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(54) SYSTEM AND METHOD FOR PROVIDING VIDEOMARKS FOR A VIDEO PROGRAM

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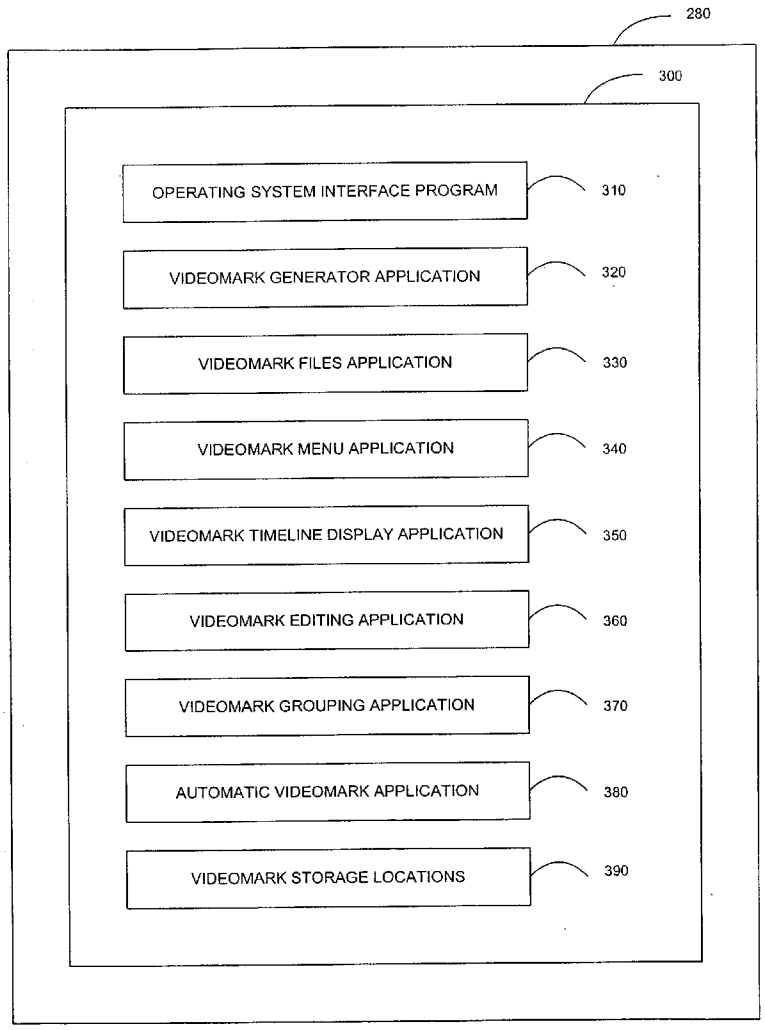
(57) **ABSTRACT**

A system and method is disclosed comprising a videomark controller and videomark computer software for creating videomarks for a video program. When a user desires to mark an event in a video program the user sends a videomark creation command to the videomark controller. The videomark controller creates a videomark that corresponds to the time of receipt of the videomark creation command and enters a user annotation that references the content of the video program. The videomark controller is capable of creating a file that contains a plurality of videomarks for the video program. The videomarks may be displayed in a videomark menu or in a videomark timeline in which a videomark display icon represents each videomark. Each videomark may be selected to access its respective portion of the video program.



Aylo Exhibit 1013

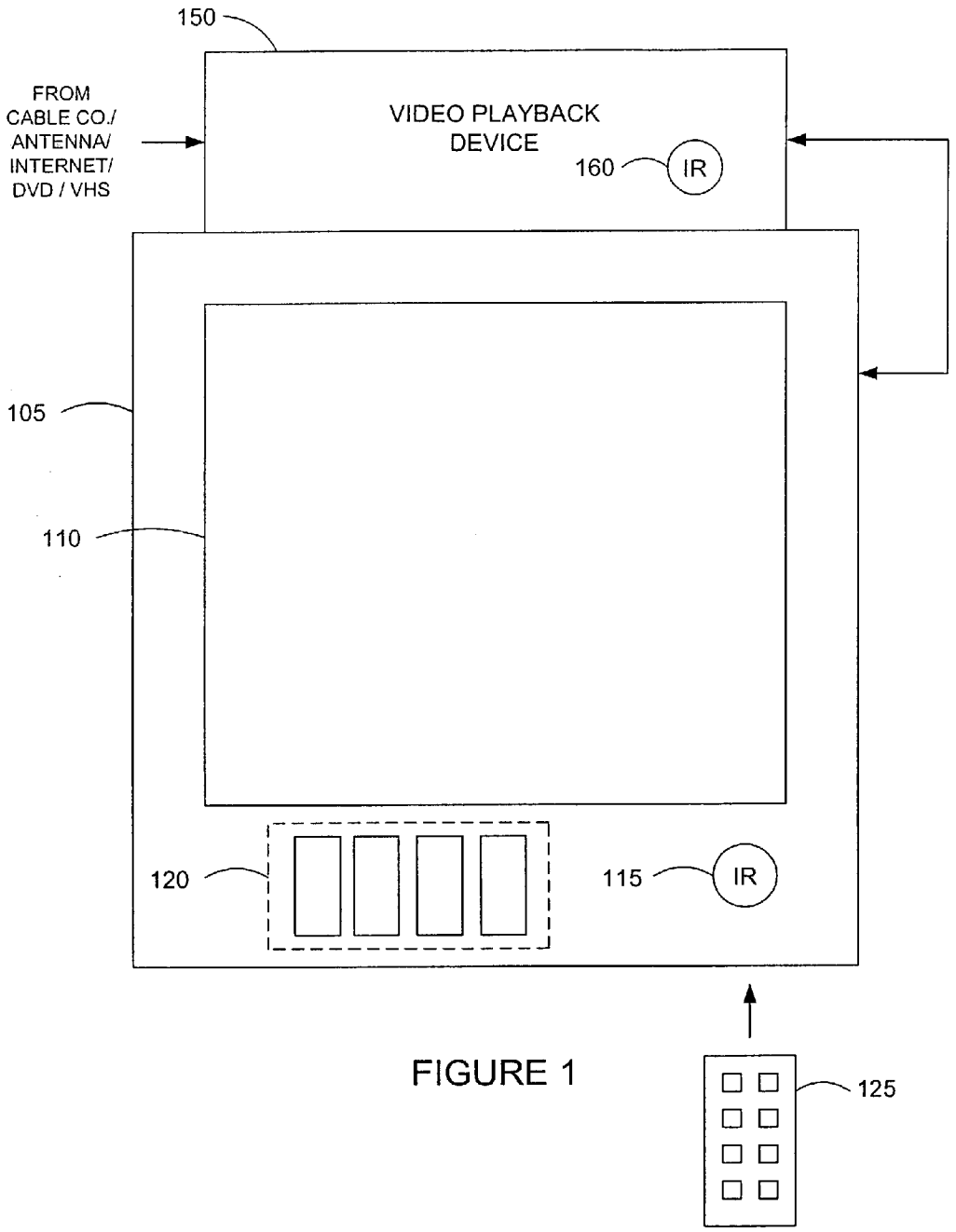

150
FROM
CABLE CO./
ANTENNA/
INTERNET/
DVD / VHS
VIDEO PLAYBACK
DEVICE
160
IR
105
110
120
115
IR
125

FIGURE 1

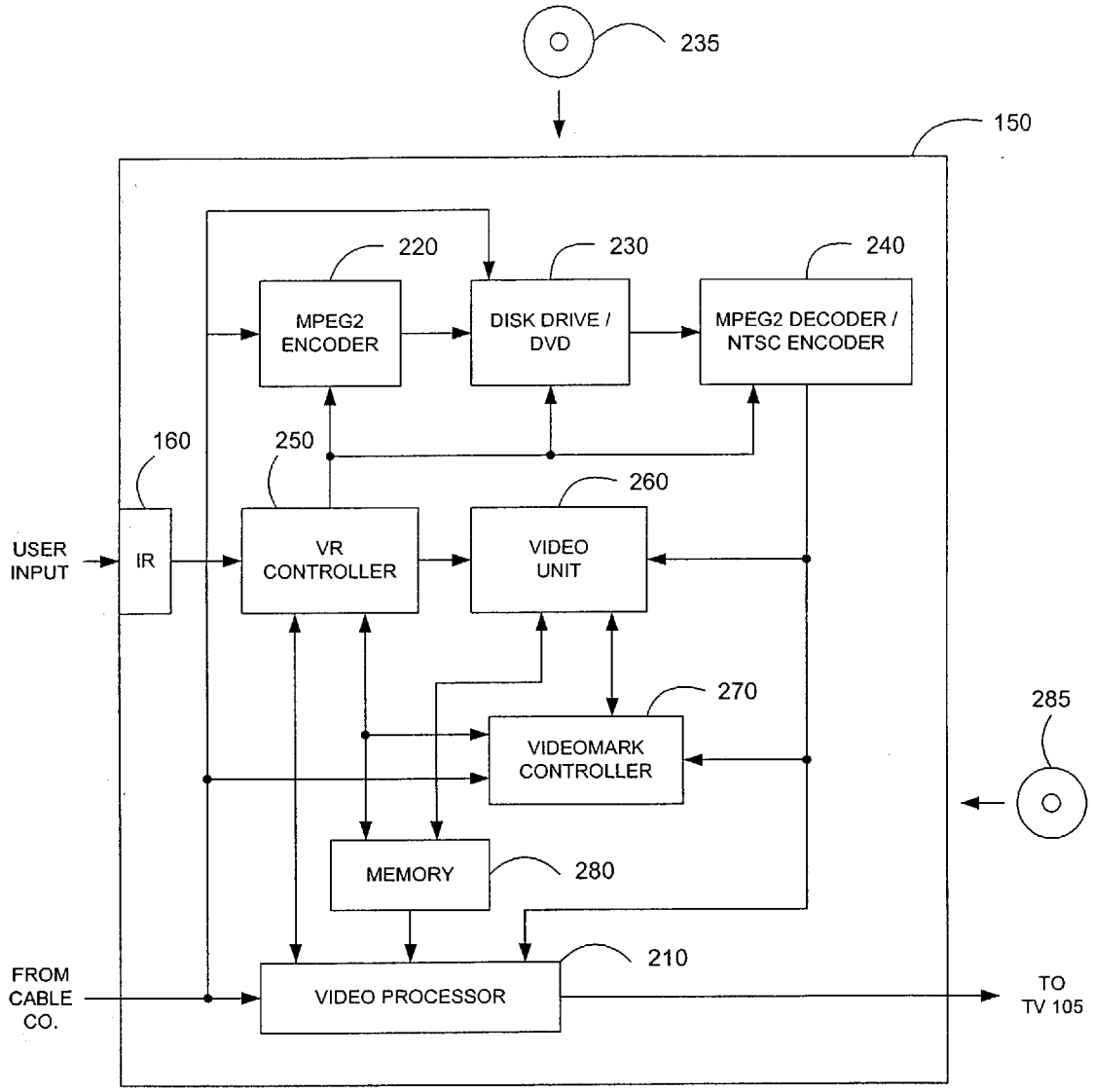

235
150
220
230
240
MPEG2 ENCODER
DISK DRIVE / DVD
MPEG2 DECODER / NTSC ENCODER
160
250
260
USER INPUT
IR
VR CONTROLLER
VIDEO UNIT
270
285
VIDEOMARK CONTROLLER
MEMORY
280
210
FROM CABLE CO.
VIDEO PROCESSOR
TO TV 105

FIGURE 2

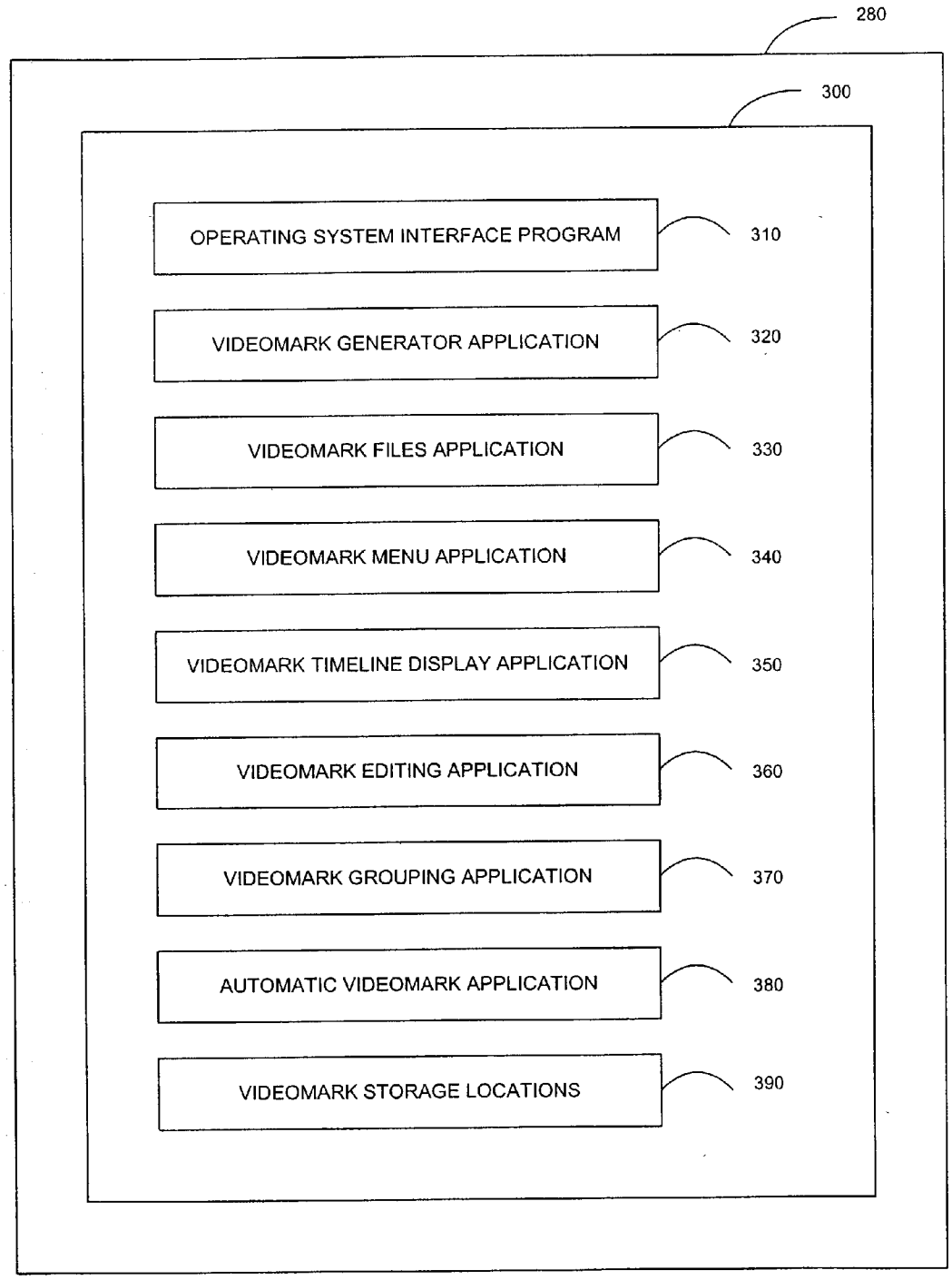

280
300
OPERATING SYSTEM INTERFACE PROGRAM
310
VIDEOMARK GENERATOR APPLICATION
320
VIDEOMARK FILES APPLICATION
330
VIDEOMARK MENU APPLICATION
340
VIDEOMARK TIMELINE DISPLAY APPLICATION
350
VIDEOMARK EDITING APPLICATION
360
VIDEOMARK GROUPING APPLICATION
370
AUTOMATIC VIDEOMARK APPLICATION
380
VIDEOMARK STORAGE LOCATIONS
390

FIGURE 3

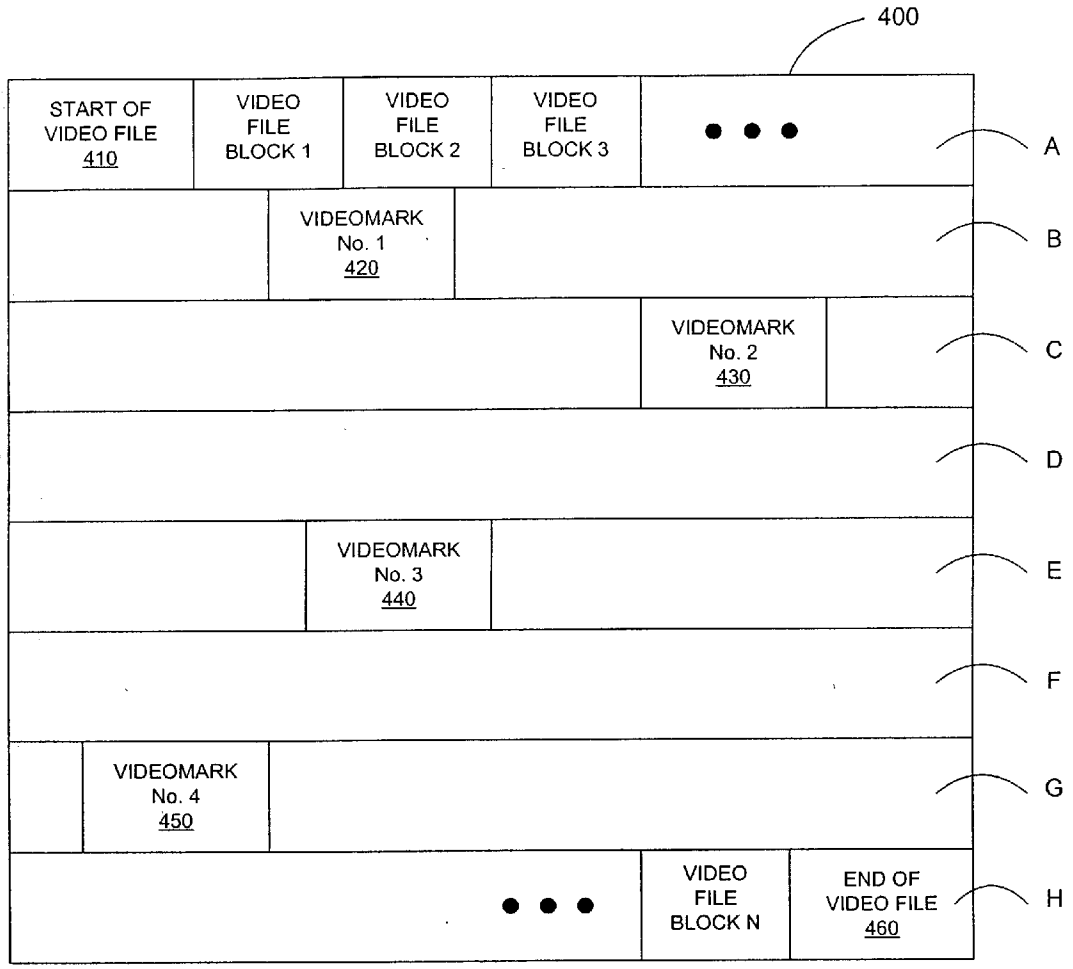

400
START OF VIDEO FILE 410
VIDEO FILE BLOCK 1
VIDEO FILE BLOCK 2
VIDEO FILE BLOCK 3
A
VIDEOMARK No. 1 420
B
VIDEOMARK No. 2 430
C
D
VIDEOMARK No. 3 440
E
F
VIDEOMARK No. 4 450
G
VIDEO FILE BLOCK N
END OF VIDEO FILE 460
H

FIGURE 4

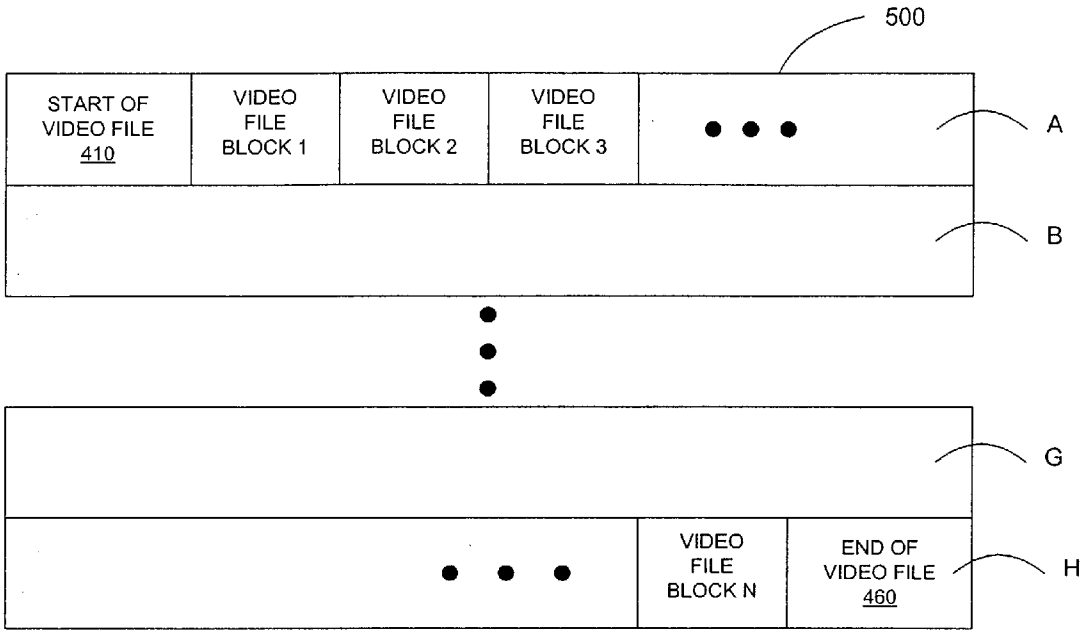


FIGURE 5

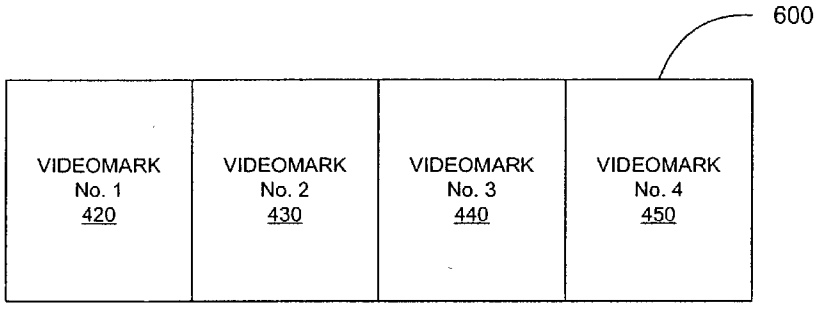


FIGURE 6

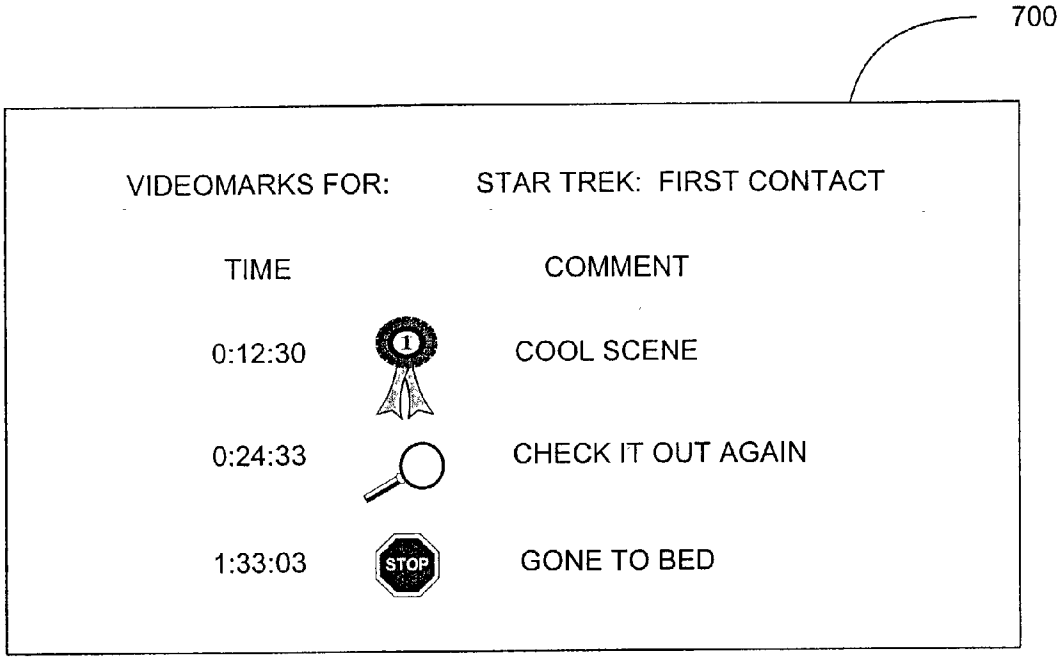


FIGURE 7

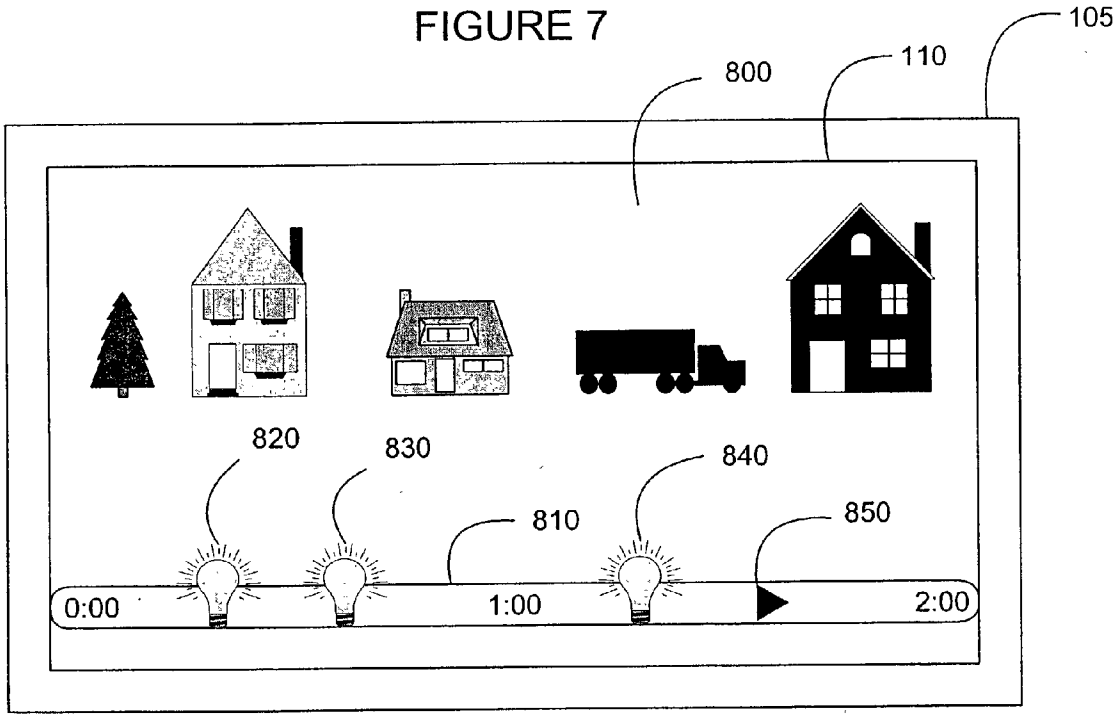


FIGURE 8

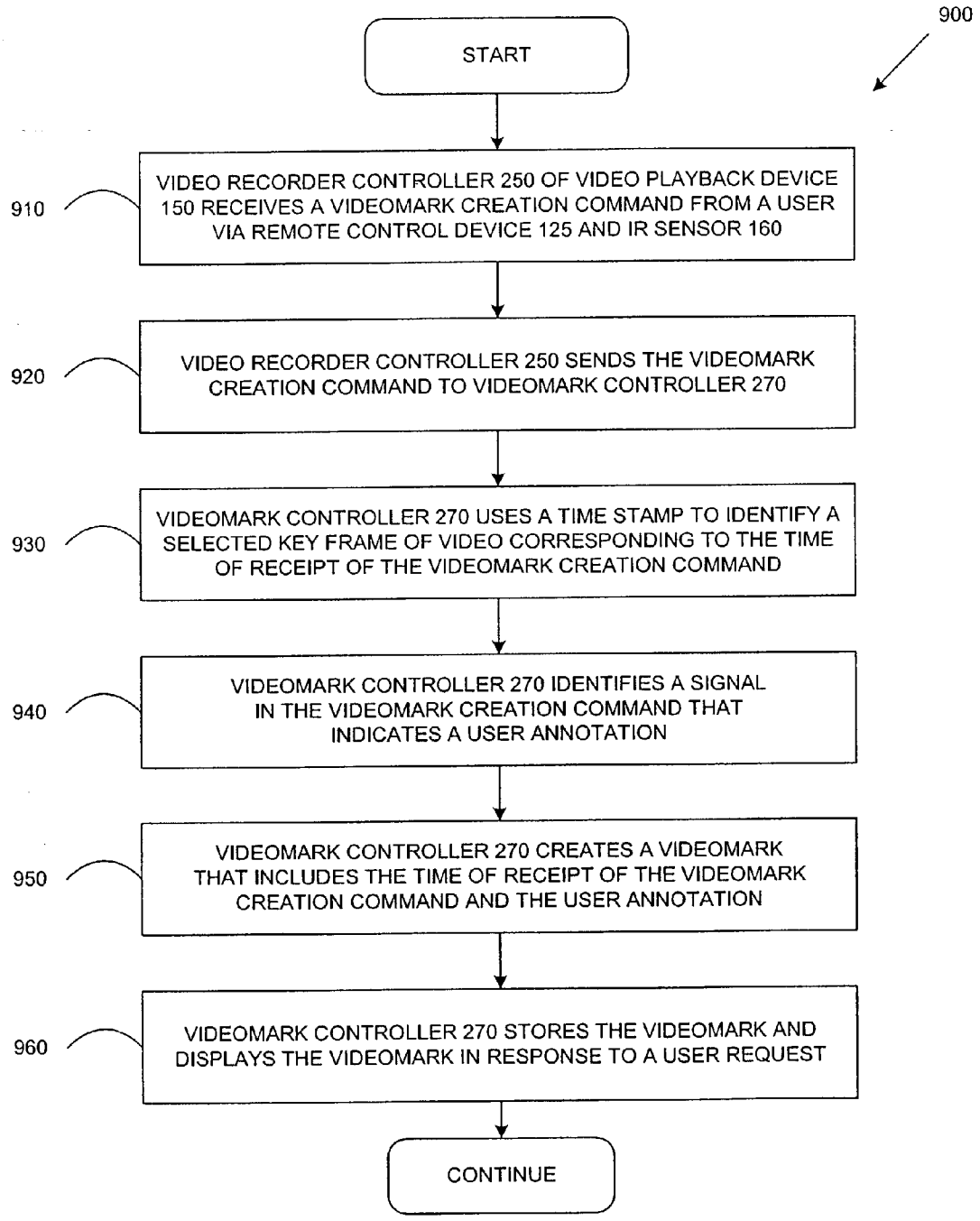

900
START
910
VIDEO RECORDER CONTROLLER 250 OF VIDEO PLAYBACK DEVICE 150 RECEIVES A VIDEOMARK CREATION COMMAND FROM A USER VIA REMOTE CONTROL DEVICE 125 AND IR SENSOR 160
920
VIDEO RECORDER CONTROLLER 250 SENDS THE VIDEOMARK CREATION COMMAND TO VIDEOMARK CONTROLLER 270
930
VIDEOMARK CONTROLLER 270 USES A TIME STAMP TO IDENTIFY A SELECTED KEY FRAME OF VIDEO CORRESPONDING TO THE TIME OF RECEIPT OF THE VIDEOMARK CREATION COMMAND
940
VIDEOMARK CONTROLLER 270 IDENTIFIES A SIGNAL IN THE VIDEOMARK CREATION COMMAND THAT INDICATES A USER ANNOTATION
950
VIDEOMARK CONTROLLER 270 CREATES A VIDEOMARK THAT INCLUDES THE TIME OF RECEIPT OF THE VIDEOMARK CREATION COMMAND AND THE USER ANNOTATION
960
VIDEOMARK CONTROLLER 270 STORES THE VIDEOMARK AND DISPLAYS THE VIDEOMARK IN RESPONSE TO A USER REQUEST
CONTINUE

FIGURE 9

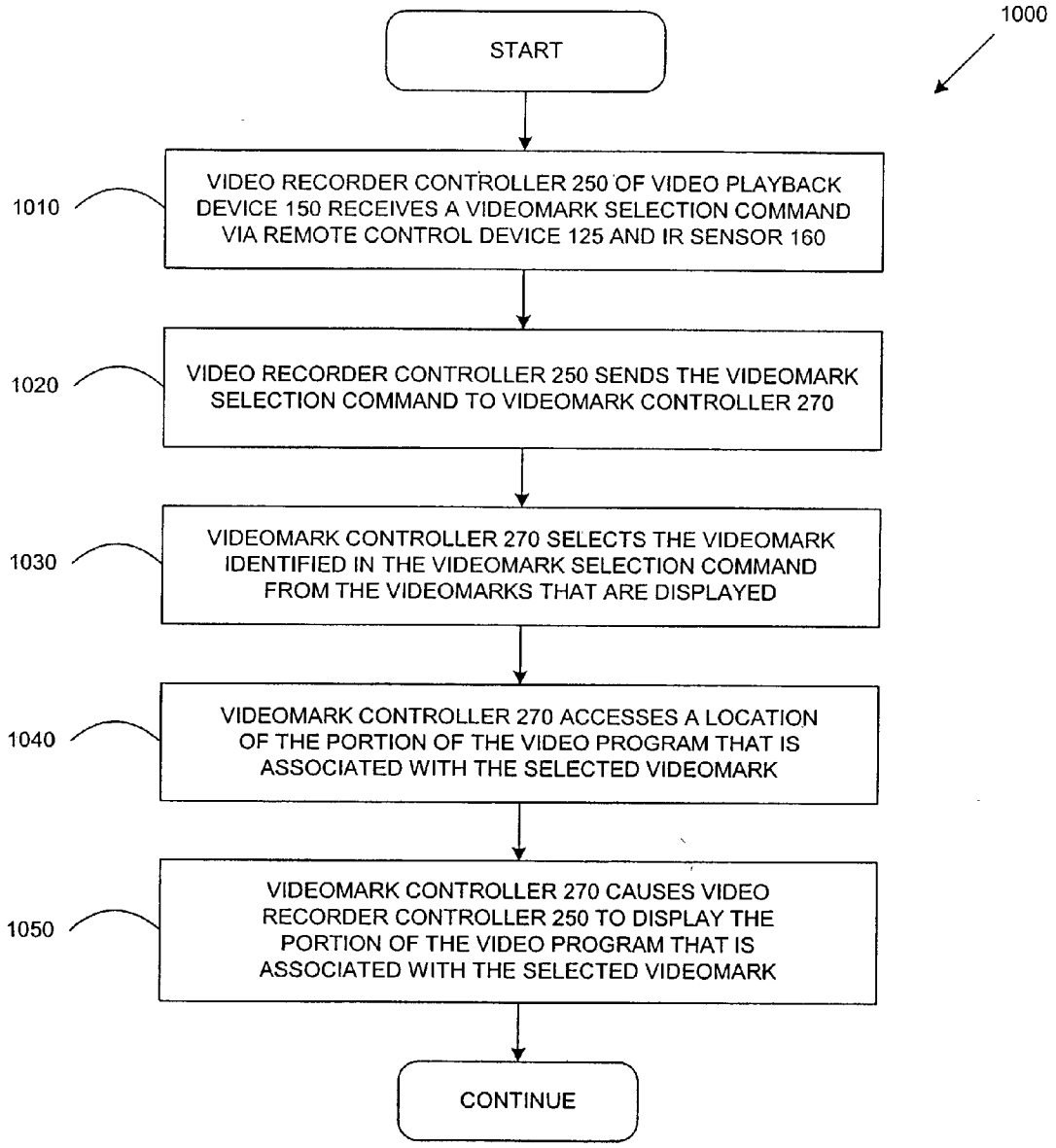

1000
START
1010
VIDEO RECORDER CONTROLLER 250 OF VIDEO PLAYBACK DEVICE 150 RECEIVES A VIDEOMARK SELECTION COMMAND VIA REMOTE CONTROL DEVICE 125 AND IR SENSOR 160
1020
VIDEO RECORDER CONTROLLER 250 SENDS THE VIDEOMARK SELECTION COMMAND TO VIDEOMARK CONTROLLER 270
1030
VIDEOMARK CONTROLLER 270 SELECTS THE VIDEOMARK IDENTIFIED IN THE VIDEOMARK SELECTION COMMAND FROM THE VIDEOMARKS THAT ARE DISPLAYED
1040
VIDEOMARK CONTROLLER 270 ACCESSES A LOCATION OF THE PORTION OF THE VIDEO PROGRAM THAT IS ASSOCIATED WITH THE SELECTED VIDEOMARK
1050
VIDEOMARK CONTROLLER 270 CAUSES VIDEO RECORDER CONTROLLER 250 TO DISPLAY THE PORTION OF THE VIDEO PROGRAM THAT IS ASSOCIATED WITH THE SELECTED VIDEOMARK
CONTINUE

FIGURE 10

SYSTEM AND METHOD FOR PROVIDING VIDEOMARKS FOR A VIDEO PROGRAM

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention is directed in general to video display systems, and more particularly, to a system and method for providing videomarks for a video program.

BACKGROUND OF THE INVENTION

[0002] A wide variety of video playback devices are available in the marketplace. Most people own, or are familiar with, a video cassette recorder (VCR), also referred to as a video tape recorder (VTR). More recently, video recorders that use computer magnetic hard disks rather than magnetic cassette tapes to store video programs have appeared in the market. For example, the ReplayTVJ recorder and the TiVOJ recorder digitally record television programs on hard disk drives using, for example, MPEG-2 compression. Additionally, some video playback devices may record on a readable/writable digital versatile disk (DVD) rather than a magnetic disk.

[0003] In recent years the number of video programs available for viewing has increased significantly. It is becoming increasingly important for viewers to have the ability to quickly search through a video program to find a portion of the video program (or an event in the video program) that the viewer is interested in viewing. The current options for viewers who wish to locate a desired portion of a video program in a recorded video program include (1) watching the entire video program, (2) fast forwarding through the recording of the entire video program in order to find the portion of the program that is of interest, and (3) using data from an Electronic Program Guide (EPG) that provides only a general program description.

[0004] In the analog domain video cassette recorders (VCRs) have a mechanism that allows a user to add an "index" mark to a particular point in a videotape. These analog "index" marks can be located by fast forwarding or rewinding the videotape. However, these analog "index" marks are lost when the videotape is ejected from the VCR.

[0005] In the video indexing domain a variety of methods have been developed to provide automatic indexing and video access. However, these methods do not index individual video points.

[0006] There is therefore a need in the art for a system and method that allows a user to identify the location of individual events in a video program for future access. There is also a need in the art for a system and method that allows a user to annotate the content of a video program by entering user comments.

SUMMARY OF THE INVENTION

[0007] To address the above-discussed deficiencies of the prior art, it is a primary object of the present invention to provide, for use in a video display system capable of displaying a video program, a system and method for providing videomarks for a video program.

[0008] A "videomark" comprises information that marks the location of an event within a video program. The location information within a videomark may comprise a frame number of the video program. A "videomark" may also comprise information that identifies an event within a video program. The identification information within a videomark may comprise a brief text that identifies the type of event displayed within the video program at the location of the videomark.

[0009] The present invention comprises a videomark generator that is capable of creating videomarks for a video program. The videomark generator comprises a videomark controller and videomark computer software. When a user desires to mark an event in a video program the user sends a videomark command to the videomark controller. The videomark controller creates a videomark that corresponds to the time of receipt of the videomark command and enters a user annotation that references the content of the video program. The videomark controller is capable of creating a file that contains a plurality of videomarks for the video program. Alternatively, the videomarks may be embedded at their respective locations in a file that contains the video program. The videomarks may be displayed in a videomark menu or in a videomark timeline in which a videomark display icon represents each videomark. The videomarks that are displayed may be selected by the user to access the locations in the video program that are associated with the videomarks.

[0010] According to an advantageous embodiment of the present invention, the videomark controller receives a videomark command from a user. The videomark command indicates a time during the video program when the video program displays an event that the user desires to select for videomarking. The videomark controller creates a videomark for the event that is selected by the user by associating a user annotation with the time of receipt of the videomark command.

[0011] According to an advantageous embodiment of the present invention, the videomark controller is capable of creating a plurality of videomarks for a video program.

[0012] According to an advantageous embodiment of the present invention, the videomark controller is capable of displaying videomarks for a video program in a videomark menu.

[0013] According to another advantageous embodiment of the present invention, the videomark controller is capable of displaying videomarks for a video program in a videomark timeline for a video program.

[0014] According to an advantageous embodiment of the present invention, the videomark controller is capable of receiving a videomark command from the user to select a videomark and to access the location (or locations) in the video program associated with the selected videomark.

[0015] The foregoing has outlined rather broadly the features and technical advantages of the present invention so that those skilled in the art may better understand the detailed description of the invention that follows. Additional features and advantages of the invention will be described hereinafter that form the subject of the claims of the invention. Those skilled in the art should appreciate that they may readily use the conception and the specific embodiment disclosed as a basis for modifying or designing other structures for carrying out the same purposes of the present

invention. Those skilled in the art should also realize that such equivalent constructions do not depart from the spirit and scope of the invention in its broadest form.

[0016] Before undertaking the DETAILED DESCRIPTION, it may be advantageous to set forth definitions of certain words and phrases used throughout this patent document: the terms "include" and "comprise," as well as derivatives thereof, mean inclusion without limitation; the term "or," is inclusive, meaning and/or; the phrases "associated with" and "associated therewith," as well as derivatives thereof, may mean to include, be included within, interconnect with, contain, be contained within, connect to or with, couple to or with, be communicable with, cooperate with, interleave, juxtapose, be proximate to, be bound to or with, have, have a property of, or the like; and the term "controller" means any device, system or part thereof that controls at least one operation, such a device may be implemented in hardware, firmware or software, or some combination of at least two of the same. It should be noted that the functionality associated with any particular controller may be centralized or distributed, whether locally or remotely. In particular, a controller may comprise one or more data processors, and associated input/output devices and memory, that execute one or more application programs and/or an operating system program. Definitions for certain words and phrases are provided throughout this patent document, those of ordinary skill in the art should understand that in many, if not most instances, such definitions apply to prior uses, as well as to future uses, of such defined words and phrases.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] For a more complete understanding of the present invention, and the advantages thereof, reference is now made to the following descriptions taken in conjunction with the accompanying drawings, wherein like numbers designate like objects, and in which:

[0018] **FIG. 1** illustrates an exemplary video display system;

[0019] **FIG. 2** illustrates an advantageous embodiment of a system for generating videomarks for a video program in the exemplary video display system shown in **FIG. 1**;

[0020] **FIG. 3** illustrates videomark computer software used with an advantageous embodiment of the present invention;

[0021] **FIG. 4** illustrates an exemplary video file containing a plurality of embedded videomarks created by an advantageous embodiment of the videomark generator of the present invention;

[0022] **FIG. 5** illustrates the exemplary video file shown in **FIG. 4** without videomarks;

[0023] **FIG. 6** illustrates a videomark file containing a copy of the videomarks embedded in the exemplary video file shown in **FIG. 4**;

[0024] **FIG. 7** illustrates an exemplary videomark menu;

[0025] **FIG. 8** illustrates an exemplary display format of a video program showing an advantageous embodiment of a videomark timeline displayed at the bottom of the video display;

[0026] **FIG. 9** is a flow chart illustrating an advantageous embodiment of a method of the present invention for providing videomarks for a video program; and

[0027] **FIG. 10** is a flow chart illustrating an advantageous embodiment of a method of the present invention for accessing and displaying a portion of a video program associated with a videomark.

DETAILED DESCRIPTION OF THE INVENTION

[0028] **FIGS. 1 through 10**, discussed below, and the various embodiments used to describe the principles of the present invention in this patent document are by way of illustration only and should not be construed in any way to limit the scope of the invention. In the description of the exemplary embodiment that follows, the present invention is integrated into, or is used in connection with, a television receiver. However, this embodiment is by way of example only and should not be construed to limit the scope of the present invention to television receivers. In fact, those skilled in the art will recognize that the exemplary embodiment of the present invention may easily be modified for use in any type of video display system.

[0029] **FIG. 1** illustrates exemplary video playback device **150** and television set **105** according to an advantageous embodiment of the present invention. Video playback device **150** receives incoming television signals from an external source, such as a cable television service provider (Cable Co.), a local antenna, a satellite, the Internet, or a digital versatile disk (DVD) or a Video Home System (VHS) tape player. Video playback device **150** transmits television signals from a selected channel to television set **105**. A channel may be selected manually by the viewer or may be selected automatically by a recording device previously programmed by the viewer. Alternatively, a channel and a video program may be selected automatically by a recording device based upon information from a program profile in the viewer=s personal viewing history.

[0030] In Record mode, video playback device **150** may demodulate an incoming radio frequency (RF) television signal to produce a baseband video signal that is recorded and stored on a storage medium within or connected to video playback device **150**. In Play mode, video playback device **150** reads a stored baseband video signal (i.e., a program) selected by the viewer from the storage medium and transmits it to television set **105**. Video playback device **150** may comprise a video recorder of the type that is capable of receiving, recording, interacting with, and playing digital signals.

[0031] Video playback device **150** may comprise a video recorder of the type that utilizes recording tape, or that utilizes a hard disk, or that utilizes solid state memory, or that utilizes any other type of recording apparatus. If video playback device **150** is a video cassette recorder (VCR), video playback device **150** stores and retrieves the incoming television signals to and from a magnetic cassette tape. If video playback device **150** is a disk drive-based device, such as a ReplayTVJ recorder or a TiVOJ recorder, video playback device **150** stores and retrieves the incoming television signals to and from a computer magnetic hard disk rather than a magnetic cassette tape, and retrieves stored television signals from the hard disk. In still other embodiments, video

playback device **150** may store and retrieve from a local read/write (R/W) digital versatile disk (DVD) or a read/write (R/W) compact disk (CD-RW). The local storage medium may be fixed (e.g., hard disk drive) or may be removable (e.g., DVD, CD-RW).

[**0032**] Video playback device **150** comprises infrared (IR) sensor **160** that receives commands (such as Channel Up, Channel Down, Volume Up, Volume Down, Record, Play, Fast Forward (FF), Reverse, and the like) from remote control device **125** operated by the viewer. Television set **105** is a conventional television comprising screen **110**, infrared (IR) sensor **115**, and one or more manual controls **120** (indicated by a dotted line). IR sensor **115** also receives commands (such as Volume Up, Volume Down, Power On, Power Off) from remote control device **125** operated by the viewer.

[**0033**] Alternatively, remote control device **125** may be coupled to video playback device **150** (and television set **105**) by wire instead of through an infrared (IR) link. Also alternatively, remote control device **125** may comprise a keyboard (not shown) and a display (not shown) to enable the user to type and send text messages to video playback device **150**. As will be more fully described, in one alternate advantageous embodiment of the present invention the user can send text messages to video playback device **150** to edit videomark annotations.

[**0034**] It should be noted that video playback device **150** is not limited to receiving a particular type of incoming television signal from a particular type of source. As noted above, the external source may be a cable service provider, a conventional RF broadcast antenna, a satellite dish, an Internet connection, or another local storage device, such as a DVD player or a VHS tape player. In some embodiments, video playback device **150** may not even be able to record, but may be limited to playing back television signals that are retrieved from a removable DVD or CD-ROM. Thus, the incoming signal may be a digital signal, an analog signal, or Internet protocol (IP) packets. However, for purposes of simplicity and clarity in explaining the principles of the present invention, the descriptions that follow shall generally be directed to an embodiment in which video playback device **150** receives incoming television signals (analog and/or digital) from a cable service provider. Nonetheless, those skilled in the art will understand that the principles of the present invention may readily be adapted for use with wireless broadcast television signals, local storage systems, an incoming stream of IP packets containing MPEG data, and the like.

[**0035**] **FIG. 2** illustrates exemplary video playback device **150** in greater detail according to an advantageous embodiment of the present invention. Video playback device **150** comprises IR sensor **160**, video processor **210**, MPEG2 encoder **220**, hard disk drive **230**, MPEG2 decoder/NTSC encoder **240**, and video recorder (VR) controller **250**. Video playback device **150** further comprises video unit **260**, videomark controller **270**, and memory **280**. VR controller **250** directs the overall operation of video playback device **150**, including View mode, Record mode, Play mode, Fast Forward (FF) mode, Reverse mode, and other similar functions. VR controller **250** also directs the creation, storage, and display of videomarks in accordance with the principles of the present invention.

[**0036**] In View mode, VR controller **250** causes the incoming television signal from the cable service provider to be demodulated and processed by video processor **210** and transmitted to television set **105**, with or without storing video signals on (or retrieving video signals from) hard disk drive **230**. Video processor **210** contains radio frequency (RF) front-end circuitry for receiving incoming television signals from the cable service provider, tuning to a user-selected channel, and converting the selected RF signal to a baseband television signal (e.g., super video signal) suitable for display on television set **105**. Video processor **210** also is capable of receiving a conventional NTSC signal from MPEG2 decoder/NTSC encoder **240** and videomarks from memory **280** and transmitting a baseband television signal to television set **105**.

[**0037**] In Record mode, VR controller **250** causes the incoming television signal to be stored on hard disk drive **230**. Under the control of VR controller **250**, MPEG2 encoder **220** receives an incoming analog television signal from the cable service provider and converts the received RF signal to MPEG format for storage on hard disk drive **230**. Alternatively, if video playback device **150** is coupled to a source that is transmitting MPEG2 data, the incoming MPEG2 data may bypass MPEG2 encoder **220** and be stored directly on hard disk drive **230**.

[**0038**] In Play mode, VR controller **250** directs hard disk drive **230** to stream the stored television signal (i.e., a program) to MPEG2 decoder/NTSC encoder **240**, which converts the MPEG2 data from hard disk drive **230** to, for example, a super video (S-Video) signal that video processor **210** transmits to television set **105**.

[**0039**] It should be noted that the choice of the MPEG2 standard for MPEG2 encoder **220** and MPEG2 decoder/NTSC encoder **240** is by way of illustration only. In alternate embodiments of the present invention, the MPEG encoder and decoder may comply with one or more of the MPEG-1, MPEG-2, MPEG-4, and MPEG-7 standards, or with one or more other types of standards.

[**0040**] For the purposes of this application and the claims that follow, hard disk drive **230** is defined to include any mass storage device that is both readable and writable, including, but not limited to, conventional magnetic disk drives and optical disk drives for read/write digital versatile disks (DVD-RW), re-writable CD-ROMs, VCR tapes and the like. In fact, hard disk drive **230** need not be fixed in the conventional sense that it is permanently embedded in video playback device **150**. Rather, hard disk drive **230** includes any mass storage device that is dedicated to video playback device **150** for the purpose of storing recorded video programs. Thus, hard disk drive **230** may include an attached peripheral drive or removable disk drives (whether embedded or attached), such as a juke box device (not shown) that holds several read/write DVDs or re-writable CD-ROMs. As illustrated schematically in **FIG. 2**, removable disk drives of this type are capable of receiving and reading re-writable CD-ROM disk **235**.

[**0041**] Furthermore, in an advantageous embodiment of the present invention, hard disk drive **230** may include external mass storage devices that video playback device **150** may access and control via a network connection (e.g., Internet protocol (IP) connection), including, for example, a

disk drive in the viewer=s home personal computer (PC) or a disk drive on a server at the viewer's Internet service provider (ISP).

[0042] VR controller **250** obtains information from video processor **210** concerning video signals that are received by video processor **210**. When VR controller **250** determines that video playback device **150** is receiving a video program, VR controller **250** determines if the video program is one that has been selected to be recorded. If the video program is to be recorded, then VR controller **250** causes the video program to be recorded on hard disk drive **230** in the manner previously described. If the video program is not to be recorded, then VR controller **250** causes the video program to be processed by video processor **210** and transmitted to television set **105** in the manner previously described.

[0043] In an exemplary embodiment of the present invention, memory **280** may comprise random access memory (RAM) or a combination of random access memory (RAM) and read only memory (ROM). Memory **280** may comprise a non-volatile random access memory (RAM), such as flash memory. In an alternate advantageous embodiment of television set **105**, memory **280** may comprise a mass storage data device, such as a hard disk drive (not shown). Memory **280** may also include an attached peripheral drive or removable disk drives (whether embedded or attached) that reads read/write DVDs or re-writable CD-ROMs. As illustrated schematically in **FIG. 2**, removable disk drives of this type are capable of receiving and reading re-writable CD-ROM disk **285**.

[0044] As previously mentioned, a videomark comprises information that marks the location of an event within a video program. The location information within a videomark may comprise a frame number of the video program. A videomark may also comprise information that identifies an event within a video program. The identification information within a videomark may comprise a brief text that identifies the type of event displayed within the video program at the location of the videomark.

[0045] **FIG. 3** illustrates a selected portion of memory **280** that contains videomark computer software **300** of the present invention. Memory **280** contains operating system interface program **310**, videomark generator application **320**, videomark files application **330**, videomark menu application **340**, videomark timeline display application **350**, videomark editing application **360**, videomark grouping application **370**, automatic videomark application **380**, and videomark storage locations **390**. Videomark controller **270** and videomark computer software **300** together comprise a videomark generator that is capable of carrying out the present invention. Operating system interface program **310** coordinates the operation of computer software **300** with the operating system of VR controller **250** and videomark controller **270**.

[0046] As will be more fully described, under the direction of instructions in computer software **300** stored within memory **280**, videomark controller **270** is capable of (1) receiving user input to request the creation of a videomark, (2) creating a videomark for a video program in response to the user input, (3) storing a videomark in a videomark storage location, and (4) displaying a plurality of videomarks in a videomark menu, (5) displaying a plurality of videomarks in a videomark timeline during the display of the video program, (6) selecting a videomark from a display of a plurality of videomarks in response to a user request, (7) displaying a portion of a video program that is associated with a selected videomark, (8) editing, saving and deleting videomarks, (9) grouping related videomarks, and (10) automatically generating videomarks in response to actions or inactions of a user.

[0047] Video recorder (VR) controller **250** receives a command from a user to create a videomark. A user command to create a videomark will be referred to as a videomark creation command. The user sends a videomark creation command to VR controller **250** via remote control device **125** and IR sensor **160**. The videomark creation command may comprise an annotation signal that indicates a particular annotation that the user desires to be added to the videomark. The annotation may identify the content of the video program (e.g., "cool scene") or may record an external event of the user (e.g., "gone to bed"). The user may send an annotation signal using one or more control buttons on remote control device **125**. Alternatively, the user may use a remote control device **125** that is equipped with a keyboard and display to send a customized text message to be used as the annotation for the videomark.

[0048] Standard videomarks are videomarks that have been previously created for use with video controller **270**. A standard videomark comprises a video icon and a corresponding videomark annotation. Video controller **270** is programmed to receive and recognize all standard videomarks. For example, a standard videomark may comprise a videomark icon with a videomark annotation such as "cool scene,""music,""show to my friends,""great action,""scored points," etc. Libraries of standard videomarks may be created for videomark users. For example, a user may access one or more libraries of standard videomarks on the Internet and download as many standard videomarks to video controller **270** as desired. Alternatively, the user may order "off line" one or more libraries of standard videomarks from a third party provider of standard videomarks.

[0049] Customized videomarks are videomarks that have been created by a user for specific individual applications. A customized videomark comprises a video icon and a corresponding customized videomark annotation. Video controller **270** is programmed to receive user input to create a customized videomark. For example, a customized videomark may comprise a videomark icon with a customized videomark annotation such as "Middle East Crisis", "Star Trek", "Dolly Parton," etc. The user can create customized videomarks using videomark editing application **360**. As previously described, the user may send the text of a customized videomark application using a keyboard equipped remote control unit **125**.

[0050] When video recorder (VR) controller **250** receives a videomark creation command from the user, VR controller **250** sends the videomark creation command and the time of receipt of the videomark creation command to videomark controller **270**. In response to receiving a videomark creation command, videomark controller **270** creates a videomark using videomark generator application **320**. Videomark controller **270** uses a time stamp to identify a selected key frame of video corresponding to the time that the videomark creation command was received.

[0051] Videomark controller **270** also identifies a signal that indicates an annotation from the user. For example,

assume that the user sends a signal that identifies the videomark as one that the user wishes to use to denote a "cool scene" in the video program. Then videomark controller **270** will identify the annotation signal and add the "cool scene" annotation to the videomark. Alternatively, the user may send a customized videomark annotation with the words "cool scene" in the text of the annotation.

[**0052**] Videomark controller **270** stores the videomark in a videomark file using videomark files application **330**. Videomark controller **270** stores the videomark file in one of the videomark storage locations **360**. Videomark controller **270** updates the videomark file for the video program as new videomarks are created.

[**0053**] As a video program is being recorded on hard disk drive **230** VR controller **250** may obtain videomarks from videomark controller **270** and insert them into the recorded video program file. **FIG. 4** illustrates an exemplary video file **400** comprising a video file and a plurality of embedded videomarks (**420**, **430**, **440**, **450**) that were created by videomark controller **270**. The start of the video file is shown as block **410** and the end of the video file is shown as block **460**. The video program portion of video file **400** is represented by sequential video blocks (Video Block 1 through Video Block N) that run from Row A through Row H of **FIG. 4**.

[**0054**] In video file **400** embedded videomark **420** (Videomark No.1) is on Row B, embedded videomark **430** (Videomark No.2) is on Row C, embedded videomark **440** (Videomark No.3) is on Row E, and embedded videomark **450** (Videomark No.4) is on Row G.

[**0055**] As previously mentioned, videomark controller **270** is capable of storing the videomarks in a separate file. For example, **FIG. 5** illustrates an exemplary video file **500** that comprises the exemplary video file **400** shown in **FIG. 4** without the embedded videomarks (**420**, **430**, **440**, **450**). **FIG. 6** illustrates an exemplary videomark file **600** containing a copy of the videomarks (**420**, **430**, **440**, **450**) that are embedded in the exemplary video file **400** shown in **FIG. 4**. Videomark controller **270** is capable of sending the videomark file **600** to a remote location. This allows a user to send his or her annotated videomarks to a friend via any suitable computer communication channel. The friend can then use the videomarks in videomark file **600** to access the videomarked points in the video program.

[**0056**] Videomark controller **270** is capable of displaying videomarks in a videomark menu using videomark menu application **340**. **FIG. 7** illustrates an exemplary videomark menu **700**. **FIG. 7** illustrates how videomarks for a video program may be displayed. Although only one page is shown, additional pages may be added. Videomark menu **700** displays the title of the video program as "Star Trek: First Contact." The first videomark occurs twelve minutes and thirty seconds (12:30) from the beginning of the video program. The user annotation of "cool scene" is displayed next to a display icon of an award ribbon. A second videomark in videomark menu **700** occurs twenty four minutes and thirty three seconds (24:33) from the beginning of the video program. In the second videomark the user annotation "check it out again" is displayed next to a display icon of a magnifying glass. A third videomark in videomark menu **700** occurs one hour thirty three minutes and three seconds (1:33:03) from the beginning of the video program. In the third videomark the user annotation "gone to bed" is displayed next to a display icon of a stop sign.

[**0057**] Videomark controller **270** is also capable of displaying videomarks in a videomark timeline using videomark timeline display application **350**. **FIG. 8** illustrates an exemplary display format **800** of a video program showing an advantageous embodiment of a videomark timeline **810** displayed at the bottom of video display format **800**. Videomark timeline **810** is displayed while the video program is being displayed on screen **110** of television set **105**. The first videomark is represented by a display icon of light bulb **820** located at a position on videomark timeline **810** that represents a time that occurs twelve minutes and thirty seconds (12:30) from the beginning of the video program.

[**0058**] The second videomark is represented by a display icon of light bulb **830** located at a position on videomark timeline **810** that represents a time that occurs twenty four minutes and thirty three seconds (24:33) from the beginning of the video program. Similarly, the third videomark is represented by a display icon of light bulb **840** located at a position on videomark timeline **810** that represents a time that occurs one hour thirty three minutes and three seconds (1:33:03) from the beginning of the video program. Triangle **850** represents a time along videomark timeline **810** associated with the video scene currently being displayed on screen **110** of television set **105**.

[**0059**] **FIG. 9** depicts flow diagram **900** illustrating the operation of the method of an advantageous embodiment of the present invention for creating videomarks. Video recorder (VR) controller **250** of video playback device **150** receives a videomark command from a user via remote control device **125** and IR sensor **160** (step **910**). Video recorder (VR) controller **250** sends the videomark command to videomark controller **270** (step **920**). Videomark controller **270** uses a time stamp to identify a selected key frame of the video corresponding to the time of receipt of the videomark command (step **930**). Videomark controller **270** then identifies a signal in the videomark command that indicates a user annotation (step **940**). Videomark controller **270** then creates a videomark that includes the time of receipt of the videomark command and the user annotation (step **950**). Videomark controller **270** then stores the videomark and displays the videomark in response to a user request (step **960**).

[**0060**] When a user desires to access a portion of a video program that is associated with a videomark, the user sends a command to video recorder controller **250** to select the videomark. A command to select a videomark will be referred to as a videomark selection command. The user sends a videomark selection command to VR controller **250** via remote control device **125** and IR sensor **160**. The videomark selection command comprises a signal that identifies the desired videomark from a plurality of videomarks displayed in a videomark menu or a videomark timeline.

[**0061**] Video recorder controller **250** sends the videomark selection command to videomark controller **270**. Videomark controller **270** then selects the identified videomark from the displayed videomarks. Videomark controller **270** then accesses a location of the portion of the video program that is associated with the selected videomark. Videomark controller **270** then causes video recorder controller **250** to display on television set **105** the portion of the video program that is associated with the selected videomark.

[0062] **FIG. 10** depicts flow diagram **1000** illustrating the operation of the method of an advantageous embodiment of the present invention for creating for accessing and displaying a portion of a video program associated with a videomark. Video recorder (VR) controller **250** of video playback device **150** receives a videomark selection command from a user via remote control device **125** and IR sensor **160** (step **1010**). Video recorder (VR) controller **250** sends the videomark selection command to videomark controller **270** (step **1020**). Videomark controller **270** selects the videomark that is identified in the videomark selection command from the videomarks that are displayed (step **1030**). Videomark controller **270** then accesses a location of the portion of the video program that is associated with the selected videomark (step **1040**). Videomark controller **270** then causes video recorder (VR) controller to display the portion of the video program that is associated with the selected program (step **1050**).

[0063] The user may modify an existing videomark using videomark editing application **360**. The user may change the text of a videomark annotation by sending a new annotation text to videomark controller **270** using a keyboard equipped remote control unit **125**. Videomark controller **270** changes the text of the annotation in the selected videomark in response to the user request. The user may also send an instruction to videomark controller **270** to change a videomark icon of a videomark. The user may then send an instruction to videomark controller **270** to save the modified videomark. The user may also send an instruction to videomark controller **270** to delete a videomark.

[0064] Videomark controller **270** may also display a special "editing" videomark. When the "editing" videomark is accessed, video controller **270** enters an "edit" mode. The user can then make the modification of videomarks described above while in "editing" mode.

[0065] Videomark controller **270** may also display a special "supplemental" videomark. When the "supplemental" videomark is accessed, video controller **270** accesses and downloads additional standard videomarks from the Internet.

[0066] Videomark controller **270** may also group two or more videomarks using videomark grouping application **370**. For example, a first videomark may mark the beginning of a particular video segment and a second videomark may mark the end of the video segment. The first videomark contains location information for the second videomark (i.e., a pointer to the second videomark) Similarly, the second videomark contains location information for the first videomark (i.e., a pointer to the first videomark) Videomark controller **270** may group the first and second videomarks and designate the video segment between the first and second videomarks with a third videomark. In this manner a single videomark (i.e., the third videomark) would designate the video segment. Videomark controller **270** (1) receives user input to identify the beginning and the end of the video segment, and (2) uses videomark grouping application **370** to create a group videomark to designate the entire video segment. The group videomark essentially identifies two locations in the video program.

[0067] In a similar manner, a group videomark may be created that identifies more than two locations in a video program. For example, consider a video program of a baseball game that contains five home runs. A group "home run" videomark may be created that contains pointers to each of the video segments that contain a home run. That is, the group "home run" videomark contains the beginning and end location of each of the "home run" video segments. Videomark controller **270** (1) receives user input to identify the beginning and the end of each of the five "home run" video segments, and (2) uses videomark grouping application **370** to create a group videomark to designate the five "home run" video segment. The group videomark essentially identifies the five "home run" locations in the video program.

[0068] Videomark controller **270** may execute videomark grouping application **370** multiple times to create multiple layers of videomarks. For example, a group videomark at a first level may point to three videomarks on a next lower level. Each of the three videomarks on that next lower level may point to additional videomarks on a next lower level, and so on. Each videomark in the hierarchy of videomarks contains information that locates the other videomarks that it is connected to.

[0069] Videomark controller **270** may also automatically create videomarks using automatic videomark application **380**. In addition to the videomarks created by the user, videomark controller **270** may create videomarks that designate events that occur due to actions or inactions of the user. For example, videomark controller **270** may execute automatic videomark application **380** to create a videomark that states "video program was paused at this location for over thirty minutes." Such automatically created videomarks could be accessible by the user at the highest level of videomarks within the system. Alternatively, videomark controller **270** could group the automatically created videomarks under a single videomark called "system videomarks."

[0070] Automatic videomarks may also be used to designate when a user gives a "fast-forward" command to fast forward a recorded video program and when the user gives an "end fast-forward" command. The location of the "fast-forward" and the location of the "end fast-forward" may be automatically videomarked and presented to the user for an appropriate videomark annotation. For example, the user may provide a videomark annotation that reads "boring part of the game" to identify the portion of the video program that was skipped by fast forwarding.

[0071] Although the present invention has been described in detail, those skilled in the art should understand that they can make various changes, substitutions and alterations herein without departing from the spirit and scope of the invention in its broadest form.

What is claimed is:

1. An apparatus for creating a videomark for a video program in a video display system capable of displaying said video program, said apparatus comprising:

a videomark generator capable of receiving a videomark creation command from a user in which said videomark creation command indicates a time during said video program when said video program displays an event selected by said user,

wherein said videomark generator is capable of creating said videomark for said video program and associating

with said videomark a time of receipt of said videomark creation command from said user, and

wherein said videomark generator is capable of receiving an annotation from said user and associating said annotation from said user with said videomark.

2. The apparatus as claimed in claim 1 wherein said videomark generator comprises:

a videomark controller capable of executing computer software instructions contained within a memory coupled to said videomark controller to create a plurality of videomarks for said video program by receiving from said user a plurality of videomark creation commands wherein each videomark creation command of said plurality of videomark creation commands comprises a time of receipt of said videomark creation command and an annotation from said user, and

wherein said videomark controller is capable of creating one of: a first file that contains said plurality of videomarks for said video program and a second file that comprises said video program and said plurality of videomarks wherein each videomark of said plurality of videomarks is located within said second file at a location that corresponds to a time of receipt of a videomark creation command from said user for said videomark.

3. The apparatus as claimed in claim 2 wherein said videomark controller is capable of executing computer software instructions contained within a memory coupled to said videomark controller to display said plurality of videomarks in one of:

a videomark menu for said video program in which each entry in said videomark menu comprises a time of receipt of a videomark creation command from said user for said videomark and an annotation from said user; and

a videomark timeline for said video program in which a videomark display icon is displayed for each videomark of said plurality of videomarks at a point on said videomark timeline that corresponds to a location within said video program when a videomark creation command was received from said user for said videomark.

4. The apparatus as claimed in claim 3 wherein said videomark controller is capable of executing computer software instructions contained within a memory coupled to said videomark controller to receive a videomark selection command from said user that selects a videomark from said plurality of videomarks, and

wherein in response to receiving said videomark selection command, said videomark controller is capable of accessing and displaying a portion of said video program associated with said selected videomark of said plurality of videomarks.

5. The apparatus as claimed in claim 4 wherein said videomark controller is capable of executing computer software instructions contained within a memory coupled to said videomark controller to receive a videomark selection command from said user that selects a videomark from said plurality of videomarks when said plurality of videomarks are displayed in one of: a videomark menu and a videomark timeline for said video program in which a videomark display icon is displayed for each videomark of said plurality of videomarks at a point on said videomark timeline that corresponds to a location within said video program when a videomark creation command was received from said user for said videomark.

6. The apparatus as claimed in claim 3 wherein said videomark controller is capable of executing computer software instructions contained within a memory coupled to said videomark controller to one of: edit a videomark, save a videomark, add a videomark, delete a videomark, associate at least two videomarks in a video group, associate at least two videomarks in more than one videomark layer, automatically create a videomark in response to an action taken by a user, and automatically create a videomark in response to an absence of an action taken by a user.

7. A video display system capable of displaying a video program, said video display system comprising:

a videomark generator capable of receiving a videomark creation command from a user in which said videomark creation command indicates a time during said video program when said video program displays an event selected by said user,

wherein said videomark generator is capable of creating said videomark for said video program and associating with said videomark a time of receipt of said videomark creation command from said user, and

wherein said videomark generator is capable of receiving an annotation from said user and associating said annotation from said user with said videomark.

8. The video display system as claimed in claim 7 wherein said videomark generator comprises:

a videomark controller capable of executing computer software instructions contained within a memory coupled to said videomark controller to create a plurality of videomarks for said video program by receiving from said user a plurality of videomark creation commands wherein each videomark creation command of said plurality of videomark creation commands comprises a time of receipt of said videomark creation command and an annotation from said user, and

wherein said videomark controller is capable of creating one of: a first file that contains said plurality of videomarks for said video program and a second file that comprises said video program and said plurality of videomarks wherein each videomark of said plurality of videomarks is located within said second file at a location that corresponds to a time of receipt of a videomark creation command from said user for said videomark.

9. The video display system as claimed in claim 8 wherein said videomark controller is capable of executing computer software instructions contained within a memory coupled to said videomark controller to display said plurality of videomarks in one of:

a videomark menu for said video program in which each entry in said videomark menu comprises a time of receipt of a videomark creation command from said user for said videomark and an annotation from said user; and

a videomark timeline for said video program in which a videomark display icon is displayed for each video-

mark of said plurality of videomarks at a point on said videomark timeline that corresponds to a location within said video program when a videomark creation command was received from said user for said videomark.

10. The video display system as claimed in claim 9 wherein said videomark controller is capable of executing computer software instructions contained within a memory coupled to said videomark controller to receive a videomark selection command from said user that selects a videomark from said plurality of videomarks, and

wherein in response to receiving said videomark selection command, said videomark controller is capable of accessing and displaying a portion of said video program associated with said selected videomark of said plurality of videomarks.

11. The video display system as claimed in claim 10 wherein said videomark controller is capable of executing computer software instructions contained within a memory coupled to said videomark controller to receive a videomark selection command from said user that selects a videomark from said plurality of videomarks when said plurality of videomarks are displayed in one of: a videomark menu and a videomark timeline for said video program in which a videomark display icon is displayed for each videomark of said plurality of videomarks at a point on said videomark timeline that corresponds to a location within said video program when a videomark creation command was received from said user for said videomark.

12. The video display system as claimed in claim 9 wherein said videomark controller is capable of executing computer software instructions contained within a memory coupled to said videomark controller to one of: edit a videomark, save a videomark, add a videomark, delete a videomark, associate at least two videomarks in a video group, associate at least two videomarks in more than one videomark layer, automatically create a videomark in response to an action taken by a user, and automatically create a videomark in response to an absence of an action taken by a user.

13. A method for creating a videomark for a video program in a video display system capable of displaying said video program, said method comprising the steps of:

receiving in a videomark generator a videomark creation command from a user in which said videomark creation command indicates a time during said video program when said video program displays an event selected by said user;

creating said videomark for said video program in said videomark generator in response to said videomark creation command;

associating with said videomark a time of receipt of said videomark creation command from said user;

receiving an annotation from said user; and

associating said annotation from said user with said videomark.

14. The method as claimed in claim 13 further comprising the steps of:

receiving from said user a plurality of videomark creation commands for said video program wherein each videomark creation command of said plurality of videomark creation commands comprises a time of receipt of said videomark creation command and an annotation from said user; and

creating one of:

a first file that contains said plurality of videomarks for said video program; and

a second file that comprises said video program and said plurality of videomarks wherein each videomark of said plurality of videomarks is located within said second file at a location that corresponds to a time of receipt of a videomark creation command from said user for said videomark.

15. The method as claimed in claim 14 further comprising the steps of:

displaying said plurality of videomarks in a videomark menu for said video program in which each entry in said videomark menu comprises a time of receipt of a videomark command from said user for said videomark and an annotation from said user; and

displaying said plurality of videomarks on a videomark timeline for said video program in which a videomark display icon is displayed for each videomark of said plurality of videomarks at a point on said videomark timeline that corresponds to a location within said video program when a videomark command was received from said user for said videomark.

16. The method as claimed in claim 14 further comprising the steps of:

receiving a videomark selection command from said user that selects a videomark from said plurality of videomarks;

accessing a portion of said video program associated with said selected videomark; and

displaying said portion of said video program.

17. The method as claimed in claim 15 further comprising the steps of:

receiving a videomark selection command from said user that selects a videomark from a plurality of videomarks that are displayed in one of: said videomark menu and said videomark timeline;

accessing a portion of said video program associated with said selected videomark; and

displaying said portion of said video program.

18. The method as claimed in claim 15 further comprising the step of one of:

editing a videomark;

saving a videomark;

adding a videomark;

deleting a videomark;

associating at least two videomarks in a videomark group;

associating at least two videomarks in more than one videomark layer;

automatically creating a videomark in response to an action taken by a user; and

automatically creating a videomark in response to an absence of an action taken by a user.

19. Computer-executable instructions stored on a computer-readable storage medium for creating a videomark for a video program in a video display system capable of displaying said video program, said computer-executable instructions comprising the steps of:

receiving in a videomark generator a videomark creation command from a user in which said videomark creation command indicates a time during said video program when said video program displays an event selected by said user;

creating said videomark for said video program in said videomark generator in response to said videomark creation command;

associating with said videomark a time of receipt of said videomark creation command from said user;

receiving an annotation from said user; and

associating said annotation from said user with said videomark.

20. The computer-executable instructions stored on a computer-readable storage medium as claimed in claim 19 wherein said computer-executable instructions further comprise the steps of:

receiving from said user a plurality of videomark creation commands for said video program wherein each videomark creation command of said plurality of videomark creation commands comprises a time of receipt of said videomark creation command and an annotation from said user; and

creating one of:

a first file that contains said plurality of videomarks for said video program; and

a second file that comprises said video program and said plurality of videomarks wherein each videomark of said plurality of videomarks is located within said second file at a location that corresponds to a time of receipt of a videomark creation command from said user for said videomark.

21. The computer-executable instructions stored on a computer-readable storage medium as claimed in claim 20 wherein said computer-executable instructions further comprise the steps of:

displaying said plurality of videomarks in a videomark menu for said video program in which each entry in said videomark menu comprises a time of receipt of a videomark command from said user for said videomark and an annotation from said user; and

displaying said plurality of videomarks on a videomark timeline for said video program in which a videomark display icon is displayed for each videomark of said plurality of videomarks at a point on said videomark timeline that corresponds to a location within said video program when a videomark command was received from said user for said videomark.

22. The computer-executable instructions stored on a computer-readable storage medium as claimed in claim 20 wherein said computer-executable instructions further comprise the steps of:

receiving a videomark selection command from said user that selects a videomark from said plurality of videomarks;

accessing a portion of said video program associated with said selected videomark; and

displaying said portion of said video program.

23. The computer-executable instructions stored on a computer-readable storage medium as claimed in claim 21 wherein said computer-executable instructions further comprise the steps of:

receiving a videomark selection command from said user that selects a videomark from said plurality of videomarks;

accessing a portion of said video program associated with said selected videomark; and

displaying said portion of said video program.

24. The computer-executable instructions stored on a computer-readable storage medium as claimed in claim 21 wherein said computer-executable instructions further comprise the step of one of:

editing a videomark;

saving a videomark;

adding a videomark;

deleting a videomark;

associating at least two videomarks in a videomark group;

associating at least two videomarks in more than one videomark layer;

automatically creating a videomark in response to an action taken by a user; and

automatically creating a videomark in response to an absence of an action taken by a user.

25. An electronic signal comprising a data file that contains a plurality of videomarks for a video program.

26. An electronic signal as claimed in claim 25 further comprising a data file that contains a video program wherein each videomark of said plurality of videomarks is located within said video program at a location that corresponds to a time of receipt of a videomark creation command for said videomark.

27. An electronic signal as claimed in claim 26 further comprising a data file that comprises one of: a videomark menu and a videomark timeline.

28. An electronic signal as claimed in claim 27 further comprising a data file that contains one of:

at least two videomarks associated in a videomark group; and

at least two videomarks associated in more than one videomark layer.

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