Title: MINIATURIZED COMPUTER SYSTEM

Abstract: A miniaturized computer system comprises a monitor provided with a HDMI port and a microcomputer connectable with said HDMI port, and is characterized in that it comprises an integrated system formed by the coupling of a back-end software with a local software installed in said microcomputer which allows a direct voice/data connectivity with a 3g/4g/LTE data transmission telephone network. The microcomputer of said computer system includes a printed circuit on which the following are installed: a USIM slot for housing a data/voice SIM card, a LTE module for managing a 3g/4g/LTE cellular communication, a pair of antennas connected with said LTE module in order to develop said cellular communication according to the standard 3GPP and a chip for supporting the 3g/4g/LTE peripheral communication device.
Miniaturized computer system

Field of application of the invention

The invention regards the field of computer systems for the home and office, which have today become largely irreplaceable for confronting and resolving daily life and work problems.

Digital technologies such as the television, radio, computer, tablet and cell phone, in the various embodiments thereof such as the smartphones, are objects of great utility, and sometimes of absolute necessity.

As always, all devices which technological progress makes available to us resolve an important series of problems, but they themselves create new problems; this is often due to the fact that the solution of old problems makes possible the actuation of new production and management processes, and work methods which generate needs unmet by said devices. For example, in offices, the widespread introduction of computers (whose advantages are not mentioned herein since they are well-known to all) originated the desire - now a need - to be able to centrally configure, control and manage all the computers of an organization; presently, rather, these actions require personalized interventions, i.e. an intervention on each computer, even if all interventions are equivalent, as in the case for example of software distribution and/or updating. Another need, even more widespread, is that of being able to replace heavy, bulky personal computers with quicker, lighter devices.

A microcomputer was thus recently developed, hereinbelow in the description
more simply defined miniPC, obtained with the miniaturized technologies of cell phones. The miniPC has substantially the size of a pocket cigarette lighter, and it contains the hardware and software of a personal computer. This miniPC, more well-known with the familiar term of "flash drive", has a connector of HDMI/MHL® type which is connected with a port with the same characteristics of the connector, expressly provided and present on the monitor, thus obtaining a computer-monitor coupling functionally identical to that of a conventional personal computer but with a device of very different size. Indeed, with this device it is possible to transform a TV screen into a smart TV, which offers the possibility to rent films, see e-mails, access Internet and download films, games and music. Nevertheless, this device is not capable of solving the abovementioned problem, not only due to the lack of a possibility of interaction with a central software in remote position but also because the Internet connection occurs with the WI-FI system, limited to the availability over the territory and not very reliable for the solution of the abovementioned problem, since it is frequently subject to temporary "no service" moments. Such "no service" moments often depend on some particular security configuration, active on the network, which often prevents the devices connected via WI-FI from freely navigating on all websites. In practice, WI-FI network system administrators often set limitations in order to prevent some services from being executed, for example for security reasons or to prevent the Internet band from being abused. A typical case is that of blocking the possibility to use Video on Demand services. There is also a different type of "flash drive" which is none other than a cell phone provided with a USB-type connector, which allows connecting a computer, generally of laptop type, but not a monitor, with Internet by means of the cell phone network. It is clear that this type flash drive is not a miniPC nor can it be compared to one, since it lacks the hardware and software that characterized a computer. Now, therefore, the Applicant has found that the described problem, i.e. the centralized management of a plurality of computers, can be overcome with a new computer system comprising a back-end software situated in a computer server, in central position with respect to a plurality of client computers, which
interacts with a software situated in a client computer, said client being a miniPC physically connected to a monitor by means of a connection of HDMI/MHL® type, said miniPC comprising a hardware and a software which allow a direct voice/data connectivity with a 3g/4g/LTE data transmission network.

Objects of the invention are therefore a computer system which by means of mutual interfacing of two softwares respectively placed in a central computer server and in a remote client computer allows the computer server to manage said client computer by means of a data transmission telephone network, and a miniPC provided with the hardware and the software necessary for carrying out the connection with said data transmission telephone network.

In a first aspect thereof, the invention therefore regards a miniaturized computer system, comprising a monitor provided with a HDMI/MHL® port and a microcomputer connectable with said HDMI/MHL® port, characterized in that it comprises an integrated system with a local software, installed in said microcomputer, which allows a direct voice/data connectivity with a data transmission telephone network.

In a second aspect thereof, the invention then regards a microcomputer that includes a printed circuit on which the following are installed: a SIM/USIM slot for housing a data/voice SIM card, a 3g or 4g LTE module for managing a 3g/4g/LTE cellular communication, a pair of antennas connected with said LTE module in order to develop said cellular communication according to the standard 3GPP, and a chip for supporting the 3g/4g/LTE peripheral communication device.

Further characteristics and advantages of the invention will be clearer from the detailed description of a preferred but not exclusive embodiment of said system according to the present invention. Such description will be set forth hereinbelow with reference to a specific embodiment of said system, and in particular of said miniPC, illustrated in the enclosed figure 1, which provides, only for exemplifying and hence non-limiting purposes, a schematic plan view of the relative hardware.

With reference to the enclosed figure, the microcomputer, or the miniPC according to the invention, has the well-known physical structure of a "flash drive" 1.
This flash drive is provided with a connector 2 of HDMI/MHL® type for the connection with a monitor or other video device, provided with a corresponding port, for the activation of the processing and the presentation of the results of said processing carried out by the computer system.

5 The HDMI/MHL® (High Definition Multimedia Interface) connection is an audio/video connection obtained for the transmission of digital signals. HDMI connects digital sources - such as Blu-ray disc readers, computers, video game consoles or AV receivers - with compatible apparatuses, such as a digital television.

10 HDMI/MHL® is currently the best way to connect all the apparatuses to a high-definition TV. With its ease of use, versatility and capacity, the HDMI/MHL® connection is quickly replacing the other connector types. Currently, the HDMI/MHL® connection is the only connection type that offers the possibility to send high-definition videos and multi-channel audio by means of a single cable.

15 HDMI/MHL® ensures maximum integrity of the signal with a secure connection between the various devices. The HDMI/MHL connector can be of male or female type, and the integration on the flash drive can be made either with male or female connector.

Such miniPC includes a printed circuit 3 on which a chip 4 is installed of SoC (System on Chip) type. Such chip executes all the operations requested of a CPU (Central Processing Unit), manages a graphic card and all the peripheral devices, of Input/Output type, possibly connected with said miniPC. Also installed on the printed circuit are a static memory 5, preferably of NAND or EMMC type, and a RAM memory 6, possibly consisting of multiple modules.

20 Also provided for is a wireless module 7 for a WI-FI or Blue-Tooth connection by means of an antenna 8. A port 9, of USB type, by means of a connection cable 10 provided with suitable known terminals 11, allows connecting the miniPC with a plurality of peripheral devices.

In accordance with the invention, the miniPC comprises a slot 12 of SIM/USIM type, for housing a data/voice SIM card, and a module 13 for managing a cellular communication by means of a pair of antennas 14 connected with said module.
Preferably, the module 13 is a module which integrates a support chip of 3g/4g/LTE type, connected with the SoC 4, which actuates said cellular communication according to the standard 3GPP.

3GPP is the acronym of "3rd Generation Partnership Project", emanated by a consortium that also defined the preceding standards of data communication via cell phone. The new communication standard defined by 3GPP is identified with the initials LTE (Long Term Evolution).

The main characteristics set by the standard 3GPP are well known, so that it is not necessary to expand upon them in the present document; it is sufficient to recall that there are essentially two most important novelties for the final user: the greater download (and upload) speed and the reduced response time, which makes the mobile network use very similar to that of a fixed network.

The miniaturized computer system, according to the invention, comprises a back-end software installed in a computer, defined server herein, which has the task of managing all the computers, in particular the miniPCs, defined clients herein, of a given organization connected thereto. Each client comprises a monitor provide with a HDMI/MHL® port and a miniPC connectable with said HDMI/MHL® port. The server computer and the client computers are not illustrated herein since they are well known; in particular it is known, and frequently illustrated in technical magazines of the field, to physically connect between a monitor and a miniPC. Naturally, the monitor can be any video device connectable with a miniPC, for example a projector or other similar devices.

In the computer system according to the invention, the miniPC comprises a software that interacts with the back-end software installed on the server and also allows a direct voice/data connectivity with a data transmission telephone network, preferably a 3g/4g/LTE network.

The advantage of this solution is given by the fact that the WI-FI connection is not very reliable, since it is not present in many places and often subjected to service interruptions. On the contrary, a telephone connection, in particular as indicated above, is a connection present practically anywhere and always active, since it lacks navigation limits/filters set by system administrators. Preferably, the monitor used for the system of the invention comprises a screen and a
device which integrates a touch-screen functionality. This functionality, when the screen does not inherently comprise it, i.e. from the start, can be provided by a separate device, i.e. a touchfoil connected with said screen. Said touch-screen functionality can be of capacitive or resistive type, or obtained with other technologies alternative to the capacitive/resistive systems, by means of the use of screen frames sensitive to infrared rays, more well-known as "IR Overlay" systems. Preferably, the monitor is a very compact device, of so-called "flat screen" type, with a screen preferably of LCD type, LED type or Plasma type. The invention solves the stated problem and attains various advantages: the interaction between the back-end software and the software installed on the miniPC allows the server to simultaneously manage all the miniPCs connected via Internet to said server, and the fact that the data transmission occurs by means of telephone network ensures the execution of the connected activities without risk of damage or malfunctioning following possible loss of the network during data transmission. With the solution provided by the invention, it is possible to substitute the conventional, bulky personal computers, reduce the energy consumptions since the flash drive technology, derived from cell phone technology, consumes 5% of the energy consumed by the classic conventional solutions of the personal PCs. It is possible to centrally configure an unlimited number of flash drives and have complete visibility thereof, in a central console, regarding the status of the resources of each single flash drive, the updating status of the operating system of the flash drive and the installed programs. It is further possible to define use policies (what can be executed and under which conditions), install software and cancel the entire content of the flash drive from a distance, allow access to the Windows and Macintosh virtual machines such that the user can work where he finds himself with his own desktop. Last but not least, the solution of the flash drive is something that can be transported and always safely managed. In the present description, not all of the possible structural and size alternatives to the specifically-described embodiments of the invention were normally illus-
trated: indeed, it did not seem necessary to expand upon the structural details of the system of the invention since the man skilled in the art - after the instructions given herein - will have no difficulty designing, through the suitable selection of materials and sizes, the most advantageous technical solution.

These variants are nevertheless equally intended to be comprised in the protective scope of the present patent, given that they are equivalent forms, *per se* easily derivable from the description given herein of the relation that links each embodiment with the result that the invention wishes to obtain.
CLAIMS

1. Miniaturized computer system, comprising a monitor provided with a HDMI port and a microcomputer connectable with said HDMI port, characterized in that it comprises an integrated system formed by the coupling of a back-end software with a local software installed in said microcomputer which allows a direct voice/data connectivity with a 3g/4g/LTE data transmission telephone network.

2. Computer system according to claim 1 characterized in that said microcomputer includes a printed circuit on which the following are installed: a USIM slot for housing a data/voice SIM/USIM card, a LTE module for managing a cellular communication, a pair of antennas connected with said LTE module in order to develop said cellular communication according to the standard 3GPP, a chip of 3g/4g/LTE type, for supporting the LTE peripheral communication device.

3. Computer system according to claim 1 characterized in that said monitor comprises a screen and a device which integrates a touch-screen functionality.

4. Computer system according to claim 3 characterized in that said device is a separate touchfoil, connected with said screen.

5. Computer system according to claim 3 characterized in that said screen inherently integrates the touch-screen functionality, whether it is of capacitive type, resistive type or obtained by means of "IR Overlay" systems.

6. Computer system according to claim 1 characterized in that said microcomputer comprises a connector of HDMI/MHL type for connecting with said monitor.

7. Computer system according to claim 3 characterized in that said microcomputer comprises a printed circuit on which the following are mounted: at least one wireless module, a static memory, and a RAM memory.

8. Computer system according to claim 3 characterized in that said support chip is of SoC (System on Chip) type, and it manages the CPU, a plurality of peripheral devices of Input/Output type and comprises at least one graphic processor.
9. Computer system according to claim 5 characterized in that said microcomputer comprises a USB port for connecting with said peripheral devices.

10. Microcomputer characterized in that include a printed circuit on which the following are installed: a USIM slot for housing a data/voice SIM/USIM card, a LTE module for managing a cellular communication, a pair of antennas connected with said LTE module in order to develop said cellular communication according to the standard 3GPP, a chip of 3g/4g/LTE type for supporting the LTE peripheral communication device.
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

INV. H04N21/4363

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)
H04N

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

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

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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<td>WO 2012/131400 AI (OMNI FONE LTD [GB]; SANT PHI LI P [GB]; KNIGHT MARK [GB]; BLACK SIMON [GB]) 4 October 2012 (2012-10-04) abstract; figures 1-3 page 13, line 1 - line 6 page 17, line 18 - page 19, line 16</td>
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<td>A</td>
<td>CN 201 413 486 Y (ZHENG LI) 24 February 2010 (2010-02-24) figure 1</td>
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Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:
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Name and mailing address of the ISA

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