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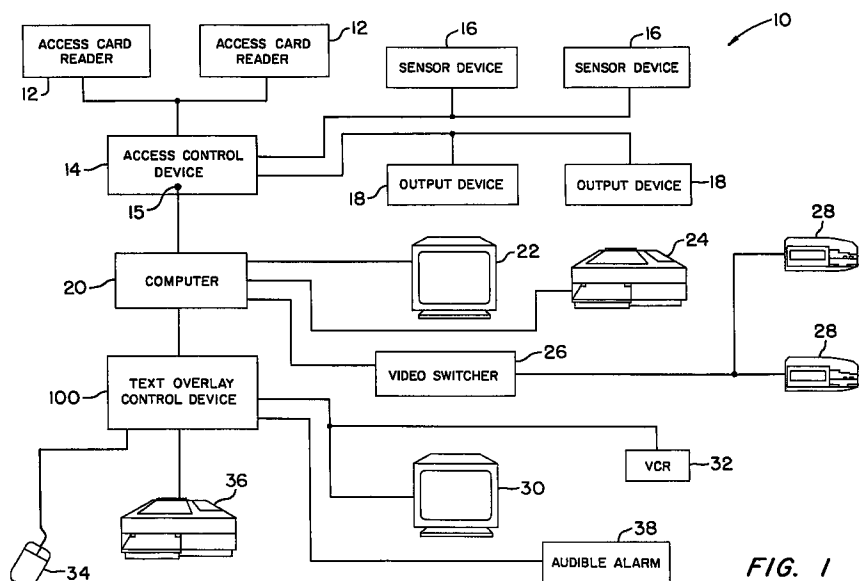
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D-90482 Nürnberg (DE)**(54) System of visually monitoring and recording of controlled access entry**

(57) An access control system for permitting or denying access to a restricted area includes an access control device capable of reading information stored on an access card and determining whether the information read from the access card corresponds with memory information stored in the access control device to permit or deny access to a restricted area. A video camera is positioned at the entry area to the restricted area to capture live video images of an individual attempting access. The access control device determines whether the card is valid or invalid and translates the information

into an output having text information through a serial communications interface port or other means of transmitting data to a text overlay control device. The text overlay control device overlays the text information describing the access control event directly onto the video images received from the video camera. The text information and video images are displayed on a video monitor while also being recorded on a video cassette recorder for later viewing.

**FIG. 1****EP 0 724 235 A2**

Description

Background of the Invention

This invention relates to a system for access control, and, in particular, to an access control system which allows for overlaying of text information directly onto live video images. This combination of text information and live video images is then displayed on a monitor.

In recent years, various types of security and access control systems have been developed to monitor entry into buildings and areas under surveillance. For example in one type of system, a video camera is positioned above a doorway to a building. An individual, attempting to enter the building, inserts an identification or access card into an access reader located at the doorway. The insertion of the card into the reader in turn activates the video camera which is preprogrammed to zoom in on the doorway area where the individual is attempting access. The video camera sends a live video image to a monitor of the individual attempting access. The monitor then displays the video image of the individual at the door. The video image may then also be recorded on a video cassette recorder ("VCR").

More particularly, when the individual inserts the card into the access reader, the reader reads the information on the card which may be stored optically, magnetically or mechanically. This information then allows an access control device, such as a sensor panel, to determine whether the card is valid or invalid as well as the individual's name, identification code and other information which may be desirable. The determination, of whether the card is valid or invalid, thereby permitting or denying entry, is referred to as "an access control event." The access control event and the individual's name, identification code, date, time, etc., are then transmitted to a printer which prints this data out as a separate log. Then if security personnel want to know who validly or invalidly entered or attempted to enter the building, such an access control system requires having to review a printout of the log while also viewing the video images recorded on the video tape to correlate the data against the video images being observed. Accordingly, it is inconvenient and difficult to coordinate a review of the video images with an inspection of the log.

It is, therefore, an object of the present invention to provide an access control system which provides both easy and convenient access to viewing text information describing access control events together with live video images on a display device while also recording the live video images with the overlaid text information for later viewing.

It is an additional object of the present invention to provide an access control system which has a simple design and is easy to view and maintain text information together with video images.

It is a further object of the present invention to provide an access control system which utilizes an access control device having a serial communications interface port or other means of transmitting data to provide text overlay information which correlates with the video image.

It is an additional object of the present invention to have the capability of triggering an alarm based on text information relating to an access control event transmitted through a serial communications interface port or other means of transmitting data in an access control device.

Summary of the Invention

In accordance with the principles of the present invention, the above and other objectives are realized in an access control system having an access control device capable of reading information stored on an access card and determining whether the information read from the access card corresponds with memory information stored in the access control device to permit or deny access to a restricted area. A video camera is positioned at the entry area to the restricted area to capture live video images of an individual attempting access. The access control device determines whether the card is valid or invalid and translates the information into an output having text information through a serial communications interface port or other means of transmitting data to a text overlay control device. The text overlay control device overlays the text information describing the access control event directly onto the video images received from the video camera. The text information and video images are displayed on a video monitor while also being recorded on a video cassette recorder for later viewing.

Brief Description of the Drawings

The above and other features and aspects of the present invention will become more apparent upon reading the following detailed description in conjunction with the accompanying drawings, in which:

FIG. 1 shows a block diagram of an access control system in accordance with the present invention; and

FIG. 2 shows a block diagram of the text overlay control device of the access control system of FIG. 1.

Detailed Description

The access control system 10 as shown in FIG. 1 allows for monitoring of individuals entering buildings or other areas requiring some means of surveillance. Particularly, an access control event occurs when an individual attempts to enter a building by using an identification or access card with information concern-

ing the individual stored therein. The information read from the card results in a determination that the access card is either a valid or invalid card being used to access the building. The access control system 10 then permits security personnel to view a display device, such as a video monitor, which displays as text information on the monitor the access control event, such as "VALID" or "DENIED INVALID", overlaid directly onto a live video image showing the individual attempting entry. Such text information being overlaid directly onto the video image enables security personnel to be immediately and easily aware of all access control events. Recording means, such as a programmed VCR, then records the combination of text information and video images together for later viewing on a recording medium, such as videotape.

The block diagram of FIG. 1 shows in greater detail the access control system 10. First and second access card readers 12, such as Sensormatic® card readers, model no. IRWS00, are provided at entry areas to a restricted area, such as doorways of a building, along with first and second closed-circuit television ("CCTV") or video cameras 28 which monitor entry to the specified doorways. For an individual to gain entry to the building, the individual inserts an access card (not shown) into one of the access card readers. The insertion of the card triggers either the first or second video camera depending upon which access card reader is being used. A video switcher 26 allows for viewing of a particular entrance to be switched between either the first or second camera.

The card used in the access card reader 12 may have, for example, magnetic information embedded within a magnetic strip which allows for a variety of information to be stored on the card. Such information stored on the card can include, but is not limited to, the individual's identification number, facility code number, name, address, etc. This information, read from the card reader 12 as a digital bitstream, is then sent to access control means or an access control device 14, such as a Sensormatic® panel, model no. SPS4. The access control device 14 compares information from the card with corresponding registered memory information stored in the memory of the access control device 14 to determine whether the information from the card corresponds with the registered information. The access control device 14 then encodes and translates the correspondence, or lack thereof, into an output having text information as an American Standard Code for Information Interchange ("ASCII") character string. This comparison determines whether the card used by the individual is valid or invalid in order to define an access control event. The text information or ASCII character string is in turn sent to computing means or computer 20 through a serial communications interface port 15.

The computer 20, such as an IBM® compatible computer configured with Sensormatic® AC 500 software, may receive the text information coming from several access control devices and display the text

information on a computer monitor 22. The access control device 14 may control up to eight access card readers at a time and the computer 20 may monitor at least one access control device. However, the access control system 10 is not limited to such a configuration but can have a variety of configurations and components in order to provide a system for permitting or denying access to a restricted area. A printer 24 attached to the computer 20 provides a print-out of the information read from the access card as well as the determination by the access control device 14 of an access control event.

The text information, as ASCII character strings, is then sent from the computer 20 to a text overlay control device 100. Video signals from the video cameras 28 of the video images at a particular entryway are also sent to the text overlay control device 100. The text overlay control device 100 then combines the text information with the video signals to overlay the text information directly onto the video image. More particularly, the text overlay control device 100 combines the text information or ASCII character string, indicating an attempted access to a restricted area, e.g., an access control event such as VALID or DENIED INVALID, with the corresponding video images. This combination is then displayed on a monitor 30 to allow security personnel to view the video images while also be informed of a valid or invalid entry to a restricted area by seeing such text information displayed therewith. This combination of text information and video images is also simultaneously recorded on a VCR 32 for later viewing.

FIG. 1 also shows a mouse 34 connected to the text overlay control device 100 as an input device. The mouse 34 allows security personnel additional monitoring of the access control system 10. A user utilizes the mouse 34 in order to program the text overlay control device 100 to recognize strings of text information that are indicative of particular access control events. By programming the text overlay control device 100 to recognize particular access control events, security personnel can be notified visually on the monitor 30 of these events as well as allow the VCR 32 to be triggered to begin recording the events.

Such programming is possible by the user utilizing the mouse 34 to access a menu driven software program generated by the text overlay control device 100. To program the text overlay control device 100, the user views a series of menus displayed on the monitor 30 by clicking the mouse 34. The first line of text in the window displayed on the monitor 30 is in reverse video or highlighted. By moving the mouse 34, the user can select the desired menu items. By selecting the desired menu item, a user can define the particular access control event, such as DENIED INVALID or INVALID, to program the text overlay control device 100 to respond to particular access control events as "alarm events."

For example, when an alarm event, such as "DENIED INVALID" occurs, the text information "DENIED INVALID" appears on the monitor 30 thereby visually alerting security personnel. In addition, the text

overlay control device 100 closes an alarm relay to begin recording the video signal from the camera 28 along with the text information "DENIED INVALID" overlaid thereon to record on the VCR 32 the "invalid" attempted entry. Further, the text overlay control device 100 triggers an audible alarm 38, such as a bell or siren, further to alert security personnel that an alarm event is occurring. In addition, a printer 36 is triggered by the text overlay control device 100 to print a hard copy of a log of the alarm events as they occur and other information from the individual's access card, such as the individual's name, address, individual's identification number, facility code number as well as the date and time.

Accordingly, by defining particular access control events as alarm events, security personnel can watch or replay on the monitor 30 the alarm event recorded by the VCR 32 to show the actual transaction along with the text information indicating the alarm event, be alerted by an audible alarm 38 and have a log printed out by the printer 36 listing each alarm event, showing how frequently an alarm event occurred and the time it occurred.

FIG. 2 illustrates in greater detail the text overlay control device 100. The text overlay control device 100 includes a microprocessor 102 having a memory (not shown) for evaluating the output of the computer 20 and for determining an access control event. The text overlay control device 100 also incorporates various types of interfaces such as a printer interface 104, an alarm interface 106, a VCR control interface 108 and a mouse interface 110 to permit communication with the corresponding device. The microprocessor 102 controls the functioning between the printer interface 104 and the printer 36, the alarm interface 106 and the audible alarm 38 and the VCR control interface 108 and the VCR 32. The mouse interface 110 is provided for connecting the mouse 34 to the microprocessor 102.

As shown in FIG. 2, the text overlay control device 100 also has video signals from the video cameras 28 via the video switcher 26 passing through a video buffer and filter 120 in the text overlay control device 100. The video signal at this point takes two paths. One path feeds the video signal to a video/text multiplexer and driver 124 while the other path feeds the video signal to a sync and character generator 122. The text information from the computer 20 is feed to the microprocessor 102 in the text overlay control device 100. The microprocessor 102 then feeds this information to the sync and character generator 122. The signal from the sync and character generator 122 is then mixed with the video signal from the output of the video buffer and filter 120 at the video/text multiplexer and driver 124. The combined video signals and text information are then displayed on a video monitor 30 while also being recorded for later viewing on the VCR 32.

The access control system 10 can be used for a variety of types of restricted areas. For example in an area with a small number of entrances, only a limited

number of access control devices 14 are needed. Accordingly, the information from the devices 14 can be sent directly to a text overlay control device 100 without requiring the computer 20. Further, one printer may be used to generate reports for both the computer 20 and the text overlay control device 100.

In addition, recording means and recording mediums can include a variety of other types of recording devices and methods. The cameras 16 can include domes or moveable cameras or pan-tilt-zoom camera assemblies to focus in on a surveillance area. Nor is the functioning of the VCR 32 limited to that recited above, but can be programmed in a variety of ways to record the permission and/or denial of entry into a restricted area.

Additionally, an access control event is not necessarily limited to text information which when displayed reads as "VALID", "INVALID" or "DENIED INVALID" on the video monitor 30 but may be any sequence of characters or words which indicates authorization or denial of entry to security personnel or any other alarm event, such as detection of a fire, unauthorized intrusion, glass breaking detection, etc. An access control event may also include text information indicating security levels, codes or other information concerning the individual which assist security personnel in monitoring access to a building or area.

In all cases it is understood that the above-described configurations are merely illustrative of the many possible specific embodiments which represent applications of the present invention. Numerous and varied other configurations, can be readily devised in accordance with the principles of the present invention without departing from the spirit and scope of the invention.

Claims

1. An access control system for permitting or denying entry into a restricted area to an individual using an access card to gain entry into said restricted area comprising:

an access card reader for reading information from the access card, said access card reader located at an entry area of said restricted area;

access control means for determining whether said information read by said access card reader corresponds with memory information stored in said access control means to permit or deny entry into the restricted area and for converting said information into an output having text information describing an access control event;

a video camera for providing video images of the entry area and positioned at said entry area;

a text overlay control device connected to said video camera and said access control means for overlaying the text information from said access control means onto said video images corresponding to said access control event; and

a display device for displaying said video images overlayed with said text information from said text overlay control device describing said access control event.

2. An access control system in accordance with claim 1, wherein said display device displays the text information describing the access control event of a denial or acceptance of entry into the restricted area.

3. An access control system in accordance with claim 2, wherein said access control means includes a serial communications interface port for transmitting the output having the text information to said text overlay control device

4. An access control system in accordance with claim 3, wherein said text information describing the access control event is an American Standard Code for Information Interchange ("ASCII") character string.

5. An access control system in accordance with claim 4, further comprising:
recording means for recording said video images overlayed with said text information describing said access control event from said text overlay control device on a recording medium.

6. An access control system in accordance with claim 5, wherein said text overlay control device further controls a printer to print a log of the text information.

7. An access control system in accordance with claim 6, wherein said text overlay control device further controls an audible alarm to sound alerting personnel of the access control event.

8. An access control system in accordance with claim 1, wherein said display device displays the text information describing the access control event of a denial or acceptance of entry into the restricted area.

9. An access control system in accordance with claim 8, wherein said text overlay control device identifies the text information as an alarm event and transmits the text information indicating the alarm event to said display device, said display device displays the text information thereby alerting personnel that the alarm event is occurring.

10. An access control system in accordance with claim 9, wherein said text overlay control device triggers a printer to print a log of the text information based upon the text overlay control device identifying the text information as the alarm event.

11. An access control system in accordance with claim 10, wherein said text overlay control device triggers an audible alarm to sound based upon the text overlay control device identifying the text information as the alarm event.

12. An access control system in accordance with claim 11, wherein said text overlay control device triggers recording means to record said video images overlayed with said text information on a recording medium based upon the text overlay control device identifying the text information as the alarm event.

13. An access control system for permitting or denying entry into a restricted area to an individual using an access card to gain entry into said restricted area comprising:

an access card reader for reading information from the access card, said access card reader located at an entry area of said restricted area;

access control means for determining whether said information read by said access card reader corresponds with memory information stored in said access control means to permit or deny entry into the restricted area and for converting said information into an output having text information describing an access control event;

a video camera for providing video images of the entry area and positioned at said entry area;

computing means connected to said access control means for controlling the functioning of said access control means and said video camera, for receiving and storing the output having the text information from said access control means and for sending the output having the text information to said text overlay control device;

a text overlay control device connected to said video camera and said computing means for overlaying the text information from said computing means onto said video images corresponding to said access control event; and

a display device for displaying said video images overlayed with said text information from said text overlay control device describing said access control event.

14. An access control system in accordance with claim 13, wherein said display device displays the text information describing the access control event of a denial or acceptance of entry into the restricted area.

15. An access control system in accordance with claim 14, further comprising:

recording means for recording said video images overlayed with said text information describing said access control event from said text overlay control device on a recording medium.

16. An access control system in accordance with claim 15, wherein said text overlay control device further controls a printer to print a log of the text information.

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17. An access control system in accordance with claim 16, wherein said text overlay control device further controls an audible alarm to sound alerting personnel of the access control event.

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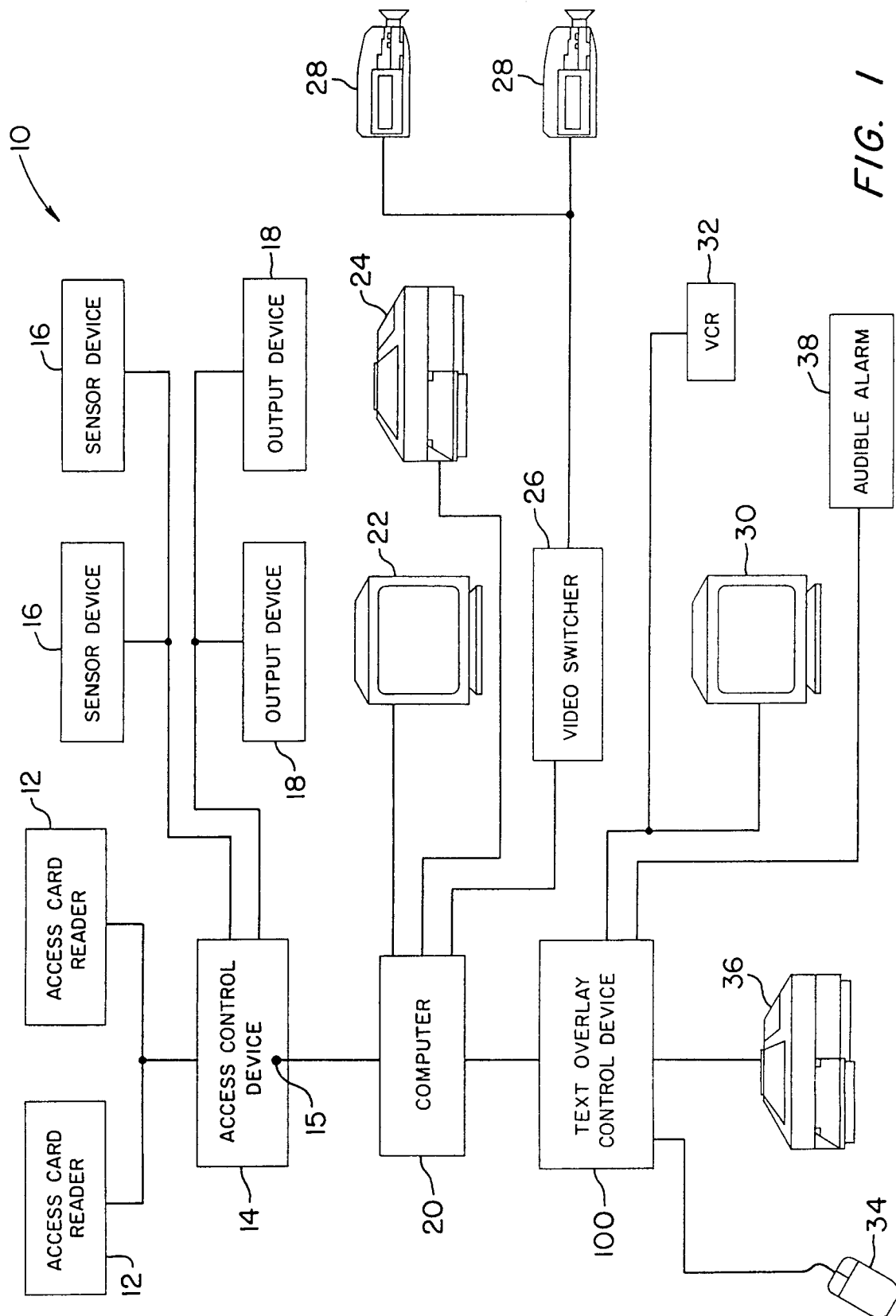


FIG. 1

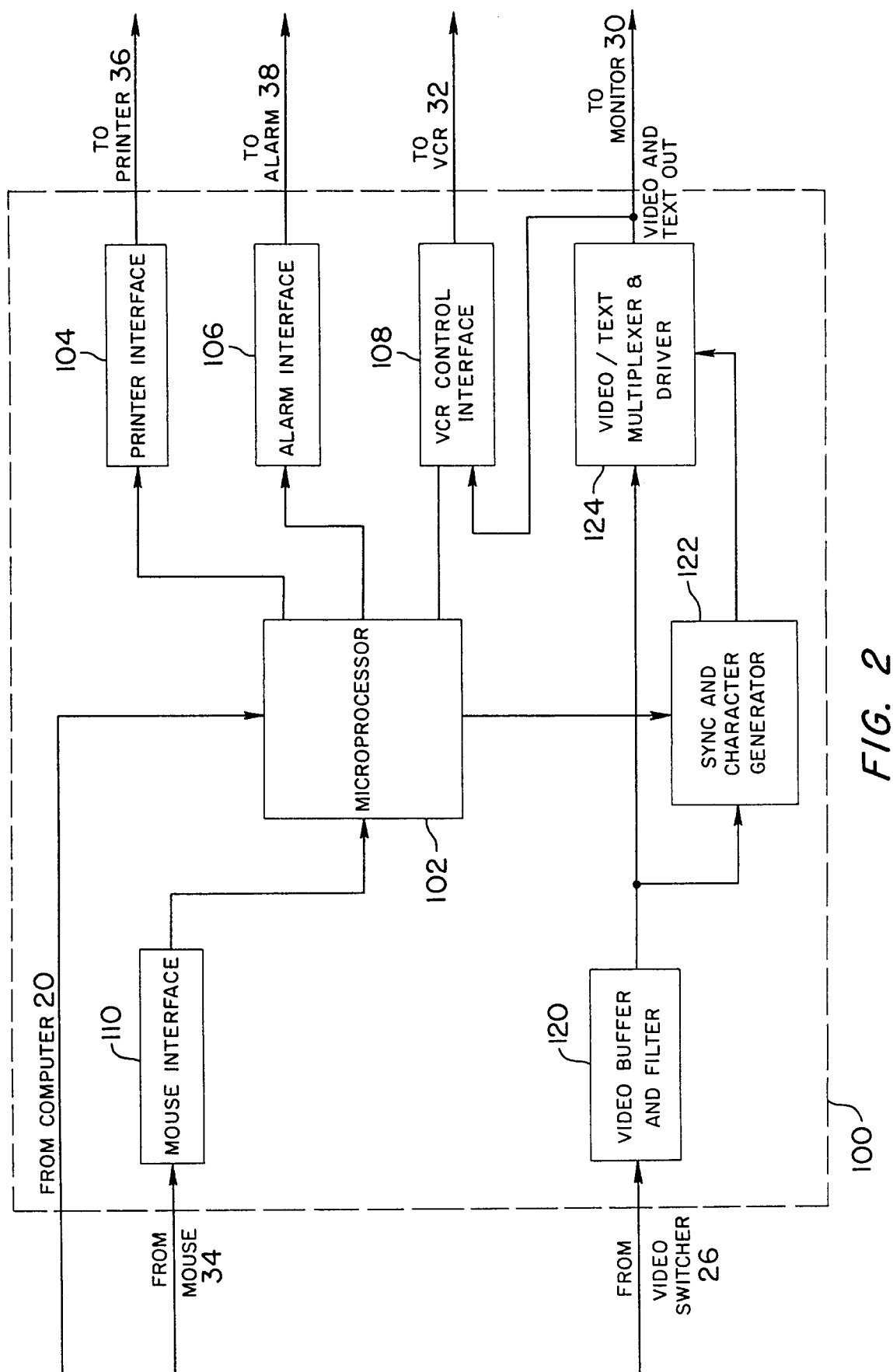


FIG. 2