White Space Challenge

Patents and Patent Research

Winter 2023

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What is Intellectual Property?

- "Intellectual property" ("IP") is a catch-all term that includes patents, trademarks, copyrights, and trade secrets.

- In the most general terms, IP is any product of the human mind which the law protects against unauthorized use by others.

- *"Congress shall have power...to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." Article I, Section 8 U.S. Constitution.*

Why is IP Important?

- Fend off Aggression from Competitors
- Higher Value Products
- Negotiation Leverage and negotiating power with Suppliers & Customers
- Deal Leverage for Acquisitions or Spinouts
- Stronger and sustainable Market Position
- Better Access to Capital and startup funding
- Prestige for Company & Its Employees

Key Areas of IP for Engineering

- PATENTS
  - Broad Protection for Technology that must be shared with public and, as a result, could easily be learned and duplicated

- TRADE SECRETS
  - Variable Levels of Protection for Information, Techniques and Know-How that must be kept confidential in order to be valuable

Reasons for Researching Patents

- Understand state of art in field
- Ascertain room for innovation in field
- Obtain better understanding of competitors' products – what legally protected features to avoid in your design
- Avoid infringement of other companies' patents when designing one's products and services
- Conduct prior art searching to 'reality check' novelty of an invention when compared to the prior art
- Make informed licensing, joint development and other corporate transactional decisions
- Obtain better understanding of strategic business options
- **Bring focus to your design into a novel white space!**

Patents – Subject Matter

- Any person who "invents or discovers any new and useful process, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent," subject to the conditions and requirements of the federal patent laws

- Interpretations of the statutory requirement by the courts have more carefully defined the limits of patentable subject matter; thus it has been held that **laws of nature**, **physical phenomena**, and **abstract ideas** are *not* patentable

Patents – Standards for Obtaining

- An invention must be **"new", "useful"** and **"non-obvious"** in order to be patentable

- **NON-OBVIOUSNESS:**
  - "obvious to a *person having ordinary skill in the art*" (i.e., the area of technology related to the invention)

From a business perspective, your invention should be creating a competitive advantage over the prior art.

Patents – Standards for Obtaining

NOVELTY:

- an invention cannot be patented if: "(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent," or "(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country more than one year prior to the application for patent in the United States . . ."

Patents – Standards for Obtaining

NON-OBVIOUSNESS

- Determining the ***scope and contents*** of the art when the invention was made;
- Ascertaining the ***differences*** between that art and the claim(s) at issue;
- Resolving the ***level of ordinary skill*** (POSITA) in the pertinent art when the invention was made; and
- Considering ***objective evidence*** present in the application indicating obviousness or non-obviousness when the invention was made.

Patents – Standards for Obtaining Obviousness Secondary Considerations

- Commercial success of products covered by the patent claims;
- A long-felt need for the invention;
- Failed attempts by others to make the invention;
- Copying of the invention by others;
- Unexpected results achieved by others;
- Praise of the invention;
- The taking of licenses under the patent by others;
- Expressions of surprise by experts at the making of the invention; and

The Issued Patent

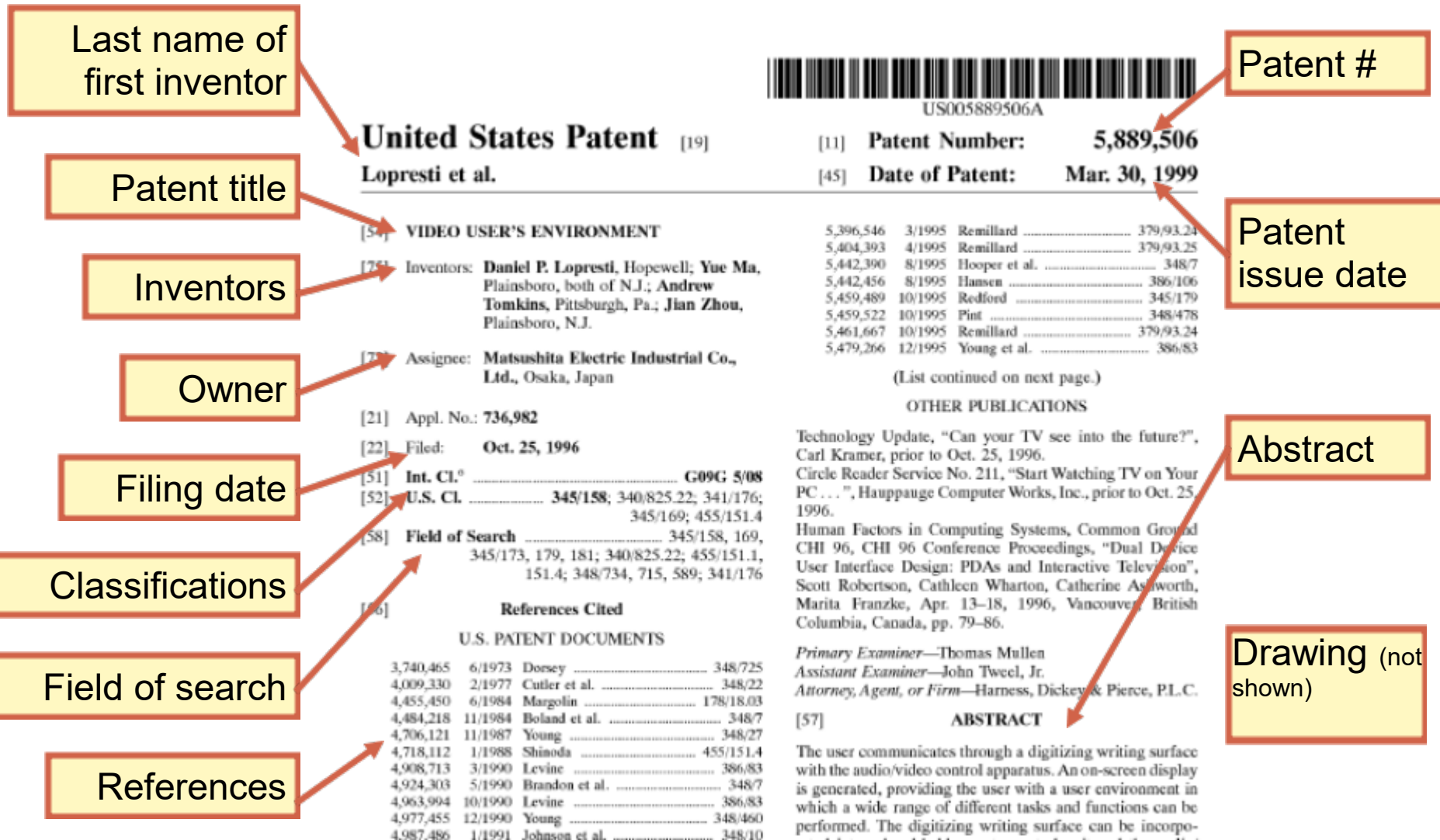
- Takes 1½ to 5+ years for a patent to issue from time of original application filing
- Is effective as a property right from date of issuance
- Confers exclusive right to owner to **make**, **have made**, **use**, **sell**, **offer for sale** or **import** patented invention or products/services incorporating invention (i.e., right to exclude others from doing such things)
- Typically, patents endure for 20 years from the date of earliest application filing

Structural Parts of a Patent

- Title
- Abstract
- Background of the Invention
- Brief Summary of the Invention
- Description of Drawings
- Detailed Specifications of the Invention
- Claims
- Prototype – Reduction to practice

Cover Page or Front Page

Contains bibliographical data about the patent



Front Page Basics

US005164839A

United States Patent [19]

Lang

[11] **Patent Number: 5,164,839**

[45] **Date of Patent: Nov. 17, 1992**

[54] **METHOD FOR HANDLING AUDIO/VIDEO SOURCE INFORMATION**

[75] Inventor: **Richard A. Lang**, Cave Creek, Ariz.

[73] Assignee: **Explore Technology, Inc.**, Scottsdale, Ariz.

[21] Appl. No.: **775,182**

[22] Filed: **Oct. 11, 1991**

Related U.S. Application Data

[60] Division of Ser. No. 347,629, May 5, 1989, Pat. No. 5,057,932, which is a continuation-in-part of Ser. No. 289,776, Dec. 27, 1988, Pat. No. 4,963,995.

[51] **Int. Cl.**[5] **H04N 5/76**

[52] **U.S. Cl.** **358/335**; 358/133; 360/8; 360/9.1; 360/14.1

[58] **Field of Search** 358/335, 133, 903, 901, 358/310, 134; 360/8, 9.1, 13, 14.1

[56] **References Cited**

U.S. PATENT DOCUMENTS

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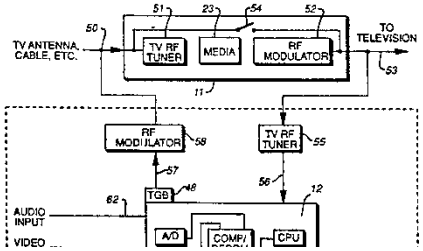
Primary Examiner—Roy N. Envall, Jr.
Assistant Examiner—Huy Nguyen
Attorney, Agent, or Firm—William E. Hein

[57] **ABSTRACT**

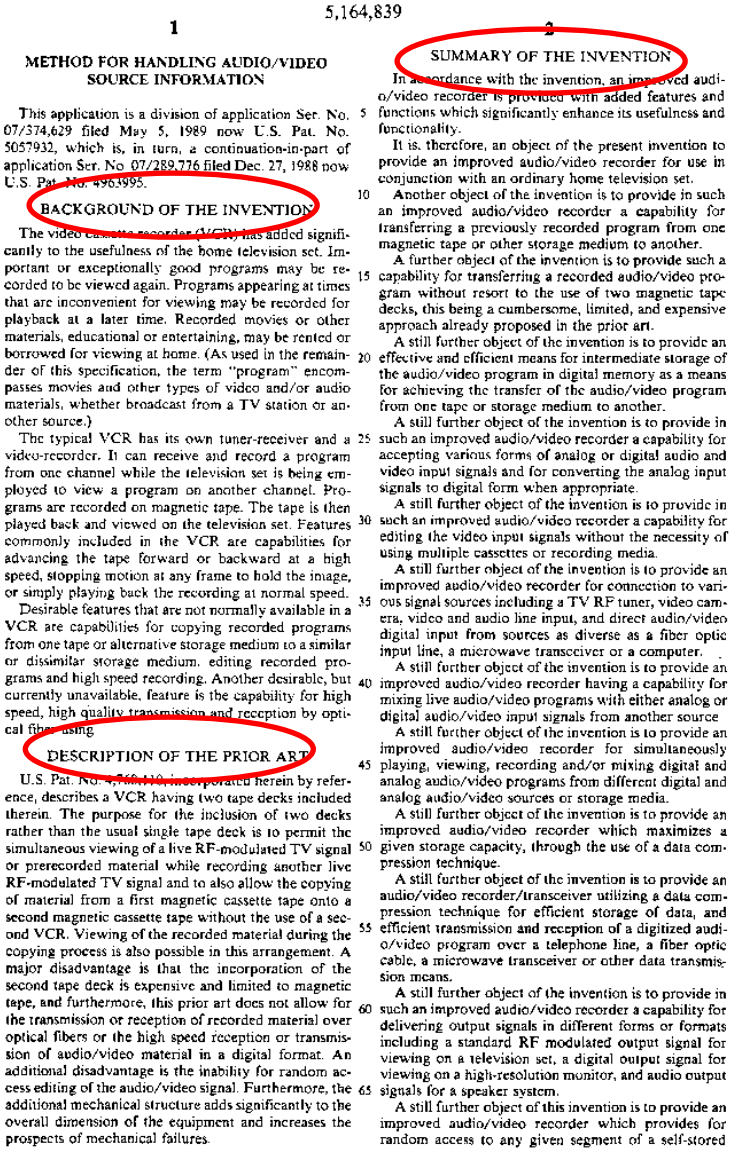
An improved video recorder/transceiver with expanded functionality ("VCR-ET") including a capability for storing video and video programs in digital format, editing such programs, transferring such programs onto a hard copy magnetic media, and transmitting such programs to a remote location using a second VCR-ET. The increased functionality is realized through the use of analog to digital conversion, signal compression and intermediate storage in an integrated circuit, random access memory. The recorder/transmitter has capabilities to transmit and receive program information in either a compressed or decompressed format over fiber optic lines, conventional phone lines or microwaves.

77 Claims, 4 Drawing Sheets



- U.S. No. 5,164,839
- Is it a patent or an application
- Is the patent owned by the Inventor('s) or Assignee
- How many prior art references were cited
- Did the examiner or the applicant identify the prior art
- Number of claims

What is the Patent's Specification?



METHOD FOR HANDLING AUDIO/VIDEO SOURCE INFORMATION

This application is a division of application Ser. No. 07/374,629 filed May 5, 1989 now U.S. Pat. No. 5057932, which is, in turn, a continuation-in-part of application Ser. No. 07/289,776 filed Dec. 27, 1988 now U.S. Pat. No. 4963995.

BACKGROUND OF THE INVENTION

The video cassette recorder (VCR) has added significantly to the usefulness of the home television set. Important or exceptionally good programs may be recorded to be viewed again. Programs appearing at times that are inconvenient for viewing may be recorded for playback at a later time. Recorded movies or other materials, educational or entertaining, may be rented or borrowed for viewing at home. (As used in the remainder of this specification, the term "program" encompasses movies and other types of video and/or audio materials, whether broadcast from a TV station or another source.)

The typical VCR has its own tuner-receiver and a video-recorder. It can receive and record a program from one channel while the television set is being employed to view a program on another channel. Programs are recorded on magnetic tape. The tape is then played back and viewed on the television set. Features commonly included in the VCR are capabilities for advancing the tape forward or backward at a high speed, stopping motion at any frame to hold the image, or simply playing back the recording at normal speed.

Desirable features that are not normally available in a VCR are capabilities for copying recorded programs from one tape or alternative storage medium to a similar or dissimilar storage medium, editing recorded programs and high speed recording. Another desirable, but currently unavailable, feature is the capability for high speed, high quality transmission and reception by optical fiber using

DESCRIPTION OF THE PRIOR ART

U.S. Pat. No. 4,[illegible], incorporated herein by reference, describes a VCR having two tape decks included therein. The purpose for the inclusion of two decks rather than the usual single tape deck is to permit the simultaneous viewing of a live RF-modulated TV signal or prerecorded material while recording another live RF-modulated TV signal and to also allow the copying of material from a first magnetic cassette tape onto a second magnetic cassette tape without the use of a second VCR. Viewing of the recorded material during the copying process is also possible in this arrangement. A major disadvantage is that the incorporation of the second tape deck is expensive and limited to magnetic tape, and furthermore, this prior art does not allow for the transmission or reception of recorded material over optical fibers or the high speed reception or transmission of audio/video material in a digital format. An additional disadvantage is the inability for random access editing of the audio/video signal. Furthermore, the additional mechanical structure adds significantly to the overall dimension of the equipment and increases the prospects of mechanical failures.

SUMMARY OF THE INVENTION

In accordance with the invention, an improved audio/video recorder is provided with added features and functions which significantly enhance its usefulness and functionality.

It is, therefore, an object of the present invention to provide an improved audio/video recorder for use in conjunction with an ordinary home television set.

Another object of the invention is to provide in such an improved audio/video recorder a capability for transferring a previously recorded program from one magnetic tape or other storage medium to another.

A further object of the invention is to provide such a capability for transferring a recorded audio/video program without resort to the use of two magnetic tape decks, this being a cumbersome, limited, and expensive approach already proposed in the prior art.

A still further object of the invention is to provide an effective and efficient means for intermediate storage of the audio/video program in digital memory as a means for achieving the transfer of the audio/video program from one tape or storage medium to another.

A still further object of the invention is to provide in such an improved audio/video recorder a capability for accepting various forms of analog or digital audio and video input signals and for converting the analog input signals to digital form when appropriate.

A still further object of the invention is to provide in such an improved audio/video recorder a capability for editing the video input signals without the necessity of using multiple cassettes or recording media.

A still further object of the invention is to provide an improved audio/video recorder for connection to various signal sources including a TV RF tuner, video camera, video and audio line input, and direct audio/video digital input from sources as diverse as a fiber optic input line, a microwave transceiver or a computer.

A still further object of the invention is to provide an improved audio/video recorder having a capability for mixing live audio/video programs with either analog or digital audio/video input signals from another source

A still further object of the invention is to provide an improved audio/video recorder for simultaneously playing, viewing, recording and/or mixing digital and analog audio/video programs from different digital and analog audio/video sources or storage media.

A still further object of the invention is to provide an improved audio/video recorder which maximizes a given storage capacity, through the use of a data compression technique.

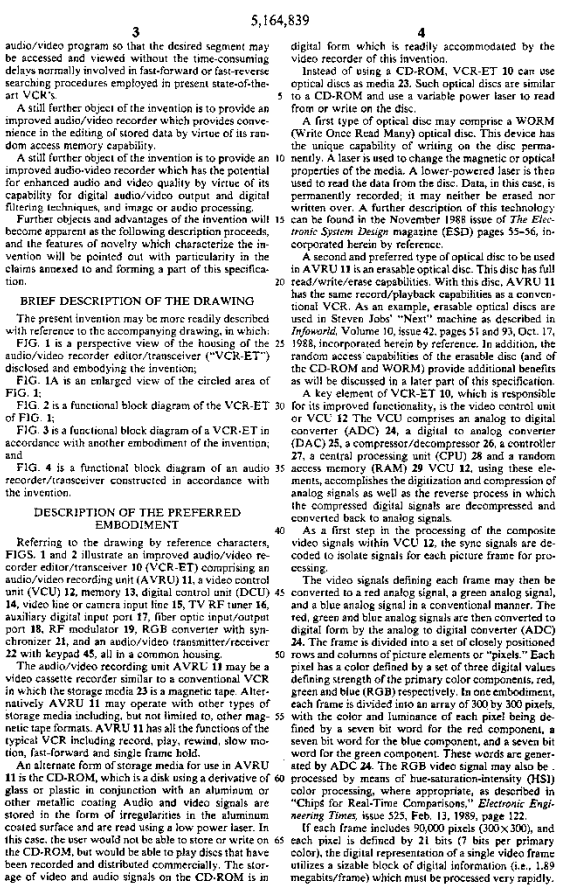
A still further object of the invention is to provide an audio/video recorder/transceiver utilizing a data compression technique for efficient storage of data, and efficient transmission and reception of a digitized audio/video program over a telephone line, a fiber optic cable, a microwave transceiver or other data transmission means.

A still further object of the invention is to provide in such an improved audio/video recorder a capability for delivering output signals in different forms or formats including a standard RF modulated output signal for viewing on a television set, a digital output signal for viewing on a high-resolution monitor, and audio output signals for a speaker system.

A still further object of this invention is to provide an improved audio/video recorder which provides for random access to any given segment of a self-stored

- The specification must set forth the precise invention for which a patent is solicited, in such manner as to distinguish it from other inventions and from what is old
- It literally must "teach" one skilled in the art how to practice, make or recreate the invention
- Includes statements re field of the invention, problem addressed or solved by the invention, and detail regarding the solution comprising the invention

What is the Patent's Specification?



5,164,839

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audio/video program so that the desired segment may be accessed and viewed without the time-consuming delays normally involved in fast-forward or fast-reverse searching procedures employed in present state-of-the-art VCR's.

A still further object of the invention is to provide an improved audio/video recorder which provides convenience in the editing of stored data by virtue of its random access memory capability.

A still further object of the invention is to provide an improved audio-video recorder which has the potential for enhanced audio and video quality by virtue of its capability for digital audio/video output and digital filtering techniques, and image or audio processing.

Further objects and advantages of the invention will become apparent as the following description proceeds, and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

BRIEF DESCRIPTION OF THE DRAWING

The present invention may be more readily described with reference to the accompanying drawing, in which:

FIG. 1 is a perspective view of the housing of the audio/video recorder editor/transceiver ("VCR-ET") disclosed and embodying the invention;

FIG. 1A is an enlarged view of the circled area of FIG. 1;

FIG. 2 is a functional block diagram of the VCR-ET of FIG. 1;

FIG. 3 is a functional block diagram of a VCR-ET in accordance with another embodiment of the invention; and

FIG. 4 is a functional block diagram of an audio recorder/transceiver constructed in accordance with the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing by reference characters, FIGS. 1 and 2 illustrate an improved audio/video recorder editor/transceiver 10 (VCR-ET) comprising an audio/video recording unit (AVRU) 11, a video control unit (VCU) 12, memory 13, digital control unit (DCU) 14, video line or camera input line 15, TV RF tuner 16, auxiliary digital input port 17, fiber optic input/output port 18, RF modulator 19, RGB converter with synchronizer 21, and an audio/video transmitter/receiver 22 with keypad 45, all in a common housing.

The audio/video recording unit AVRU 11 may be a video cassette recorder similar to a conventional VCR in which the storage media 23 is a magnetic tape. Alternatively AVRU 11 may operate with other types of storage media including, but not limited to, other magnetic tape formats. AVRU 11 has all the functions of the typical VCR including record, play, rewind, slow motion, fast-forward and single frame hold.

An alternate form of storage media for use in AVRU 11 is the CD-ROM, which is a disk using a derivative of glass or plastic in conjunction with an aluminum or other metallic coating. Audio and video signals are stored in the form of irregularities in the aluminum coated surface and are read using a low power laser. In this case, the user would not be able to store or write on the CD-ROM, but would be able to play discs that have been recorded and distributed commercially. The storage of video and audio signals on the CD-ROM is in

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digital form which is readily accommodated by the video recorder of this invention.

Instead of using a CD-ROM, VCR-ET 10 can use optical discs as media 23. Such optical discs are similar to a CD-ROM and use a variable power laser to read from or write on the disc.

A first type of optical disc may comprise a WORM (Write Once Read Many) optical disc. This device has the unique capability of writing on the disc permanently. A laser is used to change the magnetic or optical properties of the media. A lower-powered laser is then used to read the data from the disc. Data, in this case, is permanently recorded; it may neither be erased nor written over. A further description of this technology can be found in the November 1988 issue of *The Electronic System Design* magazine (ESD) pages 55–56, incorporated herein by reference.

A second and preferred type of optical disc to be used in AVRU 11 is an erasable optical disc. This disc has full read/write/erase capabilities. With this disc, AVRU 11 has the same record/playback capabilities as a conventional VCR. As an example, erasable optical discs are used in Steven Jobs' "Next" machine as described in *Infoworld*, Volume 10, issue 42, pages 51 and 93, Oct. 17, 1988, incorporated herein by reference. In addition, the random access capabilities of the erasable disc (and of the CD-ROM and WORM) provide additional benefits as will be discussed in a later part of this specification.

A key element of VCR-ET 10, which is responsible for its improved functionality, is the video control unit or VCU 12. The VCU comprises an analog to digital converter (ADC) 24, a digital to analog converter (DAC) 25, a compressor/decompressor 26, a controller 27, a central processing unit (CPU) 28 and a random access memory (RAM) 29. VCU 12, using these elements, accomplishes the digitization and compression of analog signals as well as the reverse process in which the compressed digital signals are decompressed and converted back to analog signals.

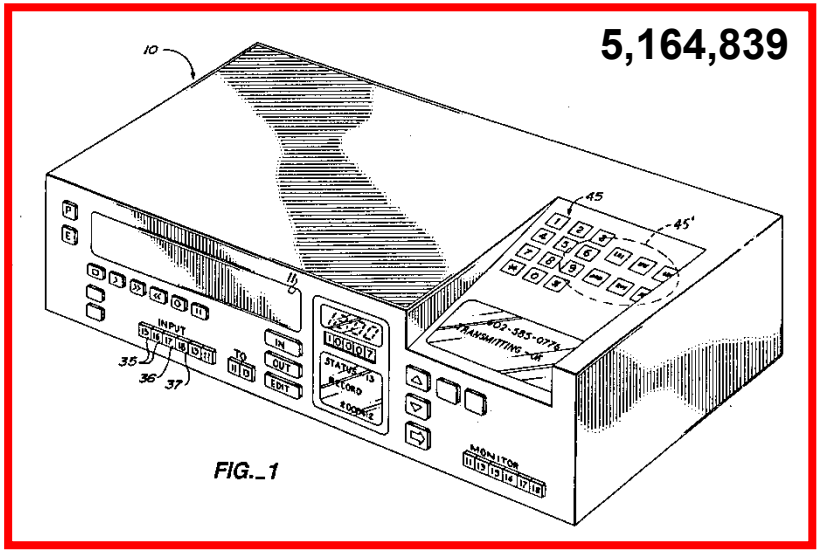
As a first step in the processing of the composite video signals within VCU 12, the sync signals are decoded to isolate signals for each picture frame for processing.

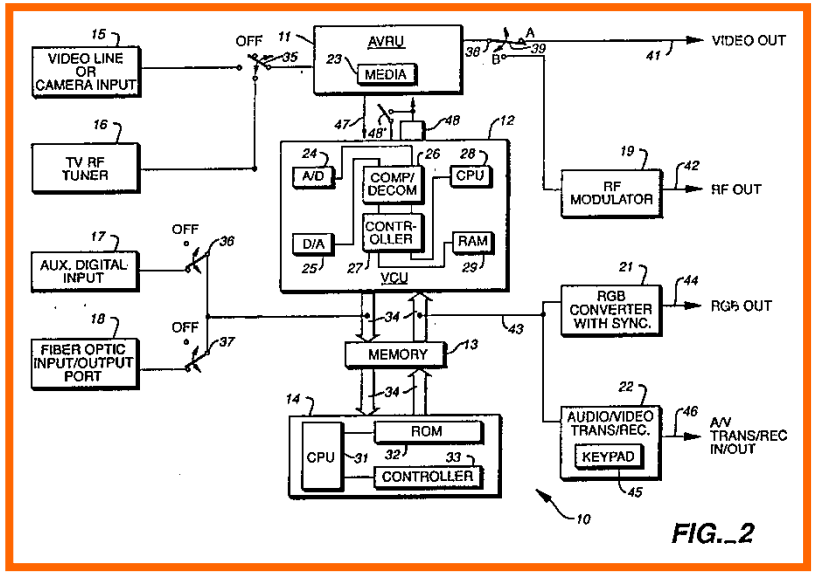
The video signals defining each frame may then be converted to a red analog signal, a green analog signal, and a blue analog signal in a conventional manner. The red, green and blue analog signals are then converted to digital form by the analog to digital converter (ADC) 24. The frame is divided into a set of closely positioned rows and columns of picture elements or "pixels." Each pixel has a color defined by a set of three digital values defining strength of the primary color components, red, green and blue (RGB) respectively. In one embodiment, each frame is divided into an array of 300 by 300 pixels, with the color and luminance of each pixel being defined by a seven bit word for the red component, a seven bit word for the blue component, and a seven bit word for the green component. These words are generated by ADC 24. The RGB video signal may also be processed by means of hue-saturation-intensity (HSI) color processing, where appropriate, as described in "Chips for Real-Time Comparisons," *Electronic Engineering Times*, issue 525, Feb. 13, 1989, page 122.

If each frame includes 90,000 pixels (300×300), and each pixel is defined by 21 bits (7 bits per primary color), the digital representation of a single video frame utilizes a sizable block of digital information (i.e., 1.89 megabits/frame) which must be processed very rapidly.

- It must describe completely a specific embodiment of the process, machine, manufacture, composition of matter or improvement invented, and must explain the mode of operation or functional principle whenever applicable
- Detailed written description typically corresponds to illustration(s) of invention and/or prior art through numerical annotations
- It must set forth the best mode contemplated by the inventor for carrying out the invention

Specification - The Drawings





[redacted]

BRIEF DESCRIPTION OF THE DRAWING

The present invention may be more readily described with reference to the accompanying drawing, in which:

FIG. **1** is a perspective view of the housing of the audio/video recorder editor/transceiver ("VCR-ET") disclosed and embodying the invention;

FIG. **1A** is an enlarged view of the circled area of FIG. **1**;

FIG. **2** is a functional block diagram of the VCR-ET of FIG. **1**;

FIG. **3** is a functional block diagram of a VCR-ET in accordance with another embodiment of the invention; and

FIG. **4** is a functional block diagram of an audio recorder/transceiver constructed in accordance with the invention.

Patent Claims Basics

- Describes legal rights of the patent owner
- At least 1 claim in a patent
- At least 1 independent claim in a patent
- Beneficial to have dependent claims
  - Interpreted in the context of parent claim
  - Narrower in scope but makes infringements fit your claims better

Claims Basics *cont.*

- Structure of claims
  - Preamble
    - Sets up general technical environment
  - Transitional phrase
    - “comprises of”, “consisting of”, “consisting essentially of”
  - Main body
    - Lists main components of the invention in a legal form

- To construe a claim = to understand the scope of the owner’s exclusive rights
  - Scope directly impacts strength of the patent

What are the Patent's Claims?

[redacted]

1. A method for handling audio/video source information, the method comprising:

receiving audio/video source information;

compressing the received audio/video source information into a time compressed representation thereof having an associated burst time period that is shorter than a time period associated with a real time representation of the received audio/video source information;

storing said time compressed representation of the received audio/video source information; and

transmitting, in said burst time period, the stored time compressed representation of the received audio/video source information to a selected destination.

- The specification must conclude with a claim or claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as the invention
- The portion of the patent setting forth the claim or claims is an important part of the patent, as it is the claims that define the scope of the legal protection afforded by the patent and around which questions of infringement are judged by the courts

What are Patent Claim Types?

1. An audio/video transceiver apparatus comprising:

input means for receiving audio/visual source information;

compression means, coupled to said input means, for compressing said audio/video source information into a time compressed representation thereof having an associated time period that is shorter than a time period associated with a real time representation of said audio/video source information;

random access storage means, coupled to said compression means, for storing the time compressed representation of said audio/video source information; and

output means, coupled to said random access storage means, for receiving the time compressed audio/video source information stored in said random access storage means for transmission away from said audio/video transceiver apparatus.

1. A method for handling audio/video source information, the method comprising:

receiving audio/video source information;

compressing the received audio/video source information into a time compressed representation thereof having an associated burst time period that is shorter than a time period associated with a real time representation of the received audio/video source information;

storing said time compressed representation of the received audio/video source information; and

transmitting, in said burst time period, the stored time compressed representation of the received audio/video source information to a selected destination.

Dependent Claims

[redacted]

2. A method as in claim **1** further comprising the steps of:

editing the stored time compressed representation of said audio/video source information; and

storing the edited time compressed representation of said audio/video source information.

3. A method as in claim **2** further comprising the step of monitoring the stored, time compressed representation of said audio/video source information during editing.

4. A method as in claim **1** wherein the step of transmitting comprises transmitting said time compressed representation of said audio-video source information over an optical channel.

5. A method as in claim **1** wherein the step of transmitting comprises transmitting said time compressed representation of said audio-video source information over a telephone transmission channel.

6. A method as in claim **1** wherein the step of storing comprises storing the time compressed representation of said audio/video source information on an optical disk.

7. A method as in claim **1** wherein the step of storing comprises storing the time compressed representation of said audio/video source information in a semiconductor memory.

- More than one claim may be presented provided they differ substantially from each other and are not unduly multiplied. One or more claims may be presented in dependent form, referring back to and further limiting another claim or claims in the same application. Any dependent claim which refers back to more than one other claim is considered a "multiple dependent claim."
- The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description.

Published Applications vs. Issued Patents

- Most patent applications published 18 months from filing date
- Published applications contain information (specification, claims, diagrams) as initially filed
  - Subject to alteration during examination process
- Constitute most up-to-date and often relevant prior art

PRIOR ART PATENT RESEARCHING

Cited Patents

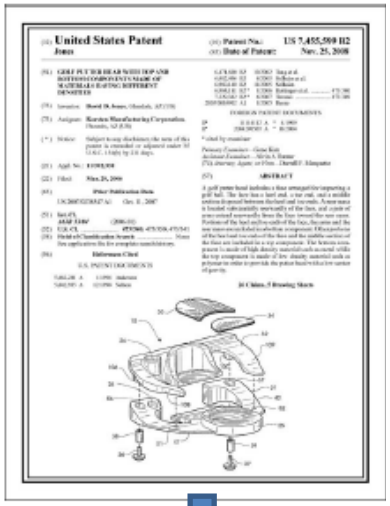
Search By Class

Find a close patent

Boolean Word Search

BOTH!

Citing Patents



Don't forget to research the family!