehicle, to access the stored digital video information." *Id.* at Abstract. In embodiments, the "local wireless interface 390 is a Bluetooth-compatible interface, which can communicate with other Bluetooth-compatible devices," including mobile phones. *Id.* at [0031], [0037], [0041].

515. In the Yerazunis/Fiore system, files are stored in local memory (*e.g.*, DRAM 58), and the addition of Lewellen's local wireless interface 390 would have advantageously enabled access to the local memory using Bluetooth-enabled devices, including mobile phones. A POSITA would have been motivated to implement the Yerazunis/Fiore video recording system with these features for at least the reasons explained above in Section VIII.C.1.

516. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore, in further view of Lewellen, renders obvious claim 8 of the '471 patent.

517. ***Claim 9:*** Dependent claim 9 depends from claim 1 and recites "wherein a mobile phone automatically receives the file and automatically forwards the file to a remote memory." Yerazunis alone or as combined with Fiore, in further view of Lewellen, renders obvious this limitation. As discussed above for claim 8 of the '471 patent, the combination of Yerazunis, Fiore, and Lewellen would have included the local wireless interface 390 for enabling a mobile phone to access a write-protected file stored in the DRAM 58 (*i.e.*, "local memory," as claimed). The mobile phone would have automatically received the file as required by claim 9: Lewellen discloses that the local wireless interface 390 "automatically transmit[s]" digital video to compatible devices, including mobile phones. EX1019 at [0043].

518. Lewellen further discloses that the mobile phone "automatically forwards the file to a remote memory," as claimed. Lewellen specifically discloses that after the vehicle video system connects to a Bluetooth-enabled device, "the digital video information collected … is automatically transferred to the database" (*id.* at Abstract):

> According to the preferred embodiments, a vehicle video system includes a small camera in the passenger area that uses illumination in the non-visible spectrum to illuminate the passenger area…. The vehicle video system includes a local wireless interface, such as a Bluetooth-compatible interface, that automatically connects to a compatible device in the parking area of the vehicle that is coupled to a database. In this manner, the digital video information collected by the vehicle video system is automatically transferred to the database when the vehicle is

> parked, removing the need for any human intervention for the logging and cataloging of video tapes.

Id. at [0010]. Thus, Lewellen's vehicle video system automatically transmits digital video to a "compatible device … that is coupled to a database," and the compatible device then "automatically transfer[s]" the video "to the database" (*i.e.*, a remote memory). *Id.*; *see also id.* at [0043]. The compatible devices include various Bluetooth-compatible mobile phones (*id.* at [0031], [0037], [0041]), and a POSITA would have been motivated to implement the Yerazunis/Fiore video recording system with these features for the reasons explained above in Section VIII.C.1.

519. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore, in further view of Lewellen, renders obvious claim 9 of the '471 patent.

D. Ground 1c: Claim 11 Of The '471 Patent Would Have Been Obvious Over Yerazunis Alone Or As Combined With Fiore, In Further View Of Mann

1. Motivation To Combine

520. A POSITA would have been motivated to combine Mann with the Yerazunis/Fiore system and had a reasonable expectation of success for at least the reasons stated in Section VIII.D.1 above.

2. Dependent Claim 11

521. Claim 11 depends from claim 10[4] and recites "wherein the mount is selected from the group consisting of: a pair of wearable glasses, a lapel pin, a collar button, a hat, a visor, a hair pin, a pen, and a front of a purse." Mann discloses this limitation. Mann describes a body-worn portable electronic camera system with wearable viewfinder means, particularly as built into eyeglass frames 100 with lenses 105 and cameras 110 and 120, as illustrated in Figure 1. EX1015 at [0001], [0056]-[0058], Fig. 1. Thus, Mann discloses the claimed mount "selected from the group consisting of: a pair of wearable glasses, a lapel pin, a collar button, a hat, a visor, a hair pin, a pen, and a front of a purse."

522. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore, in further view of Mann, renders obvious claim 11 of the '471 patent.

[4] Claim 11 of the '471 patent refers to the "apparatus of claim 9," but this appears to be a typographical error. Claim 11 recites "wherein the mount is selected from the group consisting of [various wearable mounts]." This limitation is presumably referring back to "a mount for the sensor," as recited is claim 10. Thus, for purposes of this declaration, I assume that claim 11 depends from claim 10, not claim 9.

E. Ground 2a: Claims 1, 2, 4-7, 10, 12, And 13 Of The '471 Patent Would Have Been Obvious Over Ely Alone Or As Combined With Fiore

1. Motivation To Combine

523. A POSITA would have been motivated to combine Ely and Fiore with a reasonable expectation of success for at least the reasons stated in Section VIII.F.1 above.

2. Claim 1

a) Preamble: An apparatus, comprising:

524. Ely discloses the preamble of claim 1. Ely discloses a "video surveillance system" that "includes a central control station and a plurality of video cameras each mounted inside a dome housing unit." EX1020 at Abstract. Thus, Ely discloses an apparatus.

b) Element 1: a sensor having a data capturing component that captures sensor data;

525. Ely discloses this claim element. Ely's video surveillance system includes a camera 130 with the claimed "sensor having a data capturing component that captures sensor data":

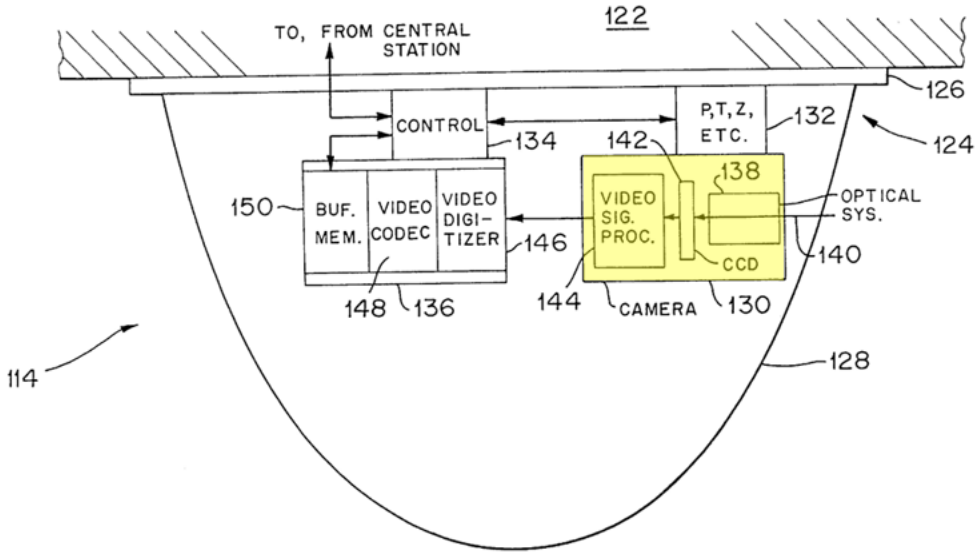


FIG. 3

EX1020 at Fig. 3 (color added).

526. The camera 130 "may be of conventional design, and includes an optical system 138 that receives and forms into an optical image light 140 which passes through the dome 128 into the interior of the camera unit 114. The image formed by the optical system 138 is converted into an electrical signal at CCD 142 and the resulting signal is subjected to conventional analog signal processing at video signal processing circuit 144." *Id.* at 6:21-28. The camera 130 thus discloses the claimed "sensor" because it has a CCD 142 (*i.e.*, a "data capturing component," as claimed) that captures video images that impinge on it (*i.e.*, "sensor data," as claimed).

527. Ely's camera 130 also discloses the claimed "sensor having a data capturing component that captures sensor data" because its disclosure is similar to that

of the ’471 patent referring to cameras as being sensing devices. *See*, *e.g.*, EX1001 at 4:10-37.

c) Element 2: a local memory functionally coupled to the sensor;

528. Ely discloses this claim element. As explained in Section VI.A above, the term “a local memory functionally coupled to the sensor” should be construed to mean “a memory that is distanced less than 20 cm from the camera and is coupled to the camera using entirely physical connectors.” Ely’s video surveillance system includes a memory board 136 having a memory device 150 that discloses the claimed “local memory” (EX1020 at 6:17-21, 6:48-53, 6:61-65):

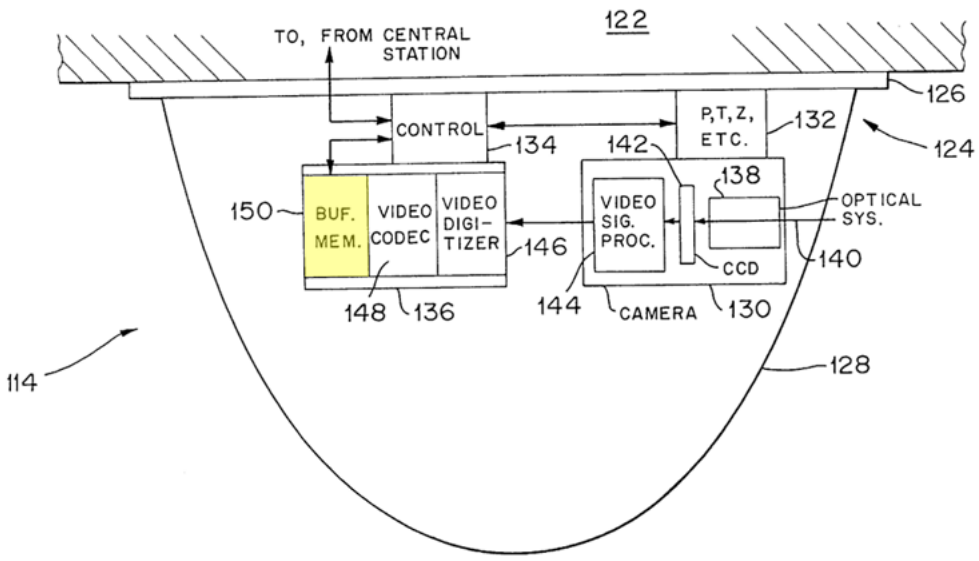


FIG. 3

Id. at Fig. 3 (color added).

529. A POSITA would have understood that the memory device 150 (*i.e.*, the “local memory”) is coupled to the camera 130 using entirely physical connectors. As

seen above, the camera 130 is coupled to the memory board 136, with the memory board 136 being configured "to receive an analog video signal output from the camera 130 and to digitize, compress and store the video signal" in the memory device 150. EX1020 at 6:48-65. A POSITA would have understood the coupling between the camera 130 and memory device 150 as using only physical connectors. The arrow shown between components 130 and 150 in Figure 3 of Ely would have represented a wired connection to a POSITA. Additionally, if the connection between the camera 130 and memory device 150 was intended to be wireless, then a POSITA would have understood that a wireless sender and receiver would have been depicted. Lacking any depiction of such wireless sender and receiver, a POSITA would have understood the connection between the camera 130 and memory device 150 as being physical. Accordingly, the memory device 150 (*i.e.*, "local memory") is coupled to the camera 130 "using entirely physical connectors," as required by the parties' agreed upon construction.

530. A POSITA would have further understood that the memory device 150 is distanced less than 20 cm from the camera 130 (and CCD image sensor 142 within camera 130). Ely discloses that the memory device is "provided adjacent to the camera" (EX1020 at 4:17-25), and "may be constituted by one or more of RAM, EEPROM, flash memory, and so forth." *Id.* at 6:61-63. A POSITA would have understood that the memory device 150, being located adjacent to the camera within the housing of the

surveillance video camera "dome unit," as shown, for example, in Figure 3, is located near (less than 20 cm from) the camera/sensor.

531. Thus, Ely discloses the claimed "local memory functionally coupled to the sensor."

d) Element 3: a recording facility that records the sensor data into available portions of a buffer in the local memory; and

532. Ely discloses this claim element. Ely's video surveillance system includes a "video data buffer memory, storing compressed video data generated by the camera," which "is mounted with each camera in the respective dome unit." EX1020 at Abstract. "The memory device 150 may be constituted by one or more of RAM, EEPROM, flash memory, and so forth," and "functions as a buffer for the video signal generated by the camera 130, and is controlled by the control circuit 134." *Id.* at 6:61-65. More particularly, "the memory 150 serves as a ring buffer, in which currently generated compressed video data is written over the oldest compressed video data that had previously been stored in the memory 150." *Id.* at 7:28-34.

533. Thus, the control circuit 134 includes "a recording facility" that "records the sensor data into available portions of a buffer in the local memory," as claimed.

e) Element 4: a protecting facility that responds to a signal to record the sensor data by designating a segment of the buffer as a write-protected segment and by indexing the write-protected segment as a file in the buffer, wherein the write-protected segment includes a pre-recorded subset recorded before the signal is received and a post-recorded subset to be recorded after the signal is received.

534. Ely alone or as combined with Fiore discloses this claim element.

535. First, Ely's control circuit 134 includes a "protecting facility that responds to a signal to record the sensor data by designating a segment of the buffer as a write-protected segment[,] … wherein the write-protected segment includes a pre-recorded subset recorded before the signal is received and a post-recorded subset to be recorded after the signal is received," as claimed. Specifically, Ely discloses that "[w]hen an alarm command is received, a process (indicated by block 160) is carried out in which the control circuit 134 protects from over-writing compressed digital video data previously stored in the memory 150." EX1020 at 7:48-55. The write-protected video data "correspond[s] to a time interval beginning at a predetermined time prior to receipt of the alarm command, and continu[es] for a predetermined time after receipt of the alarm command." *Id.*; *see also id.* at 10:11-15 ("the corresponding camera unit or units respond to the alarm command by protecting buffered video data which corresponds to a predetermined pre- and post-alarm time period").

536. Second, Ely's protecting facility "responds to a signal to record the sensor data … by indexing the write-protected segment as a file in the buffer." Ely discloses

that "[a]fter the compressed video data stored at one of the camera units has been protected pursuant to an alarm command, the data (which will sometimes be referred to as 'alarm data') can be selectively retrieved in response to user instruction either for display (block 180) or directly for taperecording (block 182)." EX1020 at 10:17-23. While Ely never expressly refers to its alarm data as a "file," a POSITA would have understood that selectively retrieving alarm data associated with an alarm command necessitates an ability to locate the alarm data within the buffer. A POSITA would have therefore understood that Ely necessarily discloses—or at minimum, renders obvious—the claimed "indexing." Ely's alarm data must be stored in the buffer in some way, and a POSITA would have understood that indexing data as files was a well-known approach for doing so, further evidencing the obviousness of this limitation.

537. To the extent, however, that a POSITA wanted further guidance on the indexing of alarm data as files in Ely's ring buffer, a POSITA would have been motivated to turn to Fiore. Specifically, a POSITA would have been motivated to implement Ely's protecting facility such that it "responds to a signal to record the sensor data … by indexing the write-protected segment as a file in the buffer" in the manner disclosed in Fiore. As explained in Section VII.C above, Fiore implements its circular storage buffer 15 as a memory-mapped file and describes indexing collections of frame data for respective events as files within the memory-mapped file. *See*, *e.g.*, EX1009 at [0022]-[0023], [0051], [0059], [0060]. Fiore also describes the benefits of its file-based approach, including that it enables playback of video data for a specific event

from the circular buffer without interrupting simultaneous recording of new video data into the buffer. *See*, *e.g.*, *id.* at [0065], [0067], [0068], [0072]. In view of these exemplary benefits and the additional reasons explained in Section VIII.F.1 above, a POSITA would have been motivated to implement Ely's control circuit 134 to "respond[] to a signal to record the sensor data" by "indexing the write-protected segment as a file in the buffer," as disclosed in Fiore. Ely's selective retrieval of alarm data necessitates an ability to locate the alarm data within the buffer, and a POSITA would have been motivated to employ Fiore's indexing of video data to achieve this ability for the above-noted reasons.

538. Additionally, a POSITA would have recognized the claimed "indexing the write-protected segment as a file in the buffer" as being one of a finite number of identified solutions for storing alarm data in Ely, further evidencing its obviousness. *See* Sections VIII.F.2 and VIII.F.2 above.

539. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 1 of the '471 patent.

3. Dependent Claims 2, 4-7, 10, 12, and 13

540. ***Claim 2:*** Dependent claim 2 depends from claim 1 and recites "a sending facility configured to transmit the file from the local memory to a remote memory." Ely discloses this limitation. Ely discloses that the "[d]ata buffered at the dome units may be selectively protected from over-writing in response to alarm signals and then retrieved for display or tape-recording by the central control station." EX1020 at

Abstract. As illustrated in Figure 5B, below, "[a]fter the alarm data has been retrieved, the user has the option, indicated at block 188, of recording the retrieved alarm data" on a VCR as shown at block 192. *See id.* at 10:24-47. The VCR (or, alternatively, a digital video tape recorder (*see id.* at 9:51-58)) at the central command station is a "remote memory," as claimed.

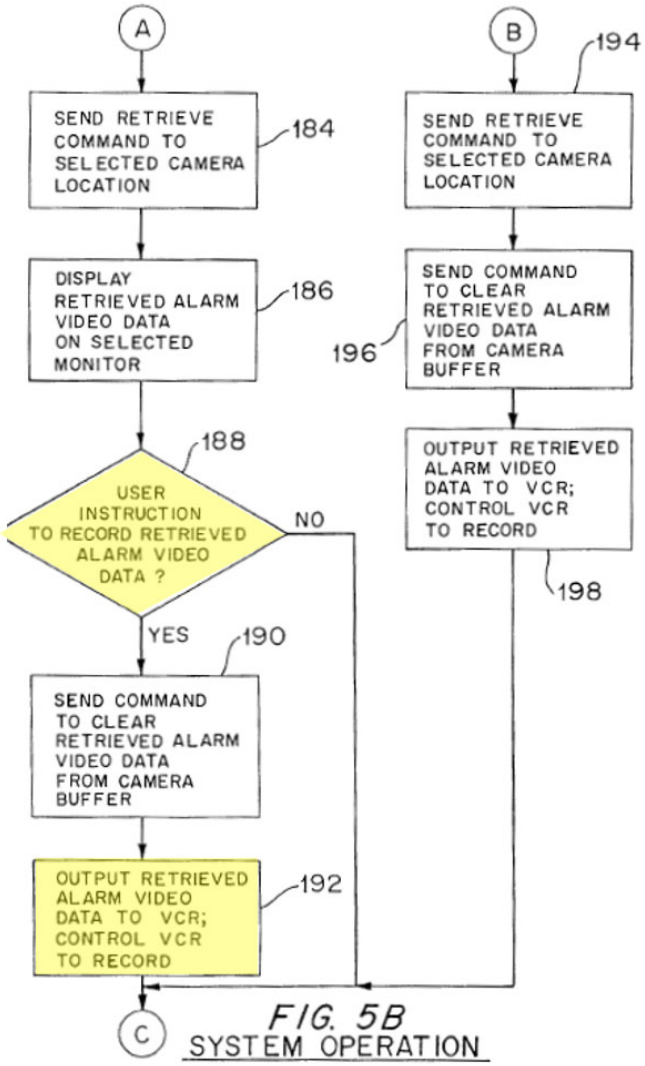


FIG. 5B
SYSTEM OPERATION

541. "If a user indicates that a block of alarm video data is to be displayed, the host 104 sends a retrieve command (via LAN 112) to the selected camera unit 114

(block 184, FIG. 5B). The desired alarm data is then read out from the buffer memory in the designated camera unit and transmitted via the LAN 112." *Id.* at 10:24-30. LAN 112 is a "sending facility." Thus, Ely discloses the claimed "sending facility configured to transmit the file from the local memory to a remote memory."

542. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 2 of the '471 patent.

543. ***Claim 4:*** Dependent claim 4 depends from claim 1 and recites "a sensor that automatically triggers the signal to record upon detecting identified content in at least one of the captured images." Ely discloses this limitation. Ely's video surveillance system comprises one or more sensor devices 120, which "are preferably of conventional types that detect, for example, unauthorized opening of doors, windows and display cases and the like and generate alarm signals indicative of these occurrences." EX1020 at 5:50-53. "The sensors 120 may also include conventional motion and/or heat sensing devices." *Id.* at 5:54-55.

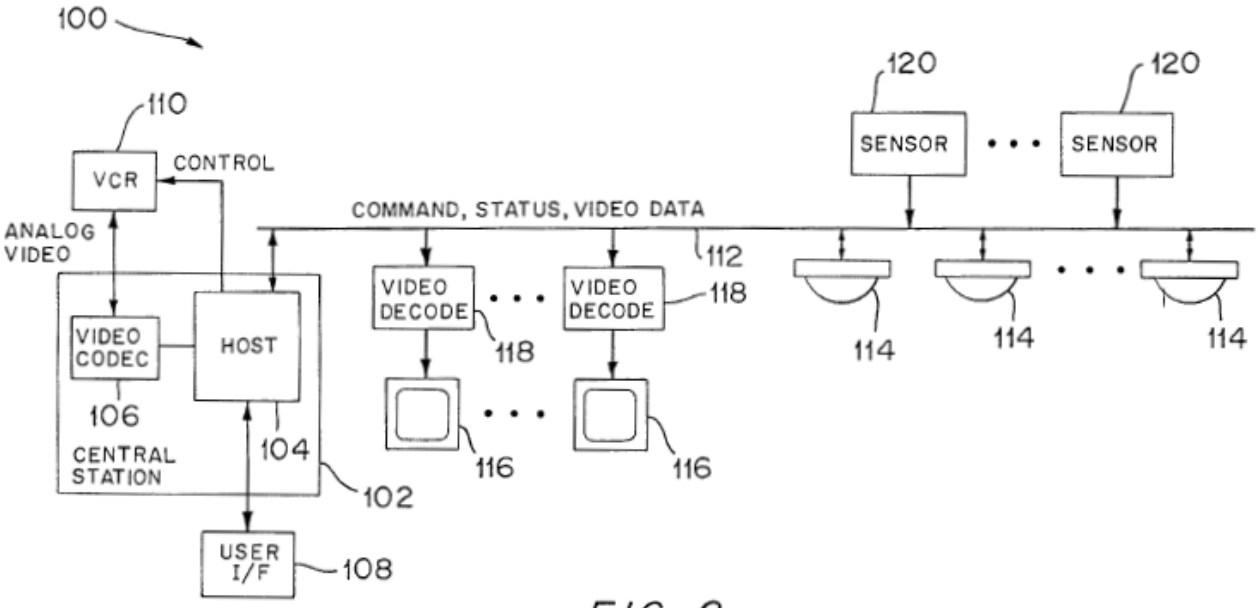


FIG. 2

544. Moreover, "in addition to or in place of sensor-generated alarms, an alarm condition can be generated by a system operator via the user interface, or an alarm condition can be detected by machine analysis of the content of live video signals generated by one or more of the camera units." *Id.* at 11:42-47. Thus, Ely discloses the claimed "sensor that automatically triggers the signal to record upon detecting identified content in at least one of the captured images."

545. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 4 of the '471 patent.

546. ***Claim 5:*** Dependent claim 5 depends from claim 1 and recites "an interface through which a tactile switch triggers the signal." Ely discloses this limitation. The '471 patent discloses that a button is a type of switch (EX1001 at 8:55-57), and that the term "interface" refers to an input mechanism for receiving user input.

See, *e.g.*, *id*. at 2:49-51, 6:27-37, 8:55-59, 8:67-9:12. Ely discloses an input mechanism (*e.g.*, a user interface) through which a tactile switch (*e.g.*, that of the "TOUCHTRACKER" control console or a mouse or keyboard button) triggers the write-protecting signal.

547. Specifically, Ely discloses that "an alarm condition can be generated by a system operator via the user interface." EX1020 at 11:42-47. The reference further describes the user interface as responding to inputs from common computer peripherals (*e.g.*, a mouse, keyboard) and a "TOUCHTRACKER" control module. *Id.* at 5:60-6:3. Thus, Ely discloses the claimed "interface through which a tactile switch triggers the signal."

548. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 5 of the '471 patent.

549. ***Claim 6:*** Dependent claim 6 depends from claim 1 and recites "an interface through which an audio receiver triggers the signal when an audio command is recognized." Ely in view of Fiore renders obvious this limitation. Ely discloses that the "sensor devices 120 are preferably of conventional types that detect, for example, unauthorized opening of doors, windows and display cases and the like and generate alarm signals indicative of these occurrences," and "may also include conventional motion and/or heat sensing devices." EX1020 at 5:50-55. To the extent Ely does not expressly disclose an audio sensor, Fiore does so. Fiore's data recording and playback system includes a signal processor connected to a monitoring device. EX1009 at

[0040]. The monitoring device "may be any type of a device for monitoring such as a video camera, microphone, a sensor, etc., that functions as a signal source for providing an input signal data to the signal processor." *Id.* Fiore's data recording and playback system further comprises an analyzer that "applies various pattern recognition algorithms automatically to the data." *Id.* at [0046]. In "the case of an audio signal the analyzer may trigger an event on the sudden change of amplitude." *Id.*

550. A POSITA would have been motivated to implement the Ely/Fiore system with Fiore's teachings regarding a microphone or an audio sensor for triggering an alarm signal. Ely discloses sensor devices 120 "that detect, for example, unauthorized opening of doors, windows and display cases and the like and generate alarm signals indicative of these occurrences," where the alarm signals cause data to be write protected in the circular buffer. EX1020 at 5:46-53, 7:48-55. To the extent that Ely does not expressly describe "an interface through which an audio receiver triggers the signal when an audio command is recognized," a POSITA would have been motivated to utilize a microphone as an alarm sensor as taught by Fiore in Ely's video surveillance system. A POSITA would have recognized this audio sensing as complementing Ely's other sensor types and advantageously enabling a wider variety of events to be detected.

551. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 6 of the '471 patent.

552. ***Claim 7:*** Dependent claim 7 depends from claim 1 and recites "an interface through which a human can designate a length of time of at least one of the

pre-recorded subset, the post-recorded subset, and the segment." Ely discloses this limitation. As explained above for claim 1 of the '471 patent, when an alarm command is received, Ely's video surveillance system protects from overwriting video data previously stored in the memory that "correspond[s] to a time interval beginning at a *predetermined time prior to receipt of the alarm command*, and continuing for a *predetermined time after receipt of the alarm command*." EX1020 at 7:45-55; *see also id.* at 10:10-23. Ely thus discloses that each of the pre-alarm and post-alarm intervals are predetermined. As one example:

> [A]ssume that each camera unit buffer has a storage capacity which corresponds to thirty minutes of video signals, and that each alarm command initiates protection of buffered video signals corresponding to a ten minute period (say five minutes prior to the alarm and five minutes after).

Id. at 10:60-65. In order for a human to "predetermine" the amounts of time to be protected before and after the alarm command, Ely necessarily discloses the "interface" of claim 7.

553. Ely further discloses a user interface 108 for providing instructions input by users of the system, as illustrated in Figure 1, below. *See* EX1020 at 5:60-64, 8:16-27.

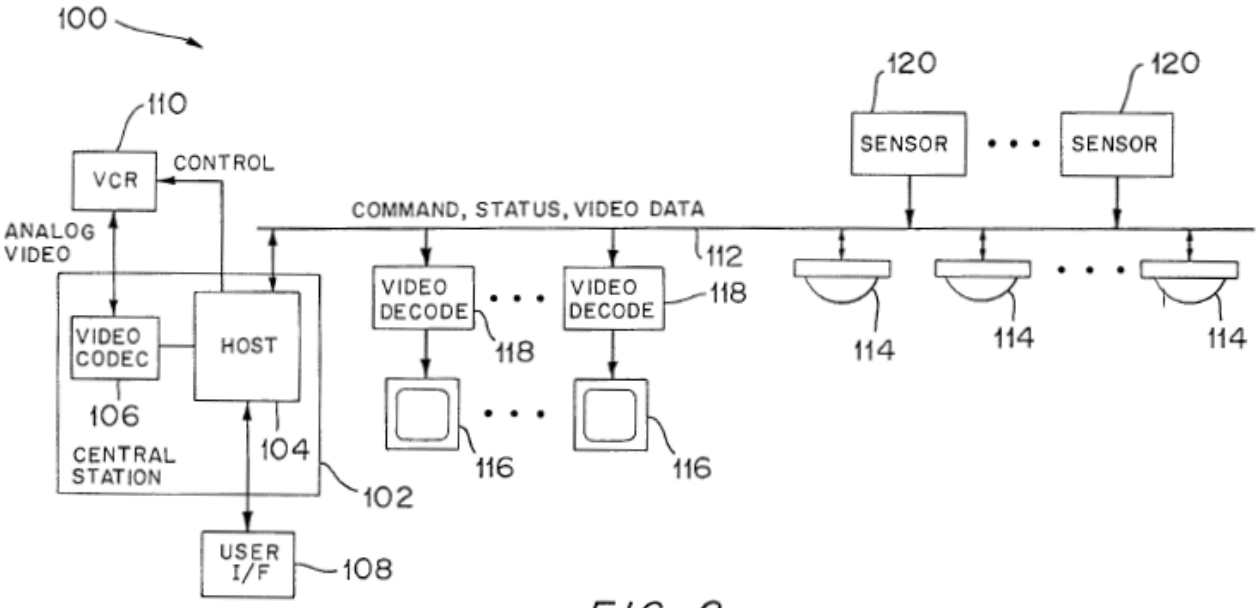


FIG. 2

Id. at Fig. 2. Thus, Ely discloses the claimed "interface through which a human can designate a length of time of at least one of the pre-recorded subset, the post-recorded subset, and the segment."

554. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 7 of the '471 patent.

555. ***Claim 10:*** Dependent claim 10 depends from claim 1 and recites "a mount for the sensor." Ely discloses this limitation. Ely discloses that "[e]ach camera unit may be mounted at a ceiling 122 or at another appropriate location, and includes a housing 124 constituted, at least in part, by a base portion 126 and a dome portion 128." EX1020 at 6:7-15.

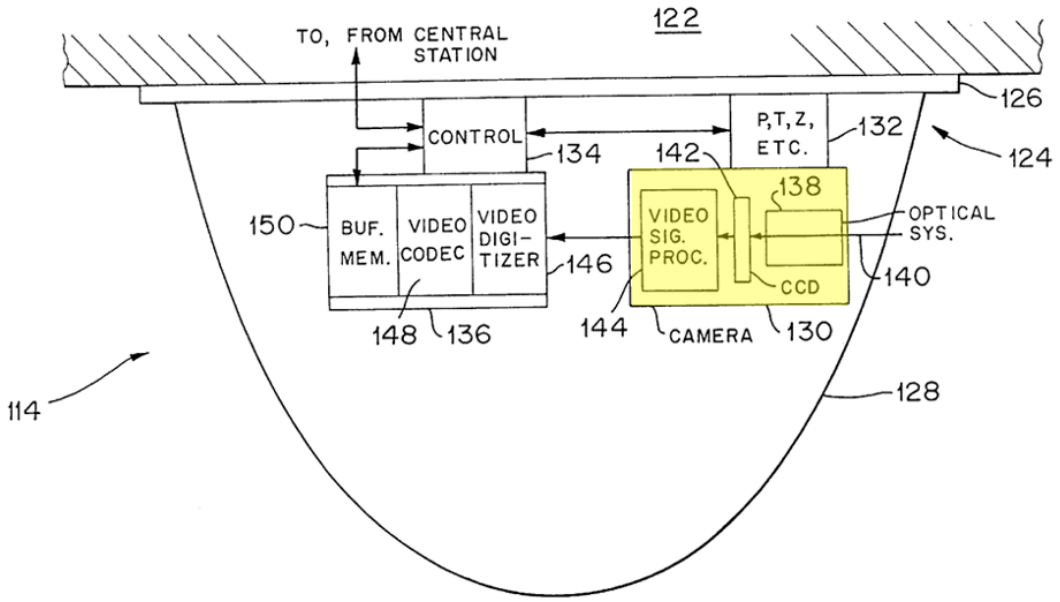


FIG. 3

Id. at Fig. 3. Thus, Ely discloses the claimed "mount for the sensor."

556. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 10 of the '471 patent.

557. ***Claim 12:*** Dependent claim 12 depends from claim 1 and recites "an electronic index that provides a directory to the file within the buffer." Ely alone or in combination with Fiore discloses this limitation. Ely discloses that "[a]fter the compressed video data stored at one of the camera units has been protected pursuant to an alarm command, the data (which will sometimes be referred to as 'alarm data') can be selectively retrieved in response to user instruction either for display (block 180) or directly for tape recording (block 182)." EX1020 at 17:23. A POSITA would have understood that the selective retrieval of alarm data from the buffer necessitates an

ability to locate the alarm data within the buffer, such that Ely necessarily discloses "an electronic index that provides a directory to the file within the buffer."

558. To the extent that a POSITA wanted further guidance as to particular methods for indexing of alarm data as files in Ely's buffer, a POSITA would have been motivated to turn to Fiore. As explained in Section VII.C above, Fiore implements its circular storage buffer 15 as a memory-mapped file and describes indexing collections of frame data for respective events as files within the memory-mapped file. *See*, *e.g.*, EX1009 at [0022]-[0023], [0051], [0059], [0060]. A POSITA would have understood that Ely's selective retrieval of alarm data from the buffer necessitates an ability to locate the video data within the buffer, and would have been motivated to employ Fiore's indexing of video data to achieve this ability for the reasons stated above in Sections VIII.B.1. Thus, Ely in view of Fiore renders obvious the claimed "electronic index that provides a directory to the file within the buffer."

559. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 12 of the '471 patent.

560. ***Claim 13:*** Dependent claim 13 depends from claim 1 and further recites: "wherein the protecting facility automatically overwrites at least some of the sensor data when the memory capacity is full." Ely discloses this limitation. Ely's control circuit 134 further controls memory addressing and writing of data into the memory so that memory 150 "serves as a ring buffer, in which currently generated compressed video data is written over the oldest compressed video data that had previously been

stored in the memory 150." EX1020 at 7:28-34. Thus, Ely discloses the claimed "protecting facility automatically overwrit[ing] at least some of the sensor data when the memory capacity is full.

561. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 13 of the '471 patent.

F. Ground 2b: Claims 3, 8, And 9 Of The '471 Patent Would Have Been Obvious Over Ely Alone Or As Combined With Fiore, In Further View Of Lewellen

1. Motivation To Combine

562. A POSITA would have been motivated to combine the Ely/Fiore system described above with Lewellen and had a reasonable expectation of success for at least the reasons stated in Section VIII.F.1.

2. Dependent Claims 3, 8, and 9

563. ***Claim 3:*** Dependent claim 3 depends from claim 2 and recites "wherein the sending facility comprises a wireless transmitter." As explained above for Ground 1b of the '471 patent, Lewellen discloses this limitation. Further, a POSITA would have been motivated to implement the Ely/Fiore system with Lewellen's local wireless interface for at least the reasons explained above in Section VIII.C.1. For these reasons, it is my opinion that Ely alone or as combined with Fiore, in further view of Lewellen, therefore renders obvious claim 3 of the '471 patent.

564. ***Claim 8:*** Dependent claim 8 depends from claim 1 and recites "wherein the local memory is configured to provide access to the file to a mobile phone." As

explained above for Ground 1b of the ’471 patent, Lewellen discloses this limitation. Further, a POSITA would have been motivated to implement the Ely/Fiore system with Lewellen’s teaching of providing access to a local memory to a mobile phone for the reasons explained above VIII.F.1. For these reasons, it is my opinion that Ely alone or as combined with Fiore, in further view of Lewellen, therefore renders obvious claim 8 of the ’471 patent.

565. ***Claim 9:*** Dependent claim 9 depends from claim 1 and recites “wherein a mobile phone automatically receives the file and automatically forwards the file to a remote memory.” As explained above for Ground 1b of the ’471 patent, Lewellen discloses this limitation. Further, a POSITA would have been motivated to implement the Ely/Fiore system with Lewellen’s teaching of a mobile phone that automatically receives the file and then automatically forwards the file to a remote memory for at least the reasons explained above in Section VIII.F.1. For these reasons, it is my opinion that Ely alone or as combined with Fiore, in further view of Lewellen, therefore renders obvious claim 9 of the ’471 patent.

G. Ground 2c: Claim 11 Of The ’471 Patent Would Have Been Obvious Over Ely Alone Or As Combined With Fiore, In Further View Of Mann

1. Motivation To Combine

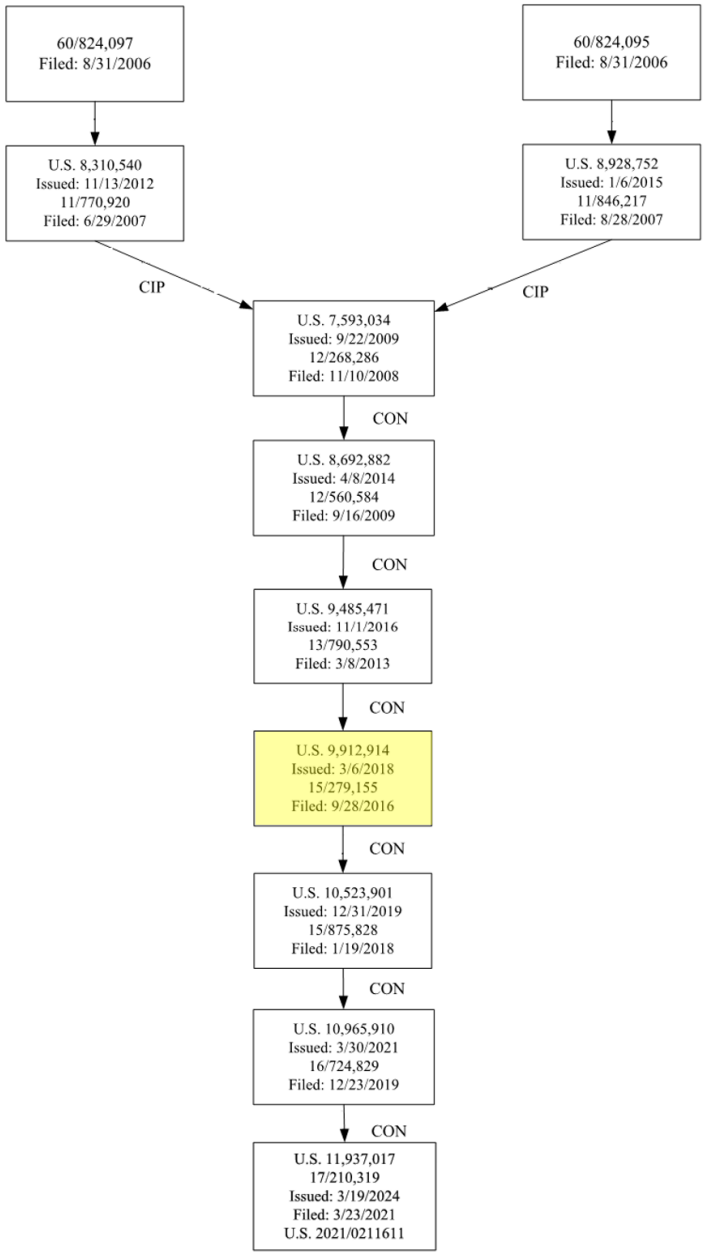
566. A POSITA would have been motivated to combine Mann with Ely and Fiore and had a reasonable expectation of success for at least the reasons stated in Section VIII.G above.

2. Dependent Claim 11

567. Claim 11 depends from claim 9 and further recites: "wherein the mount is selected from the group consisting of: a pair of wearable glasses, a lapel pin, a collar button, a hat, a visor, a hair pin, a pen, and a front of a purse." As explained above for Ground 1c of the '471 patent, Mann discloses this limitation, and a POSITA would have been motivated to implement Mann's eyeglasses-mounted apparatus with the file-based circular buffer approach of the Ely/Fiore system for the reasons explained above in Section VIII.G. For these reasons, it is my opinion that Ely alone or as combined with Fiore, in further view of Mann, therefore renders obvious claim 11 of the '471 patent.

XI. '914 Patent: Claims 1-23

568. The '914 patent of the Stellar patent family is highlighted below:



569. As seen above, the ’914 patent claims priority back to U.S. Patent No. 7,593,034 (the ’034 patent, EX1010), filed November 10, 2008, as a continuation application. EX1031 at 1:3-22.

A. Summary Of The ’914 Patent File History

570. Application No. 15/279,155, which eventually issued as the ’914 patent, was filed on September 28, 2016 with 23 claims. EX1032 at 1-41. The Office initially

rejected all claims on the basis of non-statutory double patenting over the ’034 patent and other commonly-owned patents. *Id.* at 48-53. The Office noted, however, that claims 1-23 would be allowable if the non-statutory double patenting objections were overcome because the prior art of record allegedly did “not anticipate nor render obviousness a protecting facility that responds to a trigger signal to record the at least some of the sensor data by designating a segment of the at least one buffer as a write-protected segment as at least one file in the at least one buffer, wherein the write-protected segment includes a pre-recorded subset recorded before the trigger signal is received and a post-recorded subset to be recorded after the trigger signal is received and in combination with other limitations as specified in claim 1.” *Id.* at 52.

571. Applicant submitted terminal disclaimers, *see id.* at 330-357, and the examiner then allowed claims 1-23. *Id.* at 371-375.

B. Ground 1a: Claims 1-10, 13-16, And 18-23 Of The ’914 Patent Would Have Been Obvious Over Yerazunis Alone Or As Combined With Fiore

1. Motivation To Combine

572. A POSITA would have been motivated to combine Yerazunis and Fiore and had a reasonable expectation of success for at least the reasons stated in Section VIII.B.1 above.

2. Claim 1

a) Preamble: A recording system comprising:

573. Yerazunis discloses the preamble of claim 1. Yerazunis discloses "a video recording device" that "is contained within a compactly sized housing." EX1017 at 2:12-14. Yerazunis thus discloses "a recording system."

b) Element 1: a sensor interface that captures sensor data from at least one sensor;

574. Yerazunis discloses this claim element. Yerazunis's video recording device includes a camera 40 that discloses the claimed "sensor interface that captures sensor data from at least one sensor":

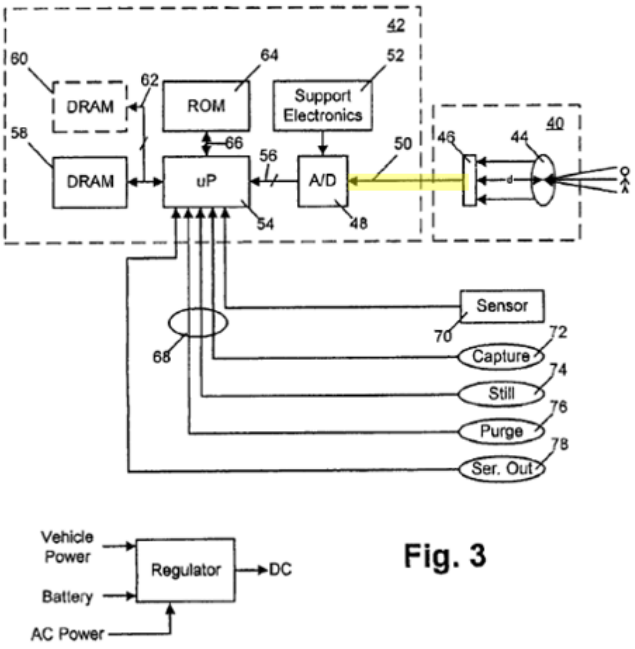


Fig. 3

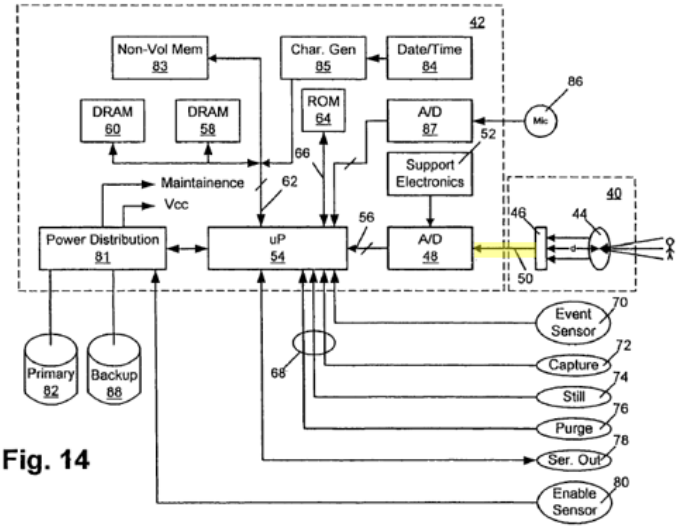


Fig. 14

EX1017 at Figs. 3, 14 (color added); *see also id.* at 2:33-41.

575. The camera 40 is "comprised of a lens 44 which is disposed a predetermined distance d from the surface of an image sensor 46." *Id.* at 5:43-45. "The image sensor 46, as described above, may comprise a [CCD] array, an artificial retina, or any other suitable image sensor operative to provide an output signal representative of a video image which impinges upon the sensor." *Id.* at 5:45-49. The output signal is "an analog signal which is coupled to one or more A/D converters" via signal path 50, and the one or more A/D converters "generate a digital representation of the video image." *Id.* at 2:37-41. The signal path 50 thus discloses the claimed "sensor interface" because it captures video data from the camera 40 (*i.e.*, "sensor data from at least one sensor," as claimed).

576. Yerazunis's camera 40 also discloses the claimed "sensor interface that captures sensor data from at least one sensor" because its disclosure is similar to that of

the ’914 patent referring to cameras as being sensing devices. *See*, *e.g.*, EX1031 at 4:21-39.

c) Element 2: a memory coupled with the sensor interface;

577. Yerazunis discloses this claim element. Yerazunis’s video recording device includes video electronics 42 with DRAMs 58, 60 that disclose the claimed “memory coupled with the sensor interface” (EX1017 at 5:40-43, 6:24-36):

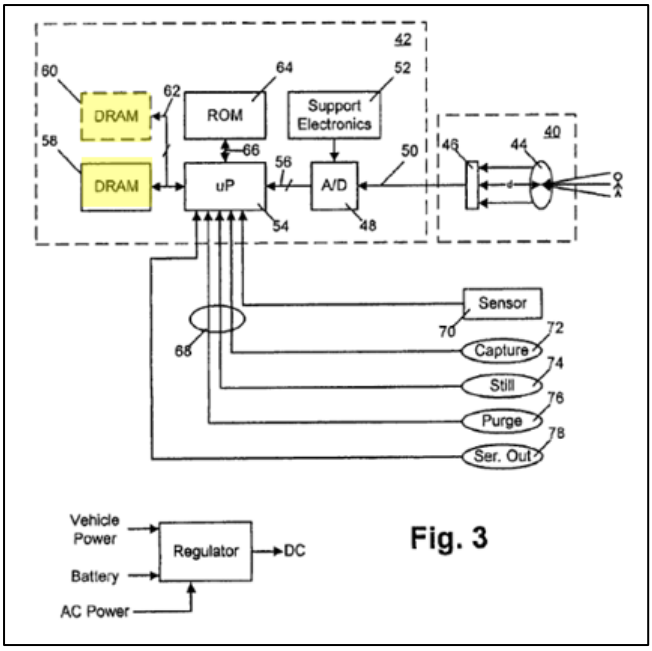


Fig. 3

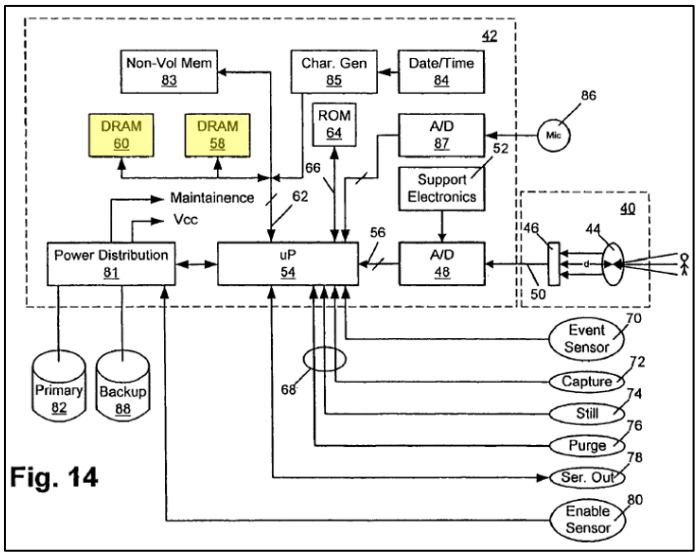


Fig. 14

Id. at Figs. 3, 14 (color added).

578. As seen in the figures above, the DRAMs 58, 60 (*i.e.*, the "memory") are coupled to the camera 40. Yerazunis discloses that "microprocessor 54 and the DRAM 58 may be obtained as a single integrated circuit [IC]" (*id.* at 6:24-29), meaning that their connection would be via one or more physical connectors on the IC (*e.g.*, conductive lines and/or vias, etc.). Yerazunis further discloses that the DRAM 60 is "coupled to the microprocessor 54 via a bus 62." *Id.* at 6:30-36. The microprocessor 54, in turn, is coupled to analog-to-digital converter (ADC) 48 "via path 56 which comprises a parallel signal bus." *Id.* at 6:14-23. Finally, the ADC 48 is coupled to the camera 40 "via a signal path 50" to enable the ADC 48 to sample the output of the camera's image sensor 46 at predetermined intervals. *Id.* at 5:40-67. Accordingly, the DRAMs 58, 60 (*i.e.*, the "memory") are "coupled with the sensor interface."

579. For at least these reasons, Yerazunis discloses "a memory coupled with the sensor interface," as claimed.

d) Element 3: a recording facility coupled with the sensor interface and memory, and that records at least some of the sensor data into an available portion of at least one buffer in the memory; and

580. Yerazunis discloses this claim element. Yerazunis's video recording device "records video frames successively in at least one circular buffer memory organized as a continuous loop overwriting the oldest frame within the respective buffer

memory with a more recently received frame." EX1017 at 2:19-23, 17:9-20, 17:50-59. Specifically, Yerazunis's camera 40 captures video, and the aforementioned ADC 48 converts the captured video into a digital signal. *Id.* at 5:40-67. The digital signal is provided to inputs of the microprocessor 54, and the microprocessor 54 "compresses the digitized frame data and stores the compressed frame data in the next sequential location of [a] circular buffer." *Id.* at 2:45-47, 6:24-26, 6:52-7:6, 10:55-67, 17:50-59; *see also id.*, 11:50-14:44, Figs. 6-8.

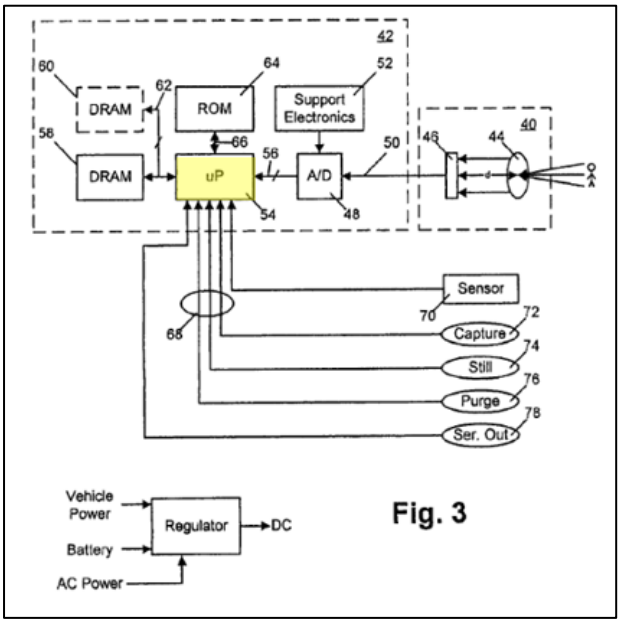


Fig. 3

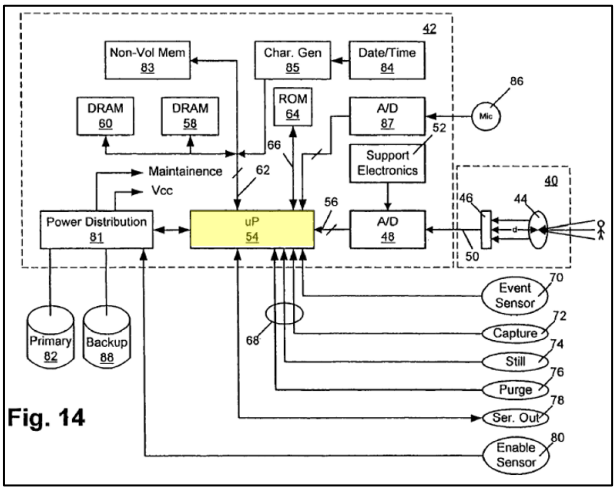


Fig. 14

Id. at Figs. 3, 14 (color added).

581. Yerazunis's circular buffer is formed in the DRAM 58. *Id.* at 7:7-61, 18:7-12. Thus, the microprocessor 54 includes "a recording facility coupled with the sensor interface and memory" that "records at least some of the sensor data into an available portion of at least one buffer in the memory," as claimed. Yerazunis's disclosure of the recording facility is similar to that of the '914 patent. Like Yerazunis, the '914 patent describes a recorder 160 that uses a processor 162 to perform various "facilities" or "functions." *See*, *e.g.*, EX1031 at 4:61-66 ("Recorder 160 preferably includes a processor 162 with software or hardware that accomplishes the functions described herein …."), 5:35-37 (the electronics of recorder 160 include "a unitary printed circuit board" with "different functions, or facilities, encoded on a programmable chip or disk"), 5:43-45 ("different facilities" can be "part of a single hardware or software program" or they can be "split into different components").

582. Yerazunis thus discloses the claimed "recording facility coupled with the sensor interface and memory, and that records at least some of the sensor data into an available portion of at least one buffer in the memory."

e) Element 4: a protecting facility coupled with the recording facility that responds to a trigger signal to record the at least some of the sensor data by designating a segment of the at least one buffer as a write-protected segment and by storing the write-protected segment as at least one file in the at least one buffer,

583. Yerazunis alone or as combined with Fiore discloses this claim element.

584. First, Yerazunis's microcontroller 54 includes a "protecting facility coupled with the recording facility that responds to a trigger signal to record the at least some of the sensor data by designating a segment of the at least one buffer as a write-protected segment," as claimed. Specifically, in Yerazunis's gun-camera embodiment, the event sensor 70 is "responsive to the discharge of [a] gun" and thus generates a "gun firing signal" "upon discharge of the gun." EX1017 at 3:20-33, 8:8-25, 14:55-61. Upon detection of the gun firing signal from the event sensor 70, the microprocessor 54 causes "specified frame data associated with [the] firing event both before and after the event" to be "preserved," such that it "cannot be overwritten as a result of further use of the gun or subsequent firing events." *Id.* at 3:25-38, 8:26-30, 15:9-13. With the specified frame data being write protected, "[f]rame data associated with each subsequent firing event[] is stored within an unused portion of the circular buffer memory." *Id.* at 3:31-33.

585. Yerazunis discloses that the write protecting performed by its microprocessor 54 may include storing pointers that define areas of the circular buffer that are not to be overwritten:

> It is noted that while storage of video frame data terminates in the case of a single trigger event such as in the situation in which the recording device is employed to preserve a record of a car crash, in the present application, recording of data continues since a subsequent firing event may occur. *To accommodate this objective, after the conclusion of data storage associated with one firing event, the head pointer 104 and the*

> *tail pointer 102 (or pointers in the event multiple buffer groups are employed as discussed above) defining the area(s) of the circular buffer memory, are stored in a table to allow later retrieval of the video data pertaining to each firing of the gun.* The head and the tail pointers are then reset to allow continued recording into another portion of the circular buffer memory without overwriting the previously stored and preserved data. This process continues as each trigger event occurs until the buffer memory is full.

Id. at 17:45-61.

586. In sum, Yerazunis's microcontroller 54 responds to a "gun firing signal" generated by the event sensor 70 by designating a segment of the buffer—*i.e.*, the portion of the buffer containing video data associated with the firing of a gun—as being write-protected. Further, the write-protected segment includes "frame data associated with [the] firing event both before and after the event." *Id.* at 3:25-38. Yerazunis's microcontroller 54 thus includes the claimed "protecting facility coupled with the recording facility that responds to a trigger signal to record the at least some of the sensor data by designating a segment of the at least one buffer as a write-protected segment."

587. Second, Yerazunis's protecting facility "responds to a trigger signal to record the at least some of the sensor data … by storing the write-protected segment as at least one file in the at least one buffer." Yerazunis's tagging, use of pointers to identify a collection of data for write protection, and storage of such pointers in a table

"to allow later retrieval" of video data for gun-firing events (EX1017 at 17:45-61) discloses indexing the write-protected segment as a file in the buffer, as a POSITA would have understood that retrieving video data for gun-firing events necessitates an ability to locate the video data within the buffer, such that Yerazunis necessarily discloses indexing.

588. The '914 patent is a continuation of the '471 patent, the '882 patent, and the '034 patent, all of which are discussed above. The claims of the '471, '882, and '034 patents recite "indexing" a write-protected portion or segment whereas the '914 patent claims requiring "storing the write-protected segment." The Patent Office understood the "indexing" and "storing" limitations as effectively meaning the same thing. EX1032 at 48-53 (rejecting the pending '914 patent claims on the basis of non-statutory obviousness-type double patenting over the '471, '882, and '034 patents, and finding the pending claims to be "not patentably distinct" from those of the previously issued patents).

589. To the extent there is any difference, a POSITA would have understood "storing" as a file to be broader in scope than "indexing" as a file, including at least because claim 22 of the '914 patent, which depends from claim 1, recites "wherein the protecting facility is further configured to store the at least one file by indexing the write-protected segment in the at least one buffer." Yerazunis's disclosure of indexing write-protected segments as files therefore discloses "storing the write-protected segment as at least one file in the at least one buffer." Thus, while Yerazunis does not

expressly refer to "storing" write-protected segments as "files," a POSITA would have understood Yerazunis as describing—or at minimum, rendering obvious—this limitation. *Id.*, 6:1-13, 6:33-36, 7:23-32, 10:37-39, 10:63-67, 11:31-43.

590. Further, a POSITA would have recognized the claimed "storing the write-protected segment as at least one file" as being one of a finite number of identified solutions for storing data in Yerazunis, further evidencing its obviousness. A POSITA would have recognized that the Yerazunis's event data must be stored in some way, and using files was a well-known approach for doing so. Storing event data using this conventional approach was not innovative but rather a straightforward application of ordinary skill or common sense.

591. To the extent, however, that a POSITA wanted further guidance as to particular methods for indexing or storing of event data as files in Yerazunis's buffer, a POSITA would have been motivated to turn to Fiore. As explained in Section VII.C above, Fiore implements its circular storage buffer 15 as a memory-mapped file and describes indexing collections of frame data for respective events as files within the memory-mapped file. *See*, *e.g.*, EX1009 at [0022]-[0023], [0051], [0059], [0060]. Fiore also describes the benefits of its file-based approach, including that it enables playback of video data for a specific event from the circular buffer without interrupting simultaneous recording of new video data into the buffer. *See*, *e.g.*, *id.* at [0065], [0067], [0068], [0072]. In view of these exemplary benefits and the additional reasons explained in Section VIII.B.1 above, a POSITA would have been motivated to

implement Yerazunis's microcontroller 54 to "respond[] to a trigger signal to record" by indexing the write-protected segment as a file in the buffer in the manner disclosed in Fiore. Yerazunis's retrieval of video data for gun-firing events necessitates an ability to locate the video data within the buffer, and a POSITA would have been motivated to employ Fiore's indexing of video data to achieve this ability for the above-noted reasons.

592. Thus, Yerazunis alone or as combined with Fiore discloses the claimed "protecting facility coupled with the recording facility that responds to a trigger signal to record the at least some of the sensor data by designating a segment of the at least one buffer as a write-protected segment and by storing the write-protected segment as at least one file in the at least one buffer."

f) Element 5: wherein the write-protected segment includes a pre-recorded subset recorded before the trigger signal is received and a post-recorded subset to be recorded after the trigger signal is received.

593. Yerazunis discloses this claim element. Specifically, in Yerazunis's gun-camera embodiment, the event sensor 70 is "responsive to the discharge of [a] gun" and thus generates a "gun firing signal" "upon discharge of the gun." EX1017 at 3:20-33, 8:8-25, 14:55-61. Upon detection of the gun firing signal from the event sensor 70, the microprocessor 54 causes "specified frame data associated with [the] firing event both before and after the event" to be "preserved," such that it "cannot be overwritten as a result of further use of the gun or subsequent firing events." *Id.* at 3:25-38, 8:26-30,

15:9-13. Thus, Yerazunis discloses the claimed "wherein the write-protected segment includes a pre-recorded subset recorded before the trigger signal is received and a post-recorded subset to be recorded after the trigger signal is received."

594. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 1 of the '914 patent.

3. Dependent Claims 2-10, 13-16, 18-23

595. ***Claim 2:*** Dependent claim 2 depends from claim 1 and recites "further comprising a sending facility coupled with the memory and configured to transmit data associated with the at least one file from the memory to a remote memory." Yerazunis discloses this limitation. The reference's microprocessor 54 includes a serial output channel 78 that is "provided to permit recorded frame data to be downloaded to a computer for viewing." EX1017 at 3:1-2, 6:45-51, 18:60-66.

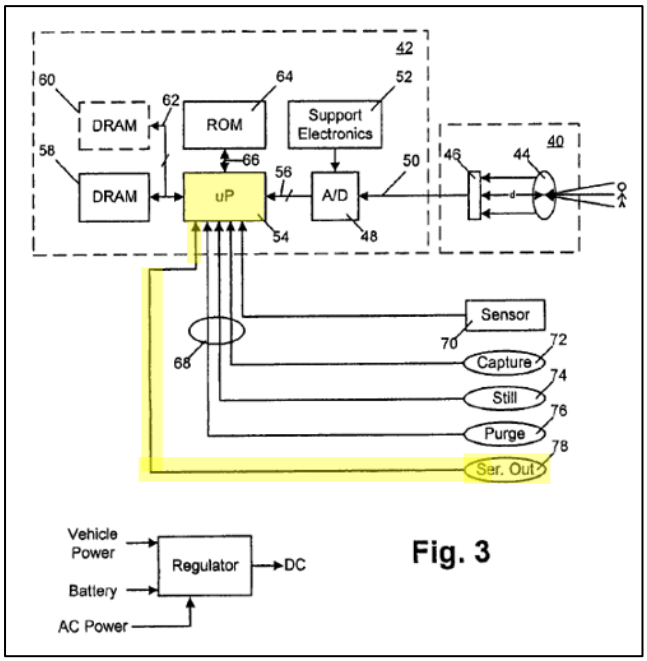
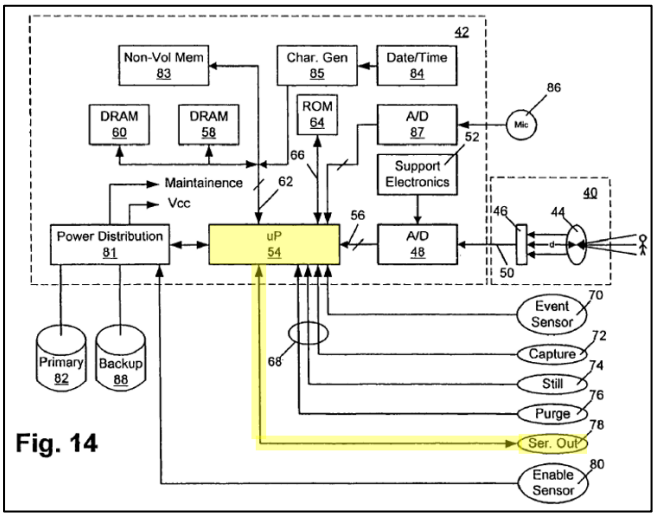


Fig. 3



Id. at Figs. 3, 14 (color added). Although the output channel 78 is a serial output channel, Yerazunis states that "any appropriate data transfer link and protocol may be employed." *Id.* at 3:3-4, 18:64-66.

596. Because the microprocessor's serial output channel 78 (or other appropriate data transfer link) "is employed to download captured and stored video images" from the circular buffer of DRAM 58 "to an external Personal Computer (PC)" (*id.*), the microprocessor 54 includes the claimed "sending facility coupled with the memory and configured to transmit data associated with the at least one file from the memory to a remote memory." As detailed above, Yerazunis's video recording device stores files containing recorded frame data in the circular buffer of DRAM 58. The microprocessor 54 with serial output channel 78 transmits write-protected files stored in the DRAM 58 (*i.e.*, "memory," as claimed) to an external computer having "remote memory" for storing such files. The microprocessor 54 therefore includes the claimed "sending facility" of claim 2. Yerazunis's disclosure of the claimed "sending facility"

is similar to that of the '914 patent, which likewise describes a recorder 160 with processor 162 for performing various "facilities" or "functions," including the recording, protecting, and sending facilities/functions. EX1031 at 4:61-66, 5:35-45.

597. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 2 of the '914 patent.

598. ***Claim 3:*** Dependent claim 3 depends from claim 1 and recites "wherein the sensor data comprises at least one of the following: image data and video data." Yerazunis discloses this limitation. As discussed for claim 1 above, Yerazunis discloses a video recording device comprising a camera 40 with a sensor that captures video data. EX1017 at Figs. 3, 14; 2:33-41, 5:43-49. Thus, Yerazunis discloses "wherein the sensor data comprises at least … video data," as claimed.

599. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 3 of the '914 patent.

600. ***Claims 4 and 5:*** Dependent claim 4 depends from claim 3 and recites "wherein the sensor data comprises a resolution of at least 640x480 pixels." Dependent claim 5 depends from claim 4 and recites "wherein the sensor data comprises a resolution of at least 1080p." These limitations would have been obvious to a POSITA in view of Yerazunis. Yerazunis teaches that the video image sensor 46 of the camera 40 has a resolution, and that the "specific number of bytes required for a particular frame is dependent upon the resolution of the video image sensor 46, the sampling rate of the analog to digital converter 48, and the efficiency of the compression algorithm."

EX1017 at 7:28-32. Yerazunis also discloses that "the resolution may be varied," such as "to provide a different resolution in response to a trigger event." *Id.* at 10:23-36. Thus, for example, Yerazunis's recording device may selectively increase the resolution for important video data that is to be preserved. *Id.* A POSITA would have further been motivated to select an image sensor capable of capturing video data at a sufficient resolution, such as of at least 640x480 pixels or 1080p, so that the video captured would be clearly presented upon playback.

601. Indeed, such resolutions were well-known as of the purported June 2007 priority date of the '914 patent, and the selection of an image sensor that captures video data at these conventional resolutions would have been obvious to a POSITA. EX1034 at 3:24-33. An article entitled "The Patrol Video Project" (EX1007) confirms that video resolutions like those claimed were well-known in the art, including in the context of in-car mobile video records:

> **resolution** the number of pixels or dots that make up the full area of an image. It is usually expressed as the number of pixels horizontally and vertically, e.g., 640x480, 1280x768, etc. As these numbers increase, the image will appear less grainy and more lifelike, and can be enlarged to a bigger size without loss of detail. Large resolutions greatly inflate the size of the file that contains their information. A 640x480 image contains four times as many pixels as a 320x240 image.

EX1007 at 22.

602. A POSITA would have had a reasonable expectation of success because image sensors capable of capturing video data at the claimed resolutions were well-known, and implementing such image sensors in the Yerazunis/Fiore recording system would have been routine and well within a POSITA's skill.

603. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claims 4 and 5 of the '914 patent.

604. ***Claim 6:*** Dependent claim 6 depends from claim 1 and recites "wherein the sensor data recorded into the available portions of the at least one buffer is compressed." Yerazunis discloses this limitation. Yerazunis discloses that the microprocessor 54 in Yerazunis's video recording devices "compresses the digitized frame data" received from the image sensor "and stores the compressed frame data in the next sequential location of the circular buffer." EX1017 at 2:45-48; *see also id.* at 6:52-55, 7:7-14. Compression "permit[s] a greater number of frames to be stored within the circular buffer memory than would otherwise be possible absent such compression." *Id.* at 10:63-67. Multiple suitable compression techniques were well-known in the art. EX1017 at 6:55-7:6.

605. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 6 of the '914 patent.

606. ***Claims 7 and 8:*** Dependent claim 7 depends from claim 6 and recites "wherein the sensor data recorded into the available portions of the at least one buffer is time compressed." Dependent claim 8 depends from claim 6 and recites "wherein

the sensor data recorded into the available portions of the at least one buffer is frame compressed." These limitations would have been obvious to a POSITA in view of Yerazunis. As discussed above for claim 6 of the '914 patent, Yerazunis discloses "wherein the sensor data recorded into the available portions of the at least one buffer is compressed," and further discloses that multiple suitable compression techniques were well-known in the art. EX1017 at 6:55-7:6. Two such well-known techniques as of the purported June 2007 priority date were time compression and frame compression. It would have been obvious to a POSITA to select either or both of these conventional compression techniques in the Yerazunis/Fiore video recording system. Before the purported June 2007 priority date of the challenged patents, image and video data, by necessity, was almost always compressed to save storage as well as I/O and network bandwidth requirements. Cameras and video encoders before June 2007 already had the ability to change the frame rate and bitrate. MPEG-1, released in 1991, used a combination of spatial and temporal compression. Appx NN, a set of lecture notes entitled "Video Compression," discuss this (downloaded from https://www.cs.ucf.edu/courses/cap5015/Video_compression_2005.pdf, last accessed July 21, 2024). The respective "time compression" and "frame compression" limitations of claims 7 and 8 would have been obvious over the Yerazunis alone or as combined with Fiore for at least these reasons.

607. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claims 7 and 8 of the '914 patent.

608. ***Claim 9:*** Dependent claim 9 depends from claim 1 and recites "wherein the sensor data comprises at least one of the following: audio data and motion data." Yerazunis discloses this limitation. Yerazunis discloses an example in which a first vehicle has backed up into a second vehicle having mounted a Yerazunis video recording device, where the video recording device captures an evidentiary record (by video) of the first vehicle backing into the second vehicle and causing damage to it. *See* EX1017 at 4:35-56. By disclosing the capture of video data comprising motion of a subject (the first vehicle backing up), Yerazunis discloses "wherein the sensor data comprises at least … motion data."

609. Yerazunis also discloses an example in which the video recording device captures video data associated with the shooting of a person or target, which is also motion data. EX1017 at 1:32-43. When Yerazunis's video recording device is used with a gun, "an audio track may be recording to capture audio data around the time of the gun firing." EX1017 at 19:35-36. Yerazunis thus discloses "wherein the sensor data comprises at least one of the following: audio data and motion data," as claimed.

610. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 9 of the '914 patent.

611. ***Claim 10:*** Dependent claim 10 depends from claim 1 and recites "wherein the memory comprises at least one of the following: RAM and flash." Yerazunis discloses this limitation. The dynamic random access memories (DRAMs) 58, 60 (*i.e.*,

the claimed "memory") are "RAM"—random access memory—as recited in claim 10 (EX1017 at 5:40-43, 6:24-36):

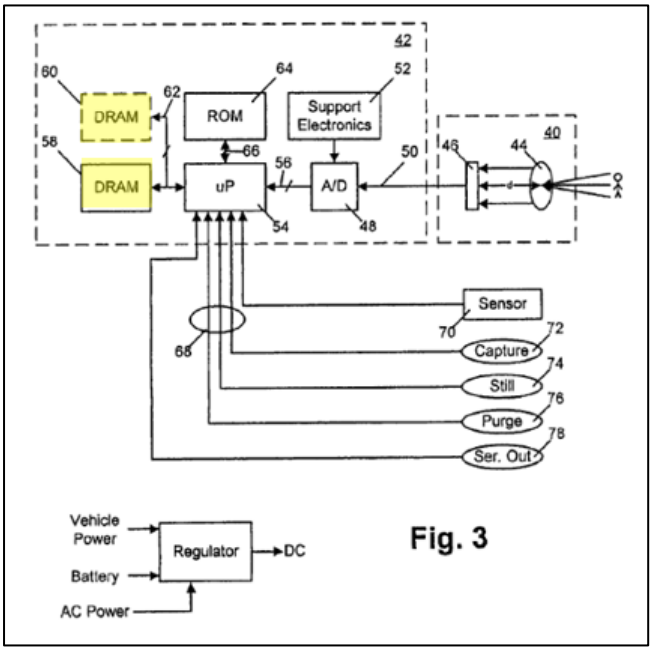


Fig. 3

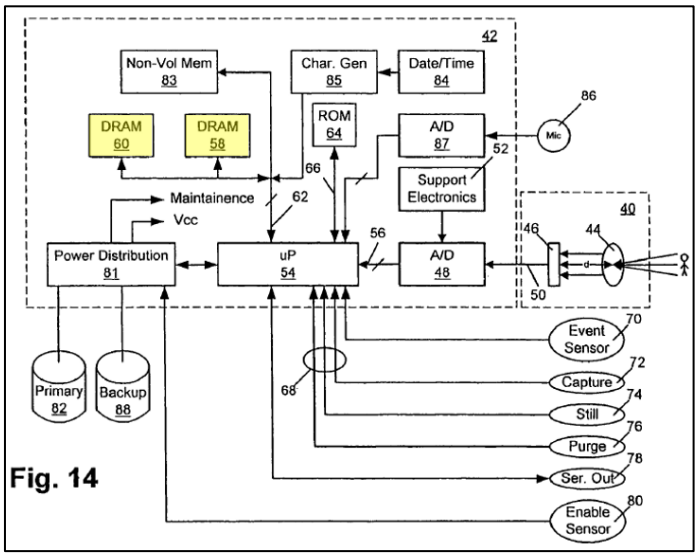


Fig. 14

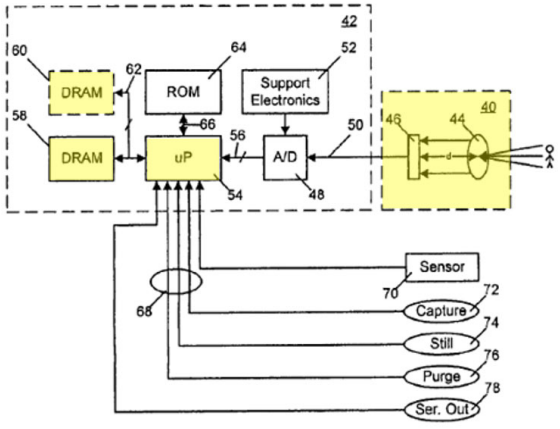
Id. at Figs. 3, 14 (color added). Yerazunis thus discloses "wherein the memory comprises at least … RAM," as claimed.

612. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 10 of the '914 patent.

613. ***Claim 13:*** Dependent claim 13 depends from claim 1 and recites "wherein the at least one buffer comprises a circular buffer." Yerazunis discloses this limitation. As discussed above for claim 1 of the '914 patent, Yerazunis's video recording device "records video frames successively in at least one *circular buffer memory* organized as a continuous loop overwriting the oldest frame within the respective buffer memory with a more recently received frame." EX1017 at 2:19-23, 7:7-61, 17:9-20, 17:50-59, 18:7-12.

614. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 13 of the '914 patent.

615. ***Claim 14:*** Dependent claim 14 depends from claim 1 and recites "a camera including the sensor interface, the memory, and the recording facility." Yerazunis discloses this limitation. Yerazunis's video recording system includes the signal path 50 (*i.e.*, "sensor interface"), DRAMs 58, 60 (*i.e.*, the "memory"), and microprocessor 54 including the claimed "recording facility" (EX1017 at 5:40-45, 6:24-36):



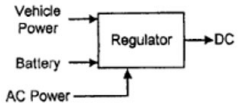


Fig. 3

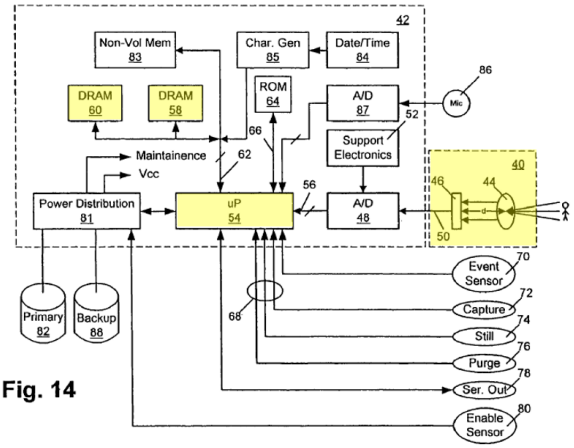


Fig. 14

Id. at Figs. 3, 14 (color added).

616. Although Yerazunis refer to components 44, 46 (i.e., lens and image sensor, respectively) as being a "camera 40," a POSITA would have understood Yerazunis's video recording systems (including video electronics 42 and camera 40) as being a camera. At the purported priority date of the challenged patents (June 2007), the term "camera" was often used in referring to systems with imaging components, microprocessor controllers, and memory for storing image and video data, like the systems depicted in Figures 3 and 14 of Yerazunis. Thus, Yerazunis discloses "a

camera including the sensor interface, the memory, and the recording facility," as claimed.

617. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 14 of the '914 patent.

618. ***Claim 15:*** Dependent claim 15 depends from claim 14 and recites "wherein the camera comprises a security camera." Yerazunis discloses this limitation. Yerazunis discloses that its video recording device is suitable "in security applications" (EX1017 at 1:22-31), and that trigger events include "a signal indicative of a security or fire alarm condition," such as "movement, glass breakage, or unauthorized entry" (*id.* at 2:53-64, 8:8-25). Thus, Yerazunis discloses the claimed "security camera."

619. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 15 of the '914 patent.

620. ***Claim 16:*** Dependent claim 16 depends from claim 1 and recites "further comprising a cell phone including the sensor interface, the memory, and the recording facility." This limitation would have been obvious to a POSITA in view of Yerazunis. As discussed above for claim 14 of the '914 patent, Yerazunis discloses "a camera including the sensor interface, the memory, and the recording facility." Likewise, cell phones were well-known as of the purported June 2007 priority date of the '914 patent, and it would have been obvious to a POSITA to implement the Yerazunis/Fiore video recording device in a cell phone. Cell phones as of June 2007 included cameras, memory, and microprocessor components, and a POSITA would have therefore

understood cell phones as being well-suited for implementing the Yerazunis/Fiore video recording device. A POSITA would have been motivated to do so at least because implementation of the Yerazunis/Fiore video recording device in a cell phone would enhance portability and accessibility of the device, because cell phones were carried by much of the public, including police officers.

621. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 16 of the '914 patent.

622. ***Claim 18:*** Dependent claim 18 depends from claim 1 and recites "wherein the at least one file in the at least one buffer comprises a single file." Yerazunis alone or as combined with Fiore discloses this claim element. Yerazunis discloses that the write protecting performed by its microprocessor 54 includes storing pointers that define areas of the circular buffer that are not to be overwritten, thus providing an electronic index to each write-protected segment, *i.e.*, "a single file" in the buffer, "to allow later retrieval":

> It is noted that while storage of video frame data terminates in the case of a single trigger event such as in the situation in which the recording device is employed to preserve a record of a car crash, in the present application, recording of data continues since a subsequent firing event may occur. To accommodate this objective, *after the conclusion of data storage associated with one firing event, the head pointer 104 and the tail pointer 102 (or pointers in the event multiple buffer groups are employed as discussed above) defining the area(s) of the circular buffer memory, are stored in a table to allow later retrieval of the video data*

> *pertaining to each firing of the gun*. The head and the tail pointers are then reset to allow continued recording into another portion of the circular buffer memory without overwriting the previously stored and preserved data. This process continues as each trigger event occurs until the buffer memory is full.

EX1017 at 17:45-61. Yerazunis therefore discloses "at least one file in the at least one buffer comprises a single file," as claimed.

623. To the extent that a POSITA wanted further guidance as to particular methods for indexing of event data as files in Yerazunis's buffer, a POSITA would have been motivated to turn to Fiore. As explained in Section VII.C above, Fiore implements its circular storage buffer 15 as a memory-mapped file and describes indexing collections of frame data for respective events as files within the memory-mapped file. *See, e.g.*, EX1009 at [0022]-[0023], [0051], [0059], [0060]. A POSITA would have understood that Yerazunis's selective retrieval of video data from the buffer necessitates an ability to locate the video data as single files within the buffer, and would have been motivated to employ Fiore's indexing of video data to achieve this ability for the reasons stated above in Sections VIII.B.1. Thus, Yerazunis in view of Fiore renders obvious "at least one file in the at least one buffer comprises a single file," as claimed.

624. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 18 of the '914 patent.

625. ***Claim 19:*** Dependent claim 19 depends from claim 18 and recites "wherein the single file comprises an entirety of the at least one buffer." Yerazunis alone or as combined with Fiore discloses this claim element. As explained above for claim 1 of the '914 patent, Fiore implements its circular storage buffer as a memory-mapped file, preferably "a single continuous disk file." EX1009 at [0071]. Fiore therefore discloses "wherein the single file comprises an entirety of the at least one buffer."

626. A POSITA would have been motivated to implement Yerazunis's video recording device with Fiore's teaching of a memory-mapped file for at least the reasons stated above in Section VIII.B.1.

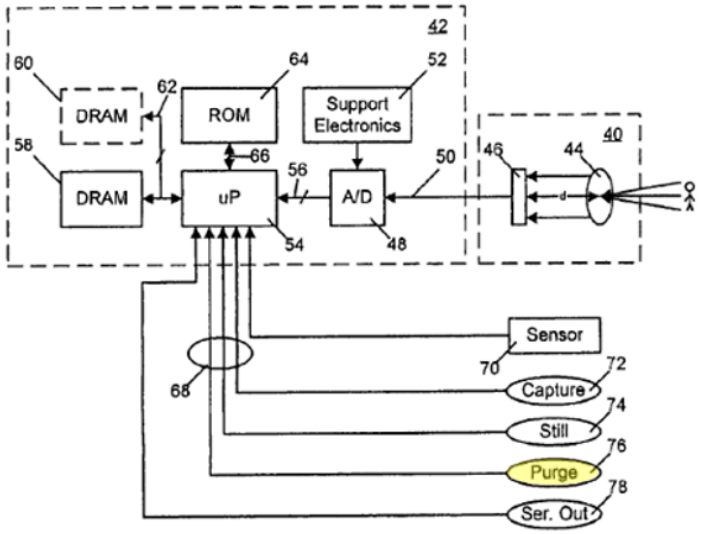
627. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 19 of the '914 patent.

628. ***Claim 20:*** Dependent claim 20 depends from claim 1 and recites "wherein the trigger signal represents detection of at least one of the following: a motion, a sound, an image, content in a data stream, a pattern in the sensor data, a person, a human face, a computer screen, an event, a verbal command, operation of a switch, and operation of a button." Yerazunis discloses this limitation. In Yerazunis, "the event sensor 70 is operative to generate a trigger signal in response to the discharge of the gun," and preferably comprises "a microphone, or any other suitable sensor which can detect a characteristic associated with the firing of the gun." EX1017 at 16:43-43-50. "In the case of a microphone, the event sensor 70 is operative to detect the sound associated

with the firing of the gun." *Id.* at 16:52-55. Thus, Yerazunis discloses "wherein the trigger signal represents detection of at least … a sound," as claimed.

629. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 20 of the '914 patent.

630. ***Claim 21:*** Dependent claim 21 depends from claim 1 and recites "wherein the protecting facility is further configured to update the write-protected segment as being non-protected and free for recording." Yerazunis discloses this limitation. Yerazunis discloses a purge button 76 that is electronically coupled to the microprocessor 54. EX1017 at 9:47-48. "Upon activation of the purge button, the contents of the circular buffer and any still images that have been captured are erased. Thus, in the event that a user captures images which, for any reason, such user does not desire to retain, they may be erased." *Id.* at 9:48-53. Accordingly, contents of the circular buffer, including write-protected segments, are updated as being non-protected and free for recording.



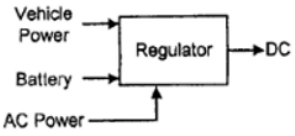


Fig. 3

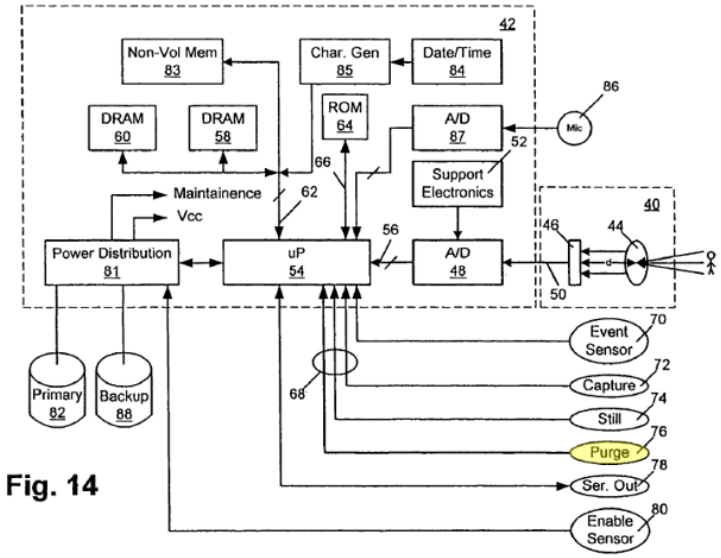


Fig. 14

EX1017 at Figs. 3, 14 (color added). Yerazunis also discloses that "the purge control 76 … may be omitted or protected by a keylock or software password to provide the ability to preserve the evidentiary integrity or recorded data." *Id.* at 19:30-34.

631. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 21 of the ’914 patent.

632. ***Claim 22:*** Dependent claim 22 depends from claim 1 and recites “wherein the protecting facility is further configured to store the at least one file by indexing the write-protected segment in the at least one buffer.” As explained above for claim 1 of the ’914 patent, Yerazunis alone or as combined with Fiore discloses this limitation.

633. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 22 of the ’914 patent.

634. ***Claim 23:*** Dependent claim 23 depends from claim 22 and recites “wherein the protecting facility is further configured to index the write-protected segment while the recording facility is still recording the sensor data into the memory.” Yerazunis alone or as combined with Fiore discloses this limitation. When Yerazunis’s video recording device is used with a gun, “recording of data continues [during and after a first firing event] since a subsequent firing event may occur.” EX1017 at 17:45-50. This is achieved by indexing, as described above for claim 1 of the ’914 patent:

> To accommodate this objective, after the conclusion of data storage associated with one firing event, the head pointer 104 and the tail pointer 102 (or pointers in the event multiple buffer groups are employed as discussed above) defining the area(s) of the circular buffer memory, are stored in a table to allow later retrieval of the video data pertaining to each firing of the gun. The head and the tail pointers are then reset to allow continued recording into another portion of the circular buffer

> memory without overwriting the previously stored and preserved data. This process continues as each trigger event occurs until the buffer memory is full.

Id. at 17:50-61; *see also id.* at 2:19-23, 4:45-49, 7:7-61, 9:34-38, 17:45-61. Thus, Yerazunis alone or as combined with Fiore discloses "wherein the protecting facility is further configured to index the write-protected segment while the recording facility is still recording the sensor data into the memory," as claimed.

635. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore renders obvious claim 23 of the '914 patent.

C. Ground 1b: Claims 11, 12, And 17 Of The '914 Patent Would Have Been Obvious Over Yerazunis Alone Or As Combined With Fiore, In Further View of Lewellen

1. Motivation To Combine

636. A POSITA would have been motivated to combine Lewellen with the Yerazunis/Fiore system and had a reasonable expectation of success for at least the reasons stated above in Section VIII.C.1.

2. Dependent Claims 11, 12, and 17

637. ***Claim 11:*** Dependent claim 11 depends from claim 1 and recites "wherein the sensor interface comprises a wireless interface to the at least one sensor." Yerazunis alone or as combined with Fiore, in further view of Lewellen, renders obvious this limitation. Lewellen discloses a local wireless interface 390 for wirelessly coupling to Bluetooth-compatible devices. EX1019 at [0022], [0031], [0042]-[0048]. A POSITA

would have been motivated to incorporate Lewellen's local wireless interface 390 into the Yerazunis/Fiore system and to use this interface to wirelessly couple to an off-board camera (*i.e.*, "at least one sensor") for at least the reasons explained above in Section VIII.C.1.

638. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore, in further view of Lewellen, renders obvious claim 11 of the '914 patent.

639. ***Claim 12:*** Dependent claim 12 depends from claim 11 and recites "wherein the wireless interface comprises a BlueTooth® wireless interface." Yerazunis alone or as combined with Fiore, in further view of Lewellen, renders obvious this limitation. Lewellen discloses that the local wireless interface 390 is a Bluetooth wireless interface in embodiments. EX1019 at [0022], [0031], [0042]-[0048]. A POSITA would have been motivated to incorporate Lewellen's Bluetooth wireless interface into the Yerazunis/Fiore system for at least the reasons explained above in Section VIII.C.1.

640. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore, in further view of Lewellen, renders obvious claim 12 of the '914 patent.

641. ***Claim 17:*** Dependent claim 17 depends from claim 1 and recites "further comprising a personal area network coupled with the protecting facility and including at least two of the following: the sensor interface, the memory, and the recording facility." Yerazunis alone or as combined with Fiore, in further view of Lewellen, renders obvious this limitation. The '914 patent provides minimal disclosure on the

claimed "personal area network," stating that it can be implemented with a Bluetooth wireless interface or other suitable interface and be used to couple the disclosed recording system to other Bluetooth-compatible components. EX1031 at 6:25-29, 7:15-22, 10:16-44.

642. Lewellen likewise discloses the use of a Bluetooth wireless interface for coupling to Bluetooth-compatible devices, and a POSITA would have been motivated to implement the Yerazunis/Fiore video recording device with Lewellen's Bluetooth wireless interface for the reasons stated in Section VIII.C.1.

643. For these reasons, it is my opinion that Yerazunis alone or as combined with Fiore, in further view of Lewellen, renders obvious claim 17 of the '914 patent.

D. Ground 2a: Claims 1-10, 13-16, And 18-23 Of The '914 Patent Would Have Been Obvious Over Ely Alone Or As Combined With Fiore

1. Motivation To Combine

644. A POSITA would have been motivated to combine Ely and Fiore with a reasonable expectation of success for at least the reasons stated in Section VIII.F.1 above.

2. Claim 1

a) Preamble: A recording system comprising:

645. Ely discloses the preamble of claim 1. Ely discloses a "video surveillance system" that "includes a central control station and a plurality of video cameras each

mounted inside a dome housing unit." EX1020 at Abstract. Thus, Ely discloses a "recording system."

b) Element 1: a sensor interface that captures sensor data from at least one sensor;

646. Ely discloses this claim element. Ely's video surveillance system includes a camera 130 with the claimed "sensor interface that captures sensor data from at least one sensor":

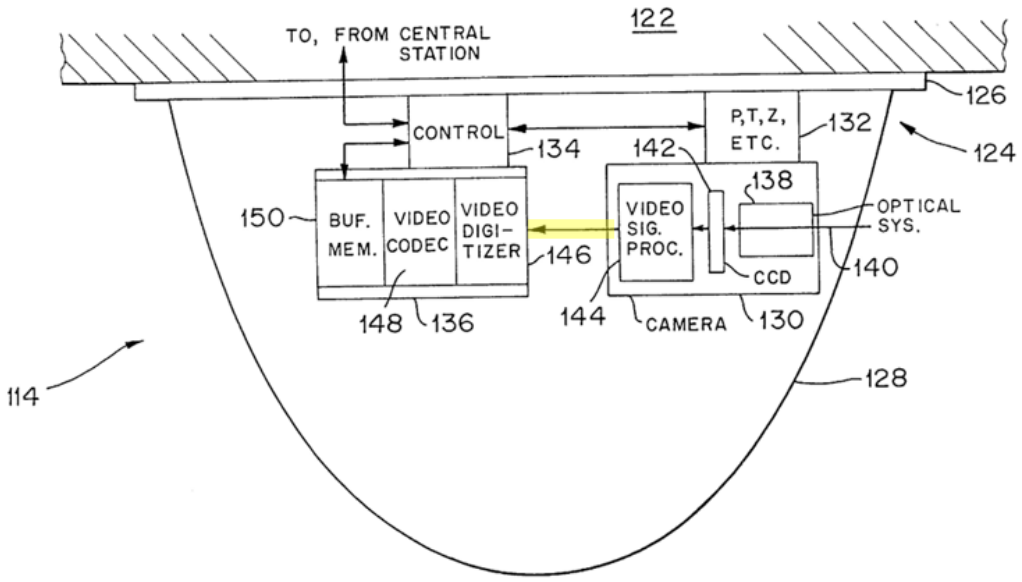


FIG. 3

EX1020 at Fig. 3 (color added).

647. The camera 130 "may be of conventional design, and includes an optical system 138 that receives and forms into an optical image light 140 which passes through the dome 128 into the interior of the camera unit 114. The image formed by the optical system 138 is converted into an electrical signal at CCD 142 and the resulting signal is subjected to conventional analog signal processing at video signal processing

circuit 144." *Id.* at 6:21-28. "The memory board 136 is provided in accordance with the invention to receive an analog video signal output from the camera 130 and to digitize, compress and store the video signal. *Id.* at 6:48-51. The connection between camera 130 and memory board 136 thus discloses the claimed "sensor interface" because captures video images from camera 130 (*i.e.*, "sensor data from at least one sensor," as claimed).

648. Ely's camera 130 also discloses the claimed "sensor interface that captures sensor data from at least one sensor" because its disclosure is similar to that of the '914 patent referring to cameras as being sensing devices. *See*, *e.g.*, EX1031 at 4:21-39.

c) Element 2: a memory coupled with the sensor interface;

649. Ely discloses this claim element. Ely's video surveillance system includes a memory board 136 having a memory device 150 that discloses the claimed "memory" (EX1020 at 6:17-21, 6:48-53, 6:61-65):

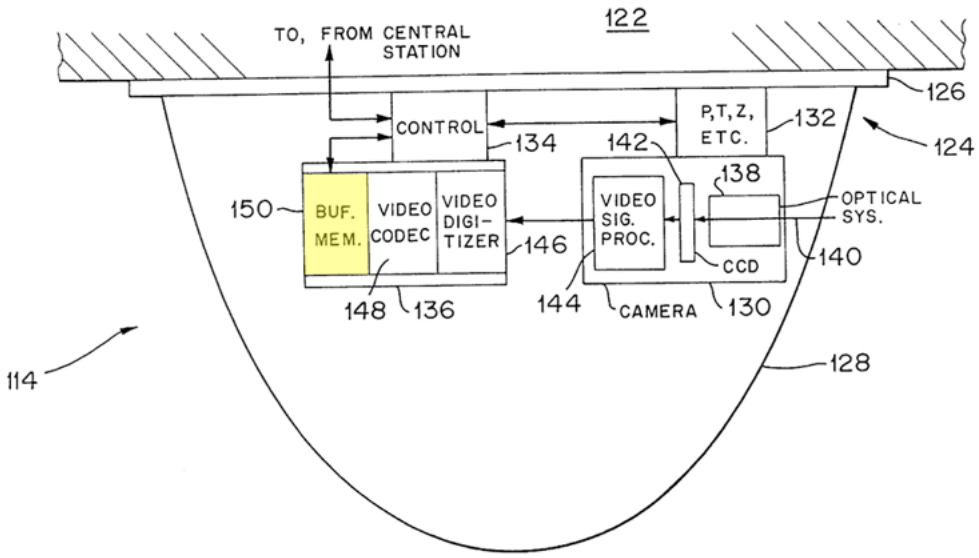


FIG. 3

Id. at Fig. 3 (color added).

650. As seen above, the camera 130 is coupled to the memory board 136 via an interface (*i.e.*, the claimed "sensor interface"), with the memory board 136 being configured "to receive an analog video signal output from the camera 130 and to digitize, compress and store the video signal" in the memory device 150. EX1020 at 6:48-65.

651. Thus, Ely discloses the claimed "memory coupled with the sensor interface."

d) Element 3: a recording facility coupled with the sensor interface and memory, and that records at least some of the sensor data into an available portion of at least one buffer in the memory; and

652. Ely discloses this claim element. Ely's video surveillance system includes a "video data buffer memory, storing compressed video data generated by the camera,"

which "is mounted with each camera in the respective dome unit." EX1020 at Abstract. "The memory device 150 may be constituted by one or more of RAM, EEPROM, flash memory, and so forth," and "functions as a buffer for the video signal generated by the camera 130, and is controlled by the control circuit 134." *Id.* at 6:61-65. More particularly, "the memory 150 serves as a ring buffer, in which currently generated compressed video data is written over the oldest compressed video data that had previously been stored in the memory 150." *Id.* at 7:28-34. As illustrated in Figure 3, below, the control circuit 134 is coupled to memory device 150 (on memory board 136), which is coupled to the camera 130 via an interface (*i.e.*, the claimed "sensor interface") (*id.* at 6:37-47, 6:63-65, 7:5-11):

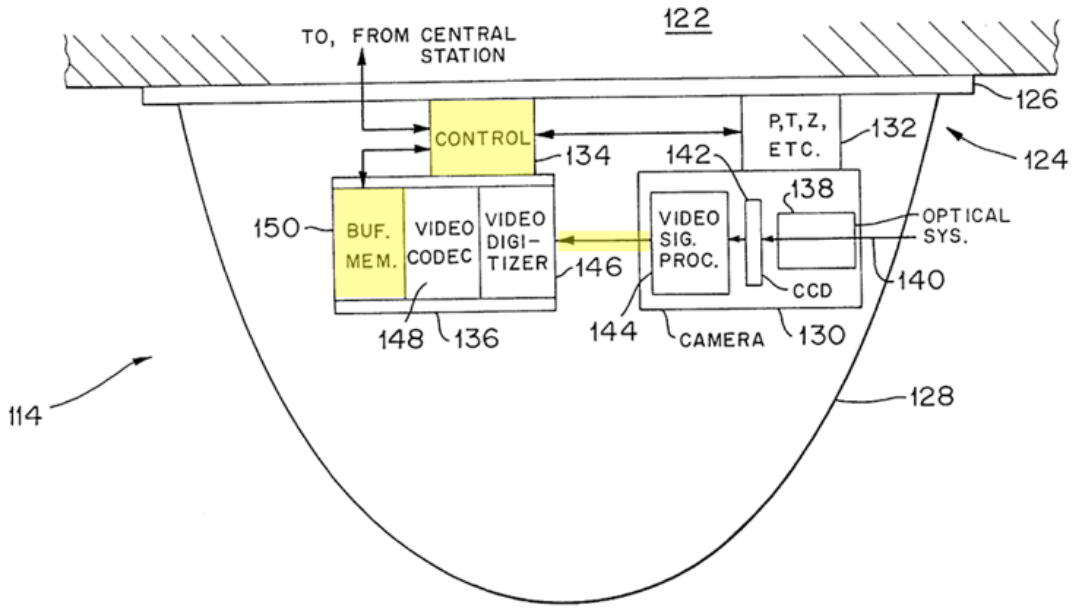


FIG. 3

Id. at Fig. 3 (color added).

653. Thus, the control circuit 134 includes "a recording facility coupled with the sensor interface and memory" that "records at least some of the sensor data into an available portion of at least one buffer in the memory," as claimed.

e) Element 4: a protecting facility coupled with the recording facility that responds to a trigger signal to record the at least some of the sensor data by designating a segment of the at least one buffer as a write-protected segment and by storing the write-protected segment as at least one file in the at least one buffer,

654. Ely alone or as combined with Fiore discloses this claim element.

655. First, Ely's control circuit 134 includes a "protecting facility coupled with the recording facility that responds to a trigger signal to record the at least some of the sensor data by designating a segment of the at least one buffer as a write-protected segment," as claimed. Specifically, Ely discloses that "[w]hen an alarm command is received, a process (indicated by block 160) is carried out in which the control circuit 134 protects from over-writing compressed digital video data previously stored in the memory 150." EX1020 at 7:48-55. The write-protected video data "correspond[s] to a time interval beginning at a predetermined time prior to receipt of the alarm command, and continu[es] for a predetermined time after receipt of the alarm command." *Id.*; *see also id.* at 10:11-15 ("the corresponding camera unit or units respond to the alarm command by protecting buffered video data which corresponds to a predetermined pre- and post-alarm time period").

656. Second, Ely's protecting facility "responds to a trigger signal to record the at least some of the sensor data … by storing the write-protected segment as at least one file in the at least one buffer." Ely discloses that "[a]fter the compressed video data stored at one of the camera units has been protected pursuant to an alarm command, the data (which will sometimes be referred to as 'alarm data') can be selectively retrieved in response to user instruction either for display (block 180) or directly for taperecording (block 182)." EX1020 at 10:17-23. While Ely never expressly refers to its alarm data as a "file," a POSITA would have understood that selectively retrieving alarm data associated with an alarm command necessitates an ability to locate the alarm data within the buffer. A POSITA therefore would have understood such that Ely necessarily discloses —or at minimum, renders obvious—indexing the write-protected segment as at least one file in the buffer. Ely's disclosure of "indexing" discloses "storing the write-protected segment as at least one file in the at least one buffer." *See* Section XI.B.2.e above (explaining that a disclosure of "indexing" as a file satisfies the claimed "storing" limitation). Ely's alarm data must be stored in the buffer in some way, and a POSITA would have understood that storing data as files was a well-known approach for doing so, further evidencing the obviousness of this limitation.

657. Further, as discussed above in Section XI.B.2.e, during prosecution of the '914 patent, the Patent Office understood the "indexing" and "storing" limitations as effectively meaning the same thing. EX1032 at 48-53 (rejecting the pending '914 patent claims on the basis of non-statutory obviousness-type double patenting over the

’471, ’882, and ’034 patents, and finding the pending claims to be “not patentably distinct” from those of the previously issued patents). To the extent there is any difference, a POSITA would have understood “storing” as a file to be broader in scope than “indexing” as a file, including at least because claim 22 of the ’914 patent, which depends from claim 1, recites “wherein the protecting facility is further configured to store the at least one file by indexing the write-protected segment in the at least one buffer.” Accordingly, Ely’s disclosure of indexing write-protected segments as files discloses “storing the write-protected segment as at least one file in the at least one buffer.”

658. To the extent, however, that a POSITA wanted further guidance on the indexing or storing of alarm data as files in Ely’s ring buffer, a POSITA would have been motivated to turn to Fiore. Specifically, a POSITA would have been motivated to implement Ely’s protecting facility such that it “responds to a trigger signal to record” by indexing or storing the write-protected segment as a file in the buffer in the manner disclosed in Fiore. As explained in Section VII.C above, Fiore implements its circular storage buffer 15 as a memory-mapped file and describes indexing collections of frame data for respective events as files within the memory-mapped file. *See*, *e.g.*, EX1009 at [0022]-[0023], [0051], [0059], [0060]. Fiore also describes the benefits of its file-based approach, including that it enables playback of video data for a specific event from the circular buffer without interrupting simultaneous recording of new video data into the buffer. *See*, *e.g.*, *id.* at [0065], [0067], [0068], [0072]. In view of these

exemplary benefits and the additional reasons explained in Section VIII.F.1 above, a POSITA would have been motivated to implement Ely's control circuit 134 to "respond[] to a trigger signal to record" by indexing the write-protected segment as a file in the buffer in the manner disclosed in Fiore. Ely's selective retrieval of alarm data necessitates an ability to locate the alarm data within the buffer, and a POSITA would have been motivated to employ Fiore's indexing of video data to achieve this ability for the above-noted reasons.

659. Additionally, a POSITA would have recognized storing the write-protected segment as a file in the buffer as being one of a finite number of identified solutions, further evidencing its obviousness. *See* Sections VIII.F.2 and IXF.2above. Thus, Ely alone or as combined with Fiore discloses the claimed "protecting facility coupled with the recording facility that responds to a trigger signal to record the at least some of the sensor data by designating a segment of the at least one buffer as a write-protected segment and by storing the write-protected segment as at least one file in the at least one buffer."

f) Element 5: wherein the write-protected segment includes a pre-recorded subset recorded before the trigger signal is received and a post-recorded subset to be recorded after the trigger signal is received.

660. Ely discloses this claim element. Specifically, Ely discloses that "[w]hen an alarm command is received, a process (indicated by block 160) is carried out in which the control circuit 134 protects from over-writing compressed digital video data

previously stored in the memory 150." EX1020 at 7:48-55. The write-protected video data "correspond[s] to a time interval beginning at a predetermined time prior to receipt of the alarm command, and continu[es] for a predetermined time after receipt of the alarm command." *Id.*; *see also id.* at 10:11-15 ("the corresponding camera unit or units respond to the alarm command by protecting buffered video data which corresponds to a predetermined pre- and post-alarm time period"). Thus, Ely discloses "wherein the write-protected segment includes a pre-recorded subset recorded before the trigger signal is received and a post-recorded subset to be recorded after the trigger signal is received," as claimed.

661. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 1 of the '914 patent.

3. Dependent Claims 2-10, 13-16, 18-23

662. ***Claim 2:*** Dependent claim 2 depends from claim 1 and recites "further comprising a sending facility coupled with the memory and configured to transmit data associated with the at least one file from the memory to a remote memory." Ely discloses this limitation. Ely discloses that the "[d]ata buffered at the dome units may be selectively protected from over-writing in response to alarm signals and then retrieved for display or tape-recording by the central control station." EX1020 at Abstract. As illustrated in Figure 5B, below, "[a]fter the alarm data has been retrieved, the user has the option, indicated at block 188, of recording the retrieved alarm data" on a VCR as shown at block 192. *See id.* at 10:24-47. The VCR (or, alternatively, a

digital video tape recorder (*see id.* at 9:51-58)) at the central command station is a "remote memory," as claimed.

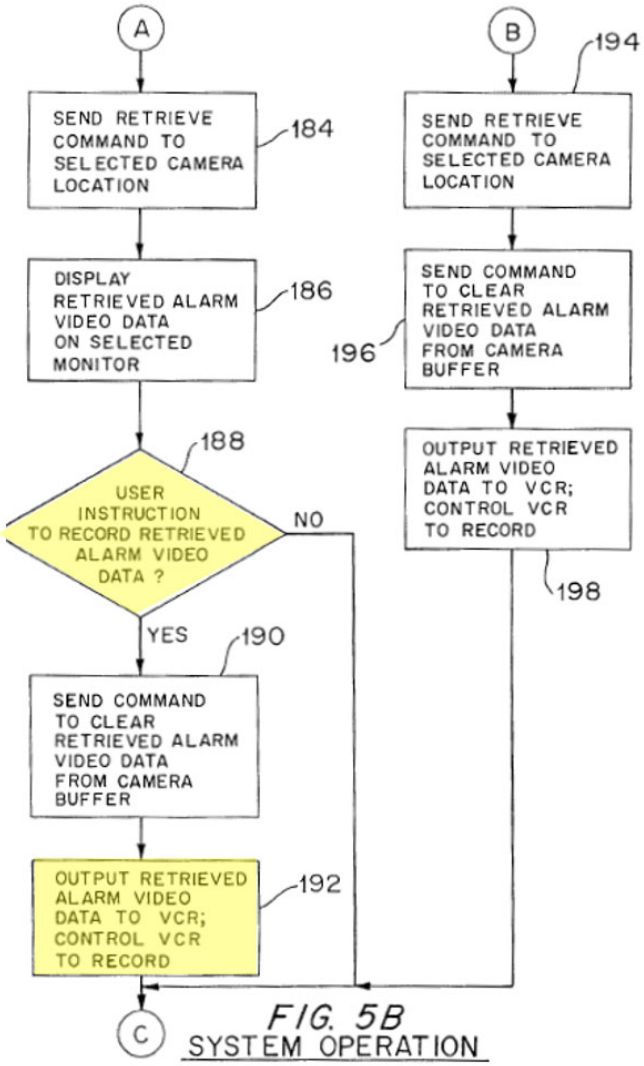


FIG. 5B
SYSTEM OPERATION

663. "If a user indicates that a block of alarm video data is to be displayed, the host 104 sends a retrieve command (via LAN 112) to the selected camera unit 114 (block 184, FIG. 5B). The desired alarm data is then read out from the buffer memory in the designated camera unit and transmitted via the LAN 112." *Id.* at 10:24-30. LAN 112 is a "sending facility." Thus, Ely discloses the claimed "sending facility coupled

with the memory and configured to transmit data associated with the at least one file from the memory to a remote memory."

664. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 2 of the '914 patent.

665. ***Claim 3:*** Dependent claim 3 depends from claim 1 and recites "wherein the sensor data comprises at least one of the following: image data and video data." Ely discloses this limitation. As discussed for claim 1 above, Ely discloses a camera 130 that "may be of conventional design, and includes an optical system 138 that receives and forms into an optical image light 140 which passes through the dome 128 into the interior of the camera unit 114. The image formed by the optical system 138 is converted into an electrical signal at CCD 142 and the resulting signal is subjected to conventional analog signal processing at video signal processing circuit 144." *Id.* at 6:21-28. Thus, Ely discloses "wherein the sensor data comprises at least … video data," as claimed.

666. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 3 of the '914 patent.

667. ***Claims 4 and 5:*** Dependent claim 4 depends from claim 3 and recites "wherein the sensor data comprises a resolution of at least 640x480 pixels." Dependent claim 5 depends from claim 4 and recites "wherein the sensor data comprises a resolution of at least 1080p." These limitations would have been obvious to a POSITA in view of Ely. As discussed above for claim 1 of the '914 patent, Ely's video

surveillance system includes a camera 130 that includes a sensor interface that captures data from at least one sensor.

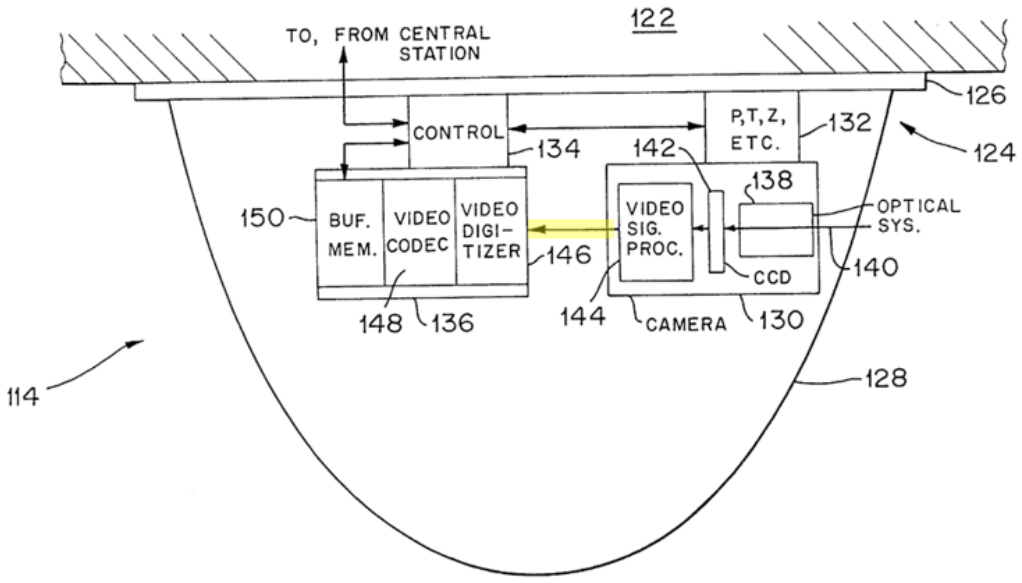


FIG. 3

EX1020 at Fig. 3 (color added).

668. As seen above, the camera 130 is coupled to the memory board 136 via an interface (*i.e.*, the claimed "sensor interface"), with the memory board 136 being configured "to receive an analog video signal output from the camera 130 and to digitize, compress and store the video signal" in the memory device 150. EX1020 at 6:48-65. The camera 130 "may be of conventional design, and includes an optical system 138 that receives and forms into an optical image light 140 which passes through the dome 128 into the interior of the camera unit 114. The image formed by the optical system 138 is converted into an electrical signal at CCD 142 and the resulting signal is subjected to conventional analog signal processing at video signal processing circuit

144." *Id.* at 6:21-28. A POSITA would have understood that a conventional camera would have a resolution. A POSITA would have further been motivated to select an camera capable of capturing video data at a sufficient resolution, such as of at least 640x480 pixels or 1080p, so that the video captured would be clearly presented upon playback.

669. Indeed, such resolutions were well-known as of the purported June 2007 priority date of the '914 patent (including in the context of in-car mobile video recorders, EX1007 at 22), and the selection of an image sensor that captures video data at these conventional resolutions would have been obvious to a POSITA. EX1034 at 3:24-33. A POSITA would have had a reasonable expectation of success because cameras capable of capturing video data at the claimed resolutions were well-known, and implementing such cameras in the Ely/Fiore recording system would have been routine and well within a POSITA's skill.

670. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claims 4 and 5 of the '914 patent.

671. ***Claim 6:*** Dependent claim 6 depends from claim 1 and recites "wherein the sensor data recorded into the available portions of the at least one buffer is compressed." Ely discloses this limitation. Ely's video surveillance system includes "processing circuitry disposed within the housing for applying a data compression algorithm to the digital video signal to form compressed video data, the compressed video data being stored in the storage device," said storage device comprising a ring

buffer. EX1020 at 2:65-3:5, 3:56-67, 4:49-56. In one embodiment, the processing circuitry compresses video data according to the H.261 standard:

> The memory board 136 is provided in accordance with the invention to receive an analog video signal output from the camera 130 and to digitize, compress and store the video signal. Components of the memory board 136 include a video digitizer circuit 146, a video data coding/decoding circuit 148 and a memory device 150. The video digitizer 146 may be suitably realized by the "WAVEWATCHER TV II" video digitizer card available from AITech International, Fremont, Calif. A suitable video codec is the model VCI-10, available from VistaCom, OY, Tietajantie 14, 02130, Espoo, Finland. The model VCI-10 compresses video data in accordance with the H.261 standard, and also provides the function of reconstituting video data that has been compressed in accordance with that standard. The memory device 150 may be constituted by one or more of RAM, EEPROM, flash memory, and so forth. As will be seen, the memory device 150 functions as a buffer for the video signal generated by the camera 130, and is controlled by the control circuit 134.

Id. at 6:48-65.

672. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 6 of the ’914 patent.

673. ***Claims 7 and 8:*** Dependent claim 7 depends from claim 6 and recites “wherein the sensor data recorded into the available portions of the at least one buffer is time compressed.” Dependent claim 8 depends from claim 6 and recites “wherein

the sensor data recorded into the available portions of the at least one buffer is frame compressed." These limitations would have been obvious to a POSITA in view of Ely. As discussed above for claim 6 of the '914 patent, Ely's video surveillance system includes processing circuitry that compresses video data stored in the ring buffer. EX1020 at 2:65-3:5, 3:56-67, 4:49-56, 6:48-65. Two well-known compression techniques as of the purported June 2007 priority date were time compression and frame compression. It would have been obvious to a POSITA to select either or both of these conventional compression technique in the Ely/Fiore video recording system. Before the purported June 2007 priority date of the challenged patents, image and video data, by necessity, was almost always compressed to save storage as well as I/O and network bandwidth requirements. Cameras and video encoders before June 2007 already had the ability to change the frame rate and bitrate. MPEG-1, released in 1991, used a combination of spatial and temporal compression. Appx NN, a set of lecture notes entitled "Video Compression," discuss this. The respective "time compression" and "frame compression" limitations of claims 7 and 8 would have been obvious over Ely alone or as combined with Fiore for at least these reasons.

674. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claims 7 and 8 of the '914 patent.

675. ***Claim 9:*** Dependent claim 9 depends from claim 1 and recites "wherein the sensor data comprises at least one of the following: audio data and motion data." Ely discloses this limitation. Ely's camera 130 generates video signals that "may be

analog video signals, in which case the digital storage circuitry includes circuitry for converting the analog video signals into digital video signals and circuitry for compressing the digital video signals to form compressed digital video data." EX1020 at 4:49-54. "Alternatively, the video signals generated by the camera 130 may be in the form of compressed digital video data." *Id.* at 4:54-56. A POSITA would have understood that video data would necessarily comprise motion data (*e.g.*, motion data showing unauthorized opening of doors, windows, display cases, and the like, *see id.* at 1:39-47, 5:50-53, 10:1-23). Thus, Ely discloses "wherein the sensor data comprises at least … motion data," as claimed.

676. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 9 of the '914 patent.

677. ***Claim 10:*** Dependent claim 10 depends from claim 1 and recites "wherein the memory comprises at least one of the following: RAM and flash." Ely discloses this limitation. The memory board 136 having a memory device 150 (*i.e.*, the claimed "memory" (EX1020 at 6:17-21, 6:48-53, 6:61-65)) "may be constituted by one or more of RAM, EEPROM, flash memory, and so forth." *Id.* at 6:61-63.

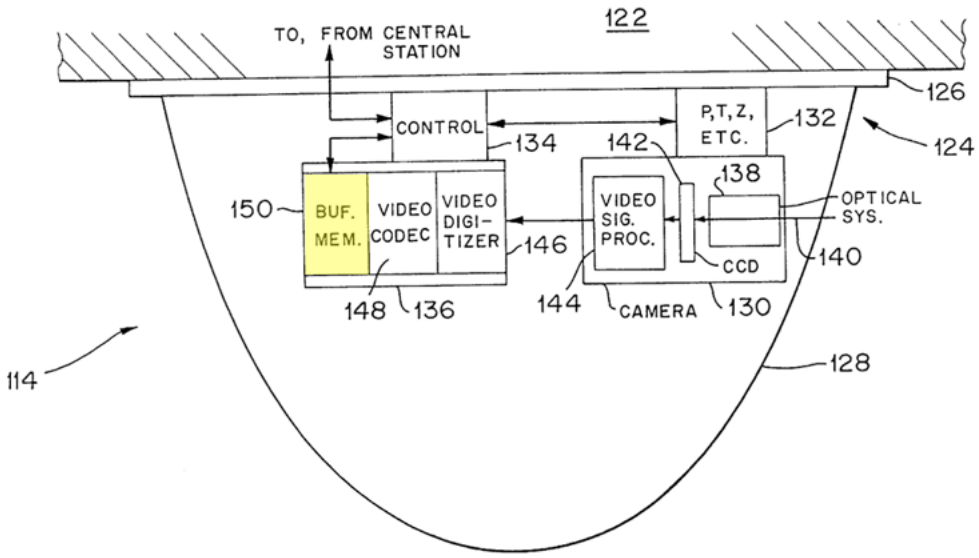


FIG. 3

Id. at Fig. 3 (color added).

678. Ely thus discloses "wherein the memory comprises at least one of the following: RAM and flash," as claimed.

679. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 10 of the '914 patent.

680. ***Claim 13:*** Dependent claim 13 depends from claim 1 and recites "wherein the at least one buffer comprises a circular buffer." Ely discloses this limitation. As discussed above for claim 1 of the '914 patent, Ely's video surveillance system includes a memory device 150 that "functions as a buffer for the video signal generated by the camera 130, and is controlled by the control circuit 134." EX1020 at Abstract, 6:61-65. "[T]he memory 150 serves as a ring buffer, in which currently generated compressed video data is written over the oldest compressed video data that had

previously been stored in the memory 150." *Id.* at 7:28-34. A POSITA would have understood the "ring buffer" to mean a "circular buffer" of the type disclosed in the '914 patent. Thus, Ely discloses "wherein the at least one buffer comprises a circular buffer," *i.e.*, a ring buffer, as claimed.

681. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 13 of the '914 patent.

682. ***Claim 14:*** Dependent claim 14 depends from claim 1 and recites "a camera including the sensor interface, the memory, and the recording facility." Ely discloses this limitation. Ely's surveillance system includes a connection between the camera 130 and memory board 136 (*i.e.*, "sensor interface"), memory device 150 (*i.e.*, the "memory"), and control circuit 134 including the claimed "recording facility":

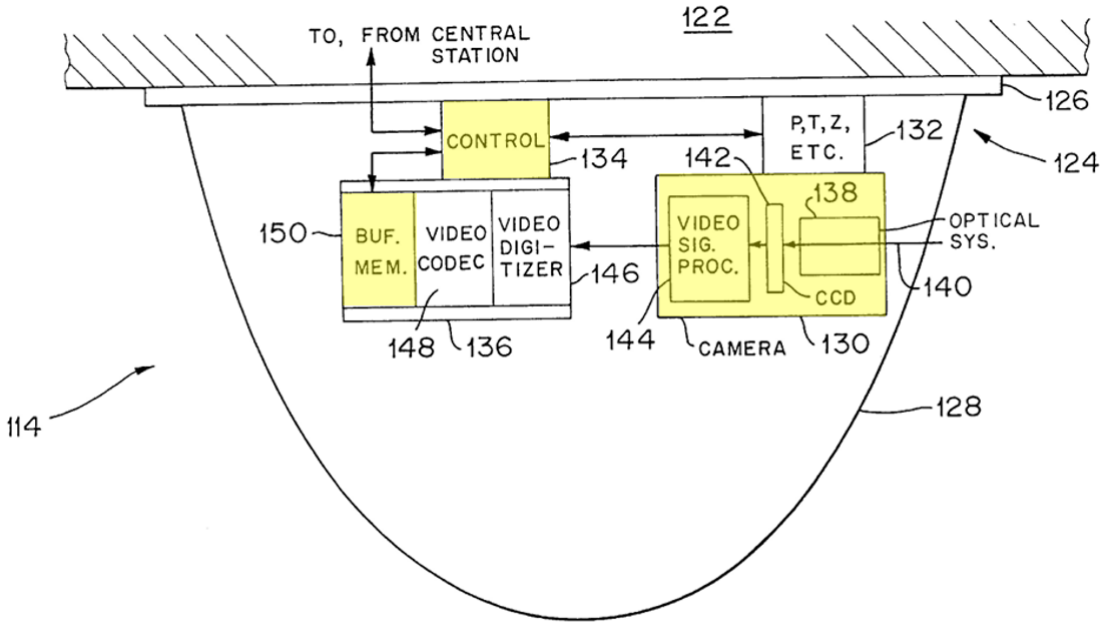


FIG. 3

EX1020 at Fig. 3; *see also id.* at 6:4-6.

683. As illustrated above, the sensor interface, memory, and recording facility are all included in camera unit 114, which a POSITA would have understood to be a "camera," as claimed. At the purported priority date of the challenged patents (June 2007), the term "camera" was often used in referring to systems with imaging components, microprocessor controllers, and memory for storing image and video data, like the camera unit 114 depicted in Figure 3 of Ely. Thus, Ely's camera unit 114 is "a camera including the sensor interface, the memory, and the recording facility," as claimed.

684. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 14 of the '914 patent.

685. ***Claim 15:*** Dependent claim 15 depends from claim 14 and recites "wherein the camera comprises a security camera." Ely discloses this limitation. Ely's "video surveillance system" includes "sensors for advising the system of alarm conditions." EX1020 at 1:5-8. These alarm conditions include "unauthorized opening of doors, windows and display cases and the like." *Id.* at 2:50-55. Thus, Ely discloses the claimed "security camera."

686. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 15 of the '914 patent.

687. ***Claim 16:*** Dependent claim 16 depends from claim 1 and recites "further comprising a cell phone including the sensor interface, the memory, and the recording facility." This limitation would have been obvious to a POSITA in view of Ely. As

discussed above for claim 14 of the '914 patent, Ely discloses "a camera including the sensor interface, the memory, and the recording facility." Likewise, cell phones were well-known as of the purported June 2007 priority date of the '914 patent, and it would have been obvious to a POSITA to implement the Ely/Fiore video recording device in a cell phone. Cell phones as of June 2007 included cameras, memory, and microprocessor components, and a POSITA would have therefore understood cell phones as being well-suited for implementing the Ely/Fiore video recording device. A POSITA would have been motivated to do so at least because implementation of the Ely/Fiore video recording device in a cell phone would enhance portability and accessibility of the device, because cell phones were carried by much of the public, including security professionals.

688. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 16 of the '914 patent.

689. ***Claim 18:*** Dependent claim 18 depends from claim 1 and recites "wherein the at least one file in the at least one buffer comprises a single file." Ely alone or in combination with Fiore discloses this limitation. Ely discloses that "[a]fter the compressed video data stored at one of the camera units has been protected pursuant to an alarm command, the data (which will sometimes be referred to as 'alarm data') can be selectively retrieved in response to user instruction either for display (block 180) or directly for tape recording (block 182)." EX1020 at 17:23. A POSITA would have understood that the selective retrieval of alarm data from the buffer necessitates an

ability to locate the alarm data as a single file within the buffer, such that Ely necessarily discloses "wherein the at least one file in the at least one buffer comprises a single file."

690. To the extent that a POSITA wanted further guidance as to particular methods for indexing of alarm data as files in Ely's buffer, a POSITA would have been motivated to turn to Fiore. As explained in Section VII.C above, Fiore implements its circular storage buffer 15 as a memory-mapped file and describes indexing collections of frame data for respective events as files within the memory-mapped file. *See, e.g.*, EX1009 at [0022]-[0023], [0051], [0059], [0060]. A POSITA would have understood that Ely's selective retrieval of video data from the buffer necessitates an ability to locate the video data as single files within the buffer, and would have been motivated to employ Fiore's indexing of video data to achieve this ability for the reasons stated above in Section VIII.F.1. Thus, Ely in view of Fiore renders obvious "at least one file in the at least one buffer comprises a single file," as claimed.

691. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 18 of the '914 patent.

692. ***Claim 19:*** Dependent claim 19 depends from claim 18 and recites "wherein the single file comprises an entirety of the at least one buffer." Ely alone or in combination with Fiore discloses this limitation. Fiore implements its circular storage buffer as a memory-mapped file, preferably "a single continuous disk file." EX1009 at [0071]. Fiore therefore discloses "wherein the single file comprises an entirety of the at least one buffer."

693. A POSITA would have been motivated to implement Ely's video recording device with Fiore's teaching of a memory-mapped file for the reasons stated above in Section VIII.F.1.

694. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 19 of the '914 patent.

695. ***Claim 20:*** Dependent claim 20 depends from claim 1 and recites "wherein the trigger signal represents detection of at least one of the following: a motion, a sound, an image, content in a data stream, a pattern in the sensor data, a person, a human face, a computer screen, an event, a verbal command, operation of a switch, and operation of a button." Ely discloses this limitation. Ely's video surveillance system comprises one or more sensor devices 120, which "are preferably of conventional types that detect, for example, unauthorized opening of doors, windows and display cases and the like and generate alarm signals indicative of these occurrences." EX1020 at 5:50-53. "The sensors 120 may also include conventional motion and/or heat sensing devices." *Id.* at 5:54-55.

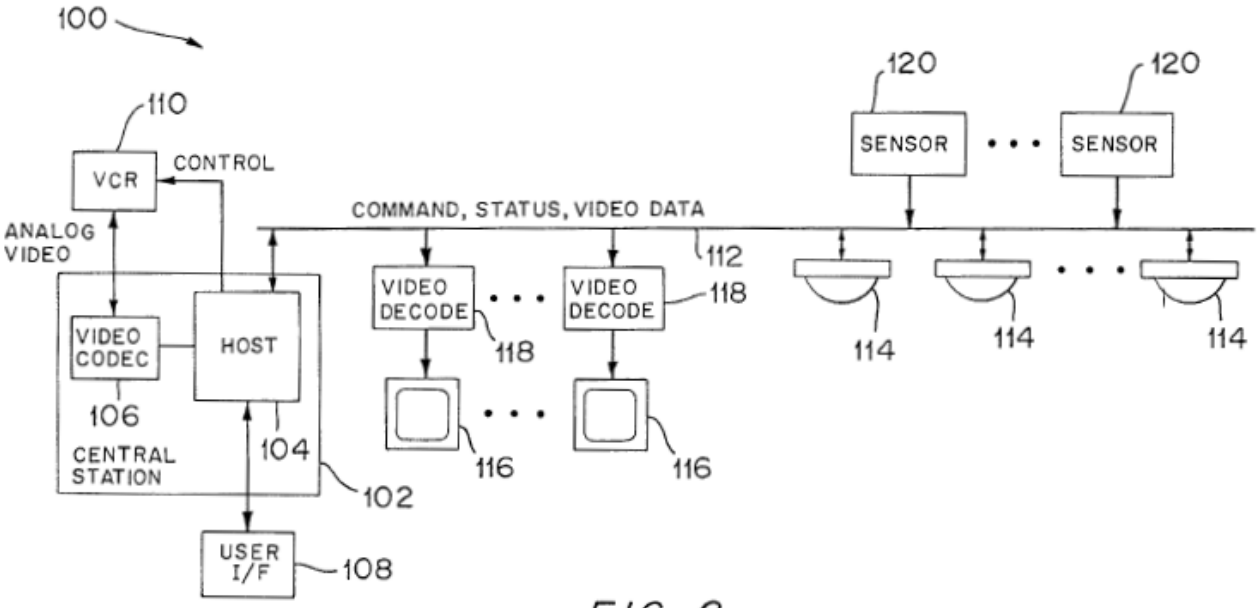


FIG. 2

696. Thus, Ely discloses "wherein the trigger signal represents detection of at least one of the following: a motion," as claimed.

697. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 20 of the '914 patent.

698. ***Claim 21:*** Dependent claim 21 depends from claim 1 and recites "wherein the protecting facility is further configured to update the write-protected segment as being non-protected and free for recording." Ely discloses this limitation. The control circuit 134 of Ely's video surveillance system is conditioned to receive commands relating to the previously stored compressed video data. EX1020 at 7:56-59. "As indicated by decision block 166, the control circuit 134 is also conditioned to receive 'clear' commands, in response to which the control circuit removes a previously protected block of stored video data from protection, thereby permitting 'live' video

data to be written over the now-unprotected stored video data." *Id.* at 8:7-12. In one embodiment, the clear command may be sent after write-protected alarm data is retrieved:

> If a user indicates that a block of alarm video data is to be displayed, the host 104 sends a retrieve command (via LAN 112) to the selected camera unit 114 (block 184, FIG. 5B). The desired alarm data is then read out from the buffer memory in the designated camera unit and transmitted via the LAN 112, as was discussed above in connection with blocks 162 and 164 (FIG. 4). The transmitted data is then "virtually routed" to a designated monitor (block 186), by, for example, any of the practices that were previously described in connection with routing of live video. The selected monitor may be a portion of the user interface 108, in which case the routing may be by way of the host 104. After the alarm data has been retrieved, the user has the option, indicated at block 188, of recording the retrieved alarm data. If this option is exercised, the alarm data, having been re-buffered at the host computer 104, can be cleared from the camera unit buffer by sending a clear command (block 190, FIG. 5B) which causes the camera unit to unprotect the data, as previously discussed in connection with block 168 (FIG. 4).

Id. at 10:24-43; *see also id.* at 10:51-55 ("After retrieval of the alarm data is complete, a clear command is sent (block 196) to the camera unit to clear the retrieved alarm data from the camera unit buffer, and the retrieved alarm data is recorded on the VCR (block 198).").

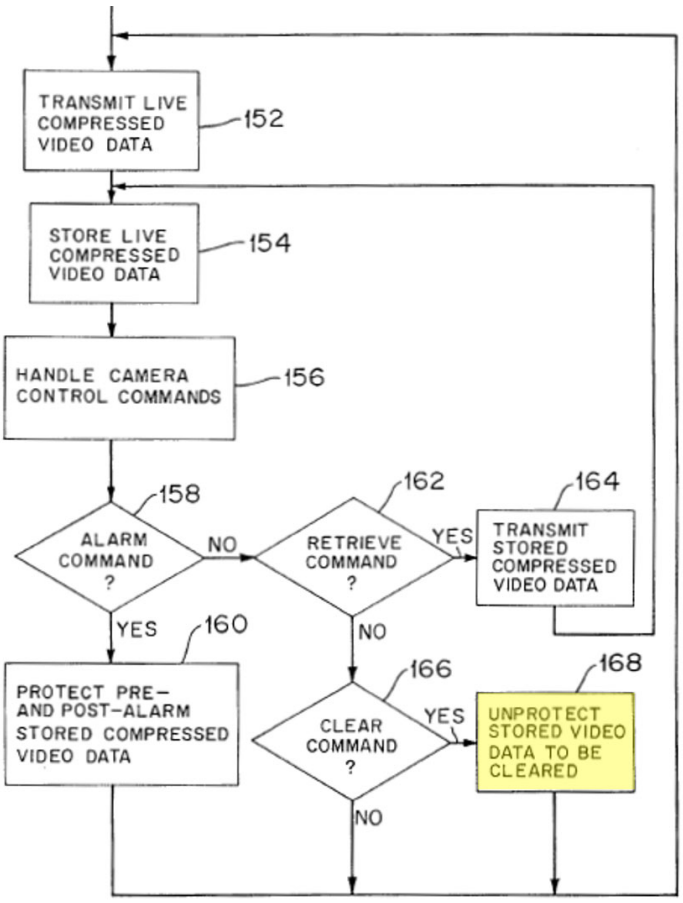


FIG. 4
CAMERA UNIT OPERATION

Id. at Fig. 4 (color added); *see also id.* at Fig. 5B (block 190).

699. Thus, Ely discloses "wherein the protecting facility is further configured to update the write-protected segment as being non-protected and free for recording," as claimed.

700. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 21 of the '914 patent.

701. ***Claim 22:*** Dependent claim 22 depends from claim 1 and recites "wherein the protecting facility is further configured to store the at least one file by indexing the

write-protected segment in the at least one buffer." As explained above for claim 1 of the '914 patent, Ely alone or as combined with Fiore discloses this limitation.

702. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 22 of the '914 patent.

703. ***Claim 23:*** Dependent claim 23 depends from claim 22 and recites "wherein the protecting facility is further configured to index the write-protected segment while the recording facility is still recording the sensor data into the memory." Ely alone or as combined with Fiore discloses this limitation.

704. Ely discloses that its "control circuit 134 is conditioned (as indicated by decision block 162) to receive commands calling for reading-out and transmission to the central station of previously-stored compressed video data." EX1020 at 7:56-59. "The transmission of the compressed video data that was read out from the memory 150 may be in place of, or virtually in parallel with, continued transmission of 'live' compressed video data." *Id.* at 7:66-8:2. "Preferably, … transmission of stored compressed video data in response to corresponding retrieval commands does not interrupt ongoing storage of 'live' video data." *Id.* at 8:2-6. A POSITA would have understood that the selective retrieval and transmission of alarm data without interrupting ongoing storage of "live" video data necessitates that the control circuit 134 be configured to index the alarm data (*i.e.*, the write-protected segment) while continuing to record the video data into the memory. Thus, Ely alone or as combined with Fiore discloses "wherein the protecting facility is further configured to index the

write-protected segment while the recording facility is still recording the sensor data into the memory," as claimed.

705. For these reasons, it is my opinion that Ely alone or as combined with Fiore renders obvious claim 23 of the '914 patent.

E. Ground 2b: Claims 11, 12, And 17 Of The '914 Patent Would Have Been Obvious Over Ely Alone Or As Combined With Fiore, In Further View Of Lewellen

1. Motivation To Combine

706. A POSITA would have been motivated to combine the Ely/Fiore system described above with Lewellen and had a reasonable expectation of success for at least the reasons stated in Section VIII.F.1.

2. Dependent Claims 11, 12, and 17

707. ***Claim 11:*** Dependent claim 11 depends from claim 1 and recites "wherein the sensor interface comprises a wireless interface to the at least one sensor." As explained above for Ground 1b of the '914 patent, Lewellen discloses this limitation. Further, a POSITA would have been motivated to incorporate Lewellen's local wireless interface 390 into the Ely/Fiore system and to use this interface to wirelessly couple to a remote camera (*i.e.*, "at least one sensor") for at least the reasons explained above in Section VIII.F.1. For these reasons, it is my opinion that Ely alone or as combined with Fiore, in further view of Lewellen, therefore renders obvious claim 11 of the '914 patent.

708. ***Claim 12:*** Dependent claim 12 depends from claim 11 and recites "wherein the wireless interface comprises a BlueTooth® wireless interface." As explained above for Ground 1b of the '914 patent, Lewellen discloses this limitation. Further, a POSITA would have been motivated to implement the Ely/Fiore system with Lewellen's Bluetooth wireless interface for at least the reasons explained above in Section VIII.F.1. For these reasons, it is my opinion that Ely alone or as combined with Fiore, in further view of Lewellen, therefore renders obvious claim 11 of the '914 patent.

709. ***Claim 17:*** Dependent claim 17 depends from claim 1 and recites "further comprising a personal area network coupled with the protecting facility and including at least two of the following: the sensor interface, the memory, and the recording facility." As explained above for Ground 1b, the '914 patent provides minimal disclosure on the claimed "personal area network," stating that it can be implemented with a Bluetooth wireless interface or other suitable interface and be used to couple the disclosed recording system to other Bluetooth-compatible components. EX1031 at 6:25-29, 7:15-22, 10:16-44. And as explained above in Section VIII.C.1, Lewellen discloses this limitation: Lewellen discloses the use of a Bluetooth wireless interface for coupling to Bluetooth-compatible devices, and a POSITA would have been motivated to implement the Ely/Fiore system with Lewellen's Bluetooth wireless interface for at least the reasons explained above in Section VIII.F.1. For these reasons,

it is my opinion that Ely alone or as combined with Fiore, in further view of Lewellen, therefore renders obvious claim 17 of the ’914 patent.

APPENDICES (Exhibit 1041)

APPENDIX	TITLE
A	*Curriculum Vitae* of Nabil J. Sarhan
B	U.S. Patent No. 2003/0151663 (Lorenzetti)
C	U.S. Patent No. 7,804,426 (Etcheson)
D	U.S. Patent Pub. No. 2002/0131768 (Gammenthaler 1)
E	U.S. Patent Pub. No. 2004/0201765 (Gammenthaler 2)
F	RESERVED
G	RESERVED
H	RESERVED
I	U.S. Patent No. 6,389,340 (Rayner)
J	U.S. Patent No. 6,421,080 (Lambert)
K	U.S. Patent No. 6,088,635 (Cox)
L	U.S. Patent Pub. No. 2004/0252193 (Higgins)
M	U.S. Patent Pub. No. 2004/0150717 (Page)
N	POLICE VIDEO Up Close and Personal, LAW and ORDER, August 1999
O	Sheriff Baca Introduces In-Car Video System and "Cop-Cam," County Digest (Country of Los Angeles), March 2000
P	Deja View Camwear Model 100, CARPE'04, October 15, 2004
Q	U.S. Patent Pub. No. 2005/0088521 (Blanco 2)
R	U.S. Patent No. 8,350,907 (Blanco)
S	RESERVED
T	RESERVED
U	U.S. Patent Pub. No. 2005/0078195 (Van Wagner)
V	U.S. Patent No. 6,995,668 (Junqua)
W	U.S. Patent Pub. No. 2001/0005217 (Hamilton)
X	PCT Patent Pub. No. WO2004/036926 (Pearlson)
Y	U.S. Patent No. 6,690,294 (Zierden)
Z	U.S. Patent No. 6,831,556 (Boykin)
AA	Bing-Fei WU et al., "A Practical Home Security System via Mobile Phones," Proceedings of the 5th WSEAS International Conference on

APPENDIX	TITLE
	Telecommunications and Informatics, Istanbul, Turkey, May 27-29, 2006 (pages 299-304)
BB	S.C. Hui et al., "Remote Video Monitoring Over the WWW," Multimedia Tools and Applications, 21, 173–195, 2003, Kluwer Academic Publishers, The Netherlands
CC	Video Process Monitoring, Steve Rubin, automation.com, Feb. 3, 2003
DD	U.S. Patent No. 6,578,070 (Weaver)
EE	U.S. Patent No. 7,088,387 (Freeman 2)
FF	U.S. Patent No. 7,747,143 (DeKeyser)
GG	U.S. Patent No. U.S. 2007/0071395 A1 (Boone)
HH	U.S. Patent Pub. No. U.S. 2007/0132773 A1 (Plante 2)
II	"Operating Systems" (Third Ed. 2004) by H.M Deitel, P.J. Deitel, and D.R. Choffnes (excerpt)
JJ	SecurityMagazine.com – VIDEOSurveillance: Wireless Mesh Networks
KK	DeepSentinel – A Brief History of Surveillance Cameras
LL	Wireless Video Surveillance: A Survey
MM	Cost-Efficient Mining Techniques for Data Streams
NN	Video Compression – Lecture Notes