Doc Code: PET.SPRE.ACX

PTO/SB/28 (04-07)
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PETITION TO MAKE SPECIAL UNDER ACCELERATED EXAMINATION PROGRAM

Attorney Docket Number	101488.0003US2	First Named Inventor	Paul DeKeyser
Application Number (if Known)			
Title of Invention	Loop Recording With Book Marking		

APPLICANT HEREBY PETITIONS TO MAKE THE ABOVE-IDENTIFIED APPLICATION SPECIAL UNDER THE REVISED ACCELERATED EXAMINATION PROGRAM. See Instruction sheet on page 3.

1. **Claims of the application:**
   a. The application must contain three (3) or fewer independent claims and twenty (20) or fewer total claims. The application may not contain any multiple dependent claims.

   b. **Applicant hereby agrees not to separately argue the patentability of any dependent claim during any appeal** in the application. Specifically, the applicant agrees that the dependent claims will be grouped together with and not argued separately from the independent claim from which they depend in any appeal brief filed in the application (37 CFR 41.37(c)(1)(vii)).

   c. The claims must be directed to **a single invention**.

2. **Interviews:**
   Applicant hereby agrees to have (if requested by examiner):
   a. An interview (including an interview before a first Office action) to discuss the prior art and any potential rejections or objections with the intention of clarifying and possibly resolving all issues with respect to patentability at that time, and

   b. A telephonic interview to make an election without traverse if the Office determines that the claims are not obviously directed to a single invention.

3. **Preexamination Search Statement and Accelerated Examination Support Document:**
   With this petition, applicant is providing: a **preexamination search statement**, in compliance with the requirements set forth in item 8 of the instruction sheet, and an **"accelerated examination support document"** that includes:
   a. An **information disclosure statement** in compliance with 37 CFR 1.98 citing each reference deemed most closely related to the subject matter of each of the claims;

   b. For each reference cited, **an identification of all the limitations of the claims** that are disclosed by the reference specifying where the limitation is disclosed in the cited reference;

   c. A **detailed explanation of how each of the claims are patentable** over the references cited with the particularity required by 37 CFR 1.111(b) and (c);

   d. A concise **statement of the utility** of the invention as defined in each of the independent claims (unless the application is a design application);

   e. An identification of any cited references that may be disqualified as prior art under 35 U.S.C. 103(c) as amended by the CREATE act; and

   f. **A showing of where each limitation of the claims finds support under the first paragraph of 35 U.S.C. 112** in the written description of the specification. If applicable, the showing must also identify: (1) each means- (or step-) plus-function claim element that invokes consideration under 35 U.S.C. 112, ¶6; and (2) the structure, material, or acts that correspond to any means- (or step-) plus-function claim element that invokes consideration under 35 U.S.C. 112, ¶6. If the application claims the benefit of one or more applications under title 35, United St ates Code, the showing must also include where each limitation of the claims finds support under the first paragraph of 35 U.S.C. 112 in each such application in which such support exists.

The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This form is estimated to take 12 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. *If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

Motorola v. Stellar
Motorola Exhibit 1013
Page 001

Doc Code: PET.SPRE.ACX

PTO/SB/28 (04-07)
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PETITION TO MAKE SPECIAL UNDER ACCELERATED EXAMINATION PROGRAM (Continued)

Attorney Docket Number	101488.0003US2	First Named Inventor	Paul DeKeyser

Attachments:

a.		Accelerated Examination Support Document (see item 3 above).
b.		A statement, in compliance with the requirements set forth in item 8 of the instruction sheet, detailing the preexamination search which was conducted.
c.		Information Disclosure Statement.
d.	☐	Other (*e.g.*, a statement that the claimed subject matter is directed to environmental quality, energy, or countering terrorism (37 CFR 1.102(c)(2)).

Fees: The following fees must be filed electronically via EFS or EFS-Web:

a.	The basic filing fee, search fee, examination fee, and application size fee (if required) under 37 CFR 1.16.
b.	Petition fee under 37 CFR 1.17(h) - unless the petition is filed with a showing under 37 CFR 1.102(c)(2).

Signature:

Click Remove if you wish to remove this signatory — Remove

Signature	/Robert D. Fish/	Date	2008-11-10
Name (Print/Typed)	Robert D. Fish	Registration Number	33880

Click Add if you wish to add additional signatory — Add

Note: *Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.*

PTO/SB/28 (04-07)
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Instruction Sheet Petition to Make Special Under the Accelerated Examination

A grantable petition must meet the following conditions:

1. The petition to make special under the accelerated examination program must be filed with the application and accompanied by the fee set forth in 37 CFR 1.17(h) or a statement that the claimed subject matter is directed to environmental quality, energy, or countering terrorism.

2. The application must be a non-reissue utility or design application filed under 35 U.S.C. 111(a).

3. The application must be **filed electronically** using the Office electronic filing system (EFS) or EFS-Web.

4. The application must be complete under 37 CFR 1.51 and in condition for examination on filing. For example, the application must be filed together with the basic filing fee, search fee, examination fee, and application size fee (if applicable), and an oath or declaration under 37 CFR 1.63.

5. The application must contain three (3) or fewer independent claims and twenty (20) or fewer total claims. The application may not contain any multiple dependent claims. The petition must include a statement that **applicant will agree not to separately argue the patentability of any dependent claim during any appeal** in the application. Specifically, the applicant is agreeing that the dependent claims will be grouped together with and not argued separately from the independent claim from which they depend in any appeal brief filed in the application (37 CFR 41.37(c)(1)(vii)).

6. The claims must be directed to a **single invention**. The petition must include a statement that applicant will agree to have a telephonic interview to make an election without traverse in a telephonic interview if the Office determines that all the claims are not directed to a single invention.

7. The petition must include a statement that **applicant will agree** to have an interview (including an interview before a first Office action) to discuss the prior art and any potential rejections or objections with the intention of clarifying and possibly resolving all issues with respect to patentability at that time.

8. At the time of filing, applicant must provide a statement that a **preexamination search was conducted**, including an identification of the field of search by United States class and subclass and the date of the search, where applicable, and, for database searches, the search logic or chemical structure or sequence used as a query, the name of the file or files searched and the database service, and the date of the search.
   a. This preexamination search must involve U.S. patents and patent application publications, foreign patent documents, and nonpatent literature, unless the applicant can justify with reasonable certainty that no references more pertinent than those already identified are likely to be found in the eliminated source and includes such a justification with this statement.
   b. This preexamination search must be directed to the claimed invention and encompass all of the features of the independent claims, giving the claims the broadest reasonable interpretation.
   c. The preexamination search must also encompass the disclosed features that may be claimed, in that an amendment to the claims (including any new claim) that is not encompassed by the preexamination search will be treated as non-responsive and will not be entered.
   d. A search report from a foreign patent office will not be accepted unless the search report satisfies the requirements set forth above.
   e. Any statement in support of a petition to make special must be based on a good faith belief that the preexamination search was conducted in compliance with these requirement. See 37 CFR 1.56 and 10.18.

9. At the time of filing, applicant must provide in support of the petition an **accelerated examination support document that includes:**
   a. An **information disclosure statement** in compliance with 37 CFR 1.98 citing each reference deemed most closely related to the subject matter of each of the claims;
   b. For each reference cited, **an identification of all the limitations of the claims** that are disclosed by the reference specifying where the limitation is disclosed in the cited reference;
   c. A **detailed explanation of how each of the claims are patentable** over the references cited with the particularity required by 37 CFR 1.111(b) and (c);
   d. A concise **statement of the utility** of the invention as defined in each of the independent claims (unless the application is a design application);
   e. An identification of any cited references that may be disqualified as prior art under 35 U.S.C. 103(c) as am ende d by the CREATE act; and
   f. A **showing of where each limitation of the claims finds support under the first paragraph of 35 U.S.C. 112** in the written description of the specification. If applicable, the showing must also identify: (1) each means- (or step-) plus-function claim element that invokes consideration under 35 U.S.C. 112, ¶6; and (2) the structure, material, or acts that correspond to any means- (or step-) plus-function claim element that invokes consideration under 35 U.S.C. 112, ¶6. If the application claims the benefit of one or more applications under title 35, United States Code, the showing must also include where each limitation of the claims finds support under the first paragraph of 35 U.S.C. 112 in each such application in which such support exists.
   For more information, see notice "Changes to Practice for Petitions in Patent Applications to Make Special and for Accelerated Examination" available on the USPTO web site at http://www.uspto.gov/web/office s/pac/dapp/ogsheet.html

Motorola v. Stellar
Motorola Exhibit 1013
Page 003

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Fr eedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about indivi duals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Motorola v. Stellar
Motorola Exhibit 1013
Page 004

Doc Code: OATH

Document Description: Oath or declaration filed

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

[X] Declaration Submitted With Initial Filing **OR** [ ] Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (f)) required)

Attorney Docket Number	101488.0003US2
First Named Inventor	Paul DeKeyser
COMPLETE IF KNOWN	
Application Number	
Filing Date	
Art Unit	
Examiner Name	

I hereby declare that: (1) Each inventor's residence, mailing address, and citizenship are as stated below next to their name; and (2) I believe the inventor(s) named below to be the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Loop Recording with Book Marking

(Title of the Invention)

the application of which

[X] is attached hereto

OR

[ ] was filed on (MM/DD/YYYY) [ ] as United States Application Number or PCT International Application Number [ ] and was amended on (MM/DD/YYYY) [ ] (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified application, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

Authorization To Permit Access To Application by Participating Offices

[X] If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), and any other intellectual property offices in which a foreign application claiming priority to the above-identified application is filed access to the above-identified patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, or other intellectual property office in which a foreign application claiming priority to the above-identified application is filed to have access to the application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the application-as-filed with respect to: 1) the above-identified application, 2) any foreign application to which the above-identified application claims priority under 35 USC 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the above-identified US application, and 3) any U.S. application from which benefit is sought in the above-identified application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing the Authorization to Permit Access to Application by Participating Offices.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 21 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Motorola v. Stellar
Motorola Exhibit 1013
Page 005

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DECLARATION – Utility or Design Patent Application

Claim of Foreign Priority Benefits

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number s	Country	Foreign Filing Date MM/DD/YYYY	Priority Not Claimed	Certified Copy Attached? YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

Motorola v. Stellar
Motorola Exhibit 1013
Page 006

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DECLARATION – Utility or Design Patent Application

Direct all correspondence to:	[X] The address associated with Customer Number:	24392	OR [ ]	Correspondence address below

Name		
Address		
City	State	ZIP
Country	Telephone	Email

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available. Petitioner/applicant is advised that documents which form the record of a patent application (such as the PTO/SB/01) are placed into the Privacy Act system of records DEPARTMENT OF COMMERCE, COMMERCE-PAT-7, System name: *Patent Application Files*. Documents not retained in an application file (such as the PTO-2038) are placed into the Privacy Act system of COMMERCE/PAT-TM-10, System name: *Deposit Accounts and Electronic Funds Transfer Profiles*.

I hereby declare that all statements made herein of 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 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR:		[ ] A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Paul		DeKeyser	
Inventor's Signature			Date 11/6/08
Residence: City	State	Country	Citizenship
Irvine	CA	US	US
Mailing Address 55 Hidden Trail			
City	State	Zip	Country
Irvine	CA	92603	US

[ ] Additional inventors or a legal representative are being named on the _____ supplemental sheet(s) PTO/SB/02A or 02LR attached hereto.

LOOP RECORDING WITH BOOK MARKING

[0001] This application is a continuation-in-part of U.S. patent application serial no. 11/770920, filed June 29, 2007, which claims the benefit of U.S. provisional patent 60/824097, filed August 31, 2006, and this application is a continuation-in-part of U.S. patent application serial no. 11/846217, filed August 28, 2007, which claims the benefit of U.S. provisional patent 60/824095, filed August 31, 2006. These and all other referenced extrinsic materials are incorporated herein by reference in their entirety. Where a definition or use of a term in an incorporated reference is inconsistent or contrary to the definition of that term provided herein, the definition of that term provided herein applies and the definition of that term in the reference does not apply.

I. Field of the Invention

[0002] The field of the invention is video camera recording technology.

II. Background

[0003] 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.

[0004] 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.

[0005] Vanman and all other extrinsic materials identified herein are incorporated by reference in their entirety. Where a definition or use of a term in an incorporated reference is inconsistent or contrary to the definition of that term provided herein, the definition of that term provided herein applies and the definition of that term in the reference does not apply.

[0006] 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. Patent 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.

[0007] Thus, there is still a need for a recording camera that provides better recording and editing functions.

III. Summary of the Invention

[0008] The present invention provides 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.

[0009] The surveillance apparatus generally has a camera functionally coupled to a local memory with a circular buffer. 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.). This contrasts with a "remote memory functionally coupled to the camera", which would be a memory that is distanced from the camera by at least 20 cm, or is coupled to the camera

Motorola v. Stellar
Motorola Exhibit 1013
Page 009

using a wireless connection. The circular buffer is preferably organized into a series of memory segments that loops back on itself and is organized into both available segments and write-protected segments. This allows a recording facility to record the data stream available in portions of the circular buffer while skipping over write-protected matter. Preferably, the local memory is large enough to store at least 5 or 10 minutes of imaged data.

[0010] Preferably, the recording facility continuously records the data stream into the circular buffer any time the surveillance apparatus is powered on. As used herein, the term "continuous" with respect to recording a video data stream means that data is recorded at least every half second over a given ten second period. When a signal to record is sent to the surveillance apparatus, a protecting facility designates a segment of the circular buffer to be write-protected to prevent that segment from being overwritten during the next recording loop. 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. The pre-recorded subset could be as long as 5 seconds, 10 seconds, 30 seconds, or more. Preferably, various aspects of both the pre-recorded subset and the post-recorded subset can be configured with a user interface. While the write-protected portions could be electronically indexed using a memory heap or a clustered index, the write-protected portions are preferably stored as separate files in the memory. Such files could be stored in physically dis-contiguous parts of the circular buffer. Additionally, the indexing is preferably performed while the recording facility is still recording data into the memory.

[0011] The signal to record is preferably automatically triggered by a sensor that detects an image in the camera or a sound by the camera's microphone. For example, the signal to record could be triggered by a human face, an open book, a computer screen, a whistle, a verbal command, a recognized object, or a pattern of knocks. Alternatively, a user interface could allow a human user to manually send the signal to record and could even allow the human user to designate a length of time of the pre-recorded subset or the post-recorded subset. A user could send two signals, one to start recording and another to stop recording, but preferably the user merely sends a signal to start recording for a specified period of time. In an exemplary embodiment, when the specified period of time has almost expired, say, for example, 5 seconds, 10 seconds, or longer, the user could extend the length of specified time by sending another

trigger to the surveillance apparatus. For example, the surveillance apparatus could send a warning 10 seconds before it is scheduled to stop recording by vibrating against the user; in response the user could say "don't stop" or merely cough to extend the length of the write-protected portion of memory.

[0012] While the surveillance apparatus could be a mounted on a hand-held video camera, the surveillance apparatus is preferably a small device that can be mounted inconspicuously on a person. For example, contemplated surveillance apparatus mounts are a pair of wearable sunglasses or eyeglasses, a lapel pin, a collar button, a hat or visor, a hair pin, or a front of a purse.

[0013] Since the surveillance apparatus is typically too small to house a large amount of memory, the surveillance apparatus also preferably has a wireless transmitter that is also functionally connected to the local memory. A sending facility uses the wireless transmitter to transmit write-protected portions of the circular buffer to a remote memory that is not physically connected to the local memory in some way. For example, the wireless transmitter could send write-protected portions of the circular buffer to a mobile phone, or the surveillance apparatus could be plugged into a mobile phone which is then used as a wireless transmitter to forward a write-protected portion to another remote memory. In a preferred embodiment, after a write-protected portion of the circular buffer is transferred to a remote memory, the protecting facility could remove the corresponding portion from protection so that the recording facility could use that portion to record data.

[0014] Various objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of preferred embodiments of the invention, along with the accompanying drawings in which like numerals represent like components.

IV. Brief Description of The Drawing

[0015] Fig. 1 is a camera mounted on a pair of glasses connected to a circular buffer in a local memory that is controlled by a ring.

[0016] Fig. 2A and 2B show user interface buttons for the ring of Figure 1.

Motorola v. Stellar
Motorola Exhibit 1013
Page 011

[0017] Fig. 3 shows a diagram representation of the circular buffer of Figure 1.

[0018] Fig. 4A-4H show representations of the circular buffer of Figure 1 while the surveillance apparatus is in use.

V. Detailed Description

[0019] In **Figure 1**, an example surveillance apparatus 100 generally comprising eyeglasses 110 having a camera 120 mounted at the nose bridge, and an optional viewfinder 130 applied onto one of the lenses. A data and power cord 140 couples the camera 120 to a belt-worn recorder 160, which cooperates with a ring-shaped signaling device 150 and a remote memory 170. Those skilled in the art will appreciate that the term "surveillance" is used herein in its broadest possible sense, to include not only professional or commercial types of surveillance, but also any other type of observation, including for example an ordinary person watching a baseball game or birthday party.

[0020] The eyeglasses 110 are used here euphemistically to represent any type of camera mount. In a preferred embodiment, the camera mount is disguised to be a common object worn by a person or lying around a house, but could also be shaped and sized to look like a camera. Contemplated mounts include lapel pins, hair clips, shirt buttons, purses, staplers, desk clocks, tripods, head gear, hand grips, or security camera mounts. As used herein the term "camera" means any device or collection of devices that includes an image capturing component that captures image data, and a converting component that converts the image data into digital data, possibly at least one data stream. An image capturing component could include one or more charge-couple devices (CCD) complimentary metal-oxide-semiconductors (CMOS), CMOS focal plane arrays (CFP), radiometers, or other manners of image obtaining devices. Camera 120 should be interpreted euphemistically to include all such variants. Likewise, a suitable converting component could include one or more analog-to-digital converters, software codecs, or integrated circuits.

[0021] Camera 120 contains an imager lens 122 used to focus images for camera 120. Conventional lenses allow one or more of the following adjustments: aperture (to control the amount of light), zoom (to control the field-of-view), or shutter speed (to capture continuous

motion.). In preferred embodiments, these adjustments are automatically controlled by the camcorder electronics, generally to maintain constant exposure onto the imager without the manual adjustment from a user. It is contemplated that the preferred embodiments offer direct user control of all major optical functions. As with most modern digital recorders and camcorders, an analog-to-digital (ADC) converter is used to digitize the analog imager waveform output into a discrete digital-video signal. Thus, the recorder can be used to record analog or digital formats.

[0022] Viewfinder image lens 130 is calibrated to have the same field of view as camera 120. Preferably, viewfinder image lens 130 is embedded in between the two glass lenses of eyeglasses 110. Preferably viewfinder image lens 130 is a zoom lens with preferred standard zoom ration of 3x in or out of the focal length of the camera. A more sophisticated viewfinder image lens 130 is contemplated to have a greater zoom range and also has nighttime vision or is able to render images under different light conditions. Within the lenses, viewfinder image lens 130 is outlined by tinted area or graticle and the outline graticle is embedded with glowing fiber optic filament. Eye-glasses are made preferably from opaque, translucent, or possibly photo gray-type tint of glasses. Alternatively, glasses change color slightly when energized.

[0023] Where the camera is a hand-held camera and is not embedded in a pair of eyeglasses, viewfinder image lens 130 can be permanently fixed to camera 120, or it can be interchangeable with lenses of different focal lengths and other properties depending on the need and circumstances of use.

[0024] Recorder 160 is any recording device that records video and/or audio/video data, including conventional recorders. Recorder 160 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. Typically, the recorder or the camera converts analog images into a digital format to be stored in the memory, or also preferably records both audio and video input analog signals from the camera to the memory. Those skilled in the art will also appreciate that the concepts described herein with respect to video and/or audio/video data can be applied to recordation of purely audio, or in fact any other type of data stream; this specification should be interpreted as expressly including such

application. A wearer could clip recorder 160 as a belt clip or another compact device. Contemplated recorders include MP3 players, purses, or buttons. It is also contemplated that recorder 160 could also comprise a cell or mobile phone having a suitable recorder application installed that is configured to communicate with the other components of apparatus 100.

[0025] Although not expressly shown, recorder 160 also includes an appropriate power supply or connection, supporting electronics, or a display or other interface. The power source can vary considerably. For example, in embodiments where the recorded is relatively large, a suitable power source can include a rechargeable battery. On the other hand, when the recorder is relatively small, an appropriate power source can include an external power source (e.g., transformer for wall outlet or cigarette lighter adapter). Whether embodied in control buttons or in some other manner, it is also contemplated that recorder can include some sort of security control requiring a password and some sort of automatic turnoff feature that activates after a certain amount of inactivity. Authentication or authorization of user access provides for ensuring a proper user of apparatus 100 retains desired control. For example, once a user is authenticated, the user can control indexing, editing, transmitting, or adjusting content data in memory.

[0026] Recorder 160 would typically record images in digital format, but analog or combination formats are also contemplated. Preferably, the recorder's electronics are preferably all on a unitary printed circuit board with different functions, or facilities, encoded on a programmable chip or disk. For example, a recording facility 163 could record the data stream from camera 120 to local memory 166, a protecting facility 164 could protect segments (not shown) of recorded data on memory 166, or a sending facility 165 could transmit protected segments (not shown) of recorded data to remote memory 170. While the different facilities are preferably part of a single hardware or software program, the facilities could be split into different components as necessary. Other facilities could be installed, for example a facility that allows editing of the received image data or protected data. It is contemplated that such facilities could be purchased through or installed on a cell phone, possibly through an on-line application store.

[0027] The contemplated memory could vary depending on the particular configuration of the recorder. Particularly suitable memories include commercially available micro hard drives with a 1-inch disc (which can preferably have a capacity of more than 1 GB), flash memory cards

with a capacity of up to 128 MB and more, or other transient and/or permanent memory units. Likewise, suitable memory can also include SDRAM, MRAM, racetrack memory, SIMM, DIMM, etc. with a capacity of at least 32 MB, more preferably at least 64 MB, or most preferably above 128 MB. In preferred embodiments, memory 164 is a SDRAM capable of storing at least 1000 frames of data. Once received by memory 164, frames are preferably compressed by employing conventional compression rates and methods to achieve at least a 50:1 ratio.

[0028] In preferred embodiments, image data received by recorder 160 is stored in a circular buffer 167 on memory 166. Preferably, all of the free space in memory 166 is used to create circular buffer 167, however, multiple circular buffers could be created in the memory where there exist multiple cameras connected to a single recorder. Once the recorder is turned on, image data is continuously stored in circular buffer 167 for access. If no record or protect button is pushed, the recorder will loop back and store the image data for a said length of time. Recording, book-marking and protecting are used synonymously herein. Recording, book-marking and protecting means that a portion of the imaged data is write-protected upon an activation of a signal by a user and can not then be overwritten unless the write-protection is later removed. Consequently, protected data cannot be overwritten by newly stored imaged data in the circular buffer.

[0029] The circular buffer is preferably large enough to store at least 3 minutes of data, more preferably 5 minutes and most preferred 10 minutes of data. However, it is contemplated that depending on the size and capacity of the device, any length longer or shorter is possible. It is preferred when the recorder is turned on the entire circular buffer is treated and stored as a single file. Thus, if no recording is protected or bookmarked, then the entire file will be erased and the recording will start at the beginning of the circular buffer.

[0030] Signaling device 150 is shown in the figure as a ring that communicates wirelessly (*e.g.,* BlueTooth, Skinplex, wireless USB, 802.11, 802.15, UWB, Z-Wave, IrDa, Zigbee, etc.) with the recorder, possibly as part of a personal area network (PAN). The ring can have any suitable interface, shown in **Figures 2A and 2B**, including for example buttons on its outer periphery, or a sensor along its inner edge. In Figure 2A, ring 150 has user interface 200, with a start signal

button 210, a stop signal button 220, a transmit button 230, a zoom in button 240, or a zoom out button 250. Alternatively, the buttons could have decorative symbols in lieu of words of function as shown in Figure 2B, or could even have arbitrary symbols surrounding the entirety of signaling device 150. These buttons allow a user to manipulate and control image data and to generate protected data.

[0031] In an alternative embodiment, turning the ring in one direction might produce a start signal, and continuing to turn the ring in that direction might extend backwards the time period that is protected. Where a default time period for storing pre-start signal data is used, extending the time can be considered overriding the default. Similarly, turning the ring in the opposite direction might produce a stop signal, and where a default time period for storing post-start signal data is used, extending the time can be considered overriding that default. Electronics for such a ring or other control device are readily available, and for example are similar to those used in key fobs. Indeed, signaling device 150 should be interpreted euphemistically to include key fob type device.

[0032] It is contemplated that the signaling device could be integrated into other items as an accessory and that is wearable on an individual, for example a lapel pin or a pen within a pocked protector. It is also contemplated that the switch could be portable or can be hidden or attached to other devices such as a vehicle, furniture, etc. The signal could also be generated in non-tactile ways, for example by an audio command or whistle, or by an automatic sensor. Preferably, the user could configure the audio signal to match only his/her voice.

[0033] At any moment, the user can signal recorder 160 to place a "bookmark" in the recording. This signal can be sent by pressing a button that will then transmit a signal through wires 140 that attach to the glasses then to the recorder. The wires 140 could be fiber optic wires that are small and thin to avoid detection. In an exemplary embodiment, the user could control the entire system using signaling device 150, for example by turning the camera on and off, recording a portion of image data, stop the recording, zooming in and out of image data; or transmitting protected data into the remote memory 170.

[0034] While remote memory 170 is shown in the figure as a mobile or cell phone, remote memory 170 should be interpreted euphemistically to include any memory that is not connected

to surveillance apparatus 100, for example, a DVD writer, a wireless network attached storage (NAS) device, a wireless storage area network (SAN) device, a home computer, or even a second surveillance apparatus. Preferably, sending facility 165 sends protected segments of circular buffer 169 wirelessly to remote memory 170 whenever remote memory 170 is within range of wireless transceiver 169, possibly as part of a PAN using one or more wireless communication technologies (*e.g.,* BlueTooth, Skinplex, wireless USB, 802.11, 802.15, UWB, Z-Wave, IrDa, Zigbee, etc.). However, sending facility 165 could also respond to manual commands, for example through a button on signaling device 150, recorder 160, or the mobile phone itself. In an alternative embodiment, the mobile phone does not act as a remote memory depository, and instead forwards the protected segment to a remote memory via a mobile internet or wi-fi connection. Preferably, once protected data is transferred to a remote memory, the protected memory areas then will go back to become free memory areas that are available for further loop recording.

[0035] Write-protected data could be sent to the remote memory by an image sensor that outputs data directly in "block" format typically converted with a raster-to-block converter. Further compression could be used before transmitting the data if wireless bandwidth is an issue. Either DCT or wavelet transformed data on native sensor formats could be used. The data is preferably transmitted via the Internet, but could also be transmitted using radio waves, a pager, a two-way pager, a physical cable, email, text message, picture message, or any other suitable communication mechanism.

[0036] **Figure 3** shows a diagram representation of circular buffer 167 in memory 166, with unprotected segment 320 and write-protected segment 330. Write-protected segment 330 is characterized as a predefined portion of the recording data. The recording facility 163 continuously records the data stream 310 into circular buffer 167. The recording facility 163 records over unprotected segment 320 of circular buffer 167, while skipping over protected segments 330 of circular buffer 167. 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.

[0037] **Figures 4A-4H** show an alternative diagram representation of a circular buffer 300 as it is being used.

[0038] In **Figure 4A** the recording facility (not shown) records data stream "A" into circular buffer 400. The "_" character is used to designate blank memory, or unprotected memory that can be overwritten. The ellipsis "..." is used to show that the memory can be very large relative to the number of positions shown in the figure. It is contemplated, for example, that memory 400 can be up to several hundred megabytes, 1 GB, 2GB, 4GB, 8GB, or even more. Such memory is preferably of a flash type, non-volatile RAM, preferably in the form of a standard flash memory card. In a preferred embodiment, circular buffer 400 comprises a logical representation of a physical memory area. Buffer 400 can be configured to store data in the physical memory by taking into account wear-leveling across the physical memory.

[0039] In **Figure 4B** the protecting facility (not shown) has protected a recent period of data stream "A" as a function of a start signal, shown by the character "|". The start signal can be triggered in any suitable manner, including for example manual operation of a trigger or a switch by a user. For example, the ring of Figure 1 could be used as a switch, or any other wearable accessory could have a switch integrated into it. In other examples, start signals can be triggered by detection of a particular circumstance by a motion, sound or other sensor. In an exemplary system, software can operate upon content in the data stream, such as by monitoring an entrance to a building using a data stream received from one or more cameras, and could then send a start signal when the image shows a person loitering in a certain area of the screen.

[0040] The "[" character is used to designate the start of protected memory. Concomitantly, the portion of the data stream prior to the protected portion has once again been marked "_" to show that it is unprotected. In protecting recent data, the system can protect a default historical time period before the start signal is sent and protect a default period after the start signal is sent (such as 30 seconds, 2 minutes, etc). All suitable defaults are contemplated. Alternatively, the historical time period being protected could be altered in some manner, such as by software or by a user operating a history button. For example, if a user hits a start button, the system might default to protecting the last 30 seconds and the next 60 seconds; or it might protect the last 15 seconds and the next 2 minutes.

[0041] Preferably, before the protecting facility stops protecting data, the system sends a signal to the user that the system is about to stop write-protecting data. For example, the system could send an audio chirp signal, or in the case of a pair of eyeglasses, a portion of the glasses could slightly vibrate to signal that the system will stop recording in 10 seconds. If the user wishes to protect an additional 60 second time period, the user could hit a "more time" button. In this manner a user could protect a 5 or 10 minute period, or an even much longer portion of a data stream prior to a start signal. Indeed, if memory 400 is interpreted as a multi gigabyte flash memory, it is entirely possible that one could back up sufficiently to protect an hour or more of such a data stream.

[0042] In **Figure 4C** the protecting facility has received a "stop" signal some time after receiving the start signal, thereby lengthening the protected portion of the "A" data stream. The stop signal is shown as character "]" and could be automatically generated from software or hardware as a function of a default time after the start signal, or could be manually sent by the user of the system. All suitable defaults are contemplated, including for example a 30 second or 1 minute time period. Stop signals could also be generated in a variable fashion, again as a function of software or hardware, through action of a user, or in any other suitable manner. Thus, a user can well operate a start button or other switch, a more time switch, and a stop switch, which could have the same or different interfaces. It is also contemplated that the system could recognize a user's verbal commands for these functions.

[0043] Just as the system can utilize a default pre-start signal period of time for which a portion of the data stream is stored unless overridden in some manner, contemplated systems can utilize a default post-start signal period of time for which a portion of the data stream is stored unless overridden in some manner. Using defaults for both pre-start and post-start signal periods allows a system to operate with an extremely high level of user convenience. For example, in one contemplated class of systems using such defaults, a user could operate a single button, ring or other interface to initiate a start signal, and the system could respond by automatically storing a default 60 second portion of a data stream prior to the signal, as well as a default 30 time period of the data stream after the signal. And all of that could be accomplished with a single operation of the button. An interface could also be provided to allow the user to alter the length of time for

Motorola v. Stellar
Motorola Exhibit 1013
Page 019

the pre-recorded portion and the length of time for the post-recorded portion. As should be apparent from the description above, all reasonable the default time periods are contemplated.

[0044] In **Figure 4D**, the system has finished protecting the desired portion of the "A" data stream, and the recording facility continues to store a "B" data stream into circular buffer 400. Of course, the "B" data stream can be contiguous with the "A" data stream, so that differentiation of "A" and "B" streams is merely an artifact of how the data is being stored. For example, if a system included an eyeglasses camera being used at baseball game, the wearer might watch the game for an hour or more without anything of interest happening. During all that time the system would record image frames from the camera, looping in memory if the memory had remaining capacity for less than an hour of images. When finally the wearer sees an interesting play that he wants to protect, he operates a start button, or perhaps a more time button to protect the previous minute of play. Once the interesting action has completed, he operates a stop button, which thereby causes the system to complete protecting the entire "A" period of interest. But the wearer continues watching the game, and the subsequent images, continuous with the "A" images, would be considered "B" images. In some embodiments, the wearer can select to have more of previously recorded data to be protected. For example, once the wearer operates the start button, the wearer could also indicates that additional previously recorded data should be protected (*e.g.*, past 10 seconds, 30 seconds, one minute, five minutes, etc.) while new image data is being stored and protected.

[0045] In **Figure 4E** the system has again received a start signal, and has again protected a fixed or variable historical time period. In **Figure 4F** the system has received a stop signal, and has protected the entire desired portion of the "B" data stream.

[0046] In **Figure 4G t**he system has continued to record data, which is now depicted as data stream "C" because it follows data stream "B". This figure is particularly significant in that recordation of the "C" data stream skips over the protected portion of the "A" data stream. In **Figure 4H** the system received another start signal, and has protected a desired portion of the "C" data stream that straddles the protected "A" stream. As shown, the C data stream is saved as a physically dis-contiguous file.

[0047] In a preferred embodiment, segments of recorded data are "write-protected" by being indexed in an electronic index. This scheme allows the system to protect previously recorded areas of memory without interrupting any concurrent recording, and further allows the system to easily locate such protected segments for play-back or offloading to a remote memory. Additionally, this allows the system to keep track of multiple fragments dis-contiguous fragments of a single write-protected segment. The electronic index is preferably a hash table or a clustered index, but other methods of addressing memory are also suitable.

[0048] Protected data can be copied to a memory separate from the circular buffer, for example in a separate file within a local memory. Multiple segments of protected data could thus be stored as a series of protected files in a directory structure. In an exemplary embodiment, as soon as the data is designated in the index as being protected, the recorder searches for a remote memory in range, and immediately copies the protected data from the circular buffer to the remote memory. Once confirmation of copying is received, the index can be updated to identify the previously protected portion of the circular buffer as being non-protected.

[0049] As previously discussed, a sending facility uses a wireless transmitter to transmit write-protected data to a remote memory. One should note that there are many additional aspects of the inventive subject matter surrounding transmitting the data to the remote memory. In some embodiments a surveillance apparatus participates in a PAN with other components including the remote memory. In such embodiments the apparatus can discover other components of the system, including the remote memory or signaling devices, by sending message over one or more suitable protocols (*e.g.,* BlueTooth, Skinplex, wireless USB, 802.11, 802.15, 802.16, UWB, Z-Wave, IrDA, Zigbee, etc.). Component discovery can be via a push where the apparatus sends a discovery message over a protocol to remote components or via a pull where the remote components send a discovery message to the apparatus. The components of the system can respond with a discovery response message. Preferred discovery or discovery response messages comprise characteristics of the various responding components including buffer size, read/write rates, authentication, authorized command sets, or other parameters. For example, the surveillance apparatus could send a discovery message out to discover any suitable remote memories in the PAN where the message is encapsulated in a BlueTooth protocol packet. A cell phone could respond by allocating a memory area to operate as a remote memory and by sending

a discovery response message back to the apparatus describing the amount of memory available. Such an approach provides for creating surveillance apparatus products that are able to operate across multiple cell phone platforms by allowing a cell phone user to download or install an application, or possibly a driver for their specific cell phone model, capable of being discovered and operating with the apparatus.

[0050] Another aspect of transmitting data to the remote memory includes authenticating the various components with respect to access or to control remote memory. In some embodiments, the surveillance apparatus, or even the signaling facility, can be authenticated with the remote memory via a suitable token exchange (*e.g.*, passwords, public-private key, handshakes, etc.). For example, a remote memory could be bound to a specific apparatus via a secret key, possibly having a UUID or GUID. Furthermore, the components of the system can be authorized to access various levels of functionality based on their authentication. Some apparatus could have read only access, while other could have write access, or while still others have editing capabilities.

[0051] Yet another aspect of transmitting data to the remote memory includes the remote memory providing access to multiple surveillance apparatus. For example, a single remote memory, possibly a cell phone, could be in close proximity (*e.g.*, physically local within 100 meters or logically local within the same network) to two or more apparatus. The remote memory can provide image storage as necessary to each apparatus, assuming appropriate authentication or permissions. In addition, it is contemplated that a single apparatus could have more than one camera where each camera has its data transmitted to the remote memory collectively via the apparatus or even individually, possibly where each camera has access to different remote memories, or different areas (*e.g.*, files) in the same remote memory.

[0052] One should also note that a surveillance apparatus can employ multiple wireless protocols to interact with the various components. For example, the apparatus's signaling device could connect to a recorded via Zigbee or Skiplex protocols while the apparatus could connect to the remote memory via IEEE 802.16.

[0053] One purpose of the invention is to allow secret recording by a user. The user can integrate the recorder as part of his/her wardrobe or even as clothing accessories, such as a pin or

a hat. Preferably, recorder will record video and audio as seen from the wearer's point of view without requiring the wearer to exert any special effort to operate the recorder. The recorder operates for extended periods of time while remaining unobtrusive both to the wearer/operator and to the subject(s) being recorded.

[0054] In order for the device to be practical, physical size and weight are of primary importance. The recorder portion must be small and lightweight enough to be unobtrusive. Preferably, the size of the recorder is two inches by three inches by one-half inch and six ounces in weight including battery. The camera or imaging component must be small and lightweight enough to be mounted on a pair of eyeglasses without conspicuous bulk or uncomfortable weight on the order of one-quarter inch by one-quarter inch by one inch or smaller and weighing one ounce or less. Further, the imaging component must be capable of sufficient resolution that the image quality of the resulting recording is comparable with existing consumer camcorder products. Preferred resolutions are at least 640 x 480 pixels. However, more preferred resolutions include high definition quality resolutions (*e.g.*, 720p, 1080i, 1080p, 2160p, etc.).

[0055] Since the recorder will be worn on the body and the wearer can move actively about when the device is in operation, it is important that the entire device be mechanically rugged and that all components, particularly the storage media, be impervious to the shocks resulting from such body movement. The device is also likely to be exposed to environmental stresses such as dust and moisture so the components and packaging must accommodate this exposure. Solid state media such as compact flash memory is particularly suitable as the recorder's storage media since it meets these requirements.

[0056] Alternatively, the recorder device can be mounted on vehicles, planes or any other objects for ease of use. It is contemplated that the present invention can be used in military or field intelligence operations.

[0057] The advantages of the disclosed techniques are clear. A user of the inventive subject matter can capture image data while also participating with others in an event without being trapped behind a recording device. Furthermore, the user's hands can remain substantially free while recording.

[0058] Thus, specific embodiments and applications of recording images to a circular buffer in a local memory and transmitting it wirelessly to a remote memory have been disclosed. It should be apparent, however, to those skilled in the art that many more modifications besides those already described are possible without departing from the inventive concepts herein. The inventive subject matter, therefore, is not to be restricted except in the spirit of the appended claims. Moreover, in interpreting both the specification and the claims, all terms should be interpreted in the broadest possible manner consistent with the context. In particular, the terms "comprises" and "comprising" should be interpreted as referring to elements, components, or steps in a non-exclusive manner, indicating that the referenced elements, components, or steps can be present, or utilized, or combined with other elements, components, or steps that are not expressly referenced. Where the specification claims refers to at least one of something selected from the group consisting of A, B, C …. and N, the text should be interpreted as requiring only one element from the group, not A plus N, or B plus N, etc.

Motorola v. Stellar
Motorola Exhibit 1013
Page 024

CLAIMS

What is claimed is:

1. A surveillance apparatus, comprising:
    a camera having an image capturing component that captures images, and a converting component that converts the images into at least one data stream;
    a local memory functionally coupled to the camera;
    a wireless transmitter functionally coupled to the local memory;
    a recording facility that continuously records the data stream into available portions of a circular buffer in the local memory;
    a protecting facility that responds to a signal to record by designating a recorded segment of the circular buffer as a write-protected portion, wherein a pre-recorded subset of the recorded segment is recorded before the signal is received; and
    a sending facility that uses the transmitter to wirelessly transmit the write-protected portion to a remote memory.

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

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

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 by the camera.

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

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, a post-recorded subset, and the recorded segment.

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

Motorola v. Stellar
Motorola Exhibit 1013
Page 025

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.

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

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

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

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.

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

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

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

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.

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

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

Motorola v. Stellar
Motorola Exhibit 1013
Page 026

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.

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.

Motorola v. Stellar
Motorola Exhibit 1013
Page 027

ABSTRACT

A surveillance apparatus continuously records imaged data from a camera into a circular buffer in a local memory. When a record signal is received, the system records the video stream that was recorded before the record signal was received, and the video stream that is recorded after the record signal was received. The recorded segment is then write-protected, so that the surveillance apparatus does not overwrite the recorded segment. The recorded segment could then be sent to a remote memory via a wireless connection to free up local memory for future recording sessions.

Motorola v. Stellar
Motorola Exhibit 1013
Page 028

Doc Code: PREX.SRCH

Applicant:	Paul DeKeyser
Attorney Docket No.:	101488.0003US2
Serial No.:	Not yet assigned
For:	Loop Recording With Book Marking
Filed:	Herewith

PRE-EXAMINATION SEARCH DOCUMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This pre-examination search statement is provided in support of the petition for accelerated examination filed herewith.

A pre-examination search was conducted involving U.S. patents and patent application publications, foreign patent documents and non-patent literature as indicated below. The results of the search are provided on an Information Disclosure Statement filed concurrently herewith.

Motorola v. Stellar
Motorola Exhibit 1013
Page 029

Searches directed to non-patent literature utilized the following databases as suggested by the search templates for technological classes 340, 345, 346, 348, 359, 360, 369, 370, 375, 381, 386, 455, 711, 725, and D14:

ABI/INFORM, Gale Group Trade & Industry Database™, Gale Group PROMT®, Gale Group New Product Announcements/Plus®, Gale Group Computer Database™, Gale Group Newsletter Database™, Gale Group Globalbase™, Inspec, Periodical Abstracts PlusText, Ei Compendex®, Business & Industry, PIRA, EMBASE®, BIOSIS Previews®, MEDLINE®, Business Dateline®, NTIS, PR Newswire, Inside Conferences, CA Search®, The McGraw-Hill Companies Publications Online, Science Direct, Google, Yahoo!, IEEE, Scirus, ACM, Cambridge Journals, IBM TDB, CiteSeer

Other databases suggested by the search templates failed to yield relevant results.

8 (A) Pre-examination Search

1. **Database Search: Delphion™**

   Date Conducted: June 27, 2008

   US Field of Search:

   Class(es)/Subclass(es) Searched: Searches were not restricted to class or subclass.

   Files Searched:

   US (Granted; Full text), US (Applications; Full text), European (Granted; Full text), European (Applications; Full text), German (Granted; Full text), German (Applications; Full text), WIPO PCT Publications (Full text), Abstracts of Japan, INPADOC

   Search Logic:

   L1 (surveillance or monitor*) and (apparatus or device or system); results

   L2 (surveillance and (device or apparatus or system)); results

   L3 (surveillance apparatus); results

Motorola v. Stellar
Motorola Exhibit 1013
Page 030

L4 (electronic and surveillance and (apparatus or system or device)); 33,415 results

L5 (electronic surveillance and (apparatus or system or device)); 1,083 results

L6 (electronic surveillance <near/5> (apparatus or system or device)); 480 results

L7 (electronic surveillance apparatus or (electronic surveillance device or electronic surveillance system)); 380 results

L8 ((electronic surveillance apparatus)); 7 results

L9 (camera); 618,178 results

L10 (camera and image); 438,055 results

L11 (camera and image and (convert or change or modify)); 340,972 results

L12 ((camera and image and convert and data stream)); 12,479 results

L13 (camera and (convert <near/5> image) and data stream); 3,374 results

L14 (camera and ((convert <near/5> image) <near/10> data stream)); 91 results

L15 (camera and capture and image and convert and data stream); 7,041 results

L16 (camera and (capture <near/5> image) and ((convert <near/5> image) <near/10> data stream)); 49 results

L17 (camera and memory); 238,537 results

L18 (camera <near/10> memory); 39,030 results

L19 (camera <near/5> memory); 19,521 results

L20 ((camera <near/5> memory) or (camera <near/5> RAM)); 20,425 results

L21 (camera <near/5> RAM); 1,380 results

L22 (camera memory); 1,190 results

L23 (wireless and transmit*); 413,956 results

L24 ((wireless and transmit*) and memory); 272,717 results

L25 (wireless transmitter); 14,912 results

L26 (wireless transmitter and memory); 9,291 results

L27 (wireless transmitter <near/5> memory); 161 results

L28 (wireless transmitter with memory); 0 results

L29 (record* and data and memory); 666,343 results

L30 (record* and data and memory and buffer); 195,591 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 031

L31 (record* and data and memory and circular buffer); 4,080 results

L32 (circular buffer); 8,167 results

L33 ((record* <near/5> data) and (memory <near/5> buffer)); 33,951 results

L34 ((record* <near/5> data) and (memory <near/5> circular buffer)); 333 results

L35 record* and (subset or part or portion or segment); 1,602,672 results

L36 ((record* and (subset or part or portion or segment) and (buffer or memory or RAM))); 852,566 results

L37 (record* and (subset or part or portion or segment) and circular buffer); 4,270 results

L38 ((record* <near/10> (subset or part or portion or segment)) <near/10> circular buffer); 39 results

L39 ((record* <near/10> (available or unused or unprotected or free or empty)) <near/10> (subset or part or portion or segment)) <near/10> circular buffer; 0 results

L40 (record* and (available or unused or unprotected or free or empty) and circular buffer); 4,017 results

L41 (record* <near/10> (available or unused or unprotected or free or empty)) <near/10> circular buffer; 7 results

L42 recording <near/5> (device or apparatus or system or facility); 629,143 results

L43 (recording device or recording facility or recording apparatus or recording system); 211,150 results

L44 (recording facility); 535 results

L45 ((recording facility and continuous* and record and data stream)); 12 results

L46 ((continuous* <near/5> record*) and ((unused or available or free or unprotected) <near/5> memory)); 1,364 results

L47 ((continuous* <near/5> record*) and ((unused or available or free or unprotected) <near/5> circular buffer)); 6 results

L48 ((continuous* <near/5> record*) and ((unused or available or free or unprotected) <near/5> circular data storage)); 0 results

L49 ((continuous* <near/5> record*) and ((unused or available or free or unprotected) <near/5> circular storage)); 0 results

L50 (protect* and (signal or trigger or event or command) and record* and (before or prior or retro*)); 359,054 results

L51 (write-protect* and (signal or trigger or event or command) and record* and (before or prior or retro*)); 0 results

L52 write-protect*; 0 results

L53 (write protect*); 8,641 results

L54 ((write protect* and ((signal or command or instruct* or trigger) <near/5> record) and ((before or prior or previous or retro) <near/5> (event or occurrence or point or incident)))); 276 results

L55 (write protect* and (signal <near/5> record) and ((before or prior or previous or retro) <near/5> event)); 24 results

L56 (retroactive recording); 35 results

L57 (retroactive recording and circular buffer); 19 results

L58 (retroactive recording and circular buffer and protect); 11 results

L59 (retroactive recording and circular buffer and protect and (portion or segment)); 11 results

L60 (retroactive recording and circular buffer and protect and (unused or empty or free or unprotected) and (portion or segment)); 11 results

L61 (retroactive recording and circular buffer and protect and (unprotected) and (portion or segment)); 0 results

L62 (retroactive recording and circular buffer and protect and (unused) and (portion or segment)); 0 results

L63 (circular buffer and (portion or segment) and (protect*)); 2,276 results

L64 ((circular buffer and write protect and previously recorded)); 2 results

L65 (wireless and transmit data); 56,724 results

L66 (wireless and transmit image data); 1,384 results

L67 (sending and (component or facility or device or part)); >1,000,000 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 033

L68 (sending facility); 110 results

L69 ((send or transmit) and write protected and data); 4,297 results

L70 ((send or transmit) and write protected data); 181 results

L71 ((send or transmit) and write protected data and wireless*); 23 results

L72 (electronic surveillance apparatus and camera); 1 result

L73 (surveillance and camera and (circular memory or ring buffer or circular buffer) and (bookmark or index or metadata or label) and write protect and skip); 1 result

L74 ((surveillance and camera and buffer)); 4,800 results

L75 ((surveillance and camera and circular buffer)); 114 results

L76 (((surveillance and camera and circular buffer and skip))); 20 results

L77 (surveillance and camera and circular buffer and index); 45 results

L78 (surveillance and camera and circular buffer and bookmark); 0 results

L79 (surveillance and camera and circular buffer and metadata); 7 results

L80 (camera and (circular buffer or ring buffer) and wireless); 739 results

L81 (camera and (circular buffer or ring buffer) and wireless and transmit*); 682 results

L82 ((camera and record and after-the-fact)); 864 results

L83 ((camera and record and after-the-fact and 5 seconds)); 79 results

L84 (camera and ((record <near/10> retroactive) or (record <near/10> after-the-fact)) and (second* or minute* or hour*)); 103 results

L85 (camera and (circular buffer or ring buffer) and ((record <near/10> retroactive) or (record <near/10> after-the-fact)) and sensor); 11 results

L86 (camera and (circular buffer or ring buffer) and ((record <near/10> retroactive) or (record <near/10> after-the-fact)) and sensor and algorithm); 6 results

L87 ((camera and (circular buffer or ring buffer) and ((record <near/10> retroactive) or (record <near/10> after-the-fact)) and interface)); 11 results

L88 ((camera and (circular buffer or ring buffer) and ((record <near/10> retroactive) or (record <near/10> after-the-fact)) and interface and user input)); 2 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 034

L89 (camera and ((record <near/10> retroactive) or (record <near/10> after-the-fact)) and (second* or minute* or hour*) and (change or modify or pre-set or adjust)); 85 results

L90 (camera and wireless and transmit and phone); 26,308 results

L91 (camera and wireless* <near/5> transmit* and phone); 9,363 results

L92 (camera and wireless* <near/5> transmit* and mobile phone); 3,251 results

L93 (camera and wireless* <near/5> transmit* and mobile phone and memory and storage); 2,215 results

L94 (camera and wireless* <near/5> send* and mobile phone and memory and storage); 849 results

L95 (camera and wireless and transmit to a mobile phone); 5 results

L96 (camera and wireless transmitter); 3,108 results

L97 (camera and wireless transmitter and (forward or send) and second memory); 35 results

L98 (camera and wireless transmitter and (forward or send) and second memory and phone); 18 results

L99 (camera and mount); 216,563 results

L100 (camera and (base or stand)); 235,615 results

L101 (camera mount); 12,378 results

L102 ((camera mount and glasses)); 607 results

L103 (camera mount <near/5> glasses); 4 results

L104 (camera <near/5> eye glasses); 38 results

L105 ((camera <near/5> glasses) and wear); 217 results

L106 ((electronic index)); 198 results

L107 (camera and image data and electronic index); 19 results

L108 ((method or procedure) and process and image and data and camera); 243,414 results

L109 (method and process and image data and camera); 87,997 results

L110 (camera and receive* and image data and stream); 16,951 results

L111 (camera and capture and data); 121,798 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 035

L112 (camera and (capture <near/5> (image or data))); 94,567 results

L113 (camera and (capture <near/5> image) and record and stream); 12,869 results

L114 (camera and (capture <near/5> image) and record and data stream); 3,837 results

L115 camera and (capture <near/5> image) and record and data stream and (ring buffer or circular buffer); 153 results

L116 (camera and (capture <near/5> image) and record and data stream and circular buffer); 113 results

L117 (camera and record and (retroactive or after-the-fact)); 1,092 results

L118 (method and camera and record and signal and (retroactive or after-the-fact)); 885 results

L119 ((method and camera and record and ((prior or before) <near/5> signal))); 14,061 results

L120 ((method and camera and record and ((prior or before) <near/5> signal)) and buffer; 6,510 results

L121 (((method and camera and record and ((prior or before) <near/5> signal)) and (circular buffer or ring))); 3,710 results

L122 ((ring buffer or circular buffer) and (portion or part or segment) and (write-protect* or protect or write protect) and (index or bookmark or metadata)); 1,679 results

L123 (method and (ring buffer or circular buffer) and (portion or part or segment) and (write-protect* or protect or write protect) and (index or bookmark or metadata)); 1,643 results

L124 ((method and (ring buffer or circular buffer) and write protect and index)); 122 results

L125 (method and (wireless* <near/10> transmit*) and circular buffer and remote memory); 43 results

L126 (method and camera and (wireless* <near/10> transmit*) and circular buffer and remote memory); 9 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 036

L127 ((method and camera and (wireless* <near/10> transmit*) and circular buffer and (remote <near/5> (storage or memory)))); 31 results

L128 (method and (image <near/5> data) and camera and stream and receive and circular buffer and signal and protect and record and (retroactive or after-the-fact)); 5 results

L129 ((method and (image <near/5> data) and camera and stream and receive and circular buffer and signal and protect and record and (retroactive or after-the-fact)) and wireless and (transmit or send)); 5 results

L130 ((method or step) and (store <near/10> file) and (file <near/10> data) and separate and write-protect); 1,090 results

L131 (((method or step) and (store <near/10> file) and (file <near/10> data) and separate and write-protect and circular buffer)); 13 results

L132 ((circular buffer or ring buffer) <near/10> (part or segment or portion) <near/10> (discontiguous or separate)); 6 results

L133 camera and record and signal and stop and start; 44,519 results

L134 (camera and record and start signal and stop signal); 595 results

L135 (camera and signal <near/5> protect and recording); 1,597 results

L136 (camera and audio signal <near/5> protect <near/10> recording); 1 result

L137 (camera and (signal <near/5> protect <near/10> recording) and switch); 86 results

L138 (camera and record and (retroactive or after-the-fact) and configure and (second or minute or hour) and circular buffer; 19 results

L139 (camera and record and (retroactive or after-the-fact) and configure and size and (second or minute or hour) and circular buffer); 17 results

L140 (circular buffer and (unprotect or clear or erase or overwrit*) and (after <near/5> transmit*)); 650 results

L141 (method and camera and circular buffer and (unprotect or clear or erase or overwrit*) and (after <near/5> transmit*)); 145 results

L142 ((method and camera and circular buffer and record and (warn <near/10> user))); 32 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 037

L143 method and camera and circular buffer and record and (extend or change or increase) and length and (signal <near/10> (audio or switch)); 408 results

L144 method and camera and circular buffer and record and (extend <near/5> length) and (signal <near/10> (audio or switch)); 77 results

2. **Database Search: Delphion™**

Date Conducted: July 11, 2008

US Field of Search:

Class(es)/Subclass(es) Searched:

US Class	US Subclass	Size of Subclass	Title
340		**63,134**	**Communications: Electrical**
	5.61	863	Wireless transceiver
	5.64	557	Wireless transmitter
	825.72	1,749	Wireless link
	7.35	88	Address based
	7.47	22	Source address
	825.52	870	Addressing
	907	519	Traffic Control Indicator
	908	264	Portable
	937	449	With camera
345		**85,512**	**Computer Graphics Processing And Selective Visual Display Systems**
	7	988	Image superposition by optical means (e.g., heads-up display)
	8	950	Operator body-mounted heads-up display (e.g., helmet mounted display)
	188	8	Addressing with priority (345/188)
	545	567	Frame Buffer
	556	186	For Storing Condition Code, Flag Or Status
	565	151	Using memory for storing address information
	193	24	Addressing (345/193)
	511	87	Data transfer between memories (345/511)
346		**7,954**	**Recorders**

Motorola v. Stellar
Motorola Exhibit 1013
Page 038

	107.2	86	Including camera
348		**97,257**	**Television**
	61	354	Special Applications
	143	1,601	Observation of or from a specific location (e.g., surveillance)
	158	95	Portable
	207.1	666	Camera connected to computer
	211.2	199	Wireless
	211.14	48	Camera located remotely from image processor (i.e., camera head)
	231.3	364	Storage of additional data
	231.7	140	Detachable
	231.9	104	Details of communication between memory and camera
	373	1,010	Support or Housing
	376	339	Portable or hand-held
	715	208	For storing a sequence of frames or fields
	719	64	Including processor interface (e.g., CPU)
	143	1,600	Observation of or from a specific location (e.g., surveillance)
	601	60	Marker or pointer generator
	180	508	Monitoring, Testing, Or Measuring
	E7.085	638	Closed circuit television systems, i.e., systems in which the signal is not broadcast (EPO)
359		**87,832**	**Optical: Systems And Elements**
	618	936	Single channel simultaneously to or from plural channels (e.g., light dividing, combining, or plural image forming, etc.)
	630	1,152	Superimposing visual information on observer`s field of view (e.g., head-up arrangement, etc.)
360		**38,074**	**Dynamic Magnetic Information Storage Or Retrieval**
	5	141	Recording For Selective Retention Of A Special Occurrence
	7	89	Recording For Monetary Delay Of An Analog Signal
369		**21,550**	**Dynamic Information Storage Or Retrieval**
	13.16	17	Over-writing
	13.25	27	Over-writing

Motorola v. Stellar
Motorola Exhibit 1013
Page 039

	13.34	34	In compact size assembly
	30.04	231	Using recorded information indicative of storage medium contents
	47.22	293	Having location identification information
	13.01	142	Storage Or Retrieval By Simultaneous Application Of Diverse Types Of Electromagnetic Radiation
	13.04	27	Erasing
	13.05	65	Reading
	13.54	62	Recording mark dimension
	27.01	53	With access to or marking of specified location (e.g., indexing)
	29.02	41	Portable device
	30.01	167	Selective addressing of storage medium (e.g., programmed access)
	30.23	211	Buffering
	44.33	52	Recording (e.g., inhibit recording upon defect, etc.)
	84	319	Duplication or copying (e.g., rerecording)
	85	88	To diverse type of storage medium
370		**96,106**	**Multiplex Communications**
	222	391	In a ring or loop network
	223	239	Using a secondary ring or loop network
	224	173	Loopback of signals on the secondary ring or loop
	310	1,114	Communication over free space
	328	3,173	Having a plurality of contiguous regions served by respective fixed stations
375		**51,697**	**Pulse Or Digital Communications**
	E7.014	213	Involving buffer level management (EPO)
381		**21,642**	**Electrical Audio Signal Processing Systems And Devices**
	381	223	Hook over ear or spectacle
386		**16,924**	**Television Signal Processing For Dynamic Recording Or Reproducing**
	6	44	Fast producing
	7	41	Slow producing
	20	64	Digital technique

	35	84	Selective recording and producing
	40	149	Digital recording and producing
	46	2,369	Processing Of Television Signal For Dynamic Recording Or Reproducing
	68	1,070	Fast, slow, or stop reproducing
	83	991	Including programmable apparatus
	91	61	By controlling read-write operations
	95	2,699	Having another signal
455		**74,305**	**Telecommunications**
	3.01	596	Wireless Distribution System
711		**41,608**	**Electrical Computers And Digital Processing Systems: Memory**
	1	597	Addressing Combined With Specific Memory Configuration Or System
	2	377	Addressing extended or expanded memory
	100	1,869	Storage Accessing And Control
	104	816	Solid-state random access memory (RAM)
	110	191	Circulating memory
	117	499	Hierarchical memories
	200	593	Address Formation
	213	514	Generating prefetch, look-ahead, jump, or predictive address
	E12.001	343	Accessing, Addressing Or Allocating Within Memory Systems Or Architectures (Epo)
	E12.004	245	With look-ahead addressing means (EPO)
	E12.007	24	In block-addressed memory (EPO)
	E12.091	48	Protection against unauthorized use of memory (EPO)
725		**16,306**	**Interactive Video Distribution Systems**
	12	84	By passive determination and measurement (e.g., by detecting motion or ambient temperature, or by use of video camera)
	81	374	Using wireless link
	89	298	By use of memory at receiver
	94	148	Buffering and switching
	105	707	Video Distribution System With Upstream Communication
	109	656	Having link to external network (e.g., interconnected computer network)

	112	633	Link transmission (e.g., URL sent to user)
	113	307	Conveyed in video image
	115	349	Data storage or retrieval
	116	609	Control process
	123	73	Wireless return path
	143	169	Video Distribution System Components
	145	202	Data storage or retrieval
	146		Control process
D14		**30,910**	**Recording, Communication, Or Information Retrieval Equipment**
	496	557	Video Or Audio Transmission, Recording Or Playback Equipment
	125	177	Video
	163	215	Portable
	165	199	Portable
	171	210	Digital type
	239	174	Video

Files Searched:

US (Granted; Full text), US (Applications; Full text), European (Granted; Full text), European (Applications; Full text), German (Granted; Full text), German (Applications; Full text), WIPO PCT Publications (Full text), Abstracts of Japan, INPADOC

Search Logic:

L145 ((34000561 or 34000564 or 34082572 or 34000735 or 34000747 or 34082552 or 340907 or 340908 or 340937 or 345007 or 345008 or 345188 or 345545 or 345556 or 345565 or 345193 or 345511 or 3461072 or 348061 or 348143 or 348158 or 3482071 or 3482112 or 34821114 or 3482313 or 3482317 or 3482319 or 348373 or 348376 or 348715 or 348719 or 348143 or 348601 or 348180 or 348E07085 or 359618 or 359630 or 360005 or 360007 or 36901316 or 36901325 or 36901334 or 36903004 or 36904722 or 36901301 or 36901304 or 36901305 or 36901354 or 36902701 or 36902902 or 36903001 or 36903023 or

Motorola v. Stellar
Motorola Exhibit 1013
Page 042

36904433 or 369084 or 369085 or 370222 or 370223 or 370224 or 370310 or 370228 or 375E07014 or 381223 or 386006 or 386007 or 386020 or 386035 or 386040 or 386046 or 386068 or 386083 or 386091 or 386095 or 45500301 or 711001 or 711002 or 711100 or 711104 or 711110 or 711117 or 711200 or 711213 or 711E12001 or 711E12004 or 711E12007 or 711E12091 or 725012 or 725081 or 725089 or 725094 or 725105 or 725109 or 725112 or 725113 or 725115 or 725116 or 725123 or 725143 or 725145 or 725146 or D14496 or D14125 or D14163 or D14165 or D14171 or D14239) <in> NC); 37,360 results

L146 L145 and (surveillance or monitor*) and (apparatus or device or system); 16,706 results

L147 L145 and (surveillance and (device or apparatus or system)); 1,532 results

L148 L145 and (surveillance apparatus); 59 results

L149 L145 and (electronic and surveillance and (apparatus or system or device)); 906 results

L150 L145 and (electronic surveillance and (apparatus or system or device)); 47 results

L151 L145 and (electronic surveillance <near/5> (apparatus or system or device)); 27 results

L152 L145 and (electronic surveillance apparatus or (electronic surveillance device or electronic surveillance system)); 15 results

L153 L145 and (electronic surveillance apparatus); 1 result

L154 L145 and (camera); 9,652 results

L155 L145 and (camera and image); 9,008 results

L156 L145 and (camera and image and (convert or change or modify)); 8,326 results

L157 L145 and ((camera and image and convert and data stream)); 781 results

L158 L145 and (camera and (convert <near/5> image) and data stream); 184 results

L159 L145 and (camera and ((convert <near/5> image) <near/10> data stream)); 7 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 043

L160 L145 and (camera and capture and image and convert and data stream); 416 results

L161 L145 and (camera and (capture <near/5> image) and ((convert <near/5> image) <near/10> data stream)); 3 results

L162 L145 and (camera and memory); 7,051 results

L163 L145 and (camera <near/10> memory); 2,060 results

L164 L145 and (camera <near/5> memory); 1,311 results

L165 L145 and ((camera <near/5> memory) or (camera <near/5> RAM)); 1,378 results

L166 L145 and (camera <near/5> RAM); 103 results

L167 L145 and (camera memory); 93 results

L168 L145 and (wireless and transmit*); 7,561 results

L169 L145 and ((wireless and transmit*) and memory); 5,647 results

L170 L145 and (wireless transmitter); 505 results

L171 L145 and (wireless transmitter and memory); 354 results

L172 L145 and (wireless transmitter <near/5> memory); 8 results

L173 L145 and (wireless transmitter with memory); 0 results

L174 L145 and (record* and data and memory); 14,787 results

L175 L145 and (record* and data and memory and buffer); 6,664 results

L176 L145 and (record* and data and memory and circular buffer); 198 results

L177 L145 and (circular buffer); 317 results

L178 L145 and ((record* <near/5> data) and (memory <near/5> buffer)); 2,508 results

L179 L145 and ((record* <near/5> data) and (memory <near/5> circular buffer)); 25 results

L180 L145 and (record* and (subset or part or portion or segment)); 18,586 results

L181 L145 and ((record* and (subset or part or portion or segment) and (buffer or memory or RAM))); 15,328 results

L182 L145 and (record* and (subset or part or portion or segment) and circular buffer); 196 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 044

L183 L145 and ((record* <near/10> (subset or part or portion or segment)) <near/10> circular buffer); 2 results

L184 L145 and (((record* <near/10> (available or unused or unprotected or free or empty)) <near/10> (subset or part or portion or segment)) <near/10> circular buffer); 0 results

L185 L145 and (record* and (available or unused or unprotected or free or empty) and circular buffer); 195 results

L186 L145 and ((record* <near/10> (available or unused or unprotected or free or empty)) <near/10> circular buffer); 0 results

L187 L145 and (recording <near/5> (device or apparatus or system or facility)); 11,007 results

L188 L145 and (recording device or recording facility or recording apparatus or recording system); 5,234 results

L189 L145 and (recording facility); 19 results

L190 L145 and ((recording facility and continuous* and record and data stream)); 0 results

L191 L145 and ((continuous* <near/5> record*) and ((unused or available or free or unprotected) <near/5> memory)); 119 results

L192 L145 and ((continuous* <near/5> record*) and ((unused or available or free or unprotected) <near/5> circular buffer)); 1 results

L193 L145 and ((continuous* <near/5> record*) and ((unused or available or free or unprotected) <near/5> circular data storage)); 0 results

L194 L145 and ((continuous* <near/5> record*) and ((unused or available or free or unprotected) <near/5> circular storage)); 0 results

L195 L145 and (protect* and (signal or trigger or event or command) and record* and (before or prior or retro*)); 4,303 results

L196 L145 and (write-protect* and (signal or trigger or event or command) and record* and (before or prior or retro*)); 0 results

L197 L145 and write-protect*; 0 results

L198 L145 and (write protect*); 270 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 045

L199 L145 and ((write protect* and ((signal or command or instruct* or trigger) <near/5> record) and ((before or prior or previous or retro) <near/5> (event or occurrence or point or incident)))); 27 results

L200 L145 and (write protect* and (signal <near/5> record) and ((before or prior or previous or retro) <near/5> event)); 3 results

L201 L145 and ((camera or video or image capture) and (wireless or radio frequency or infrared or electromagnetic wav*) and (write protect* or write block* or read only or overwrite)); 2578 results

L202 L145 and ((camera or video or image capture) and (wireless or radio frequency or infrared or electromagnetic wav*) <near/10> (write protect* or write block* or read only or overwrite)); 9 results

L203 L145 and (retroactive recording); 8 results

L204 L145 and (retroactive recording and circular buffer); 6 results

L205 L145 and (retroactive recording and circular buffer and protect); 2 results

L206 L145 and (retroactive recording and circular buffer and protect and (portion or segment)); 2 results

L207 L145 and (retroactive recording and circular buffer and protect and (unused or empty or free or unprotected) and (portion or segment)); 2 results

L208 L145 and (retroactive recording and circular buffer and protect and (unprotected) and (portion or segment)); 0 results

L209 L145 and (retroactive recording and circular buffer and protect and (unused) and (portion or segment)); 0 results

L210 L145 and (circular buffer and (portion or segment) and (protect*)); 78 results

L211 L145 and ((circular buffer and write protect and previously recorded)); 1 results

L212 L145 and (wireless and transmit data); 1,042 results

L213 L145 and (wireless and transmit image data); 93 results

L214 L145 and (sending and (component or facility or device or part)); 14,858 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 046

L215 L145 and (sending facility); 0 results

L216 L145 and ((send or transmit) and write protected and data); 186 results

L217 L145 and ((send or transmit) and write protected data); 13 results

L218 L145 and ((send or transmit) and write protected data and wireless*); 2 results

L219 L145 and (electronic surveillance apparatus and camera); 1 result

L220 L145 and (surveillance and camera and (circular memory or ring buffer or circular buffer) and (bookmark or index or metadata or label) and write protect and skip); 0 result

L221 L145 and ((surveillance and camera and buffer)); 299 results

L222 L145 and ((surveillance and camera and circular buffer)); 20 results

L223 L145 and (surveillance and camera and circular buffer and skip); 3 results

L224 L145 and (surveillance and camera and circular buffer and index); 1 result

L225 L145 and (surveillance and camera and circular buffer and bookmark); 0 results

L226 L145 and (surveillance and camera and circular buffer and metadata); 2 results

L227 L145 and (camera and (circular buffer or ring buffer) and wireless); 43 results

L228 L145 and (camera and (circular buffer or ring buffer) and wireless and transmit*); 39 results

L229 L145 and (camera and record and after-the-fact); 46 results

L230 L145 and (camera and record and after-the-fact and 5 seconds); 10 results

L231 L145 and (camera and ((record <near/10> retroactive) or (record <near/10> after-the-fact)) and (second* or minute* or hour*)); 18 results

L232 L145 and (camera and (circular buffer or ring buffer) and ((record <near/10> retroactive) or (record <near/10> after-the-fact)) and sensor); 3 results

L233 L145 and (camera and (circular buffer or ring buffer) and ((record <near/10> retroactive) or (record <near/10> after-the-fact)) and sensor and algorithm); 2 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 047

L234 L145 and ((camera and (circular buffer or ring buffer) and ((record <near/10> retroactive) or (record <near/10> after-the-fact)) and interface)); 4 results

L235 L145 and ((camera and (circular buffer or ring buffer) and ((record <near/10> retroactive) or (record <near/10> after-the-fact)) and interface and user input)); 1 results

L236 L145 and (camera and ((record <near/10> retroactive) or (record <near/10> after-the-fact)) and (second* or minute* or hour*) and (change or modify or pre-set or adjust)); 15 results

L237 L145 and (camera and wireless and transmit and phone); 955 results

L238 L145 and (camera and wireless* <near/5> transmit* and phone); 433 results

L239 L145 and (camera and wireless* <near/5> transmit* and mobile phone); 104 results

L240 L145 and (camera and wireless* <near/5> transmit* and mobile phone and memory and storage); 71 results

L241 L145 and (camera and wireless* <near/5> send* and mobile phone and memory and storage); 15 results

L242 L145 and (camera and wireless and transmit to a mobile phone); 0 results

L243 L145 and (camera and wireless transmitter); 195 results

L244 L145 and (camera and wireless transmitter and (forward or send) and second memory); 4 results

L245 L145 and (camera and wireless transmitter and (forward or send) and second memory and phone); 2 results

L246 L145 and (camera and mount); 4,857 results

L247 L145 and (camera and (base or stand)); 4,152 results

L248 L145 and (camera mount); 781 results

L249 L145 and (camera mount and glasses); 40 results

L250 L145 and (camera mount <near/5> glasses); 0 results

L251 L145 and (camera <near/5> eye glasses); 0 results

L252 L145 and ((camera <near/5> glasses) and wear); 10 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 048

L253 L145 and (electronic index); 3 results

L254 L145 and (camera and image data and electronic index); 3 results

L255 L145 and ((method or procedure) and process and image and data and camera); 6,297 results

L256 L145 and (method and process and image data and camera); 3,103 results

L257 L145 and (camera and receive* and image data and stream); 947 results

L258 L145 and (camera and capture and data); 3,723 results

L259 L145 and (camera and (capture <near/5> (image or data))); 3,166 results

L260 L145 and (camera and (capture <near/5> image) and record and stream); 660 results

L261 L145 and (camera and (capture <near/5> image) and record and data stream); 235 results

L262 L145 and (camera and (capture <near/5> image) and record and data stream and (ring buffer or circular buffer)); 13 results

L263 L145 and (camera and (capture <near/5> image) and record and data stream and circular buffer); 7 results

L264 L145 and (camera and record and (retroactive or after-the-fact)); 68 results

L265 L145 and (method and camera and record and signal and (retroactive or after-the-fact)); 4 results

L266 L145 and (method and camera and record and ((prior or before) <near/5> signal)); 587 results

L267 L145 and (((method and camera and record and ((prior or before) <near/5> signal)) and buffer); 268 results

L268 L145 and ((method and camera and record and ((prior or before) <near/5> signal)) and (circular buffer or ring)); 100 results

L269 L145 and ((ring buffer or circular buffer) and (portion or part or segment) and (write-protect* or protect or write protect) and (index or bookmark or metadata)); 64 results

L270 L145 and (method and (ring buffer or circular buffer) and (portion or part or segment) and (write-protect* or protect or write protect) and (index or bookmark or metadata)); 64 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 049

L271 L145 and ((method and (ring buffer or circular buffer) and write protect and index)); 1 results

L272 L145 and (method and (wireless* <near/10> transmit*) and circular buffer and remote memory); 13 results

L273 L145 and (method and camera and (wireless* <near/10> transmit*) and circular buffer and remote memory); 3 results

L274 L145 and ((method and camera and (wireless* <near/10> transmit*) and circular buffer and (remote <near/5> (storage or memory)))); 7 results

L275 L145 and (method and (image <near/5> data) and camera and stream and receive and circular buffer and signal and protect and record and (retroactive or after-the-fact)); 0 results

L276 L145 and ((method and (image <near/5> data) and camera and stream and receive and circular buffer and signal and protect and record and (retroactive or after-the-fact)) and wireless and (transmit or send)); 0 results

L277 L145 and ((method or step) and (store <near/10> file) and (file <near/10> data) and separate and write-protect); 76 results

L278 L145 and ((method or step) and (store <near/10> file) and (file <near/10> data) and separate and write-protect and circular buffer); 0 results

L279 L145 and ((circular buffer or ring buffer) <near/10> (part or segment or portion) <near/10> (discontiguous or separate)); 0 results

L280 L145 and (camera and record and signal and stop and start); 1,955 results

L281 L145 and (camera and record and start signal and stop signal); 17 results

L282 L145 and (camera and signal <near/5> protect and recording); 182 results

L283 L145 and (camera and audio signal <near/5> protect <near/10> recording); 1 result

L284 L145 and (camera and (signal <near/5> protect <near/10> recording) and switch); 9 results

L285 L145 and (camera and record and (retroactive or after-the-fact) and configure and (second or minute or hour) and circular buffer); 5 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 050

L286 L145 and (camera and record and (retroactive or after-the-fact) and configure and size and (second or minute or hour) and circular buffer); 4 results

L287 L145 and (circular buffer and (unprotect or clear or erase or overwrit*) and (after <near/5> transmit*)); 20 results

L288 L145 and (method and camera and circular buffer and (unprotect or clear or erase or overwrit*) and (after <near/5> transmit*)); 4 results

L289 L145 and ((method and camera and circular buffer and record and (warn <near/10> user))); 1 results

L290 L145 and (method and camera and circular buffer and record and (extend or change or increase) and length and (signal <near/10> (audio or switch))); 18 results

L291 L145 and (method and camera and circular buffer and record and (extend <near/5> length) and (signal <near/10> (audio or switch))); 4 results

3. **Database Search: Dialog™ (non-patent literature)**

Date Conducted: Oct 2, 2008.

Files Searched:

Searching Dialog's Science and Technology databases for "camera" revealed that following NPL databases as being the most relevant:

ABI/INFORM , Gale Group Trade & Industry Database™, Gale Group PROMT®, Gale Group New Product Announcements/Plus®, Gale Group Computer Database™, Gale Group Newsletter Database™, Gale Group Globalbase™, Inspec, Periodical Abstracts PlusText, Ei Compendex®, Business & Industry, PIRA, EMBASE®, BIOSIS Previews®, MEDLINE®, Business Dateline®, NTIS, PR Newswire, Inside Conferences, CA Search®, The McGraw-Hill Companies Publications Online

Numerical codes for databases: 15, 148, 160, 621, 275, 636, 583, 2, 484, 8, 9, 248, 72, 5, 154, 635, 6, 613, 65, 399, 624

Motorola v. Stellar
Motorola Exhibit 1013
Page 051

The remaining Dialog databases lacked sufficient relevance or lacked sufficient results pertaining to cameras.

Search Logic:

L292 CAMERA; 601,595 results

L293 WIRELESS OR RADIO FREQUENCY OR INFRARED OR ELECTROMAGNETIC WAVES; 3,284,128 results

L294 WRITE PROTECT??? OR WRITE BLOCK??? OR READ ONLY OR OVERWRITE; 7718 results

L295 MEMORY OR STORAGE DEVICE OR DRIVE OR DISK; 4,621,715

L296 L292 AND L293 AND L294 AND L295; 51 results

L297 CIRCULAR BUFFER OR LOOP BUFFER OR BOUNDED QUEUE; 48 results

L298 L293 AND L294 AND L295 AND L297; 0 results

L299 CELLPHONE OR MOBILE PHONE OR WIRELESS PHONE OR CELLULAR PHONE; 26,251 results

L300 L295 AND L999; 3,703 results

L301 L297 AND L299; 0 results

L302 L294 AND TRANSMIT AND L299; 0 results

L303 L294 AND L299; 1 result

L304 FORWARD OR RETRANSMIT OR RELAY OR TRANSLATE; 6,262,903 results

L305 L299 AND L304; 2,869 results

L306 HASH TABLE OR MEMORY HEAP OR CLUSTERED INDEX OR DATABASE; 1,939,931 results

L307 L294 AND L306; 97 results

L308 L294 AND FILE; 3,647

L309 (DISCONTIGUOUS OR FRAGMENTED OR DICONNECTED OR SPLIT)(5N)(FILE); 1497 results

L310 L297 AND L309; 0 results

L311 TRANSMIT OR SEND OR BROADCAST OR PASS OR EXPORT; 4,394,747 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 052

L312 L294 AND L312; 2,126 results

L313 L294 AND L297; 0 results

L314 (WARN OR ALERT OR NOTIFY OR THRESHOLD); 1,437,532 results

L315 (STOP OR HALT OR PAUSE OR END)(5N)L294; 54 results

L316 L314 AND L315; 0 results

L317 (EXTEND LENGTH OR CONTINUE OR PERSIST OR PROLONG); 5,386,191 results

L318 (SWITCH OR SIGNAL OR CUE OR THRESHOLD OR TRIGGER); 5,136,703 results

L319 L317 AND L318; 673,212 results

L320 L294 AND L319; 358 results

L321 (PRE-RECORDED OR PRERECORDED OR RECORDED BEFORE); 61,124 results

L322 L321 AND (SECONDS OR MINUTES); 60 results

L323 (HUMAN OR PERSON OR HOMOSAPIEN OR FINGER OR MANUAL); 20,505,233 results

L324 L294 AND L323; 1217 results

L325 (CAMERA(5N)(MOUNT OR SUPPORT OR ATTACHMENT)); 7,351 results

L326 L325 AND (GLASSES OR SPECTACLES OR EYEGLASSES); 86 results

4. **Database Search: MicroPatent™**

Date Conducted: October 3, 2008

US Field of Search:

Classes/Subclasses Searched: Not restricted to class/subclass

Files Searched:

German (Applications; Full text), German (Granted; Full text), European (Applications; Full text), European (Granted; Full text), INPADOC, Abstracts of Japan, US (Granted; Full text), WIPO PCT Publications (Full text), US (Applications; Full text)

Motorola v. Stellar
Motorola Exhibit 1013
Page 053

L327 ((Surveillance or observation or spy*3 or intelligence) near3 camera) and (captur*3 or seiz*3 or grab*4) near3 (imag*3 or pictur*3 or scene*1 or photo*1 or photograph*3) and (convert*3 or chang*3 or switch*4) near5 (imag*3 or pictur*3 or scene*1 or photo*1 or photograph*3) and (data adj stream*3 or stream*3 or data*1); 823 results

L328 (Local near5 (memor*3 or storage or storing or disc*1)) and ((coupl*3 or attach*3 or link*3 or join*3 or connect*3 or engag*3) near3 camera*1) and (functional*4 or operation*4 or procedur*4) near3 (coupl*3 or attach*3 or link*3 or join*3 or connect*3 or engag*3); 298 results

L329 ((Surveillance or observation or spy*3 or intelligence) near3 camera); 6522 results

L330 (Local near5 (memor*3 or storage or storing or disc*1)) and ((coupl*3 or attach*3 or link*3 or join*3 or connect*3 or engag*3) near3 camera*1); 2497 results

L331 L329 and L330; 98 results

L332 (wire adj less*3 or radio or connect*4 adj less*3) near5 (transmit*4 or send*3 or transfer*4) and ((coupl*3 or attach*3 or link*3 or join*3 or connect*3 or engag*3) near3 (memor*3 or local adj memor*4)) and (functional*4 or operation*4 or procedur*4) near3 (coupl*3 or attach*3 or link*3 or join*3 or connect*3 or engag*3); 1319 results

L333 L329 and L332; 3 results

L334 (record*3 or writ*4 or read*4 or transcript*4) near3 (data*1 or data*1 adj stream*3 or stream*3) and (available or useable or functional or usable) near2 (segment*1 or portion*1 or part*1) and circular adj buffer*1 and (Local near5 (memor*3 or storage or storing or disc*1)); 144 results

L335 ((writ*3 adj protect*3 or read*3 adj protect*3) or (protect*4 or secure*4) near3 (writ*3 or read*3)) and (respond*4 or answer*3 or react*4 or reply*3) near3 (signal*4 or point*1) and (record*3 or writ*4 or read*4 or transcript*4) near2 (segment*1 or portion*1 or part*1); 240 results

L336 (wire adj less*3 or radio or connect*4 adj less*3) near5 (transmit*4 or send*3 or transfer*4) and ((writ*3 adj protect*3 or read*3 adj protect*3)

Motorola v. Stellar
Motorola Exhibit 1013
Page 054

or (protect*4 or secure*4) near3 (writ*3 or read*3)) and (record*3 or writ*4 or read*4 or transcript*4) near3 (segment*1 or portion*1 or part*1) and (remote or distan*3) near2 (memor*3 or storage or storing or disc*1); 8 results

L337 circular adj buffer*1 and pre adj record*3 near3 (set*1 or subset*1) and (record*3 or writ*4 or read*4 or transcript*4) and (receiv*3 or reach*3 or meet*3 or obtain*3) near3 (signal*4 or point*1); 3 results

L338 (writ*3 adj protect*3 or read adj protect*3 or (writ*4 or read*3) adj2 (protect*3 or secur*3)) and (portion or segment*1 or part*1) near3 (memor*3 or storage or stor*3) and (wire adj less*3 or wireless*3) near3 (send*3 or transfer*3 or transmit*4) and (writ*4 or read*3) adj2 (protect*3 or secur*3) with (part*1 or segment*1 or portion*1) and (remote or distan*3) near2 (memor*3 or storage or storing or disc*1); 10 results

L339 (record*3 or writ*3 or read*3) near5 (subset*1 or set*1) and (second*1 or moment*1 or sec*1) near2 (long or length*3 or duration); 5740 results

L340 (pre adj (writ*3 or record*3 or read*4)) with (subset*1 or set*1) and (second*1 or moment*1 or sec*1) near2 (long or length*3 or duration); 180 results

L341 (Sensor or detect*3) and (automatic*5 or mechanic*4) near10 (initiat*4 or start*3 or begin*4) and (signal*1 or sign*3) near3 (record*4 or writ*4 or read*4) and (Sensor or detect*3) near3 (operat*4 or work*4 or act*3 or function*3) and (content*1 or image*1 or picture*1 or photo*1 or photograph*1) and (captur*3 or seiz*3 or grab*4) near3 camera*1; 168 results

L342 (interface*1 or port*1 or circuit*1) adj (through or by or along) and (initiat*4 or start*3 or begin*4) near3 (signal*1 or sign*3); 29331 results

5. **Database Search: MicroPatent™**

Date Conducted: October 6, 2008

US Field of Search:

Classes/Subclasses Searched: Not restricted to class/subclass

Motorola v. Stellar
Motorola Exhibit 1013
Page 055

Files Searched:

German (Applications; Full text), German (Granted; Full text), European (Applications; Full text), European (Granted; Full text), INPADOC, Abstracts of Japan, US (Granted; Full text), WIPO PCT Publications (Full text), US (Applications; Full text)

L343 (interface*1 or port*1 or circuit*1) near3 (through or by or along) and (assign*3 or design*4 or allot*4 or allocat*4) and (length*1 or duration*1 or long) near3 (time*1 or clock*1) and (pre or post) adj (record*3 or writ*3 or read*4) and (record*3 or writ*3 or read*3) near3 (subset*1 or set*1); 1242 results

L344 (remote or distan*3) near2 (memor*3 or storage or storing or disc*1) and (mobile or mobile near2 (phone*1 or cell*1 or device*1)); 11528 results

L345 (mobile or mobile near2 (phone*1 or cell*1 or device*1)) and (record*3 or writ*3 or read*3) near3 (part*1 or portion*1 or segment*1) and (wire adj less*3 or radio or connect*4 adj less*3) near5 (transmit*4 or send*3 or transfer*4) and (forward*3 or send*3 or frontward*3) and (remote or distan*3) near2 (memor*3 or storage or storing or disc*1); 99 results

L346 ((Mount*3 or coupl*3 or attach*4 or fix*3) near5 camera*1); 129105 results

L347 (Mount*3 or coupl*3 or attach*4 or fix*3) near10 (spectac*4 or glass*3 or spec*1); 229503 results

L348 (electronic*4 or automatic*4) near3 (index*3 or indicator*1) and (referenc*3 or cite*1 or mention*1 or quote*1) near5 (address*3 or locat*4) and (writ*3 adj protect*3 or read adj protect*3 or (writ*4 or read*3) adj2 (protect*3 or secur*3)) and (part*1 or portion*1 or segment*1); 85 results

L349 (record*4 or writ*3 or read*3) near3 stream*3 and (available or useable or vacant or free or usable) near3 (portion*1 or part*1 or segment*1) and circular adj buffer*1; 90 results

L350 (Process*3 or execut*3) near10 (imag*3 or pictur*3 or scene*1 or photo*1 or photograph*3) and (data*1 or informat*3 or info) near3

Motorola v. Stellar
Motorola Exhibit 1013
Page 056

camera*1 and (receiv*3 or get*4 or obtain*4) near3 stream*3 and (imag*3 or pictur*3 or scene*1 or photo*1 or photograph*3) near3 (data*1 or information*1 or info); 1012 results

L351 (respond*4 or answer*3 or reply*3 or respons*4) near3 signal*1 and (writ*3 adj protect*3 or read adj protect*3 or (writ*4 or read*3) adj2 (protect*3 or secur*3)) and (new*3 or just or fresh*4) near2 (record*3 or writ*4); 475 results

L352 (index*3 or classif*5 or list*3) near3 (portion*1 or part*1 or segment*1) and (writ*3 adj protect*3 or read adj protect*3 or (writ*4 or read*3) adj2 (protect*3 or secur*3)) and (portion*1 or part*1 or segment*1) near3 buffer*1; 42 results

L353 (portion*1 or part*1 or segment*1) adj buffer*1 and (subset*1 or set*1) near3 (portion*1 or part*1 or segment*1) and (record*3 or writ*4 or read*4 or transcript*4) near2 (before or ahead or earlier) and (receiv*3 or reach*3 or meet*3 or obtain*3) near3 (signal*4 or point*1); 8 results

L354 (wire adj less*3 or radio or connect*4 adj less*3) near5 (transmit*4 or send*3 or transfer*4) and (remote or distan*3) near2 (memor*3 or storage or storing or disc*1); 2023 results

L355 (writ*3 adj protect*3 or read adj protect*3 or (writ*4 or read*3) adj2 (protect*3 or secur*3)) and (portion*1 or part*1 or segment*1) near3 buffer*1; 442 results

L356 (stor*4 or sav*3 or put*3) near3 (segment*1 or portion*1 or part*1) and (writ*3 adj protect*3 or read adj protect*3 or (writ*4 or read*3) adj2 (protect*3 or secur*3)) and (separat*3 or disjoin*4 or divid*3) near3 (file*1 or record*1); 319 results

L357 (record*4 or writ*3 or read*3) near3 stream*3 and circular adj buffer*1; 826 results

L358 physical*3 with ((dis or un or "not") adj (contigu*4 or adjacent*3 or neighbour*3 or neighbor*3)); 610 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 057

L359 Signal*1 and (sav*3 or stor*4) near3 (record*3 or stor*3 or sav*3) and ((record*3 or writ*3 or read*3) near3 (stop*3 or paus*3 or terminat*3)) and (record*3 or writ*3 or read*3) near3 (start* or begin*3); 13027 results

L360 (Receiv*3 or obtain*3 or get*3 or find*3) near3 signal*1 and (sav*3 or stor*3) near5 (record*4 or writ*4 or read*3 or tap*5) and (((manual*4 or hand*3) near3 (operat*4 or work*4 or control*4 or function*4)) with (switch*3 or chang*3 or shift*3)) and (((manual*3 or hand*4) near3 (operat*4 or work*4 or control*4 or function*4)) with (audio adj signal*1)); 271 results

L361 (Configur*4 or set*4 or assembl*4 or put*4) near5 siz*3 and (pre adj record*3 or pre adj read*4 or pre adj writ*4) with (sub adj set*1 or set*1); 217 results

L362 (Remov*3 or withdraw*4) near5 ((writ*4 or chang*3 or updat*4) adj (protect*4 or secur*4)); 207 results

L363 (transmit*4 or transfer*4 or transport*4) with ((writ*4 or chang*3 or updat*4) adj (protect*4 or secur*4)) and (after or later or subsequent*4 or afterward*3) near3 (transmit*4 or transfer*4 or transport*4); 235 results

L364 (send*4 or inform*4 or communicat*4) near5 (warn*4 or notif*6 or notic*3) and (before or earlier or ahead) near5 (full*3 or entir*3) and (record*3 or read*4 or writ*4) near3 (portion*1 or part*1 or segment*1); 123 results

L365 (extend*4 or prolong*4 or increas*4 or stretch*4 or elong*5) near5 (length*3 or siz*4 or durat*5) and (record*3 or read*4 or writ*4) near3 (portion*1 or part*1 or segment*1) and (((manual*4 or hand*3) near3 (operat*4 or work*4 or control*4 or function*4)) with (switch*3 or chang*3 or shift*3)) and (((manual*3 or hand*4) near3 (operat*4 or work*4 or control*4 or function*4)) with (audio adj signal*1)); 21 results

L366 circular adj buffer*1 and camera*1 and (overwri*4 or writ*3) near5 (avoid*4 or prevent*4 or protect*3 or secur*4); 200 results

L367 memor*4 and wireless near3 transmi*6 and remote near3 (memor*4 or locat*5 or device*1); 21725 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 058

L368 L366 and L367; 12 results

L369 (Surveillanc*3 or observat*4 or spy*3 or intelligen*5); 1007430 results

L370 camera*1; 719192 results

L371 L332 and L369 and L370; 120 results

L372 L339 and L369 and L370; 349 results

L373 (writ*3 adj protect*3 or read adj protect*3 or (writ*4 or read*3) adj2 (protect*3 or secur*3)) and (portion or segment*1 or part*1) near3 (memor*3 or storage or stor*3) and (wire adj less*3 or wireless*3) near3 (send*3 or transfer*3 or transmit*4) and (writ*4 or read*3) adj2 (protect*3 or secur*3) with (part*1 or segment*1 or portion*1); 33 results

L374 Circular adj buffer*1 and camera*1 and (remote or distan*3) near2 (memor*3 or storage or storing or disc*1 or location*1 or device*1); 389 results

L375 (writ*3 adj protect*3 or read adj protect*3 or (writ*4 or read*3 or overwri*4 or over adj wri*4) adj2 (prevent*3 or avoid*4 or protect*3 or secur*3)) and (portion or segment*1 or part*1 or block*1) near3 (memor*3 or storage or stor*3) and (wire adj less*3 or wireless*3) near3 (send*3 or transfer*3 or transmit*4) and (writ*4 or read*3 or overwri*5 or over adj wri*4) adj2 (protect*3 or secur*3 or avoid*4 or prevent*4) with (part*1 or segment*1 or portion*1); 46 results

6. **Database Search: MicroPatent™**

Date Conducted: October 7, 2008

US Field of Search:

Classes/Subclasses Searched: 34000561, 34000564, 340082572, 34000735, 34000747, 34082552, 340907, 340908, 340937, 345007, 345008, 345188, 345545, 345556, 345565, 345193, 345551, 3461072, 348061, 348143, 348158, 3482071, 3482112, 34821114, 3482313, 3482317, 3482319, 348373, 348376, 348715, 348719, 348143, 348601, 348180, 348E07085, 359618, 359630, 360005, 360007, 36901316, 36901325, 36901334, 36903004, 36904722, 36901301, 36901304, 36901305, 36901354, 36902701, 36902902, 36903001, 36903023, 36904433, 369084, 369085, 370222, 370223, 370224, 370310, 370328,

Motorola v. Stellar
Motorola Exhibit 1013
Page 059

375E07014, 381381, 386006, 386007, 386020, 386035, 386040, 386046, 386068, 386083, 386091, 386095, 45500301, 711001, 711002, 711100, 711104, 711110, 711117, 711200, 711213, 711E12001, 711E12004, 711E12007, 711E12091, 725012, 725081, 725089, 725094, 725105, 725109, 725112, 725113, 725115, 725116, 725123, 725143, 725145, 725146, D14496, D14125, D14163, D14165, D14171, D14239

Files Searched:

German (Applications; Full text), German (Granted; Full text), European (Applications; Full text), European (Granted; Full text), INPADOC, Abstracts of Japan, US (Granted; Full text), WIPO PCT Publications (Full text), US (Applications; Full text)

L376 Any Classification 34000561 or 34000564 or 34082572 or 34000735 or 34000747 or 34082552 or 340907 or 340908 or 340937 or 345007 or 345008 or 345188 or 345545 or 345556 or 345565 or 345193 or 345551 or 3461072 or 348061 or 348143 or 348158 or 3482071 or 3482112 or 34821114 or 3482313 or 3482317 or 3482319 or 348373 or 348376 or 348715 or 348719 or 348143 or 348601 or 348180 or 348E07085 or 359618 or 359630 or 360005 or 360007 or 36901316 or 36901325 or 36901334 or 36903004 or 36904722 or 36901301 or 36901304 or 36901305 or 36901354 or 36902701 or 36902902 or 36903001 or 36903023 or 36904433 or 369084 or 369085; 17456 results

L377 370222 or 370223 or 370224 or 370310 or 370328 or 375E07014 or 381381 or 386006 or 386007 or 386020 or 386035 or 386040 or 386046 or 386068 or 386083 or 386091 or 386095; 13007 results

L378 45500301 or 711001 or 711002 or 711100 or 711104 or 711110 or 711117 or 711200 or 711213 or 711E12001 or 711E12004 or 711E12007 or 711E12091 or 725012 or 725081 or 725089 or 725094 or 725105 or 725109 or 725112 or 725113 or 725115 or 725116 or 725123 or 725143 or 725145 or 725146; 10808 results

L379 D14496 or D14125 or D14163 or D14165 or D14171 or D14239; 1555 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 060

L380 (surveillance or monitor*4 or vigilance or inspect*4 or observat*4 or investigat*4 or hidden or secret) near2 camera*1; 24897 results

L381 circular near2 (buffer*3 or fashion*1) and (memor*4 or storage*1 or stor*4); 12891 results

L382 (writ*3 or read*3 or overwri*6 or over adj wri*6 or edit*5) near3 (protect*3 or prevent*3 or avoid*4 or secur*4); 143388 results

L383 L376 and L382; 538 results

L384 L376 and L381; 112 results

L385 L376 and L380; 1272 results

L386 L377 and L380; 138 results

L387 L377 and L381; 119 results

L388 L377 and L382; 328 results

L389 L378 and L380; 125 results

L390 L378 and L381; 199 results

L391 L378 and L382; 773 results

L392 L359 and L327; 16 results

L393 Circular adj buffer*1 and camera*1; 1127 results

L394 L354 and L393; 10 results

L395 L350 and L381; 32 results

L396 L347 and L380; 642 results

L397 L346 and L381 and L382; 36 results

L398 L385 and L369; 854 results

L399 (wire adj less*3 or radio or connect*4 adj less*3 or wireless) near5 (transmi*6 or send*3 or transfer*4) and (remote or distan*3) near2 (memor*3 or storage or storing or disc*1); 6376 results

L400 L399 and L380; 174 results

L401 L343 and L330; 4 results

L402 L342 and L329; 28 results

L403 L344 and L67; 24 results

L404 L346 and L329 and L330; 82 results

L405 L347 and L329; 185 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 061

L406 L359 and L330; 46 results

L407 camera*1 and memor*4 and (remote or distant) and (wireless or wire adj less) and (writ*5 or overwri*5 or over adj wri*5) Inventor(s) (Amini and Shaun) or (Backlund and Gary) or (Monroe and David) or (Chen and Hsin) or (Singer and Brian) or (Jones and Kevin) or (Finizio and Francesco) or (Bengoechea and Xavier) or (Grich and Richard) or (Thacher and Kerry) or (Kavanagh and Christopher) or (Wieler and Conway) or (McConnell and Robert) or (Braun and Timothy) or (Freiling and Donald) or (Wotherspoon and Kent) or (Gillanders and William) or (Szolyga and Thomas) or (William and Hastings) or (Monroe and David) or (Kelly and Simon) or (Truefitt and Gordon); 61 results

L408 camera*1 and memor*4 and (remote or distant) and (wireless or wire adj less) and (writ*5 or overwri*5 or over adj wri*5) Assignee/Applicant Vigilos or obs or (Thales and Avionics) or (Librestream and Technologies); 29 results

L409 Any Classification 34000561; 912 results

L410 Any Classification 34000564; 572 results

L411 Any Classification 34082572; 1894 results

L412 Any Classification 34000735; 89 results

L413 Any Classification 34000747; 23 results

L414 Any Classification 34082552; 944 results

L415 Any Classification 340907; 606 results

L416 Any Classification 340937; 482 results

L417 Any Classification 345007; 1072 results

L418 Any Classification 345008; 985 results

L419 Any Classification 345188; 8 results

L420 Any Classification 345545; 577 results

L421 Any Classification 345556; 189 results

L422 Any Classification 345565; 151 results

L423 Any Classification 345193; 23 results

L424 Any Classification 345551; 139 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 062

L425 Any Classification 3461072; 329 results

L426 Any Classification 348061; 386 results

L427 Any Classification 348143; 1675 results

L428 Any Classification 3482071; 696 results

L429 Any Classification 3482112; 210 results

L430 Any Classification 34821114; 50 results

L431 Any Classification 3482313; 380 results

L432 Any Classification 3482317; 146 results

L433 Any Classification 3482319; 111 results

L434 Any Classification 348373; 1053 results

L435 Any Classification 348376; 356 results

L436 Any Classification 348715; 213 results

L437 Any Classification 348719; 64 results

L438 Any Classification 348601; 65 results

L439 Any Classification 348180; 527 results

L440 Any Classification 348E07085; 1096 results

L441 Any Classification 359618; 1076 results

L442 Any Classification 359630; 1201 results

L443 Any Classification 360005; 171 results

L444 Any Classification 360007; 161 results

L445 Any Classification 36901316; 17 results

L446 Any Classification 36901325; 27 results

L447 Any Classification 36901334; 34 results

L448 Any Classification 36903004; 237 results

L449 Any Classification 36904722; 300 results

L450 Any Classification 36901301; 147 results

L451 Any Classification 36901304; 27 results

L452 Any Classification 36901305; 66 results

L453 Any Classification 36902701; 153 results

L454 Any Classification 36901354; 63 results

L455 Any Classification 36902902; 99 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 063

L456 Any Classification 36903001; 222 results

L457 Any Classification 36903023; 214 results

L458 Any Classification 36904433; 56 results

L459 Any Classification 369084; 477 results

L460 Any Classification 369085; 159 results

L461 Any Classification 370222; 399 results

L462 Any Classification 370223; 245 results

L463 Any Classification 370224; 175 results

L464 Any Classification 370310; 1244 results

L465 Any Classification 370328; 3346 results

L466 Any Classification 375E07014; 435 results

L467 Any Classification 381381; 251 results

L468 Any Classification 386006; 44 results

L469 Any Classification 386007; 41 results

L470 Any Classification 386020; 64 results

L471 Any Classification 386035; 86 results

L472 Any Classification 386040; 153 results

L473 Any Classification 386046; 2461 results

L474 Any Classification 386068; 1117 results

L475 Any Classification 386083; 1047 results

L476 Any Classification 386091; 62 results

L477 Any Classification 386095; 2826 results

L478 Any Classification 45500301; 669 results

L479 Any Classification 711001; 618 results

L480 Any Classification 711002; 386 results

L481 Any Classification 711100; 1974 results

L482 Any Classification 711104; 837 results

L483 Any Classification 711110; 213 results

L484 Any Classification 711200; 624 results

L485 Any Classification 711117; 518 results

L486 Any Classification 711213; 523 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 064

L487 Any Classification 711E12001; 600 results

L488 Any Classification 711E12004; 407 results

L489 Any Classification 711E12007; 62 results

L490 Any Classification 711E12091; 92 results

L491 Any Classification 725012; 87 results

L492 Any Classification 725081; 405 results

L493 Any Classification 725089; 315 results

L494 Any Classification 725094; 154 results

L495 Any Classification 725105; 736 results

L496 Any Classification 725109; 676 results

L497 Any Classification 725112; 642 results

L498 Any Classification 725113; 310 results

L499 Any Classification 725115; 358 results

L500 Any Classification 725116; 623 results

L501 Any Classification 725143; 196 results

L502 Any Classification 725123; 75 results

L503 Any Classification 725145; 205 results

L504 Any Classification 725146; 263 results

L505 Any Classification D14496; 587 results

L506 Any Classification D14125; 193 results

L507 Any Classification D14163; 222 results

L508 Any Classification D14165; 209 results

L509 Any Classification D14171; 223 results

L510 Any Classification D14239; 200 results

L511 (wire adj less*3 or wireless or radio or connect*4 adj less*3) near5 (transmit*4 or send*3 or transfer*4) and ((coupl*3 or attach*3 or link*3 or join*3 or connect*3 or engag*3) near3 (memor*3 or local adj memor*4)); 24021 results

L512 ((Surveillance or observation or spy*3 or intelligence) and camera) and (captur*3 or seiz*3 or grab*4) near3 (imag*3 or pictur*3 or scene*1 or photo*1 or photograph*3) and (convert*3 or chang*3 or switch*4) near5

Motorola v. Stellar
Motorola Exhibit 1013
Page 065

(imag*3 or pictur*3 or scene*1 or photo*1 or photograph*3) and (data adj stream*3 or stream*3 or data*1); 8576 results

L513 L511 and L512; 152 results

L514 (wire adj less*3 or radio or connect*4 adj less*3 or wireless) near5 (transmit*4 or send*3 or transfer*4) and ((writ*3 adj protect*3 or read*3 adj protect*3) or (protect*4 or secure*4) near3 (writ*3 or read*3) or over adj wri*4 or overwri*4) and (record*3 or writ*4 or read*4 or transcript*4) near3 (segment*1 or portion*1 or part*1) and (remote or distan*3) near2 (memor*3 or storage or storing or disc*1); 75 results

L515 (extend*4 or prolong*4 or increas*4 or stretch*4 or elong*5) near5 (length*3 or siz*4 or durat*5) and (record*3 or read*4 or writ*4) near3 (portion*1 or part*1 or segment*1) and (((manual*3 or hand*4) near3 (operat*4 or work*4 or control*4 or function*4)) with (audio adj signal*1)); 33 results

L516 (Receiv*3 or obtain*3 or get*3 or find*3) near3 signal*1 and (sav*3 or stor*3) near5 (record*4 or writ*4 or read*3 or tap*5) and (((manual*3 or hand*4) near3 (operat*4 or work*4 or control*4 or function*4)) with (audio adj signal*1)); 591 results

L517 (interface*1 or port*1 or circuit*1) and (assign*3 or design*4 or allot*4 or allocat*4) and (length*1 or duration*1 or long) near3 (time*1 or clock*1) and (pre or post) adj (record*3 or writ*3 or read*4) and (record*3 or writ*3 or read*3) near3 (subset*1 or set*1); 1798 results

L518 L517 and L369 and L370; 165 results

L519 (extend*4 or prolong*4 or increas*4 or stretch*4 or elong*5) near5 (length*3 or siz*4 or durat*5) and (record*3 or read*4 or writ*4) near3 (portion*1 or part*1 or segment*1) and (((manual*4 or hand*3) near3 (operat*4 or work*4 or control*4 or function*4)) with (switch*3 or chang*3 or shift*3)); 2147 results

L520 L519 and L369 and L370; 298 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 066

L521 (wire adj less*3 or radio or connect*4 adj less*3 or wireless) near5 (transmit*4 or send*3 or transfer*4) and (remote or distan*3) near2 (memor*3 or storage or storing or disc*1 or device*1); 24649 results

L522 L521 and L369 and L370 and L4; 98 results

L523 (Receiv*3 or obtain*3 or get*3 or find*3) near3 signal*1 and (sav*3 or stor*3) near5 (record*4 or writ*4 or read*3 or tap*5) and (((manual*4 or hand*3) near3 (operat*4 or work*4 or control*4 or function*4)) with (switch*3 or chang*3 or shift*3)); 15301 results

L524 L525 and L369 and L370 and L4; 98 results

L525 camera*2 and (record* or video) and ((writ* near6 protect*3) or overwrit* or over-write) and transmi* and ((cyclic or circular) near4 buffer*2); 574 results

L526 (monitor* or surveillance or inspect* and track*) and camera and ((cyclic or circular) near6 buffer) and transmi*5 and ((writ*3 near4 protect*) or write-protect); 119 results

L527 (monitor* or surveillance or inspect* and track*) and camera and ((cyclic or circular) near6 buffer) and transmi*5 and (glass*2 or goggle*2); 94 results

7. **Database Search IEEE™ (non-patent literature)**

Date Conducted: October 8, 2008

Files Searched:

All files.

Search Logic:

L528 (surveillance<and>camera); 10113 results

L529 (circular<and>buffer)<and>camera; 1195 results

L530 (remote<and>memory)<and>camera; 5302 results

L531 (local<and>memory)<and>camera; 10687 results

L532 (wireless<and>transmit)<and>camera; 5596 results

L533 (record<and>segment)<and>protect; 5503 results

L534 (transmit<and>wireless)<and>protect; 9917 results

L535 (pre-recorded<and>wireless)<and>remote; 130 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 067

L536 (recorded<and>transmit)<and>remote; 18612 results

L537 (sensor<and>signal)<and>record; 53149 results

L538 (image<and>capture)<and>camera; 29174 results

L539 (interface<and>initiate)<and>signal; 27787 results

L540 (interface<and>designate)<and>time; 21050 results

L541 (length<and>pre-recorded)<and>time; 557 results

L542 (length<and>post-recorded)<and>time; 7 results

L543 (length<and>recorded)<and>segment; 29031 results

L544 (remote<and>memory)<and>mobile; 10300 results

L545 (mobile <and>phone)<and>recorded; 11327 results

L546 (mobile <and>transmit)<and>remote; 15678 results

L547 (mount<and>camera)<and>surveillance; 2301 results

L548 (mount<and>wearable)<and>glasses; 249 results

L549 (surveillance<and>wearable)<and>glasses; 76 results

L550 (electronic<and>index)<and>address; 44332 results

L551 (memory<and>index)<and>address; 47955 results

L552 (stream <and>image)<and>camera; 12972 results

L553 (record<and>stream)<and>buffer; 11648 results

L554 (respond<and>signal)<and>write-protect; 37 results

L555 (respond<and>signal)<and>record; 27140 results

L556 (subset<and>signal)<and>record; 20133 results

L557 (record<and>before)<and>signal; 97146 results

L558 (indexing<and>write)<and>protected; 10553 results

L559 (indexing<and>buffer)<and>recording; 14298 results

L560 (wireless<and>transmission)<and>write-protected; 6 results

L561 (transmit<and>'circular buffer')<and>remote; 186 results

L562 (storing<and>write-protected)<and>separate; 98 results

L563 (storing<and>write-protected)<and>file; 99 results

L564 (recording<and>stream)<and>dis-contiguous; 1 hit

L565 (recording<and>stream)<and>buffer; 11641 results

L566 (signal<and>save)<and>recording; 23240 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 068

L567 (signal<and>start)<and>stop; 56369 results

L568 (receiving<and>save)<and>recording; 27682 results

L569 (recording<and>manual)<and>switch; 13764 results

L570 (recording<and>audio)<and>signal; 21580 results

L571 (configuring<and>size)<and>pre-recorded; 141 results

L572 (removing<and>write-protection)<and>transmitted; 26 results

L573 (removing<and>write-protection)<and> transmission; 23 results

L574 (send<and>warning)<and>recording; 4669 results

L575 (warning<and>before)<and>full; 7155 results

L576 (extend<and>length)<and>recording; 58688 results

L577 (extend<and>length)<and>switch; 65618 results

L578 (extend<and>length)<and>signal; 130978 results

L579 (extend<and>length)<and>manual; 19609 results

L580 (circular<and>buffer)<and>wireless<and>(write<and>protect); 0 results

8. **Google™ Scholar (non-patent literature)**

Date Conducted: October 8, 2008

Files Searched:

All files

Search Logic:

L581 Surveillance OR observation OR spy OR intelligence camera memory transmit record; 15,100 results

L582 circular buffer ~surveillance camera; 13,500 results

L583 ~write ~protect circular buffer memory camera; 3,260 results

L584 local memory camera surveillance remote memory; 11,500 results

L585 local memory camera surveillance remote memory glass; 3,390 results

L586 data stream circular buffer surveillance camera; 596 results

L587 record segment protect transmit wireless; 8,990 results

L588 transmit remote memory wireless write protected; 9,850 results

L589 pre-recorded surveillance camera remote wireless; 398 results

L590 recorded surveillance camera remote transmit; 6,980 results

L591 sensor signal record image capture camera; 23,700 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 069

L592 interface initiate signal camera; 20,500 results

L593 interface designate time length pre-recorded OR post-recorded OR recorded segment; 22,400 results

L594 remote memory mobile phone surveillance camera; 3,300 results

L595 mobile OR cellular wireless memory; 201,000 results

L596 mount camera surveillance remote memory; 2,100 results

L597 mount wearable glasses surveillance camera; 127 results

L598 electronic index address write protected; 60,300 results

L599 stream image surveillance camera; 17,500 results

L600 recording stream circular buffer; 17,300 results

L601 responding signal write protect recorded buffer; 19,300 results

L602 subset recorded before signal; 38,400 results

L603 index write protected buffer recording; 21,400 results

L604 wireless transmit write protected circular buffer remote memory; 652 results

L605 store write protected separate file; 61,100 results

L606 record stream dis-contiguous circular buffer; 30 results

L607 signal save recording start stop; 57,400 results

L608 receiving save recording manual operated switch; 20,900 results

L609 receiving save recording audio signal; 15,400 results

L610 configure size pre-recorded subset; 2,150 results

L611 remove write protection transmission; 52,900 results

L612 send warning full record; 111,000 results

L613 extend length new recorded manual operated switch; 28,200 results

L614 extend length audio signal; 70,300 results

L615 circular buffer wireless write protect; 686 results

L616 "circular buffer" wireless write protect; 301 results

9. **Database Search: Scirus (non-patent literature)**

Date Conducted: October 8, 2008

Files Searched:

All files.

Motorola v. Stellar
Motorola Exhibit 1013
Page 070

Search Logic:

L617 camera surveillance local remote memory; 21,226 results

L618 local memory camera surveillance; 34,601 results

L619 data stream circular buffer surveillance camera; 2,208 results

L620 record segment protect transmit wireless; 13,586 results

L621 transmit remote memory wireless write protected; 14,415 results

L622 pre-recorded surveillance camera remote wireless; 7,183 results

L623 recorded surveillance camera remote transmit; 8,989 results

L624 sensor signal record image capture camera; 28,837 results

L625 interface initiate signal camera; 45,567 results

L626 interface designate time length pre-recorded; 39,753 results

L627 interface designate time length post-recorded; 29,676 results

L628 interface designate time recorded segment; 24,956 results

L629 remote memory mobile phone surveillance camera; 13,964 results

L630 Surveillance camera memory transmit record; 8,556 results

L631 circular buffer surveillance camera; 3,809 results

L632 write protect circular buffer memory camera; 3,998 results

L633 mount camera surveillance remote memory; 8,020 results

L634 surveillance camera mount wearable glasses; 275 results

L635 electronic index address write protected; 105,189 results

L636 stream image surveillance camera; 23,658 results

L637 record stream circular buffer surveillance camera; 1,763 results

L638 respond signal write protect recorded buffer; 14,854 results

L639 subset recorded before signal; 151,925 results

L640 index write protected buffer recording; 18,934 results

L641 wireless transmit write protected circular buffer remote memory; 1,713 results

L642 store write protected separate file; 151,059 results

L643 recording stream dis-contiguous circular buffer; 1,488 results

L644 signal save recording start stop; 72,453 results

L645 receiving save recording manual operated switch; 18,560 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 071

L646 receiving save recording audio signal; 31,651 results

L647 configuring size pre-recorded subset; 26,755 results

L648 removing write protection transmitted write protected after transmission; 25,894 results

L649 sending warning before new record buffer full recorded; 18,841 results

L650 extending length new recorded manual operated switch; 26,830 results

L651 extending length new recorded audio signal; 31,493 results

L652 circular buffer wireless write protect; 3,795 results

10. **Google™ (non-patent literature)**

Date Conducted: Oct 8, 2008.

Files Searched:

All files.

L653 Surveillance OR observation OR spy OR intelligence camera memory transmit record; 80,700 results

L654 circular buffer ~surveillance camera; 48,000 results

L655 ~write ~protect circular buffer memory camera; 239,000 results

L656 local memory camera surveillance remote memory; 274,000 results

L657 local memory camera surveillance remote memory glass; 132,000 results

L658 data stream circular buffer surveillance camera; 14,400 results

L659 record segment protect transmit wireless; 74,800 results

L660 transmit remote memory wireless write protected; 511,000 results

L661 pre-recorded surveillance camera remote wireless; 13,200 results

L662 recorded surveillance camera remote transmit; 1,680,000 results

L663 pre-record segment duration; 2,050 results

L664 record segment duration; 6,300,000 results

L665 sensor signal record image capture camera; 185,000 results

L666 interface initiate signal camera; 273,000 results

L667 interface designate time length pre-recorded OR post-recorded OR recorded segment; 1,650,000 results

L668 remote memory mobile phone surveillance camera; 362,000 results

L669 phone forward remote memory; 306,000 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 072

L670 mount camera surveillance remote memory; 750,000 results

L671 mount wearable glasses surveillance camera; 11,900 results

L672 electronic index address write protected; 350,000 results

L673 stream image surveillance camera; 248,000 results

L674 recording stream circular buffer; 68,100 results

L675 responding signal write protect recorded buffer; 79,400 results

L676 subset record before signal; 248,000 results

L677 index write protect buffer recording; 182,000 results

L678 wireless transmit write protected circular buffer remote memory; 6,460 results

L679 store write protect separate file; 330,000 results

L680 record stream dis-contiguous circular buffer; 585 results

L681 signal save recording start stop; 301,000 results

L682 signal save recording manual operated switch; 123,000 results

L683 receive save recording audio signal; 282,000 results

L684 configure size pre-recorded subset; 11,700 results

L685 remove write protect transmission; 304,000 results

L686 send warning buffer full record; 1,110,000 results

L687 extend length new record manual switch; 3,330,000 results

L688 extend length new record audio signal; 303,000 results

L689 circular buffer wireless write protect; 13,000 results

11. Database Search: Cambridge Journals: (non-patent literature)

Date Conducted: October 8, 2008

Files Searched:

All files.

Search Logic:

L690 camera surveillance local remote memory; 95570 results

L691 record segment protect transmit wireless; 59960 results

L692 local memory camera surveillance remote memory; 95570 results

L693 data stream circular buffer surveillance camera; 141339 results

L694 transmit remote memory wireless write protect; 66155 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 073

L695 pre-recorded surveillance camera remote wireless; 26419 results

L696 recorded remote transmit surveillance camera; 60338 results

L697 sensor signal record image capture camera; 82507 results

L698 interface initiate signal camera; 41735 results

L699 interface designate time length pre-recorded; 148634 results

L700 interface designate time length post-recorded; 148632 results

L701 interface designate time length recorded segment; 152937 results

L702 remote memory mobile phone surveillance camera; 51765 results

L703 phone transmit remote location; 48702 results

L704 Surveillance camera memory transmit record; 62499 results

L705 circular buffer surveillance camera; 35405 results

L706 write protect circular buffer memory camera; 77605 results

L707 mount camera surveillance remote memory; 48412 results

L708 surveillance camera mount goggles; 21036 results

L709 surveillance camera mount glasses; 22477 results

L710 electronic index address write protected; 107944 results

L711 stream image surveillance camera; 54434 results

L712 record stream circular buffer surveillance camera; 68686 results

L713 respond signal write protect recorded buffer; 96727 results

L714 subset recorded before signal; 124019 results

L715 index write protect buffer recording; 86617 results

L716 wireless transmit write protected circular buffer remote memory; 78021 results

L717 storing write protected separate file; 79842 results

L718 recording stream dis-contiguous circular buffer; 46017 results

L719 signal save recording start stop; 71705 results

L720 receiving save recording manual operated switch; 66054 results

L721 receiving save recording audio signal; 55497 results

L722 configuring size pre-recorded subset; 78523 results

L723 remove write protection transmitted write protected after transmission; 148075 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 074

L724 send warning before new record buffer full recorded; 181590 results

L725 extend length new recorded manual operated switch; 174455 results

L726 extend length new recorded audio signal; 173330 results

L727 circular buffer wireless write protect; 63,466 results

12. Database Search: IBM_TDB

Date Conducted: October 8, 2008

Files Searched:

All files.

Search Logic:

L728 surveillance; 36 results

L729 circular buffer; 44 results

L730 remote memory; 6 results

L731 local memory; 76 results

L732 wireless transmission; 3 results

L733 record protection; 2 results

L734 (recorded segment); 8 results

L735 (pre-recorded); 37 results

L736 (sensor signal); 40 results

L737 (interface signal); 71 results

L738 (sensor signal); 0 results

L739 (remote memory); 6 results

L740 (mobile transmit); 0 results

L741 (glass camera); 0 results

L742 (mount glass); 2 results

L743 (mount camera); 2 results

L744 (separate file); 59 results

L745 electronic index; 0 hit

L746 (stream image memory); 0 hit

L747 (write-protected); 38 results

L748 (start stop recording signal); 0 hit

L749 (configure size); 0 hit

Motorola v. Stellar
Motorola Exhibit 1013
Page 075

L750 remove protection; 12 results

L751 extend length; 18 results

L752 (recording manual switch); 0 hit

L753 (warning before recording); 0 hit

L754 (new recording audio); 0 hit

13. **Database Search: FindArticles.com**

Date Conducted: October 8, 2008

Files Searched:

All files.

Search Logic:

L755 camera surveillance local memory; 53 results

L756 local memory camera surveillance remote memory glass; 3 results

L757 data stream circular buffer surveillance camera; 0 hit

L758 record segment protect transmit wireless; 26 results

L759 transmit remote memory wireless write protect; 2 results

L760 pre-record surveillance camera remote wireless; 4 results

L761 recording surveillance camera remote transmit; 73 results

L762 sensor signal record image capture camera; 67 results

L763 interface initiate signal camera; 124 results

L764 interface designate time length pre-recorded; 2 results

L765 interface designate time length post-recorded; 0 hit

L766 interface designate time length recorded segment; 39 results

L767 remote memory mobile phone surveillance camera; 9 results

L768 Surveillance camera memory transmit record; 22 results

L769 circular buffer surveillance camera; 0 hit

L770 write protect circular buffer memory camera; 0 hit

L771 mount camera surveillance remote memory; 10 results

L772 surveillance camera mount wearable glasses; 0 hit

L773 electronic index address write protected; 66 results

L774 stream image surveillance camera; 162 results

L775 recording stream circular buffer surveillance camera; 0 hit

Motorola v. Stellar
Motorola Exhibit 1013
Page 076

L776 respond signal write protect recorded buffer; 0 hit

L777 subset record before signal; 21 results

L778 index write protect buffer recording; 1 hit

L779 wireless transmit write protected circular buffer remote memory; 0 hit

L780 store write protected separate file; 159 results

L781 recording stream dis-contiguous circular buffer; 0 hit

L782 signal save recording start stop; 98 results

L783 receiving save recording manual operated switch; 59 results

L784 receiving save recording audio signal; 98 results

L785 configure size pre-recorded subset; 0 hit

L786 remove write protection transmission; 57 results

L787 send warning new buffer full recorded; 2 results

L788 extend length new recorded manual operated switch; 10 results

L789 extend length new recorded audio signal; 30 results

14. Database Search: Yahoo (non-patent literature)

Date Conducted: October 8, 2008

Files Searched:

All files.

Search Logic:

L790 circular buffer surveillance camera; 40,800 results

L791 surveillance camera local memory remote; 2,570,000 results

L792 protect record segment transmit wireless; 481,000 results

L793 camera surveillance remote memory glass; 805,000 results

L794 data stream circular buffer surveillance camera; 704 results

L795 transmit remote memory wireless write protected; 507,000 results

L796 pre-recorded surveillance camera remote wireless; 237,000 results

L797 recorded surveillance camera remote transmit; 777,000 results

L798 sensor signal record image capture camera; 980,000 results

L799 interface initiate signal camera local memory; 283,000 results

L800 interface designate time length pre-recorded; 175,000 results

L801 interface designate time length post-recorded; 148,000 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 077

L802 interface designate time length recorded segment; 664,000 results

L803 remote memory mobile phone surveillance camera; 3,330,000 results

L804 Surveillance camera memory transmit record; 550,000 results

L805 write protect circular buffer memory camera; 78,900 results

L806 mount camera surveillance remote memory; 1,300,000 results

L807 surveillance camera mount wearable glasses; 30,000 results

L808 electronic index address write protected; 3,140,000 results

L809 stream image surveillance camera local memory; 390,000 results

L810 recording stream circular buffer surveillance camera; 19,600 results

L811 responding signal write protect recorded buffer; 593,000 results

L812 subset recorded before signal local memory; 941,000 results

L813 indexing write protected buffer recording; 1,490,000 results

L814 wireless transmit write-protected circular buffer remote memory; 2,880 results

L815 storing write protected separate file local memory; 2,110,000 results

L816 recording stream dis-contiguous circular buffer; 611 results

L817 signal save recording start stop; 11,100,000 results

L818 receiving save recording manual operated switch; 721,000 results

L819 receiving save recording audio signal; 2,380,000 results

L820 configuring size pre-recorded subset; 70,700 results

L821 removing write protection transmitted write protected after transmission; 458,000 results

L822 sending warning before new record buffer full recorded; 2,240,000 results

L823 extending length new recorded manual operated switch; 911,000 results

L824 extending length new recorded audio signal; 2,720,000 results

L825 circular buffer wireless write protect; 63,500 results

15. **Database Search: Google™ (non-patent literature)**

Date Conducted: October 10, 2008

Files Searched:

All files.

Search Logic:

Motorola v. Stellar
Motorola Exhibit 1013
Page 078

L826 record segment overwrite prevented OR protected transmit wireless surveillance OR hidden camera; 2,050 results

L827 wireless transmit remote memory write protected data stream camera; 23,500 results

L828 pre-recorded recorded segment recorded before signal remote wireless surveillance camera; 31,800 results

L829 recorded surveillance camera transmit remote memory circular buffer; 6,350 results

L830 sensor signal record image capture camera circular buffer remote memory; 6,920 results

L831 interface signal surveillance OR hidden OR spy camera record data stream overwrite protected; 4,490 results

L832 interface time length pre-recorded OR post-recorded OR recorded segment circular buffer camera; 105,000 results

L833 remote memory mobile phone surveillance camera overwrite protected circular buffer; 1,110 results

L834 mount surveillance camera wireless transmit write protected data stream remote memory; 14,100 results

L835 mount camera wearable glasses wireless transmit remote memory; 51,600 results

L836 mount camera wearable glasses wireless transmit overwrite protected remote memory; 299 results

L837 mount camera wearable glasses wireless transmit overwrite protected data stream remote memory; 284 results

L838 electronic index address data memory wireless transmit write protected remote memory; 36,700 results

L839 record stream image circular buffer memory overwrite protect surveillance camera remote location; 1,620 results

L840 record stream circular buffer camera overwrite protected transmit remote memory; 11,500 results

Motorola v. Stellar
Motorola Exhibit 1013
Page 079

L841 respond signal write OR overwrite protected recorded buffer camera; 32,700 results

L842 subset recorded data signal circular buffer memory camera remote; 5,190 results

L843 indexing write protected recorded data buffer wireless transmit camera remote memory; 8,800 results

L844 wireless transmit write protected circular buffer remote memory surveillance camera; 4,020 results

L845 storing write protected data circular buffer memory separate file hidden OR surveillance camera; 54,700 results

L846 store write OR overwrite protected data circular buffer memory separate file hidden OR surveillance camera; 6,000 results

L847 record stream discontiguous OR contiguous circular buffer camera remote protected; 2,630 results

L848 signal save record start OR stop circular buffer memory camera transmit remote; 5,380 results

L849 receive save record manual operated switch camera circular buffer memory; 6,600 results

L850 receive save record audio signal camera circular buffer memory overwrite protected; 1,440 results

L851 configuring size pre-recorded subset circular buffer memory camera wireless transmit; 293 results

L852 remove write protection transmitted write protected data after transmission circular buffer memory; 93,600 results

L853 warning new record buffer full circular memory camera wireless transmit; 3,460 results

L854 extend length new record manual operated switch circular buffer memory camera remote transmit; 4,760 results

L855 extend length new record audio signal circular buffer memory camera transmit remote; 5,270 results

16. Database Search: MicroPatent™

Motorola v. Stellar
Motorola Exhibit 1013
Page 080

Date Conducted: October 10, 2008

US Field of Search:

Classes/Subclasses Searched: Not restricted to class/subclass

Files Searched:

German (Applications; Full text), German (Granted; Full text), European (Applications; Full text), European (Granted; Full text), INPADOC, Abstracts of Japan, US (Granted; Full text), WIPO PCT Publications (Full text), US (Applications; Full text)

L856 (extend*4 or prolong*4 or increas*4 or stretch*4 or elong*5) near5 (length*3 or siz*4 or durat*5) and (record*3 or read*4 or writ*4) near3 (portion*1 or part*1 or segment*1) and (audio adj signal*1); 2377 results

L857 (record*4 or stream*4 or circular buffer*4 or camera*1 or overwrit*4 or protect*4 or transmit*4 or remote memor*3) and L369 and L370; 178 results

L858 (extend*4 or prolong*4 or increas*4 or stretch*4 or elong*5) near5 (length*3 or siz*4 or durat*5) and (record*3 or read*4 or writ*4) near3 (portion*1 or part*1 or segment*1) and (audio adj signal*1 or sound*1 or voice*1); 8948 results

L859 (subset*3 or record*4 or data signal*3 or circular buffer*3 or memor*3 or camera remot*3) and (respond*3 or signal*3 or write protect*4 or recorded buffer*3) and (interface*3 or designat*3 or time length*1 or post-record*3 or recorded segment*3); 308 results

L860 (Receiv*3 or obtain*3 or get*3 or find*3) near3 signal*1 and (sav*3 or stor*3) near5 (record*4 or writ*4 or read*3 or tap*5) and (audio adj signal*1 or voice*1 or sound*3); 93239 results

L861 (wireless or transmit*4 or writ*4 or protect*4 or circular buffer*3 or remote memor*3 or surveillance camera*1) and (respond*3 or signal*2 or write protect*3 or recorded buffer*3) and (interface*4 or designat*4 or time length*4 or post-record*4 or recorded segment*2)– 649 results

L862 (stor*4 or record*4 or sav*3) and (segment*1 or portion*1) and camera*1 and memor*4 and ((protect*4 or preserv* or avoid* or prevent*) near5

Motorola v. Stellar
Motorola Exhibit 1013
Page 081

(overwri*6 or writ*4 or edit*4)) and (wireless or wire adj less) near2 (transmi*5 or transfer*4 or send*4); 200 results

L863 (stor*4 or record*4 or sav*3) and (data adj stream*1 or stream*1 or data*1) and camera*1 with glass*3 and memor*4 and ((protect*4 or preserv* or avoid* or prevent*) near5 (overwri*6 or writ*4 or edit*4)) and (wireless or wire adj less) near3 (transmi*5 or transfer*4 or send*4); 8 results

L864 (circular or fifo) with (memor*4 or buffer*4) and camera*1 and ((protect*4 or preserv* or avoid* or prevent*) near5 (overwri*6 or writ*4 or edit*4)) and (wireless or wire adj less) with (transmi*5 or transfer*4 or send*4) and (remote or distan*4); 84 results

8(B) Search Directed to the Invention

The pre-examination search was directed to the claimed invention, encompassing all the features of the claims and giving the claims their broadest reasonable interpretation.

8(C) Search Directed to the Disclosure

No disclosed features that are unclaimed at this time are currently seen as features that may be claimed later.

8(D) Search Report from a Foreign Patent Office

No search report from a foreign patent office is provided here as the pre-examination search.

8(E) Statement of Good Faith

Motorola v. Stellar
Motorola Exhibit 1013
Page 082

All statements above in support of the petition to make special are based on a good faith belief that the search was conducted in compliance with the requirements of this rule.

Respectfully submitted,
Fish & Associates, PC

Date: NOV 10, 2008

By _____
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Motorola v. Stellar
Motorola Exhibit 1013
Page 083

Doc Code: ACCX.SUP.DOC

Applicant:	Paul DeKeyser
Attorney Docket No.:	101488.0003US2
Serial No.:	Not yet Assigned
For:	Loop Recording With Book Marking
Filed:	Herewith

ACCELERATED EXAMINATION
SUPPORT DOCUMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This accelerated examination support document is provided in support of the petition for accelerated examination filed herewith.

9(A) Information Disclosure Statement

The information disclosure statement is filed concurrently herewith and attached to this document.

9(B) Identification of All the Limitations to the Claims

Claim 1. A surveillance apparatus, comprising:

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

a local memory functionally connected to the camera;

a wireless transmitter functionally connected to the local memory;

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

a protecting facility that responds to a signal to record by designating a segment of the circular buffer as a write-protected portion, wherein a pre-recorded subset of the segment is recorded before the signal is received; and

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

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

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

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 to 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

9(C) Detailed Explanation of Claims Patentability

Independent claim 1 is patentable because none of the prior art circular buffer cameras teach the limitation of a sending facility that uses the transmitter to wirelessly transmit the write-protected portion to a remote memory.

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 7 limits the surveillance apparatus of claim 1 to further comprise a mobile phone that houses the remote memory. This limitation appears to be separately patentable beyond the limitations contained in the parent claim, and is certainly patentable in combination with the limitations of claim 1.

Claim 8 limits the surveillance apparatus of claim 1 to further comprise a mobile phone that receives the recorded segment from the wireless transmitter and then forwards that recorded segment to a remote memory. This limitation appears to be separately patentable beyond the limitations contained in the parent claim, and is certainly patentable in combination with the limitations of claim 1.

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 11 limits the surveillance apparatus of claim 1 to further comprise an electronic index that references addresses of the write-protected portion. This limitation appears to be separately patentable beyond the limitations contained in the parent claim, and is certainly patentable in combination with the limitations of claim 1.

Independent claim 12 is patentable because none of the prior art teaches indexing write-protected portions of the buffer while recording, or wirelessly transmitting at least one of the write-protected portions of the circular buffer to a remote memory.

Claim 13 limits the method of claim 12 to further comprise storing the write-protected portions as separate files. This limitation appears to be separately patentable beyond the limitations contained in the parent claim, and is certainly patentable in combination with the limitations of claim 12.

Claim 14 limits the method of claim 12 to further comprise recording the stream into physically dis-contiguous parts of the circular buffer. This limitation appears to be separately patentable beyond the limitations contained in the parent claim, and is certainly patentable in combination with the limitations of claim 12.

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.

Claim 18 limits the method of claim 12 to further comprise removing write-protection from a transmitted write-protected portion after transmission. This limitation appears to be separately patentable beyond the limitations contained in the parent claim, and is certainly patentable in combination with the limitations of claim 12.

Claim 19 limits the method of claim 12 to further comprise sending a warning to a user before the newly recorded portion of the buffer is fully recorded. This limitation appears to be

separately patentable beyond the limitations contained in the parent claim, and is certainly patentable in combination with the limitations of claim 12.

Claim 20 limits the method of claim 12 to further comprise extending a length of the newly recorded portion in response to at least one of a manually operated switch and an audio signal. This limitation appears to be separately patentable beyond the limitations contained in the parent claim, and is certainly patentable in combination with the limitations of claim 12.

References

Below is a summary of the references most closely related and the limitations each reference does and does not anticipate. The shaded areas are not anticipated by any of the references.

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		

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			

W.I.P.O. Publication No.: WO 6,044,476 (Vanman):

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.

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])

Limitation 4 - a local memory functionally connected to the camera

Not Satisfied. Vanman teaches a hard drive functionally connected to the camera. (See para [0029] and corresponding Figure 1, elements 15 and 80)

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

Not Satisfied. Vanman fails to teach a protecting facility that responds to a signal to record by designating a segment of the circular buffer as a write-protected portion. Vanman continuously overwrites the circular buffer on the hard drive. (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 9 - a sending facility that uses the transmitter to wirelessly transmit the write-protected portion to a remote memory

Not Satisfied. Vanman fails to teach having any write-protected portions in the memory at all. Vanman only teaches using a transmitter to wirelessly transmit non-write protected portions in the memory to a central office. (See para [0034])

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 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 17 - the remote memory is located on a mobile phone

Not Satisfied. Vanman fails to teach that the remote memory is located on a mobile phone.

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

Not Satisfied. Vanman fails to teach that a mobile phone receives the recorded segment from the wireless transmitter.

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

Not Satisfied. Vanman fails to teach that the mobile phone forwards the recorded segment to the remote memory.

Limitation 20 - a mount for the camera

Satisfied. Vanman teaches that the camera is mounted on a vehicle. (See para [0002]-[0004], [0065])

Limitation 21 - the mount is a pair of wearable glasses

Not Satisfied. Vanman fails to teach that the camera is mounted on a pair of wearable glasses.

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

Not Satisfied. Vanman fails to teach that any of the memory is write-protected.

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

Not Satisfied. Vanman fails to teach responding to a signal by write-protecting a newly recorded portion of the buffer. Vanman continuously overwrites the circular buffer on the hard drive. (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 28 - indexing write protected portions of the buffer during the step of recording

Not Satisfied. Vanman fails to teach that the buffer is write-protected at all, much less indexing write-protected portions of the buffer while recording.

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

Not Satisfied. Vanman fails to teach that the buffer is write-protected at all, much less wirelessly transmitting one of the write-protected portions of the circular buffer to a remote memory.

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

Not Satisfied. Vanman fails to teach that the buffer is write-protected at all, much less storing the write-protected portions as separate files.

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

Not Satisfied. Vanman fails to teach that the stream is recorded in the circular buffer into physically dis-contiguous parts.

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

Not Satisfied. Vanman fails to teach receiving the signal to save a recording through an audio signal.

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])

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

Not Satisfied. Vanman fails to teach that the buffer is write-protected at all, much less removing write-protection from a transmitted write-protected portion after transmission.

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

Not Satisfied. Vanman fails to teach sending a warning to a user before the newly recorded portion of the buffer is fully recorded.

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

Not Satisfied. Vanman fails to teach 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

Not Satisfied. Vanman fails to teach extending a length of the newly recorded portion in response to an audio signal.

E.P.O. Patent No.: EP 1,064,783 (Mann)

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.

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])

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 5 - a wireless transmitter functionally connected to the local memory

Not Satisfied. Mann teaches either a wireless transmitter functionally connected to the camera, or a computer with a storage device functionally connected to the camera. Mann does not teach having both in one device. (See para [0058], [0065])

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

Not Satisfied. Mann fails to teach 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

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

Not Satisfied. Mann fails to teach that any of the circular buffer is write-protected, much less that the sending facility uses the transmitter to wirelessly transmit the write-protected portion to a remote memory.

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 12 - a sensor that automatically initiates the signal to record

Not Satisfied. Mann fails to teach that a sensor automatically initiates the signal to record. The signal to record is manually initiated by the wearer of the camera. (See para [0065])

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

Not Satisfied. Mann fails to teach that the sensor operates upon content in at least one of the images captured from the camera. The signal to record is manually initiated by the wearer of the camera. (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 15 - an interface through which a human can designate a length of time of the pre-recorded subset

Not Satisfied. Mann fails to teach an interface through which a human can designate a length of time of the pre-recorded subset

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

Not Satisfied. Mann teaches fails to teach an interface through which a human can designate a size of the post-recorded segment

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

Not Satisfied. Mann fails to teach that the remote memory is located on a mobile phone.

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

Not Satisfied. Mann fails to teach a mobile phone, much less that the mobile phone receives the recorded segment from the wireless transmitter.

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

Not Satisfied. Mann fails to teach a mobile phone, much less that the mobile phone forwards the recorded segment to the remote memory.

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

Not Satisfied. Mann fails to teach an electronic index that references addresses of the write-protected portion

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])

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

Not Satisfied. Mann fails to teach 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

Satisfied. Mann teaches that the recorded portion was recorded 5 minutes before the signal to record is received. (See para [0065])

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

Not Satisfied. Mann fails to teach 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

Not Satisfied. Mann fails to teach that any of the circular buffer is write-protected, much less that the write-protected portions of the circular buffer are wirelessly transmitted to a remote memory.

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

Not Satisfied. Mann fails to teach that any of the circular buffer is write-protected, much less that the write-protected portions are stored as separate files.

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

Not Satisfied. Mann fails to teach recording the stream into physically dis-contiguous parts of the circular buffer

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

Not Satisfied. Mann teaches that the signal to save a recording comprises a signal to start recording, (See para [0065]) but fails to teach that the signal to save a recording comprises a signal to stop recording.

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])

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

Not Satisfied. Mann fails to teach receiving the signal to save a recording through an audio signal.

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

Not Satisfied. Mann fails to teach configuring the size of the pre-recorded subset

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

Not Satisfied. Mann fails to teach that any of the circular buffer is write-protected, much less that the write-protection is removed from a transmitted write-protected portion after transmission.

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

Not Satisfied. Mann fails to teach sending a warning to a user before the newly recorded portion of the buffer is fully recorded

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

Not Satisfied. Mann fails to teach 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

Not Satisfied. Mann fails to teach extending a length of the newly recorded portion in response to an audio signal.

U.S.P.T.O. Patent No.: US 5,523,799 (Hattori)

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.

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 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 5 - a wireless transmitter functionally connected to the local memory

Not Satisfied. Hattori fails to teach 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

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

Not Satisfied. Hattori fails to teach a sending facility that uses a transmitter to wirelessly transmit the write-protected portion to a remote memory

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

Not Satisfied. Hattori fails to teach a size of the memory, much less how much was recorded before a portion of the memory is write-protected.

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

Not Satisfied. Hattori fails to teach a size of the memory, much less how much was recorded before a portion of the memory is write-protected.

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

Not Satisfied. Hattori fails 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

Not Satisfied. Hattori fails to teach that the sensor operates upon content in at least one of the images captured from the camera

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

Not Satisfied. Hattori teaches an operation unit that can be operated on to initiate the signal, but does not specify whether or not a human initiates that signal. (See C3/L62-C4'L2)

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

Not Satisfied. Hattori fails to teach an interface through which a human can designate a size of the pre-recorded subset

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

Not Satisfied. Hattori fails to teach an interface through which a human can designate a length of time of the post-recorded segment

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

Not Satisfied. Hattori fails to teach a remote memory, much less that the remote memory is located on a mobile phone.

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

Not Satisfied. Hattori fails to teach a mobile phone that receives the recorded segment from the wireless transmitter.

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

Not Satisfied. Hattori fails to teach a mobile phone that forwards the recorded segment to the remote memory.

Limitation 20 - a mount for the camera

Not Satisfied. Hattori fails to teach a mount for the camera.

Limitation 21 - the mount is a pair of wearable glasses

Not Satisfied. Hattori fails to teach a mount that is a pair of wearable glasses.

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

Not Satisfied. Hattori fails to teach an electronic index that references addresses of the write-protected portion.

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

Not Satisfied. Hattori fails to teach 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

Not Satisfied. Hattori fails to teach wirelessly transmitting at least one of the write-protected portions of the circular buffer to a remote memory

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

Not Satisfied. Hattori fails to teach storing the write-protected portions as separate files.

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

Not Satisfied. Hattori fails to teach recording the stream into physically dis-contiguous parts of the circular buffer.

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

Not Satisfied. Hattori fails to teach that the signal to save a recording comprises a signal to start recording and a signal to stop recording.

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

Not Satisfied. Hattori fails to teach 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

Not Satisfied. Hattori fails to teach receiving the signal to save a recording through an audio signal.

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)

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

Not Satisfied. Hattori fails to teach removing write-protection from a transmitted write-protected portion after transmission

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

Not Satisfied. Hattori fails to teach sending a warning to a user before the newly recorded portion of the buffer is fully recorded

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

Not Satisfied. Hattori fails to teach 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

Not Satisfied. Hattori fails to teach extending a length of the newly recorded portion in response to an audio signal.

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.

9(E) Showing of Each Limitations of the Claims Findings Support under 1st paragraph of 35. U.S.C. 112

There are no means/steps plus function terms in any of the claims.

Limitation 1 - a surveillance apparatus

Current Application – Abstract, para [0008]

Patent Application 11/770920 – P2/L13-16

Provisional Patent Application 60/824097 – P1/L5-6

Patent Application 11/846217 – para [0002]

Provisional Patent Application 60/824095 – P1/L6-7

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

Current Application – Abstract, para [0009]

Patent Application 11/770920 – P5/L4-6, P10/L19-22

Provisional Patent Application 60/824097 – P1/L9-10, P2/L17-20

Patent Application 11/846217 – para [0023], P9/Claim 1

Provisional Patent Application 60/824095 – P2/L15-16

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

Current Application – Abstract, para [0009]

Patent Application 11/770920 – P5/L4-6, P10/L19-22

Provisional Patent Application 60/824097 – P1/L9-10, P2/L17-20

Patent Application 11/846217 – para [0023], P9/Claim 1

Provisional Patent Application 60/824095 – P2/L15-16

Limitation 4 - a local memory functionally connected to the camera

Current Application – Abstract, para [0009]

Patent Application 11/770920 – P2/L13-17, P4/L9-15 and corresponding Figure 1, elements 140-200

Provisional Patent Application 60/824097 – P3/L12-15

Patent Application 11/846217 – para [0023], [0032], and corresponding Figure 4, element 46

Provisional Patent Application 60/824095 – P3/L6-8

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

Current Application – Abstract, para [0008]-[0009]

Patent Application 11/770920 – P3/L3-5, P7/L19-23, P10/L2-11

Provisional Patent Application 60/824097 – P2/L8-9

Patent Application 11/846217 – not disclosed

Provisional Patent Application 60/824095 – P1/L15-16, P5/L11-12

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

Current Application – Abstract, para [0008]-[0009]

Patent Application 11/770920 – P5/L17-24, P7/L1-3

Provisional Patent Application 60/824097 – P2/L3-5

Patent Application 11/846217 – para [0012], [0029]

Provisional Patent Application 60/824095 – P1/L7-8, P3/L4

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

Current Application – Abstract, para [0008]-[0009]

Patent Application 11/770920 – P2/L13-P3/L16, P5/L17-24, P6/L1-8

Provisional Patent Application 60/824097 – P2/L10-12

Patent Application 11/846217 – para [0012], [0023]

Provisional Patent Application 60/824095 – P1/L8-10, P3/L6-8

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

Current Application – Abstract, para [0008]-[0009]

Patent Application 11/770920 – P5/L18-19, P6/L22-24

Provisional Patent Application 60/824097 – P2/L12-13

Patent Application 11/846217 – para [0024], [0027], [0028], and corresponding Figure 3E.

Provisional Patent Application 60/824095 – P3/L6-8

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

Current Application – Abstract, para [0008]-[0009]

Patent Application 11/770920 – P3/L3-5, P4/L14-15, P7/L7-8

Provisional Patent Application 60/824097 – P5/L13-14, P10/Claim 12

Patent Application 11/846217 – not disclosed

Provisional Patent Application 60/824095 – P2/L15-16

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

Current Application – para [0010]-[0011]

Patent Application 11/770920 – P2/L28-P3/L2, P6/L22-23

Provisional Patent Application 60/824097 – P2/L14-16

Patent Application 11/846217 – para [0036]

Provisional Patent Application 60/824095 – P4/L5-6

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

Current Application – para [0010]-[0011]

Patent Application 11/770920 – P6/L22-24

Provisional Patent Application 60/824097 – P2/L14-16

Patent Application 11/846217 – para [0024], para [0025]

Provisional Patent Application 60/824095 – P4/L5-6

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

Current Application – para [0011]

Patent Application 11/770920 – not disclosed

Provisional Patent Application 60/824097 – not disclosed

Patent Application 11/846217 – para [0023], [0034]

Provisional Patent Application 60/824095 – P5/L7

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

Current Application – para [0011], [0039]

Patent Application 11/770920 – not disclosed

Provisional Patent Application 60/824097 – not disclosed

Patent Application 11/846217 – para [0023]

Provisional Patent Application 60/824095 – not disclosed

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

Current Application – para [0011]

Patent Application 11/770920 – P10/L27-29

Provisional Patent Application 60/824097 – P2/L6-7

Patent Application 11/846217 – para [0023]

Provisional Patent Application 60/824095 – P3/L6

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

Current Application – para [0011]

Patent Application 11/770920 – not disclosed

Provisional Patent Application 60/824097 – P2/L3-16

Patent Application 11/846217 – para [0036]

Provisional Patent Application 60/824095 –

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

Current Application – para [0010]

Patent Application 11/770920 – P6/L21-24

Provisional Patent Application 60/824097 – P2/L3-16

Patent Application 11/846217 – para [0014], [0025], [0036]

Provisional Patent Application 60/824095 – not disclosed

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

Current Application – para [0013]

Patent Application 11/770920 – not disclosed

Provisional Patent Application 60/824097 – not disclosed

Patent Application 11/846217 – not disclosed

Provisional Patent Application 60/824095 – not disclosed

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

Current Application – para [0013]

Patent Application 11/770920 – not disclosed

Provisional Patent Application 60/824097 – not disclosed

Patent Application 11/846217 – not disclosed

Provisional Patent Application 60/824095 – not disclosed

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

Current Application – para [0013]

Patent Application 11/770920 – not disclosed

Provisional Patent Application 60/824097 – not disclosed

Patent Application 11/846217 – not disclosed

Provisional Patent Application 60/824095 – not disclosed

Limitation 20 - a mount for the camera

Current Application – para [0012]

Patent Application 11/770920 – P9/L7-8

Provisional Patent Application 60/824097 – P1/L5-6, P3/L4-5

Patent Application 11/846217 – para [0030], [0036], and corresponding Figure 4

Provisional Patent Application 60/824095 – P1/L6, P2/L14, P6/L7

Limitation 21 - the mount is a pair of wearable glasses

Current Application – para [0012]

Patent Application 11/770920 – P11/L10-13

Provisional Patent Application 60/824097 – P3/L4-5

Patent Application 11/846217 – para [0027], [0030], and corresponding Figure 4.

Provisional Patent Application 60/824095 – P1/L6-7, P1/L19-20, P2/L14

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

Current Application – para [0010], [0047]

Patent Application 11/770920 – not disclosed

Provisional Patent Application 60/824097 – not disclosed

Patent Application 11/846217 – not disclosed

Provisional Patent Application 60/824095 – not disclosed

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

Current Application – Abstract, para [0008]

Patent Application 11/770920 – P7/L24

Provisional Patent Application 60/824097 – P4/L4-9

Patent Application 11/846217 – para [0011], [0036], and corresponding Figure 5, element 50

Provisional Patent Application 60/824095 – P4/L4

Limitation 24 - receiving a stream of the imaged data

Current Application – Abstract, para [0008]-[0009]

Patent Application 11/770920 – P7/L24-26

Provisional Patent Application 60/824097 – P2/L1, P2/L3

Patent Application 11/846217 – para [0023], [0036], and corresponding figure 5, element 52

Provisional Patent Application 60/824095 – P3/L4

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

Current Application – Abstract, para [0008]-[0009]

Patent Application 11/770920 – P7/L5-7, P6/28-29

Provisional Patent Application 60/824097 – P2/L3-5

Patent Application 11/846217 – para [0013], [0029]

Provisional Patent Application 60/824095 – P1/L7-8, P3/L4, P3/L7-8

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

Current Application – Abstract, para [0008]-[0009]

Patent Application 11/770920 – P6/L1-2, P6/L9

Provisional Patent Application 60/824097 – P2/L10-12

Patent Application 11/846217 – para [0023]

Provisional Patent Application 60/824095 – P3/L6-8

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

Current Application – Abstract, para [0008]-[0009]

Patent Application 11/770920 – P6/L22-24

Provisional Patent Application 60/824097 – P2/L14-16

Patent Application 11/846217 – para [0024]

Provisional Patent Application 60/824095 – P3/L6-8

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

Current Application – para [0010], [0047]

Patent Application 11/770920 – not disclosed

Provisional Patent Application 60/824097 – P2/L18-20

Patent Application 11/846217 – not disclosed

Provisional Patent Application 60/824095 – P5/L3-4

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

Current Application – Abstract, para [0008], [0013]

Patent Application 11/770920 – P3/L3-5

Provisional Patent Application 60/824097 – P5/L13-15

Patent Application 11/846217 – not disclosed

Provisional Patent Application 60/824095 – P5/L11-12

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

Current Application – para [0010]

Patent Application 11/770920 – P2/L19-21

Provisional Patent Application 60/824097 – P4/L12-13

Patent Application 11/846217 – not disclosed

Provisional Patent Application 60/824095 – not disclosed

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

Current Application – para [0010], [0046] and corresponding Figure 4H

Patent Application 11/770920 –P6/L28-29

Provisional Patent Application 60/824097 – not disclosed

Patent Application 11/846217 – para [0013], [0036], and corresponding figure 5, element Step 54A, P9/Claim 5

Provisional Patent Application 60/824095 – P4/L10-11, P4/L10-13

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

Current Application – para [0011]

Patent Application 11/770920 – P2/L24-26, P6/L19-20

Provisional Patent Application 60/824097 – P2/L12-13, P5/L5-6

Patent Application 11/846217 – para [0025], [0028]

Provisional Patent Application 60/824095 – not disclosed

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

Current Application – para [0011]

Patent Application 11/770920 – P2/L27-28, P6/L9-12

Provisional Patent Application 60/824097 – P5/L7

Patent Application 11/846217 – para [0014]

Provisional Patent Application 60/824095 – P3/L6-8

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

Current Application – para [0011]

Patent Application 11/770920 – P2/L28

Provisional Patent Application 60/824097 – not disclosed

Patent Application 11/846217 – not disclosed

Provisional Patent Application 60/824095 – P5/L10

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

Current Application – para [0010]

Patent Application 11/770920 – P6/L21-24

Provisional Patent Application 60/824097 – P2/L13-16

Patent Application 11/846217 – para [0014] , [0036], and corresponding figure 5, element 56

Provisional Patent Application 60/824095 – not disclosed

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

Current Application – para [0013]

Patent Application 11/770920 – P6/L6-8, P7/L7-8

Provisional Patent Application 60/824097 – P5/L13-15

Patent Application 11/846217 – not disclosed

Provisional Patent Application 60/824095 – not disclosed

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

Current Application – para [0011]

Patent Application 11/770920 – not disclosed

Provisional Patent Application 60/824097 – not disclosed

Patent Application 11/846217 – not disclosed

Provisional Patent Application 60/824095 – not disclosed

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

Current Application – para [0011]

Patent Application 11/770920 – not disclosed

Provisional Patent Application 60/824097 – not disclosed

Patent Application 11/846217 – para [0034]

Provisional Patent Application 60/824095 – not disclosed

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

Current Application – para [0011]

Patent Application 11/770920 – not disclosed

Provisional Patent Application 60/824097 – not disclosed

Patent Application 11/846217 – not disclosed

Provisional Patent Application 60/824095 – not disclosed

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9(F) References Disqualified as Prior Art under 35 U.S.C. 103(c)

None.

Respectfully submitted,
Fish & Associates, PC

Date: NOV 10. 2008

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	Filing Date	2008-11-11
	First Named Inventor	Paul DeKeyser
	Art Unit	
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	1	2006/044476 A2	WO		2006-04-27	Robert Vernon VANMAN		☐

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	2	1064783	EP		2003-04-06	Stephen MANN		☐

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(11) EP 1 064 783 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
04.06.2003 Bulletin 2003/23

(21) Application number: **99908727.3**

(22) Date of filing: **25.03.1999**

(51) Int Cl.[7]: **H04N 5/232**, G06F 1/16

(86) International application number:
PCT/CA99/00249

(87) International publication number:
WO 99/049656 (30.09.1999 Gazette 1999/39)

(54) **WEARABLE CAMERA SYSTEM WITH VIEWFINDER MEANS**

TRAGBARES KAMERASYSTEM MIT VISIERMITTEL

SYSTEME DE CAMERA PORTABLE AVEC VISEUR

(84) Designated Contracting States:
AT BE CH DE FR GB IE IT LI SE

(30) Priority: **25.03.1998 CA 2233047**
15.10.1998 CA 2249976

(43) Date of publication of application:
03.01.2001 Bulletin 2001/01

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- **PATENT ABSTRACTS OF JAPAN vol. 096, no. 011, 29 November 1996 & JP 08 179223 A (CANON INC), 12 July 1996 & US 5 815 741 A (OKUYAMA ET AL.)**
- **25 - 32: "WEARABLE COMPUTING: A FIRST STEP TOWARD PERSONAL IMAGING" COMPUTER, vol. 30, no. 2, 1 February 1997, pages 25-32, XP000722152**

Remarks:
The file contains technical information submitted after the application was filed and not included in this specification

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Description

FIELD OF THE INVENTION

[0001] The present invention pertains generally to a new photographic or video means and apparatus comprising a body-worn portable electronic camera system with wearable viewfinder means.

BACKGROUND OF THE INVENTION

[0002] In photography (and in movie and video production), it is desirable to capture events in a natural manner with minimal intervention and disturbance. Current state-of-the-art photographic or video apparatus, even in its most simple "point and click" form, creates a visual disturbance to others and attracts considerable attention on account of the gesture of bringing the camera up to the eye. Even if the size of the camera could be reduced to the point of being negligible (e.g. no bigger than the eyecup of a typical camera viewfinder, for example), the very gesture of bringing a device up to the eye is unnatural and attracts considerable attention, especially in establishments such as gambling casinos or department stores where photography is often prohibited. Although there exist a variety of covert cameras such a camera concealed beneath the jewel of a necktie clip, cameras concealed in baseball caps, and cameras concealed in eyeglasses, these cameras tend to produce inferior images, not just because of the technical limitations imposed by their small size, but, more importantly because they lack a means of viewing the image. Because of the lack of a viewfinder, investigative video and photojournalism made with such cameras suffers from poor composition.

[0003] It appears that apart from large view cameras upon which the image is observed on a ground glass, most viewfinders present an erect image. See, for example, U.S. Pat. No. 5095326 entitled "Neppler-type erect image viewfinder and erecting prism". In contrast to this fact, it is well-known that one can become accustomed, through long-term psychophysical adaptation (as reported by George M. Stratton, in *Psychology Review,* in 1896 and 1897) to eyeglasses that present an upside-down image. After wearing upside-down glasses constantly, for eight days (keeping himself blindfolded when removing the glasses for bathing or sleeping) Stratton found that he could see normally through the glasses. More recent experiments, as conducted by and reported by Mann, in an MIT technical report *Mediated Reality,* medialab vismod TR-260, (1994), (the report is available in http://wearcam.org/mediated-reality/index.html) suggest that slight transformations such as rotation by a few degrees or small image displacements give rise to a reversed aftereffect that is more rapidly assimilated by the wearer, and that such effects can often have a more detrimental effect on performing other tasks through the camera as well as more detrimental flashbacks upon removal of the camera. These findings suggest that merely mounting a conventional camera such as a small 35mm rangefinder camera or a small video camcorder to a helmet, so that one can look through the viewfinder and use it it hands-free while performing other tasks, will result in poor performance at doing those tasks while looking through the camera viewfinder. Moreover, these findings suggest that doing tasks while looking through the viewfinder of a conventional camera, over a long period of time, may give rise to detrimental flashback effects that may persist even after the camera is removed. This is especially true when the tasks involve a great deal of hand-eye coordination, such as when one might, for example, wish to photograph, film, or make video recordings of the experience of eating or playing volleyball or the like, by doing the task while concentrating primarily on the eye that is looking through the camera viewfinder. Indeed, since known cameras were never intended to be used this way (to record events from a first-person-perspective while looking through the viewfinder) it is not surprising that performance is poor in this usage.

[0004] Part of the reason for poor performance associated with simply attaching a conventional camera to a helmet is the induced parallax and the failure to provide an orthoscopic view. Even viewfinders which correct for parallax, as described in U.S. Pat. No. 5692227 in which a rangefinder is coupled to a parallax error compensating mechanism, only correct for parallax between the viewfinder and the camera lens that is taking the picture, but do not correct for parallax between the viewfinder and the image that would be observed with the naked eye while not looking through the camera.

[0005] Traditional camera viewfinders often include the ability to overlay virtual objects, such as camera shutter speed, or the like, on top of reality, as described in U.S. Pat. No. 5664244 which describes a viewfinder with additional information display capability.

[0006] Open-air viewfinders are often used on extremely low cost cameras, as well as on some professional cameras for use at night when the light levels would be too low to tolerate any optical loss in the viewfinder. Examples of open-air viewfinders used on professional cameras, in addition to regular viewfinders, include those used on the Grafflex press cameras of the 1940s (which had three different kinds of viewfinders), as well as those used on some twin-lens reflex cameras. While such viewfinders, if used with a wearable camera system, would have the advantage of not inducing the problems such as flashback effects described above, they would fail to provide an electronically mediated reality. Moreover, although such open air viewfinders would eliminate the parallax between what is seen in the real world and what is seen in the real world looking through the viewfinder, they fail to eliminate the parallax error between the viewfinder and the camera.

[0007] A manner of using a plurality of pictures of the same scene or object, in which the pictures were taken

Motorola v. Stellar
Motorola Exhibit 1013
Page 132

using a camera with automatic exposure control, automatic gain control, or the like has been proposed in *'PENCIGRAPHY' WITH AGC: JOINT PARAMETER ESTIMATION IN BOTH DOMAIN AND RANGE OF FUNCTIONS IN SAME ORBIT OF THE* PROJECTIVE-WYCKOFF *GROUP*, published by S. Mann, in M.I.T. (medialab vismod) tech report TR-384, December, 1994, and later published also in Proceedings of the IEEE International Conference on Image Processing (ICIP-96), Lausanne, Switzerland, September 16-19, 1996, pages 193-196. (The report is also available on a world wide web site: http://wearcam.org/icip96/index.html as a hypertext document, along with related documents on http://wearcam.org.) This report relates to a manner of camera self-calibration in which the unknown nonlinear response function of the camera is determined up to a single unknown scalar constant. Therefore, once the camera is so understood, it may be used, within the context of the method, as a quantigraphic light measuring instrument. As each pixel of the camera then becomes a light measuring instrument, successive pictures in a video sequence become multiple estimates of the same quantity once the multiple images are registered and appropriately interpolated. The measurement from a plurality of - such estimates gives rise to knowledge about the scene sufficient to render pictures of increased dynamic range and tonal fidelity, as well as increased spatial resolution and extent. In this way a miniature video camera as may be concealed inside a pair of eyeglasses may be used to generate images of very high quality, sufficient for fine-arts work or other uses where good image quality is needed.

[0008] WO-A-97 34411 discloses a beamsplitter in front of an eye of a user, wherein the beamsplitter diverts some of the eyeward bound light to an electronic camera, and where the output of the camera is transmitted to a remote display. My article "Wearable Computing: A First Step Toward Personal Imaging" in IEEE Computer, Vol. 30, No. 2, published 1997 February 1, on pages 25-32, discusses a head-mounted camera and display system, in which the display is responsive to an output of the camera.

[0009] United States Patent 5,550,585 shows, in serial order, a lens, image sensor array, display, and a further lens, all four of these being directly in front of an eye of a user of the apparatus. The sensor output enters a processor, and the output of the processor enters the display. United States Patent 4,786,966 discloses a head-mounted video camera and a video display in front of the eyes of a user.

[0010] In DE-A-44 36 528, a camera and display are mounted to an eyeglass holder so that the display shoes an enlarged view of subject matter viewed by the camera.

[0011] In WO96/36721, video cameras are mounted at the sides of the head of a wearer and the cameras are oriented and focused based on eye tracking measurements. The cameras only capture an approximation of the natural vision of the wearer.

[0012] In U.S. Pat. No. 5,610,678, a head borne viewfinder is provided for a body worn camera.

SUMMARY OF THE INVENTION

[0013] It is an object of this invention to provide a method of positioning a camera in which both hands may be left free.

[0014] It is a further object of this invention to provide a means of exposing a film or acquiring a picture electronically where the spatial extent (field of view) of the image may be ascertained without having to hold any device up to the eye.

[0015] What is described is a wearable camera and viewfinder for capturing video of exceptionally high compositional and artistic calibre. In addition to the fact that covert versions of the apparatus can be used to create investigative documentary videos having very good composition. for everyday usage the device need not necessarily be covert. In fact, it may be manufactured as a fashionable device that serves as both a visible crime deterrent, as well as a self-explanatory (through its overt obviousness) tool for documentary videomakers and photojournalists.

[0016] Another feature of the invention is that the wearable camera has a viewfinder such that the image may be presented in a natural manner suitable for long-term usage patterns.

[0017] There are several reasons why it might be desired to wear the camera over a sustained period of time:

1. There is the notion of a personal visual diary of sorts.

2. There is the idea of being always ready. By constantly recording into a circular buffer, a retroactive record function, such as a button that instructs the device to "begin recording from five minutes ago" may be useful in personal safety (crime reduction) as well as in ordinary everyday usage, such as capturing a baby's first steps on video. With the prior art in photography and video, we spend so much time preparing the camera and searching for film, batteries, etc., or at the very least, just getting the camera out of its carrying case, that we often miss important moments like a baby's first steps, or a spontaneous facial expression during the opening of a gift.

3. There is the fact that the wearable camera system, after being worn for a long period of time, begins to behave as a true extension of the wearer's mind and body. As a result, the composition of video shot with the device is often impeccable without even the need for conscious thought or effort on the part of the user. Also, one can engage in other activities, and one is able to record the experience

Motorola v. Stellar
Motorola Exhibit 1013
Page 133

without the need to be encumbered by a camera, or even the need to remain aware, at a conscious level, of the camera's existance. This lack of the need for conscious thought or effort suggests a new genre of documentary video characterized by long-term psychophysical adaptation to the device. The result is a very natural first-person perspective documentary, whose artistic style is very much as if a recording could be made from a video tap of the optic nerve of the eye itself. Events that may be so recorded include involvement in activities such as horseback riding, climbing up a rope, or the like, that cannot normally be well recorded from a first-person perspective using cameras of the prior art. Moreover, a very natural first-person perspective genre of video results. For example, while Wearing an embodiment of the invention, it is possible to look through the eyepiece of a telescope or microscope and record this experience, including the approach toward the eyepiece. The experience is recorded, from the perspective of the participant.

4. A computational system, either built into the wearable camera, or worn on the body elsewhere and connected to the camera system, may be used to enhance images. This may be of value to the visually impaired. The computer may also perform other tasks such as object recognition. Because the device is worn constantly, it may also function as a photographic/videographic memory aid, e.g. to help in way-finding through the recall and display of previously captured imagery.

[0018] It is desired that the proposed viewfinder arrangement be suitable for long-term usage, such as when one may be wearing the camera for sixteen hours per day, looking through it all the while. Traditional viewfinders are only looked through on a shorter term basis. Thus there will be some important differences between the wearable camera system and traditional cameras. For example, when the wearable camera system comprises a zoom lens for the camera, it is desired that the viewfinder also comprise a zoom lens, so that when zooming into a scene, the image in the viewfinder can be made to subtend a lesser visual angle (appear to get smaller). It is also desired that the exact extent of this reduction in apparent visual angle be controlled to exactly cancel out the usual effect in which zooming in produces increased magnification. In this manner the wearable camera system provides the wearer with absolutely no apparent magnification, or change in apparent magnification, while looking through the viewfinder and exploring the full range of zoom adjustment.

[0019] Some viewfinders are equipped with a zoom capability, as, for example, is described in U.S. Pat. No. 5323264, so that their field of coverage (magnification) varies with the varying of a zoom lens. The reader will need to be careful not to confuse these zoom viewfinders of the prior art with the zoom viewfinder of the wearable camera invention in which viewing takes place through an electronic viewfinder where the decrease in visual angle subtended by the image of the viewfinder screen is coupled to the increase in focal length of the camera within the proposed invention. This coupling negates (cancels out) any increase in magnification that would otherwise result from zooming in on the scene. At first this lack of increase in apparent magnification with increase in lens focal-length may seem counter-intuitive, in the sense that we normally expect zooming in to produce an increase in apparent magnification as observed while looking through a camera viewfinder. This expectation is owing to known cameras. However, after using the wearable camera system for an extended period of time, one quickly grows accustomed to the unique characteristics of its viewfinder, and the much more seamless integration of its viewfinder with everyday life. This seamlessness is such that after time, the wearer will begin to operate the wearable camera invention without appreciable conscious thought or effort. With magnification, or changes in magnification, it is much more difficult to fully adapt to the presence of the camera.

[0020] An important aspect of the proposed invention is the capability of the apparatus to mediate (augment, diminish, or otherwise alter) the visual perception of reality.

[0021] The proposed camera viewfinder is related to the displays that are used in the field of Virtual Reality (VR) in the sense that both are wearable. However, an important difference is that the proposed invention allows the wearer to continue to see the real world, while VR displays block out the ability to see the real world.

[0022] It is possible with the invention to allow visual reality to be mediated in order to make certain that exposure is correct as well as to keep the wearer of the apparatus in the feedback loop of the photo compositional process by constantly providing the wearer with a video stream. Moreover, it is desired that the apparatus will allow the wearer to experience a computationally mediated visual reality, and for that experience to be shared through wireless communications networks so that the wearer may receive additional visual information, as well as be aware of modifications to visual reality that might arise, for example, as part of a communications process in a shared virtual environment. For such compositional and interactional capabilities, a simple air-based viewfinder is inadequate.

[0023] It is possible with this invention to provide such a method of exposing a film or acquiring a picture electronically where the tonal characteristics of the picture may be ascertained without having to hold any device up to the eye.

[0024] It is possible with this invention to provide such a method of exposing a film or acquiring a picture electronically where no apparent difference in body movement or gesture between when a picture is being taken

Motorola v. Stellar
Motorola Exhibit 1013
Page 134

and when no picture is being taken is detectable by others.

[0025] It is possible with this invention to provide the user with a means of determining the composition of the picture from a display device that is located such that only the user can see the display device, and so that the user can ascertain the composition of a picture or take a picture or video and transmit image(s) to one or more remote locations without the knowledge of others in the immediate environment.

[0026] It is possible with this invention to provide the user with a means of determining the composition of the picture from a display device that is located such that only the user can see the display device, as well as an optional additional display device that the user can show to others if and when the user desires to do so.

[0027] It is possible with this invention to provide the user with a means of determining the composition of the picture from a display device that is located such that both the user as well as others can see it, if the user should so desire.

[0028] It is possible with this invention to provide a wearable camera viewfinder means in which video is displayed on a viewfinder in such a way that all rays of light from the viewfinder that enter the eye appear to emanate from essentially the same direction as they would have had the apparatus not been worn.

[0029] It is possible with this invention to provide a means for a user to experience additional information overlaid on top of his or her visual field of view such that the information is relevant to the imagery being viewed.

[0030] It is possible with this invention to provide a means and apparatus for a user to capture a plurality of images of the same scene or objects, in a natural process of simply looking around, and then have these images combined together into a single image of increased spatial extent, spatial resolution, dynamic range, or tonal fidelity.

[0031] It is possible with this invention to provide a viewfinder means in which the viewfinder has a focusing mechanism that is coupled to a focusing mechanism of a camera system, so that when the camera is focused on a particular object the viewfinder also presents that object in a manner such that when the apparatus moves relative to the user's eye, the object appears to neither move with or against the movement of the eye, so that the rays of light entering the eye are approximately the same in direction as if the apparatus were not present.

[0032] It is possible with this invention to provide a viewfinder means in which the viewfinder has a focusing mechanism that is coupled to a focusing mechanism of a camera system, so that when the camera is focused on a particular object the viewfinder also presents that object in the same focal depth plane as the object would appear to the user with the apparatus removed.

[0033] It is possible with this invention to provide a viewfinder means in which the viewfinder has a focusing mechanism that is controlled by an automatic focusing mechanism of a camera system.

[0034] It is possible with this invention to provide a stereo viewfinder means in which the viewfinder system has camera focusing, camera vergence, display focusing, and display vergence control where all four are linked together so that there is only need for a single control.

[0035] It is possible with this invention to provide a stereo viewfinder means in which the viewfinder has focusing and vergence control mechanisms that are controlled by an automatic focusing mechanism of a camera system.

[0036] It is possible with this invention to provide a viewfinder means in which the viewfinder has a focusing mechanism that is controlled by an automatic focusing mechanism of a camera system, and in which the apparatus comprises an eye-tracking mechanism that causes the focus of the camera to be based on where the user is looking, and therefore the focus of the viewfinder mechanism to be also focused in such a manner that the convergence of light rays from whatever object happens to be within the foveal region of the eye's view also produces rays of light that have the same focal distance as they would have had with the apparatus removed from the user.

[0037] The proposed invention facilitates a new form of visual art, in which the artist may capture, with relatively little effort, a visual experience as viewed from his or her own perspective. With some practice, it is possible to develop a very steady body posture and mode of movement that best produces video of the genre pertaining to this invention. Because the apparatus may be lightweight and close to the head, there is not the protrusion associated with carrying a hand-held camera. Also because components of the proposed invention are mounted very close to the head, in a manner that balances the weight distribution. Mounting close to the head minimizes the moment of inertia about the rotational axis of the neck, so that the head can be turned quickly while wearing the apparatus. This arrangement allows one to record the experiences of ordinary day-today activities from a first-person perspective. Moreover, because both hands are free, much better balance and posture is possible while using the apparatus. Anyone skilled in the arts of body movement control as is learned in the martial arts such as karate, as well as in dance, most notably ballet, will have little difficulty capturing exceptionally high quality video using the apparatus of this invention.

[0038] With known video or movie cameras, the best operators tend to be very large people who have trained for many years in the art of smooth control of the cumbersome video or motion picture film cameras used. In addition to requiring a very large person to optimally operate such cameras, various stabilization devices are often used, which make the apparatus even more cumbersome. The apparatus of the invention may be optimally operated by people of any size. Even young chil-

Motorola v. Stellar
Motorola Exhibit 1013
Page 135

dren can become quite proficient in the use of the wearable camera system.

[0039] A typical embodiment of the invention comprises one or two spatial light modulators or other display means built into a pair of eyeglasses together with one or more sensor arrays. Typically one or more CCD (charge coupled device) image sensor arrays and appropriate optical elements comprise the camera portion of the invention. Typically a beamsplitter or a mirror silvered on both sides is used to combine the image of the viewfinder with the apparent position of the camera. The viewfinder is simply a means of determining the extent of coverage of the camera in a natural manner, and may comprise either of:

- A reticle, graticule, rectangle, or other marking that appears to float within a portion of the field of view.
- A display device that shows a video image, or some other dynamic information perhaps related to the video image coming from the camera.

[0040] One aspect of the invention allows a photographer or videographer to wear the apparatus continuously and therefore always end up with the ability to produce a picture from something that was seen a couple of minutes ago. This may be useful to everyone in the sense that we may not want to miss a great photo opportunity, and often great photo opportunities only become known to us after we have had time to think about something we previously saw.

[0041] Such an apparatus might also be of use in personal safety. Although 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. Most notably there have been several examples in which such centralized infrastructure has been abused by the owners of it (as in roundups and detainment of peaceful demonstrators). Moreover, "public safety" systems may fail to protect individuals against crimes committed by the organizations that installed the systems. The apparatus of this invention allows the storage and retrieval of images by transmitting and recording images at one or more remote locations. Images may be transmitted and recorded in different countries, so that they would be difficult to destroy, in the event that the perpetrator of a crime might wish to do so.

[0042] The apparatus of the invention allows images to be captured in a natural manner, without giving an unusual appearance to others (such as a potential assailant).

[0043] Moreover, as an artistic tool of personal expression, the apparatus allows the user to record, from a first-person-perspective, experiences that have been difficult to so record in the past. For example, a user might be able to record the experience of looking through binoculars while riding horseback, or the experience of waterskiing, rope climbing, or the like. Such experiences captured from a first-person perspective provide a new genre of video by way of a wearable camera system with viewfinder means that goes beyond current state-of-the-art point of view sports videos (such as created by cameras mounted in sports helmets which have no viewfinder means).

[0044] A typical embodiment of the invention comprises a wearable viewfinder system which is fitted with a motorized focusing mechanism. A camera also fitted with a motorized focusing mechanism is positioned upon one side of a mirror that is silvered on both sides, so that the viewfinder can be positioned on the other side and provide a view that is focused to whatever the camera is focused on. Such an apparatus allows the user to record a portion of his or her eye's visual field of view. With the correct design, the device will tend to cause the wearer to want to place the recording zone over top of whatever is most interesting in the scene. This tendency arises from the enhancement of the imagery in this zone. In much the same way that people tend to look at a TV set in a darkened room, regardless of what is playing (even if the TV is tuned to a blank station and just playing "snow"), there is a tendency when wearing the invention to look at the recording/display/viewfinder zone. Therefore, there is a tendency to try to put the recording zone on top that which is of most interest. Therefore using the apparatus, after time, does not require conscious thought or effort. It was once said that television is more real than real life, and in much the same way, the wearer of the apparatus becomes a cybernetic organism (cyborg) in a true synergy of human and camera. This is particularly true with a low vision system in which one can actually see better through the viewfinder than in real life (e.g. at night when an image intensifier provides enhanced vision). In this case, the tendency of the wearer to want to become an organism that seeks best picture is very pronounced.

[0045] Accordingly, the present invention in one aspect comprises headgear having an electronic camera borne by said headgear and an electronic display borne by said headgear, said electronic display responsive to an output from said electronic camera, wherein the improvement comprises: reflective optics arranged for, at least partially, reflecting light such that a first pencil of light which would otherwise converge at a first point outside a lens assembly of said camera is at least partially reflected to a second pencil of light directed at an optical center of said lens assembly of said camera, said lens assembly comprising at least one lens, wherein said reflective optics is further for reflecting light from said display such that said reflected light from said display forms a third pencil of light approximating said first pencil of light, in order to provide substantial exact registration of what would have been seen at said first point due to said first pencil of light, in the absence of said headgear, with what, in the presence of said headgear, is seen at said

Motorola v. Stellar
Motorola Exhibit 1013
Page 136

first point due to said third pencil of light.

[0046] According to another aspect of the present invention, there is provided headgear having a sensor borne by said headgear, a display borne by said headgear, said display situated for being visible to a wearer of said headgear when said headgear is worn, an output from said sensor for a processor, and an input to said display for accepting input from said processor, wherein the improvement comprises: reflective optics arranged for reflecting light such that at least a portion of at least some rays of light which would otherwise, in the absence of said reflective optics, not be measured by said sensor, is reflected to be measured by said sensor, said processor for determining a quantity of light in each of said at least some rays of light, said processor for controlling said display to provide outgoing rays of light each one being collinear with, and responsive to, one of said at least some rays of light.

BRIEF DESCRIPTION OF THE DRAWINGS

[0047] The invention will now be described in more detail, by way of examples which in no way are meant to limit the scope of the invention, but, rather, these examples will serve to illustrate the invention with reference to the accompanying drawings, in which:

FIG. **1** is a diagram of a simple embodiment of the invention in which there are two cameras, a wide-angle camera concealed in the nose bridge of a pair of sunglasses, a telecamera concealed in the top part of the frame of the sunglasses, and combined by way of a beamsplitter with the wide-camera, as well as a viewfinder means concealed in the left temple side-piece of the glasses with optics concealed in or behind the glass of the left lens. FIG 1A is an exploded view of a portion of FIG 1. FIG 1B is a detail view of a portion of FIG 1. FIG 1C and FIG 1D illustrate aspects of the operation of the embodiment of FIG 1.

FIG. **2** is a diagram of the wearable camera system with an improvement in which the viewfinder is constructed so that when other people look at the wearer of the apparatus they can see both of the wearer's eyes in such a way that they do not notice any unusual magnification of the wearer's left eye which might otherwise look unusual or become a problem in making normal eye contact with the wearer.

FIG. **3** illustrates the principle of a camera viewfinder which replaces a portion of the visual field of view with the view from a camera, yet allows the wearer to see through the apparatus without experiencing any psychophysical adaptation or coordinate transformation.

FIG. **4** illustrates a version of the apparatus similar to that in FIG. 1, except where a portion of the visual field of view is only partially replaced, owing to the use of polarizers to prevent video feedback, as well as a beamsplitter rather than a double-sided mirror.

FIG. **5** shows an embodiment of the invention in which there are two televisions of different sizes which are each superimposed upon exactly the field of view that corresponds to each of two cameras, one being wide-angle and the other being tele.

FIG. **6** shows an embodiment of the wearable camera invention in which the viewfinder contains considerable magnification, yet allows other people to see both of the wearer's eyes except for a slight amount of blocked vision which may be concealed by making the glasses look like bifocal glasses.

FIG. **7** shows an embodiment of the invention where there is coupling between camera focus and viewfinder focus.

FIG. **8** shows an embodiment of the invention where there is a zoom capability, and where the virtual light principle is preserved regardless of zoom setting.

FIG. **9** shows a stereo embodiment of the invention where both cameras are focused by the left camera, and where the left camera also controls the focus of both viewfinders and the vergence of the entire system.

FIG. **10** shows an embodiment of the invention where an eye tracker is used to set the stereo camera focus, the stereo viewfinder focus, and the vergence, to all correspond with the object. the wearer is looking at.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0048] While the invention shall now be described with reference to the preferred embodiments shown in the drawings, it should be understood that the intention is not to limit the invention only to the particular embodiments shown but rather to cover all alterations, modifications and equivalent arrangements possible within the scope of appended claims.

[0049] In all aspects of the present invention, references to "camera" mean any device or collection of devices capable of simultaneously determining a quantity of light arriving from a plurality of directions and or at a plurality of locations, or determining some other attribute of light arriving from a plurality of directions and or at a plurality of locations. Similarly references to "display", "television", or the like, shall not be limited to just television monitors or traditional televisions used for the display of video from a camera near or distant, but shall also include computer data display means, computer data monitors, other video display devices, still picture display devices, ASCII text display devices, terminals, systems that directly scan light onto the retina of the eye to form the perception of an image, direct electrical stimulation through a device implanted into the back of the brain (as might create the sensation of vision in a blind person), and the like.

[0050] With respect to both the cameras and displays,

Motorola v. Stellar
Motorola Exhibit 1013
Page 137

as broadly defined above, the term "zoom" shall be used in a broad sense to mean any lens of variable focal length, any apparatus of adjustable magnification, or any digital, computational, or electronic means of achieving a change in apparent magnification. Thus, for example, a zoom viewfinder, zoom television, zoom display, or the like, shall be taken to include the ability to display a picture upon a computer monitor in various sizes through a process of image interpolation as may be implemented on a body-worn computer system.

[0051] References to "processor", or "computer" shall include sequential instruction, parallel instruction, and special purpose architectures such as digital signal processing hardware, Field Programmable Gate Arrays (FPGAs), programmable logic devices, as well as analog signal processing devices.

[0052] References to "transceiver" shall include various combinations of radio transmitters and receivers, connected to a computer by way of a Terminal Node Controller (TNC), comprising, for example, a modem and a High Level Datalink Controller (HDLCs), to establish a connection to the Internet, but shall not be limited to this form of communication. Accordingly, "transceiver" may also include analog transmission and reception of video signals on different frequencies, or hybrid systems that are partly analog and partly digital. The term "transceiver" shall not be limited to electromagnetic radiation in the frequence bands normally associated with radio, and may therefore include infrared or other optical frequencies. Moreover, the signal need not be electromagnetic, and "transceiver" may include gravity waves, or other means of establishing a communications channel.

[0053] While the architecture illustrated shows a connection from the headgear, through a computer, to the transceiver, it will be understood that the connection may be direct, bypassing the computer, if desired, and that a remote computer may be used by way of a video communications channel (for example a full-duplex analog video communications link) so that there may be no need for the computer to be worn on the body of the user.

[0054] The term "headgear" shall include helmets, baseball caps, eyeglasses, and any other means of affixing an object to the head, and shall also include implants, whether these implants be apparatus imbedded inside the skull, inserted into the back of the brain, or simply attached to the outside of the head by way of registration pins implanted into the skull. Thus "headgear" refers to any object on, around, upon, or in the head, in whole or in part.

[0055] When it is said that object "A" is "borne" by object "B", this shall include the possibilities that A is attached to B, that A is part of B, that A is built into B, or that A is B.

[0056] Fig 1 shows an embodiment of the invention built into eyeglass frames 100, typically containing two eyeglass lenses 105. An electronic wide-angle camera 110 is typically concealed within the nose bridge of the eyeglass frames 100. In what follows, the wide-angle camera 110 may be simply referred to as the "wide-camera", or as "wide-angle camera". In this embodiment of the wearable camera, a second camera, 120, is also concealed in the eyeglass frames 100. This second camera is one which has been fitted with a lens of longer focal length, and will be referred to as a "narrow-angle camera", or simply a "narrow-camera" in what follows. The wide-camera 110 faces forward looking through a beamsplitter 130. The narrow-camera 120 faces sideways looking through the beamsplitter. For clarity, the beamsplitter 130 and camera 110 are shown separated in Fig 1a, while in actual construction, the beamsplitter is cemented between the two cameras as shown in Fig 1. The beamsplitter 130 is typically mounted at a 45 degree angle, and the optical axes of the two cameras are typically at 90 degree angles to each other. The optical axes of the two cameras should intersect and thus share a common viewpoint. Thus the narrow camera 120 may have exactly the same field of view as the wide-camera 110. Typically eyeglasses with black frames are selected, and a CCD sensor array for wide-camera 110 is concealed in a cavity which is also used as a nose bridge support, so that the eyeglasses have a normal appearance. Typically, the body of the wide-camera is formed from epoxy, which sets it permanently in good register with the beamsplitter and the narrow-camera 120. During setting of the epoxy, the cameras are manipulated into an exact position, to ensure exact collinearity of the two effective optical axes. The wide-camera 110 is typically fitted with a lens having a diameter of approximately 1/32 inch (less than one millimeter) — small enough that it cannot be easily seen by someone at close conversational distance to the person wearing the eyeglasses. The narrow-camera 120 is typically concealed in the upper portion of the eyeglass frames. The narrow-camera 120 is preferably custom-made, like the wide-camera, by encapsulating a CCD sensor array, or the like, in an epoxy housing together with the appropriate lens, so that cameras 110 and 120 are both bonded to beamsplitter 130, and all three are in turn bonded to the eyeglass frame. A satisfactory narrow-camera, for use in small-production runs of the invention (where it is difficult to construct the housing from epoxy) is an Elmo (TM) model QN42H camera, owing to its long and very slender (7mm diameter) construction. In mass-production, a custom-made narrow-camera could be built directly into the eyeglass frames. Since the narrow-camera 120 is typically built into the top of the eyeglass frames, the wide-camera 110 should also be mounted near the top of the frames, so the two optical axes can be made to intersect at right angles, making the effective optical axes (e.g. that of camera 120 as reflected in beamsplitter 130) collinear.

[0057] Preferably, a complete camera system providing NTSC video is not installed directly in the eyeglasses. Instead, wires 125 from the camera sensor arrays

Motorola v. Stellar
Motorola Exhibit 1013
Page 138

are concealed inside the eyeglass frames and run inside a hollow eyeglass safety strap 126. A satisfactory eyeglass safety strap is the safety strap that is sold under the trademark "Croakies". Eyeglass safety strap 126 typically extends to a cloth-wrapped cable harness 127 typically made of the same kind of hollow cloth material from which safety strap 126 is made. There is typically a connection between cable harness 127 and a wiring harness 180, where wiring harness 180 is typically not wrapped in cloth. Wiring harness 180 and cable harness 127 are connected together by connection 175. Connection 175 typically includes a strain relief clip or the like that clips to the inside of the wearer's shirt, at the back of the neck, so that wiring harness 180 will not pull on cable harness 127. In this way, cable harness 127 is slack, and allows safety strap 126 to fall slack and thus have an appearance that it just happened to fall down partially inside the wearer's shirt.

[0058] Wires 125 are run down to a belt pack or to a body-worn pack 128, often comprising a computer as part of processor 182, powered by battery pack 181 which also powers the portions of the camera and display system located in the headgear. The processor 182, if it includes a computer, preferably contains also a nonvolatile storage device or network connection. Alternatively, or in addition to the connection to processor 182, there is often another kind of recording device, or connection to a transmitting device 186. The transmitter 186, if present, is typically powered by the same battery pack 181 that powers the processor. In some embodiments, a minimal amount of circuitry may be concealed in the eyeglass frames so that the wires 125 may be driven with a buffered signal in order to reduce signal loss. In or behind one or both of the eyeglass lenses 105, there is typically an optical system 150. This optical system provides a magnified view of an electronic display in the nature of a miniature television screen 160 in which the viewing area is typically less than one inch (or less than 25 millimeters) on the diagonal. The electronic display acts as a viewfinder screen. The viewfinder screen may comprise a 1/4 inch (approx. 6mm) television screen comprising an LCD spatial light modulator with a field-sequenced LED backlight. Preferably custom-built circuitry is used. However, a satisfactory embodiment of the invention may be constructed by having the television screen be driven by a coaxial cable carrying a video signal similar to an NTSC RS-170 signal. In this case the coaxial cable and additional wires to power it are concealed inside the eyeglass safety-strap and run down to a belt pack or other body-worn equipment by wiring harness 180.

[0059] In some embodiments, television 160 contains a television tuner so that a single coaxial cable may provide both signal and power. In other embodiments the majority of the electronic components needed to construct the video signal are worn on the body, and the eyeglasses contain only a minimal amount of circuitry, perhaps only a spatial light modulator, LCD flat panel, or the like, with termination resistors and backlight. In this case, there are a greater number of wires 170. In some embodiments of the invention the television screen 160 is a VGA computer display, or another form of computer monitor display, connected to a computer system worn on the body of the wearer of the eyeglasses.

[0060] Wearable display devices have been described, such as in U.S. Pat. No. 5546099, Head mounted display system with light blocking structure, by Jessica L. Quint and Joel W. Robinson, Aug. 13, 1996, as well as in U.S. Pat. No. 5708449, Binocular Head Mounted Display System by Gregory Lee Heacock and Gordon B. Kuenster, Jan. 13, 1998. (Both of these two patents are assigned to Virtual Vision (TM), a well-known manufacturer of head-mounted displays). A "personal liquid crystal image display" has been described U.S. Pat. No. 4636866, by Noboru Hattori, Jan. 13, 1987. Any of these head-mounted displays of the prior art may be modified into a form such that they will function in place of television display 160.

[0061] In typical operation of the system of Fig 1, light enters the eyeglasses and is absorbed and quantified by one or more cameras. By virtue of a connection through wiring harness 180, information about the light entering the eyeglasses is available to the body-worn computer system previously described. The computer system may calculate the actual quantity of light, up to a single unknown scalar constant, arriving at the glasses from each of a plurality of directions corresponding to the location of each pixel of the camera with respect to the camera's center of projection. This calculation may be done using photoquantigraphic image processing. In some embodiments of the invention the narrow-camera 120, is used to provide a more dense array of such photoquanta estimates. This increase in density toward the center of the visual field of view matches the characteristics of the human visual system in which there is a central foveal region of increased visual acuity. Video from one or both cameras is possibly processed by the body-worn computer 182 and recorded or transmitted to one or more remote locations by a body-worn video transmitter 186 or body-worn Internet connection, such as a standard WA4DSY 56 kbps RF link with a KISS 56 eprom running TCP/IP over an AX25 connection to the serial port of the body-worn computer. The possibly processed video signal is sent back up into the eyeglasses through wiring harness 180 and appears on viewfinder screen 160, viewed through optical elements 150.

[0062] Typically, rather than displaying raw video on display 160, processed video is displayed thereupon, with reference also to FIG 1b (a close-up detail view of processor 182), as follows: The video outputs from cameras 110 and 120 pass through wiring harness 180 into vision analysis processor 183. Vision analysis processor 183 typically uses the output of the wide-camera for head-tracking. This head-tracking determines the rela-

Motorola v. Stellar
Motorola Exhibit 1013
Page 139

tive orientation (yaw, pitch, and roll) of the head based on the visual location of objects in the field of view of camera 110. Vision analysis processor 183 may also perform some 3-D object recognition or parameter estimation, or construct a 3-D scene representation. Information processor 184 takes this visual information, and decides which virtual objects, if any, to insert into the viewfinder. Graphics synthesis processor 185 creates a computer-graphics rendering of a portion of the 3-D scene specified by the information processor 184, and presents this computer-graphics rendering by way of wires in wiring harness 180 to television screen 160. Typically the objects displayed are synthetic (virtual) objects overlaid in the same position as some of the real objects from the scene. Typically the virtual objects displayed on television 160 correspond to real objects within the field of view of narrow-camera 120. In this way, narrow camera 120 provides vision analysis processor 183 with extra details about the scene so that the analysis is more accurate in this foveal region, while wide-camera 110 provides both an anticipatory role and a head-tracking role. In the anticipatory role, vision analysis processor 183 is already making crude estimates of identity or parameters of objects outside the field of view of the viewfinder screen 160, with the possible expectation that the wearer may at any time turn his or her head to include some of these objects, or that some of these objects may move into the field of view of viewfinder 160 and narrow camera 120. With this operation, synthetic objects overlaid on real objects in the viewfinder provide the wearer with enhanced information of the real objects as compared with the view the wearer has of these objects outside of the viewfinder.

[0063] Thus even though television viewfinder screen 160 may only have 240 lines of resolution, a virtual television screen, of extremely high resolution, wrapping around the wearer, may be implemented by virtue of the head-tracker, so that the wearer may view very high resolution pictures through what appears to be a small window that pans back and forth across the picture by the head-movements of the wearer. Optionally, in addition to overlaying synthetic objects on real objects to enhance real objects, graphics synthesis processor 182 (FIG 1b may cause the display of other synthetic objects on the virtual television screen. For example, FIG 1c illustrates a virtual television screen with some virtual (synthetic) objects such as an Emacs Buffer upon an xterm (text window in the commonly-used X-windows graphical user-interface). The graphics synthesis processor 182 causes the viewfinder screen 160 (FIG 1) to display a reticle seen in the viewfinder window at 192. Typically viewfinder screen 160 has 640 pixels across and 480 down, which is only enough resolution to display one xterm window since an xterm window is typically also 640 pixels across and 480 down (sufficient size for 24 rows of 80 characters of text). Thus the wearer can, by turning the head to look back and forth, position viewfinder reticle 192 on top of any of a number of xterms 194 that appear to hover in space above various real objects 198. The real objects themselves, when positioned inside the mediation zone established by the viewfinder, may also be visually enhanced as seen through the viewfinder. Suppose the wearer is in a department store and, after picking up a $7 item for purchase, the wearer approaches the cashier, hands the cashier a $20 dollar bill, but only receives change for a $10 bill (e.g. only receives $3 change from $20). Upon realizing this fact a minute or so later, the wearer locates a fresh available, (e.g. one that has no programs running in it so that it can accept commands) xterm 196. The wearer makes this window active by head movement up and to the right, as shown in Fig 1d. Thus the camera functions also as a head tracker, and it is by orienting the head (and hence the camera) that the cursor may be positioned. Making a window active in the X-windows system is normally done by placing the mouse cursor on the window and possibly clicking on it. However, having a mouse on a wearable camera/computer system is difficult owing to the fact that it requires a great deal of dexterity to position a cursor while walking around. With the invention described here, the viewfinder is the mouse/cursor: the wearer's head is the mouse, and the center of the viewfinder is the cursor. In Fig 1c and Fig 1d, windows outside the viewfinder are depicted in dashed lines, because they are not actually visible to the wearer. The wearer can see real objects outside the field of view of the viewfinder (either through the remaining eye, or because the viewfinder permits one to see around it). However, only xterms in the viewfinder are visible. Portions of the xterms within the viewfinder are shown with solid lines, as this is all that the wearer will see.

[0064] Once the wearer selects window 196 by looking at it, then the wearer presses the letter "d" to begin "recorDing", as indicated on window 196. Note that the letter "d" is pressed for "recorD", because the letter "r" means "Recall" (in some ways equivalent to "Rewind" on a traditional video cassette recorder). Letters are typically selected by way of a small number of belt-mounted switches that can be operated with one hand, in a manner similar to the manner that courtroom stenographers use to form letters of the alphabet by pressing various combinations of pushbutton switches. Such devices are commonly known as "chording keyboards" and are well known in the prior art. Also note that the wearer did not need to look right into all of window 196: the window accepts commands as long as it is active, and doesn't need to be wholly visible to accept commands.

[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 "d" begins recording starting from 5 minutes ago, e.g. starting from 5 minutes before "d" is pressed. This means that if the wearer presses "d" within a couple of minutes of realizing that the cashier short-changed the wearer, then the transaction will have been sucessfully

Motorola v. Stellar
Motorola Exhibit 1013
Page 140

recorded. The customer can then see back into the past 5 minutes, and can assert with confidence (through perfect photographic/videographic memory Recall, e.g. by pressing "r") to the cashier that a $20 bill was given. The extra degree of personal confidence afforded by the invention typically makes it unnecessary to actually present the video record (e.g. to a supervisor) in order to correct the situation. Of course, if there was a belief that the cashier was dishonest, the customer could file a report or notify authorities while at the same time submitting the recording as evidence. Typically the recording is also transmitted by way of transmitter 186 so that the cashier or other representatives of the department store (such as a department store security guard who might be a close personal friend of the cashier) cannot sieze and destroy the storage medium upon which the recording was made.

[0066] Note that here the drawings depict objects moved translationally (e.g. the group of translations specified by two scalar parameters) while in actual practice, virtual objects undergo a projective coordinate transformation in two dimensions, governed by eight scalar parameters, or objects undergo three dimensional coordinate transformations. When the virtual objects are flat, such as text windows, such a user-interface is called a "Reality Window Manager" (RWM).

[0067] In using the invention, typically various windows appear to hover above various real objects, and regardless of the orientation of the wearer's head (position of the viewfinder), the system sustains the illusion that the virtual objects 194 (in this example, xterms) are attached to real objects 198. The act of panning the head back-and forth in order to navigate around the space of virtual objects also may cause an extremely high-resolution picture to be acquired through appropriate processing of a plurality of pictures captured on narrow-camera 120. This action mimicks the function of the human eye, where saccades are replaced with head movements to sweep out the scene using the camera's light-measurement ability as is typical of photoquantigraphic image processing. Thus head movements are used to direct the camera to scan out a scene in the same way that eyeball movements normally orient the eye to scan out a scene.

[0068] Processor 182 is typically responsible for ensuring that the view rendered in graphics processor 185 matches the viewing position of the eye in front of optics 150, and not the original position from which the video was presented from cameras 110 and 120 to vision processor 183. Thus there is a change of viewing angle, in the rendering, so as to compensate for the difference in position (parallax) between the cameras and the view afforded by the display.

[0069] Some homographic and quantigraphic image analysis embodiments do not require a 3-D scene analysis, and instead use 2-D projective coordinate transformations of a flat object or flat surface of an object, in order to effect the parallax correction between virtual objects and the view of the scene as it would appear with the glasses removed from the wearer.

[0070] A drawback of the apparatus depicted in Fig 1 is that the optical elements 150 block the eye(s) of the wearer. The wearer may be able to adapt to this condition, or at least compensate for it through the display of video from the wearable camera to create an illusion of transparency, in the same way that a hand-held camcorder creates an illusion of transparency when it is on and running even though it would function as a vision-blocking eye patch when turned off. However, because of the parallax between cameras 110 and 120 and the actual eye position given by viewfinder optics 150, creating the illusion of transparency requires passing all objects through the analysis processor 183, followed by the synthesis processor 185, and this may present processor 182 with a formidable task. Moreover, the fact that the eye of the wearer is blocked means that others cannot make eye-contact with the wearer. In social situations this creates an unnatural form of interaction. Although the lenses of the glasses may be made sufficiently dark that the viewfinder optics are concealed, it is preferable that the viewfinder optics may be concealed in eyeglasses that allow others to see both of the wearer's eyes. A beamsplitter may be used for this purpose, but it is preferable that there be a strong lens directly in front of the eye of the wearer to provide for a wide field of view. While a special contact lens might be worn for this purpose, there are limitations on how short the focal length of a contact lens can be, and such a solution is inconvenient for other reasons.

[0071] Accordingly, a viewfinder system is depicted in Fig 2 in which an optical path 200 brings light from a viewfinder screen 210, through a first relay mirror 220, along a cavity inside the left temple-side piece of the glasses formed by an opaque side shield 230, or simply by hollowing out a temple side-shield. Light travels to a second relay mirror 240 and is combined with light from the outside environment as seen through diverging lens 250. The light from the outside and from the viewfinder is combined by way of beamsplitter 260. The rest of the eyeglass lenses 261 are typically tinted slightly to match the beamsplitter 260 so that other people looking at the wearer's eyes do not see a dark patch where the beamsplitter is. Converging lens 270 magnifies the image from the viewfinder screen 210, while canceling the effect of the diverging lens 250. The result is that others can look into the wearer's eyes and see both eyes at normal magnification, while at the same time, the wearer can see the camera viewfinder at increased magnification. The rest of the system of Fig 2 is similar to that of Fig 1 (and like parts have been given like reference numerals in their last two digits), except that the video transmitter 186 shown in Fig 1 has been replaced with a data communications transceiver 286. Transceiver 286 along with appropriate instructions loaded into computer 282 provides a camera system allowing collaboration between the user of the apparatus and one or

Motorola v. Stellar
Motorola Exhibit 1013
Page 141

more other persons at remote locations. This collaboration may be facilitated through the manipulation of shared virtual objects such as cursors, or computer graphics renderings displayed upon the camera viewfinder(s) of one or more users.

[0072] Similarly, transceiver 286, with appropriate instructions executed in computer 282, allows multiple users of the invention, whether at remote locations or side-by-side, or in the same room within each other's field of view, to interact with one another through the collaborative capabilities of the apparatus. This also allows multiple users, at remote locations, to collaborate in such a way that a virtual environment is shared in which camera-based head-tracking of each user results in acquisition of video and subsequent generation of virtual information being made available to the other(s).

[0073] Multiple users, at the same location, may also collaborate in such a way that multiple camera viewpoints may be shared among the users so that they can advise each other on matters such as composition, or so that one or more viewers at remote locations can advise one or more of the users on matters such as composition or camera angle.

[0074] Multiple users, at different locations, may also collaborate on an effort that may not pertain to photography or videography directly, but an effort nevertheless that is enhanced by the ability for each person to experience the viewpoint of another.

[0075] It is also possible for one or more remote participants at conventional desktop computers or the like to interact with one or more users of the camera system, at one or more other locations, to collaborate on an effort that may not pertain to photography or videography directly, but an effort nevertheless that is enhanced by the ability for one or more users of the camera system to either provide or obtain advice from or to another individual at a remote location.

[0076] The embodiments of the wearable camera system depicted in Fig 1 and Fig 2 give rise to a small displacement between the actual location of the camera, and the location of the virtual image of the viewfinder. Therefore, either the parallax must be corrected by a vision system 183, followed by 3-D coordinate transformation (e.g. in processor 184), followed by re-rendering (e.g. in processor 185), or if the video is fed through directly, the wearer must learn to make this compensation mentally. When this mental task is imposed upon the wearer, when performing tasks at close range, such as looking into a microscope while wearing the glasses, there is a discrepancy that is difficult to learn, and may also give rise to unpleasant psychophysical effects such as nausea or "flashbacks". Initially when wearing the glasses, the tendency is to put the microscope eyepiece up to one eye, rather than the camera 110 which is right between the eyes. As a result, the apparatus fails to record exactly the wearer's experience, until the wearer can learn that the effective eye position is right in the middle. Locating the cameras elsewhere does not help appreciably, as there will always be some error. It is preferred that the apparatus will record exactly the wearer's experience. Thus if the wearer looks into a microscope, the glasses should record that experience for others to observe vicariously through the wearer's eye. Although the wearer can learn the difference between the camera position and the eye position, it is preferable that this not be required, for otherwise, as previously described, long-term usage may lead to undesirable flashback effects.

[0077] Accordingly, Fig 3 illustrates a system whereby rays of light spanning a visual angle from ray 310 to ray 320 enter the apparatus and are intercepted by a two-sided mirror 315, typically mounted at a 45 degree angle with respect to the optical axis of a camera 330. These rays of light enter camera 330. Camera 330 may be a camera that is completely (only) electronic, or it may be a hybrid camera comprising photographic emulsion (film) together with a video tap, electronic previewer, or other manner of electronic output, so that a film may be exposed and the composition may also be determined by monitoring an electronic output signal. Such a camera that provides an electronic output signal from which photographic, videographic, or the like, composition can be judged, will be called an "electronic camera" regardless of whether it may also contain other storage media such as photographic film. The video output of the camera 330 is displayed upon television screen 340 possibly after having been processed on a body-worn computer system or the like. A reflection of television screen 340 is seen in the other side of mirror 315, so that the television image of ray 310 appears as virtual ray 360 and the television image of ray 320 appears as ray 370. Since the camera 330 records an image that is backwards, a backwards image is displayed on the television screen 340. Since the television 340 is observed in a mirror, the image is reversed again so that the view seen at pencil of light rays 390 is not backwards. In this way a portion of the wearer's visual field of view is replaced by the exact same subject matter, in perfect spatial register with the real world as it would appear if the apparatus were absent. Thus the portion of the field of view spanned by rays 310 to 320 which emerges as virtual light, will align with the surrounding view that is not mediated by the apparatus, such as rays 311 and 321 which pass through the apparatus and enter directly into the eye without being deflected by two-sided mirror 315. The image could, in principle also be registered in tonal range, using the photoquantigraphic image processing framework for estimating the unknown nonlinear response of the camera, and also estimating the response of the display, and compensating for both. So far focus has been ignored, and infinite depth-of-field has been assumed. In practice, a viewfinder with a focus adjustment is used, and the focus adjustment is driven by a servo mechanism controlled by an autofocus camera. Thus camera 330 automatically focuses on the subject matter of interest, and controls the focus of viewfinder

Motorola v. Stellar
Motorola Exhibit 1013
Page 142

330 so that the apparent distance to the object is the same while looking through the apparatus as with the apparatus removed.

[0078] It is desirable that embodiments of the wearable camera system comprising manual focus cameras have the focus of the camera linked to the focus of the viewfinder so that both may be adjusted together with a single knob. Moreover, a camera with zoom lens may be used together with a viewfinder having zoom lens. The zoom mechanisms are linked in such a way that the viewfinder image magnification is reduced as the camera magnification is increased. Through this appropriate linkage, any increase in magnification by the camera is negated exactly by decreasing the apparent size of the viewfinder image.

[0079] The calibration of the autofocus zoom camera and the zoom viewfinder may be done by temporarily removing the mirror 315 and adjusting the focus and zoom of the viewfinder to maximize video feedback. This must be done for each zoom setting, so that the zoom of the viewfinder will properly track the zoom of the camera. By using video feedback as a calibration tool, a computer system may monitor the video output of the camera while adjusting the viewfinder and generating a lookup table for the viewfinder settings corresponding to each camera setting. In this way, calibration may be automated during manufacture of the wearable camera system.

[0080] The apparatus of Fig 3 does not permit others to make full eye-contact with the wearer. Accordingly, Fig 4 depicts a similar apparatus in which only a portion of the rays of the leftmost ray of light 310 is deflected by beamsplitter 415 which is installed in place of mirror 315. The visual angle subtended by incoming light ray 310 to light ray 320 is deflected by way of beamsplitter 415 into camera 330. Output from this camera is displayed on television 340, possibly after processing on a body-worn computer or processing at one or more remote sites, or a combination of local and remote image processing or the like. A partial reflection of television 340 is visible to the eye of the wearer by way of beamsplitter 415. The leftmost ray of light 460 of the partial view of television 340 is aligned with the direct view of the leftmost ray of light 310 from the original scene. Thus the wearer sees a superposition of whatever real object is located in front of ray 310 and the television picture of the same real object at the same location. The rightmost ray of light 320 is similarly visible through the beamsplitter 415 in register with the rightmost virtual ray reflected off the beamsplitter 415.

[0081] Note that the partial transparency of beamsplitter 415 allows one to see beyond the screen, so it is not necessary to carefully cut beamsplitter 415 to fit exactly the field of view defined by television 340, or to have the degree of silvering feather out to zero at the edges beyond the field of view defined by television 340.

[0082] Rays 460 and 470 differ from rays 360 and 370 in that 460 and 470 present the viewer with a combination of virtual light and real light. In order to prevent video feedback, in which light from the television screen would shine into the camera, a polarizer 480 is positioned in front of the camera. The polarization axis of the polarizer is aligned at right angles to the polarization axis of the polarizer inside the television, assuming the television already has a built-in polarizer as is typical of small battery powered LCD televisions, LCD camcorder viewfinders, and LCD computer monitors. If the television does not have a built in polarizer, a polarizer is added in front of the television. Thus video feedback is prevented by virtue of the two crossed polarizers in the path between the television 340 and the camera 330. Alternatively, instead of using explicit polarizers, a beamsplitter with polarization properties may be used for beamsplitter 415. Although many beamsplitters will exhibit some polarization properties, on account of being somewhat near the Brewster angle (functioning somewhat like a Brewster plate), certain kinds of beamsplitters, such as dichroic beamsplitters, exhibit very strong polarization characteristics. For example, beamsplitter 415 may comprise a dichroic beamsplitter cube.

[0083] The pencil of rays of light 490 will provide a mixture of direct light from the scene, and virtual light from the television display 340. The pencil of rays 490 thus differs from the pencil of rays 390 (FIG 3) in that 490 is a superposition of the virtual light as in 390 with real light from the scene.

[0084] In describing this invention, the term "pencil" of rays shall be taken to mean rays that intersect at a point in arbitrary dimensions (e.g. 3D as well as 2D) even though the term "pencil" usually only so-applies to 2D in common usage. This will simplify matters (rather than having to use the word "bundle" in 3D and "pencil" in 2D).

[0085] It is desired that both the real light and virtual light be in perfect or near perfect registration. However, in order that the viewfinder provide a distinct view of the world, it may be desirable that the virtual light from the television be made different in color or the like from the real light from the scene. For example, simply using a black and white television, or a black and red television, or the like, or placing a colored filter over the television, will give rise to a unique appearance of the region of the wearer's visual field of view by virtue of a difference in color between the television image and the real world upon which it is exactly superimposed. Even with such chromatic mediation of the television view of the world, it may still be difficult for the wearer to discern whether or not video is correctly exposed. Accordingly, a pseudocolor image may be displayed, or unique patterns may be used to indicate areas of over exposure or under exposure. Once the wearer becomes aware of areas of improper exposure (such as when an automatic exposure algorithm is failing), the parameters of the automatic exposure algorithm (such as setting of program mode to "backlight", "high contrast", "sports mode" or the like) may be changed, or the automatic exposure may be

Motorola v. Stellar
Motorola Exhibit 1013
Page 143

overridden.

[0086] Television 340 may also be fitted with a focusing lens so that it may be focused to the same apparent depth as the real objects in front of the apparatus. A single manual focus adjustment may be used for both camera 330 and television 340 to adjust them both together. Alternatively, an autofocus camera 330 may control the focus of television 340. Similarly, if a varifocal or zoom camera is used, a varifocal lens in front of television 340 should be used, and should be linked to the camera lens, so that a single knob may be used to adjust the zoom setting for both.

[0087] The apparatus of Fig 4 may be calibrated by temporarily removing the polarizer, and then adjusting the focal length of the lens in front of television 340 to maximize video feedback for each zoom setting of camera 330. This process may be automated if desired, for example, using video feedback to generate a lookup table used in the calibration of a servo mechanism controlling the zoom and focus of television 340.

[0088] The entire apparatus is typically concealed in eyeglass frames in which the beamsplitter is either embedded in one or both glass lenses of the eyeglasses, or behind one or both lenses. In the case in which a monocular version of the apparatus is being used, the apparatus is built into one lens, and a dummy version of the beamsplitter portion of apparatus may be positioned in the other lens for visual symmetry. These beamsplitters may be integrated into the lenses in such a manner to have the appearance of ordinary lenses in ordinary bifocal eyeglasses. Moreover, magnification may be unobtrusively introduced by virtue of the bifocal characteristics of such eyeglasses. Typically the entire eyeglass lens is tinted to match the density of the beamsplitter portion of the lens, so there is no visual discontinuity introduced by the beamsplitter.

[0089] Fig 5 depicts a foveated embodiment of the invention in which incoming light 500 and 501 is intercepted from the direct visual path through the eyeglasses and directed instead, by double-sided mirror 510 to beamsplitter 520. A portion of this light passes through beamsplitter 520 and is absorbed and quantified by wide-camera 530. A portion of this incoming light is also reflected by beamsplitter 520 and directed to narrow-camera 540. The image from the wide-camera 530 is displayed on a large screen television 550, typically of size 0.7 inches (approx. 18mm) on the diagonal, forming a wide-field-of-view image of virtual light 551 from the wide-camera. The image from the narrow-camera 540 is displayed on a small screen television 560, typically of screen size 1/4 inch (approx. 6mm) on the diagonal, forming a virtual image of the narrow-camera as virtual light 561.

[0090] Real rays of light in the periphery of the mediation zone formed by the apparatus emerge as virtual rays from television 550 only. For example, real ray 500 emerges as virtual ray 551.

[0091] Real rays near the central (foveal) region of the mediation zone emerge as virtual rays from both televisions (e.g. they also emerge as virtual rays from television 560). Television 560 subtends a smaller visual angle, and typically has the same total number of scanlines or same total number of pixels as television 550, so the image is sharper in the central (foveal) region. Thus television 560 is visually more dominant in that region, and the viewer can ignore television 550 in this region (e.g. the blurry image and the sharp image superimposed appear as a sharp image in the central region).

[0092] Thus, for example, unlike the real light ray 500 which emerges as virtual light from only one of the two televisions (from only television 550), the real light ray 501 emerges as virtual light from both televisions. Only one of the virtual rays collinear with real ray 501 is shown, in order to emphasize the fact that this virtual ray is primarily associated with television 560 (hence the break between where the solid line 501 is diverted by mirror 510 and where the collinear portion continues after mirror 570). This portion of the dotted line between mirror 510 and mirror 570 that is collinear with real light ray 510 has been omitted to emphasize the visual dominance of television 560 over television 550 within the central (foveal) field of view,

[0093] In this foveal region, it is the virtual light from television 560 that is of interest, as this virtual light will be perceived as more pronounced, since the image of television 560 will be sharper (owing to its more closely packed pixel array or scanlines). Thus even though real light ray 501 emerges as two virtual rays, only one of these, 561, is shown: the one corresponding to television 560.

[0094] A smaller television screen is typically used to display the image from the narrow-camera in order to negate the increased magnification that the narrow-camera would otherwise provide, when equal magnification lenses are used for both. In this manner, there is no magnification, and both images appear as if the rays of light were passing through the apparatus, so that the virtual light rays align with the real light rays were they not intercepted by the double-sided mirror 510. Television 550 is viewed as a reflection in mirror 510, while television 560 is viewed as a reflection in beamsplitter 570. Note also that the distance between the two televisions 550 and 560 should equal the distance between double-sided mirror 510 and beamsplitter 570 as measured in a direction perpendicular to the optical axes of the cameras. In this way, the apparent distance to both televisions will be the same, so that the wearer experiences a view of the two televisions superimposed upon one-another in the same depth plane. Alternatively, the televisions may be equipped with lenses to adjust their magnifications so that the television displaying the image from the tele camera 540 subtends a smaller visual angle than the television displaying the image from wide camera 530, and so that these visual angles match the visual angles of the incoming rays of light 500. In this way, two television screens of equal size may be used,

Motorola v. Stellar
Motorola Exhibit 1013
Page 144

which simplifies manufacture of the apparatus. Typically, the entire apparatus is built within the frames 590 of a pair of eyeglasses, where cameras 530 and 540, as well as televisions 550 and 560 are concealed within the frames 590 of the glasses, while double-sided mirror 510 and beamsplitter 570 are mounted in, behind, or in front of the lens of the eyeglasses. In some embodiments, mirror 510 is mounted to the front of the eyeglass lens, while beamsplitter 570 is mounted behind the lens. In other embodiments, one or both of mirror 510 and beamsplitter 570 are actually embedded in the glass of the eyeglass lens.

[0095] Two-sided mirror 510 may instead be a beamsplitter, or may be fully silvered in places (to make a partial beamsplitter and partial fully silvered two-sided mirror). For example, it may be silvered more densely in the center, where the visual acuity is higher, owing to the second television screen. It may also be feathered out, so that it slowly fades to totally transparent around the edges, so there is not an abrupt discontinuity between the real world view and the portion that has been replaced by virtual light. In this case, it is often desirable to insert the appropriate polarizer(s) to prevent video feedback around the edges, or to use appropriate polarizing beamsplitters, such as dichroic beamsplitter materials.

[0096] Fig 6 depicts an alternate embodiment of the wearable camera invention depicted in Fig 4 in which both the camera and television are concealed within the left temple side-piece of the eyeglass frames. A first beamsplitter 610 intercepts a portion of the incoming light and directs it to a second beamsplitter 620 where some of the incoming light is directed to camera 630 and some is wasted illuminating the television screen 640. However, the screen 640, when presented with a video signal from camera 630 (possibly after being processed by a body-worn computer, or remotely by way of wireless communications, or the like) directs light back through beamsplitter 620, where some is wasted but is absorbed by the eyeglass frame to ensure concealment of the apparatus, and some is directed to beamsplitter 610. Some of this light is directed away from the glasses and would be visible by others, and some is directed to the curved mirror 650 where it is magnified and directed back toward beamsplitter 610. The portion that is reflected off of beamsplitter 610 is viewed by the wearer, while the portion that continues back toward beamsplitter 620 must be blocked by a polarizer 660 to prevent video feedback. Implicit in the use of polarizer 660 is the notion that the television produces a polarized output. This is true of LCD televisions which comprise a liquid crystal display between crossed polaroids. If the television is of a type that does not already produce a polarized output, an additional polarizer should be inserted in front of television 640. Finally, if it is desired that the apparatus be unobtrusive, an additional polarizer or polarizing beamsplitter should be used so that the television 640 is not visible to others by way of its reflection in beamsplitter 610. Beamsplitter 610 may, for example, be a dichroic cube beamsplitter that has polarization properties. Alternatively, in certain situations it may actually be desirable to make the display visible to others. For example when the system is used for conducting interviews, it might be desirable that the person being interviewed see himself or herself upon the screen. This may be facilitated by exposing beamsplitter 620 to view, or allowing the reflection of the television to be seen in beamsplitter 610. Alternatively, another television may be mounted to the glasses, facing outwards. Therefore, just as the wearer of an embodiment of the invention may see the image captured by the camera, along with additional information such as text of a teleprompter, the interviewee(s) may also be presented with an image of themselves so that they appear to be looking into an electronic mirror, or may be teleprompted by this outward-facing display, or both. In some embodiments of the invention, the use of two separate screens was useful for facilitation of an interview, in which the same image was presented to both the inward-facing television and the outward-facing television, but the images were mixed with different text. In this way the wearer was teleprompted with one stream of text, while the interviewee was prompted with a different stream of text.

[0097] While the optical elements of the camera system of the described embodiments are embedded in eyeglasses, equally these elements may be embedded in other headgear such as a helmet.

[0098] The beamsplitter 415 of figure 4 and 610 of figure 6 could conveniently be implemented as a metallisation within a lens of the eyeglasses. These beamsplitters and diverging lens 250 of figure 2 may be embedded within the eyeglass lens below the main optical axis of the eye in its normal position so that the embedded elements may appear to be a feature of bifocal eyeglasses.

[0099] Fig 7 depicts a wearable camera system with automatic focus. While the system depicted in Fig 3 may operate with a fixed focus camera 330, so long as it has sufficient depth of field, there is still the question of at what focus depth television 340 will appear. Ideally the apparent depth of the display would match that of objects seen around the display, as represented by rays of light 311, 321, which are beyond two-sided mirror 315. This may be achieved if display medium 340 is such that it has nearly infinite depth of field, for example, by using a scanning laser ophthalmoscope (SLO), or other device which displays an image directly onto the retina of the eye, for display 340, or if display 340 were a holographic video display.

[0100] A lower-cost alternative is to use a variable focus display. The primary object(s) of interest, 700 are imaged by lens assembly 710 which is electronically focusable by way of a servo mechanism 720 linked to camera 730 to provide automatic focus. Automatic focus cameras are well known in the prior art, so the details of automatic focus mechanisms will not be explained

Motorola v. Stellar
Motorola Exhibit 1013
Page 145

here. A signal, 750, from the automatic focus camera is derived by way of reading out the position of the servo 720, and this signal 750 is conveyed to a display focus controller (viewfinder focus controller) 760. Viewfinder focus controller 760 drives, by way of focus control signal 770, a servo mechanism 780 which adjusts the focus of viewfinder optics 790. The arrangement of signals and control systems is such that the apparent depth of television screen 340 is the same as the apparent depth at which the primary object(s) of interest in the real scene would appear without the wearable camera apparatus.

[0101] Other objects, 701, located in different depth planes, will not be in focus in camera 730, and will thus appear blurry on screen 340. They may appear slightly misaligned with where they would have appeared in the absence of the wearable camera system. The degree of misalignment will depend on eye position - the misalignment may or may not be present, or may be quite small. However, because the objects are out of focus, and are not the primary details of the scene, a small possible misalignment will not be particularly objectionable to the wearer of the apparatus.

[0102] In this example, rays 310 and 311 are both in the depth plane of the central object of interest, so that there is no discontinuity between emergent virtual light 360 and real light 311. Thus there is no discontinuity in perceived depth at the leftmost edge of two-sided mirror 315. There is, however, a difference in depth between virtual ray 370 of real ray 320 and almost adjacent real ray 321, because virtual ray 370 is in the same depth plane as 310, 311, and 360, while real ray 321 is in a more distant depth plane owing to the more distant facing surface of objects 701. However, because the eye will be focused on the depth plane of 310, 311, and 360, ray 311 from the real world will be out of focus by virtue of the limited depth of focus of the human eye itself. Thus the real objects will appear blurry, and a discontinuity between these real objects and their blurry image on screen 340 will not be appreciably perceptible.

[0103] Fig 8 depicts an embodiment of the wearable camera system having a zoom lens. Rays of light, for example, rays 500 and 501, enter the wearable camera system and emerge from display 840 as virtual light rays 800 and 801 respectively. In this process of going from light input to virtual light output, two-sided mirror 510 serves to deflect light to autofocus camera 730. Autofocus camera 730 comprises lens 810 and servo mechanism 820 configured in such a manner as to function as a conventional automatic focus camera functions, except that there is, provided to the rest of the system, a signal 750 that indicates the focus setting of the camera 730 and its lens 810 as selected by the camera's control system and servo mechanism 820, and that the camera is also a zoom camera in which the zoom setting can be controlled remotely by zoom signal input 850. Zoom signal input 850 controls, by way of servo 820, the relative position of various optical elements 810, so that, in addition to automatic focus, the camera can be given a desired focal length (field of view). The focus signal 750 goes into a focus and zoom controller 860 which accepts a zoom control signal input, 852, from the user, and directs this zoom control signal to the camera by way of signal 850, and also directs an appropriately processed version of this zoom control signal 851 to display controller 861. In this embodiment, display zoom is achieved as an electronic zoom. While camera zoom is achieved optically, display zoom is achieved electronically, by way of display controller 861 and display signal 870. The camera zooms in by adjustment of lens 810 for longer focal length, increasing the focal distance from the lens to the sensor array in camera 730, resulting in increased magnification. This increase in magnification is acompanied by a decrease, by operation of display controller 861, of the image size displayed on television 840. Television 840 may differ from television 340 (of FIG 7) in the sense that television 840 is optimized for display of resampled (electronically resized) images. This reduction in image size cancels out what would otherwise be an increase in magnification when zooming in with camera 730. It is this precicely controlled cancellation of any magnification that ensures that rays of light entering the apparatus are collinear with rays of virtual light emerging from the other side of the apparatus.

[0104] Fig. 9 depicts a stereo embodiment of the wearable camera system. An eyeglass frame comprising left temple side-piece 910 and right temple side-piece 911 contains two complete assemblies, 920 and 921, each one similar to the entire assembly depicted in Fig 7 or Fig 8.

[0105] Rays of light, for example, ray 320, enter the left eye assembly 920, and emerge as rays of virtual light, for example, 370. As a result, a focus of autofocus camera 730 results, by virtue of the main object of interest before assembly 920. The autofocus camera 730 includes a servo mechanism 720, and the control voltage that the camera feeds to this servo mechanism to keep the camera in focus is also sent outside assembly 920 to focus controller 930. Focus controller 930 drives camera 731 inside the right eye assembly 921. Camera 731 is not an autofocus camera, but, instead is a remotely focusable camera. By remotely focusable, what is meant is that rather than having its servo mechanism 721 driven by the camera itself, as it hunts for best focus, the servo mechanism is instead driven by an external signal. This external signal comes from the camera 730 in the left eye assembly 920. The reason for not having two independently automatically focusing cameras is that it is desired that both cameras will focus in the same depth plane irrespective of slight errors that might be present in the focus of either one.

[0106] Focus controller 930 also sets the focus of both left and right viewfinders by controlling left viewfinder lens servo 780 and right viewfinder lens servo 781. Moreover, focus controller 930 sends a signal to ver-

Motorola v. Stellar
Motorola Exhibit 1013
Page 146

gence controller 940 which drives servo mechanism 950 to adjust the vergence of left eye assembly 920 and servo mechanism 951 to adjust the vergence of right eye assembly 921.

[0107] In this embodiment, the focus of both cameras, the focus of both displays, and the vergence of both assemblies are all controlled by the focus of the left camera, so that whatever object the left camera focuses itself onto, will define the depth plane perceived by both eyes looking at their respective displays. This depth plane will also correspond to the vergence of the displays, so that depth and disparity will match at all times.

[0108] Fig. 10 depicts the left eye portion of an embodiment of the wearable camera system where the camera focus and vergence are driven by the output of an eyetracker. Eyetracker assembly 1010 (comprising camera and infrared light sources) illuminates and observes the eyeball by way of rays of light 1011 that partially reflect off beamsplitter 1020. Beamsplitter 1020 also allows the wearer to see straight through to mirror 315 and thus see virtual light from viewfinder 340. The eyetracker 1010 reports the direction of eye gaze and conveys this information as a signal 1012 to eye tracker processor 1030 which converts this direction into "X" and "Y" coordinates that correspond to the screen coordinates of viewfinder screen 340. These "X" and "Y" coordinates, which are expressed as signal 1031, indicate where on the viewfinder screen 340 the wearer is looking. Signal 1031 and the video output 1032 of camera 730 are both passed to focus analyzer 1040. Focus analyzer 1040 selects a portion of the video signal 1032 in the neighbourhood around the coordinates specified by signal 1031. In this way, focus analyzer 1040 ignores video except in the vicinity of where the wearer of the apparatus is looking. Because the coordinates of the camera match the coordinates of the display (by way of the virtual light principle), the portion of video analyzed by focus analyzer 1040 corresponds to where the wearer is looking. The focus analyzer 1040 examines the high-frequency content of the video in the neighbourhood of where the wearer is looking, to derive an estimate of how well focused that portion of the picture is. This degree of focus is conveyed by way of focus sharpness signal 1041 to focus controller 1050 which drives, by way of focus signal 1051, the servo mechanism 720 of camera 730. Focus controller 1050 is such that it causes the servo mechanism 720 to hunt around until it sharpness signal 1041 reaches a global or local maximum.

[0109] The focus analyzer 1040 and focus controller 1050 thus create a feedback control system around camera 730 so that it tends to focus on whatever object (s) is (are) in the vicinity of camera and screen coordinates 1031. Thus camera 730 acts as an automatic focus camera, but instead of always focusing on whatever is in the center of its viewfinder, it focuses on whatever is being looked at by the left eye of the wearer.

[0110] In addition to driving the focus of the left camera 730, focus controller 1050 also provides a control voltage 1052 identical to the control voltage of 1051. Control signal 1052 drives servo mechanism 780 of lens 790, so that the apparent depth of the entire screen 340 appears focused at the same depth as whatever object the wearer is looking at. In this way, all objects in the viewfinder appear in the depth plane of the one the wearer is looking at.

[0111] Focus controller 1050 provides further control voltages, 1053 and 1054 for the right eye camera and right eye viewfinder, where these signals 1053 and 1054 are identical to that of 1051. Moreover, focus controller 1050 provides the same control voltage to the vergence controller 940 so that it can provide the control signal to angle the left and right assemblies inward by the correct amount, so that all focus and vergence controls are based on the depth of the object the left eye is looking at. It is assumed left and right eyes are looking at the same object, as is normal for any properly functioning human visual system.

[0112] In other embodiments of the invention, it may be desired to know which object is of interest when there are multiple objects in the same direction of gaze, as might happen when the wearer is looking through a dirty glass window. In this case there are three possible objects of interest: the object beyond the window, the object reflected in the glass, and the dirt on the window. All three may be at different depth planes but in the same gaze direction.

[0113] An embodiment of the wearable camera system with a human-driven autofocus camera (e.g. driven by eye focus), could be made from an eye tracker that would measure the focus of the wearer's left eye. Preferably, however, two eyetrackers may be used, one on the left eye, and one on the right eye, in order to attempt to independently track each eye, and attempt to obtain a better estimate of the desired focus by way of the vergence of the wearer's eyes.

[0114] A reality window manager (RWM), similar to that depicted in Fig 1c and Fig 1d, may also be driven by the eyetracker, so that there can be an independent head position (framing) and cursor position (where looking), rather than always having the cursor in the center of the viewfinder. This arangement would also facilitate movement of the cursor without moving the head, which may reduce head movements that appeal unnatural to others watching the user of the wearable camera system.

[0115] The apparatus of this invention allows the wearer to experience the camera over a long period of time. For example, after wearing the apparatus sixteen hours per day for several weeks, it begins to function as a true extension of the mind and body. In this way, photographic composition is much more optimal, because the act of taking pictures or shooting video no longer requires conscious thought or effort. Moreover, the intentionality of the picture-taking process is not evident to others, because picture-taking is not preceeded by a

Motorola v. Stellar
Motorola Exhibit 1013
Page 147

gesture such as holding a viewfinder object up to the eye. The wearable viewfinder is an important element of the wearable camera invention allowing the wearer to experience everyday life through a screen, and therefore be always ready to capture anything that might happen, or even anything that might have happened previously by virtue of the retroactive record capability of the invention. Moreover, additional information beyond just exposure and shutter speed may be displayed in the camera viewfinder. For example, the camera allows the wearer to augment, diminish, or otherwise alter his or her perception of visual reality. This mediated-reality experience may be shared. The wearer may allow others to alter his or her perception of reality. In this way the invention is useful as a new communications medium, in the context of collaborative photography, collaborative videography, and telepresence. Moreover, the invention may perform other useful tasks such as functioning as a personal safety device and crime deterrent by virtue of its ability to maintain a video diary transmitted and recorded at multiple remote locations. As a tool for photojournalists and reporters, the invention has clear advantages over other competing technologies.

[0116] From the foregoing description, it will thus be evident that the present invention provides a design for a wearable camera with a viewfinder. As various changes can be made in the above embodiments and operating methods without departing from the spirit or scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings should be interpreted as illustrative and not in a limiting sense.

[0117] Variations or modifications to the design and construction of this invention, within the scope of the invention as defined by the claims, may occur to those skilled in the art upon reviewing the disclosure herein.

Claims

1. Headgear (100) having an electronic camera (330, 530, 540) borne by said headgear and an electronic display (340) borne by said headgear, said electronic display responsive to an output from said electronic camera, wherein the improvement comprises: reflective optics (314, 415, 510, 610, 620, 650) arranged for, at least partially, reflecting light such that a first pencil of light which would otherwise converge at a first point outside a lens assembly (710, 720; 810, 820) of said camera is at least partially reflected to a second pencil of light directed at an optical center of said lens assembly of said camera, said lens assembly comprising at least one lens, wherein said reflective optics is further for reflecting light from said display such that said reflected light from said display forms a third pencil of light approximating said first pencil of light, in order to provide substantial exact registration of what would have been seen at said first point due to said first pencil of light, in the absence of said headgear, with what, in the presence of said headgear, is seen at said first point due to said third pencil of light.

2. The headgear of claim 1 arranged such that, in use, said first point (390, 490) is at an eye of a wearer of said headgear.

3. The headgear of claim 3 (was 2) wherein said electronic camera comprises a first camera and wherein said headgear further includes an electronic second camera (330, 530, 540) borne by said headgear, one of said first camera and said second camera comprising a wide angle camera and another of said first camera and said second camera comprising a narrow angle camera.

4. The headgear of claim 2 wherein said electronic camera comprises a narrow angle camera (540) and wherein said headgear further includes an electronic wide angle camera (530) borne by said headgear, and wherein said electronic display is responsive to an output from said narrow angle camera for providing a viewfinder for said narrow angle camera and said wide angle camera.

5. The headgear of claim 2 wherein said electronic camera comprises a wide angle camera and wherein said headgear further includes an electronic narrow angle camera borne by said headgear, and wherein said electronic display is a first electronic display and including a second electronic display (560) responsive to an output of said narrow angle camera and including optics (570) for directing light from said second electronic display to said eye of said wearer in order to provide a viewfinder for said narrow angle camera.

6. The headgear of claim 3 wherein said optics is first optics and including second optics (520) directing incoming light so that a center of a field of view of said first camera is collinear with a center of a field of view of said second camera.

7. The headgear of claim 6 wherein said second optics comprises a beamsplitter.

8. The headgear of claim 7 wherein said second optics further comprises a mirror directing incoming light to said beamsplitter.

9. The headgear of claim 1 wherein said optics comprises at least one of:

   - a mirror;
   - a beamsplitter.

Motorola v. Stellar
Motorola Exhibit 1013
Page 148

10. The headgear of claim 1 wherein said optics comprises an optical element which is one of:

- a mirror;
- a beamsplitter,

said optical element arranged for reflecting light such that at least said portion of said first pencil of light which would otherwise converge at said first point outside said lens assembly of said camera is reflected to said second pencil of light directed at said optical center of said lens assembly of said camera, wherein said optical element is further for reflecting light from said display such that said reflected light from said display forms a pencil of light approximating said first pencil of light.

11. The headgear of claim 10 wherein light enters said camera from one side of said optical element, and wherein light reaches said first point from an opposite side of said optical element.

12. The headgear of claim 2 wherein said optics comprises at least one mirror for directing light from said electronic display to a beamsplitter in front of an eye of a wearer.

13. The headgear of claim 1 including optics arranged for reflecting light which would otherwise enter an eye of a wearer to said camera and for reflecting light from said display to said eye of a wearer such that reflected light from said display is collinear with said light which would otherwise enter said eye of said wearer.

14. The headgear of claim 13 wherein said camera and said display are opposite one another so as to have aligned optical axes and said optics comprises an optical element positioned so as to be in front of an eye of a wearer and between said camera and said electronic display.

15. The headgear of claim 14 wherein said optical element comprises a two-sided mirror making a 45 degree angle with said optical axes.

16. The headgear of claim 15, wherein the effective distance between an optical center of said lens assembly of said camera and an optical center of said two-sided mirror is equal to the effective distance between an optical center of said two-sided mirror and said eye.

17. The headgear of claim 14 wherein said optical element comprises a beamsplitter making a 45 degree angle with said optical axes and wherein said electronic display incorporates a polarizer and wherein said headgear includes a further polarizer in front of said camera oriented to block polarized light from said display.

18. The headgear of claim 17, wherein the effective distance between an optical center of said lens assembly of said camera and an optical center of said beamsplitter is equal to the effective distance between an optical center of said beamsplitter and said eye.

19. The headgear of claim 13 wherein said optics comprises a mirror and including a beamsplitter, said beamsplitter positioned between said mirror and an eye of a wearer.

20. The headgear of claim 19 wherein said beamsplitter comprises a first beamsplitter, an optical axis of said camera is perpendicular to an optical axis of said display, and said electronic display incorporates a polarizer and including a second beamsplitter interposed along said optical axes and making a 45 degree angle with said optical axes; a polarizer in front of said camera oriented to block polarised light from said display.

21. The headgear of claim 4 further including head tracking means input with an electronic output signal of said wide angle camera.

22. The headgear of claim 21 including a processor (182; 183, 184, 185) for providing a reality window manager (192, 194, 196, 198) said processor outputting to said electronic display such that said display provides a virtual window as well as providing a viewfinder for said narrow-angle electronic camera.

23. The headgear of claim 2 including means for (i) directing incoming rays of light that would enter an eye of a wearer in an absence of said means into said camera and (ii) directing rays of light from said display into said eye of a wearer, each directed ray of light being approximately collinear with an incoming ray of light from which said each directed ray of light was derived, prior to direction of said incoming ray of light into said camera.

24. The headgear of claim 9 where said optics comprises a two sided mirror.

25. The headgear of claim 24 where said mirror comprises a flat transparent surface with a metallic coating on one side, and where said one side faces toward said camera.

26. The headgear of claim 13 where said optics includes a beamsplitter and where said optics further

Motorola v. Stellar
Motorola Exhibit 1013
Page 149

includes a concave reflective material discontinuity.

27. The headgear of claim 13 where said optics includes a beamsplitter and where light from said display passes through said beamsplitter at least once before travelling away from said beamsplitter and then back toward said beamsplitter and being reflected off of said beamsplitter toward an eye of said wearer.

28. The headgear of claim 27 where said display includes a polarizer.

29. The headgear of claim 27 where said display beamsplitter comprises a dichroic beamsplitter which has polarization properties.

30. The headgear of any of claims 1 to claim 29, where said headgear is eyeglasses (590, 910, 911).

31. The eyeglasses of claim 30 said optics for directing light from said electronic display to an eye of a wearer of said eyeglasses.

32. The eyeglasses of claim 30 said optics arranged for reflecting a pencil of light which would otherwise enter an eye of a wearer to an optical center of said lens assembly of said camera and for reflecting light from said display to said eye of a wearer such that said reflected light from said display is collinear with said light which would otherwise enter said eye of said wearer.

33. The eyeglasses of claim 30 wherein said optics comprises a beamsplitter implemented as a metallisation in a lens of said eyeglasses.

34. The headgear of claim 1 including a transmitter for transmitting camera signals.

35. The headgear of claim 1 wherein said headgear comprises eyeglasses having a safety strap said strap receiving an output wire from said camera and including a body pack receiving a recorder fed with said camera output wire from said strap.

36. The headgear of any of claims 1 to claim 29 including a focusable camera and focusable display means where said focusable camera and focusable display means are such that they may be operated by a single control that focuses real light going to said camera and virtual light coming from said display onto the same depth plane.

37. The headgear of any of claims 1 to claim 29 including a camera with zoom and display means with zoom where a zoom setting of both said camera and said display means may be operated by a single control so that a virtual light principle is maintained for all zoom settings.

38. The headgear of any of claims 1 to claim 29 including an autofocus camera and remotely focusable display means where said autofocus camera drives a focus of said focusable display means.

39. The headgear of any of claims 1 to claim 29 where said camera is a left camera, said display is a left display, and said optics are left optics, and further including a right camera, right display, and right optics, similarly arranged, except that one of said cameras is an automatic focus camera and the other is a remotely focusable camera, where said automatic focus camera provides a focus output to said remotely focusable camera.

40. The headgear of claim 39 where said left display and said right display are remotely focusable displays and where said automatic camera also provides outputs to focus both of said remotely focusable displays onto the same depth plane as an object onto which said automatic focus camera is focussed.

41. The headgear of any of claims 1 to claim 29 including an automatic focus camera providing a signal to automatically adjust vergence of at least two cameras so that the optical axes of said at least two cameras intersect in the vicinity of an object to which they are focussed.

42. Headgear (100) having a sensor (330) borne by said headgear, a display (340) borne by said headgear, said display situated for being visible to a wearer of said headgear when said headgear is worn, an output from said sensor for a processor (182; 183, 184, 185), and an input to said display for accepting input from said processor, wherein the improvement comprises:

- reflective optics (314, 415) arranged for reflecting light such that at least a portion of at least some rays of light which would otherwise, in the absence of said reflective optics, not be measured by said sensor, is reflected to be measured by said sensor,

said processor for determining a quantity of light in each of said at least some rays of light, said processor for controlling said display to provide outgoing rays of light each one being collinear with, and responsive to, one of said at least some rays of light.

43. The headgear of claim 42 said optics for reflecting light which would otherwise enter an eye of a wearer to said headgear and for reflecting light from said

Motorola v. Stellar
Motorola Exhibit 1013
Page 150

display to said eye of said wearer such that said reflected light from said display is collinear with said light which would otherwise enter said eye of said wearer.

44. The headgear of claim 42 wherein said processor comprises a computer wirelessly connected to a computer network.

45. The headgear of claim 42 wherein said headgear comprises eyeglasses having a safety strap said strap receiving an output wire from said camera and including a body pack receiving a recorder fed with said camera output wire from said strap.

46. The headgear of claim 42 where said processor comprises a vision analysis processor and a graphics synthesis processor.

47. The headgear of claim 46 where-said processor includes a machine vision process, and a computer graphics rendering process.

48. The headgear of claim 42 wherein said sensor comprises a first camera and wherein said headgear further includes an electronic second camera borne by said headgear, one of said first camera and said second camera comprising a wide angle camera and another of said first camera and said second camera comprising a narrow angle camera.

49. The headgear of claim 42 wherein said sensor comprises a narrow angle camera and wherein said headgear further includes an electronic wide angle camera borne by said headgear, and wherein said electronic display is responsive to an output from said narrow angle camera for providing a viewfinder for said narrow angle camera and said wide angle camera.

50. The headgear of claim 42 wherein said sensor comprises a wide angle camera and wherein said headgear further includes an electronic narrow angle camera borne by said headgear, and wherein said electronic display is a first electronic display and including a second electronic display responsive to an output of said narrow angle camera and including optics for directing light from said second electronic display to said eye of said wearer in order to provide a viewfinder for said narrow angle camera.

51. The headgear of claim claim 48, 49, or 50, including optics for directing incoming light so that a center of a field of view of said first camera is collinear with a center of a field of view of said second camera.

52. The headgear of claim 51 wherein said second optics comprises a beamsplitter.

53. The headgear of claim 48, 49, or 50, further including head tracking means input with an electronic output signal of said wide angle camera.

54. The headgear of claim 53 including a processor for providing a reality window manager, said processor outputting to said electronic display such that said display provides a virtual window as well as providing a viewfinder for said electronic camera.

55. The headgear of claim 42 said processor (182) for providing a view rendered in a graphics processor (185) matches the viewing position of an eye viewing said display, said viewing position not being the original viewing position of said camera (110; 120).

56. The headgear of claim 42 said processor (182) for providing a change of viewing angle, in rendering, to compensate for a difference in position between said sensor and a view afforded by said display.

57. The headgear of claim 55 or 56, said processor (182) for providing a homographic or quantigraphic image analysis not requiring a three dimensional scene analysis.

58. The headgear of claim 42 said means for compensating including the use of a 2-D projective coordinate transformation of a flat object or fiat surface of an object.

59. The headgear of claim 42 said means for compensating effecting a parallax correction between virtual objects and a view of a scene as it would appear with said headgear removed from a wearer of said headgear.

Patentansprüche

1. Kopfgestell (100), das eine elektronische Kamera (330,530,540), die durch das Kopfgestell getragen wird, und eine elektronische Anzeige (340) aufweist, die durch das Kopfgestell getragen wird, wobei die elektronische Anzeige auf eine Ausgabe aus der elektronischen Kamera anspricht, wobei die Verbesserung aufweist: eine reflektierende Optik (314, 415, 510, 610, 620, 650), die mindestens teilweise dazu angeordnet ist, Licht so zu reflektieren, daß ein erstes Lichtbüschel, das andernfalls an einen ersten Punkt außerhalb eines Objektivaufbaus (710, 720; 810, 820) der Kamera konvergieren würde, mindestens teilweise zu einem zweiten Lichtbüschel reflektiert wird, das auf ein optisches Zentrum des Objektivaufbaus der Kamera gerichtet ist, wobei der Linsenaufbau mindestens eine Linse aufweist, wobei die reflektierende Optik ferner dazu dient. Licht von der Anzeige so zu reflektieren, daß

Motorola v. Stellar
Motorola Exhibit 1013
Page 151

das reflektierte Licht von der Anzeige ein drittes Lichtbüschel formt, das sich dem ersten Lichtbüschel nähert, um eine im wesentlichen genaue Dekkung dessen, was an dem ersten Punkt infolge des ersten Lichtbüschels beim Fehlen des Kopfgestells gesehen worden wäre, mit dem bereitzustellen, was beim Vorhandensein des Kopfgestells am ersten Punkt infolge des dritten Lichtbüschels gesehen wird.

2. Kopfgestell nach Anspruch 1, das so angeordnet ist, daß sich im Gebrauch der erste Punkt (390, 490) an einem Auge eines Trägers des Kopfgestells befindet.

3. Kopfgestell nach Anspruch 3 (war 2), wobei die elektronische Kamera eine erste Kamera aufweist und wobei das Kopfgestell ferner eine elektronische zweite Kamera (330, 530, 540) aufweist, die durch das Kopfgestell getragen wird, wobei eine der ersten Kamera und der zweiten Kamera eine Weitwinkelkamera ist und eine andere der ersten Kamera und der zweiten Kamera eine Engwinkelkamera ist.

4. Kopfgestell nach Anspruch 2, wobei die elektronische Kamera eine Engwinkelkamera (540) aufweist und wobei das Kopfgestell ferner eine elektronische Weitwinkelkamera (530) aufweist, die durch das Kopfgestell getragen wird, und wobei die elektronische Anzeige auf einer Ausgabe aus der Engwinkelkamera anspricht, um einen Sucher für die Engwinkelkamera und die Weitwinkelkamera bereitzustellen.

5. Kopfgestell nach Anspruch 2, wobei die elektronische Kamera eine Weitwinkelkamera aufweist und wobei das Kopfgestell ferner eine elektronische Engwinkelkamera aufweist, die durch das Kopfgestell getragen wird, und wobei die elektronische Anzeige eine erste elektronische Anzeige ist und eine zweite elektronische Anzeige (560) aufweist, die auf eine Ausgabe der Engwinkelkamera anspricht und eine Optik (570) aufweist, um Licht von der zweiten elektronischen Anzeige zum Auge des Trägers zu leiten, um einen Sucher für die Engwinkelkamera bereitzustellen.

6. Kopfgestell nach Anspruch 3, wobei die Optik eine erste Optik ist und eine zweite Optik (520) aufweist, die einfallendes Licht so richtet, daß ein Zentrum eines Gesichtsfelds der ersten Kamera kollinear mit einem Zentrum eines Gesichtsfelds der zweiten Kamera ist.

7. Kopfgestell nach Anspruch 6, wobei die zweite Optik einen Strahlteiler aufweist.

8. Kopfgestell nach Anspruch 7, wobei die zweite Optik ferner einen Spiegel aufweist, der einfallendes Licht auf den Strahlteiler richtet.

9. Kopfgestell nach Anspruch 1, wobei die Optik mindestens einen aufweist aus:

einem Spiegel;
einem Strahlteiler.

10. Kopfgestell nach Anspruch 1, wobei die Optik ein optisches Element aufweist, das eines aus
einem Spiegel;
einem Strahlteiler.
ist, wobei das optische Element angeordnet ist, um Licht so zu reflektieren, daß mindestens der Anteil des ersten Lichtbüschels, das sonst an dem ersten Punkt außerhalb des Linsenaufbaus der Kamera konvergieren würde, zu dem zweiten Lichtbüschel reflektiert wird, das auf das optische Zentrum des Linsenaufbaus der Kamera gerichtet ist, wobei das optische Element ferner dazu dient, Licht von der Anzeige so zu reflektieren, daß das reflektierte Licht von der Anzeige ein Lichtbüschel bildet, das sich dem ersten Lichtbüschel nähert.

11. Kopfgestell nach Anspruch 10, wobei das Licht in die Kamera von einer Seite des optischen Elements eintritt, und wobei Licht den ersten Punkt von einer entgegengesetzten Seite des optischen Element erreicht.

12. Kopfgestell nach Anspruch 2, wobei die Optik mindestens einen Spiegel aufweist, um Licht von der elektronischen Anzeige zu einem Strahlteiler vor einem Auge eines Trägers zu richten.

13. Kopfgestell nach Anspruch 1, das eine Optik aufweist, die angeordnet ist, um Licht, das sonst in ein Auge eines Trägers eintreten würde, zur Kamera zu reflektieren und um Licht von der Anzeige so zum Auge eines Trägers zu reflektieren, daß reflektiertes Licht von der Anzeige mit dem Licht kollinear ist, das sonst in das Auge des Trägers eintreten würde.

14. Kopfgestell nach Anspruch 13, wobei die Kamera und die Anzeige einander gegenüberliegen, so daß sie ausgerichtete optische Achsen aufweisen, und die Optik ein optisches Element aufweist, das so angeordnet ist, daß es sich vor einem Auge eines Trägers und zwischen der Kamera und der elektronischen Anzeige befindet.

15. Kopfgestell nach Anspruch 14, wobei das optische Element einen doppelseitigen Spiegel aufweist, der einen Winkel von 45 Grad mit den optischen Achsen bildet.

Motorola v. Stellar
Motorola Exhibit 1013
Page 152

16. Kopfgestell nach Anspruch 15, wobei der effektive Abstand zwischen einem optischen Zentrum des Linsenaufbaus der Kamera und einem optischen Zentrum des doppelseitigen Spiegels gleich dem effektiven Abstand zwischen einem optischen Zentrum des doppelseitigen Spiegels und dem Auge ist.

17. Kopfgestell nach Anspruch 14, wobei das optische Element einen Strahlteiler aufweist, der einen Winkel von 45 Grad mit den optischen Achsen bildet, und wobei die elektronische Anzeige einen Polarisator enthält und wobei das Kopfgestell einen weiteren Polarisator vor der Kamera aufweist, der so orientiert ist, daß er polarisiertes Licht von der Anzeige sperrt.

18. Kopfgestell nach Anspruch 17, wobei der effektive Abstand zwischen einem optischen Zentrum des Linsenaufbaus der Kamera und einem optischen Zentrum des Strahlteilers gleich dem effektiven Abstand zwischen einem optischen Zentrum des Strahlteilers und dem Auge ist.

19. Kopfgestell nach Anspruch 13, wobei die Optik einen Spiegel aufweist und einen Strahlteiler aufweist, wobei der Strahlteiler zwischen dem Spiegel und einem Auge eines Trägers angeordnet ist.

20. Kopfgestell nach Anspruch 19, wobei der Strahlteiler einen ersten Strahlteiler aufweist, eine optische Achse der Kamera senkrecht zu einer optischen Achse der Anzeige ist, und die elektronische Anzeige einen Polarisator enthalt und einen zweiten Strahlteiler aufweist, der längs der optischen Achsen dazwischen angeordnet ist und einen Winkel von 45 Grad mit den optischen Achsen bildet; wobei ein Polarisator vor der Kamera so orientiert ist, daß er polarisiertes Licht von der Anzeige sperrt.

21. Kopfgestell nach Anspruch 4, das ferner eine Kopfverfolgungseinrichtung aufweist, in die ein elektronisches Ausgangssignal der Weitwinkelkamera eingegeben wird.

22. Kopfgestell nach Anspruch 21, das einen Prozessor (182; 183, 184, 185) aufweist, um einen Realitätsfensterverwalter (192, 194, 196, 198) bereitzustellen, wobei der Prozessor so Daten an die elektronische Anzeige ausgibt, daß die Anzeige ebenso ein virtuelles Fenster wie auch einen Sucher für die elektronische Engwinkelkamera bereitstellt.

23. Kopfgestell nach Anspruch 2, das eine Einrichtung aufweist, um (i) einfallende Lichtstrahlen, die beim Fehlen der Einrichtung in ein Auge eines Trägers eintreten würden, in die Kamera zu richten und (ii) Lichtstrahlen aus der Anzeige in das Auge eines Trägers zu richten, wobei jeder gerichtete Lichtstrahl annähemd kollinear mit einem einfallenden Lichtstrahl ist, von dem der gerichtete Lichtstrahl vor der Richtung des einfallenden Lichtstrahls in die Kamera abgeleitet wurde.

24. Kopfgestell nach Anspruch 9, wobei die Optik einen doppelseitigen Spiegel aufweist.

25. Kopfgestell nach Anspruch 24, wobei der Spiegel eine ebene transparente Oberfläche mit einer Metallbeachichtung auf einer Seite aufweist, und wobei die eine Seite zur Kamera weist.

26. Kopfgestell nach Anspruch 13, wobei die Optik einen Strahlteiler aufweist und wobei die Optik ferner eine konkave reflektierende Materialdiskontinuität aufweist.

27. Kopfgestell nach Anspruch 13, wobei die Optik einen Strahlteiler aufweist und wobei Licht von der Anzeige mindestens einmal durch den Strahlteiler geht, bevor er vom Strahlteiler weg und dann zurück zum Strahlteiler geht und vom Strahlteiler weg zu einem Auge des Trägers reflektiert wird.

28. Kopfgestell nach Anspruch 27, wobei die Anzeige einen Polarisator aufweist.

29. Kopfgestell nach Anspruch 27, wobei der Anzeigenstrahlteiler einen dichroltischen Strahlteiler aufweist, der Polarisationseigenschaften aufweist.

30. Kopfgestell nach einem der Ansprüche 1 bis 29, wobei das Kopfgestell eine Brille (590, 910, 911) ist.

31. Brille nach Anspruch 30, wobei die Optik angenordnet ist, um Licht von der elektronischen Anzeige auf ein Auge eines Träger der Brille zu richten.

32. Brille nach Anspruch 30, wobei die Optik angeordnet ist, um ein Lichtbüschel, das sonst in ein Auge eines Trägers eintreten würde, auf ein optisches Zentrum des Linsenaufbaus der Kamera zu reflektieren und um Licht von der Anzeige so zum Auge eines Trägers zu reflektieren, daß das reflektierte Licht von der Anzeige kollinear mit dem Licht ist, das sonst in das Auge des Tragers eintreten würde.

33. Brille nach Anspruch 30, wobei die Optik einen Strahlteiler aufweist, der als eine Metallisierung in einer Linse der Brille implementiert ist.

34. Kopfgestell nach Anspruch 1, das einen Sender zum Senden von Kamerasignalen aufweist.

35. Kopfgestell nach Anspruch 1, wobei das Kopfgestell eine Brille ausweist, die ein Sicherheitsband

Motorola v. Stellar
Motorola Exhibit 1013
Page 153

aufweist, wobei das Band eine Ausgangsleitung von der Kamera aufnimmt, und ein Körperpack aufweist, das einen Recorder aufnimmt, der mit der Kameraausgangsteitung von dem Band versorgt wird.

36. Kopfgestell nach einem der Anspruche 1 bis 29, das eine fokussierbare Kamera und fokussierbare Anzeigeeinrichtung aufweist, wobei die fokussierbare Kamera und die fokussierbare Anzeigeeinrichtung so gestaltet sind, daß sie durch eine einzelne Steuerung betrieben werden können, die reales Licht, das zur Kamera geht, und virtuelles Licht, das von der Anzeige kommt, auf dieselbe Tiefenebene fokussiert.

37. Kopfgestell nach einem der Ansprüche 1 bis 29, das eine Kamera mit Zoom und eine Anzeigeeinrichtung mit Zoom aufweist, wobei eine Zoomeinstellung sowohl der Kamera und als auch der Anzeigeeinrichtung durch eine einzelne Steuerung betrieben werden kann, so daß eine virtuelle Lichtgrundlage für alle Zoomeinstellungen erhalten wird.

38. Kopfgestell nach einem der Ansprüche 1 bis 29, das eine Kamera mit selbsttätiger Scharfeinstellung und eine femfokussierbare Anzeigeeinrichtung aufweist, wobei die Kamera mit selbsttätiger Scharfeinstellung eine Scharfeinstellung der fokussierbaren Anzeigeeinrichtung betreibt.

39. Kopfgestell nach einem der Ansprüche 1 bis 29, wobei die Kamera eine linke Kamera ist, die Anzeige eine linke Anzeige ist und die Optik eine linke Optik ist, und ferner eine rechte Kamera, eine rechte Anzeige und eine rechte Optik aufweist, die entsprechend angeordnet sind, außer daß eine der Kameras eine automatisch fokussierende Kamera ist und die andere eine fernfokussierbare Kamera ist, wobei die automatisch fokussierende Kamera eine Fokussierausgabe an die fernfokussierbare Kamera bereitstellt.

40. Kopfgestell nach Anspruch 39, wobei die linke Anzeige und die rechte Anzeige femfokussierbare Anzeigen sind und wobei die automatische Kamera auch Ausgaben bereitstellt, um beide fernfokussierbaren Anzeigen auf dieselbe Tiefenebene wie ein Gegenstand zu fokussieren, auf den die automatisch fokussierende Kamera fokussiert ist.

41. Kopfgestell nach einem der Ansprüche 1 bis 29, das eine automatisch fokussierende Kamera aufweist, die ein Signal bereitstellt, um automatisch die Vergenz mindestens zweier Kameras einzustellen, so daß sich die optischen Achsen der mindestens zwei Kameras in der Nähe eines Objekts schneiden, auf die sie fokussiert sind.

42. Kopfgestell (100), das aufweist: einen Sensor (330, der durch das Kopfgestell getragen wird, eine Anzeige (340), die durch das Kopfgestell getragen wird, wobei die Anzeige so angeordnet ist, daß sie für einen Träger des Kopfgestells sichtbar ist, wenn das Kopfgestell getragen wird, einen Ausgang von dem Sensor für einen Prozessor (182; 183, 184, 185), und einen Eingang in die Anzeige zur Aufnahme des Eingangs vom Prozessor, wobei die Verbesserung aufweist:

eine reflektierende Optik (314, 415), die angeordnet ist, um Licht so zu reflektieren, daß mindestens ein Anteil mindestens einiger Lichtstrahlen, die beim Fehlen der reflektierenden Optik sonst durch den Sensor nicht gemessen würden, reflektiert wird, um durch den Sensor gemessen zu werden,

wobei der Prozessor angeordnet ist, um eine Lichtmenge in jedem der mindestens einigen Lichtstrahlen zu bestimmen, der Prozessor angeordnet ist, um die Anzeige zu steuern, um abgehende Lichtstrahlen bereitzustellen, die jeweils mit mindestens einigen Lichtstrahlen kollinear sind und auf sie ansprechen.

43. Kopfgestell nach Anspruch 42, wobei die Optik angeordnet ist, um Licht zu reflektieren, das sonst in ein Auge eines Trägers des Kopfgestells eintreten würde, und um Licht von der Anzeige zum Auge des Trägers zu reflektieren, so daß das reflektierte Licht von der Anzeige kollinear mit dem Licht ist, das sonst in das Auge des Trägers eintreten würde.

44. Kopfgestell nach Anspruch 42, wobei der Prozessor einen Computer aufweist, der drahtlos mit einem Computarnetzwerk verbunden ist.

45. Kopfgestell nach Anspruch 42, wobei das Kopfgestell eine Brille aufweist, die ein Sicherheitsband aufweist, wobei das Band eine Ausgangsleitung von der Kamera aufnimmt, und ein Körperpack aufweist, das einen Recorder aufnimmt, der mit der Kameraausgangsleitung aus dem Band versorgt wird.

46. Kopfgestell nach Anspruch 42, wobei der Prozessor einen Bildanalyse-Prozessor und eine Graphiksynthese-Prozessor aufweist.

47. Kopfgestell nach Anspruch 46, wobei der Prozessor einen maschinellen Bilderkennungsprozeß und einen Computergraphikbilderzeugungsprozeß aufweist.

48. Kopfgestell nach Anspruch 42, wobei der Sensor eine erste Kamera aufweist und wobei das Kopfgestell ferner eine elektronische zweite Kamera auf-

Motorola v. Stellar
Motorola Exhibit 1013
Page 154

weist, die durch das Kopfgestell getragen wird, wobei eine der ersten Kamera und der zweiten Kamera eine Weitwinkelkamera aufweist und eine andere der ersten Kamera und der zweiten Kamera eine Engwinkelkamera aufweist.

49. Kopfgestell nach Anspruch 42, wobei der Sensor eine Engwinkelkamera aufweist und wobei das Kopfgestell ferner eine elektronische Weitwinkelkamera aufweist, die durch das Kopfgestell getragen wird, und wobei die elektronische Anzeige auf eine Ausgabe der Engwinkelkamera anspricht, um einen Sucher für die Engwinkelkamera und die Weitwinkelkamera bereitzustellen.

50. Kopfgestell nach Anspruch 42, wobei der Sensor eine Weitwinkelkamera aufweist, wobei das Kopfgestell ferner eine elektronische Engwinkelkamera aufweist, die durch das Kopfgestell getragen wird, und wobei die elektronische Anzeige eine erste elektronische Anzeige ist und eine zweite elektronische Anzeige aufweist, die auf eine Ausgabe der Engwinkelkamera anspricht und eine Optik aufweist, um Licht von der zweiten elektronischen Anzeige auf das Auge des Trägers zu richten, um einen Sucher für die Engwinkelkamera bereitzustellen.

51. Kopfgestell nach Anspruch 48, 49 oder 50, das eine Optik aufweist, um einfallendes Licht so zu richten, daß ein Zentrum eines Gesichtsfelds der ersten Kamera kollinear mit einem Zentrum eines Gesichtsfelds der zweiten Kamera ist.

52. Kopfgestell nach Anspruch 51, wobei die zweite Optik einen Strahlteiler aufweist.

53. Kopfgestell nach Anspruch 48, 49 oder 50, das ferner eine Kopfverfolgungseinrichtung aufweist, in die ein elektronisches Ausgangssignal der Weitwinkelkamera eingegeben wird.

54. Kopfgestell nach Anspruch 53, das einen Prozessor aufweist, um einen Realitätsfensterverwalter bereitzustellen, wobei der Prozessor so Daten an die elektronische Anzeige ausgibt, daß die Anzeige ebenso ein virtuelles Fenster wie auch einen Sucher für die elektronische Kamera bereitstellt.

55. Kopfgestell nach Anspruch 42, wobei der Prozessor (182) zur Bereitstellung einer Ansicht, die in einem Graphikprozessor (185) erzeugt wird, die Betrachtungsposition eines Auges anpaßt, das die Anzeige betrachtet, wobei die Betrachtungsposition nicht die ursprüngliche Betrachtungsposition der Kamera (110; 120) ist.

56. Kopfgestell nach Anspruch 42, wobei der Prozessor (182) angeordnet ist, um bei der Bilderzeugung eine Änderung des Betrachtungswinkels bereitzustellen, um eine Positionsdifferenz zwischen dem Sensor und einer Ansicht zu kompensieren, die durch die Anzeige geboten wird.

57. Kopfgestell nach Anspruch 55 oder 56, wobei der Prozessor (182) angeordnet ist, um eine homographische oder quantigraphische Bildanalyse bereitzustellen, die keine dreidimensionale Szenenanalyse benötigt.

58. Kopfgestell nach Anspruch 42, wobei die Einrichtung zur Kompensation die Verwendung einer projektiven 2-D-Koordinatentransformation eines ebenen Objekts oder einer ebenen Oberfläche eines Objekts aufweist.

59. Kopfgestell nach Anspruch 42, wobei die Einrichtung zur Kompensation eine Parallaxenkorrektur zwischen virtuellen Objekten und einer Ansicht einer Szene bewirkt, wie sie erscheinen würde, wenn das Kopfgestell vom Träger des Kopfgestells entfernt würde.

Revendications

1. Équipement de tête (100) ayant une caméra électronique (330, 530, 540) portée par ledit équipement de tête et un afficheur électronique (340) porté par ledit équipement de tête, ledit afficheur électronique réagissant à une sortie de ladite caméra électronique, dans lequel l'amélioration comprend : une optique réfléchissante (314, 415, 510, 610, 620, 650) agencée pour, au moins partiellement, réfléchir la lumière de telle façon qu'un premier pinceau de lumière qui autrement convergerait en un premier point à l'extérieur d'un ensemble de lentilles (710, 720 ; 810, 820) de ladite caméra est au moins partiellement réfléchi vers un deuxième pinceau de lumière dirigé sur un centre optique dudit ensemble de lentilles de ladite caméra, ledit ensemble de lentilles comprenant au moins une lentille, dans lequel ladite optique réfléchissante est en outre destinée à réfléchir la lumière provenant dudit afficheur de telle façon que ladite lumière réfléchie provenant dudit afficheur forme un troisième pinceau de lumière approchant ledit premier pinceau de lumière, afin de fournir une correspondance sensiblement exacte de ce qui aurait été observé au dit premier point du fait dudit premier pinceau de lumière, en l'absence dudit équipement de tête, avec ce qui, en présence dudit équipement de tête, est observé au dit premier point du fait dudit troisième pinceau de lumière.

2. Equipement de tête selon la revendication 1, agen-

Motorola v. Stellar
Motorola Exhibit 1013
Page 155

cé de telle façon qu'à l'utilisation, ledit premier point (390, 490) se situe au niveau d'un oeil d'un porteur dudit équipement de tête.

3. Équipement de tête selon la revendication 3 (anciennement 2), dans lequel ladite caméra électronique comprend une première caméra et dans lequel ledit équipement de tête comprend en outre une deuxième caméra électronique (330, 530, 540) portée par ledit équipement de tête, l'une de ladite première caméra et de ladite deuxième caméra comprenant une caméra grand-angulaire et une autre de ladite première caméra et de ladite deuxième caméra comprenant une caméra petit-angulaire.

4. Équipement de tête selon la revendication 2, dans lequel ladite caméra électronique comprend une caméra petit-angulaire (540) et dans lequel ledit équipement de tête comprend en outre une caméra électronique grand-angulaire (530) portée par ledit équipement de tête, et dans lequel ledit afficheur électronique réagit à une sortie provenant de ladite caméra petit-angulaire afin de produire un viseur pour ladite caméra petit-angulaire et ladite caméra grand-angulaire.

5. Équipement de tête selon la revendication 2, dans lequel ladite caméra électronique comprend une caméra grand-angulaire et dans lequel ledit équipement de tête comprend en outre une caméra électronique petit-angulaire portée par ledit équipement de tête, et dans lequel ledit afficheur électronique est un premier afficheur électronique et comprenant un deuxième afficheur électronique (560) réagissant à une sortie de ladite caméra petit-angulaire et comprenant une optique (570) destinée à diriger la lumière provenant dudit deuxième afficheur électronique vers ledit oeil dudit porteur afin de produire un viseur pour ladite caméra petit-angulaire.

6. Equipement de tête selon la revendication 3, dans lequel ladite optique est un première optique et comprenant une deuxième optique (520) dirigeant la lumière entrante de telle façon qu'un centre du champ de vision de ladite première caméra est colinéaire avec un centre d'un champ de vision de ladite deuxième caméra.

7. Équipement de tête selon la revendication 6, dans lequel ladite deuxième optique comprend un séparateur de faisceaux.

8. Équipement de tête selon la revendication 7, dans lequel ladite deuxième optique comprend en outre un miroir dirigeant la lumière entrante vers ledit séparateur de faisceaux.

9. Équipement de tête selon la revendication 1, dans lequel ladite optique comprend au moins un élément parmi :

un miroir ;
un séparateur de faisceaux.

10. Equipement de tête selon la revendication 1, dans lequel ladite optique comprend un élément optique qui est un élément parmi :

un miroir ;
un séparateur de faisceaux,
ledit élément optique étant agencé pour réfléchir la lumière de telle façon qu'au moins ladite partie dudit premier pinceau de lumière qui autrement convergerait en ledit premier point à l'extérieur dudit ensemble de lentilles de ladite caméra est réfléchie vers ledit deuxième pinceau de lumière dirigé sur ledit centre optique dudit ensemble de lentilles de ladite caméra, dans lequel ledit élément optique est en outre destiné à réfléchir la lumière provenant dudit afficheur de telle façon que ladite lumière réfléchie provenant dudit afficheur forme un pinceau de lumière approchant ledit premier pinceau de lumière.

11. Équipement de tête selon la revendication 10, dans lequel la lumière entre dans ladite caméra à partir d'un côté dudit élément optique, et dans lequel la lumière atteint ledit premier point à partir d'un côté opposé dudit élément optique.

12. Équipement de tête selon la revendication 2, dans lequel ladite optique comprend au moins un miroir pour diriger la lumière provenant dudit afficheur électronique vers un séparateur de faisceaux en face d'un oeil d'un porteur.

13. Equipement de tête selon la revendication 1, comprenant une optique agencée pour réfléchir la lumière qui autrement pénétrerait dans un oeil d'un porteur vers ladite caméra et pour réfléchir la lumière provenant dudit afficheur vers ledit oeil d'un porteur de telle façon que la lumière réfléchie provenant dudit afficheur est colinéaire avec ladite lumière qui autrement pénétrerait dans ledit oeil dudit porteur.

14. Equipement de tête selon la revendication 13, dans lequel ladite caméra et ledit afficheur sont opposés l'un à l'autre de façon à avoir des axes optiques alignés et ladite optique comprend un élément optique positionné de façon à être en face d'un oeil d'un porteur et entre ladite caméra et ledit afficheur électronique.

Motorola v. Stellar
Motorola Exhibit 1013
Page 156

15. Équipement de tête selon la revendication 14, dans lequel ledit élément optique comprend un miroir à deux faces faisant un angle de 45 degrés avec lesdits axes optiques.

16. Équipement de tête selon la revendication 15, dans lequel la distance effective entre un centre optique dudit ensemble de lentilles de ladite caméra et un centre optique dudit miroir à deux faces est égale à la distance effective entre un centre optique dudit miroir à deux faces et ledit oeil.

17. Equipement de tête selon la revendication 14, dans lequel ledit élément optique comprend un séparateur de faisceaux faisant un angle de 45 degrés avec lesdits axes optiques et dans lequel ledit afficheur électronique intègre un polariseur et dans lequel ledit équipement de tête comprend un autre polariseur en face de ladite caméra orienté de façon à bloquer la lumière polarisée provenant dudit afficheur.

18. Equipement de tête selon la revendication 17, dans lequel la distance effective entre un centre optique dudit ensemble de lentilles de ladite caméra et un centre optique dudit séparateur de faisceaux est égale à la distance effective entre un centre optique dudit séparateur de faisceaux et ledit oeil.

19. Equipement de tête selon la revendication 13, dans lequel ladite optique comprend un miroir et comprenant un séparateur de faisceaux, ledit séparateur de faisceaux étant positionné entre ledit miroir et un oeil d'un porteur.

20. Equipement de tête selon la revendication 19, dans lequel ledit séparateur de faisceaux comprend un premier séparateur de faisceaux, un axe optique de ladite caméra est perpendiculaire à un axe optique dudit afficheur et ledit afficheur électronique intègre un polariseur, et comprenant un deuxième séparateur de faisceaux interposé le long desdits axes optiques et faisant un angle de 45 degrés avec lesdits axes optiques ; un polariseur en face de ladite caméra étant orienté de façon à bloquer la lumière polarisée provenant dudit afficheur.

21. Equipement de tête selon la revendication 4, comprenant en outre des moyens de poursuite de tête recevant un signal de sortie électronique de ladite caméra grand-angulaire.

22. Equipement de tête selon la revendication 21, comprenant un processeur (182 ; 183, 184, 185) destiné à fournir un gestionnaire de fenêtres de réalité (192, 194, 196, 198), ledit processeur délivrant des signaux au dit afficheur électronique de telle façon que ledit afficheur fournit une fenêtre virtuelle ainsi qu'un viseur pour ladite caméra électronique petit-angulaire.

23. Equipement de tête selon la revendication 2, comprenant des moyens destinés (i) à diriger des rayons de lumière entrants qui pénétreraient dans un oeil d'un porteur en l'absence desdits moyens dans ladite caméra et (ii) à diriger des rayons de lumière provenant dudit afficheur dans ledit oeil d'un porteur, chaque rayon de lumière dirigé étant approximativement colinéaire avec un rayon de lumière entrant à partir duquel ledit chaque rayon de lumière dirigé a été dérivé, avant que ledit rayon de lumière entrant soit dirigé dans ladite caméra.

24. Equipement de tête selon la revendication 9, où ladite optique comprend un miroir à deux faces.

25. Equipement de tête selon la revendication 24, où ledit miroir comprend une surface plane transparente dotée d'un revêtement métallique sur un côté, et dans lequel ledit un côté est orienté vers ladite caméra.

26. Equipement de tête selon la revendication 13, où ladite optique comprend un séparateur de faisceaux et où ladite optique comprend en outre une discontinuité matérielle réfléchissante concave.

27. Équipement de tête selon la revendication 13, où ladite optique comprend un séparateur de faisceaux et où la lumière provenant dudit afficheur traverse ledit séparateur de faisceaux au moins une fois avant de s'éloigner dudit séparateur de faisceaux, puis de revenir vers ledit séparateur de faisceaux et d'être réfléchi par ledit séparateur de faisceaux vers un oeil dudit porteur.

28. Équipement de tête selon la revendication 27, où ledit afficheur comprend un polariseur.

29. Equipement de tête selon la revendication 27, où ledit séparateur de faisceaux de l'afficheur comprend un séparateur de faisceaux dichroique ayant des propriétés de polarisation.

30. Équipement de tête selon l'une quelconque des revendications 1 à 29, où ledit équipement de tête est des lunettes (590, 910, 911).

31. Lunettes selon la revendication 30, ladite optique étant destinée à diriger la lumière provenant dudit afficheur électronique vers un oeil d'un porteur desdites lunettes.

32. Lunettes selon la revendication 30, ladite optique étant agencée pour réfléchir un pinceau de lumière qui autrement pénétrerait dans un oeil d'un porteur

Motorola v. Stellar
Motorola Exhibit 1013
Page 157

vers un centre optique dudit ensemble de lentilles de ladite caméra et pour réfléchir la lumière provenant dudit afficheur vers ledit oeil d'un porteur de telle façon que ladite lumière réfléchie provenant dudit afficheur est colinéaire avec ladite lumière qui autrement pénétrerait dans ledit oeil dudit porteur.

33. Lunettes selon la revendication 30, dans lesquelles ladite optique comprend un séparateur de faisceaux se présentant comme une métallisation sur une lentille desdites lunettes.

34. Equipement de tête selon la revendication 1, comprenant un transmetteur pour transmettre des signaux de caméra.

35. Equipement de tête selon la revendication 1, dans lequel ledit équipement de tête comprend des lunettes ayant une sangle de sécurité, ladite sangle recevant un fil de sortie venant de ladite caméra et comprenant un boîtier recevant un enregistreur alimenté par le fil de sortie de ladite caméra à partir de ladite sangle.

36. Équipement de tête selon l'une quelconque des revendications 1 à 29, comprenant une caméra focalisable et des moyens d'affichage focalisables, où ladite caméra focalisable et les moyens d'affichage focalisables sont tels qu'ils peuvent être pilotés par une seule commande qui focalise la lumière réelle allant vers ladite caméra et la lumière virtuelle venant dudit afficheur sur le même plan de profondeur.

37. Équipement de tête selon l'une quelconque des revendications 1 à 29, comprenant une caméra avec zoom et des moyens d'affichage avec zoom, où un réglage de zoom de ladite caméra et desdits moyens d'affichage peut être piloté par une seule commande de telle façon qu'un principe de lumière virtuelle est conservé pour tous les réglages de zoom.

38. Équipement de tête selon l'une quelconque des revendications 1 à 29, comprenant une caméra à focalisation automatique et des moyens d'affichage focalisables à distance, où ladite caméra à focalisation automatique commande un foyer desdits moyens d'affichage focalisables.

39. Équipement de tête selon l'une quelconque des revendications 1 à 29, où ladite caméra est une caméra gauche, ledit afficheur est un afficheur gauche et ladite optique est une optique gauche, et comprenant en outre une caméra droite, un afficheur droit et une optique droite, agencés d'une façon similaire, si ce n'est que l'une desdites caméras est une caméra à focalisation automatique et l'autre est une caméra focalisable à distance, où ladite caméra à focalisation automatique délivre une sortie de focalisation à ladite caméra focalisable à distance.

40. Équipement de tête selon la revendication 39, où ledit afficheur gauche et ledit afficheur droit sont des afficheurs focalisables à distance et où ladite caméra automatique délivre aussi des sorties pour focaliser l'un et l'autre desdits afficheurs focalisables à distance sur le même plan de profondeur qu'un objet sur lequel ladite caméra à focalisation automatique est focalisée.

41. Equipement de tête selon l'une quelconque des revendications 1 à 29, comprenant une caméra à focalisation automatique délivrant un signal pour ajuster automatiquement la vergence d'au moins deux caméras de telle façon que les axes optiques desdites au moins deux caméras se coupent au voisinage d'un objet sur lequel elles sont focalisées.

42. Équipement de tête (100) ayant un capteur (330) porté par ledit équipement de tête, un afficheur (340) porté par ledit équipement de tête, ledit afficheur étant situé pour être visible par un porteur dudit équipement de tête quand ledit équipement de tête est porté, une sortie dudit capteur pour un processeur (182 ; 183, 184, 185), et une entrée dudit afficheur pour accepter l'entrée venant dudit processeur, dans lequel l'amélioration comprend :

une optique réfléchissante (314, 415) agencée pour réfléchir la lumière de telle façon qu'au moins une partie d'au moins certains rayons de lumière qui autrement, en l'absence de ladite optique réfléchissante, ne serait pas mesurée par ledit capteur, est réfléchie pour être mesurée par ledit capteur,
ledit processeur étant destiné à déterminer une quantité de lumière dans chacun desdits au moins certains rayons de lumière, ledit processeur étant destiné à commander ledit afficheur pour fournir des rayons de lumière sortants, chacun étant colinéaire avec, et réagissant à, l'un desdits au moins certains rayons de lumière.

43. Equipement de tête selon la revendication 42, ladite optique étant destinée à réfléchir la lumière qui autrement pénétrerait dans un oeil d'un porteur vers ledit équipement de tête et à réfléchir la lumière provenant dudit afficheur vers ledit oeil dudit porteur de telle façon que ladite lumière réfléchie provenant dudit afficheur est colinéaire avec ladite lumière qui autrement pénétrerait dans ledit oeil dudit porteur.

44. Equipement de tête selon la revendication 42, dans lequel ledit processeur comprend un ordinateur relié par une liaison sans fil à un réseau d'ordinateurs.

Motorola v. Stellar
Motorola Exhibit 1013
Page 158

45. Equipement de tête selon la revendication 42, dans lequel ledit équipement de tête comprend des lunettes ayant une sangle de sécurité, ladite sangle recevant un fil de sortie venant de ladite caméra et comprenant un boîtier recevant un enregistreur alimenté par le fil de sortie de ladite caméra à partir de ladite sangle.

46. Equipement de tête selon la revendication 42, où ledit processeur comprend un processeur d'analyse de vision et un processeur de synthèse graphique.

47. Equipement de tête selon la revendication 46, où ledit processeur intègre un processus de vision artificielle et un processus de rendu de graphismes informatiques.

48. Equipement de tête selon la revendication 42, dans lequel ledit capteur comprend une première caméra et dans lequel ledit équipement de tête comprend en outre une deuxième caméra électronique portée par ledit équipement de tête, l'une de ladite première caméra et de ladite deuxième caméra comprenant une caméra grand-angulaire et une autre de ladite première caméra et de ladite deuxième caméra comprenant une caméra petit-angulaire.

49. Equipement de tête selon la revendication 42, dans lequel ledit capteur comprend une caméra petit-angulaire et dans lequel ledit équipement de tête comprend en outre une caméra électronique grand-angulaire portée par ledit équipement de tête, et dans lequel ledit afficheur électronique réagit à une sortie provenant de ladite caméra petit-angulaire afin de fournir un viseur pour ladite caméra petit-angulaire et ladite caméra grand-angulaire.

50. Équipement de tête selon la revendication 42, dans lequel ledit capteur comprend une caméra grand-angulaire et dans lequel ledit équipement de tête comprend en outre une caméra électronique petit-angulaire portée par ledit équipement de tête, et dans lequel ledit afficheur électronique est un premier afficheur électronique et comprenant un deuxième afficheur électronique réagissant à une sortie de ladite caméra petit-angulaire et comprenant une optique pour diriger la lumière provenant dudit deuxième afficheur électronique vers ledit oeil dudit porteur afin de fournir un viseur pour ladite caméra petit-angulaire.

51. Equipement de tête selon la revendication 48, 49 ou 50, comprenant une optique pour diriger la lumière entrante de telle façon qu'un centre d'un champ de vision de ladite première caméra est colinéaire avec un centre d'un champ de vision de ladite deuxième caméra.

52. Équipement de tête selon la revendication 51, dans lequel ladite deuxième optique comprend un séparateur de faisceaux.

53. Equipement de tête selon la revendication 48, 49 ou 50, comprenant en outre des moyens de poursuite de tête recevant un signal de sortie électronique de ladite caméra grand-angulaire.

54. Equipement de tête selon la revendication 53, comprenant un processeur destiné à fournir un gestionnaire de fenêtres de réalité, ledit processeur délivrant des signaux au dit afficheur électronique de telle façon que ledit afficheur fournit une fenêtre virtuelle ainsi qu'un viseur pour ladite caméra électronique.

55. Equipement de tête selon la revendication 42, dans lequel ledit processeur (182) destiné à fournir une vue rendue dans un processeur graphique (185) adapte la position de vision d'un oeil observant ledit afficheur, ladite position de vision n'étant pas la position de vision originale de ladite caméra (110 ; 120).

56. Equipement de tête selon la revendication 42, ledit processeur (182) étant destiné à fournir un changement de l'angle de vision, lors du rendu, pour compenser une différence de position entre ledit capteur et une vue fournie par ledit afficheur.

57. Equipement de tête selon la revendication 55 ou 56, ledit processeur (182) étant destiné à fournir une analyse d'image homographique ou quantigraphique ne nécessitant pas une analyse de scène en trois dimensions.

58. Equipement de tête selon la revendication 42, lesdits moyens pour compenser comprenant l'utilisation d'une transformation de coordonnées de projection en 2 dimensions d'un objet plan ou d'une surface plane d'un objet.

59. Equipement de tête selon la revendication 42, lesdits moyens pour compenser effectuant une correction de parallaxe entre des objets virtuels et une vue d'une scène telle qu'elle apparaîtrait quand ledit équipement de tête est retiré d'un porteur dudit équipement de tête.

Motorola v. Stellar
Motorola Exhibit 1013
Page 159

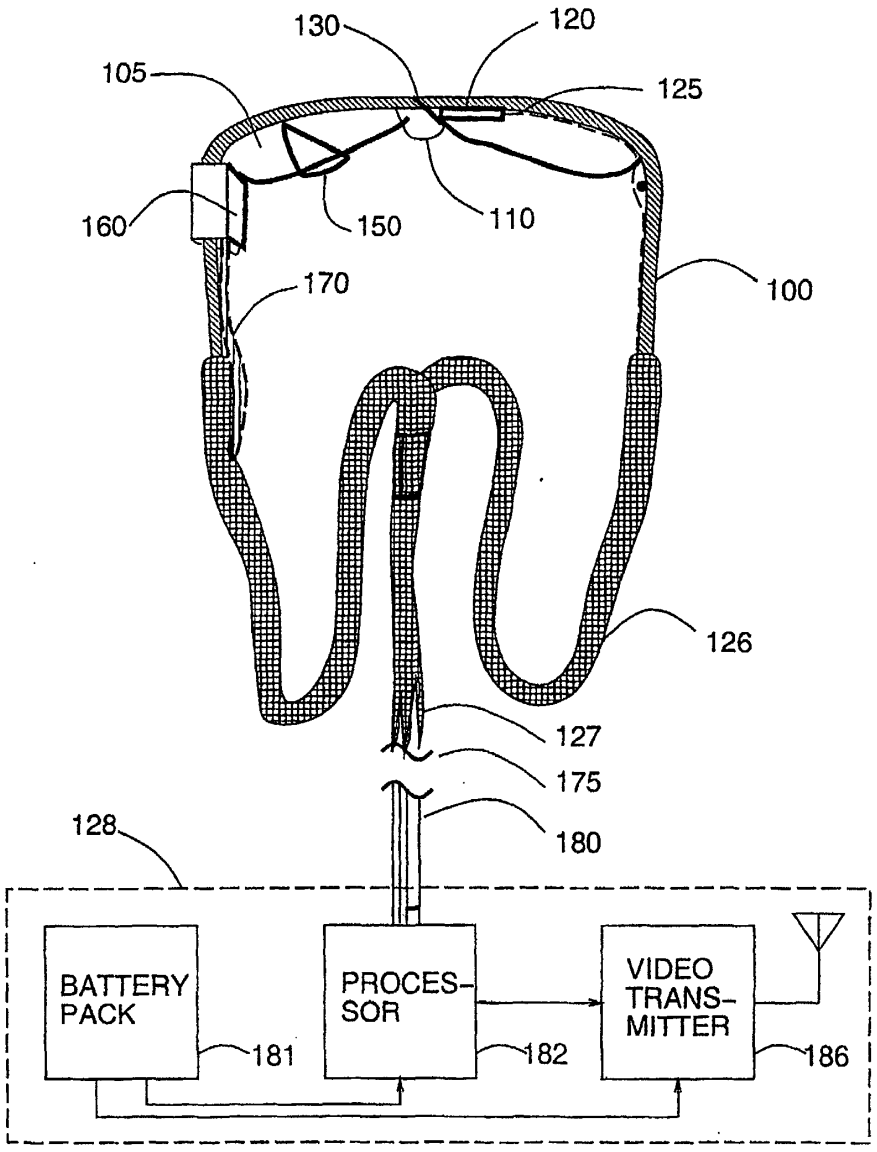


FIG. 1 - FOVEATED EMBODIMENT OF WEARABLE CAMERA SYSTEM

Motorola v. Stellar
Motorola Exhibit 1013
Page 160

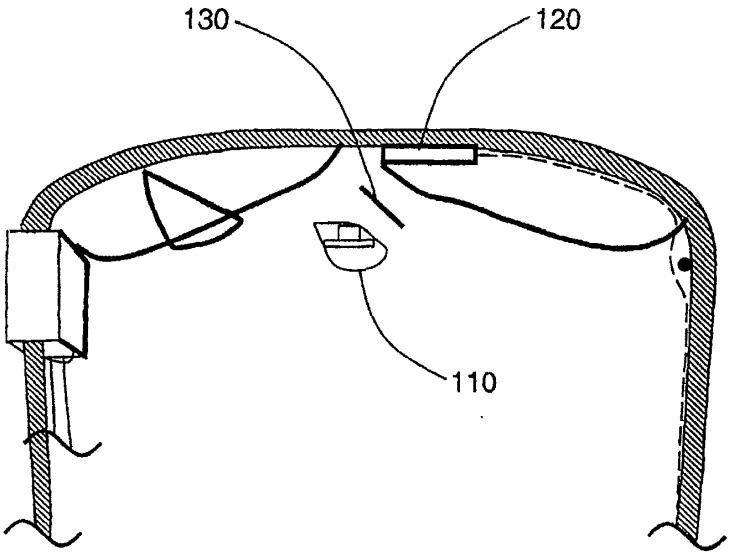


FIG. 1a – FOVEATED EMBODIMENT OF WEARABLE CAMERA SYSTEM – DETAIL OF BEAMSPLITTER

Motorola v. Stellar
Motorola Exhibit 1013
Page 161

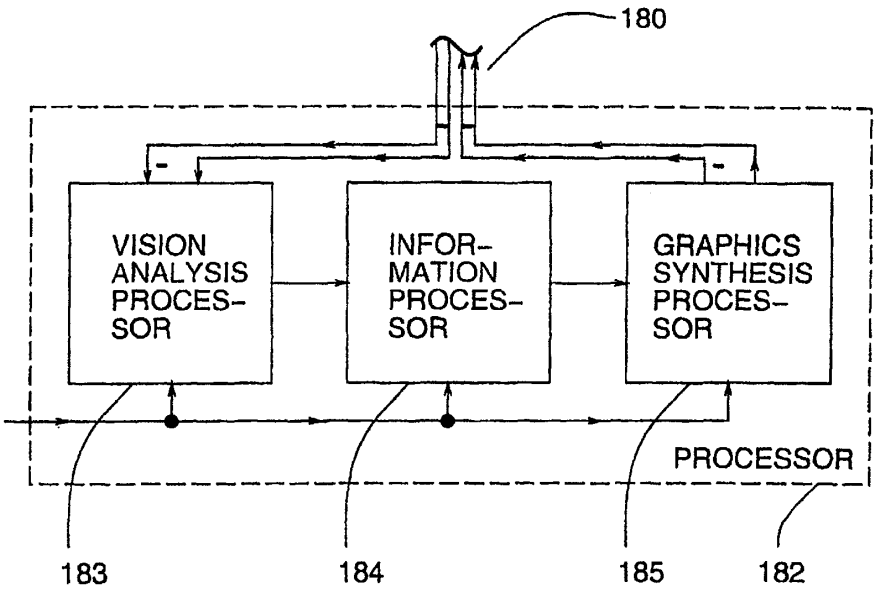


FIG. 1b – FOVEATED EMBODIMENT OF WEARABLE CAMERA SYSTEM – DETAIL OF PROCESSOR

Motorola v. Stellar
Motorola Exhibit 1013
Page 162

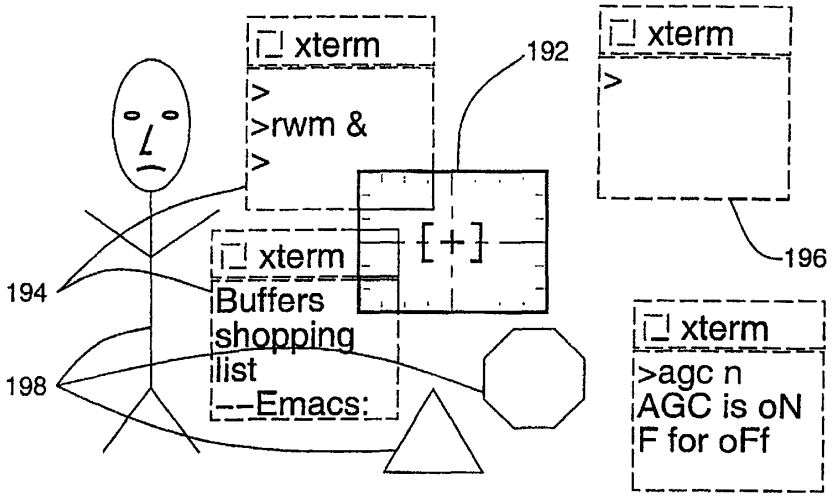


FIG. 1c – FOVEATED EMBODIMENT OF WEARABLE CAMERA SYSTEM – AS SEEN WHILE LOOKING THROUGH VIEWFINDER

Motorola v. Stellar
Motorola Exhibit 1013
Page 163

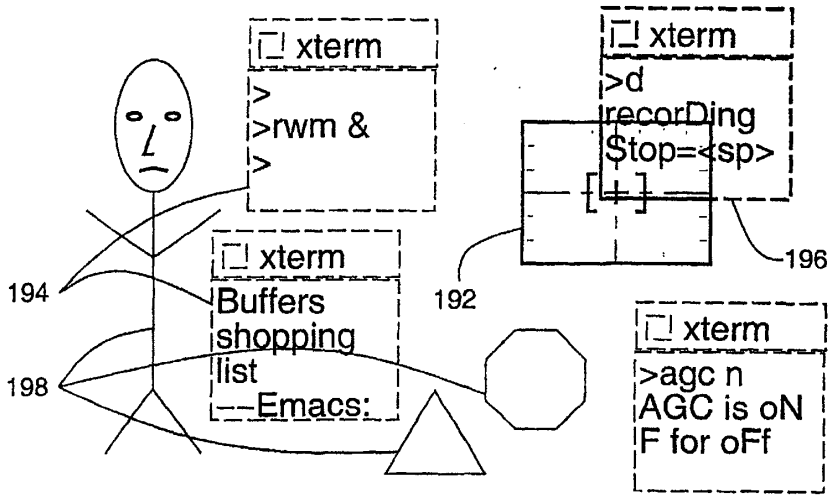


FIG. 1d – FOVEATED EMBODIMENT OF WEARABLE CAMERA SYSTEM – AS SEEN WHILE LOOKING THROUGH VIEWFINDER

Motorola v. Stellar
Motorola Exhibit 1013
Page 164

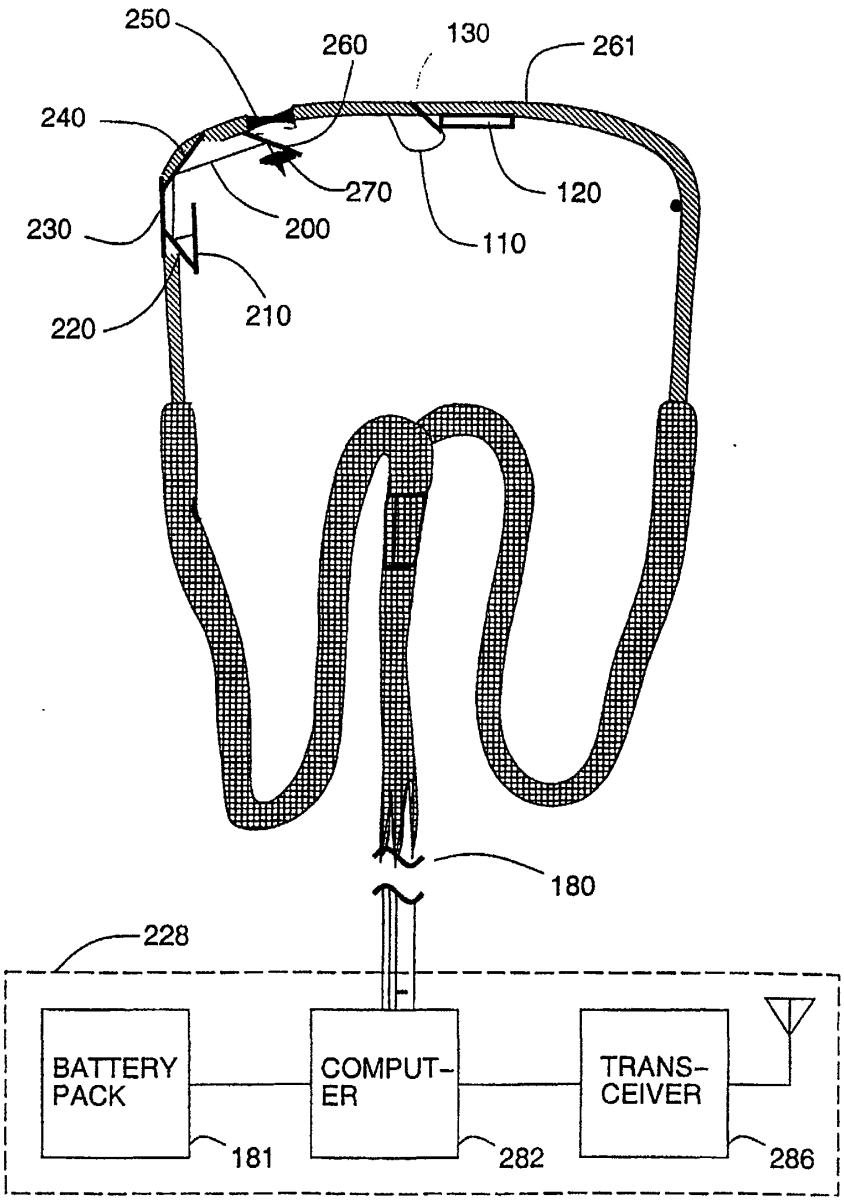


FIG. 2 – EMBODIMENT OF WEARABLE CAMERA SYSTEM WITH BOTH EYES VISIBLE TO OTHERS

Motorola v. Stellar
Motorola Exhibit 1013
Page 165

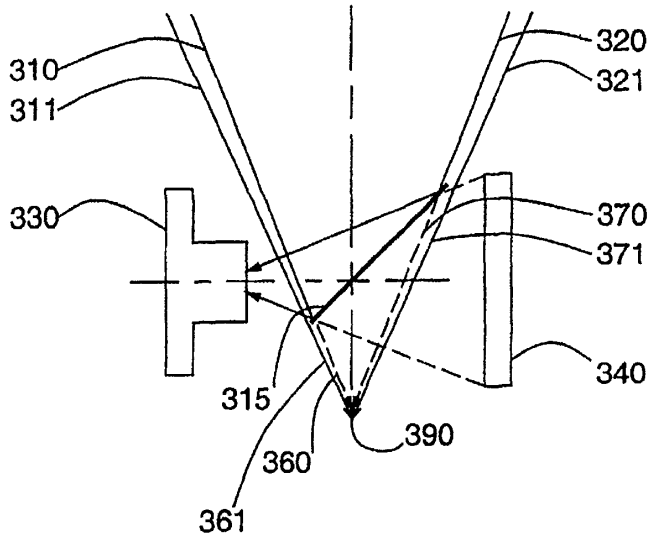


FIG. 3 - VIRTUAL LIGHT

Motorola v. Stellar
Motorola Exhibit 1013
Page 166

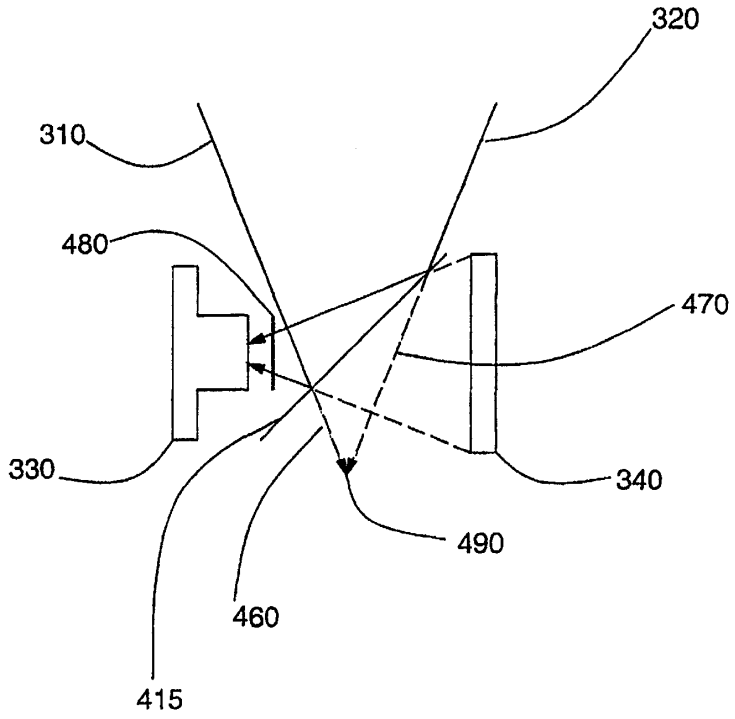


FIG. 4 – PARTIAL VIRTUAL LIGHT WITH VIDEO FEEDBACK PREVENTION MEANS

Motorola v. Stellar
Motorola Exhibit 1013
Page 167

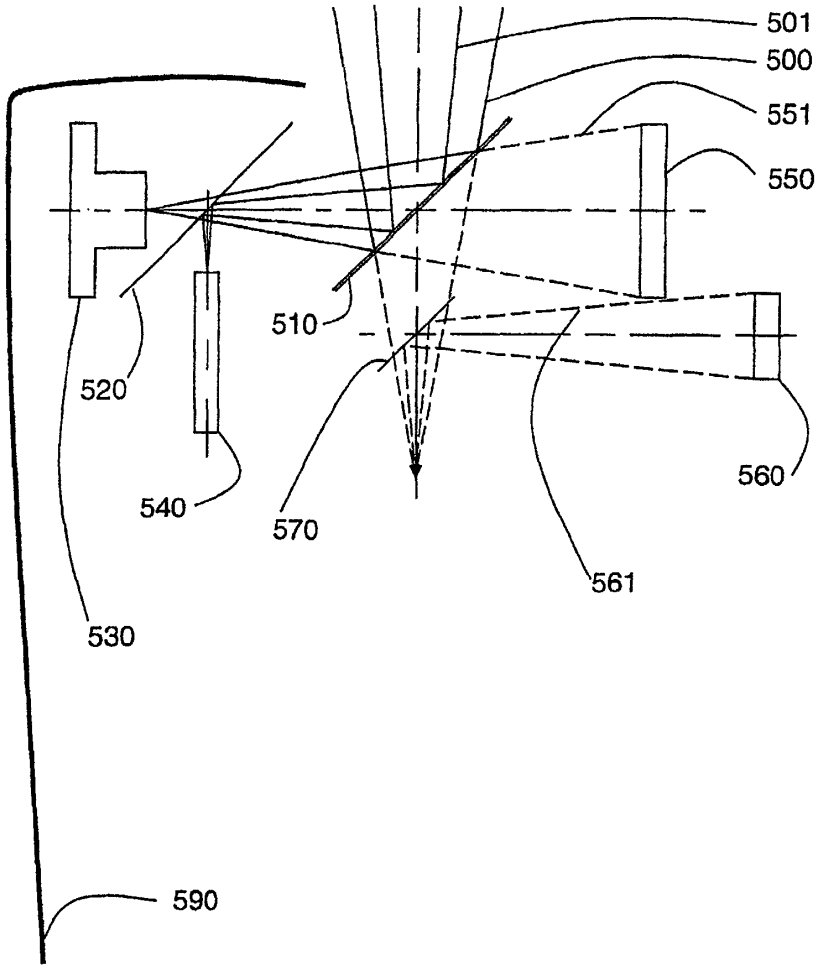


FIG. 5 – FOVEATED WEARABLE CAMERA WITH FOVEATED VIEWFINDER MEANS

Motorola v. Stellar
Motorola Exhibit 1013
Page 168

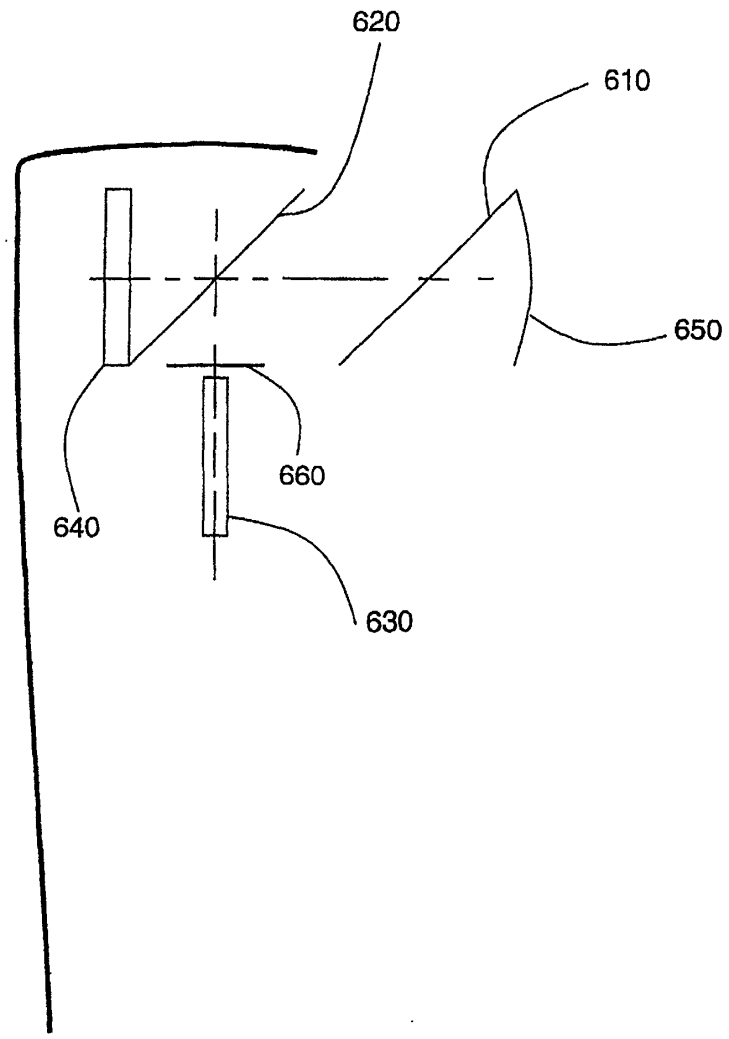


FIG. 6 – WEARABLE CAMERA SYSTEM WITH VIEWFINDER ALLOWING OTHERS TO SEE BOTH OF WEARER'S EYES

Motorola v. Stellar
Motorola Exhibit 1013
Page 169

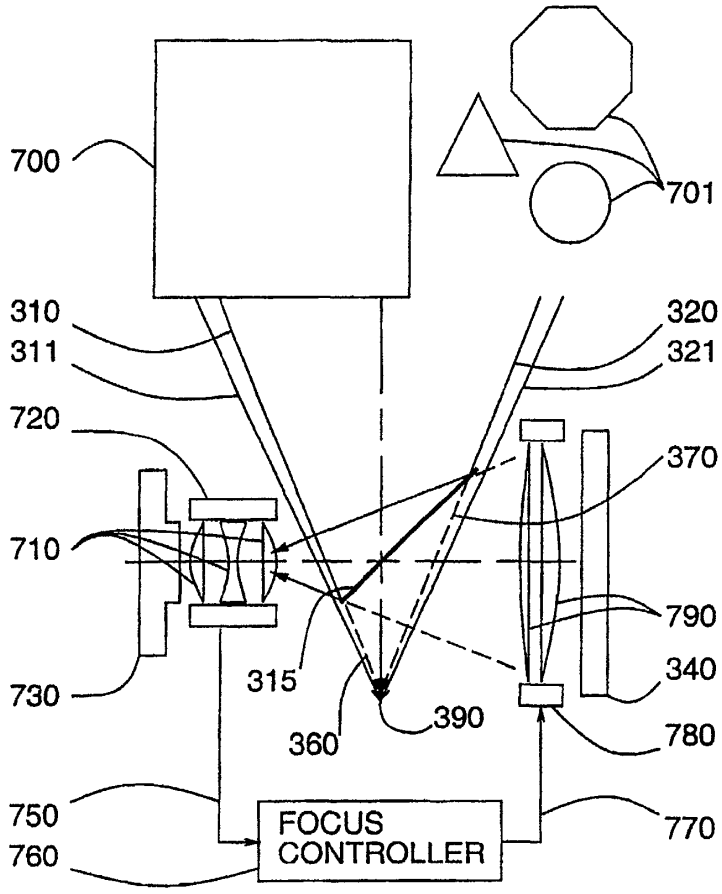


FIG. 7 – VIRTUAL LIGHT WITH FOCUS COUPLING

Motorola v. Stellar
Motorola Exhibit 1013
Page 170

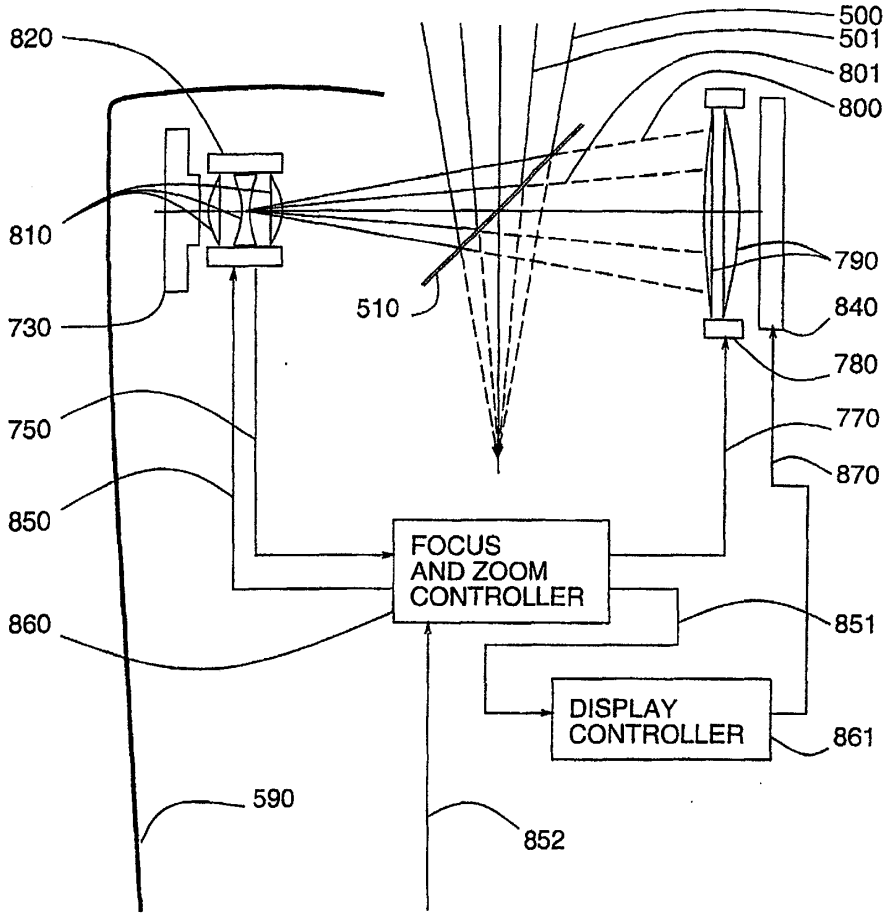


FIG. 8 – WEARABLE CAMERA SYSTEM WITH ZOOM LENS

Motorola v. Stellar
Motorola Exhibit 1013
Page 171

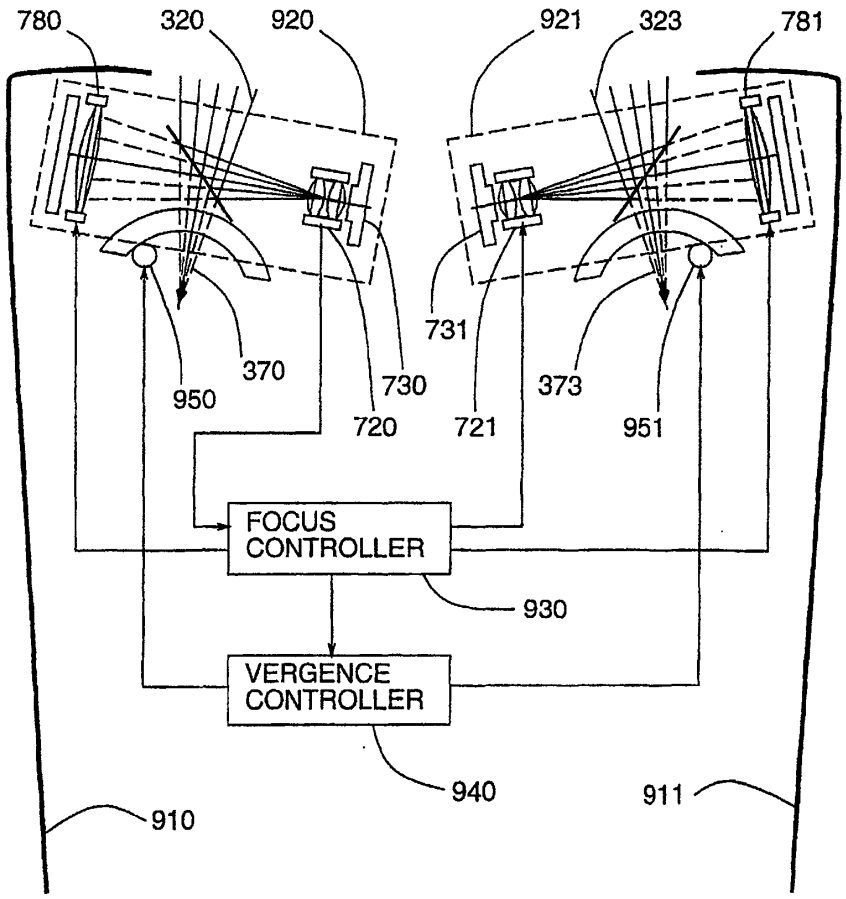


FIG. 9 – STEREO WEARABLE CAMERA SYSTEM

Motorola v. Stellar
Motorola Exhibit 1013
Page 172

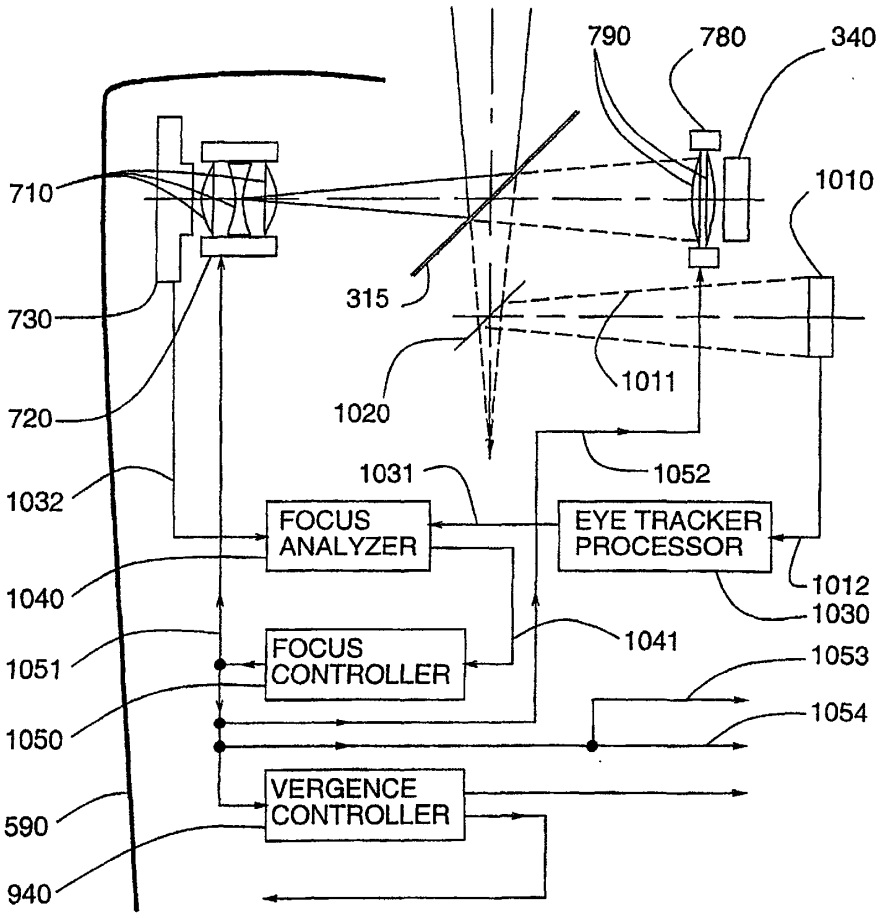


FIG. 10 – WEARABLE CAMERA SYSTEM WITH AUTOFOCUS AND VERGENCE DRIVEN BY EYETRACKER

Motorola v. Stellar
Motorola Exhibit 1013
Page 173

US005523799A

United States Patent [19]

Hattori et al.

[11] **Patent Number: 5,523,799**

[45] **Date of Patent: Jun. 4, 1996**

[54] **IMAGE STORING DEVICE INCLUDING AN INHIBITING FUNCTION**

[75] Inventors: **Yuichiro Hattori**; **Akira Nakaya**, both of Yokohama; **Tatsuro Yamazaki**, Tachikawa, all of Japan

[73] Assignee: **Canon Kabushika Kaisha**, Tokyo, Japan

[21] Appl. No.: **274,666**

[22] Filed: **Jul. 13, 1994**

Related U.S. Application Data

[63] Continuation of Ser. No. 871,486, Apr. 21, 1992, abandoned.

[30] **Foreign Application Priority Data**

Apr. 24, 1991 [JP] Japan 3-094487
Apr. 24, 1991 [JP] Japan 3-094488
Apr. 24, 1991 [JP] Japan 3-094489

[51] **Int. Cl.**[6] **H04N 5/907**

[52] **U.S. Cl.** **348/715**; 358/337; 360/35.1; 369/44.33

[58] **Field of Search** 348/716, 718, 348/719, 715; 345/200, 203; 358/908, 337, 338; 360/36.2, 35.1, 36.1, 14.1; 369/44.33, 44.32; H04N 5/907

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Oberbeck, "Design and Application of a Solid–State Video Disk System", National Aerospace and Electronics Conference, May 1984, New York, NY, pp. 62–67.

Kingelhofer et al., "HDTV Digital Frame Recorder", SMPTE Journal, vol. 100, No. 1, Jan. 1991, Scarsdale, New York, pp. 10–13.

Primary Examiner—Safet Metjahic
Assistant Examiner—Jeffrey S. Murrell

[57] **ABSTRACT**

A memory capable of memorizing a video signal has part of its address area into which an information signal is inhibited from being written. A writing address controller for cyclically specifying writing addresses of the memory cyclically specifies writing addresses in the remaining address area except for the part of address area to allow a plurality of different moving picture scenes to be memorized in the one and same memory.

For according to a large capacity main memory, a sub-memory is interposed to access to the main memory with a predetermined information amount being as the unit, thereby facilitating address management of the main memory as well as improving a utilizing effeciency of the main memory.

11 Claims, 7 Drawing Sheets

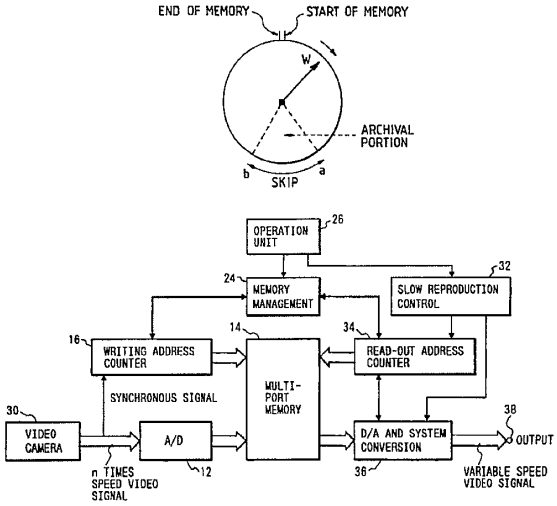


FIG. 1

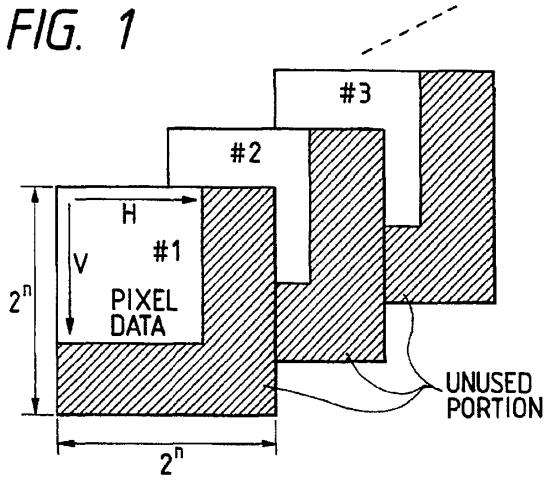

#3
#2
H
V
#1
PIXEL DATA
2^n
2^n
UNUSED PORTION

FIG. 2

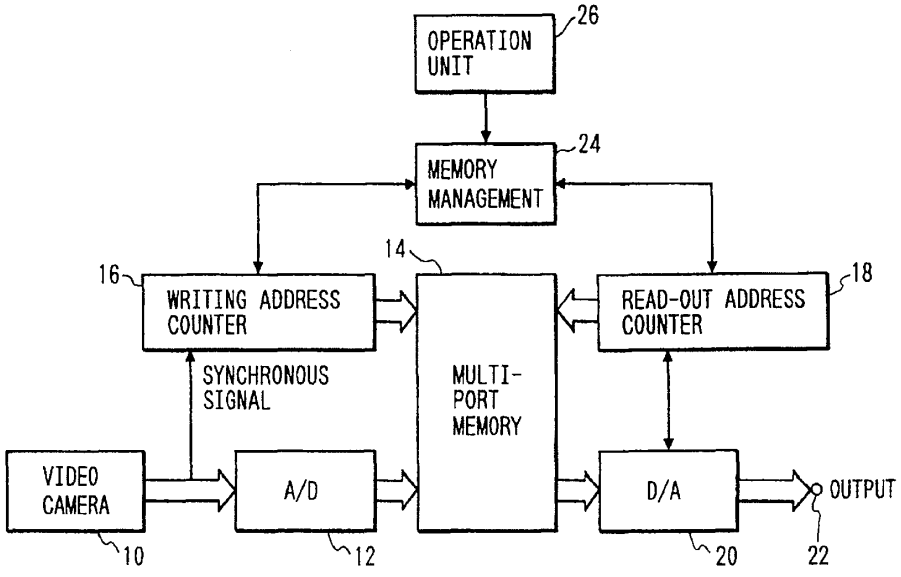

OPERATION UNIT
26
MEMORY MANAGEMENT
24
14
16
WRITING ADDRESS COUNTER
18
READ-OUT ADDRESS COUNTER
SYNCHRONOUS SIGNAL
MULTI-PORT MEMORY
VIDEO CAMERA
A/D
D/A
OUTPUT
10
12
20
22

FIG. 3

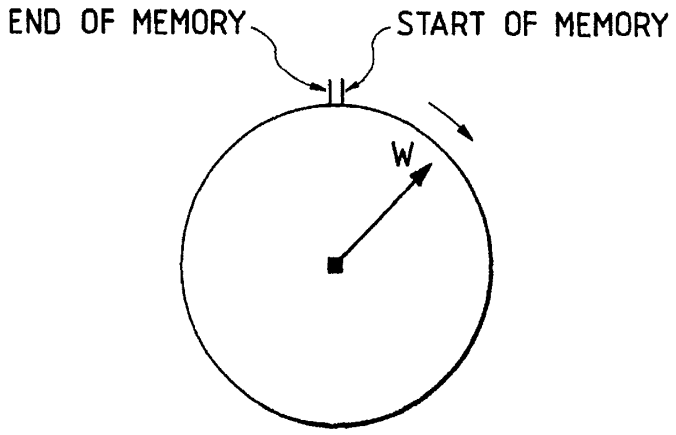

END OF MEMORY
START OF MEMORY
W

FIG. 4

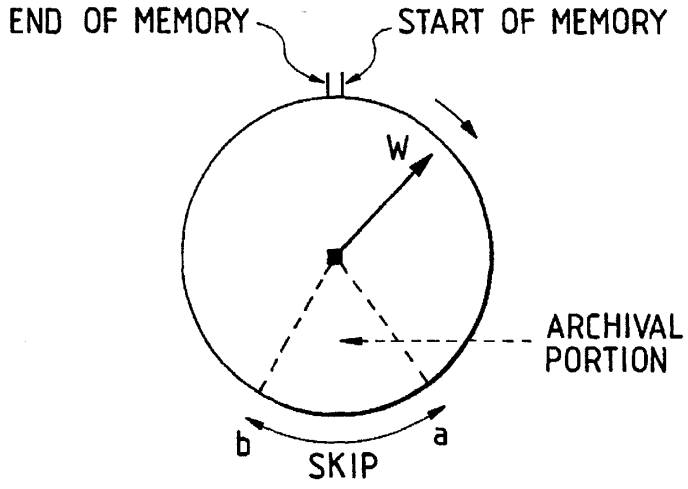
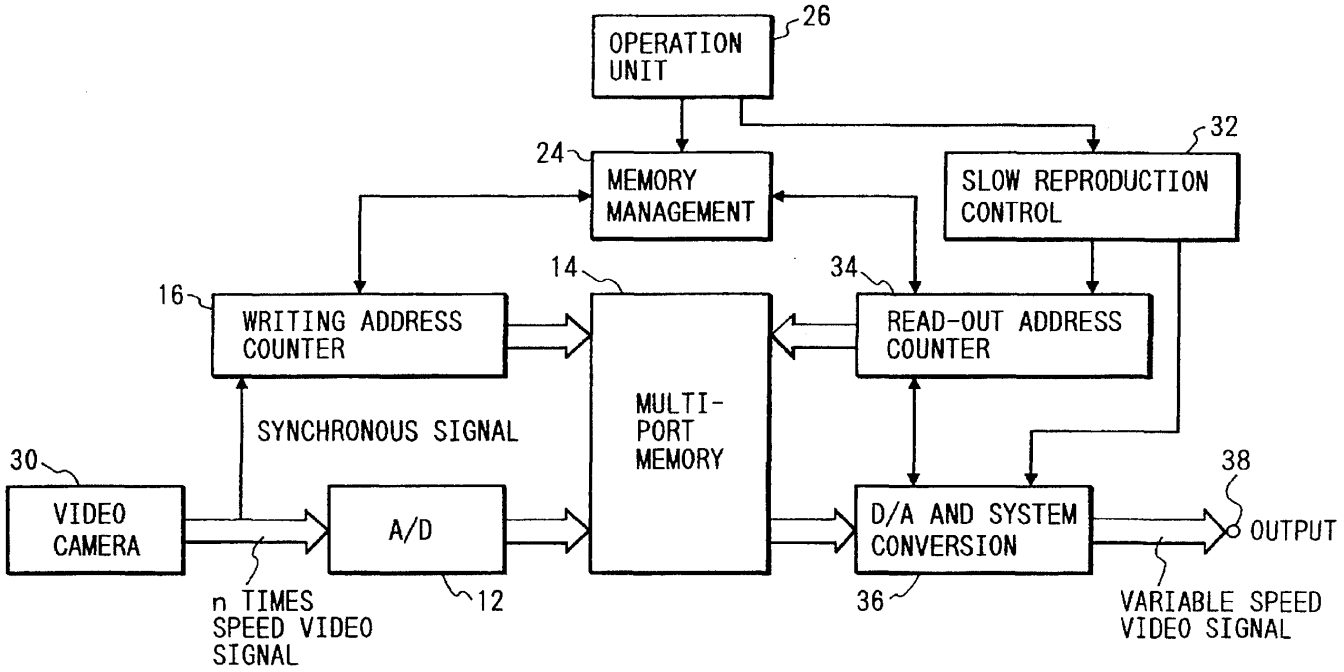

END OF MEMORY
START OF MEMORY
W
ARCHIVAL PORTION
b
a
SKIP

FIG. 5



Motorola v. Stellar
Motorola Exhibit 1013
Page 177

FIG. 6

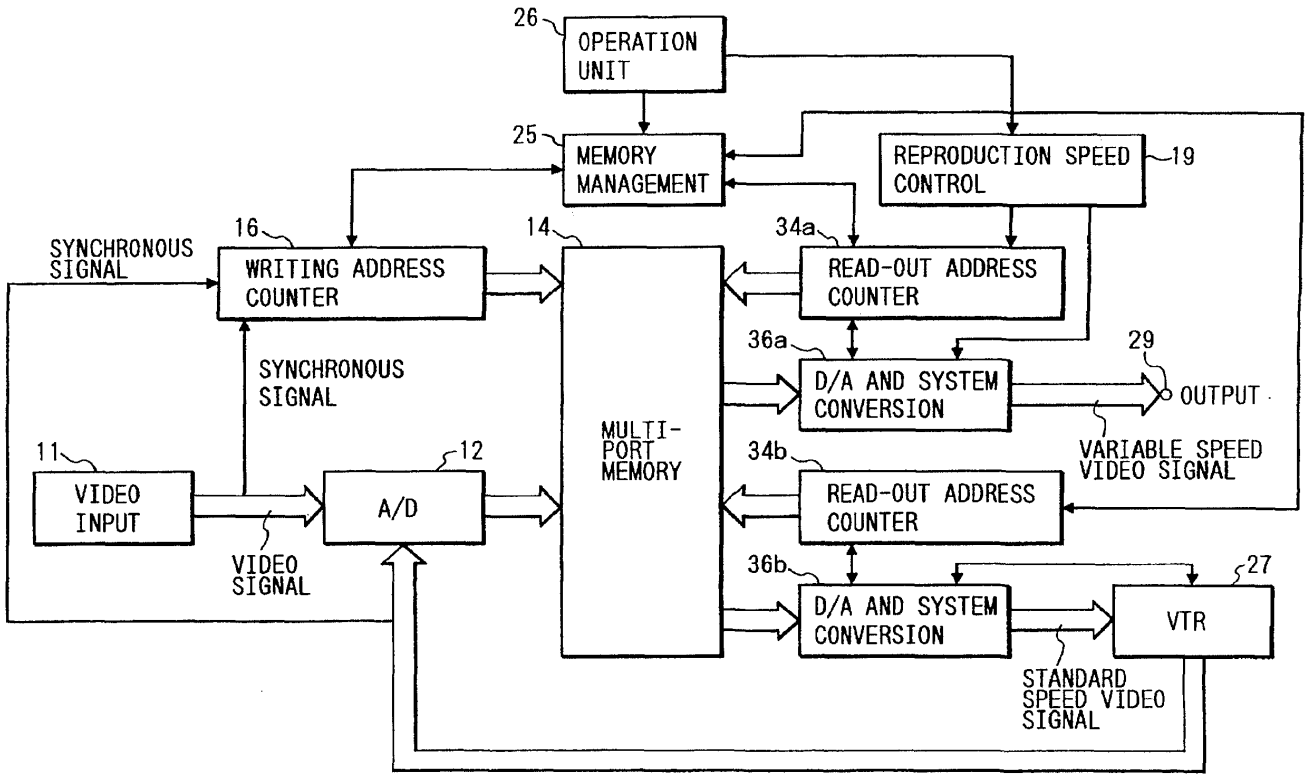

26
OPERATION UNIT
25
MEMORY MANAGEMENT
REPRODUCTION SPEED CONTROL
19
16
WRITING ADDRESS COUNTER
14
34a
READ-OUT ADDRESS COUNTER
SYNCHRONOUS SIGNAL
SYNCHRONOUS SIGNAL
36a
D/A AND SYSTEM CONVERSION
29
OUTPUT
VARIABLE SPEED VIDEO SIGNAL
MULTI-PORT MEMORY
11
VIDEO INPUT
12
A/D
34b
READ-OUT ADDRESS COUNTER
VIDEO SIGNAL
36b
27
D/A AND SYSTEM CONVERSION
VTR
STANDARD SPEED VIDEO SIGNAL

FIG. 7

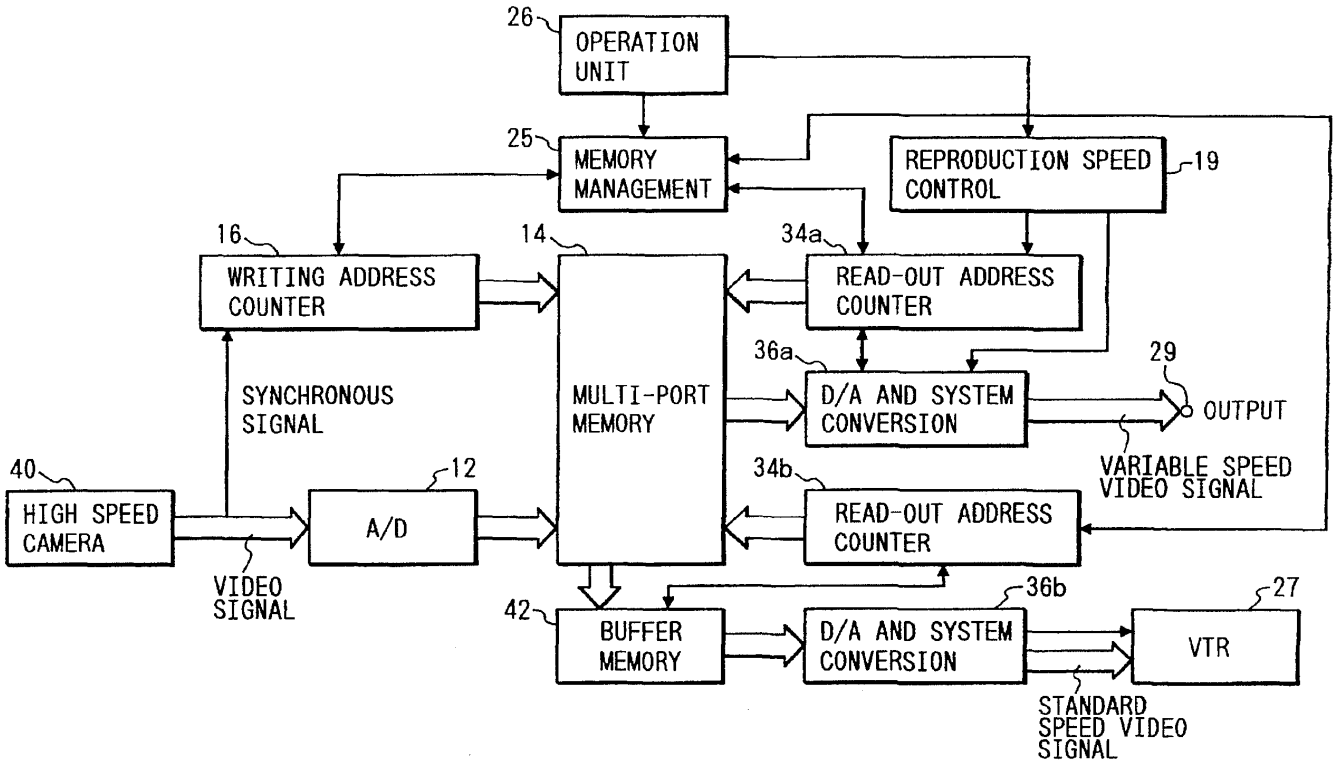

26
OPERATION UNIT
25
MEMORY MANAGEMENT
REPRODUCTION SPEED CONTROL
19
16
WRITING ADDRESS COUNTER
14
34a
READ-OUT ADDRESS COUNTER
36a
29
SYNCHRONOUS SIGNAL
MULTI-PORT MEMORY
D/A AND SYSTEM CONVERSION
OUTPUT
VARIABLE SPEED VIDEO SIGNAL
40
12
34b
HIGH SPEED CAMERA
A/D
READ-OUT ADDRESS COUNTER
VIDEO SIGNAL
42
36b
27
BUFFER MEMORY
D/A AND SYSTEM CONVERSION
VTR
STANDARD SPEED VIDEO SIGNAL

FIG. 8

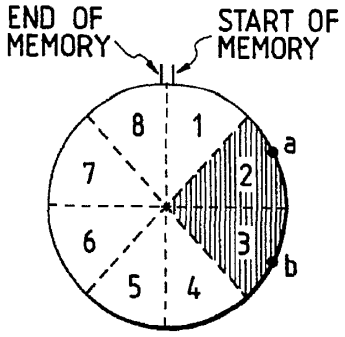

END OF MEMORY
START OF MEMORY
8
1
2
3
4
5
6
7
a
b

FIG. 10

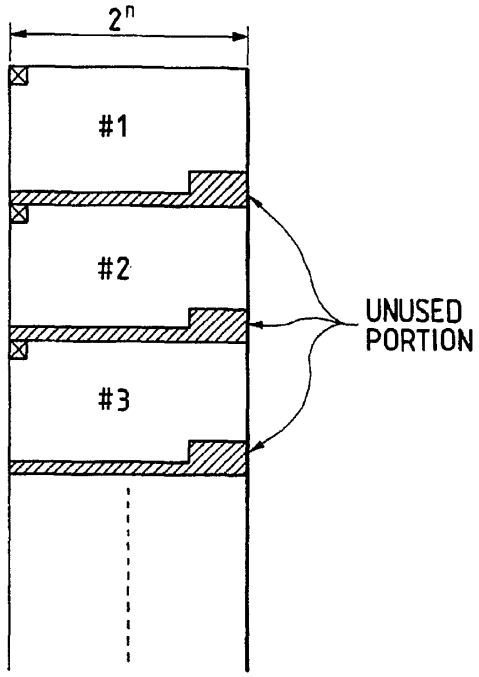

2^n
#1
#2
#3
UNUSED PORTION

FIG. 9

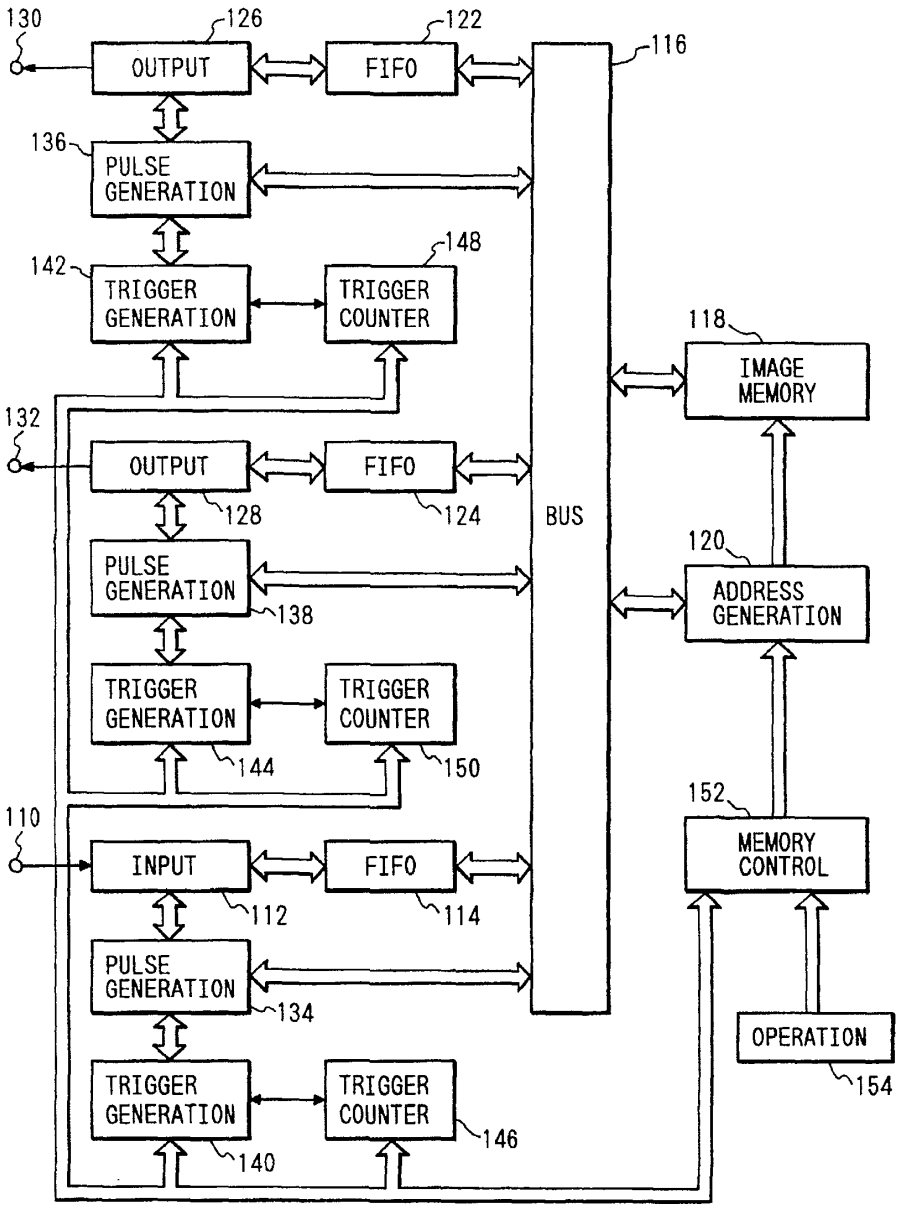

130
126
122
116
OUTPUT
FIFO
136
PULSE GENERATION
142
148
TRIGGER GENERATION
TRIGGER COUNTER
118
IMAGE MEMORY
132
OUTPUT
FIFO
128
124
BUS
120
PULSE GENERATION
138
ADDRESS GENERATION
TRIGGER GENERATION
TRIGGER COUNTER
144
150
152
110
INPUT
FIFO
MEMORY CONTROL
112
114
PULSE GENERATION
134
OPERATION
154
TRIGGER GENERATION
TRIGGER COUNTER
146
140

IMAGE STORING DEVICE INCLUDING AN INHIBITING FUNCTION

This is a continuation of application Ser. No. 07/871,486, filed on Apr. 21, 1992, now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an image memorizing device, and more particularly, to an image memorizing device for processing a large amount of image data such as moving pictures by using large capacity memories.

2. Related Background Art

There have been known a kind of memory which is adapted to cyclically memorize data within its storage area by linking the end address of the storage area to the start address of the same and an addressing control therefor as a so-called ring memory, and an image memorizing device for storing image signals in such a ring memory has been also known.

In the ring memory, previously memorized information cannot be protected from being overwritten by next information due to the nature of its addressing control. For example, when moving pictures are to be memorized, a previously memorized image is lost by overwriting the next image, so that non-sequential images in terms of time cannot be obtained.

Incidentally, such an image memory tends to have a larger capacity and now becomes sufficiently usable as a recording medium for moving pictures. If a solid state memory such as a dynamic random access memory is used as a recording medium for moving pictures, there are advantages, e.g., a search can be performed at a high speed; data can be readily rearranged in the memory; and data can be recorded and reproduced at an arbitrary speed.

Generally, in an image signal processing circuit for processing moving pictures by using such a large capacity image memory, a digital video signal digitally converted from an analog signal, as it is, is written into an image memory by one frame portion or a plural-frame portion. Addressing of the image memory is controlled by a timing of a synchronous signal of an image signal to be written thereinto.

Conventionally, since an addressing control of an image memory is defined by a synchronizing timing of a synchronous signal, quite a few unused portion, as indicated by hatching in FIG. **1**, is produced and left useless. This unused portion may occupy an unneglectable amount depending upon the number of horizontal pixels and the number of horizontal lines.

Specifically, a memory capacity assigned to one frame portion is, for example, a capacity for $(2^n \times 2^n)$ pixels, as shown in FIG. **1**, which has 2^n kinds of horizontal and vertical addresses, respectively. The number of scanning lines is **525** in the case of an NTSC signal and **625** in the case of a PAL signal, so that approximately 700– 800 of horizontal pixels are required. Therefore, substituting 10 for n, approximately 1024 $(=2^{10})$ addresses are required for the horizontal pixels.

Further, in the case of a high vision signal, substituting 11 for n, 2048 addresses are required for each of the horizontal and vertical addresses.

Thus, the unused portions as shown in FIG. **1** include an extremely large amount of address, thereby exhibiting a quite low memory using efficiency. However, unless the address is reset in the horizontal scanning line units or frame units, management of the address in a large capacity memory becomes extremely difficult.

SUMMARY OF THE INVENTION

In view of the above-mentioned background, it is an object of the present invention to provide an image memorizing apparatus which is capable of writing a new moving image into a single large capacity memory while preserving a desired portion of moving images which have previously been written in the same memory.

To achieve the above object, according to one embodiment of the present invention, there is provided an image memorizing device comprising:

(a) input means for inputting a video signal;

(b) a memory into which the video signal inputted from the input means can be written;

(c) writing address control means for cyclically specifying a writing address of the memory; and

(d) inhibiting means for inhibiting a video signal from being written into part of address area of the memory.

wherein the writing address control means cyclically specifies writing addresses for the remaining address area except for the part of address area when the inhibiting means inhibits a video signal from being written into the part of address area.

It is another object of the present invention to provide an image memorizing device which is capable of largely improving a using efficiency of a memory capacity in spite of relatively easy addressing management.

To achieve the above object, according to another embodiment of the present invention, there is provided an image memorizing apparatus comprising:

(a) a main memory capable of memorizing a video signal;

(b) access means for accessing the main memory to the outside; and

(c) a sub-memory connected between the access means and the main memory, the sub-memory adapted to supply the main memory with a predetermined information amount of a video signal from the access means as the unit, the predetermined information amount being less than one frame portion of the video signal from the access means.

Objects other than those described above and features of the present invention will become apparent from the following detailed description of embodiments with reference to accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a diagram used for explaining an ordinary memory using situation;

FIG. **2** is a block diagram showing the structure of an image memorizing apparatus as an embodiment of the present invention;

FIG. **3** is a diagram used for explaining the operation of a memory shown in FIG. **2**;

FIG. **4** is a diagram used for explaining the operation of the memory in FIG. **2** when a writing inhibited area is set therein;

FIG. **5** is a block diagram showing the structure of an image memorizing device as another embodiment of the present invention;

Motorola v. Stellar
Motorola Exhibit 1013
Page 182

FIG. **6** is a block diagram showing the structure of an image memorizing device as a further embodiment of the present invention;

FIG. **7** is a block diagram showing the structure of an image memorizing device as a further embodiment of the present invention;

FIG. **8** is a diagram used for explaining another using manner of the memory in each embodiment;

FIG. **9** is a block diagram showing the structure of an image memorizing device as another embodiment of the present invention; and

FIG. **10** is a diagram showing a using situation of a memory in the device of the embodiment shown in FIG. **9**.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Embodiments of the present invention will hereinafter be described with reference to the accompanying drawings.

FIG. **2** is a block diagram showing the structure of an image memorizing device according to an embodiment of the present invention which is applied to output processing of a video camera. Reference numeral **10** designates a video camera; **12** an analog-to-digital (A/D) convertor for digitizing a video signal outputted from the video camera **10**; and **14** a multi-port random access memory for memorizing a digital video signal outputted from the A/D convertor **12**. In the present embodiment, the memory **14** may have a capacity of memorizing a several-second to approximately 50-second portion of video signals.

Reference numeral **16** designates a writing address counter for generating a writing address of the memory **14** in response to a synchronous signal multiplexed with the video signal outputted from the video camera **10**; **18** a read-out counter for generating a read-out address of the memory **14**; **20** a digital-to-analog (D/A) convertor for converting video data read from the memory **14** to an analog signal; and **22** an output terminal.

Also, reference numeral **24** designates a memory managing circuit for controlling the writing address counter **16** and the read-out address counter **18** in accordance with a writing inhibited area registered in the memory **14**. The user can select through an operation unit **26** and register in the memory managing circuit **24** a writing inhibited area in the memory **14**, that is, an arbitrary number of images to be preserved.

Next, the operation of the above-mentioned image memorizing device will be described. A video signal outputted from the video camera **10** is digitized by the A/D convertor **12** and written into addresses indicated by the writing address counter **16**. The address of the writing address counter **16** is incremented by the synchronous signal multiplexed with the video signal. The writing address counter **16** returns to the start address of the memory **14** by an increment after the end address of the memory **14** has reached. Thus, the memory **14** operates as a ring memory. FIG. **3** schematically illustrates the writing addresses of the memory **14**. A writing position is represented as a vector W which rotates at an angular velocity ω.

If there is a scene to be preserved during making a film, the operation unit **26** is operated to specify a portion to be preserved immediately after the scene has been written into the memory **14**. With this operation, the memory managing circuit **24** instructs a writing inhibition to addresses in the memory **14** corresponding to the portion to be preserved. In this event, an arbitrary address area of the memory **14** can be specified, and the size of the area can be arbitrarily set.

After completing the registration (setting), film-making is resumed. The writing address counter **16** skips writing addresses for the address area registered in the memory managing circuit **24**. For example, if it is assumed that an area between points a and b shown in FIG. **4** is registered as a writing inhibited area, the writing vector W, when reaching the point a, skips the area between the points a and b, and then writes data at the point b. Thus, video data memorized in the area between the points a and b is preserved.

Next, description will be made as to another embodiment where the present invention is applied to processing of an n-times speed video signal. FIG. **5** shows the structure of the embodiment in a block form. The constituents identical to those in FIG. **2** are designated the same reference numerals. Reference numeral **30** designates a video camera which is capable of making a film at a field frequency n times that of a standard television signal, the output video signal of which is written into a memory **14** by an A/D convertor **12**, a writing address counter **16** and a memory managing circuit **24**, similarly to the device shown in FIG. **2**. A slow reproduction control circuit **32** controls a read-out address counter **34** to read data from the memory **14** at an arbitrary speed and converts the read data to a standard television signal by a D/A converting and system converting circuit **36**. More specifically, in the present embodiment one field portion of a video signal is read out in one field period of a standard television signal, however, in a 1/n slow reproduction mode, a read-out field address is updated once per field period.

In a normal reproduction mode, a field address read out once per field period is advanced by n fields. Further, in a 1/2n slow reproduction mode, a signal in the one and same field is repeatedly read out twice over two field periods, and a read-out field address is updated once per two field periods. By thus constructing the device, a video signal can be outputted at an arbitrary speed.

As described above, according to the device of the present invention disclosed in FIGS. **2** to **5**, by setting a particular address area of a memory as a writing inhibited area, it is possible to memorize two or more kinds of different moving images in a single memory and read them therefrom.

Next, another embodiment of the present invention will be described.

FIG. **6** is a block diagram showing the structure of an image memorizing device as another embodiment of the present invention, wherein constituents similar to those in FIG. **5** are designated the same reference numeral, and explanation thereof will be omitted.

Reference numeral **19** designates a reproduction speed control circuit for controlling a read-out speed (that is, an output speed of a read-out image) from a memory **14**; **34***a* a read-out address counter for generating a read-out address of the memory **14** under the control of the reproduction speed control circuit **19**; **36***a* a D/A and system converting circuit for converting video data read from the memory **14** by the read-out address counter **34**A to an analog signal and further converting the analog signal to a video signal according to a predetermined system; and **25** an output terminal.

Also, reference numeral **27** designates a video tape recorder (VTR) for recording an image to be preserved; **25** a memory managing circuit for reading out an image to be preserved to have the VTR **27** record the same and for inhibiting writing into a recording area in which the image to be preserved is memorized for a necessary period; **34***b* a read-out address counter for generating a read-out address of

Motorola v. Stellar
Motorola Exhibit 1013
Page 183

the memory **14** under the control of the memory managing circuit **28**; and **36***b* a D/A and system converting circuit for converting video data read from the memory **14** by the read-out address counter **34***b* to an analog signal and further converting the analog signal to a video signal according to a predetermined system. An output from the D/A and system converting circuit **36***b* is supplied to the VTR **27**.

For re-loading a video signal recorded by the VTR **27** to the memory **14**, a video signal output reproduced by the VTR **27** is applied to the A/D convertor **12**, while a synchronous signal multiplexed with the reproduced video signal is applied to the writing address counter **16**.

Next, the operation of the device shown in FIG. **6** will be described. Reference numeral **11** designates a video input terminal to which a video signal is inputted from a video camera. The operation for writing a video signal from the video input terminal **11** into the memory **14** is entirely the same as the operation for memorizing a video signal from the video camera **10** into the memory **14** of FIG. **2**.

The memory **14**, as described above, is handled as a ring memory. If a writing inhibited area is not set therein, the memory **14** stores a video signal of a past period T from the current time, wherein reference letter T represents a recordable period of the memory **14**.

The whole recording area of the memory **14** is divided into n blocks in arbitrary sizes, and the memory managing circuit **25** holds this division information. The memory managing circuit **25** controls writing by the writing address counter **16**, and read-out by the read-out address counters **20**, **30** in this block unit.

For example, if the area between the points a and b shown in FIG. **4** is designated a block **#1** and the remaining area block **#2** by an operation unit **26**, and if the block **#1** is specified as a writing inhibited area, a writing vector W of the writing address counter **16**, when reaching the point a, skips the area between the points a and b and indicates the address at the point b. Thus, video data memorized in the area between a and b is preserved. Also, with respect to read-out, read-out is permitted or inhibited in the specified block unit.

Next, a back-up operation will be described. Assume that video data is being written into a certain block, in the manner described above. Data is read from a writing inhibited block (a block in which an image to be preserved is recorded) other than the block into which video data is being written by the read-out address counter **34***b*, and converted to an analog signal and further to a signal according to the standard system by the D/A and system converting circuit **36***b*. Then, in association with an output operation of the D/A and system converting circuit **36***b*, the VTR **27** is operated to record the video signal converted to the standard system. Specifically, the D/A and system converting circuit **36***b* controls the VTR **27** to start and stop the recording. By these operations, the video signal to be preserved can be backed up on a recording medium by the VTR **27**.

After the video signal has been backed up the VTR **27**, when the read-out address counter **34***b* supplies the memory managing circuit **25** with a signal indicative of the termination of this back-up operation, the memory managing circuit **25** permits writing into the writing inhibited block from which the video signal has been read.

Since a video signal memorized in the memory **14** need to be backed up, a video signal read from the D/A and system converting circuit **36***b* is preferably a video signal at a standard speed. In the device shown in FIG. **6**, since a video signal written into the memory **14** is a standard video signal, a field address is updated by the counter **34***b* once per field period of this standard video signal, whereby a normal reproduction can be performed.

On the other hand, a video signal may be outputted to an output terminal **29** at one of various speeds as the user desires. Specifically, the reproduction speed control circuit **19** can vary the updated period of the field address of the counter **34***a* via the operation unit **26**. For example, when a slow motion reproduction is to be performed, the field address is updated once per several field periods, and video signals at the same field addresses are repeatedly read out during these several fields. Also, when a high speed search is to be performed, the field address may be advanced by several fields once per field period.

FIG. **7** is a block diagram showing the structure of a second embodiment of the present invention. Constituents having functions similar or analogous to those in FIG. **6** are designated the same reference numerals. As an image source, there is connected a high speed camera **40** which outputs a video signal at a field frequency n times that of the standard television system, and a high speed buffer memory **42** is connected between a multi-port memory **14** and a D/A and system converting circuit **36***b*. A transfer speed from the memory **14** to the buffer memory **42** is the same as a speed at which data is written into the memory **14**, that is, n times a transfer speed from the D/A and system converting circuit **36***b* to a VTR **26**. The D/A and system converting circuit **36***b* sequentially converts video data from the buffer memory **42** to a standard video signal which in turn is recorded on a video tape by the VTR **27**.

Thus, even a high speed video signal can be backed up at a high speed, and accordingly the memory can be highly efficiently utilized.

Although in the above-mentioned embodiment, the memory **14** is divided into two blocks respectively having a different size from each other and managed, it may be divided into m banks of a fixed length (for example eight banks **1**–**8** in FIG. **8**), and the presence or absence of back-up may be managed in the bank units. For example, if an area between points a and b is to be preserved in FIG. **8**, writing addresses of banks **#2**, **#3** including that area are skipped, and images recorded therein are backed up on a video tape. Such banks of a fixed length can alleviate the load of a memory managing circuit **25**.

As will be readily understood from the above explanation, according to the device described in connection with FIGS. **6**–**8**, an important image memorized in a soild-state memory device can be preserved or backed up on a separate recording medium without being erased by a subsequent image. This back-up operation allows an efficient utilization of a memory capacity of the solid-state memory device. Further, since writing and read-out are simultaneously performed, data can be preserved on a separate recording medium at a high speed.

FIG. **9** is a block diagram showing the structure of a further embodiment of the present invention. Reference numeral **110** designates an input terminal to which an image signal (moving pictures or a still image) is fed from a video camera or a video reproducing apparatus; **112** an input circuit comprising an A/D convertor for digitizing an image from the input terminal **110**; **114** an FIFO (First-In First-Out) memory (buffer memory) for a synchronously supplying an output of the input circuit **112** to a bus **116**; **118** an image memory; and **120** an address generating circuit for generating an address of the image memory **118**. The bus **116** comprises a data bus, a plurality of control signal lines and a clock line.

Motorola v. Stellar
Motorola Exhibit 1013
Page 184

Reference numerals **122, 124** designate FIFO memories for supplying respective output circuits **126, 128** with image data read from the image memory **118** and inputted through the bus **116**. The output circuits **126, 128** respectively comprise, for example, a D/A convertor. Reference numerals **130, 132** designate output terminals for connecting to a monitor or a video recording apparatus.

Reference numerals **134, 136, 138** designates pulse generating circuits for generating a clock and control signals necessary to transfer data between the input and output circuits **112, 126, 128** and the FIFO memories **114, 122, 124** and to transfer data between the FIFO memories **114, 122, 124** and the image memory **118** via the bus **116**; **140, 142, 144** trigger generating circuits for generating a request for transferring every predetermined amount of data between the input and output circuits **112, 126, 128** and the FIFO memories **114, 122, 124**; and **146, 148, 150** trigger counters for counting the numbers of triggers generated by the trigger generating circuits **140, 142**, 144, respectively.

Reference numeral **152** designates a memory control circuit for arbitrating a request for data transfer between the respective input and output circuits **112, 126, 128** and controlling data transfer between the image memory **118** and the FIFO memories **114, 122, 124**; and **154** an operation unit for inputting an indication of an operation mode for the whole device.

Next, the operation of the present embodiment will be described in connection with a case where an image signal inputted to the input terminal **110** is stored in the image memory **118**, by way of example.

The user indicates from the operation unit **154** the memory control circuit **152** to store input image data to the image memory **118**. The memory control circuit **152** instructs the pulse generating circuit **134** of writing an output of the input circuit **112** into the FIFO memory **114**. The pulse generating circuit **134** generates a control signal for writing into the FIFO memory **114** in synchronism with a synchronous signal of an image signal inputted from the input terminal **110**. The trigger generating circuit **140** in turn transmits a trigger signal to the trigger counter **146** and the memory control circuit **152** every time a predetermined amount of image data less than one frame portion of image (hereinafter referred to the memory unit) is written into the FIFO memory **114**. The trigger counter **146** counts this trigger signal and supplies the memory control circuit **52** with the number of counted trigger signals.

The memory control circuit **152**, in response to the trigger signal from the trigger generating circuit **140**, has the trigger counter **146** output the number of counted trigger signals to the address generating circuit **120** and simultaneously transfer the number of counted trigger signals to the image memory **118** via the bus **116**. The address generating circuit **120** generates an address for each of data in the memory unit, at which image data from the FIFO memory **114** is written into the image memory **118**. Assuming here that the foregoing predetermined amount is equal to 2^n pixels, a memory using situation is as shown in FIG. **10**.

By the above operations, image data is close-packed in the image memory **118**, whereby unused portions are left only in hatched areas shown in FIG. **10**. Thus, the unused portion can be largely reduced. Incidentally, blocks **#1, #2, #3** respectively indicate image data of one frame portion.

Read-out of image data from the image memory **118** to the output circuits **126, 128** is similarly executed by generating a trigger signal for requesting data transfer in the memory units. However, data transfer between the image memory **118** and the FIFO memories **122, 124** is executed only with one of the FIFO memories at a time, so that the memory control circuit **152** arbitrates respective transfer requests so as to prevent the transfer requests from being simultaneously generated.

As will be readily understood from the above explanation, the embodiment of FIG. **9** provides an image memorizing device which can reduce unused portions, facilitate the address management of the memory **118**, and present a high utilizating efficiency.

What is claimed is:

1. An image storing device, comprising:

(a) input means for inputting a motion video signal;

(b) a memory into which the motion video signal inputted from said input means can be written;

(c) writing address control means for cyclically specifying writing addresses of said memory to which the motion video signal is written; and

(d) inhibiting means for inhibiting a part of addresses of said memory from being specified by said writing address control means,

wherein said writing address control means skips the part of addresses to continuously write the motion video signal to addresses before and after the part of addresses when said inhibiting means operates.

2. A device according to claim **1**, wherein said inhibiting means includes an operation member for manually specifying said part of address area.

3. A device according to claim **1**, further comprising:

read-out address control means for specifying read-out addresses of said memory; and

output means for outputting a video signal readout from said memory.

4. A device according to claim **3**, wherein said read-out address control means can switch an update period of said read-out addresses in the frame units of said video signal.

5. A device according to claim **3**, wherein:

when said read-out address control means specifies said part of the addresses of said memory, while a video signal is being read out from addresses in said memory specified by said read-out address control means, said writing address control means cyclically specifies addresses of said memory except for said part of the writing addresses, and a video signal can be written to addresses of said memory specified by said writing address control means.

6. A device according to claim **3**, further comprising recording means for recording a video signal outputted from said output means on a recording medium.

7. An image storing device comprising:

(a) a memory capable of storing a video signal;

(b) recording means for recording a video signal read from said memory on a recording medium;

(c) writing address control means for cyclically specifying writing addresses of said memory;

(d) inhibiting means for inhibiting a video signal from being written into part of addresses of said memory, wherein said writing address control means cyclically specifies writing addresses for the remaining addresses except for said part of addresses when said inhibiting means inhibits a video signal from being written into said part of addresses; and

(e) releasing means for responsively releasing writing inhibition set by said inhibiting means which inhibits a video signal from being written into said part of

Motorola v. Stellar
Motorola Exhibit 1013
Page 185

addresses upon completing recording of a video signal read out from said part of addresses by said recording means.

8. An image storing device, comprising:

(a) a memory capable of storing a video signal;

(b) writing address control means for cyclically specifying writing addresses of said memory;

(c) output means for outputting a video signal read from said memory;

(d) recording means for recording a video signal outputted from said output means on a recording medium,

wherein said output means controls said recording means so as to operate said recording means while a video signal is being outputted; and

(e) inhibiting means for inhibiting a video signal from being written into part of addresses of said memory,

wherein said writing address control means cyclically specifies writing addresses for the remaining addresses except for said part of addresses when said inhibiting means inhibits a video signal from being written into said part of addresses.

9. An image storing device comprising:

(a) a memory capable of storing a motion video signal;

(b) writing means including address control means for specifying writing addresses of said memory to write the motion video signal into memory;

(c) inhibiting means for inhibiting said writing means from specifying a part of addresses of said memory; and

(d) read-out means including read-out address control means for specifying read-out addresses of said storage area of said memory, said read-out means being capable of reading a motion video signal, which has been previously stored in said part of addresses before the writing addresses are inhibited from being specified by said inhibiting means, during a writing operation of said writing means.

10. A device according to claim **9** wherein said writing address control means cyclically specifies writing addresses of the memory except for said part of addresses when said inhibiting means inhibits a video signal from being written into said part of addresses.

11. An image storing device comprising:

(a) a memory capable of storing a video signal;

(b) writing means including writing address control means for specifying writing addresses of said memory;

(c) inhibiting means for inhibiting said writing means from specifying writing addresses of a predetermined area of said storage area of said memory;

(d) read-out means including read-out address control means for specifying read-out addresses of said memory; and

(e) cancel means for cancelling inhibition by said inhibiting means in response to completion of a read-out operation of a video signal in the part of addresses by said read out means.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,523,799
DATED : June 4, 1996
INVENTOR(S) : Yuichiro Hattori

It is certified that error appears in the above-indentified patent and that said Letters Patent is hereby corrected as shown below:

Column 3, line 58, before "reached" please insert -- been --;

Column 4, line 58, change "34A" to -- 34a --; and

Column 4, line 60, change "25" to -- 29 --.

Signed and Sealed this

Twenty-fourth Day of September, 1996

Attest:

BRUCE LEHMAN

Attesting Officer *Commissioner of Patents and Trademarks*

[redacted]

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
27 April 2006 (27.04.2006)

PCT

(10) International Publication Number
WO 2006/044476 A2

(51) International Patent Classification:
H04B 1/66 (2006.01)

(21) International Application Number:
PCT/US2005/036701

(22) International Filing Date: 12 October 2005 (12.10.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/617,988 12 October 2004 (12.10.2004) US

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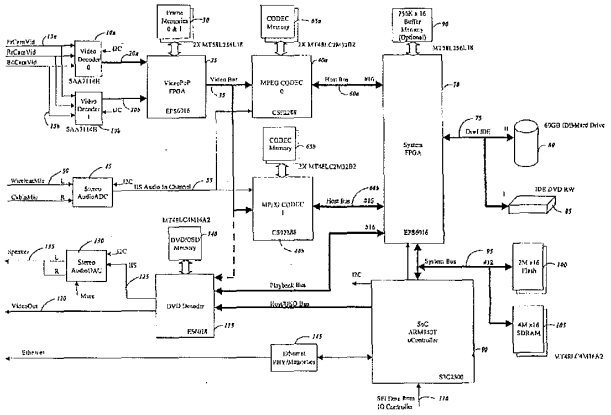
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD OF AND SYSTEM FOR MOBILE SURVEILLANCE AND EVENT RECORDING



(57) Abstract: A data-encoding system includes a source of unencoded data, and a first encoder interoperably coupled to the source, wherein the first encoder is adapted to receive the unencoded data, encode the unencoded data, and output encoded data at a first data rate. The data encoding system further includes a second encoder interoperably coupled to the source, wherein the second encoder is adapted to receive the unencoded data, encode the unencoded data, and output encoded data at a second data rate in which the second data rate exceeds the first data rate. This Abstract is provided to comply with rules requiring an Abstract that allows a searcher or other reader to quickly ascertain subject matter of the technical disclosure. This Abstract is submitted with the understanding that it will not be used to interpret or limit the scope or meaning of the claims.

WO 2006/044476 A2

METHOD OF AND SYSTEM FOR MOBILE SURVEILLANCE AND EVENT RECORDING

CROSS-REFERENCE TO RELATED APPLICATIONS

[001] This patent application claims priority from, and incorporates by reference the entire disclosure of, U.S. Provisional Patent Application No. 60/617,988, filed on October 12, 2004.

BACKGROUND OF THE INVENTION

[002] This invention is directed to a video surveillance system, and in particular, by way of example and not limitation, to a video surveillance system adapted to be mounted in a law enforcement vehicle for producing a permanent digital evidentiary record, on a multi-media disc, of a traffic stop or other event and incidents occurring after a suspect's vehicle has been stopped.

[003] In law enforcement, a reliable witness that is incapable of perjury is needed to substantiate actions taken by a law enforcement officer and to protect the officer against false allegations by persons involved in an incident. An excellent witness of this type is a video recording of the incident, now widely used in traffic stops and criminal investigations, which can be reviewed after the incident and archived. By recording the incident first-hand as it actually happens, video recordings serve to eliminate conflicting individual interpretations of the incident and facilitate effective and efficient law enforcement.

[004] Vehicle-mounted video cameras to make video records of an incident or scene external to the law enforcement vehicle are well known in the art. For example, U.S. Pat. No. 4,949,186 to Peterson discloses a vehicle-mounted system in which a video-cassette recorder is housed in a vault located in the trunk of a patrol car. U.S. Pat. No. 5,677,979 to Squicciarini et al discloses a video surveillance system which integrates the outputs of a video camera, a radar unit, a remote control, and a wireless microphone to produce a comprehensive video recording of an incident from its beginning to the end. This system also uses a video cassette recorder to capture the incident on videotape. However, VHS and digital video tapes are bulky, requiring considerable space for storage, are susceptible to damage, and degrade over time. Additionally, the data on tapes may only be accessed sequentially.

Motorola v. Stellar
Motorola Exhibit 1013
Page 189

SUMMARY OF THE INVENTION

[005] A video-data chapter segmentation method includes monitoring for at least one external start trigger, and responsive to detection of at least one of the at least one external start trigger, creating a chapter start point at a point in the video data corresponding to a specified time preceding the at least one detected external start trigger. The method further includes initiating recording of the video data beginning at the point in the video data and monitoring for at least one stop trigger. The method still further includes responsive to detection of at least one of the at least one stop trigger, creating a chapter stop point at a point in the data corresponding to a specified time preceding the at least one detected stop trigger.

[006] A video-data chapter segmentation computer system includes a processor and a memory. The memory includes software instructions adapted to enable the computer system to perform the steps of monitoring for at least one external start trigger, and responsive to detection of at least one of the at least one external start trigger, creating a chapter start point at a point in the video data corresponding to a specified time preceding the at least one detected external start trigger. The software instructions are further adapted to enable the computer system to perform the steps of initiating recording of the video data beginning at the point in the video data, monitoring for at least one stop trigger, and responsive to detection of at least one of the at least one stop trigger, creating a chapter stop point at a point in the data corresponding to a specified time preceding the at least one detected stop trigger.

[007] A data-encoding system includes a source of unencoded data, and a first encoder interoperably coupled to the source, wherein the first encoder is adapted to receive the unencoded data, encode the unencoded data, and output encoded data at a first data rate. The data encoding system further includes a second encoder interoperably coupled to the source, wherein the second encoder is adapted to receive the unencoded data, encode the unencoded data, and output encoded data at a second data rate in which the second data rate exceeds the first data rate.

[008] A data-encoding method includes a first encoder interoperably coupled to a source of unencoded data receiving the unencoded data, encoding the unencoded data, and outputting encoded data at a first data rate. The method further includes a second encoder interoperably coupled to the source receiving the unencoded data, encoding the unencoded data, and outputting encoded data at a second data rate, wherein the second data rate exceeds the first data rate.

Motorola v. Stellar
Motorola Exhibit 1013
Page 190

[009] A data-overflow-handling method includes storing at least one of captured audio data, video data, and metadata to a first directory of a non-removable data storage medium, and determining whether an event is being recorded. The method further includes responsive to a determination that an event is being recorded, storing an image of the stored at least one of captured audio data, video data, and metadata to a second directory of the non-removable data storage medium. The method still further includes determining whether a predefined capacity threshold relative to a removable data storage medium has been exceeded, and responsive to a determination that the predefined capacity threshold has been exceeded, creating a third directory of the non-removable data storage medium. The method still further includes determining whether data in the second directory of the non-removable storage medium has not been stored to the removable data storage medium, and responsive to a determination that data in the second directory of the non-removable storage medium has not been stored to the removable data storage medium, storing any unstored data in the second directory to the removable data storage medium. The method further includes determining whether the second directory contains finalization files, and responsive to a determination that the second directory contains finalization files, finalizing the removable storage medium and providing a prompt to insert another removable storage medium. The method still further includes responsive to a determination that the second directory contains no finalization files, returning to the step of determining whether data in the second directory of the non-removable storage medium has not been stored to the removable data storage medium.

[0010] A data-overflow-handling computer system includes a processor and a memory. The memory includes software instructions adapted to enable the computer system to perform the steps of storing at least one of captured audio data, video data, and metadata to a first directory of a non-removable data storage medium, determining whether an event is being recorded, and responsive to a determination that an event is being recorded, storing an image of the stored at least one of captured audio data, video data, and metadata to a second directory of the non-removable data storage medium. The memory further includes software instructions adapted to enable the computer system to perform the steps of determining whether a predefined capacity threshold relative to a removable data storage medium has been exceeded, and responsive to a determination that the predefined capacity threshold has been exceeded, creating a third directory of the non-removable data storage medium. The memory further includes software instructions adapted to enable the computer system to perform the steps of determining

Motorola v. Stellar
Motorola Exhibit 1013
Page 191

whether data in the second directory of the non-removable storage medium has not been stored to the removable data storage medium, and responsive to a determination that data in the second directory of the non-removable storage medium has not been stored to the removable data storage medium, storing any unstored data in the second directory to the removable data storage medium. The memory further includes software instructions adapted to enable the computer system to perform the steps of determining whether the second directory contains finalization files, and responsive to a determination that the second directory contains finalization files, finalizing the removable storage medium and providing a prompt to insert another removable storage medium. The memory still further includes software instructions adapted to enable the computer system to perform the step of responsive to a determination that the second directory contains no finalization files, returning to the step of determining whether data in the second directory of the non-removable storage medium has not been stored to the removable data storage medium.

[0011] A method for archiving data includes receiving data, storing the data on a first data storage medium, and selecting a portion of the data. The method further includes determining if at least one environmental factor indicates that environmental conditions are acceptable for storing the selected portion of the data on a second data storage medium. The method still further includes responsive to a determination that the at least one environmental factor indicates that environmental conditions are acceptable, storing the selected portion of the data on the second data storage medium.

[0012] A computer system for archiving data includes a processor and a memory. The memory includes software instructions adapted to enable the computer system to perform the steps of receiving data, storing the data on a first data storage medium, and selecting a portion of the data. The memory further software instructions adapted to enable the computer system to perform the steps of determining if at least one environmental factor indicates that environmental conditions are acceptable for storing the selected portion of the data on a second data storage medium, and responsive to a determination that the at least one environmental factor indicates that environmental conditions are acceptable, storing the selected portion of the data on the second data storage medium.

[0013] A data security method includes performing a checksum on data contained on a removable data storage medium, and storing the checksum on the removable data storage medium in at least one of an encrypted and a hidden form. The method further includes storing

Motorola v. Stellar
Motorola Exhibit 1013
Page 192

a unique serial number pertaining to the removable storage medium to the removable storage medium, and storing a checksum and a corresponding unique serial number of a plurality of previous removable storage media to the removable storage medium.

[0014] A data security computer system includes a processor and a memory. The memory includes software instructions adapted to enable the computer system to perform the steps of performing a checksum on data contained on a removable data storage medium, and storing the checksum on the removable data storage medium in at least one of an encrypted and a hidden form. The memory further includes software instructions adapted to enable the computer system to perform the steps of storing a unique serial number pertaining to the removable storage medium to the removable storage medium, and storing a checksum and a corresponding unique serial number of a plurality of previous removable storage media to the removable storage medium.

[0015] The above summary of the invention is not intended to represent each embodiment or every aspect of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] A more complete understanding of the method and apparatus of the present invention may be obtained by reference to the following Detailed Description when taken in conjunction with the accompanying Drawings wherein:

[0017] FIGURE 1 is a block diagram of an in-vehicle system for recording video, audio, and data in accordance with principles of the present invention;

[0018] FIGURE 2 is a procedure for opportunistic archiving without error checking in accordance with principles of the present invention;

[0019] FIGURE 3 is a procedure for opportunistic archiving with optional error checking in accordance with principles of the present invention;

[0020] FIGURE 4 is a procedure for automatic DVD-video chapter segmentation by external triggers in accordance with principles of the present invention;

[0021] FIGURE 5 is a procedure for parallel high and low bit-rate encoding with post even bit rate selection in accordance with principles of the present invention;

[0022] FIGURE 6 is a perspective and side view of an embodiment of a drive suspension system in accordance with principles of the present invention; and

Motorola v. Stellar
Motorola Exhibit 1013
Page 193

[0023] FIGURE 7 is a procedure for automatic DVD-video disc record overflow handling in accordance with principles of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0024] Referring now to FIGURE 1, a block diagram of an in-vehicle system for recording video, audio, and data in accordance with an embodiment of the present invention is illustrated. In the system of FIGURE 1, a first video decoder 10a and a second video decoder 10b each include a plurality of respective video inputs 15a, 15b for receiving analog video signals from one or more video sources, such as, for example, a video camera. In the embodiment of the present invention illustrated in FIGURE 1, each of the video decoder 10a and 10b receives analog video signals from a front video camera, a rear video camera, and an in-vehicle camera, although it should be understood that, in some embodiments, more or fewer cameras may be used. Each of the video decoders 10a, 10b processes the received video signals and produces respective digital video signals 20a and 20b. The digital video signals 20a and 20b are then provided to a video processor 25. The video processor 25 processes the digital video signals 20a and 20b and outputs the processed video signals to a video bus 35 as a video stream.

[0025] In an exemplary embodiment of the present invention, the video processor 25 includes a video picture-over-picture (POP) field programmable gate array (FPGA) chip that processes video from one or more sources to combine the video from the multiple sources to be combined into a single video stream. For example, two video camera feeds can be processed by the video processor 25 for simultaneous display on the same screen as a split screen image. The system of FIGURE 1 can be further provided with a frame memory 30 associated with the video processor 25 to store video frames during processing by the video processor 25. The video stream from the video bus 35 is provided to first and second audio/video encoder integrated circuits (ICs) 40a, 40b. In accordance with principles of the present invention, the first and second video encoder ICs 40a, 40b include circuitry adapted to encode video and audio in compliance with a Motion Picture Expert Group (MPEG) standard, such as the MPEG-2 standard. For example the first and second video encoders 40a, 40b can be MPEG codec ICs. However, other video-encoding standards may be used without departing from principles of the invention.

[0026] The system of FIGURE 1 also includes an audio analog-to-digital converter 45 adapted to receive analog audio signals 50 from one or more audio sources, such as

Motorola v. Stellar
Motorola Exhibit 1013
Page 194

microphones, and process the analog audio signals 50 to produce a digital audio signal 55. In accordance with the embodiment of the present invention illustrated in FIGURE 1, an analog audio signal from a wireless microphone is provided to a left channel input of the audio analog-to-digital converter 45, an analog audio signal from a cabin microphone is provided to a right channel of the audio analog-to-digital converter 45, and the audio analog-to-digital converter 45 outputs a combined digital audio signal 55 therefrom.

[0027] The digital audio signal 55 is then provided to each of the first and second audio/video encoder ICs 40a, 40b. Each of the first and second audio/video encoder ICs 40a, 40b encodes the video stream received from the video bus 35 and the digital audio signal 55 from the audio analog-to-digital converter 45 as respective encoded audio/video streams 60a and 60b, such as, for example, MPEG-2 streams. In various embodiments of the present invention, the first audio/video encoder IC 40a and the second audio/video encoder IC 40b output representations of the same video and audio streams that have been encoded at different data rates in parallel. For example, in accordance with principles of the present invention, the first audio/video encoder IC 40a outputs a high-bit-rate encoded stream 60a (e.g., 6.0 Mbps), while the second audio/video encoder IC 40b outputs a low-bit-rate encoded stream 60b (e.g., 1.0 Mbps) representation of the same audio and video signals. The low-bit-rate stream can be obtained, for example, by reducing at least one of the video resolution and the frame rate. The system of FIGURE 1 can be further provided with first and second coded memory 65a, 65b associated with each of the first and second audio/video encoder ICs 40a, 40b, respectively, for use by the first and second audio/video encoder ICs 40a, 40b as memory storage during encoding operations.

[0028] The resolution, bit-rate, and frame rate of both the low-bit-rate stream and the high-bit-rate stream can be set based on a record length selection made in a setup menu. Some example combinations are shown in Table 1:

Motorola v. Stellar
Motorola Exhibit 1013
Page 195

Resolution	Var. Bit rate	Frame Rate	Record Length
720x480	5-6 Mbps	30 fps	2 hrs
480x480	2.0 Mbps	30 fps	4 hrs
352x480	1.5 Mbps	30 fps	6 hrs
352x480	1.1 Mbps	30 fps	8 hrs

TABLE 1

[0029] Each of the first encoded stream 60a and the second encoded stream 60b are then provided to a system FPGA 70. The system FPGA 70 provides the first encoded stream 60a and the second encoded stream 60b over an IDE bus 75 to a hard drive 80. The system of FIGURE 1 can further include a buffer memory 90 associated with the system FPGA 70 to buffer data before it is written to the hard drive 80. The first encoded stream 60a and the second encoded stream 60b are each buffered and written to the hard drive 80. As a result, two versions of the same video and audio source, for example, a high-bit-rate encoded and a low-bit-rate encoded version, are buffered and written to the hard drive 80 for subsequent processing. After a predetermined time period has elapsed and/or after a particular event has occurred, the encoded video and audio data may be sent over the IDE bus 75 from the hard drive 80 to a DVD read/write (RW) drive 85 for archiving to a DVD disc. In accordance with an embodiment of the present invention, the encoded video and audio data is written to the DVD disc so that the DVD disc is formatted as a standard DVD video disc playable in a standalone (i.e., non-PC based) DVD player. The hard drive 80 is described as an example of a non-removable data storage medium such as typically found in personal computers. A DVD disc is described as an example of a removable data storage medium. Other examples of removable data storage media include floppy discs, and flash memory drives.

[0030] The system of FIGURE 1 further includes a microcontroller 90 that functions to control the various components as well as the overall operation of the system of FIGURE 1. Flash memory 100 and dynamic RAM 105 may further be connected to the microcontroller 90 via a system bus 95. The flash memory 100 may function to store firmware for use by the microcontroller 90, and the dynamic RAM 105 may be used by the microcontroller 90 as temporary storage. In accordance with principles of the present invention, the firmware within

Motorola v. Stellar
Motorola Exhibit 1013
Page 196

the flash memory 100 can be upgraded, for example, by inserting a disc including updated firmware into the DVD RW drive 85.

[0031] The microcontroller 90 is further provided with a data input 110 for receiving metadata including externally-measured data. Examples of metadata that can be provided to the data input 110 include Global Positioning System (GPS) coordinates, GPS calculated patrol speed, vehicle speed sensor (VSS) calculated patrol speed, radar measured patrol speed, radar target speed, accelerometer X, Y, and Z values, braking status, emergency lights status, siren status, system board temperature, drive door opening and closing logging, power up and power down logging, and DVD disc ejection and insertion logging. The metadata is provided by the microcontroller 90 to the system FPGA 70, which further transmits the metadata to the hard drive 80, where it is written to a metadata log file in association with the encoded audio and video data. Accordingly, a particular item of metadata can be directly linked to the audio and video segment obtained at the time that the metadata item was measured.

[0032] In addition, a subset of the metadata is included in the encoded audio and video data so that it is available for viewing in parallel with the audio and video during playback. In accordance with an embodiment of the present invention, the subset of the metadata is included in one or more closed-captioning fields of an MPEG-2 encoded DVD disc. An advantage provided by including the subset of the metadata in a closed-captioning field is that the visibility of the metadata information can be selectively toggled by a viewer of the audio and video. Another advantage provided by including the subset of the metadata in a closed-captioning field is that the information in the closed-captioning field is a text overlay that does not effect the encoding of the underlying video; thus, the underlying video is not degraded by the inclusion of the metadata. Examples of metadata that may be included in the closed-captioning field include time, date, frame counter, vehicle ID, GPS longitude and latitude, vehicle speed (from VSS signal), radar target speed, radar patrol car speed, remote microphone active indicator, emergency lights active indicator, siren active indicator, braking in progress indicator, and camera ID and zoom level. In still another embodiment of the present invention, the subset of metadata may by provided in a subtitle field.

[0033] The system of FIGURE 1 further allows for playback of encoded audio and video stored on the hard drive 80 and a disc in the DVD RW drive 85. To accomplish playback, the system of FIGURE 1 further includes a DVD decoder 115 that receives encoded audio and video from either the hard drive 80 or the DVD RW drive 85 via a playback bus. The DVD

Motorola v. Stellar
Motorola Exhibit 1013
Page 197

decoder 115 decodes the video into a video output signal 120 and decodes the audio into a digital audio signal 125. The digital audio signal 125 is provided to a digital-to-audio converter 130 that converts the digital audio signal to an analog audio signal 135. A DVD/on-screen display (OSD) memory 140 may further be provided for use by the DVD decoder 115 as temporary storage during decoding.

[0034] The system of FIGURE 1 may also be provided with an Ethernet interface 145 that allows for communication between either a wired or wireless Ethernet-connected device and the microcontroller 90. The Ethernet interface 145 may be used, for example, for transmitting encoded audio and video, as well as associated metadata, to a central office. The Ethernet port can also be used for uploading new firmware files, and for populating user settings as configured on a laptop computer attached to the invention. Specific identifiers shown in FIGURE 1 for various components illustrated therein are for illustrative purposes. These identifiers will be understood by those having skill in the art to be merely examples of components that could be employed in the system shown therein. Other commercially available components could be employed without departing from the principles of the invention.

EVENT BASED RECORDING

[0035] In various embodiments of the present invention, recording of video, audio, and metadata is event-based. In these embodiments, the system only records when a triggering event has occurred, for example, when the user turns on the emergency lights, siren, the onboard accelerometers sense a vehicle crash, or when the user manually hits a record button. Upon occurrence of the event, the beginning of a recorded event is marked. Other examples of an event that initiates recording can be, for example, a traffic stop, a chase, a domestic call, or pulling into a driveway. The recording of the event continues until a stop point is determined. In at least one embodiment of the present invention, the stop point is determined when the user hits a stop button. The system may also include an automatic stop event that allows the system to automatically stop recording at a predetermined time after all start record triggers have been turned off (e.g., the lights and siren are off and the wireless microphone is off), but the user has forgotten to hit the stop button. If the system detects that that condition has occurred based on user settings, it can decide to enter a stop flag and stop recording the event.

[0036] In at least one embodiment of the present invention, when the system is turned on, two data streams (i.e., a high bit-rate stream and a low bit-rate stream) as well as metadata are recorded to the hard drive 80. The metadata may include, for example, the status of

Motorola v. Stellar
Motorola Exhibit 1013
Page 198

the brake lights, status of the emergency lights and siren, GPS coordinates, the vehicle's speed, data from an interface from the police radar system, etc. The metadata and the high and low bit-rate streams are time-stamped and synchronized. During recording to a DVD disc, the video and/or audio of events, as well as the metadata are recorded to the DVD disc.

[0037] The system may also use vehicle speed as a recording trigger where the system can initiate the recording of an event if the patrol car exceeds a preset speed. For example, a department supervisor can decide that if an officer ever goes in excess of 110 miles an hour, the system should begin recording an event to the hard drive 80 or the DVD drive 85. A new event begins automatically and the officer has no control over the recording of the event. Likewise, organizations outside of law enforcement may utilize threshold criteria for initiating self-activating monitoring of persons or conditions.

OPPORTUNISTIC ARCHIVING

[0038] The automobile environment is subject to demanding environmental conditions for the operation of electronic equipment. Recording onto a rewriteable DVD in an automobile environment is particularly subject to these conditions. A system in accordance with principles the present invention has a drive suspension system in place. The system monitors shock and vibration in x, y, and z axes using accelerometers. The system may also monitor the vehicle speed by one or more of three methods. The system can monitor vehicle speed through the VSS signal. If an optional GPS subsystem is included in the system, the system can get speed coordinates from the GPS data. If the system is interfaced to a radar system and the radar is operating in moving mode, the system can get vehicle speed from the radar. In various embodiments of the present invention, an opportunistic archiving algorithm is used that provides parameters and steering as to when the system should burn to the DVD drive 85. Using shock and vibration measurements, the opportunistic archiving algorithm is adapted to ensure that data is not written to the DVD disc until environmental conditions are acceptable for doing so.

[0039] Referring now to FIGURE 2, a procedure for opportunistic archiving without error checking in accordance with principles of the present invention is illustrated. In step 205, background recording of data including, for example, audio data, video data, and metadata, is initiated. In background recording, an encoded stream, and optionally associated metadata, is continuously written to the hard drive 80. Thus, referring again to FIGURES 1 and 2, during background recording, the first encoded stream 60a and the second encoded stream 60b, and optionally associated metadata, are continuously written to the hard drive 80. Background

Motorola v. Stellar
Motorola Exhibit 1013
Page 199

recording of audio, video, and metadata is typically performed in one minute segments, although it should be understood that other segment lengths may be used. After initiation of background recording (step 205), the data is buffered in RAM (step 210) and then written to the hard drive 80 (step 215). A determination is then made regarding whether any record triggers are active (step 217). If a determination is made that no active record triggers exist (step 220), background recording is continued (step 225) and the procedure returns to step 205.

[0040] If a determination is made that a record trigger is active (step 230), the data to be archived on the DVD is selected (step 235). The range of data to be archived includes selected time periods before and after event start and stop points. For example, the system can be configured to archive a range of data that extends from ten minutes prior to the start point and ten minutes after the stop point. At step 240, a verification of environmental factors is performed to insure that environmental conditions are acceptable for recording data to the DVD disc. The environmental factors can include, for example, temperature, shock, and vibration measurements. If the environmental factors are determined to exceed DVD drive limits (step 245), better environmental conditions are waited for via use of, for example, a timer (step 250), and the procedure returns to step 240. Steps 240-255 can be characterized collectively as opportunistic-archiving steps.

[0041] If the environmental factors are determined to be within predetermined limits (step 255), burning of a sector of data to the DVD disc is initiated (step 260). During the burn cycle, accelerometers are monitored to determine whether any G-spikes exceed tolerable limits (step 265). An example of a tolerable limit for burning of data to a DVD is less than 0.3 G. If it is determined that a G-spike occurred during the burn cycle that is above tolerable limits (step 270), a decision is made to rewrite the sector in question (step 275) and the procedure returns to step 260. If it is determined that no G-spikes occurred during the burn cycle that are above the tolerable limits (step 280), the procedure continues to the next sector to be burned (step 285) and then returns to step 205. Steps 260-285 can be characterized collectively as reactive correction steps.

[0042] Referring now to FIGURE 3, a procedure for opportunistic archiving with optional error checking in accordance with principles of the present invention is illustrated. In step 305, background recording of data including, for example, audio data, video data , and metadata, is initiated. In background recording, an encoded stream, and optionally associated metadata, is continuously written to the hard drive 80. Thus, referring again to FIGURES 1 and

Motorola v. Stellar
Motorola Exhibit 1013
Page 200

3, during background recording, the first encoded stream 60a and the second encoded stream 60b, and optionally associated metadata, are continuously written to the hard drive 80. Background recording of audio data , video data, and metadata is typically performed in one minute segments, although it should be understood that other segment lengths may be used. After initiation of background recording (step 305), the data is buffered in RAM (step 310) and then written to the hard drive 80 (step 315). A determination is then made regarding whether any record triggers are active (step 317). If a determination is made that no active record triggers exist (step 320), background recording is continued (step 325) and the procedure returns to step 305.

[0043] If a determination is made that a record trigger is active (step 330), the data to be archived on the DVD is selected (step 335). The range of data to be archived includes selected time periods before and after event start and stop points. For example, the system can be configured to archive a range of data that extends from ten minutes prior to the start point and ten minutes after the stop point. At step 340, a verification of environmental factors is performed in order to insure that environmental conditions are acceptable for recording data to the DVD disc. The environmental factors can include, for example, temperature, shock, and vibration measurements. If the environmental factors are determined to exceed DVD drive limits (step 345), better environmental conditions are waited for via use of, for example, a timer (step 350), and the procedure returns to step 340. Steps 340-355 can be characterized collectively as opportunistic archiving steps.

[0044] If the environmental factors are determined to be within predetermined limits (step 355), burning a sector of data to the DVD disc is initiated (step 360). At step 365, a checksum is calculate for the sector from hard drive data. The burned sector is then read from the DVD disc (step 370), and a checksum is calculated from the sector read from the DVD (step 375). The checksum obtained from hard drive data and the checksum obtained from the burned DVD sector are compared and, if the checksums do not match, the sector is rewritten (step 380) and the procedure returns to step 360. If the checksums match, the archiving procedure returns to step 305. Steps 360-385 can be characterized collectively as DVD burn error correction steps.

[0045] In various embodiments, an opportunistic archiving algorithm may be used that also considers, in addition to environmental factors, how much data the system needs to archive to the DVD disc. For example, if the system starts off in the morning and there have been no events and no start flags, the system is operating with zero unburned events. However,

Motorola v. Stellar
Motorola Exhibit 1013
Page 201

if, for example, the user gets into a high-speed chase that lasts for three hours and the system has not detected a stop trigger, the system has recorded three hours of unburned data to the hard drive 80. In this situation, the system could lower the environmental limits, at step 255 or 355 for example, in order to archive the large amount of accumulated data to the DVD disc. Environmental conditions, including a speed factor, may also be considered. The system may consider whether the vehicle is driving along at a high rate of speed (e.g., hundred miles an hour) or if it is stopped. The algorithm may also consider accumulated shock and vibration.

[0046] The algorithm processing starts with the calculation of how much data is present and comes up with a numerical value. And then the processor using the algorithm comes up with a numerical value for how conducive the environment is to DVD burning. The processor using the algorithm subtracts the environment number from the unburned data number and comes up with a value. If the value is positive, the need to burn data is greater than how bad the environmental conditions are. If the algorithm defines a negative number, the unburned data does not outweigh how bad the environmental conditions are.

[0047] If the environmental conditions are very poor, the system does not record anything. Instead, the system just waits and monitors for a while and checks the environmental conditions again. If the speed factor is zero (i.e., the car is stopped), that is preferably an automatic burn decision. Condition one is no speed, which is preferably an automatic decision to burn anything on the hard drive 80 that needs to be burned. Condition number two is unacceptable environmental conditions under which the system does not burn anything. Condition number three is somewhere in between, in which the system has some unburned event data, the car is moving, and determinations are made regarding how bad the conditions are, how much does the need to burn data outweigh the environmental conditions that the system detects.

[0048] The hard drive 80 of the system preferably has a accelerometer to detect physical shocks. When the hard drive 80 detects an unacceptable shock, the system goes back and recopies the last section. An error is assumed, so the last DVD section is overwritten. The hard drive 80 may be mounted on a vibration shock mount as well. In various embodiments, the DVD drive 85 can also include an accelerometer to detect physical shocks. Hard drives typically have a 200 g shock tolerance whereas DVD drives typically have a 0.5 g shock tolerance.

[0049] An illustrative opportunistic archiving algorithm could utilize the following equation:

Motorola v. Stellar
Motorola Exhibit 1013
Page 202

(Buffer Amount)-[(Speed Factor)+(Shock Factor)+(Vibration Factor)]=Archive Threshold

where

Buffer Amount = Size of Data Buffer

Speed Factor = Accumulated Vehicle Speed From Recent History

Shock Factor = Peak Shock in Recent History

Vibration Factor = Accumulated Vibration From Recent History

[0050] If the Archive Threshold is exceeded, the need to burn data overrides the environmental conditions. If the Archive Threshold is not exceeded, the amount of unburned data does not override the environmental conditions.

AUTOMATIC CHAPTER SEGMENTATION BY EVENT MARKERS

[0051] In various embodiments of the present invention, the system may be adapted to automatically divide the video into separate navigable chapters to make location of a specific point or event easier during playback, such that each chapter of the DVD disc contains the data from one event. This process eliminates the need to fast forward or rewind the media to search for a specific traffic stop or event. The start of an event period is determined by monitoring metadata from various devices, such as external emergency lights, emergency siren, wireless microphone activation, extreme shock data from accelerometers indicating, for example, a collision or panic braking, an elapsed time period, etc. The start of an event period can also be determined by an operator pressing a RECORD key on a control panel.

[0052] The end of an event is determined by the operator pressing a STOP key on the control panel or by the passage of a predetermined period of time after any triggering device is turned off or is inactive. In various embodiments, when the system is turned on, all video data, audio data, and metadata is continuously written to the hard drive 80, and only event data is written to the DVD disc. The system is able to automatically include video and audio data that occurred prior to the start of the event period or after the end of an event period by moving event start and end flags based on rules determined by user settings. For example, a setting in a user-interface menu can be used to determine how much data to include in the DVD chapter before and after the event markers.

[0053] Referring now to FIGURE 4, a procedure for automatic DVD-video chapter segmentation by external triggers is illustrated. In step 405, background recording of data including audio, video, and metadata is initiated. In various embodiments of the present

Motorola v. Stellar
Motorola Exhibit 1013
Page 203

invention, background recording of audio, video, and metadata is performed in one-minute segments, although it should be understood that other segment lengths may be used. At step 410, external record triggers are monitored for the occurrence of one or more triggering events. If a record trigger is not detected (step 415), the procedure returns to step 405.

[0054] If a record trigger is detected (step 420), a new chapter start point is initiated (step 425) that includes a specified number of minutes of data from before the event start point to the beginning of the chapter. At step 430, burning of the data from the event period to the DVD is started. At step 435, monitoring of stop triggers is performed. The stop triggers may be either generated by a timer or user-initiated. If a stop trigger is not detected (step 440), event recording is continued (step 445), and the procedure returns to step 430. If a stop trigger is detected (step 450), a chapter stop point is determined, which step includes a specified number of minutes of data from after the event stop point being added to the end of the chapter (step 455). Next, the DVD chapter menu is built (step 460), a video frame from the event is selected for use as a selectable chapter icon (step 465), and a time/date stamp from the chapter stop point is used as part of the chapter name/number (step 470). Next, the DVD chapter is closed out (step 475), and the procedure returns to step 405.

PARALLEL HIGH AND LOW BIT-RATE ENCODING

[0055] In order to provide users with the ability to archive as many hours of video and audio data on to a single DVD disc, while still providing maximum video quality for important events, various embodiments of the present invention provide for encoding multiple versions of the same video and audio source in parallel. The system encodes both a high bit-rate stream and a lower bit-rate stream. Both streams are buffered and written to the hard drive 80.

[0056] The rules for archiving event data to the DVD disc can be determined by user settings. During typical operation, the system will automatically transfer the lower bit-rate video stream to the DVD disc based on event markers. Should the system capture some video or audio footage that the user deems to be important, the user can transfer the high bit-rate version to the DVD disc from data on the hard drive 80. This process allows users to make extended-length recordings without having to sacrifice audio and video quality of important events.

[0057] A user may choose high or low quality video after an event has occurred. The system by default archives events to the DVD that are low quality. After the recording has been made, if something that was important has occurred, the user can easily go back and set new start and stop flags. A section of video may be chosen, whether it was included in the original

Motorola v. Stellar
Motorola Exhibit 1013
Page 204

event or not, a new chapter added to the DVD, and a high resolution version of the video can be chosen to be burned to DVD. After the fact, a user can choose to grab any video from the hard drive 80 and make new chapters on the DVD. The new chapters can be based on the same event or on multiple events or non-events, and then a user could choose high or low resolution.

[0058] Referring now to FIGURE 5, a procedure for high and low bit-rate encoding with post-event bit-rate selection in accordance with principles of the present invention is illustrated. In various embodiments of the present invention, the high and low bit-rate encoding occurs in parallel. At step 505, a raw video stream, such as a BT656 stream, is split into first and second streams that are identical to each other. The first stream is provided to a first video encoder 40a, which encodes the stream at a low bit-rate to be used for normal recording (step 510). The low bit-rate stream can be optionally written to a temporary storage area, such as a hard drive 80, Flash RAM, RAM, or other storage media (step 515). The second stream is provided to a second video encoder 40b, which encodes the stream at a high bit rate to be used as a backup for important events (step 520). The data of the high bit-rate stream is then written to a circular buffer (step 525), which is a continuously-overwritten data buffer on a hard drive 80, Flash RAM, RAM, or other storage media. If no important events occur while the high bit-rate data is in the circular buffer (step 530), new high bit-rate data overwrites old data in the circular buffer (step 535).

[0059] If an operator deems a time period from the data buffer to be important (step 540), the system takes the high-bit-rate data from the important time period (step 545) selected by the operator. At step 550, the low-bit-rate data and the selected portion of the high-bit-rate data are written to storage media, such as a DVD disc, hard drive, flash memory, etc. (step 550). In various embodiments, the step 550 of writing the low-bit-rate data to the storage media can include opportunistic archiving such as that described with respect to FIGURE 2 and FIGURE 3. In various embodiment of the present invention, step 515 of writing the low-bit-rate stream to a temporary storage can be omitted, and the low-bit-rate stream can be written directly to the storage media in step 550. In other embodiments of the present invention, the temporary storage for the low-bit-rate data and the circular buffer for the high-bit-rate data are the same hard drive, and the storage media for the low-bit-rate data and the selected portion of the high-bit-rate data are a DVD disc.

RECORD AFTER-THE-FACT

Motorola v. Stellar
Motorola Exhibit 1013
Page 205

[0060] Recording after-the-fact permits manual chapter event creation to be performed. If a user wants to go in after the fact and copy some video that wasn't marked as an event, the user can go back and manually put in a new start and stop point. The system will automatically grab that section of video and feed it to the DVD drive 85 and make a new chapter. The common use of that feature will be by, for example, internal affairs in order to investigate some alleged misconduct. Of course, embodiments of the system may be applied to areas outside of the area of law enforcement, and then the conduct referred to may be an officer or another party in an organization utilizing the methods and systems of the present invention.

DRIVE SUSPENSION SYSTEM

[0061] A drive suspension system in accordance with principles of the present invention permits isolation of the DVD drive from environmental conditions that could impair DVD burning. Different suspension systems may be used in different versions of the system. One version of the system as currently envisioned is entirely overhead-console mounted. Another version of the system is a multi-piece unit (e.g., two) that may be used when there is not room to mount the overhead console-mounted version. In the second version, the user can, for example, put the recording unit underneath the seat and the display and control panel on a stalk near the radio console area. Although packaging for the drive suspension system is different on the two versions discussed, the underlying principles are analogous and other versions are possible without departing from principles of the present invention.

[0062] Referring now to FIGURE 6, a perspective and side elevational view of an embodiment of a drive suspension system in accordance with an embodiment of the present invention are illustrated. In FIGURE 6, a DVD recorder drive 605 slides into a drive chassis 610. The drive suspension system includes a momentum mass in the form of a heavy steel chassis weight 615. The assembly including the DVD recorder drive 605, the drive chassis 610, and the chassis weight 615 is suspended inside an assembly shield area 620 by expansion elements, such as, for example, assembly springs 625. On the chassis 610, four pins 635 insert into four vibrational-energy-absorption elements, such as, for example, silicon-oil-filled sack dampers 630. A hole inside the particular damper shown in FIGURE 6 is provided for the pins 635 from the chassis 610 to meet into. The four silicon-oil-filled sack dampers 630 serve to stabilize the floating mechanism, provide heavy damping characteristics, and reduce the resonance frequency. The chassis weight 615 provides momentum and also serves to help

Motorola v. Stellar
Motorola Exhibit 1013
Page 206

reduce the resonance frequency. In a typical embodiment, there is about one-half inch of suspension travel in every direction.

[0063] In the under-seat version of the system, a spring orientation pivot 640 is used to permit horizontal mounting or vertical mounting (e.g., on the side of a cage) or mounting on a stalk or on a center console. If the system is mounted flat, the springs are mounted in an upward orientation.. However, if the user turns the orientation such that the drive is pointing upward and gravity is trying to pull the drive in a different direction, the spring may be pivoted so that the spring is able to handle the gravity load in that direction.

AUTOMATIC DVD-VIDEO DISC RECORD OVERFLOW HANDLING

[0064] Various embodiments of the invention provide a method to seamlessly allow a user to record data onto the DVD disc to the disc's capacity, yet continue to capture and prepare additional data intended to be burned onto another DVD disc. With previous in-vehicle recording systems, there was a risk of running out of media (e.g., DVD) space during the middle of a patrol officer's shift. Since the media is considered evidentiary in nature, many law enforcement agencies limit access to the media, and do not provide the officer with a second piece of media. Thus, when the media became full, it would necessitate a trip back to the police station to replace the media with blank media. Automatic DVD-Video disc record overflow handling in accordance with principles of the invention serves to eliminate the need for an officer to return to the police station to replace media during a shift. The officer may continue recording even after the DVD media is at capacity. In a typical case, the system finalizes a first DVD and automatically prepares unburned data for an additional DVD. When new media (e.g., DVD) is inserted into the drive, the unburned data is automatically transferred onto the new media.

[0065] Referring now to FIGURE 7, a procedure for automatic DVD-video disc record overflow handling is illustrated. At step 705, video, audio, and data from vehicle mounted cameras, microphones, and sensors is captured. At step 710, video, audio, and data is continuously written onto a hard drive 80. Next, a determination is made regarding whether the system is in event-record mode (step 715). If the system is not in event-record mode, the procedure (step 720) returns to step 705. Steps 705-720 can be characterized collectively as a data-capture process.

[0066] If it is determined that the system is in event-record mode (step 725), the procedure continues to step 730, at which step data is written into a DVD image working

Motorola v. Stellar
Motorola Exhibit 1013
Page 207

directory on the hard drive 80. At step 735, a determination is made regarding whether the working directory is close to reaching the size limit of the DVD disc. If it is determined that the working directory is not close to reaching the size limit of the DVD disc (step 740), the procedure returns to step 715. If it is determined that the working directory is close to reaching the size limit of the DVD disc, a DVD chapter-stop point is initiated and a DVD chapter menu is built (step 745). Next, all remaining files for the DVD-video image are closed out (step 750), the current working directory is saved (step 755), and a new working directory is created (step 760). The procedure then returns to step 715. Steps 730-760 can be characterized collectively as DVD image preparation steps.

[0067] From step 730, an execution proceeds also to step 765. At step 765, un-burned data in the working directory is looked for. Next, a determination is made regarding whether there is un-burned data in the working directory (step 770). If there is no un-burned data in the working directory (step 775), the process returns to step 765. If there is unburned data in the working directory, DVD-video data from the working directory is transferred on to the DVD-video disc (step 780). At step 785, a determination is made regarding whether the working directory contains finalized files. If the working directory does not contain finalized files (step 787), the procedure returns to step 765. If the working directory contains finalized files, the DVD is finalized (step 790). At step 795, the user is prompted to replace the current DVD with a blank DVD. At step 796, a determination is made regarding if the user has loaded a blank DVD. If the user has not loaded a blank DVD (step 797), the procedure returns to step 795. If the user has loaded a blank DVD, a check is made for a new DVD working directory (step 798). The procedure then returns to step 765. Steps 765-798 can be characterized collectively as DVD burning process steps.

AUTOMATIC DVD DISC-IMAGE BACK-UP

[0068] In various embodiments, the system's hard drive 80 is formatted with a separate partition that is reserved for making mirror images of DVD discs. A typical DVD RW disc is 4.7 GB. As the system is creating a DVD disc, the system makes an exact duplicate of the entire disc on the hard drive 80 in a separate partition. An administrator or user can select how many back-up copies of DVDs the system retains.

[0069] As the user continues to create new DVDs, the oldest hard-drive backup will be overwritten; thus, if the user selected three back-up images, by the time the user creates the fourth DVD, the oldest one is being overwritten with a mirror image of the number four disc.

Motorola v. Stellar
Motorola Exhibit 1013
Page 208

Using this feature, if an original DVD is lost, unreadable, or intentionally destroyed, a supervisor can go back and create an exact copy of the same DVD disc.

VIDEO DATA SECURITY

[0070] Since the system's video files are typically in MPEG-2 format, the files could conceivably be manipulated using video-editing tools. In litigation, attorneys could attempt bring into question the authenticity of the MPEG files, suggesting that they could be exported, manipulated, and then re-inserted onto the disc. The system thus uses checksums in some embodiments to ensure that the files have not been manipulated or edited.

First Level of Security – The Self-Verifying Checksum Result

[0071] When the system is ready to close a DVD disc (e.g., just prior to disc ejection), the system performs a checksum calculation on the disc contents and writes that result into a hidden and/or encrypted file saved on the DVD disc. By using a video utility, the DVD disc can be analyzed to see if a checksum result from the disc's contents matches the result of the hidden (and/or encrypted) checksum result on that DVD disc. This process verifies that the disc's content matches the checksum file.

Second Level of Security – System Verification of the Hidden (or Encrypted) Checksum Files

[0072] The system also provides a method to verify that the checksum file that is hidden on a DVD disc has not been recreated to match a manipulated disc. This is done by comparing subsequently-recorded DVD discs (e.g., discs recorded using the same system) to the DVD disc in question. The system automatically generates a unique disc serial number for each DVD disc it records. This serial number is written onto the DVD disc and is also saved into a log file in the system's non-volatile memory. When a DVD disc is closed, the checksum result of that DVD disc is also written to the log file in the system's non-volatile memory.

[0073] The log file preferably contains the serial number and checksum result of every DVD disc that that specific system has authored. The entire contents of the log files that are stored on the system's non-volatile memory may then be copied onto every DVD disc the system creates. Every DVD disc created by a specific system can be used to verify the validity of a checksum result contained on any other DVD disc previously recorded by the same system.

COVERT RECORDING MODE

[0074] In various embodiments of the present invention, the system has the ability to be placed into a covert-recording mode. In this mode, the system has the appearance of being

Motorola v. Stellar
Motorola Exhibit 1013
Page 209

powered off. However, it is actually recording data, such as video and audio, on the hard drive 80. The covert-recording mode permits events inside a patrol car to be recorded without a suspect being aware that he is being recorded. A record trigger is generated when the system is placed into covert-recording mode. However, the system will only archive to the DVD after the system has been taken out of covert recording mode to prevent the DVD drive noise from giving an indication that the system is not actually powered off.

[0075] In an illustrative example of placing the system into covert recording mode, a user presses and holds a power OFF key for more than 2 seconds. A sound indicates that the unit has been placed into covert recording mode and all lights, backlights, indicators, and displays are turned off. This gives the appearance to a back-seat occupant that the unit is turned off. The system automatically selects an interior camera input to be recorded. The covert mode is ended by pressing POWER ON or a STOP key. At that time, the system lights, backlights, indicators, and displays are turned on, and the video that has been marked for recording will be archived to the DVD disc.

[0076] Various embodiments of the invention may reside in a computer system. Here, the term "computer system" is to be understood to include at least a memory and a processor. In general, the memory will store, at one time or another, at least portions of an executable program code, and the processor will execute one or more of the instructions included in that executable program code. It will be appreciated that the term "executable program code" and the term "software" mean substantially the same thing for the purposes of this description. It is not necessary to the practice of this invention that the memory and the processor be physically located in the same place. That is to say, it is foreseen that the processor and the memory might be in different physical pieces of equipment or even in geographically distinct locations.

[0077] Various embodiments of the invention may also be embodied in a computer program product, as will now be explained. On a practical level, the software that enables the computer system to perform the operations described further below in detail, may be supplied on any one of a variety of media. Furthermore, the actual implementation of the approach and operations of the invention are actually statements written in a programming language. Such programming language statements, when executed by a computer, cause the computer to act in accordance with the particular content of the statements. Furthermore, the software that enables a computer system to act in accordance with the invention may be provided in any number of

Motorola v. Stellar
Motorola Exhibit 1013
Page 210

forms including, but not limited to, original source code, assembly code, object code, machine language, compressed or encrypted versions of the foregoing, and any and all equivalents.

[0078] One of skill in the art will appreciate that "media", or "computer-readable media", as used here, may include a diskette, a tape, a compact disc, an integrated circuit, a ROM, a CD, a cartridge, a remote transmission via a communications circuit, or any other similar medium useable by computers. For example, to supply software for enabling a computer system to operate in accordance with the invention, the supplier might provide a diskette or might transmit the software in some form via satellite transmission, via a direct telephone link, or via the Internet. Thus, the term, "computer readable medium" is intended to include all of the foregoing and any other medium by which software may be provided to a computer.

[0079] Although the enabling software might be "written on" a diskette, "stored in" an integrated circuit, or "carried over" a communications circuit, it will be appreciated that, for the purposes of this application, the computer usable medium will be referred to as "bearing" the software. Thus, the term "bearing" is intended to encompass the above and all equivalent ways in which software may be associated with a computer usable medium.

[0080] For the sake of simplicity, therefore, the term "program product" is thus used to refer to a computer useable medium, as defined above, which bears in any form of software to enable a computer system to operate according to the above-identified invention. Thus, the invention may also be embodied in a program product bearing software that enables a computer to perform management of information according to the invention.

[0081] In the foregoing Detailed Description, it can be seen that various features may be grouped together into a single embodiment for the purpose of streamlining the disclosure. This method of disclosure is not to be interpreted as reflecting an intention that the claimed embodiment(s) of the invention require more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive subject matter lies in less than all the features of a single disclosed embodiment. Thus, the following claims are hereby incorporated into the Detailed Description, with each claim standing on its own as a separate embodiment of the invention.

Motorola v. Stellar
Motorola Exhibit 1013
Page 211

WHAT IS CLAIMED IS:

1. A video-data chapter segmentation method comprising:

monitoring for at least one external start trigger;

responsive to detection of at least one of the at least one external start trigger, creating a chapter start point at a point in the video data corresponding to a specified time preceding the at least one detected external start trigger;

initiating recording of the video data beginning at the point in the video data;

monitoring for at least one stop trigger; and

responsive to detection of at least one of the at least one stop trigger, creating a chapter stop point at a point in the data corresponding to a specified time preceding the at least one detected stop trigger.

2. The method of claim 1, wherein the step of monitoring for at least one external start trigger comprises at least one of:

monitoring for emergency light activation;

monitoring for siren activation;

monitoring for a vehicle crash;

monitoring for a predefined vehicle speed being exceeded;

monitoring for wireless microphone activation;

monitoring for record button activation; and

monitoring for acceleration outside a predefined range.

3. The method of claim 1, wherein the specified time preceding the at least one detected external start trigger is zero seconds.

4. The method of claim 1, wherein the specified time preceding the at least one detected stop trigger is zero seconds.

5. The method of claim 1, wherein the step of monitoring for at least one stop trigger comprises at least one of:

monitoring for stop button activation;

monitoring for timer expiration following deactivation of a triggering device.

Motorola v. Stellar
Motorola Exhibit 1013
Page 212

6. The method of claim 1, further comprising:

building a chapter menu;

using a frame from the video data between the chapter start point and the chapter stop inclusive as a selectable chapter icon.

7. The method of claim 6, further comprising using a time and date stamp from the chapter start point in a chapter identifier.

8. The method of claim 7, further comprising background recording the video data.

9. The method of claim 1, further comprising, prior to detection of the at least one stop trigger, continuing recording of the video data.

10. A video-data chapter segmentation computer system comprising:

a processor; and

a memory including software instructions adapted to enable the computer system to perform the steps of:

monitoring for at least one external start trigger;

responsive to detection of at least one of the at least one external start trigger, creating a chapter start point at a point in the video data corresponding to a specified time preceding the at least one detected external start trigger;

initiating recording of the video data beginning at the point in the video data;

monitoring for at least one stop trigger; and

responsive to detection of at least one of the at least one stop trigger, creating a chapter stop point at a point in the data corresponding to a specified time preceding the at least one detected stop trigger.

11. The computer system of claim 10, wherein the step of monitoring for at least one external start trigger comprises at least one of:

monitoring for emergency light activation;

monitoring for siren activation;

monitoring for a vehicle crash;

monitoring for a predefined vehicle speed being exceeded;

Motorola v. Stellar
Motorola Exhibit 1013
Page 213

monitoring for wireless microphone activation;

monitoring for record button activation; and

monitoring for acceleration outside a predefined range.

12. The computer system of claim 10, wherein the specified time preceding the at least one detected external start trigger is zero seconds.

13. The computer system of claim 10, wherein the specified time preceding the at least one detected stop trigger is zero seconds.

14. The computer system of claim 10, wherein the step of monitoring for at least one stop trigger comprises at least one of:

monitoring for stop button activation;

monitoring for timer expiration following deactivation of a triggering device.

15. The computer system of claim 10, further comprising software instructions adapted to enable the computer system to perform the steps of:

building a chapter menu;

using a frame from the video data between the chapter start point and the chapter stop inclusive as a selectable chapter icon.

16. The computer system of claim 15, further comprising software instructions adapted to enable the computer system to perform the step of using a time and date stamp from the chapter start point in a chapter identifier.

17. The computer system of claim 16, the software instructions further comprising software instructions adapted to enable the computer system to perform the steps of background recording the video data.

18. The computer system of claim 10, further comprising software instructions adapted to enable the computer system to perform the step of, prior to detection of the at least one stop trigger, continuing recording of the video data.

Motorola v. Stellar
Motorola Exhibit 1013
Page 214

19. A data-encoding system comprising:

a source of unencoded data;

a first encoder interoperably coupled to the source;

wherein the first encoder is adapted to receive the unencoded data, encode the unencoded data, and output encoded data at a first data rate;

a second encoder interoperably coupled to the source;

wherein the second encoder is adapted to receive the unencoded data, encode the unencoded data, and output encoded data at a second data rate;

wherein the second data rate exceeds the first data rate.

20. The data-encoding system of claim 19, further comprising:

a first data storage device adapted to store the data encoded at the first rate; and

a second data storage device adapted to store a user-selected portion of the data encoded at the second rate.

21. The data-encoding system of claim 20, wherein the first data storage device and the second data storage device are identical.

22. The data-encoding system of claim 20, wherein:

the first data storage comprises non-removable data storage media; and

the second data storage comprises removable data storage media.

23. The data-encoding system of claim 22, wherein:

the first data storage is a hard drive; and

the removable data storage media is selected from the group consisting of a digital video disc and a compact disc.

24. The data-encoding system of claim 22, wherein the first data storage is adapted to store at least a portion of the data encoded at the second rate and output the user-selected portion of the data encoded at the second rate.

25. The data-encoding system of claim 24, wherein the second data storage is adapted to receive the user-selected portion of the data encoded at the second rate from the first data storage and store the received user-selected portion of the data encoded at the second rate.

Motorola v. Stellar
Motorola Exhibit 1013
Page 215

26. The data-encoding system of claim 21, further comprising a third data storage adapted to receive the user-selected portion of the data encoded at the second rate from the second data storage and store the received user-selected portion of the data encoded at the second rate.

27. The data-encoding system of claim 24, wherein the first data storage cyclically overwrites previously-stored data encoded at the second rate responsive to receipt of new data encoded at the second rate.

28. The data-encoding system of claim 19, wherein the unencoded data is video data.

29. A data-encoding method comprising:

a first encoder interoperably coupled to a source of unencoded data receiving the unencoded data, encoding the unencoded data, and outputting encoded data at a first data rate;

a second encoder interoperably coupled to the source receiving the unencoded data, encoding the unencoded data, and outputting encoded data at a second data rate; and

wherein the second data rate exceeds the first data rate.

30. The data-encoding method of claim 29, further comprising:

a first data storage device storing the data encoded at the first rate; and

a second data storage device storing a user-selected portion of the data encoded at the second rate.

31. The method of claim 30, wherein the first data storage device and the second data storage device are identical.

32. The method of claim 30, wherein:

the first data storage comprises non-removable data storage media; and

the second data storage comprises removable data storage media.

33. The method of claim 32, wherein:

the first data storage is a hard drive; and

the removable data storage media is selected from the group consisting of a digital video disc and a compact disc.

Motorola v. Stellar
Motorola Exhibit 1013
Page 216

34. The data-encoding method of claim 32, further comprising the first data storage storing at least a portion of the data encoded at the second rate and outputting the user-selected portion of the data encoded at the second rate.

35. The data-encoding method of claim 34, further comprising the second data storage receiving the user-selected portion of the data encoded at the second rate from the first data storage and storing the received user-selected portion of the data encoded at the second rate.

36. The data-encoding method of claim 31, further comprising a third data storage adapted receiving the user-selected portion of the data encoded at the second rate from the second data storage and storing the received user-selected portion of the data encoded at the second rate.

37. The data-encoding method of claim 34, further comprising the first data storage cyclically overwriting previously-stored data encoded at the second rate responsive to receipt of new data encoded at the second rate.

38. The data-encoding method of claim 29, wherein the unencoded data is video data.

39. A data-overflow-handling method comprising:

storing at least one of captured audio data, video data, and metadata to a first directory of a non-removable data storage medium;

determining whether an event is being recorded;

responsive to a determination that an event is being recorded, storing an image of the stored at least one of captured audio data, video data, and metadata to a second directory of the non-removable data storage medium;

determining whether a predefined capacity threshold relative to a removable data storage medium has been exceeded;

responsive to a determination that the predefined capacity threshold has been exceeded, creating a third directory of the non-removable data storage medium;

determining whether data in the second directory of the non-removable storage medium has not been stored to the removable data storage medium;

Motorola v. Stellar
Motorola Exhibit 1013
Page 217

responsive to a determination that data in the second directory of the non-removable storage medium has not been stored to the removable data storage medium, storing any unstored data in the second directory to the removable data storage medium;

determining whether the second directory contains finalization files;

responsive to a determination that the second directory contains finalization files, finalizing the removable storage medium and providing a prompt to insert another removable storage medium; and

responsive to a determination that the second directory contains no finalization files, returning to the step of determining whether data in the second directory of the non-removable storage medium has not been stored to the removable data storage medium.

40. The data-overflow-handling method of claim 39, further comprising, responsive to insertion of another removable data storage medium, checking for the third directory.

41. The data-overflow-handling method of claim 40, further comprising:

determining whether data in the third directory of the non-removable storage medium has not been stored to the removable data storage medium;

responsive to a determination that data in the third directory of the non-removable storage medium has not been stored to the removable data storage medium, storing any unstored data in the third directory to the new removable data storage medium;

determining whether the third directory contains finalization files; and

responsive to a determination that the third directory contains finalization files, finalizing the removable storage medium and providing a prompt to insert another removable storage medium.

42. The data-overflow-handling method of claim 39, wherein:

a hard drive comprises the non-removable data storage medium; and

the removable data storage medium is a digital video disc.

Motorola v. Stellar
Motorola Exhibit 1013
Page 218

43. A data-overflow-handling computer system comprising:

a processor; and

a memory including software instructions adapted to enable the computer system to perform the steps of:

storing at least one of captured audio data, video data, and metadata to a first directory of a non-removable data storage medium;

determining whether an event is being recorded;

responsive to a determination that an event is being recorded, storing an image of the stored at least one of captured audio data, video data, and metadata to a second directory of the non-removable data storage medium;

determining whether a predefined capacity threshold relative to a removable data storage medium has been exceeded;

responsive to a determination that the predefined capacity threshold has been exceeded, creating a third directory of the non-removable data storage medium;

determining whether data in the second directory of the non-removable storage medium has not been stored to the removable data storage medium;

responsive to a determination that data in the second directory of the non-removable storage medium has not been stored to the removable data storage medium, storing any unstored data in the second directory to the removable data storage medium;

determining whether the second directory contains finalization files;

responsive to a determination that the second directory contains finalization files, finalizing the removable storage medium and providing a prompt to insert another removable storage medium; and

responsive to a determination that the second directory contains no finalization files, returning to the step of determining whether data in the second directory of the non-removable storage medium has not been stored to the removable data storage medium.

44. The computer system of claim 43, further comprising software instructions adapted to enable the computer system to perform the step of, responsive to insertion of another removable data storage medium, checking for the third directory.

Motorola v. Stellar
Motorola Exhibit 1013
Page 219

45. The system of claim 44, further comprising software instructions adapted to enable the computer system to perform the steps of::

determining whether data in the third directory of the non-removable storage medium has not been stored to the removable data storage medium;

responsive to a determination that data in the third directory of the non-removable storage medium has not been stored to the removable data storage medium, storing any unstored data in the third directory to the new removable data storage medium;

determining whether the third directory contains finalization files; and

responsive to a determination that the third directory contains finalization files, finalizing the removable storage medium and providing a prompt to insert another removable storage medium.

46. The system of claim 43, wherein:

a hard drive comprises the non-removable data storage medium; and

the removable data storage medium is a digital video disc.

47. A method of archiving data, the method comprising:

receiving data;

storing the data on a first data storage medium;

selecting a portion of the data;

determining if at least one environmental factor indicates that environmental conditions are acceptable for storing the selected portion of the data on a second data storage medium; and

responsive to a determination that the at least one environmental factor indicates that environmental conditions are acceptable, storing the selected portion of the data on the second data storage medium.

48. The method of claim 47, further comprising:

responsive to a determination that the at least one environmental factor indicates that environmental conditions are not acceptable, returning to the determining step.

49. The method of claim 47, wherein the at least one environmental factor comprises at least one of temperature, physical shock, and vibration.

Motorola v. Stellar
Motorola Exhibit 1013
Page 220

50. The method of claim 47, wherein the step of determining further comprises:

measuring the at least one environmental factor; and

determining if the at least one environmental factor is less than a predetermined threshold.

51. The method of claim 47, wherein the step of storing the selected portion of the data on the second data storage medium further comprises:

writing the selected portion of the data on the second data storage medium;

monitoring at least one accelerometer during the storing of the selected portion of the data;

determining if an output value of the at least one accelerometer exceeds a predetermined accelerometer threshold; and

responsive to a determination that the output value of the at least one accelerometer exceeds the predetermined accelerometer threshold, rewriting the selected portion of the data on the second data storage medium.

52. The method of claim 51, further comprising:

responsive to a determination that the output value of the at least one accelerometer does not exceed the predetermined accelerometer threshold, returning to the selecting step.

53. The method of claim 47, wherein the step of storing the selected portion of the data on the second data storage medium further comprises:

writing the selected portion of the data on the second data storage medium;

calculating a first checksum corresponding to the selected portion of the data;

reading the selected written portion of the data from the second data storage medium;

calculating a second checksum corresponding the selected written portion of the data read from the second data storage medium;

determining if the first checksum matches the second checksum; and

responsive to a determination that the first checksum does no match the second checksum, rewriting the selected portion of the data on the second data storage medium.

54. The method of claim 53, further comprising:

Motorola v. Stellar
Motorola Exhibit 1013
Page 221

responsive to a determination that the first checksum matches the second checksum, returning to the selecting step.

55. The method of claim 47, wherein the encoded data comprises at least one of video data, audio data, and metadata.

56. The method of claim 47, wherein the data comprises encoded data.

57. The method of claim 47, wherein the first data storage medium comprises a non-removable storage medium.

58. The method of claim 47, wherein the second data storage medium comprises a removable storage medium.

Motorola v. Stellar
Motorola Exhibit 1013
Page 222

59. A computer system for archiving data, the computer system comprising:

a processor; and

a memory including software instructions adapted to enable the computer system to perform the steps of:

receiving data;

storing the data on a first data storage medium;

selecting a portion of the data;

determining if at least one environmental factor indicates that environmental conditions are acceptable for storing the selected portion of the data on a second data storage medium; and

responsive to a determination that the at least one environmental factor indicates that environmental conditions are acceptable, storing the selected portion of the data on the second data storage medium.

60. The computer system of claim 59, further comprising software instructions adapted to enable the computer system to perform the step of, responsive to a determination that the at least one environmental factor indicates that environmental conditions are not acceptable, returning to the determining step.

61. The computer system of claim 59, wherein the at least one environmental factor comprises at least one of temperature, physical shock, and vibration.

62. The computer system of claim 59, wherein the step of determining further comprises:

measuring the at least one environmental factor; and

determining if the at least one environmental factor is less than a predetermined threshold.

63. The computer system of claim 59, wherein the step of storing the selected portion of the data on the second data storage medium further comprises:

writing the selected portion of the data on the second data storage medium;

monitoring at least one accelerometer during the storing of the selected portion of the data;

Motorola v. Stellar
Motorola Exhibit 1013
Page 223

determining if an output value of the at least one accelerometer exceeds a predetermined accelerometer threshold; and

responsive to a determination that the output value of the at least one accelerometer exceeds the predetermined accelerometer threshold, rewriting the selected portion of the data on the second data storage medium.

64. The computer system of claim 63, further comprising software instructions adapted to enable the computer system to perform the step of, responsive to a determination that the output value of the at least one accelerometer does not exceed the predetermined accelerometer threshold, returning to the selecting step.

65. The computer system of claim 59, wherein the step of storing the selected portion of the data on the second data storage medium further comprises:

writing the selected portion of the data on the second data storage medium;

calculating a first checksum corresponding to the selected portion of the data;

reading the selected written portion of the data from the second data storage medium;

calculating a second checksum corresponding the selected written portion of the data read from the second data storage medium;

determining if the first checksum matches the second checksum; and

responsive to a determination that the first checksum does no match the second checksum, rewriting the selected portion of the data on the second data storage medium.

66. The computer system of claim 65, further comprising software instructions adapted to enable the computer system to perform the step of, responsive to a determination that the first checksum matches the second checksum, returning to the selecting step.

67. The computer system of claim 59, wherein the encoded data comprises at least one of video data, audio data, and metadata.

68. The computer system of claim 59, wherein the data comprises encoded data.

69. The computer system of claim 59, wherein the first data storage medium comprises a non-removable storage medium.

Motorola v. Stellar
Motorola Exhibit 1013
Page 224

70. The computer system of claim 59, wherein the second data storage medium comprises a removable storage medium.

71. A data security method comprising:

performing a checksum on data contained on a removable data storage medium;

storing the checksum on the removable data storage medium in at least one of an encrypted and a hidden form;

storing a unique serial number pertaining to the removable storage medium to the removable storage medium; and

storing a checksum and a corresponding unique serial number of a plurality of previous removable storage media to the removable storage medium.

72. The data security method of claim 71, further comprising storing the unique serial number pertaining to the removable storage medium to a non-removable storage medium of a system used to store data to the removable storage medium.

73. A data security computer system comprising:

a processor; and

a memory including software instructions adapted to enable the computer system to perform the steps of:

performing a checksum on data contained on a removable data storage medium;

storing the checksum on the removable data storage medium in at least one of an encrypted and a hidden form;

storing a unique serial number pertaining to the removable storage medium to the removable storage medium; and

storing a checksum and a corresponding unique serial number of a plurality of previous removable storage media to the removable storage medium.

74. The data security system of claim 73, further comprising software instructions adapted to enable the computer system to perform the step of storing the unique serial number pertaining to the removable storage medium to a non-removable storage medium of a system used to store data to the removable storage medium.

Motorola v. Stellar
Motorola Exhibit 1013
Page 225

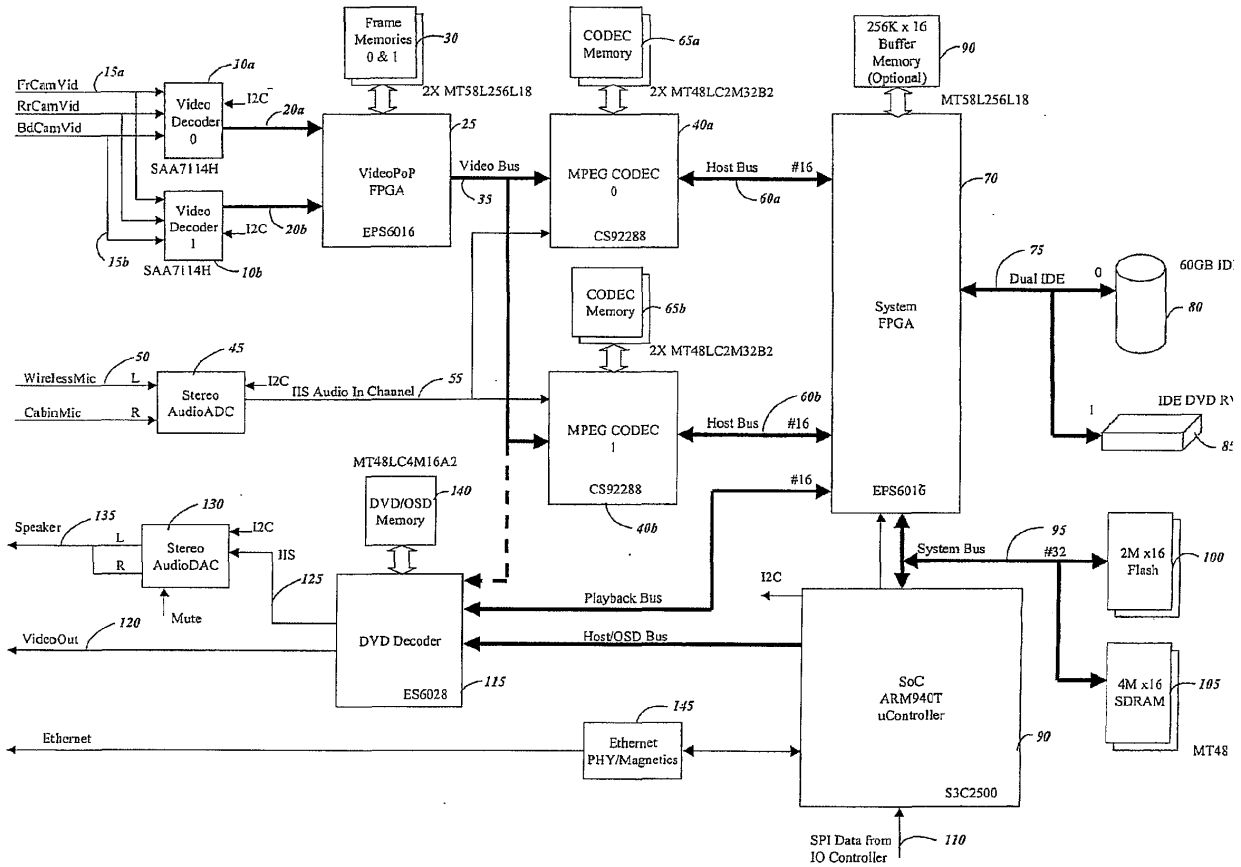


FIGURE 1

Motorola v. Stellar
Motorola Exhibit 1013
Page 226

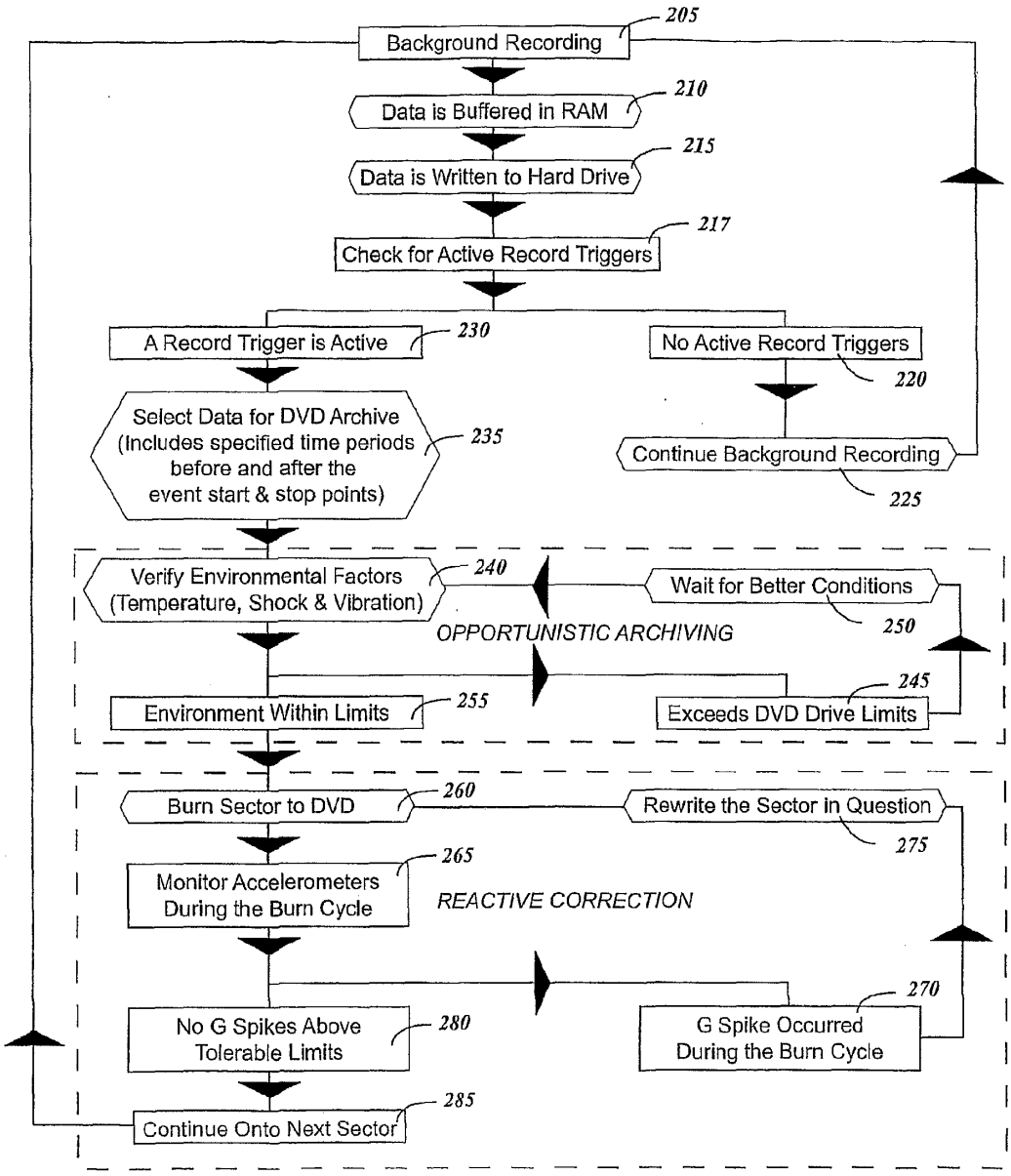


FIGURE 2

Motorola v. Stellar
Motorola Exhibit 1013
Page 227

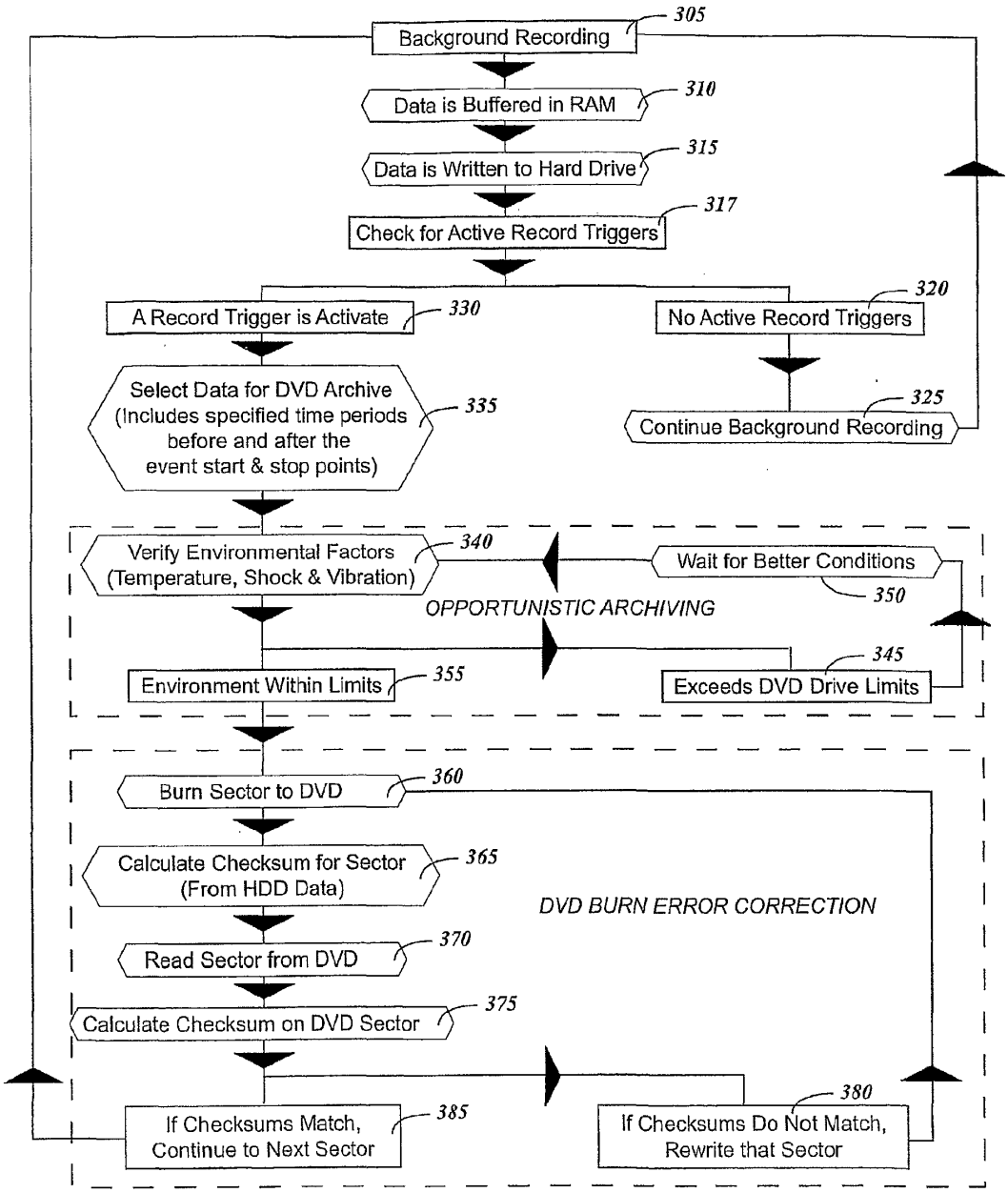


FIGURE 3

Motorola v. Stellar
Motorola Exhibit 1013
Page 228

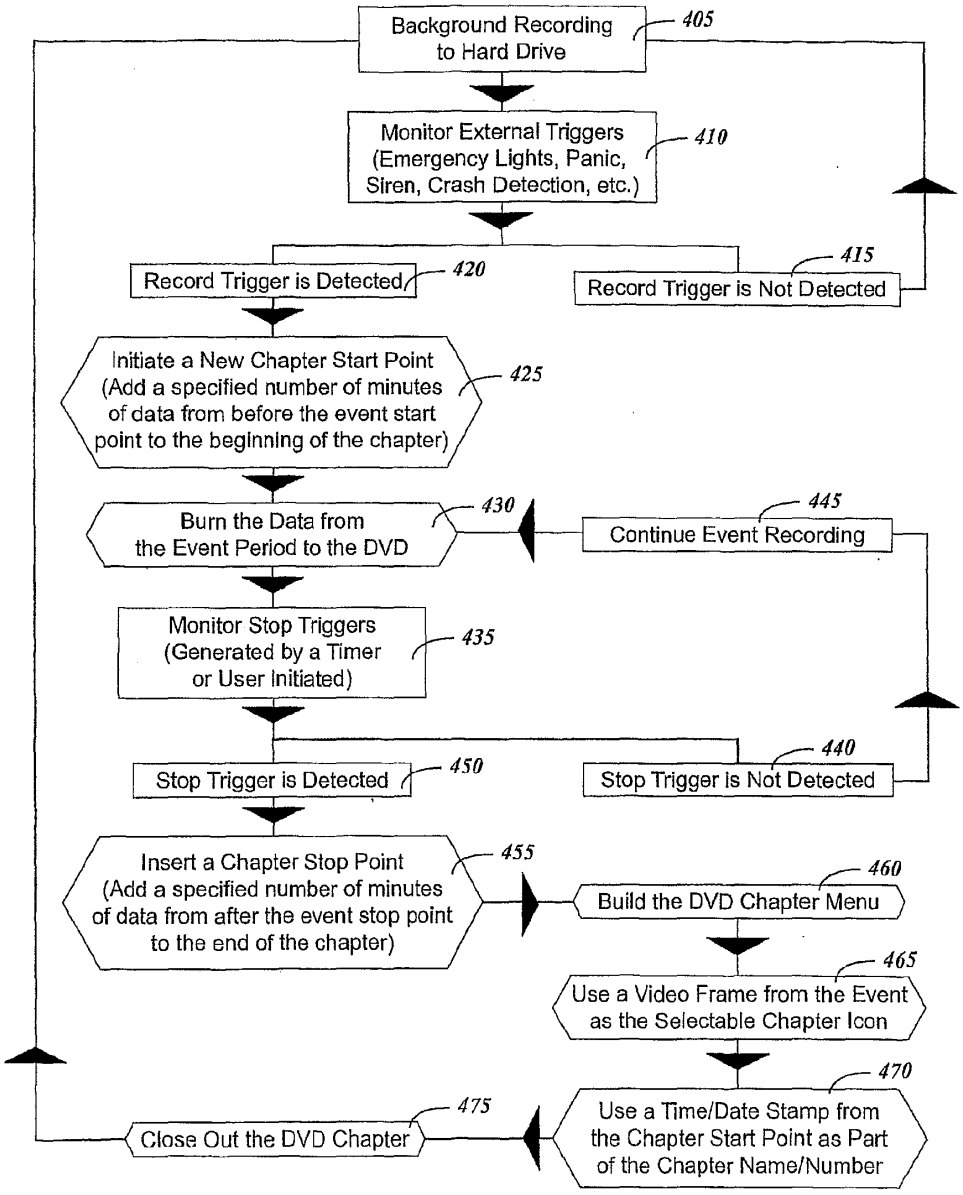


FIGURE 4

Motorola v. Stellar
Motorola Exhibit 1013
Page 229

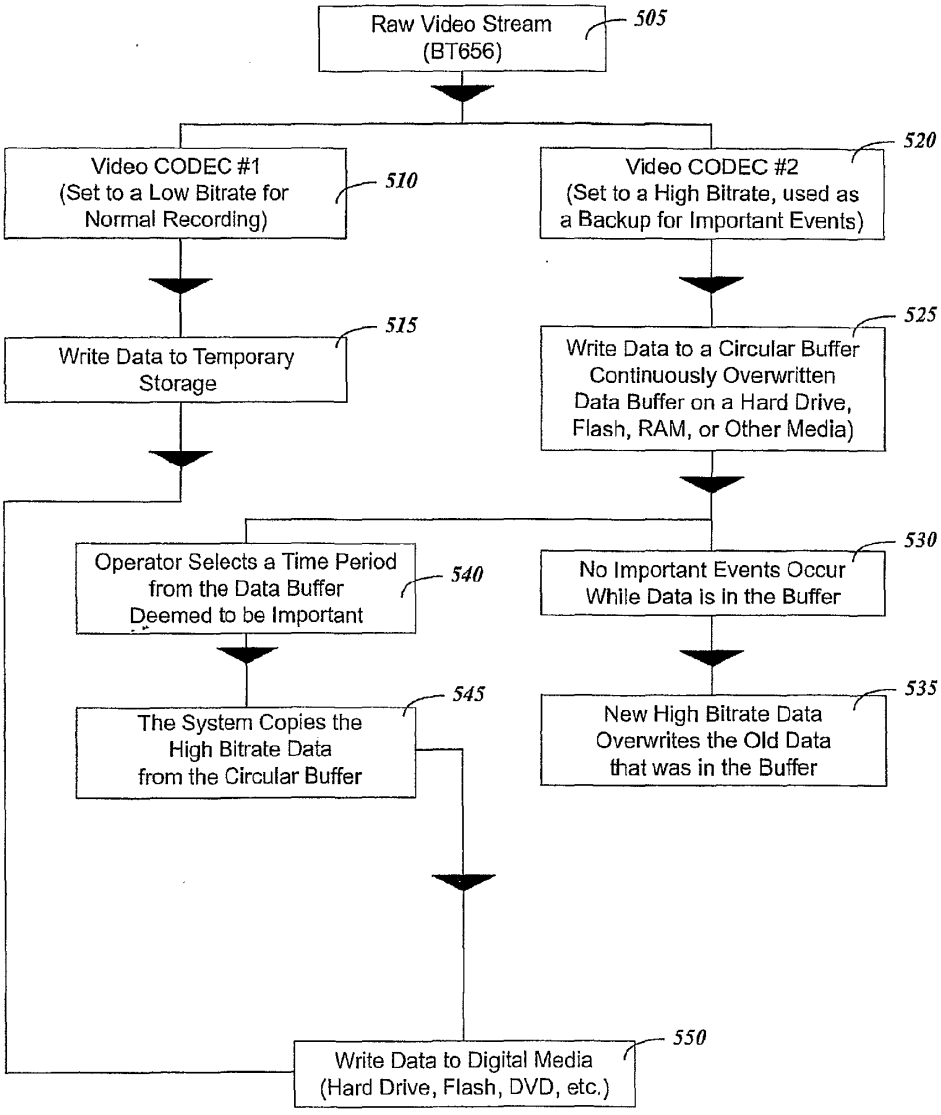


FIGURE 5

Motorola v. Stellar
Motorola Exhibit 1013
Page 230

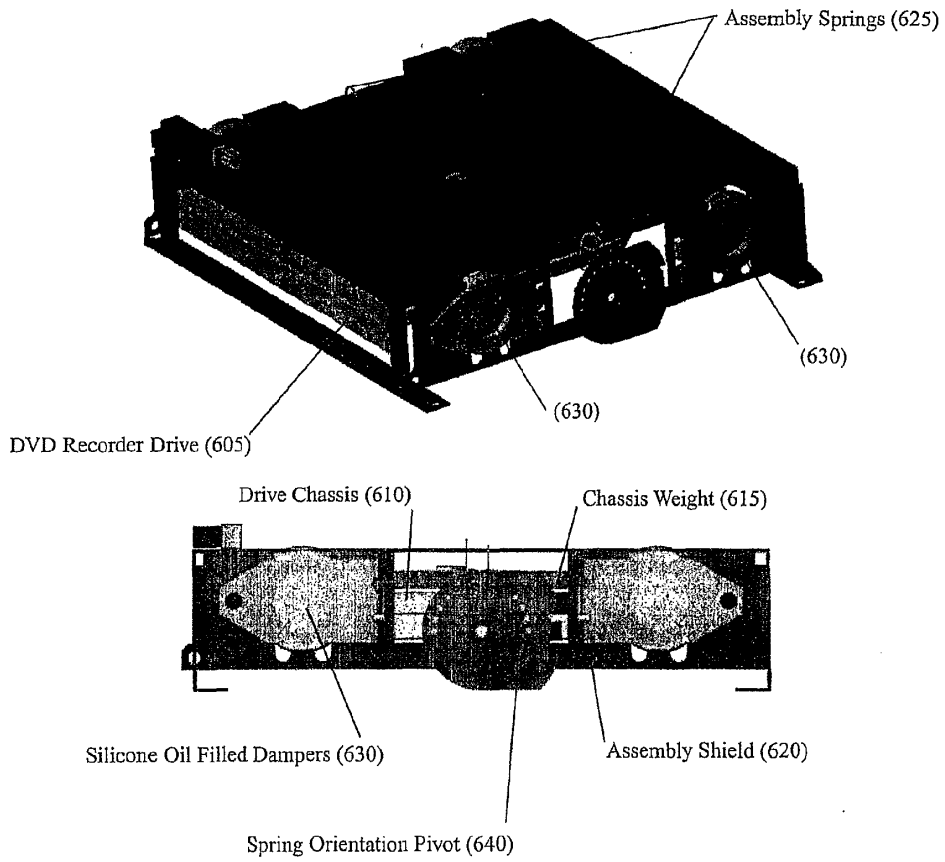


FIGURE 6

Motorola v. Stellar
Motorola Exhibit 1013
Page 231

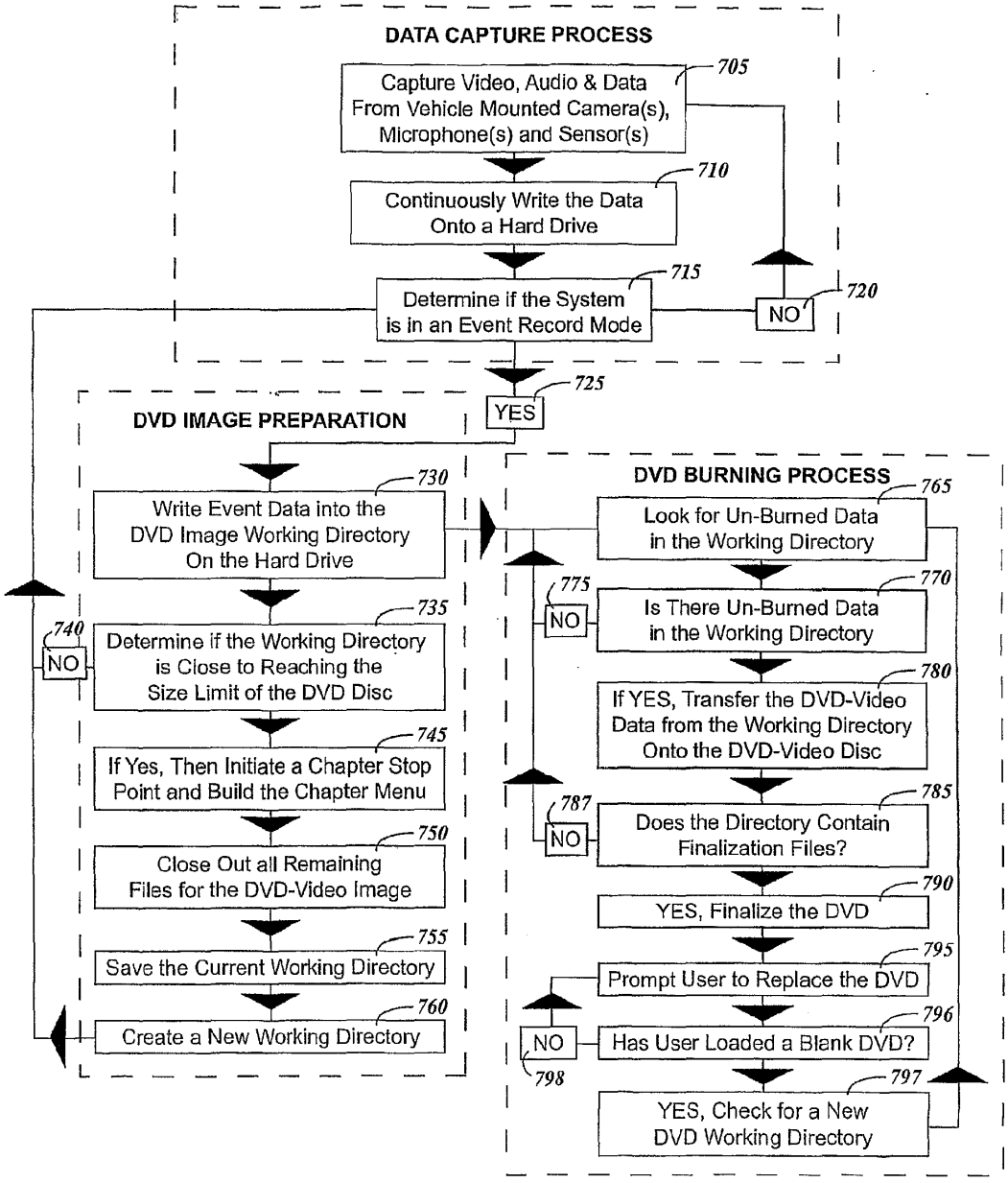


FIGURE 7

Motorola v. Stellar
Motorola Exhibit 1013
Page 232

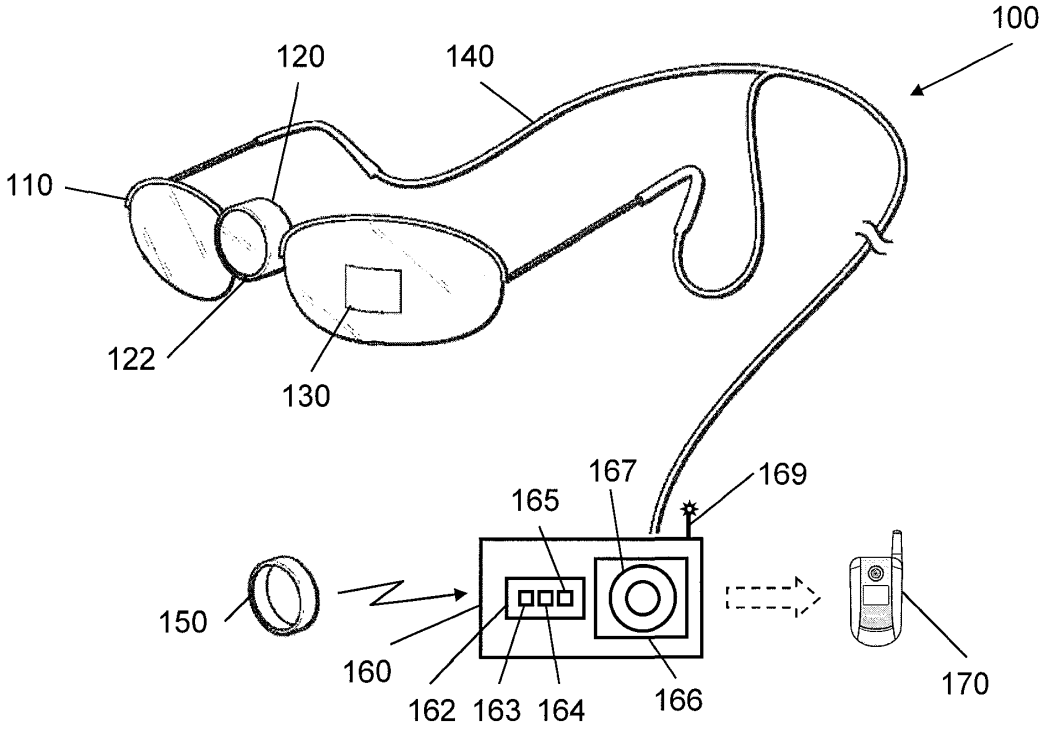

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FIG. 1

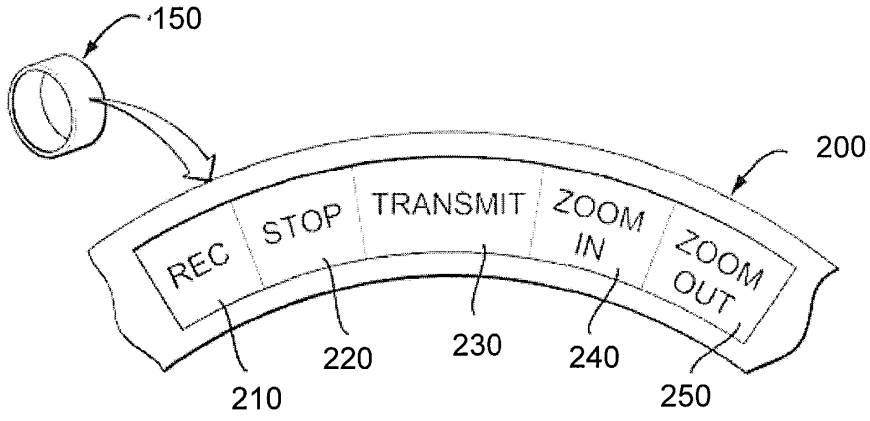

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FIG. 2A

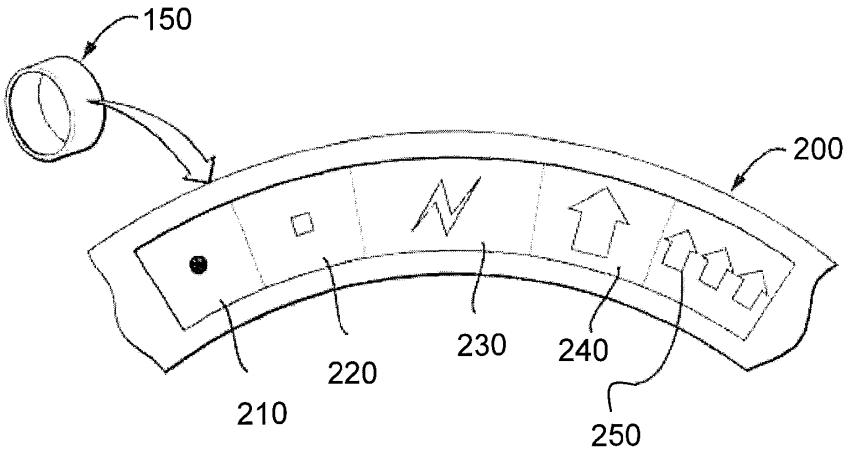


FIG. 2B

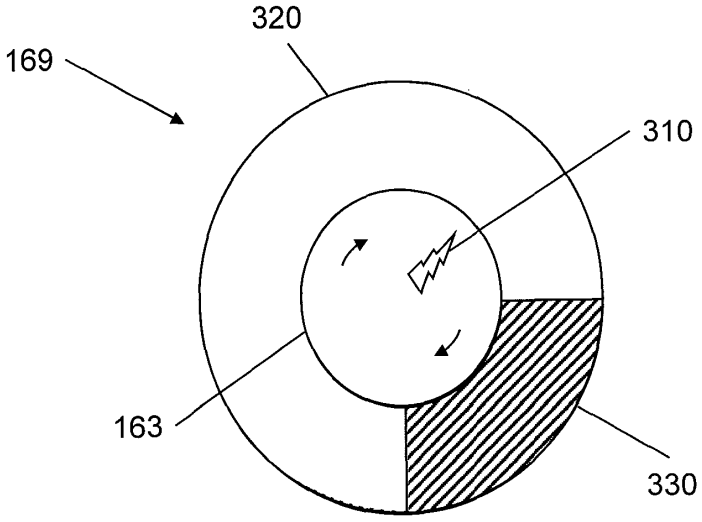


FIG. 3

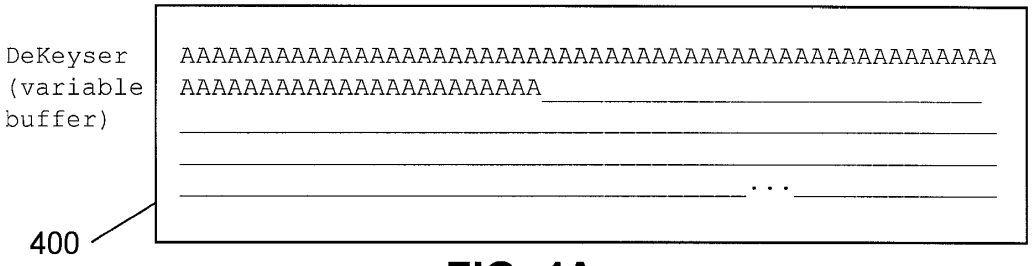


FIG. 4A

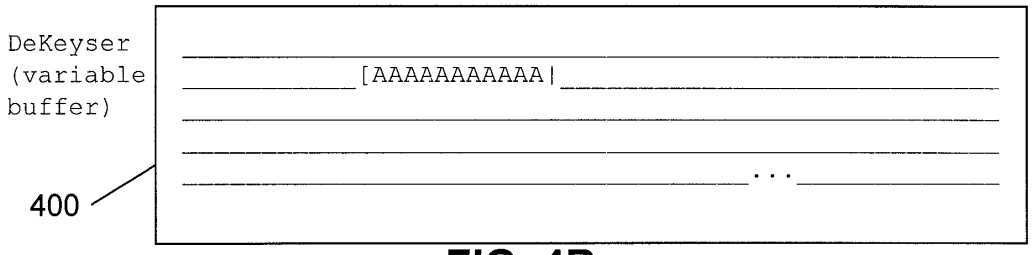


FIG. 4B

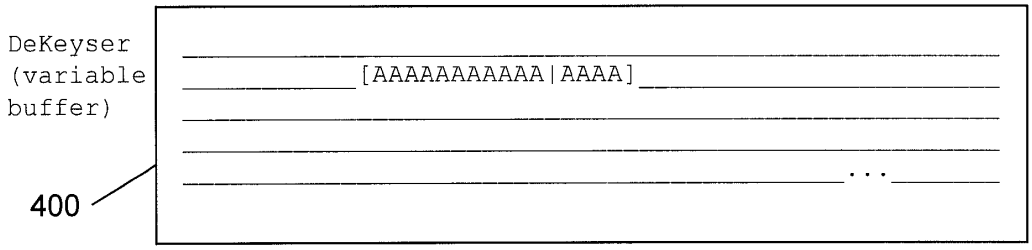


FIG. 4C

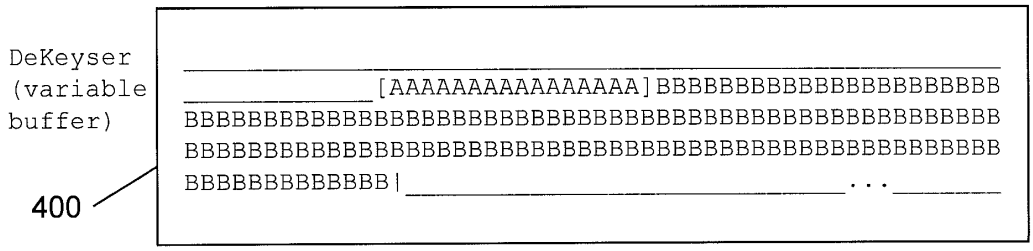


FIG. 4D

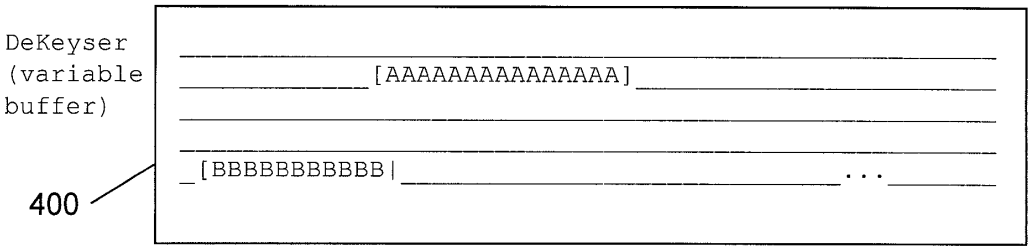


FIG. 4E

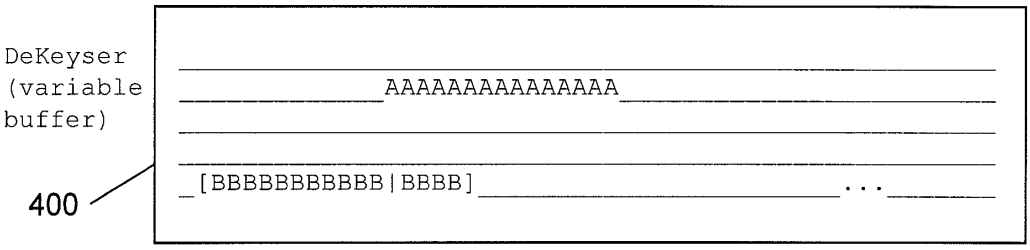


FIG. 4F

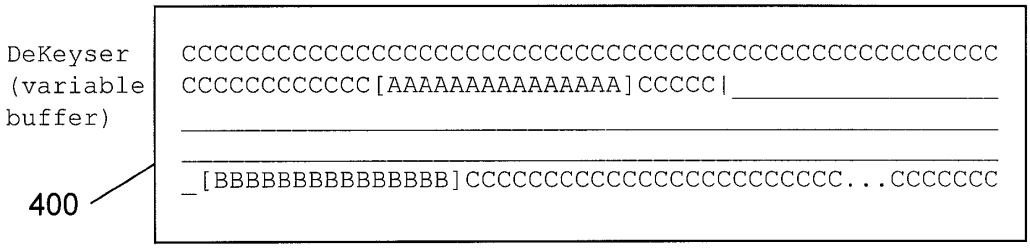


FIG. 4G

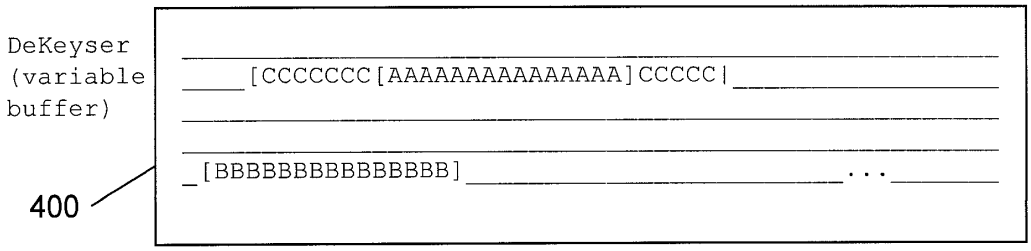


FIG. 4H

Electronic Patent Application Fee Transmittal	
Application Number:	
Filing Date:	
Title of Invention:	Loop Recording With Book Marking
First Named Inventor/Applicant Name:	Paul DeKeyser
Filer:	Martin Fessenmaier/Sara Geer
Attorney Docket Number:	101488.0003US2
Filed as Small Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	82	82
Utility Search Fee	2111	1	270	270
Utility Examination Fee	2311	1	110	110
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Petition fee- 37 CFR 1.17(h) (Group III)	1464	1	130	130

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	592

Electronic Acknowledgement Receipt	
EFS ID:	4264759
Application Number:	12268286
International Application Number:	
Confirmation Number:	7927
Title of Invention:	Loop Recording With Book Marking
First Named Inventor/Applicant Name:	Paul DeKeyser
Customer Number:	24392
Filer:	Martin Fessenmaier/Sara Geer
Filer Authorized By:	Martin Fessenmaier
Attorney Docket Number:	101488.0003US2
Receipt Date:	10-NOV-2008
Filing Date:	
Time Stamp:	18:50:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$592
RAM confirmation Number	4427
Deposit Account	500341
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees) Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	**Document Description**	**File Name**	**File Size(Bytes)/ Message Digest**	**Multi Part /.zip**	**Pages (if appl.)**
1	Application Data Sheet	US_ADS_Form_SB_14.pdf	1052690 c02f2cea2974c6c36e04196ee8acf34638449362	no	4
Warnings:					
Information:					
2	Petition for 12-month Accelerated Exam	US_AEC_Form_SB_28.pdf	840619 cd7457c8a4752e0ee496e3996bd5fb71db76913f	no	4
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Information:					
3	Oath or Declaration filed	Declaration.pdf	105478 6c65b75b28f9e921d7b540664544f6830715195	no	3
Warnings:					
Information:					
4		Application.pdf	161154 4157cd80cbf57443137dc6c04f69ea62337ee2ce	yes	21
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Specification		1	17	
	Claims		18	20	
	Abstract		21	21	
Warnings:					
Information:					
5	Statement of preexamination search	PREX_SRCH.pdf	2175479 f84b7448a2e3891bd833e74d78bfc53e4d6105e3	no	55
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Information:					
6	Examination support document	ACCX_SUP.pdf	1435117 18db3ceeaf03ccbac26dd2939a733cfa98ccfcf4	no	43
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Information:					

7	Information Disclosure Statement (IDS) Filed (SB/08)	US_IDS_Form__SB_08a.pdf	747560 df90c5e9418f464c6ebbf7d0bb4d5f574df050a6	no	4
Warnings:					
Information:					
A U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form. You may remove the form to add the required data in order to correct the Informational Message or if you chose not to, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
8	Foreign Reference	EP1064783.pdf	2801530 33fc9c9f01c673dfcc5fded9aab7154847d350ad	no	43
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/14 (02-07)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	101488.0003US2
	Application Number	
Title of Invention	Loop Recording With Book Marking	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Applicant 1 Remove

Applicant Authority ◉ Inventor ○ Legal Representative under 35 U.S.C. 117 ○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Paul		DeKeyser	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Irvine	State/Province	CA	Country of Residence [i]	US

Citizenship under 37 CFR 1.41(b) [i] US

Mailing Address of Applicant:

Address 1	55 Hidden Trail		
Address 2			
City	Irvine	State/Province	CA
Postal Code	92603	Country [i]	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	24392		
Email Address	mtsang@fishiplaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	Loop Recording With Book Marking		
Attorney Docket Number	101488.0003US2	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	4	Suggested Figure for Publication (if any)	

PTO/SB/14 (02-07)
Approved for use through 02/28/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	101488.0003US2
	Application Number	
Title of Invention	Loop Recording With Book Marking	

Publication Information:	
☐	Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐	Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not been and will not be the subject of an application filed in another country, or under a multilateral agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ US Representative (37 CFR 11.9)
Customer Number	24392		

Domestic Priority Information:

This section allows for the applicant to claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c). Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation in part of	11/770920	2007-06-29
Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
11/770920	non provisional of	60/824097	2006-08-31
Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation in part of	11/846217	2007-08-28
Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
11/846217	non provisional of	60/824095	2006-08-31

Additional Domestic Priority Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

PTO/SB/14 (02-07)
Approved for use through 02/28/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	101488.0003US2
	Application Number	
Title of Invention	Loop Recording With Book Marking	

			Remove
Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			○ Yes ◉ No
Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.			Add

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

Assignee 1 Remove

If the Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information:

Address 1			
Address 2			
City		**State/Province**	
Country [i]		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the **Add** button. Add

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/MTsang/			Date (YYYY-MM-DD)	2008-11-10
First Name	Mei	Last Name	Tsang	Registration Number	56122

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Motorola v. Stellar
Motorola Exhibit 1013
Page 246

Electronic Acknowledgement Receipt	
EFS ID:	4264759
Application Number:	12268286
International Application Number:	
Confirmation Number:	7927
Title of Invention:	Loop Recording With Book Marking
First Named Inventor/Applicant Name:	Paul DeKeyser
Customer Number:	24392
Filer:	Martin Fessenmaier/Sara Geer
Filer Authorized By:	Martin Fessenmaier
Attorney Docket Number:	101488.0003US2
Receipt Date:	10-NOV-2008
Filing Date:	
Time Stamp:	18:50:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$592
RAM confirmation Number	4427
Deposit Account	500341
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	US_ADS_Form_SB_14.pdf	1052690 c02f2cea2974c6c36e04196ee8acf34638449362	no	4
Warnings:					
Information:					
2	Petition for 12-month Accelerated Exam	US_AEC_Form_SB_28.pdf	840619 cd7457c8a4752e0ee496e3996bd5fb71db76913f	no	4
Warnings:					
Information:					
3	Oath or Declaration filed	Declaration.pdf	105478 6c65b75b28f9e921d7b540664544f6830715195	no	3
Warnings:					
Information:					
4		Application.pdf	161154 4157cd80cbf57443137dc6c04f69ea62337ee2ce	yes	21

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	17
Claims	18	20
Abstract	21	21

Warnings:					
Information:					
5	Statement of preexamination search	PREX_SRCH.pdf	2175479 f84b7448a2e3891bd833e74d78bfc53e4d6105e3	no	55
Warnings:					
Information:					
6	Examination support document	ACCX_SUP.pdf	1435117 18db3ceeaf03ccbac26dd2939a733cfa98ccfcf4	no	43
Warnings:					
Information:					

7	Information Disclosure Statement (IDS) Filed (SB/08)	US_IDS_Form__SB_08a.pdf	747560 df90c5e9418f464c6ebbf7d0bb4d5f574df050a6	no	4
Warnings:					
Information:					
A U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form. You may remove the form to add the required data in order to correct the Informational Message or if you chose not to, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
8	Foreign Reference	EP1064783.pdf	2801530 33fc9c9f01c673dfcc5fded9aab7154847d350ad	no	43
Warnings:					
Information:					
9	Information Disclosure Statement Letter	5523799.pdf	689429 044168f27b9631fd3b9561f08c46522699ed0c102	no	14
Warnings:					
Information:					
10	Foreign Reference	WO2006_044476.pdf	2117729 7005819a93c618d49f4f09811d43bf68e53631e9	no	45
Warnings:					
Information:					
11	Drawings-only black and white line drawings	Drawings.pdf	88455 ac8910f8141ec9b834a19d9011fca70a1703a8ba	no	4
Warnings:					
Information:					
12	Fee Worksheet (PTO-06)	fee-info.pdf	36426 69891e31cbc9ef48e923ba41ca46af9e621cc063	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	12251666	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (12-04)

Filing Date: **11/10/08**

Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 12/268,286

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	82		N/A	
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	270		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	110		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =		x$26		OR	x$52	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1/2 minus 3 =	*	x$110			x$220	
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $270 ($135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			195			390	
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	462		TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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UNITED STATES DEPARTMENT OF COMMERCE
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Address: COMMISSIONER FOR PATENTS
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
12/268,286	11/10/2008	2621	462	101488.0003US2	20	2

CONFIRMATION NO. 7927

24392
FISH & ASSOCIATES, PC
ROBERT D. FISH
2603 Main Street
Suite 1050
Irvine, CA 92614-6232

FILING RECEIPT

OC000000033123872

Date Mailed: 11/18/2008

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Paul DeKeyser, Irvine, CA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CIP of 11/770,920 06/29/2007
which claims benefit of 60/824,097 08/31/2006
This application 12/268,286
is a CIP of 11/846,217 08/28/2007
which claims benefit of 60/824,095 08/31/2006

Foreign Applications

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 11/14/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/268,286**

Projected Publication Date: 02/26/2009

Non-Publication Request: No

Early Publication Request: No
** **SMALL ENTITY** **

Title

Loop Recording With Book Marking

Preliminary Class

348

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

Motorola v. Stellar
Motorola Exhibit 1013
Page 253

set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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United States Patent and Trademark Office
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MAIL

FEB 03 2009

DIRECTOR'S OFFICE
TECHNOLOGY CENTER 2600

FISH & ASSOCIATES, PC
ROBERT D. FISH
2603 Main Street
Suite 1050
Irvine CA 92614-6232

In re Application of:
DEKEYSER, PAUL
Serial No.: 12/268,286
Filed: November 10, 2008

Title: **LOOP RECORDING WITH BOOK MARKING**

DECISION ON PETITION TO MAKE SPECIAL FOR NEW APPLICATION UNDER 37 C.F.R. § 1.102 & M.P.E.P. § 708.02

The petition to make the application special is **GRANTED**.

The application is eligible for accelerated examination and the petition complies with the conditions for granting the application special status pursuant to the "Change to Practice for Petitions in Patent Applications to Make Special and for Accelerated Examination" published June 26, 2006, in the Federal Register. (71 Fed. Reg. 36323).

The prosecution of the instant application will be conducted expeditiously according to the following guidelines.

1. The application will be docketed to an examiner and taken up for action within two weeks of the date of this decision.

2. Restriction Practice:
   If the examiner determines that the claims are not directed to a single invention, a telephone request to elect one single invention will be made pursuant to MPEP 812.01. As a prerequisite to the grant of this petition, the applicant has agreed to make an oral election, by telephone, without traverse. If the applicant refuses to make an election without traverse, or the examiner cannot reach the applicant after a reasonable effort, the examiner will treat the first claimed invention (invention defined by claim 1) as having being constructively elected without traverse for examination.

3. Office action:

If it is determined that, after appropriate consultation, there is a potential rejection or any other issue to be addressed, the examiner will telephone the applicant and arrange an interview to discuss and resolve the issue. An Office action, other than a Notice of Allowance and Fee(s) Due (Notice of Allowance), will not be issued unless either: 1) an interview was conducted but did not result in agreed to action that places the application in condition for allowance, or, 2) a determination is made that an interview would be unlikely to result in the application being placed in condition for allowance, and 3) an internal conference has been held to review any rejection of any claim.

4. Time for Reply:
An Office action other than a Notice of Allowance or a final Office action will set a shortened statutory period of one month or thirty days, whichever is longer, for reply with no extension of time available under 37 CFR 1.136(a). Failure to timely file a reply within this non-extendible period for reply will result in the abandonment of the application.

5. Reply by Applicant:
A timely reply to an Office action other than the Notice of Allowance must be submitted electronically via EFS or EFS-web and limited to addressing the rejections, objections and requirement made. Any amendment that attempts to: 1) add claims which would result in more than three pending independent claims or more than twenty pending total claims; 2) present claims not encompassed by the pre-examination search or an updated accelerated examination support document; or 3) present claims that are directed a non-elected invention or an invention other than that previously claimed and examined in the application, will be treated as not fully responsive and will not be entered.

   For any amendment to the claims (including any new claim) that is not encompassed by the accelerated examination support document, applicant must provide an updated accelerated examination support document that encompasses the amended or new claims at the time of filing of the amendment.

   To proceed expeditiously with the examination, it is recommended that a reply with amendments made to any claim or with any new claim being added be accompanied by an updated accelerated examination support document or a statement explaining how the amended or new claim is supported by the original accelerated examination support document.

6. Information Disclosure Statement (IDS):
Any IDS filed during prosecution must be submitted electronically via EFS or EFS-web, accompanied by an updated accelerated examination support document, and be in compliance with 37 CFR 1.97 and 1.98.

7. Post-Allowance Processing:
To expedite processing of the allowed application into a patent, the applicant must: 1) pay the required fees within one month of the date of the Notice of Allowance, and 2) not

file any post allowance papers not required by the Office. In no event may the issue fee be paid and accepted later than three months from the date of the Notice of Allowance.

8. After-Final and Appeal Procedures:
   To expedite prosecution, after receiving the final Office action, applicant must: 1) promptly file a notice of appeal, an appeal brief and appeal fees; and 2) not request a pre-appeal brief conference.

   Any amendment, affidavit or other evidence filed after final Office action must comply with applicable rules and the requirements outlined in numbered paragraphs 5 and 6 above.

   On appeal, the application will proceed according to normal appeal procedures. After appeal, the application will again be treated special.

9. Proceedings Outside the Normal Examination Process:
   If the application becomes involved in a proceeding that is outside the normal examination process (e.g., a secrecy order, national security review, interference proceeding, petitions under 37 CFR 1.181, 182 or 183), the application will be treated special before and after such proceeding.

10. Final Disposition:
    The twelve month goal of this accelerated examination procedure ends with a final disposition. The mailing of a final Office action, a Notice of Allowance, the filing of a Notice of Appeal, or the filing of a Request for Continued Examination (RCE) is the final disposition.

If, during prosecution, a paper is not filed electronically using EFS-web, a reply is filed but is not fully responsive, the application is involved in an appeal, or a proceeding outside normal examination process, the application will still be examined expeditiously, however, the final disposition may occur more than twelve months from the filing of the application.

Any inquiry regarding this decision should be directed to Ken Wieder, Quality Assurance Specialist, at (571) 272-2986.

Kenneth A. Wieder
Quality Assurance Specialist
Technology Center 2600 Communications

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/268,286	11/10/2008	Paul DeKeyser	101488.0003US2

CONFIRMATION NO. 7927

24392
FISH & ASSOCIATES, PC
ROBERT D. FISH
2603 Main Street
Suite 1000
Irvine, CA 92614-6232

PUBLICATION NOTICE

OC000000034742278

Title: Loop Recording With Book Marking

Publication No.US-2009-0051768-A1
Publication Date:02/26/2009

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/268,286	11/10/2008	Paul DeKeyser	101488.0003US2	7927

24392 7590 03/19/2009

FISH & ASSOCIATES, PC
ROBERT D. FISH
2603 Main Street
Suite 1000
Irvine, CA 92614-6232

EXAMINER	
DIEP, NHON THANH	
ART UNIT	**PAPER NUMBER**
2621	

MAIL DATE	DELIVERY MODE
03/19/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary for Applications Under Accelerated Examination	Application No.	Applicant(s)	
	12/268,286	DEKEYSER, PAUL	
	Examiner	Art Unit	
	Nhon T. Diep	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Since this application has been granted special status under the accelerated examination program,

NO extensions of time under 37 CFR 1.136(a) will be permitted and a SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE:

ONE MONTH OR THIRTY (30) DAYS, WHICHEVER IS LONGER,
FROM THE MAILING DATE OF THIS COMMUNICATION – if this is a non-final action or a *Quayle* action.
(Examiner: For **FINAL** actions, please use PTOL-326.)

The objective of the accelerated examination program is to complete the examination of an application within twelve months from the filing date of the application. Any reply must be filed electronically via EFS-Web so that the papers will be expeditiously processed and considered. If the reply is not filed electronically via EFS-Web, the final disposition of the application may occur later than twelve months from the filing of the application.

Status

1)☒ Responsive to communication(s) filed on *26 February 2009*.

2)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

3)☒ Claim(s) *1-20* is/are pending in the application.

3a) Of the above claim(s) _____ is/are withdrawn from consideration.

4)☐ Claim(s) _____ is/are allowed.

5)☒ Claim(s) *1-20* is/are rejected.

6)☐ Claim(s) _____ is/are objected to.

7)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

8)☐ The specification is objected to by the Examiner.

9)☒ The drawing(s) filed on *10 November 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

10)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

11)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

- See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/10/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Motorola v. Stellar
Motorola Exhibit 1013
Page 260

DETAILED ACTION

1. *Update Accelerated Examination Support Document Required for Claim Amendments Not Encompassed by Previous Accelerated Examination Support Document(s) - Application Under Accelerated Examination*

Applicant is reminded that for any amendments to the claims (including any new claim) that is not encompassed by the preexamination search and accelerated examination support documents previously filed, applicant is required to provide updated preexamination search and accelerated examination support documents that encompassed the amended or new claims at the time of filing the amendment. Failure to provide such updated preexamination search and accelerated examination support documents at the time of filing the amendment will cause the amendment to be treated as not fully responsive and not to be entered. See MPEP § 708.02(a) subsection VIII.D. for more information.

If the reply is not fully responsive, the final deposition of the application may occur later than twelve months from the filing of the application.

2. *Use of Proper Document and Fee Codes When Filing A Reply Electronically Via EFS-Web – Application Under Accelerated Examination*

Any reply or paper must be filed electronically via EFS-Web so that the paper will be expeditiously processed and considered. If the papers are not filed electronically via EFS-Web, the final deposition of the application may occur less than twelve months from the filing of the application.

Any reply to this communication filed via EFS-Web must include a document that is filed using the document description of "Accelerated Exam – Transmittal amendment/reply." Applicant is reminded to use proper indexing for documents to avoid any delay in the processing of follow on papers. Currently document indexing is not automatic in EFS-Web and applicant must select a particular document description for each attached file. An incorrect document description for a particular file may potentially delay processing of the application. A complete listing of all documents codes currently supported in EFS-Web is available at http://www.uspto.gov/ebc/portal/efs/docindexing.pdf.

Any payment of fees via EFS-Web must be accompanied by selection of proper fee code. An improper fee code may potentially delay processing of the application. Instructions on payment of fees via EFS-Web are available at http://www.uspto.gov.ebc/portal/efs/quick-start.pdf.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140

F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1, 4-6, 8-9 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 7, 9-11 and 12-13 of copending Application No. 11/846,217. Although the conflicting claims are not identical, they are not patentably distinct from each other because 1, 4-6, 8-9 of this application encompass claims 1, 7, 9-11 and 12-13 of Application No. 11/846,217.

5. Claims 12-13 and 15-18 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4, 8, 10, 11-16 of copending Application No. 11/770,920. Although the conflicting claims are not

identical, they are not patentably distinct from each other because 12-13 and 15-18 of this application encompass claims 1, 4, 8, 10, 11-16 of Application No. 11/770,920.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vanman (WO 6,044,476), in view of Hattori et al (both are cited by the applicants).

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 comprising the same surveillance apparatus, comprising:

a camera having an image capturing component that captures images, and a converting component that converts the images into at least one data stream (paragraph 0024);

a local memory functionally coupled to the camera (paragraph 0029, fig. 1, el. 15 and 80);

a wireless transmitter functionally coupled to the local memory (paragraph 0034, fig. 1, el. 80 and 145);

a recording facility that continuously records the data stream into available portions of a circular buffer in the local memory (paragraph 0058);

a pre-recorded subset of the recorded segment is recorded before the signal is received (paragraph 0040); and

a sending facility that uses the transmitter to wirelessly transmit information to a remote memory (paragraph 0034) as specified in claim 1. It is noted that Vanman does not particularly disclose a protecting facility that responds to a signal to record by designating a recorded segment of the circular buffer as a write-protected portion; and a sending facility that uses the transmitter to wirelessly transmit the write-protected portion instead of the information to a remote memory as specified in claim 1; wherein the pre-recorded subset is at least 5 seconds long (paragraph 0040) as specified in claim 2; wherein the recorded segment is at least 10 seconds long (paragraph 0040) as specified in claim 3; 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 by the camera (paragraph 0024, 0039, 0051) as specified in claim 4; further comprising an interface through which a human can initiate the signal (paragraph 0051) as specified in claim 5; further comprising an interface through which a human can designate a length of time of at least one of the pre-recorded subset, a post-recorded subset, and the recorded segment (paragraph 0052) as specified in claim 6; further comprising a mount for the camera (paragraph 0002-004, 0065) as specified in claim 9.

Hattori teaches an image memory apparatus that continuously writes new images into a circular buffer, and a protecting facility that responds to a signal to record by designating a segment of the circular buffer as a write-protected portion (See C3/L62-C4/L2). 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 by recording a segment of the circular buffer as a write-protected portion. Doing so would help to preserve an important image memorized without being erased by a subsequent image.

8. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vanman (WO 6,044,476), in view of Hattori et al (both are cited by the applicants), and further in view of Patel (US 7,195,164 B2).

As applied to claim 1 above, it is noted that the combination of Vanman and Hattori does not particularly disclose wherein the remote memory is located on a mobile phone; wherein a mobile phone receives the recorded segment from the wireless transmitter and forwards the recorded segment to the remote memory as specified in claims 7-8. 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.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vanman (WO 6,044,476), in view of Hattori et al (both are cited by the applicants), and further in view of Mann (EP 1 064 783 B1) (cited by the applicants).

As applied to claim 9 above, it is noted that the combination of Vanman and Hattori does not particularly disclose wherein the mount is a pair of wearable glasses as specified in claim 10. Mann teaches to the mount is a pair of wearable glasses (fig. 2). 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 applying the teaching of Mann. Doing sp would help to conceal the surveillance camera system and improve its effectiveness.

10. Claims 11-20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vanman (WO 6,044,476), in view of Hattori et al (both are cited by the applicants), and further in view of Aono (US 6,351,798 B1).

As applied to claim 1 above, it is noted that the combination of Vanman and Hattori does not particularly disclose further comprising an electronic index that references addresses of the write-protected portion as specified in claim 11. Aono teaches “the processor 200 issues a memory access request, the cell controller 100 indexes the address resolution table120 using the module address 111 (step S301). If

the validity bit 121 indicates that the entry is "invalid" (step S302), the circuit generates an address fault assuming that the access request was issued to a non-existing address. If the memory address is found an address in some other cell (step S303), the circuit accesses that cell via the network 500. If the memory address is in its own cell, the circuit accesses the corresponding module in the cell (step S304). If an access request is received from some other cell and if it is not a "write" request (step S311), the circuit accesses the corresponding memory module in the same way the circuit accesses the memory module in response to an access request generated within its own cell (step S304). On the other hand, if an access request received from some other cell is a "write" request, the circuit checks the write protection flag 130 (step S312). If the rite protection flag 130 indicates that a write from some other cell is "permitted", the circuit accesses the corresponding module (step S304); if the write protection flag 130 indicates that a write from some other cell is "inhibited", the circuit generates an access exception". 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 electronically indexing the address of any write-protected portion of the memory. Doing so would help to effectively manage memory allocation.

Regarding to claim 13, which recites storing the write-protected portions as separate files, even though, Hattori does not particularly disclose storing the write-protected portions as separate files, Hattori clearly suggests to designate an area of memory as write inhibited area (fig. 4) and because of that it would have been obvious to one skill in the art at the time the invention was made to modify the system of the

combination by separately storing a write protected area as a separate files to be different from regular files. Doing so would help to effectively control the allocation of memory.

Regarding to claim 14: Hattori discloses recording the stream into physically dis-contiguous parts of the circular buffer (fig. 4, if it is assumed that an area between points a and b shown in FIG. 4 is registered as a writing inhibited area, the writing vector W, when reaching the point a, skips the area between the points a and b, and then writes data at the point b. Thus, video data memorized in the area between the points a and b is preserved).

Regarding to claims 15-17: Vanman further discloses the signal to save a recording comprises a signal to start recording and a signal to stop recording (paragraph 0040, 0043, 0054); receiving the signal to save a recording through at least one of a manually operated switch and an audio signal (paragraph 0052); and configuring the size of the pre-recorded subset (paragraph 0052).

Regarding to claim 18, which recite removing write-protection from a transmitted write-protected portion after transmission. It would have been obvious to one of ordinary skill in the art at the time the invention was made to remove write-protection from a transmitted write-protected portion after transmission, since the protected information has been safely stored in another storage medium. Doing so would help to release spaces for other information.

Regarding to claims 19-20, which recites a warning to a user before the newly recorded portion of the buffer is fully recorded; and extending a length of the newly

recorded portion in response to at least one of a manually operated switch and an audio signal. The examiner takes Official Notice that a warning signal notifying users that memory is fully recorded and extending a length of the newly recorded portion in response to at least one of a manually operated switch and an audio signal is well known in the art. 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, Hattori and Aono by extending the length of the newly recorded portion in response to at least one of a manually operated switch and an audio signal when users receive a warning signal. Doing so would help to effectively manage memory allocation.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nhon T. Diep whose telephone number is 571-272-7328. The examiner can normally be reached on m-f.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ND

/Nhon T Diep/
Primary Examiner, Art Unit 2621

Notice of References Cited	Application/Control No. 12/268,286	Applicant(s)/Patent Under Reexamination DEKEYSER, PAUL	
	Examiner Nhon T. Diep	Art Unit 2621	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-7,195,164	03-2007	Patel, Mehul	235/454
*	B	US-6,351,798	02-2002	Aono, Fumio	712/11
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Motorola v. Stellar
Motorola Exhibit 1013
Page 272

PTO/SB/08a (05-07)
Approved for use through 11/30/2007. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	2008-11-11
	First Named Inventor	Paul DeKeyser
	Art Unit	
	Examiner Name	
	Attorney Docket Number	101488.0003US2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
/ND/	1	5523799		1996-06-04	Hattori et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					
	2					
	3					

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
/ND/	1	2006/044476 A2	WO		2006-04-27	Robert Vernon VANMAN		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	2008-11-11
	First Named Inventor	Paul DeKeyser
	Art Unit	
	Examiner Name	
	Attorney Docket Number	101488.0003US2

/ND/	2	1064783	EP		2003-04-06	Stephen MANN		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

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EXAMINER SIGNATURE

Examiner Signature	/Nhon Diep/	Date Considered	03/11/2009

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12268286	DEKEYSER, PAUL
	Examiner	Art Unit
	Nhon T Diep	2621

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/15/2009								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
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	18	✓								
	19	✓								
	20	✓								

Motorola v. Stellar
Motorola Exhibit 1013
Page 275

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12268286	DEKEYSER, PAUL
	Examiner	Art Unit
	Nhon T Diep	2621

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
East Search	3/15/2009	ND

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	48	(processor same "200" same issues same memory same access same request) and indexes same address	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/15 20:46
L2	2712	index same file same address $6 same (record$5 or memory or buffer)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/15 20:49
L3	746	index same file same address $6 same (record$5 or memory or buffer) and write and protect$6	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/15 20:49
L4	26	index same file same address $6 same (record$5 or memory or buffer) and write and protect$6 and glass	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/15 20:50
L5	917	mobile same cell$6 same phone same stor$7 same image	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/15 20:51

Motorola v. Stellar
Motorola Exhibit 1013
Page 277

L6	76	mobile same cell$6 same phone same stor$7 same image same PDA same digital adj1 camera	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/15 20:52

3/15/09 8:53:35 PM
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Motorola v. Stellar
Motorola Exhibit 1013
Page 278

Electronic Acknowledgement Receipt	
EFS ID:	5169805
Application Number:	12268286
International Application Number:	
Confirmation Number:	7927
Title of Invention:	Loop Recording With Book Marking
First Named Inventor/Applicant Name:	Paul DeKeyser
Customer Number:	24392
Filer:	Martin Fessenmaier/Sara Geer
Filer Authorized By:	Martin Fessenmaier
Attorney Docket Number:	101488.0003US2
Receipt Date:	16-APR-2009
Filing Date:	10-NOV-2008
Time Stamp:	18:54:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	Response_01.pdf	120616 1beb28e566b912f44246ce39dacdefae5dacacd0	no	9

Warnings:
Information:

Total Files Size (in bytes):	120616

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

Appl No.:	**12/268,289**
Applicant:	**DeKeyser, Paul**
Filing Date:	**November 10, 2008**
Art Unit:	**2621**
Examiner:	**Diep, Nhon Thanh**
Attorney Docket No.:	**101488.0003US2**
Title	**Loop Recording with Book Marking**

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO OFFICE ACTION

Sir:

This paper responds to the Office Action dated March 24, 2009. Please enter the amendments shown herein.

- Claim amendments begin on page 2.
- Remarks begin on page 5.

Motorola v. Stellar
Motorola Exhibit 1013
Page 281

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (Currently Amended) A surveillance apparatus, comprising:

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

a local memory functionally coupled to the camera;

a wireless transmitter functionally coupled to the local memory;

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;

a protecting facility that responds to a signal to record by designating a ~~recorded~~ 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 ~~of the recorded segment is~~ recorded before the signal is received and a post-recorded subset to be recorded after the signal is received; and

a sending facility that uses the transmitter to wirelessly transmit the ~~write-protected portion~~second file to a remote memory.

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

3. (Currently Amended) The apparatus of claim 1, wherein the ~~recorded~~ segment is at least 10 seconds long.

4. (Currently Amended) The apparatus of claim 1, further comprising a sensor that automatically ~~initiates~~ triggers the signal to record~~, wherein the sensor operates~~ upon detecting identifed content in at least one of the captured images ~~captured by the camera~~.

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

Motorola v. Stellar
Motorola Exhibit 1013
Page 282

6. (Currently Amended) 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, ~~a~~ the post-recorded subset, and the ~~recorded~~ segment.

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

8. (Currently Amended) The apparatus of claim 1, wherein a mobile phone automatically receives the ~~recorded segment~~second file from the wireless transmitter and automatically forwards the ~~recorded segment~~second file to the remote memory.

9. (Original) The system of claim 1, further comprising a mount for the camera.

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

11. (Currently Amended) The system of claim 1, further comprising an electronic index that ~~references addresses of the write-protected portion~~provides a directory to the first and the second files within the circular buffer.

12. Currently Amended) 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 as a first file using a digital video file format;

responding to a signal by write-protecting a segment that includes a newly recorded portion of the buffer, wherein ~~a subset of~~ 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;

indexing write protected portions of the buffer as separate, distinct files during the step of recording; and

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

Motorola v. Stellar
Motorola Exhibit 1013
Page 283

13. (Currently Amended) The method of claim 12, further comprising storing the distinct files from the write-protected portions as the distinct, separate files in the remote memory.

14. (Currently Amended) The method of claim 12, further comprising recording the stream as the first file into physically dis-contiguous parts of the circular buffer.

15. (Original) The method of claim 12, wherein the signal to save a recording comprises a signal to start recording and a signal to stop recording.

16. (Original) 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.

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

18. (Currently Amended) The method of claim 12, further comprising removing write-protection from a transmitted write-protected portion after transmission of its corresponding distinct file.

19. (Currently Amended) The method of claim 12, further comprising sending a warning to a user before the ~~newly recorded portion~~write protected segment of the circular buffer is fully recorded.

20. (Currently Amended) The method of claim 19, further comprising extending a length of the ~~newly recorded portion~~ write protected segment of the circular buffer in response to at least one of a manually operated switch and an audio signal.

Motorola v. Stellar
Motorola Exhibit 1013
Page 284

REMARKS/ARGUMENTS

The Office action dated March 24, 2009, has been received and carefully considered. By this amendment, the claims 1, 3, 4, 6, 8, 11 – 14, and 18 - 20 have been amended. After entry of this Amendment, claims 1 - 20 will be pending. In view of these amendments and the following remarks, Applicants respectfully request reconsideration.

Double Patenting

The Office provisionally rejected claims 1, 4 – 6, and 8 – 9 on the ground of nonstatutory obviousness type double patenting over claims 1, 7, 9 – 11, and 12 – 13 of commonly owned, co-pending application 11/846,217. The Applicant points out that the instant application is a child of application 11/846,217 and necessarily has the same term as the parent and that a terminal disclaimer does not appear necessary. Clarification is respectfully requested. Upon clarification, the Applicant is willing to file a terminal disclaimer if necessary.

The Office provisionally rejected claims 12 – 13, and 15 – 18 on the ground of nonstatutory obviousness type double patenting over claims 1, 4, 8, 10, and 11 – 16 of commonly owned, co-pending application 11/770,920. The Applicant also points out that the instant application is also a child of application 11/770,920 and necessarily has the same term as the parent and that a terminal disclaimer does not appear necessary. Clarification is respectfully requested. Upon clarification, the Applicant is willing to file a terminal disclaimer if necessary.

35 USC §103

Claims 1 – 6, and 9

The Office rejected claims 1 – 6, and 9 under 35 USC 103 as being obvious over Vanman (international patent application publication WO 2006/044476) in view of Hattori et al. (U.S. patent 5,523,799). The Applicant respectfully disagrees, especially in view of the amendments entered herein.

Amended claim 1 clarifies that the data streams are recorded in a circular buffer *as a first file* using a digital video file format, and a write-protected portion is indexed as a *second distinct file* in the circular buffer. The Applicant has appreciated that storing captured data in a *circular buffer as files* facilitates exchange of data with other remote device without requiring post

Motorola v. Stellar
Motorola Exhibit 1013
Page 285

processing or finalization of the data as is required by known systems, including the cited art. The cited art, Vanman and Hattori both discuss circular buffers. However, neither disclose storing data streams as files *within* the circular buffer, especially where a write-protected portion of the buffer is indexed as a second, distinct file from the file representing the data stream. In short, claim 1 is allowable over Vanman and Hattori, alone or combined, on the the grounds that they fail to teach, suggest, or motivate all the elements of claim 1.

The Examiner notes that Hattori lacks support for storing protected areas as separate files, and cites passage located at C3/L62 – C4/L11 as motivation storing write protected regions as separate files. The Applicant respectfully disagrees. One should note in the claimed approach files are stored *within a circular buffer* as opposed to a flat memory space (e.g., HDD, DVD, etc.) that would utilize a traditional file system with which one skilled in the art would be familiar. Traditional file systems are completely unsuitable for use within a circular buffer because they expect bounded extents, among other limitations. Therefore, having files within a circular buffer of the claimed apparatus would be non-obvious, especially where a file (*i.e.*, the second distinct file) could be created in the middle of another file (*i.e.*, the first file). The approach disclosed by the Applicant resolves such issues.

With respect to claim 4, claim 4 has been amended to clarify that a signal trigger occurs based on detection of identified content a captured image. One should note that the triggering events of Vanman are (1) generated externally to the content of the recorded stream (paragraph [0035]), or (2) generated based on metadata (paragraph [0040]). The Applicant notes that paragraph [0040] of Vanman merely discusses post processing to determine if pre-recorded data should be archived to a DVD based on the pre-recorded "active trigger" metadata, as opposed to initially recording and protecting segments of the local circular buffer in real-time based on image content (e.g., a face, a book, etc.; see paragraph [0011] of the instant application). Vanman lacks any teaching that a trigger can be based on content of an image. Hattori fails to contribute to Vanman to arrive at such a claimed feature. Claim 4 is considered allowable over the cited references on the grounds that they fail to teach the limitations of claim 4, and via claim 4's dependence on claim 1.

Motorola v. Stellar
Motorola Exhibit 1013
Page 286

Claim 2 – 3, 5 – 6, and 9 are allowable by virtue of their dependence on claim 1. Claims 3 and 6 have been amended in view of amendments to claim 1.

Claims 7 – 8

The Office rejected claims 7 – 8 under 35 USC 103 as being obvious over Vanman (international patent application publication WO 2006/044476) in view of Hattori et al. (U.S. patent 5,523,799), and in further view of Patel (U.S. patent 7,195,164). The Applicant respectfully disagrees, especially in view of the amendments entered herein. Although Patel discusses transmitting video, Patel also lacks any discussion regarding storing data streams as files within a circular buffer. Claims 7 and 8 are also allowable by virtue of their dependence on claim 1, among other reasons.

Claim 10

The Office rejected claim 10 under 35 USC 103 as being obvious over Vanman (international patent application publication WO 2006/044476) in view of Hattori et al. (U.S. patent 5,523,799), and in further view of Mann (European patent EP 1,064,783). The Applicant respectfully disagrees, especially in view of the amendments entered herein. Although Mann also discusses circular buffers, Mann fails to provide any disclosure directed toward storing data streams as files with a circular buffer, among other things, as in claim 1. Claim 10 is allowable by virtue of its dependence on claim 1 via claim 9.

Claims 11 - 20

The Office rejected claims 11 – 20 under 35 USC 103 as being obvious over Vanman (international patent application publication WO 2006/044476) in view of Hattori et al. (U.S. patent 5,523,799), and in further view of Ano (U.S. patent 6,351,798). The Applicants respectfully disagree, in view of the amendments entered herein.

With respect to claim 11, Ano discusses using an address resolution table as an index into multiprocessor system. However, Ano lacks any disclosure directed toward indexing files within a circular buffer that could be combined with Vanman or Hattori to arrive at the features of claim 1. Claim 11 is allowable by virtue of its dependence on claim 1.

Motorola v. Stellar
Motorola Exhibit 1013
Page 287

With respect to claim 12, amended claim 12 also requires the features that the data stream and write protected portions are stored as distinct files within a circular buffer. As discussed above with respect to claims 1 and 11, the cited references alone or combined fail to teach, suggest, or motivate, recording data as files within a circular buffer, especially files that have both pre-recorded and post-recorded data. Therefore, claim 12 is also allowable.

With respect to claim 13, amended claim 13 clarifies that the files from the circular buffer are essentially copied "as is" to a remote memory. Claim 13 is allowable by virtue of its dependence on claim 12.

Claims 14 – 18 are also allowable by virtue of their dependence on claim 12.

With respect to claims 19 and 20, the Examiner takes Official Notice that a warning signal notifying a user that a memory is full and that expending a length of a newly recorded portion is well know. The Applicant agrees that in general warning signals are known *per se*. However, the Applicant disagrees that the use of the claimed warning signals is known with respect to circular buffers (claim 19), or extending a write protected segment in a circular buffer in response to a signal (claim 20). Circular buffers are used merely to record loops of captured data in order to eliminate boundary issues with limited storage space. Therefore, one ordinarily would not consider utilizing a signal to warn of a reaching a memory boundary within a circular buffer simply because such boundaries do not exist in a circular buffer. The Applicant respectfully requests that the Office provide cited art to support the Official Notice with respect to the claimed subject matter. The Applicants submit that claims 19 and 20 are allowable over the cited art, among other reasons, by virtue of their dependence on claim 12, and on the grounds that the cited references fail to teach, suggest, or motive all the limitations of claims 19 and 20.

>>>

Motorola v. Stellar
Motorola Exhibit 1013
Page 288

Request For Allowance

Claims 1 – 20 are pending in this application. The applicant requests allowance of all pending claims.

Respectfully submitted,
Fish & Associates, PC

Date: April 16, 2009

By: /Robert D. Fish/
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Motorola v. Stellar
Motorola Exhibit 1013
Page 289

PTO/SB/06 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 12/268,286	Filing Date 11/10/2008	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☒		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	04/16/2009	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X $26 =	0	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $110 =	0	OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/DEBRA a. SAVOY/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/268,286	11/10/2008	Paul DeKeyser	101488.0003US2	7927

24392 7590 06/09/2009

FISH & ASSOCIATES, PC
ROBERT D. FISH
2603 Main Street
Suite 1000
Irvine, CA 92614-6232

EXAMINER	
DIEP, NHON THANH	
ART UNIT	**PAPER NUMBER**
2621	

MAIL DATE	DELIVERY MODE
06/09/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/268,286	DEKEYSER, PAUL	
	Examiner	Art Unit	
	Nhon T. Diep	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11/10/2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 4/16/2009 have been fully considered but they are not persuasive.

With regard to the applicants' argument that "The Office provisionally rejected claims 1, 4 - 6, and 8 - 9 on the ground of nonstatutory obviousness type double patenting over claims 1, 7, 9 - 11, and 12 - 13 of commonly owned, co- pending application 11/846,217. The Applicant points out that the instant application is a child of application 11/846,217 and necessarily has the same term as the parent and that a terminal disclaimer does not appear necessary. Clarification is respectfully requested. Upon clarification, the Applicant is willing to file a terminal disclaimer if necessary. The Office provisionally rejected claims 12 - 13, and 15 - 18 on the ground of nonstatutory obviousness type double patenting over claims 1, 4, 8, 10, and 11-16 of commonly owned, co-pending application I 1/770,920. The Applicant also points out that the instant application is also a child of application 11/770,920 and necessarily has the same term as the parent and that a terminal disclaimer does not appear necessary. Clarification is respectfully requested. Upon clarification, the Applicant is willing to file a terminal disclaimer if necessary". The examiner maintains his rejections because, there is no guarantee that all three applications will be allowed at the same time and that Double Patenting also is used to prevents selling multiple patents separately.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1, 4-6, 8-9 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 7, 9-11 and 12-13 of copending Application No. 11/846,217. Although the conflicting claims are not identical, they are not patentably distinct from each other because 1, 4-6, 8-9 of this application encompass claims 1, 7, 9-11 and 12-13 of Application No. 11/846,217.

4. Claims 12-13 and 15-18 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4, 8, 10, 11-16 of copending Application No. 11/770,920. Although the conflicting claims are not identical, they are not patentably distinct from each other because 12-13 and 15-18 of this application encompass claims 1, 4, 8, 10, 11-16 of Application No. 11/770,920. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nhon T. Diep whose telephone number is 571-272-7328. The examiner can normally be reached on m-f.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ND

/Nhon T Diep/
Primary Examiner, Art Unit 2621

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12268286	DEKEYSER, PAUL
	Examiner	Art Unit
	Nhon T Diep	2621

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/15/2009	05/29/2009							
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	✓	✓							
	7	✓	✓							
	8	✓	✓							
	9	✓	✓							
	10	✓	✓							
	11	✓	✓							
	12	✓	✓							
	13	✓	✓							
	14	✓	✓							
	15	✓	✓							
	16	✓	✓							
	17	✓	✓							
	18	✓	✓							
	19	✓	✓							
	20	✓	✓							

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12268286	DEKEYSER, PAUL
	Examiner	Art Unit
	Nhon T Diep	2621

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
East Search	3/15/2009	ND
Consulte w/ Rao, Vo	5/29/2009	ND

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

Appl No.:	**12/268,289**
Applicant:	**DeKeyser, Paul**
Filing Date:	**November 10, 2008**
Art Unit:	**2621**
Examiner:	**Diep, Nhon Thanh**
Attorney Docket No.:	**101488.0003US2**
Title	**Loop Recording with Book Marking**

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE AFTER FINAL OFFICE ACTION

Sir:

This paper responds to the Final Office Action dated June 9, 2009. Please enter the amendments shown herein. This document is also being filed with two terminal disclaimers.

- Claim amendments begin on page 2.
- Remarks begin on page 5.

Motorola v. Stellar
Motorola Exhibit 1013
Page 299

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (Previously Presented) A surveillance apparatus, comprising:
   a camera having an image capturing component that captures images, and a converting component that converts the images into at least one data stream;
   a local memory functionally coupled to the camera;
   a wireless transmitter functionally coupled to the local memory;
   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;
   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
   a sending facility that uses the transmitter to wirelessly transmit the second file to a remote memory.

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

3. (Previously Presented) The apparatus of claim 1, wherein the segment is at least 10 seconds long.

4. (Currently Amended) The apparatus of claim 1, further comprising a sensor that automatically triggers the signal to record upon detecting ~~identified~~identified content in at least one of the captured images.

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

Motorola v. Stellar
Motorola Exhibit 1013
Page 300

6. (Previously Presented) 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, the post-recorded subset, and the segment.

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

8. (Previously Presented) The apparatus of claim 1, wherein a mobile phone automatically receives the second file from the wireless transmitter and automatically forwards the second file to the remote memory.

9. (Original) The system of claim 1, further comprising a mount for the camera.

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

11. (Previously Presented) The system of claim 1, further comprising an electronic index that provides a directory to the first and the second files within the circular buffer.

12. (Previously Presented) 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 as a first file using a digital video file format;

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;

indexing write protected portions of the buffer as separate, distinct files during the step of recording; and

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

13. (Previously Presented) The method of claim 12, further comprising storing the distinct files from the write-protected portions as the distinct, separate files in the remote memory.

Motorola v. Stellar
Motorola Exhibit 1013
Page 301

14. (Previously Presented) The method of claim 12, further comprising recording the stream as the first file into physically dis-contiguous parts of the circular buffer.

15. (Original) The method of claim 12, wherein the signal to save a recording comprises a signal to start recording and a signal to stop recording.

16. (Original) 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.

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

18. (Previously Presented) The method of claim 12, further comprising removing write-protection from a transmitted write-protected portion after transmission of its corresponding distinct file.

19. (Previously Presented) The method of claim 12, further comprising sending a warning to a user before the write protected segment of the circular buffer is fully recorded.

20. (Previously Presented) The method of claim 19, further comprising 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.

Motorola v. Stellar
Motorola Exhibit 1013
Page 302

REMARKS/ARGUMENTS

The Final Office Action dated June 9, 2009, has been received and carefully considered. By this amendment, the claim 4 has been amended. After entry of this Amendment, claims 1 - 20 will be pending. In view of these amendments and the following remarks, Applicants respectfully request reconsideration.

Claim Amendments

Claim 4 has been amended to correct a typographical informality. The word "identifed" has been replaced with the correct word "identified".

Double Patenting

The Office provisionally rejected claims 1, 4 – 6, and 8 – 9 on the ground of nonstatutory obviousness type double patenting over claims 1, 7, 9 – 11, and 12 – 13 of commonly owned, co-pending application 11/846,217. In response, the Application submits the accompanying terminal disclaimer with respect to application 11/846,217.

The Office provisionally rejected claims 12 – 13, and 15 – 18 on the ground of nonstatutory obviousness type double patenting over claims 1, 4, 8, 10, and 11 – 16 of commonly owned, co-pending application 11/770,920. In response, the Application submits the accompanying terminal disclaimer with respect to application 11/770,920.

>>>

Motorola v. Stellar
Motorola Exhibit 1013
Page 303

Request For Allowance

Claims 1 – 20 are pending in this application. The applicant requests allowance of all pending claims.

Respectfully submitted,
Fish & Associates, PC

Date: June 17, 2009

By: /Nicholas J. Witchey/
Nicholas J. Witchey
Reg. No. 63481

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In re Application of: Paul DeKeyser

Application No.: 12/268,289

Filed: June 17, 2009

For: Loop Recording With Book Marking

The owner*, Paul DeKeyser, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 11/846,217, filed on 08/28/07, as such term is defined in 35 U.S.C. 154 and 173, and as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 and 173 of any patent granted on said **reference** application, "as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application," in the event that: any such patent: granted on the pending **reference** application: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

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I hereby declare that all statements made herein of 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 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 63481

/Nicholas J. Witchey/ — June 17, 2009
Signature — Date

Nicholas J. Witchey
Typed or printed name

(949) 943-8300
Telephone Number

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In re Application of: Paul DeKeyser

Application No.: 12/268,289

Filed: June 17, 2009

For: Loop Recording With Book Marking

The owner*, Paul DeKeyser, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 11/770,920, filed on 06/29/07, as such term is defined in 35 U.S.C. 154 and 173, and as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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I hereby declare that all statements made herein of 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 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 63481

/Nicholas J. Witchey/ — Signature
June 17, 2009 — Date

Nicholas J. Witchey — Typed or printed name

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Electronic Patent Application Fee Transmittal	
Application Number:	12268286
Filing Date:	10-Nov-2008
Title of Invention:	Loop Recording With Book Marking
First Named Inventor/Applicant Name:	Paul DeKeyser
Filer:	Martin Fessenmaier/Sara Geer
Attorney Docket Number:	101488.0003US2
Filed as Small Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Statutory disclaimer	2814	2	70	140
		Total in USD ($)		**140**

Electronic Acknowledgement Receipt	
EFS ID:	5533376
Application Number:	12268286
International Application Number:	
Confirmation Number:	7927
Title of Invention:	Loop Recording With Book Marking
First Named Inventor/Applicant Name:	Paul DeKeyser
Customer Number:	24392
Filer:	Martin Fessenmaier/Sara Geer
Filer Authorized By:	Martin Fessenmaier
Attorney Docket Number:	101488.0003US2
Receipt Date:	17-JUN-2009
Filing Date:	10-NOV-2008
Time Stamp:	14:40:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$140
RAM confirmation Number	779
Deposit Account	500341
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment After Final	Response_02.pdf	95454 0c7b342dc09a7ab19f58246840f3a24a1b369b8c	no	6
Warnings:					
Information:					
2	Terminal Disclaimer Filed	217_Terminal_Disclaimer.pdf	74025 8fad812f770ee0d71101f2e47f613859867a2e04	no	1
Warnings:					
Information:					
3	Terminal Disclaimer Filed	920_Terminal_Disclaimer.pdf	73943 dc8bbf92ee68edde2465948b930bea03e737af9b	no	1
Warnings:					
Information:					
4	Fee Worksheet (PTO-875)	fee-info.pdf	29976 2aa539978d7209f9110a77eb68fe37a996578eca	no	2
Warnings:					
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

Appl No.:	**11/846,217**
Applicant:	**DeKeyser, Paul**
Filing Date:	**August 28, 2007**
Art Unit:	**2621**
Examiner:	**Diep, Nhon Thanh**
Attorney Docket No.:	**101488.0002US1**
Title	**Recording Device with Pre-Start Signal Storage Capability**

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO OFFICE ACTION

Sir:

This paper responds to the Office Action dated March 19, 2009. The document is also accompanied by a terminal disclaimer. Please enter the amendments shown herein.

- Claim amendments begin on page 2.
- Remarks begin on page 4

Motorola v. Stellar
Motorola Exhibit 1013
Page 311

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (Currently Amended) A surveillance system comprising:

a camera that converts images into first and second data streams;

a memory; and

hardware that executes an instruction set that utilizes an area of the memory as a circular buffer, records the first data stream in the buffer; responds to a signal by protecting a recently used segment of the buffer storing at least a portion of the first data stream, ~~and~~ while continuously recordings the second data stream in an unprotected segment of the buffer, without overwriting the protected segment.

2. (Original) The system of claim 1, wherein the buffer stores at least 10 minutes of image frames.

3. (Original) The system of claim 1, wherein the second data stream is continuous with the first data stream.

4. (Original) The system of claim 1, wherein the memory stores at least a 30 second portion of the first data stream, including at least a 5 second pre-signal portion and at least a 5 second post-signal portion.

5. (Original) The system of claim 4, wherein the at least a 30 second portion of the first data stream is stored in logically dis-contiguous portions of the memory.

6. (Original) The system of claim 1, wherein at least 20% of the memory is used as the buffer.

7. (Original) The system of claim 1, further comprising a sensor that automatically initiates the signal.

8. (Original) The system of claim 7, wherein the sensor operates upon content in the first data stream.

Motorola v. Stellar
Motorola Exhibit 1013
Page 312

9. (Original) The system of claim 1, further comprising an interface through which a human can initiate the signal.

10. (Original) The system of claim 1, further comprising an interface through which a human can override a default pre-signal size of the recently used segment.

11. (Original) The system of claim 1, further comprising an interface through which a human can override a default post-signal size of the recently used segment.

12. (Original) The system of claim 1, further comprising a wireless receiver upstream of the buffer with respect to the first data stream.

13. (Original) The system of claim 1, further comprising a wearable mount for the camera.

14. (Original) The system of claim 1, further comprising a vehicle mount for the camera.

15. (New) The system of claim 1, further comprising a wireless signaling device in wireless communication with the camera and the hardware, and that is configured to wirelessly send the signal to the hardware.

16. (New) The system of claim 15, wherein the wireless signaling device comprises a human wearable ring.

17. (New) The system of claim 15, wherein the wireless signaling device comprises a key fob.

18. (New) The system of claim 15, wherein the wireless signaling device is local to the camera and the hardware, and local about a user.

Motorola v. Stellar
Motorola Exhibit 1013
Page 313

REMARKS/ARGUMENTS

The Office Action dated March 19, 2009, has been received and carefully considered. By this amendment, claim 1 has been amended. New claims 15 – 18 have been added. After entry of this Amendment, claims 1 - 18 will be pending. In view of these amendments and the following remarks, Applicants respectfully request reconsideration.

Double Patenting

The Office provisionally rejected claims 1, 7, 9 – 11, and 12 – 13 on the ground of non-statutory obviousness-type double patenting as being un-patentable over claims 1, 4 – 6, and 8 – 9 of co-pending application having serial number 12/268,286. The Applicant acknowledges the provisional double patenting rejection and files the accompanying terminal disclaimer to overcome the provisional rejection.

Claim Amendments

Claim 1 has been amended to clarify that the buffer segments storing the first data stream are protected while continuously recording the second data stream in the buffer (see paragraphs [0028] and [0029]).

Claims 15 – 18 are newly added and include features relating to the wireless signaling device. Support for claim 15 and 16can be found in paragraph [0034]. Support for claim 17 can be found at the end of paragraph [0034]. Support for claim 18 can be found in the discussion that a user can wear an eyeglass camera (paragraph [0031]), can wear a ring (paragraph [0034]), and that the recorder can be worn on a belt (paragraph [0032]; Figure 4 element 46).

35 USC §102

The Office rejected claims 1, 3, 6, and 9 under 35 USC 102 as being anticipated by Hattori et al. (U.S. patent 5,523,799). The Applicant respectfully disagrees, especially in view of the amendments entered herein. Amended claim 1 requires that the hardware protect segments of image data while continuously recording additional data streams. Hattori provide teachings that are counter to such an approach. Hattori specifically contemplates that once data has been registered, and then film making can continue (C4/L3 – 11). Clearly Hattori contemplates that recording stops when registering a writing inhibition area as opposed to protecting segment

Motorola v. Stellar
Motorola Exhibit 1013
Page 314

while also continuing to record additional stream data. Claim 1 is allowably over Hattori, as are claims 3, 6, and 9 via their dependence on claim1, on the ground that Hattori fails to teach all the claimed features of claim 1.

35 USC §103

Claim 2

The Office rejected claim 2 under 35 USC 103 as being obvious over Hattori et al. (U.S. patent 5,523,799) in view of Washino (U.S. patent 6,370,198). Washino fails to contribute to Hattori to arrive at the feature of a protecting a data stream while continuing to record additional stream data in the same circular buffer as claimed in claim 1. Claim 2 is allowable over Hattori and Washino via its dependence on claim 1 and on the ground that the cited art, alone or combined, fail teach, suggest, or motivate the features of claim 1.

Claims 4 – 5, 7 – 8, and 10 - 11

The Office rejected claims 4 – 5, 7 – 8, and 10 – 11 under 35 USC 103 as being obvious over Hattori et al. (U.S. patent 5,523,799) in view of Plante (U.S. patent application publication 2007/0132773). Plante also fails to contribute to Hattori to arrive at the feature of protecting a data stream while continuing to record additional stream data in the same circular buffer as claimed in claim 1. Claims 4 – 5, 7 – 8, and 10 – 11 are allowable over Hattori and Plante (alone or combined) by virtue of their dependence on claim 1.

Claims 12 – 14

The Office rejected claims 12 - 14 under 35 USC 103 as being obvious over Hattori et al. (U.S. patent 5,523,799) in view of Vanman (U.S. patent application publication 2006/0158968). Vanman also fails to contribute to Hattori to arrive at the feature of protecting a data stream while continuing to record additional stream data in the same circular buffer as claimed in claim 1. Vanman merely contemplates recording into a preserved space (see steps 420 – 450 of Figure 4). Claims 12 - 14 are allowable over Hattori and Vanman (alone or combined) by virtue of their dependence on claim 1.

Motorola v. Stellar
Motorola Exhibit 1013
Page 315

New Claims 15 – 17

The Applicant submits that claims 15 – 18 are allowable over the cited art on the grounds that they depend from allowable claim 1 and that none of the cited art, alone or combined, fairly teaches, suggests, or motivates (a) using a wireless signaling device in communication with the camera and hardware, (b) using ring as a signaling device, (b) using a key fob as a signaling device, or (c) the a signaling device is disposed locally about a person along with a camera and hardware to record data streams.

Request For Allowance

Claims 1 - 18 are pending in this application. The applicant requests allowance of all pending claims.

Respectfully submitted,
Fish & Associates, PC

Date: June 17, 2009

By: /Nicholas J. Witchey/
Nicholas J. Witchey
Reg. No. 63481

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Irvine, CA 92614-4271
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Motorola v. Stellar
Motorola Exhibit 1013
Page 316

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TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION	Docket Number (Optional) 101488.0002US1

In re Application of: Paul DeKeyser

Application No.: 11/846,217

Filed: August 28, 2007

For: Recording Device With Pre-Start Signal Storage Capability

The owner*, Paul DeKeyser, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 12/268,286, filed on 11/10/08, as such term is defined in 35 U.S.C. 154 and 173, and as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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I hereby declare that all statements made herein of 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 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 63481

/Nicholas J. Witchey/ — June 17, 2009
Signature — Date

Nicholas J. Witchey
Typed or printed name

(949) 943-8300
Telephone Number

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*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this statement. See MPEP § 324.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Patent Application Fee Transmittal	
Application Number:	12268286
Filing Date:	10-Nov-2008
Title of Invention:	Loop Recording With Book Marking
First Named Inventor/Applicant Name:	Paul DeKeyser
Filer:	Martin Fessenmaier/Sara Geer
Attorney Docket Number:	101488.0003US2
Filed as Small Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Statutory disclaimer	2814	1	70	70
		Total in USD ($)		**70**

Electronic Acknowledgement Receipt	
EFS ID:	5534578
Application Number:	12268286
International Application Number:	
Confirmation Number:	7927
Title of Invention:	Loop Recording With Book Marking
First Named Inventor/Applicant Name:	Paul DeKeyser
Customer Number:	24392
Filer:	Martin Fessenmaier/Sara Geer
Filer Authorized By:	Martin Fessenmaier
Attorney Docket Number:	101488.0003US2
Receipt Date:	17-JUN-2009
Filing Date:	10-NOV-2008
Time Stamp:	15:41:10
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$70
RAM confirmation Number	1817
Deposit Account	500341
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	Response_01.pdf	96554 42607133bb31011023b7e135d1e5973a19038b23	no	6
Warnings:					
Information:					
2	Terminal Disclaimer Filed	286_Terminal_Disclaimer.pdf	74235 390e73ce1047d8e550032c816e2503c71e914b7c	no	1
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	29945 7a930f42e2375cdeaa3fcfcfa0c6a24f07709666	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	200734		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 12/268,286	Filing Date 11/10/2008	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☒		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT	06/17/2009	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X $26 =	0	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0	X $110 =	0	OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/THERESA LINDSAY/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	12/268,286	DEKEYSER, PAUL	

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☐ APPROVED	☒ DISAPPROVED
Date Filed : 06/17/09	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

3 - tds disapproved / Instant case number incorrect, see FP 14.26;

Attny not of record no evidence of chain of title to the assignee signing the Td, see FP 14.30 and 14.34.

Angie

U.S. Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

24392 7590 07/13/2009

FISH & ASSOCIATES, PC
ROBERT D. FISH
2603 Main Street
Suite 1000
Irvine, CA 92614-6232

EXAMINER	
DIEP, NHON THANH	
ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 07/13/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/268,286	11/10/2008	Paul DeKeyser	101488.0003US2	7927

TITLE OF INVENTION: LOOP RECORDING WITH BOOK MARKING

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	10/13/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

Motorola v. Stellar
Motorola Exhibit 1013
Page 324

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

24392 7590 07/13/2009

FISH & ASSOCIATES, PC
ROBERT D. FISH
2603 Main Street
Suite 1000
Irvine, CA 92614-6232

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/268,286	11/10/2008	Paul DeKeyser	101488.0003US2	7927

TITLE OF INVENTION: LOOP RECORDING WITH BOOK MARKING

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	10/13/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
DIEP, NHON THANH	2621	348-143000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Motorola v. Stellar
Motorola Exhibit 1013
Page 325

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/268,286	11/10/2008	Paul DeKeyser	101488.0003US2	7927

24392 7590 07/13/2009

FISH & ASSOCIATES, PC
ROBERT D. FISH
2603 Main Street
Suite 1000
Irvine, CA 92614-6232

EXAMINER	
DIEP, NHON THANH	
ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 07/13/2009

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

Notice of Allowability	Application No. 12/268,286	Applicant(s) DEKEYSER, PAUL	
	Examiner Nhon T. Diep	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *6/17/2009*.

2. ☒ The allowed claim(s) is/are *1-20*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Nhon T Diep/
Primary Examiner, Art Unit 2621

Motorola v. Stellar
Motorola Exhibit 1013
Page 327

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	4	dekeyser-paul $.in.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/06/25 14:15
L2	0	camera same memory same circular same wireless and transmit $6 and record $6 and wrie and protect$7 and index$6	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/06/25 14:20
L3	0	camera same memory same circular and record$6 and wrie and protect$7 and index$6	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/06/25 14:20
L4	1	(camera and memory same circular and record$6 and write and protect$7 and index$6).clm.	US-PGPUB; USPAT	OR	ON	2009/06/25 14:21
L5	8	camera same memory same circular and record$6 and writ$5 and protect$7 and index$6	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/06/25 14:22

Motorola v. Stellar
Motorola Exhibit 1013
Page 328

L6	3	camera same memory same circular same record $6 and writ$5 and protect$7 and index$6	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/06/25 14:23
L7	1	camera same memory same circular same record $6 and writ$5 same protect $7 and index $6	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/06/25 14:24

6/25/09 2:25:08 PM
C:\Documents and Settings\NDIEP\My Documents\EAST\Workspaces\11112326.wsp

Motorola v. Stellar
Motorola Exhibit 1013
Page 329

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12268286	DEKEYSER, PAUL
	Examiner	Art Unit
	Nhon T Diep	2621

SEARCHED			
Class	Subclass	Date	Examiner
348	143	6/25/2009	ND

SEARCH NOTES		
Search Notes	Date	Examiner
East Search	3/15/2009	ND
Consulte w/ Rao, Vo	5/29/2009	ND
East Search	6/25/2009	ND

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
See attached		6/25/2009	ND

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12268286	DEKEYSER, PAUL
	Examiner	**Art Unit**
	Nhon T Diep	2621

ORIGINAL		INTERNATIONAL CLASSIFICATION									
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED				
348	143	H	0	4	N	9 / 47 (2006.01.01)					
CROSS REFERENCE(S)		H	0	4	N	7 / 18 (2006.01.01)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)										

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	17	17												
2	2	18	18												
3	3	19	19												
4	4	20	20												
5	5														
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9	9														
10	10														
11	11														
12	12														
13	13														
14	14														
15	15														
16	16														

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/Nhon T Diep/ Primary Examiner.Art Unit 2621	6/25/2009	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	3 and 4G

Motorola v. Stellar
Motorola Exhibit 1013
Page 331

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 7927

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
12/268,286	11/10/2008 RULE	348	2621	101488.0003US2

APPLICANTS
Paul DeKeyser, Irvine, CA;

**** CONTINUING DATA **************************
This application is a CIP of 11/770,920 06/29/2007
which claims benefit of 60/824,097 08/31/2006
This application 12/268,286 11/10/2008
is a CIP of 11/846,217 08/28/2007
which claims benefit of 60/824,095 08/31/2006

**** FOREIGN APPLICATIONS **************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
11/14/2008

Foreign Priority claimed	35 USC 119(a-d) conditions met	Verified and Acknowledged	Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ Yes ☑ No	☐ Yes ☑ No	/NHON THANH DIEP/ Examiner's Signature	☐ Initials	CA	4	20	2

ADDRESS
FISH & ASSOCIATES, PC
ROBERT D. FISH
2603 Main Street
Suite 1000
Irvine, CA 92614-6232
UNITED STATES

TITLE
LOOP RECORDING WITH BOOK MARKING

FILING FEE RECEIVED		
462	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

Appl No.:	**12/268,289**
Applicant:	**DeKeyser, Paul**
Filing Date:	**November 10, 2008**
Art Unit:	**2621**
Examiner:	**Diep, Nhon Thanh**
Attorney Docket No.:	**101488.0003US2**
Title	**Loop Recording with Book Marking**

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE AFTER FINAL OFFICE ACTION

Sir:

This paper responds to the Final Office Action dated June 9, 2009. Please enter the amendments shown herein. This document is also being filed with two terminal disclaimers.

- Claim amendments begin on page 2.
- Remarks begin on page 5.

Please enter,
N.D.
7/5/2009

Motorola v. Stellar
Motorola Exhibit 1013
Page 333

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

24392 7590 07/13/2009

FISH & ASSOCIATES, PC
ROBERT D. FISH
2603 Main Street
Suite 1000
Irvine, CA 92614-6232

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Sara Geer (Depositor's name)
(Signature)
8/26/09 (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/268,286	11/10/2008	Paul DeKeyser	101488.0003US2	7927

TITLE OF INVENTION: LOOP RECORDING WITH BOOK MARKING

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	~~$1055~~ $1064.00	10/13/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
DIEP, NHON THANH	2621	348-143000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 Fish & Associates, PC
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☒ Publication Fee (No small entity discount permitted)
☒ Advance Order - # of Copies 3

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 50034 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature M. Fissenmaier Date 8/26/09

Typed or printed name Martin Fissenmaier Registration No. 41697

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Motorola v. Stellar
Motorola Exhibit 1013
Page 334

Electronic Patent Application Fee Transmittal	
Application Number:	12268286
Filing Date:	10-Nov-2008
Title of Invention:	LOOP RECORDING WITH BOOK MARKING
First Named Inventor/Applicant Name:	Paul DeKeyser
Filer:	Martin Fessenmaier/Sara Geer
Attorney Docket Number:	101488.0003US2
Filed as Small Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	2501	1	755	755
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
Printed copy of patent - no color	8001	3	3	9
		Total in USD ($)		**1064**

Electronic Acknowledgement Receipt	
EFS ID:	5956086
Application Number:	12268286
International Application Number:	
Confirmation Number:	7927
Title of Invention:	LOOP RECORDING WITH BOOK MARKING
First Named Inventor/Applicant Name:	Paul DeKeyser
Customer Number:	24392
Filer:	Martin Fessenmaier/Sara Geer
Filer Authorized By:	Martin Fessenmaier
Attorney Docket Number:	101488.0003US2
Receipt Date:	26-AUG-2009
Filing Date:	10-NOV-2008
Time Stamp:	14:08:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1064
RAM confirmation Number	330
Deposit Account	500341
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)	
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Issue_Fee.pdf	100213 38b9ccb5bdfb827801e951b9c6ef68ad56c1e1dc	no	1
Warnings:					
Information:					
2	Fee Worksheet (PTO-875)	fee-info.pdf	33620 0294705d79481fa9e58ecc7d3cff4813768d45f6	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	133833		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/268,286	09/22/2009	7593034	101488.0003US2	7927

24392 7590 09/02/2009

FISH & ASSOCIATES, PC
ROBERT D. FISH
2603 Main Street
Suite 1000
Irvine, CA 92614-6232

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Paul DeKeyser, Irvine, CA;

PTO/SB/44 (09-07)
Approved for use through 08/31/2013. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.
(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7593034

APPLICATION NO.: 12/268286

ISSUE DATE : Sep. 22, 2009

INVENTOR(S) : Paul DeKeyser

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the front page, please replace:
(63) Continuation-in-part of application No. 11/770,920, filed on Jun. 29, 2007, which is a continuation-in-part of application No. 11/846,217, filed on Aug. 28, 2007.

with:
(63) Continuation-in-part of application No. 11/770,920, filed on Jun. 29, 2007, and is a continuation-in-part of application No. 11/846,217, filed on Aug. 28, 2007.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Fish & Tsang LLP
2603 Main Street, Suite 1000
Irvine, CA 92614

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal				
Application Number:	12268286			
Filing Date:	10-Nov-2008			
Title of Invention:	LOOP RECORDING WITH BOOK MARKING			
First Named Inventor/Applicant Name:	Paul DeKeyser			
Filer:	Tomas Prieto/Laryssa Weiland			
Attorney Docket Number:	101488.0003US2			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Certificate of Correction	1811	1	100	100

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**100**

Electronic Acknowledgement Receipt	
EFS ID:	21395350
Application Number:	12268286
International Application Number:	
Confirmation Number:	7927
Title of Invention:	LOOP RECORDING WITH BOOK MARKING
First Named Inventor/Applicant Name:	Paul DeKeyser
Customer Number:	24392
Filer:	Tomas Prieto/Laryssa Weiland
Filer Authorized By:	Tomas Prieto
Attorney Docket Number:	101488.0003US2
Receipt Date:	04-FEB-2015
Filing Date:	10-NOV-2008
Time Stamp:	12:41:38
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$100
RAM confirmation Number	20011
Deposit Account	500341
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	Certificate_Correction-01b.pdf	164259 93c952f58744b30cc5b639035a8a3e3d35a2e5d4	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30168 e45a911e9488903f95de4cd60a176b203cf90e1c	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	194427		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO.	: 7,593,034 B2
APPLICATION NO.	: 12/268286
DATED	: September 22, 2009
INVENTOR(S)	: Paul DeKeyser

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page

replace:
item (63) Continuation-in-part of application No. 11/770,920, filed on Jun. 29, 2007, which is a continuation-in-part of application No. 11/846,217, filed on Aug. 28, 2007.

with:
(63) Continuation-in-part of application No. 11/770,920, filed on Jun. 29, 2007, and is a continuation-in-part of application No. 11/846,217, filed on Aug. 28, 2007.

Signed and Sealed this
Twenty-sixth Day of May, 2015

Michelle K. Lee

Michelle K. Lee
Director of the United States Patent and Trademark Office

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the Eastern District of Texas on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
4:22-cv-877	10/14/2022	for the Eastern District of Texas

PLAINTIFF	DEFENDANT
STELLAR, LLC	PITTASOFT CO., LTD. D/B/A BLACKVUE

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	US 7,593,034	9/22/2009	STELLAR, LLC
2	US 8,692,882	4/8/2014	STELLAR, LLC
3	US 9,485,471	11/1/2016	STELLAR, LLC
4	US 9,912,914	3/6/2018	STELLAR, LLC
5	US 10,965,910	3/30/2021	STELLAR, LLC

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director **Copy 3—Upon termination of action, mail this copy to Director**
Copy 2—Upon filing document adding patent(s), mail this copy to Director **Copy 4—Case file copy**