Title: A METHOD AND ARRANGEMENT FOR CONTROLLING TELEVISION SETS WITH INTERNET ACCESS CAPABILITY

Abstract: There is disclosed a method and arrangement for controlling television sets with Internet access capability comprising in one same apparatus the CPU (31) that processes Internet data and the microcontroller (51) that manages the operation of the TV set, wherein the audio volume and the image attributes, as well as the adjustment of the clock, channel selection and other settings are adjusted by the microcontroller (51) in response to control signals output by the said CPU (31) and sent to the said microcontroller (51) through an internal data path (56, 57) of the apparatus. In a first embodiment of the invention, there is displayed on the screen a virtual remote control means which keys are selected by means of a cursor moved by a joystick incorporated in a computer keyboard. In a second embodiment, the adjustment commands are supplied from a remote location by means of a communications line.
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
“A METHOD AND ARRANGEMENT FOR CONTROLLING TELEVISION SETS WITH INTERNET ACCESS CAPABILITY”

Field of the Invention

The present invention refers to television reception apparatuses provided with means to access the Internet. More particularly, the invention refers to the use of the CPU resources associated with the Internet network to control all the functionalities of the television set, such as clock updating, channel tuning, etc., as well as the attributes of the image displayed on the screen.

Description of the prior art

The supply of information provided on the Internet to all those who wish to use this form of communication has been hindered by the relatively high cost of the equipment traditionally used for this purpose, thereby excluding a considerable share of the population.

Aiming to enable access to resources usually provided by computers, one of these being the possibility to access the Internet, several arrangements have been proposed based on the use of resources already available in TV receptors. In these apparatuses, generically known as “Internet TV”, some computer elements are integrated in the television set housing, to allow using the part that processes the video information as an image monitor.

In Figure 1 there is shown the general layout of a typical “Internet TV” arrangement, exemplified in patent document No. EP 0928105. As shown
in the figure, the apparatus 10 comprises the Internet module 11 having a port connected to the assembly of conventional circuits of the television set 13 and the other port connected to the connector 12 whereto there is connected the telephone line 15 by means of the plug 14. The assembly 13 processes the composite signal received from the said Internet module and excites the guns of the cathode ray tube that displays the image. The remote control device 17 allows the apparatus to be controlled by means of an infrared light link.

However, when used in the Internet mode, this type of apparatus, as well as others similar thereto, requires that the image quality adjustments brightness, contrast and other attributes as well as the sound volume, be operated by means of the control panel keys, or else by means of a conventional remote control device, requiring the user to manipulate two keyboards, to wit, the one associated with the computer and the said remote control. One further problem related to image attribute control occurs in hotels and similar establishments having rooms equipped with television sets. In these cases it may happen that the guests, either deliberately or accidentally, proceed to manipulate the image controls leaving the same entirely out of the normal viewing standards, thus requiring an attendant to displace him or herself physically to the location of the apparatus in order to restore the image to its expected quality.

**Objectives of the invention**

In view of what has been set forth above, a first object of the present invention consists in providing an arrangement and a method to allow a user of an Internet TV type apparatus to adjust the image attributes directly by making use of the controls associated with the Internet operating mode, without
needing to use a conventional remote control device in order to perform such adjustments.

Another object of the invention consists in providing an arrangement and a method allowing performance of remote adjustment of those attributes in establishments provided with a plurality of apparatuses, from a central location, such as the Reception desk of a hotel.

One further object consists in providing an arrangement and a method to allow remote adjustment, from a central location, of other functions such as clock updating, blocking of channels, etc., of television sets located in remote locations.

**Brief description of the invention**

The above and other objects are achieved by the present invention in the Internet-TV combination apparatuses comprised by an Internet module including a CPU and a television set module including a microcontroller, using a method whereby the signals to control the functions of the television set are output by the said CPU and transmitted to the said controller by a data pathway internal to the apparatus.

According to another characteristic of the invention, the said control signals are generated by interaction of a mouse manipulated by the user with a virtual remote control means displayed on the video screen.

According to another characteristic of the invention, the display of
the said virtual control means is provided by selecting the corresponding icon included in the initial page displayed on the screen upon an access in Internet operating mode.

According to another characteristic of the invention, the information pertaining to the attributes of the image is received by the said CPU by means of a local area network (LAN) for data communication.

According to another characteristic of the invention, the information pertaining to the image attributes is transmitted from a server combined with a computer.

According to another characteristic of the invention, the said control signals are supplied from the said CPU by means of a parallel interface and are converted to the I²C serial standard by a converter circuit interposed between the said CPU and the microcontroller that receives these signals.

According to another characteristic of the invention, the mouse that allows the user to interact with the onscreen virtual remote control means is combined with a remote keyboard communicating with the Internet-TV apparatus by means of a radio-frequency (RF) link.

According to another characteristic of the invention, there is displayed information on the screen of the apparatus to the effect that the apparatus is connected to the Internet network via telephone, thus alerting the user to that fact.
Description of the figures

Further characteristics and advantages of the present invention will be better appraised by means of the description of a preferred embodiment thereof, given herein as an example and not in any limitative sense, as well as by the figures referring thereto, wherein:

In Figure 1 there is shown an Internet-TV apparatus built in accordance with the prior art.

In Figure 2 there is shown the remote control device used together with the apparatus of the preceding figure.

In Figure 3 there is depicted an initial page displayed on the screen of an Internet-TV apparatus including the icon corresponding to the virtual remote control means, according to the principles of the present invention.

In Figure 4 there is depicted a block diagram representing an Internet-TV apparatus showing the interconnection between the CPU and the microprocessor.

Detailed description of the invention

Referring now more specifically to Figure 3, the initial page displayed on the screen comprises a control bar wherein are displayed several icons, one of these being icon in the form of a key with the letters "RC". The said page is assembled using Visual basic software, which software includes a library that enables assembling a given image, in this case the image of a virtual remote control means. On selecting this key and clicking thereon, by moving a cursor controlled by a conventional mouse, a joystick or other screen selection.
pointing means, there is provided access to the corresponding link on the graphic interface of the browser resident in the apparatus, in order to access the subroutine that contains the data for generating the image of the virtual remote control means 23 that will be displayed onscreen. As shown, this virtual control means includes all the function selection keys found in conventional remote control devices.

Each key displayed on the video screen is associated, by means of the graphic interface of the browser, with a specific code, such that the selection of a given key using the cursor provides access to a corresponding line in a table stored in memory, such table containing the code for the command that will be transmitted by the CPU to the microcontroller.

According to the block diagram of Fig. 4, the CPU 31 has a parallel output port originally intended for communication with a parallel interface printer. According to the present invention, this output port is connected to an 8-bit bus 56, through which is carried the adjustment signal generated by the said CPU in response to the selection made using the key of the virtual remote control means. As shown in the cited figure, this bus is connected to a parallel/serial converter 58, which converts the parallel signal into a serial signal in accordance with the protocol designated as I^2C (Inter IC control), which is the protocol used by the microcontroller 51 of the television set. The signal received by the microcontroller by means of the I^2C connection 57 is interpreted according to data stored in the built-in memory (not shown), allowing adjustment of the specific image attribute, the audio volume, or yet selection of channels, adjustment of the clock, etc.
The mouse or joystick providing the movement of the cursor may be connected to the apparatus in a conventional manner using a cable and its respective connector. In a preferred embodiment of the invention, the joystick is incorporated in a keyboard that may be connected to the Internet-TV by means of a cable or by an infrared or radio-frequency (RF) link.

In an alternative embodiment of the invention, the said image control is performed from a location remote to the apparatus. To that end, the Internet-TV should remain in standby mode and should be connected to the internal communication network (LAN) by means of a cable 43 and a connector 42 or should be connected to the telephone network by means of a line 41, male/female connectors 38/39 and a modem 37. This approach is particularly useful in hotels and similar establishments that have television sets in their rooms, and those television sets should be adjusted whenever a guest checks out of the hotel. In these cases, there is installed a specific software in the server to which there is connected the said local area network, and through a computer connected to the said server there is accessed the selected apparatus, which will be identified by means of a network address, allowing the apparatus to be adjusted without requiring the physical displacement of anyone to the location where the same is installed. This adjustment does not require that the virtual remote control means be displayed onscreen and may be performed by means of a menu, allowing the individual adjustment of each item, such as for example, color, brightness, contrast, etc.. The said software may further allow the automatic adjustment to the “factory setting” conditions in one single command, which will be transmitted through the network 43 to the said CPU 31 and therefrom to the microcontroller 51 wherein is stored in a ROM memory the list
containing the original settings of the said conditions of color, brightness, etc.

As occurs in conventional computers, the access to the Internet is performed by the modem 37 through the dial-up telephone line 41. When the computer is turned off, this connection is automatically canceled. On the other hand, with the Internet-TV apparatus it may happen that subsequently to the use in computer mode connected to the Internet, the user simply switches channels and starts to watch the normal television programs. In this case, since the apparatus is kept turned on, there will not have occurred the automatic disconnection of the dial-up connection, subjecting the user to the risk of incurring charges due to the inadvertent continued use of telephone pulses as well as the charges incurred for the time spent connected to the Internet provider.

For the purpose of alerting the user, the invention provides means to indicate that the dial-up connection is active, allowing the applicable action to be taken and obviating the cited losses. The said means operate as described in the following:

a) with the apparatus set to Internet mode, the user requests, using the browser, that a dial-up connection be established with a given provider;

b) upon the connection being successfully established, the CPU sends a specific code to the output port connected to the parallel bus 56, which is converted to the serial bus 57 by the parallel-serial converter 58;

c) said binary code is received by the TV microcontroller 51, which has stored in its RAM memory a specific register storing the information that the
dial-up network is active;

d) upon exiting from Internet mode to TV or video mode, the microcontroller that manages the switching of channels looks up the information stored in the said register. If this information indicates the existence of a dial-up connection, the microcontroller generates an informative icon via OSD (on-screen display) warning the user that the dial-up network connection is active;

e) using a periodically activated subroutine, the microcontroller keeps checking the condition of the said register in order to periodically display the icon indicating that the connection to the dial-up network remains active;

f) when the user is in Internet mode and the connection is disconnected, the corresponding information will be transmitted by the CPU to the microcontroller that will in turn update the connection status information in the said register.

One other resource inherent to the present invention is the warning of receipt of email messages. In the preferred embodiment of the present invention the users of the hotmail® electronic mail program are alerted in respect of receipt of a new email message by means of the real-time mail exchange program messenger®. Both programs are products provided by Microsoft Corporation, which offers communication therebetween such that when an email message is received at the user’s hotmail® address, a message is automatically sent to the user’s messenger® program informing that a new email message has been received. In order to read the email message the user will have to access the hotmail® program.

In order to provide e-mail receipt warnings the present invention
may use any combination of electronic mail and real-time message exchange programs, provided that both services are interlinked, therefore not being restricted to the hotmail® and messenger® programs.

This resource operates as follows:

a) with the apparatus set to Internet mode, the user accesses the Internet;

b) the program for exchange of messages in real time is activated;

c) the user switches over to a video or TV channel;

d) when an email arrives at the user’s mailbox, the message exchange program informs the user’s CPU about such arrival;

e) the CPU generates a specific code that is transmitted through connections 56, 57 and 58 to the microcontroller;

f) upon receiving the code indicating that a message has been received, the microcontroller generates an informative icon via OSD;

g) if the user wishes to read the email, he or she returns to Internet mode and accesses the message by means of the electronic mail program.

Although the invention has been described based on an exemplary form of embodiment, modifications may be made therein by technicians skilled in the art provided that such modifications fall within the scope of the inventive concept. Accordingly, the invention is defined and limited by the set of claims that follows.
CLAIMS

1. A method for controlling television sets with Internet access capability, comprising in one same apparatus the CPU (31) that processes data from the Internet and the microcontroller (51) that manages the image and sound reproduction of the television set, characterized in that the image and sound attributes as well as the functions of the television set are adjusted by the microcontroller in response to control signals supplied from the said CPU and sent to the said microcontroller through an internal data path (56, 57) of the apparatus.

2. A method, according to claim 1, characterized in that the said control signals are generated by the CPU in response to the selection on the screen (20), using a cursor, of one key of a virtual remote control means (23) generated by the graphic interface of the browser resident in the apparatus.

3. A method, according to claim 2, characterized in that the said cursor is made to move on the screen by means of a mouse.

4. A method, according to claim 2, characterized in that the said cursor is made to move on the screen by means of a joystick.

5. A method, according to claim 1, characterized in that the commands for control of the image attributes are transmitted to the said CPU through a communications line (41, 43).

6. A method, according to claim 5, characterized in that the said communications line is a telephone line (41).

7. A method, according to claim 5, characterized in that the said communications line (43) includes a LAN type network.

8. A method, according to claim 5 or claim 7, characterized in that
the said commands are generated using specific software installed in a server.

9. A method, according to claim 1, characterized in that the information to the effect that the connection of the apparatus with the dial-up network is active is stored in a specific register subordinated to the microcontroller (51).

10. A method, according to claim 9, characterized in that there is displayed onscreen an icon generated by the microcontroller (51) via OSD (on-screen display) during the permanence in the register of the information indicating that there is an active connection between the apparatus and the dial-up network.

11. A method, according to claim 1, characterized in that, in apparatuses provided with the program for exchange of messages in real time and with such program active, there is displayed on the screen, while there is being viewed a video or TV program, a specific icon indicating receipt of email messages, the said icon being generated by the microcontroller (51) in response to a signal provided from the CPU (31) indicating the said receipt, transmitted through the said data path (56, 57) to the said microcontroller.

12. A control arrangement for television sets with Internet access capability, comprising in one same apparatus the CPU (31) that processes data from the Internet and the microcontroller (51) that manages the reproduction of the image and the sound as well as other functions of the television set, characterized in that the connection of the said CPU with the said controller comprises a parallel bus (56) connected to a parallel output port in the said CPU, a parallel/serial converter (58) and an I²C standard serial communication line.

13. An arrangement, according to claim 9, characterized in that the joystick that controls the movement of the cursor displayed on the screen is
integrated in a standard computer keyboard (33).

14. An arrangement, according to claim 10, characterized in that the said keyboard incorporating the said joystick communicates with the said CPU (31) by means of a radio frequency (RF) link (34).
Fig. 3

Fig. 4
### INTERNATIONAL SEARCH REPORT

**A. CLASSIFICATION OF SUBJECT MATTER**

- IPC*: H04N 7/173, 5/445

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

- IPC*: H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

- WPI, EPODOC, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tr>
<td>A</td>
<td>US 6073171 A (GAUHAN et al.) 6 June 2000 (06.06.2000) figures 1, 2, column 3, line 19 - column 4, line 41.</td>
<td>1-14</td>
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- Further documents are listed in the continuation of Box C.

- See patent family annex.

* Special categories of cited documents:
  - "A" - document defining the general state of the art which is not considered to be of particular relevance
  - "E" - earlier application or patent but published on or after the international filing date
  - "L" - document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  - "O" - document referring to an oral disclosure, use, exhibition or other means
  - "P" - document published prior to the international filing date but later than the priority date claimed

- "T" - later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" - document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" - document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" - document member of the same patent family

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22 December 2004 (22.12.2004)

**Date of mailing of the international search report**

1 February 2005 (01.02.2005)

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