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Batchelor

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[54] **CD ROM INFORMATION REFERENCES DELIVERED TO A PERSONAL COMPUTER USING THE VERTICAL BLANKING INTERVALS ASSOCIATED DATA TECHNOLOGY FROM A NABTS COMPLIANT TELEVISION BROADCAST PROGRAM**

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[73] Assignee: **Intel Corporation**, Santa Clara, Calif.

[21] Appl. No.: **558,030**

[22] Filed: **Nov. 13, 1995**

[51] **Int. Cl.**[6] **H04N 5/44**

[52] **U.S. Cl.** **348/553**; 348/460; 348/564

[58] **Field of Search** 348/552, 553, 348/563, 564, 468, 465, 473, 476, 478, 460

[56] **References Cited**

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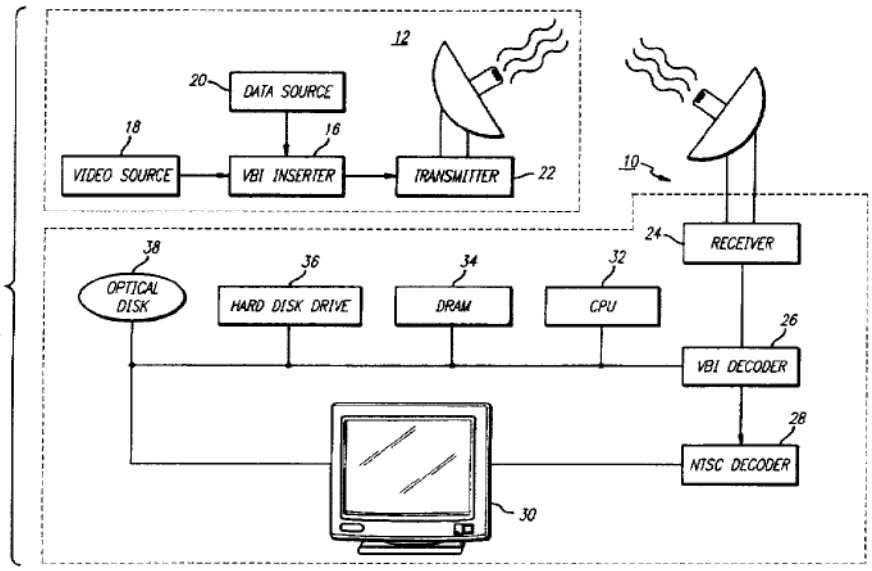
[57] **ABSTRACT**

A system that displays text and graphic information with vertical blanking interval of a publicly broadcasted video signal. The system also includes a personal computer that has a VBI decoder which can separate the data from the video signal. The separated data contains command and address information, which instruct the personal computer to retrieve text/graphic information from a storage device, and display the retrieved text/graphic information on a computer monitor. The personal computer also contains a NTSC decoder which can decode the video signal and display a television image on the computer monitor. The broadcaster inserts data that retrieves text and graphic information which correspond to the television image displayed by the computer monitor. The retrieved text and graphic information may be stored for later viewing by the user.

20 Claims, 3 Drawing Sheets



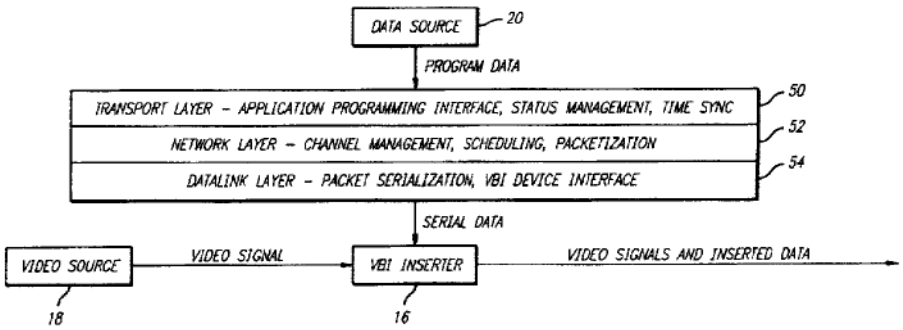
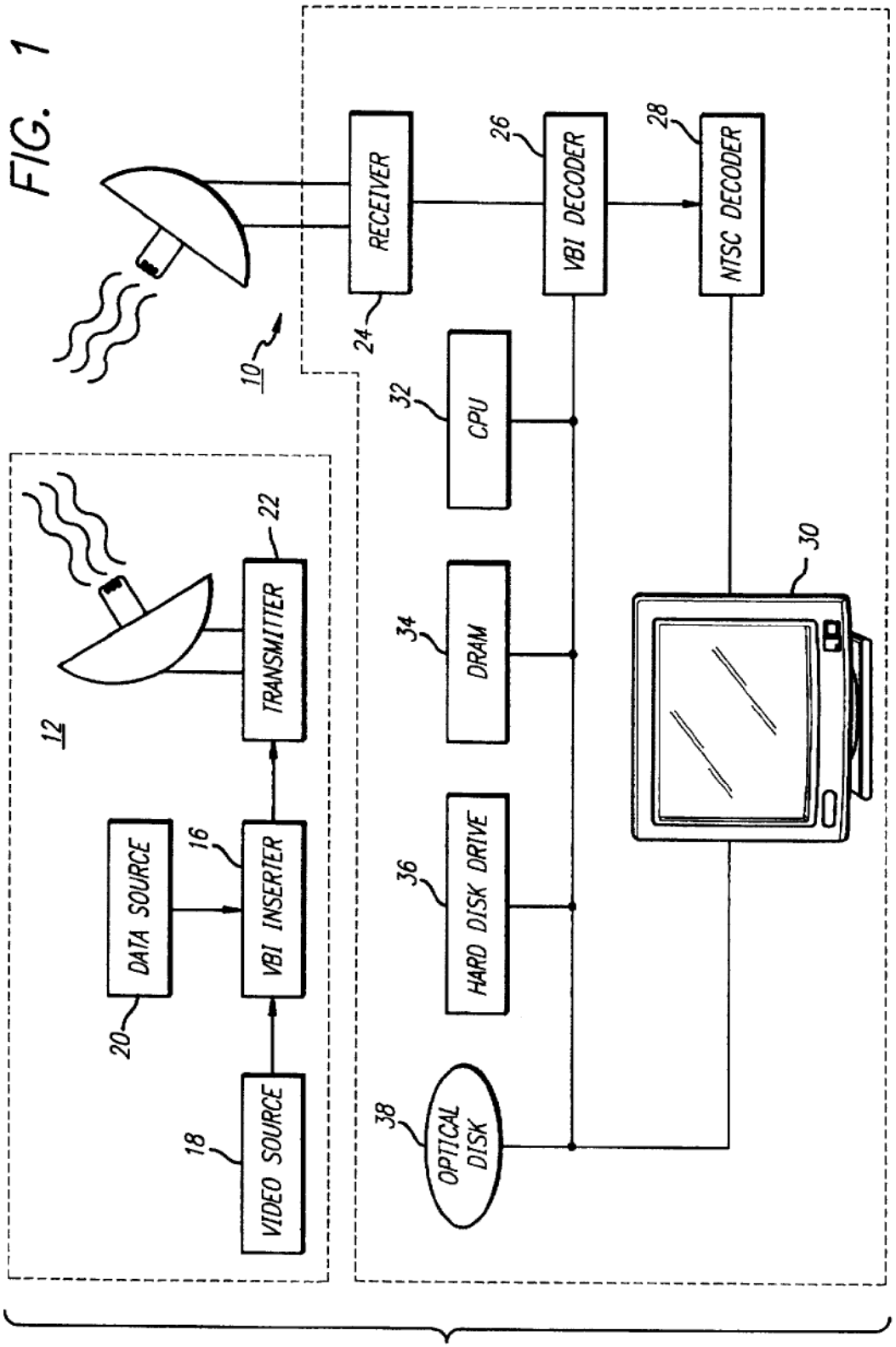


FIG. 1



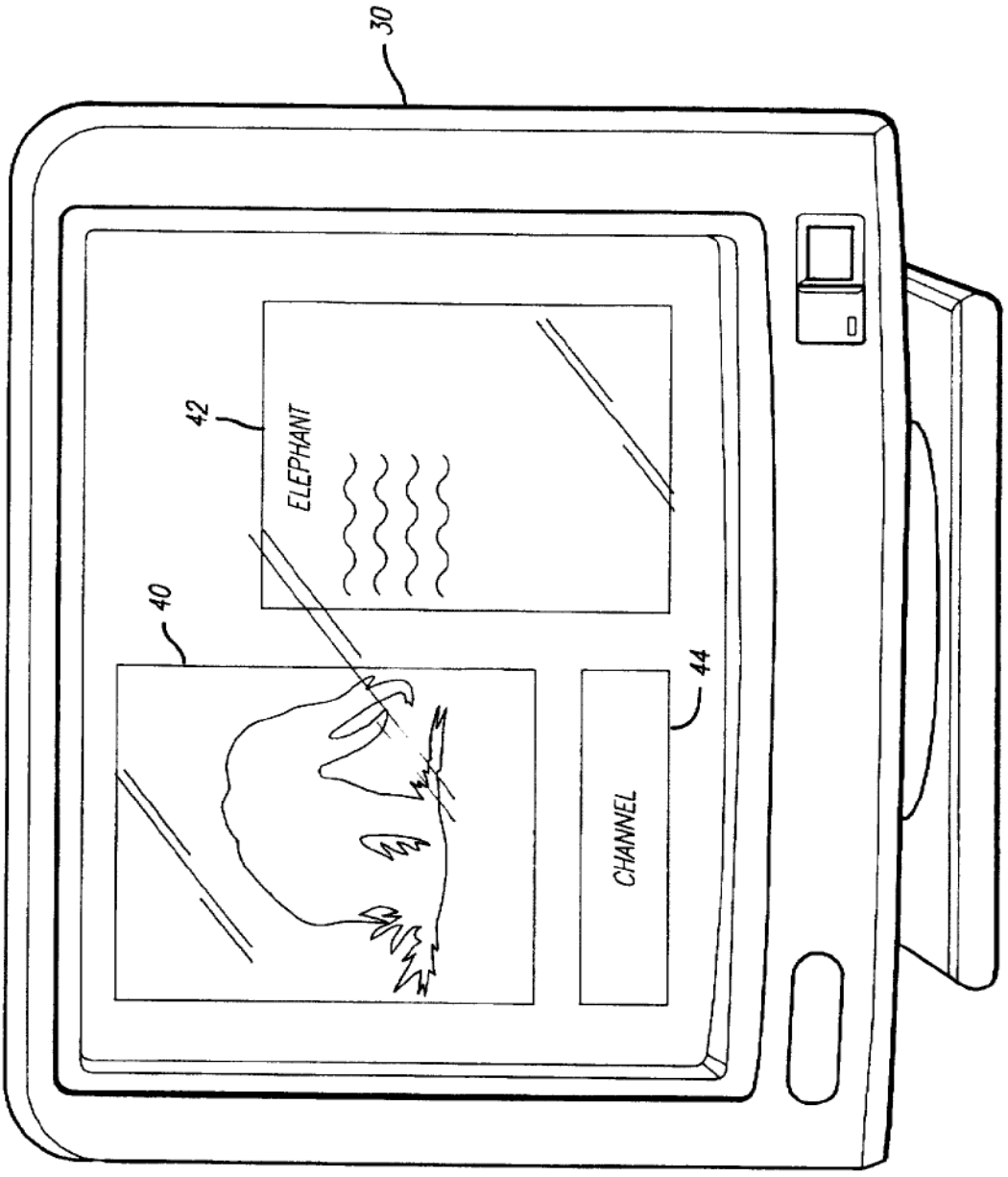


FIG. 2

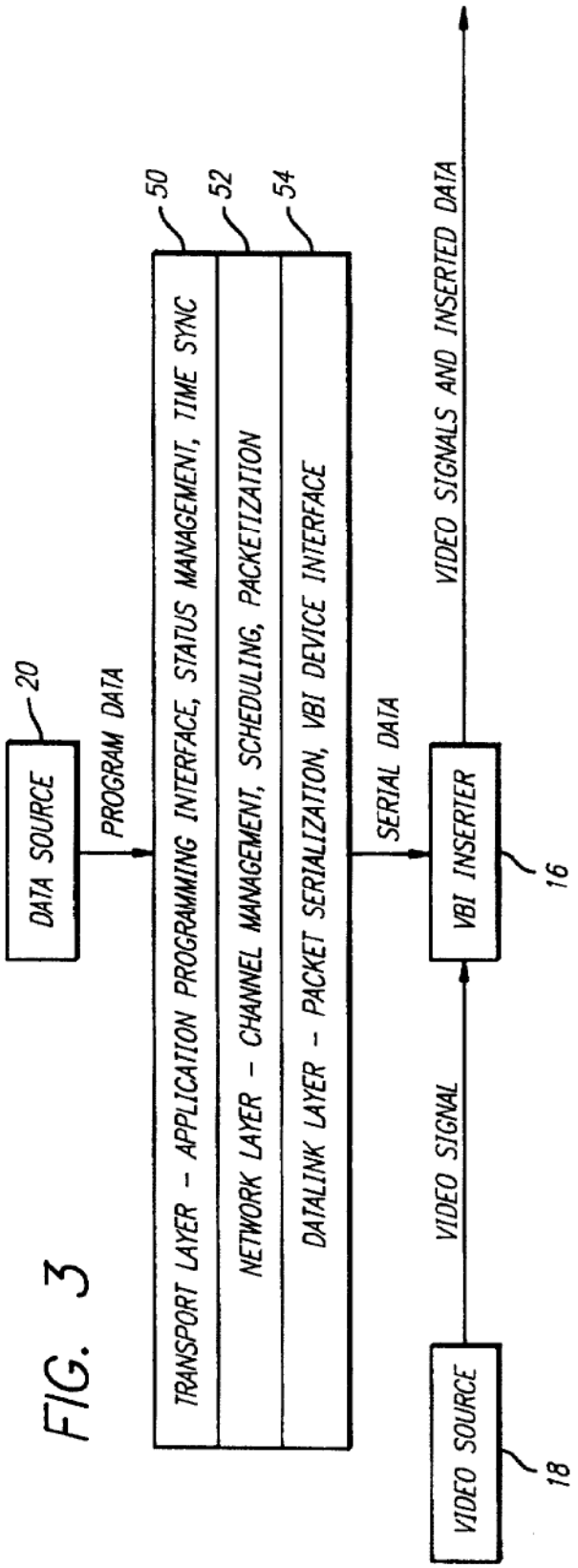


FIG. 3

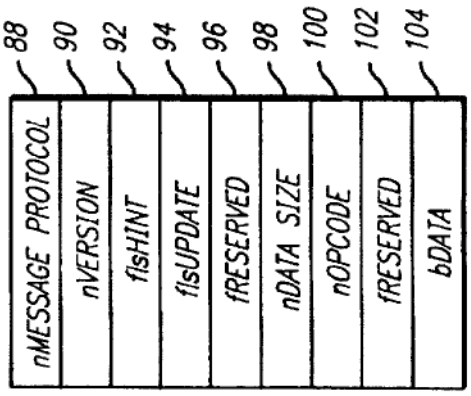


FIG. 6

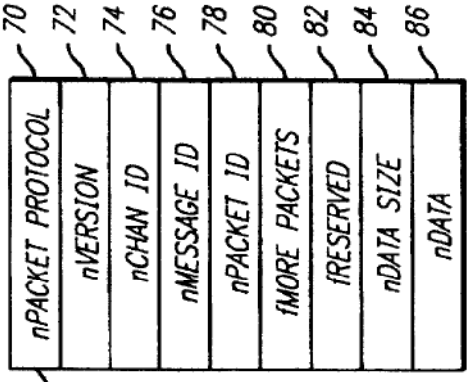


FIG. 5

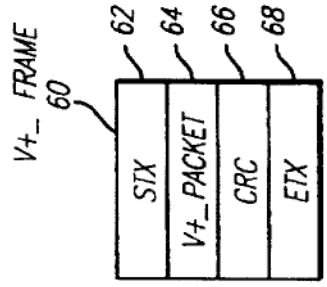


FIG. 4

CD ROM INFORMATION REFERENCES DELIVERED TO A PERSONAL COMPUTER USING THE VERTICAL BLANKING INTERVALS ASSOCIATED DATA TECHNOLOGY FROM A NABTS COMPLIANT TELEVISION BROADCAST PROGRAM

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention relates to a method and apparatus for inserting database address information into the vertical blanking interval of a video signal that is received by a personal computer

2. DESCRIPTION OF RELATED ART

Some computer systems contain NTSC decoders which allow publicly broadcasted video to be displayed on the monitor of the computer. The video may be displayed in a separate window that allows the user to view the video images while performing other operations on the system.

Personal computers can also be provided with text oriented databases that can be retrieved and viewed by the user. By way of example, there is a program marketed under the trademark INTERACTIVE ENCYCLOPEDIA by COMPTON of San Diego, Calif. which provides an interactive encyclopedia. The COMPTON product allows the user to select and review text and graphics which correspond to various historical events, geographical locations, etc.

It would be desirable to provide a system that would retrieve and display text/graphic data which corresponds to a television image displayed on a computer monitor. For example, if a user is watching an informational program on elephants, it would be desirable if various facts and graphics on elephants were presented on the screen along with the television image. It would also be desirable if the relevant facts/graphics were stored in memory for later viewing by the user.

SUMMARY OF THE INVENTION

The present invention is a system that displays text and graphic information with broadcasted television video. The broadcast system includes a vertical blanking interval (VBI) inserter which inserts data into the vertical blanking interval of a broadcasted video signal. The receiving system includes a personal computer that contains a VBI decoder which can separate the data from the video signal. The separated data contains command and address information, which instruct the personal computer to retrieve text/graphic information from a storage device, and display the retrieved text/graphic information on a monitor. The personal computer also contains a NTSC decoder which can decode the video signal and display a television image on the monitor. The broadcaster inserts data that retrieves text and graphic information which correspond to the television image displayed by the monitor. The retrieved text and graphic information may be stored for later viewing by the user.

BRIEF DESCRIPTION OF THE DRAWINGS

The objects and advantages of the present invention will become more readily apparent to those ordinarily skilled in the art after reviewing the following detailed description and accompanying drawings, wherein:

FIG. **1** is a schematic of the system of the present invention;

FIG. **2** is a screen of a video monitor;

FIG. **3** is a schematic showing the layers of a video encoder;

FIG. **4** is a schematic showing the formatting of a video frame that is inserted into the video blanking interval of a video signal;

FIG. **5** is a schematic showing the formatting of a video packet;

FIG. **6** is a schematic showing the formatting of a message provided to the encoder.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings more particularly by reference numbers, FIG. **1** shows a system of the present invention. The system includes a personal computer **10** that receives video signals and other information from a broadcaster **12**. The broadcaster **12** may be any broadcasting system including satellite and cable networks. The broadcaster **12** includes a vertical blanking interval (VBI) inserter **16** that has one input connected to a video source **18** and another input connected to a data source **20**. The video source **18** generates video signals that have a vertical blanking interval. The VBI inserter **16** inserts data generated by source **20** into the vertical blanking interval of the video signal. The VBI inserter **16** can be a unit sold by Norpak Corp. of Ottawa, Ontario, Canada under model number TDS-3. The video signal and accompanying inserted data are transmitted by a transmitter **22**.

The video signal and inserted data are received by a receiver **24**. The receiver **24** provides the signal and data to a vertical blanking interval (VBI) decoder **26**. The VBI decoder **26** which separates the data from the video signal. The video signal is provided to a NTSC decoder **28**. The decoder **28** converts the video signal into television signals that can be displayed on a computer monitor **30**.

The computer **10** typically contains a central processing unit (CPU) **32**, a dynamic random access memory (DRAM) device **34**, a massive storage device such as a hard disk drive **36**, and an optical disk drive **38**. The optical disk drive **38** may contain an optical disk which contains a text and graphic based database. By way of example, the optical disk may be a "CD-ROM" product sold by COMPTON software under the trademark INTERACTIVE ENCYCLOPEDIA. The COMPTON ENCYCLOPEDIA contains text and graphic information which relate to historical events, geographical locations, etc, typically found in an encyclopedia. The text and graphic information is located within addressable memory locations of the optical disk.

The CPU **32** receives the data separated from the video signal by the VBI decoder **26**. The data typically contains command and address information that instruct the CPU **32** to retrieve specific text and graphic information from the optical disk **38** and display the information on the computer monitor **30**.

FIG. **2** shows a screen of the computer monitor **30**. The screen may include a window **40** that displays the television image and a separate window **42** that shows the text and graphic information retrieved from the optical disk **38**. The text/graphic information typically relates to the video image shown in window **40**. For example, the video window **40** may display an elephant. The text/graphic window **42** may display particular facts regarding elephants. The monitor **30** may have a graphical user interface for input commands **44** that allows the user to change television channels. The new channel may also contain VBI inserted data which retrieves and displays text/graphic information that relates to the television images shown on the new channel.

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