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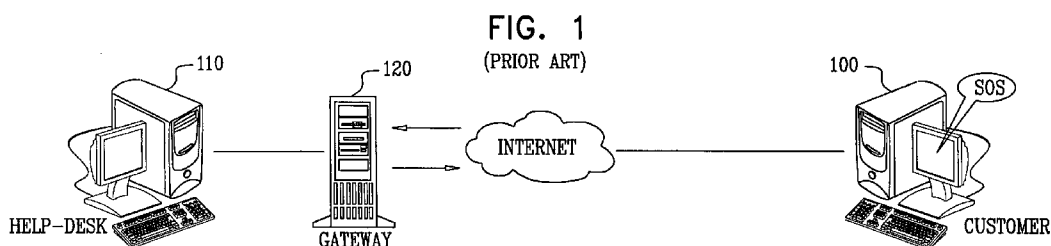
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(57) Abstract: A diagnostic system for computers, including a connector interface for connecting the diagnostic system to a PC, a storage medium for storing executable instructions that boot the PC when the diagnostic system is connected to the connector interface, for storing diagnostic testing program code that scans and tests the PC, and for storing a phone number for a remote online help-desk facility, a modem for communicating wirelessly with the online help-desk facility when the PC is not fully operational, and for enabling the remote online help-desk facility to remotely run the diagnostic testing program code on the PC and view the results, an audio subsystem for enabling voice communication between a user and a representative at the remote online help-desk facility, and a processor for controlling the storage medium, the modem and the audio subsystem. A method is also described and claimed.

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METHOD AND SYSTEM FOR REMOTE DIAGNOSTICS

REFERENCE TO RELATED APPLICATIONS

Reference is made to U.S. Patent Application Serial No. 11/893,837, filed August 16, 2007 and entitled METHOD AND SYSTEM FOR REMOTE DIAGNOSTICS, the disclosure of which is hereby incorporated by reference and priority of which is hereby claimed pursuant to 37 CFR 1.78(a) (1) and (2)(i).

FIELD OF THE INVENTION

The field of the present invention is computer technical support.

BACKGROUND OF THE INVENTION

The advancement of computer technology and the affordability of fast microprocessors and large storage disks has led to the proliferation of powerful computers among consumers. One of the challenges in keeping pace with the ever expanding market of personal computers, is providing technical support for computer-related problems. Conventional technical support is provided via help desk support, via phone calls, via websites, via e-mail and, in case of difficult problems, via technician house calls.

A growing service that has emerged in the past years is that of the online help-desk. Online help-desks originally used voice conversation or chat messaging for technical support. Currently, some online help desks use remote control applications, which enable a technician to remotely interact with an afflicted computer over the Internet, or over a company LAN. Such remote control applications may provide the

technician with the same level of control as if he were sitting in front of the afflicted computer itself. Examples of such remote control applications include (i) PCAnywhere[®] developed and marketed by Symantec Corporation of Cupertino, CA, (ii) Bomgar[™] PC remote control software developed and marketed by Bomgar Corporation of Ridgeland, MS, (iii) UltraVNC PC remote control software developed and marketed by Ultr@VNC, and (iv) NetSupport 24-7 developed and marketed by NetSupport, Inc. of Alpharetta, GA. Some remote control applications integrate voice conversation and text chat with customer support, during a support session, such as (v) Linktivity[®], marketed and developed by Inter-Tel, Inc. of Tucson, AZ.

Reference is now made to **FIG. 1**, which is a prior art illustration of an online help-desk system. Shown in **FIG. 1** is an afflicted personal computer (PC) **100**, which connects to a remote help-desk **110** via an Internet gateway **120**. Computer **100** runs remote control software that enables a technician using help-desk **110** to take control of computer **100**, including keyboard and mouse input control, with output displayed to the technician. In particular, the technician is able to run diagnostic testing tools such as anti-virus software and registry scan software, and see the results of the tests.

A drawback with current help-desk technology is that it requires an operational Internet connection. As such, in cases where there is no available Internet connection or if the problem itself is lack of Internet connectivity, online help-desk support is useless.

It would thus be of advantage to have a help-desk technology that provides remote technical support without requiring that the afflicted computer be able to connect to the Internet.

SUMMARY OF THE DESCRIPTION

Aspects of the present invention concern methods and systems for providing remote online help-desk technical support to a personal computer (PC) that is not fully operational, including circumstances where the PC is unable to connect to the Internet. The present invention includes a diagnostic device, referred to herein as a "diagnoser", which connects to the PC and remotely communicates with a remote online help-desk facility.

The diagnoser is generally used in combination with voice communication between a user of the PC and a help-desk support person. The help-desk support person guides the user in performing several actions, until the help-desk support person is able to take control of the PC. Such actions include inter alia connecting the diagnoser to the PC, turning the PC off and on, and selecting an option from a menu displayed on the screen. For user's that are not skilled with technical support operations, voice communication enables the help-desk person to explain each action to the user.

The diagnoser includes boot instructions in its disk drive and, as such, can be used to boot the PC when it is connected to the PC. The diagnoser also includes diagnostic testing program code, which the PC runs from the diagnoser's disk, that scans and tests the PC. The diagnoser further includes a modem that provides a wireless communication socket with the remote online help-desk facility.

Thus, by using the diagnoser of the present invention, together with PC remote control software, a technical support person at a remote online help-desk facility, is able to run diagnostic scans tests on the afflicted PC and view the scan and test results, in order to resolve the problem with the PC, without requiring that the PC have Internet connectivity.

It will thus be appreciated by those skilled in the art that although the afflicted PC is unable to make an Internet connection, the online help-desk facility is nevertheless able to remotely control the PC via use of the diagnoser of the present

invention, to run diagnostic scans and tests, and to provide the necessary technical support.

There is thus provided in accordance with an embodiment of the present invention a diagnostic system for computers, including a connector interface for
5 connecting the diagnostic system to a PC, a storage medium for storing executable instructions that boot the PC when the diagnostic system is connected to the connector interface, for storing diagnostic testing program code that scans and tests the PC, and for storing a phone number for a remote online help-desk facility, a modem for communicating wirelessly with the online help-desk facility when the PC is not fully
10 operational, and for enabling the remote online help-desk facility to remotely run the diagnostic testing program code on the PC and view the results, an audio system for enabling voice communication between a user and a representative at the remote online help-desk facility, and a processor for controlling the storage medium, the modem and the audio system.

There is moreover provided in accordance with an embodiment of the present invention a method for diagnosing a computer that is not fully operational, including enabling voice communication between a user and a representative at a remote on-line help-desk facility, communicatively connecting a diagnostic system (i) to a PC that is not fully operational, and (ii) to the online help-desk facility, booting the
20 PC from a disk drive on the diagnostic system, remotely running diagnostic testing program code stored in the diagnostic system on the PC, from the online help-desk facility, and remotely viewing the results of the diagnostic testing program code, from the online help-desk facility.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be more fully understood and appreciated
5 from the following detailed description, taken in conjunction with the drawings in
which:

FIG. 1 is a prior art illustration of an online help-desk system; and

FIG. 2 is an illustration of a system for online technical support using a
diagnoser device, in accordance with an embodiment of the present invention;

10 **FIG. 3** is a simplified block diagram of a diagnoser device, in
accordance with an embodiment of the present invention;

FIG. 4 is a picture of a physical diagnoser, in accordance with an
embodiment of the present invention; and

FIG. 5 is a simplified flowchart for operation of a diagnoser device, in
15 accordance with an embodiment of the present invention.

DETAILED DESCRIPTION

Aspects of the present invention relate to providing remote technical support for a PC that is unable to connect to the Internet. The present invention includes a diagnostic device, referred to as a "diagnoser", the enables a remote online help-desk facility to run diagnostic scans and tests on the PC, where the diagnostic program code resides on the diagnoser's disk. The diagnoser is also able to boot the PC, in case the PC's operating system is not functional. The diagnoser also provides a voice channel for audio guidance.

Reference is now made to **FIG. 2**, which is an illustration of a system for online technical support using a diagnoser, in accordance with an embodiment of the present invention. Shown in **FIG. 2** is an afflicted PC **100** that requires technical support from a remote help-desk **110**. Help-desk **110** is accessible over the Internet via a gateway **120**. However, computer **100** may not be able to connect to the Internet.

Also shown in **FIG. 2** is a diagnoser **130** that is able to communicate with help-desk **110** even when computer **100** is unable to do so by itself. Diagnoser **130** includes a cellular modem, and connects to the Internet via a cellular base station **140**. Diagnoser **130** provides a cellular link to computer **100**, and also provides diagnostics software to computer **100**. Diagnoser **130** functions as a mediator for storing appropriate diagnostic software, or downloading such software from server computers, and running the software on computer **100**.

In accordance with an embodiment of the present invention, diagnoser **130** is connected to computer **100** via a USB or an SD connection. Diagnoser **130**'s storage is thus exposed to computer **100**, and computer **100** is able to run the diagnostics software remotely from diagnose **130**'s memory.

Depending on the criticality of computer **100**'s state, there are two modes of diagnostics. If computer **100** is in a critical state and is not generally operable, then diagnoser **130** serves as a rescue boot device. When diagnoser **130** is connected to computer **100**, computer **100** recognizes diagnoser **130** as a boot device, and is able to boot start itself from diagnoser **130**. In this regard, it is noted that most BIOS's enable

USB boot-ability. After computer **100** is booted, the diagnostics software residing in diagnoser **130** is executed.

The diagnostics software runs system utilities on computer **100** without starting computer **100**'s operating system, or alternatively with a minimal operating system. The diagnostic software analyzes the state of computer **100**'s operating system (OS). The diagnostic software searches for damaged OS files, based on a priori knowledge about the files. If damaged OS files are discovered, then good files are fetched locally or downloaded, and copied to the proper location in computer **100**. Control is then returned to computer **100**.

If computer **100** is not in a critical state and is generally operable, then when diagnoser **130** is connected to computer **100**, computer **100** recognizes that a new device is connected, and begins auto-playing the remote diagnostics software residing in diagnoser **130**.

In either of the above modes of diagnostics, when computer **100** runs the diagnostics software, a connection is established between diagnoser **130** and help-desk **110**. If computer **100** is able to establish an Internet connection, then such connection is preferred. However, if computer is unable to make an Internet connection, the wireless cellular modem within diagnoser **130** is used instead. In accordance with an embodiment of the present invention, the connection between diagnoser **130** and help-desk **110** is a dual transfer mode (DTM) connection, which enables both a circuit switched (CS) connection and a packet switched (PS) session.

In turn, this enables a conversation with a help-desk representative while he diagnoses and fixes computer **100**'s problem. The help-desk representative instructs a user regarding operations to perform with diagnoser **130**; e.g., "Connect the diagnoser to the USB port", "turn the computer off and then on again", "what do you see on the screen". Such conversation often relies on the on-board voice communication in diagnoser **130**, in cases where a telephone line is not near computer **100**.

The help-desk representative is afforded remote control of computer **100**. If computer **100** was booted from diagnoser **130**, then the remote control of computer **100** may be limited to running applications that reside on diagnoser **130**. If computer was able to start its own operating system, then the remote control of computer **100** will

include running applications that reside on computer **100** as well as applications that reside on diagnoser **130**. Such diagnostic applications include inter alia anti-virus software and registry scan software.

Reference is now made to **FIG. 3**, which is a simplified block diagram of diagnoser **130**, in accordance with an embodiment of the present invention. Reference is also made to **FIG. 4**, which is a picture of a physical diagnoser **130**, in accordance with an embodiment of the present invention. As shown in **FIG. 3**, principal components of diagnoser **130** include a processor **310**, a memory **320** storing diagnostic program code **325** and a prescribed help-desk phone number, a communication modem **330**, an internal power source **340**, a PC interface **350** and, optionally, a user interface including an input device **360** and an output display **365**. Input device **360** and output display **365** may be used to operate computer in conjunction with a remote help-desk representative.

Diagnoser **130** also includes an audio subsystem **370**, used for conversation with the help-desk, which is generally contemporaneous with diagnostic testing and remote control of computer **100**.

Modem **330** sends and receives audio signals via a GSM antenna **380** that is connected to a power amplifier **381**. Modem **330** sends and receives digital signals via a wireless LAN **385**. Wireless LAN **385** enables diagnoser **130** to use a Wi-Fi connection as an alternative to a cellular modem connection. Diagnoser **130** also includes a SIM card **390** for GSM connection.

Reference is now made to **FIG. 5**, which is a simplified flowchart for operation of diagnoser **130**, in accordance with an embodiment of the present invention. At step **505** a user experiences a problem with his PC, which has become afflicted. At step **510** a diagnoser initiates a phone call to a help-desk, using a prescribed phone number stored in memory of the diagnoser.

At step **515** the diagnoser is connected to the USB or SD port of the PC. At step **520** a determination is made as to whether or not the PC's operating system is operational. If so, then at step **525** the PC recognizes the diagnoser as a connected device, and begins auto-playing diagnostics software that is stored in the diagnoser's memory.

At step **530** an online help-desk representative opens a data connection with the PC and makes a voice connection with the user. At step **535** the help-desk representative remotely controls the PC. At step **540** the help-desk representative runs diagnostics testing tools and configuration tools that reside on the PC or on the
5 diagnoser, or both. The method then proceeds to step **570**.

Referring back to step **520**, if the PC's operating system is not operational, then at step **545** the user reboots the PC from the diagnoser, which serves as a boot device. At step **550** the PC recognizes the diagnoser. At step **555** the help-desk representative opens a data connection with the PC, and makes a voice connection
10 with the user. At step **560** the help-desk representative takes limited remote control of the PC. At step **565** the help-desk representative runs diagnostic testing software on the PC, using software residing on the diagnoser. Finally, at step **570** the help-desk representative is able to resolve the afflicted PC problem.

In the foregoing specification, the invention has been described with
15 reference to specific exemplary embodiments thereof. It will, however, be evident that various modifications and changes may be made to the specific exemplary embodiments without departing from the broader spirit and scope of the invention as set forth in the appended claims. Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.

20

CLAIMS

What is claimed is:

- 5 **1.** A diagnostic system for computers, comprising:
 a connector interface for connecting the diagnostic system to a PC;
 a storage medium for storing executable instructions that boot the PC
 when the diagnostic system is connected to said connector interface, for storing
 diagnostic testing program code that scans and tests the PC, and for storing a phone
10 number for a remote online help-desk facility;
 a modem for communicating wirelessly with the online help-desk facility
 when the PC is not fully operational, and for enabling the remote online help-desk
 facility to remotely run the diagnostic testing program code on the PC and view the
 results;
15 an audio subsystem for enabling voice communication between a user
 and a representative at the remote online help-desk facility; and
 a processor for controlling said storage medium, said modem and said
 audio subsystem.
- 20 **2.** The diagnostic system of claim 1 further comprising a battery for
 powering said processor.
- 3.** The diagnostic system of claim 1 wherein said connector interface is a
 USB connector.
- 25 **4.** The diagnostic system of claim 1 wherein said connector interface is an
 SD connector.
- 5.** The diagnostic system of claim 1 wherein said modem communicates in
30 dual transfer mode (DTM), providing both a circuit switched (CS) connection and a
 packet switched (PS) session.

6. A method for diagnosing a computer that is not fully operational, comprising:

enabling voice communication between a user and a representative at a
5 remote on-line help-desk facility;

communicatively connecting a diagnostic system (i) to a PC that is not fully operational, and (ii) to the online help-desk facility;

booting the PC from a disk drive on the diagnostic system;

remotely running diagnostic testing program code stored in the
10 diagnostic system on the PC, from the online help-desk facility; and

remotely viewing the results of the diagnostic testing program code, from the online help-desk facility.

7. The method of claim 6 wherein said communicatively connecting the
15 diagnostic system to the remote online help-desk facility uses in dual transfer mode (DTM) connection, providing both a circuit switched (CS) connection and a packet switched (PS) session.

FIG. 1
(PRIOR ART)

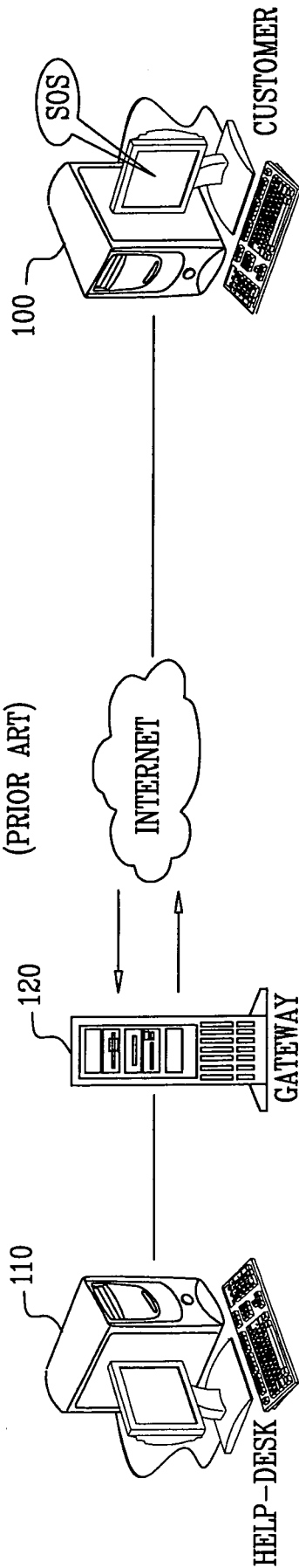
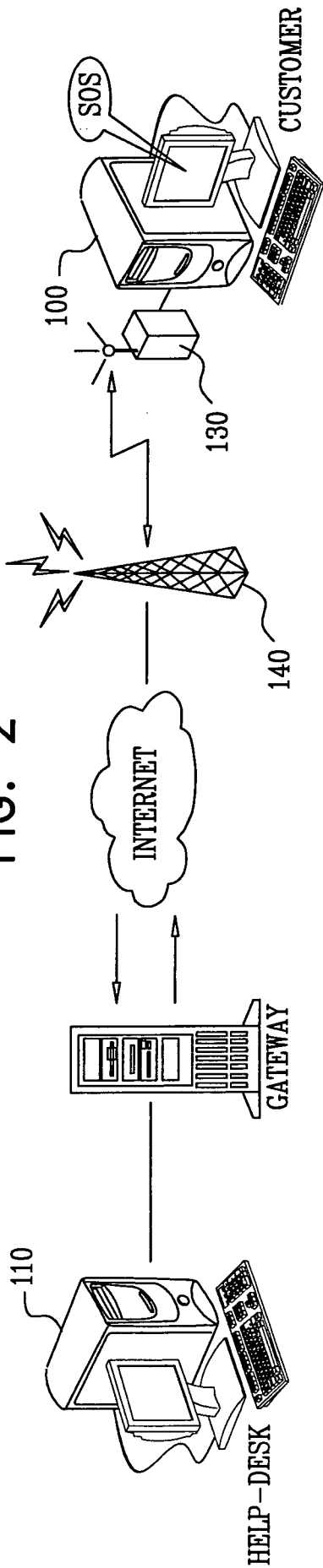
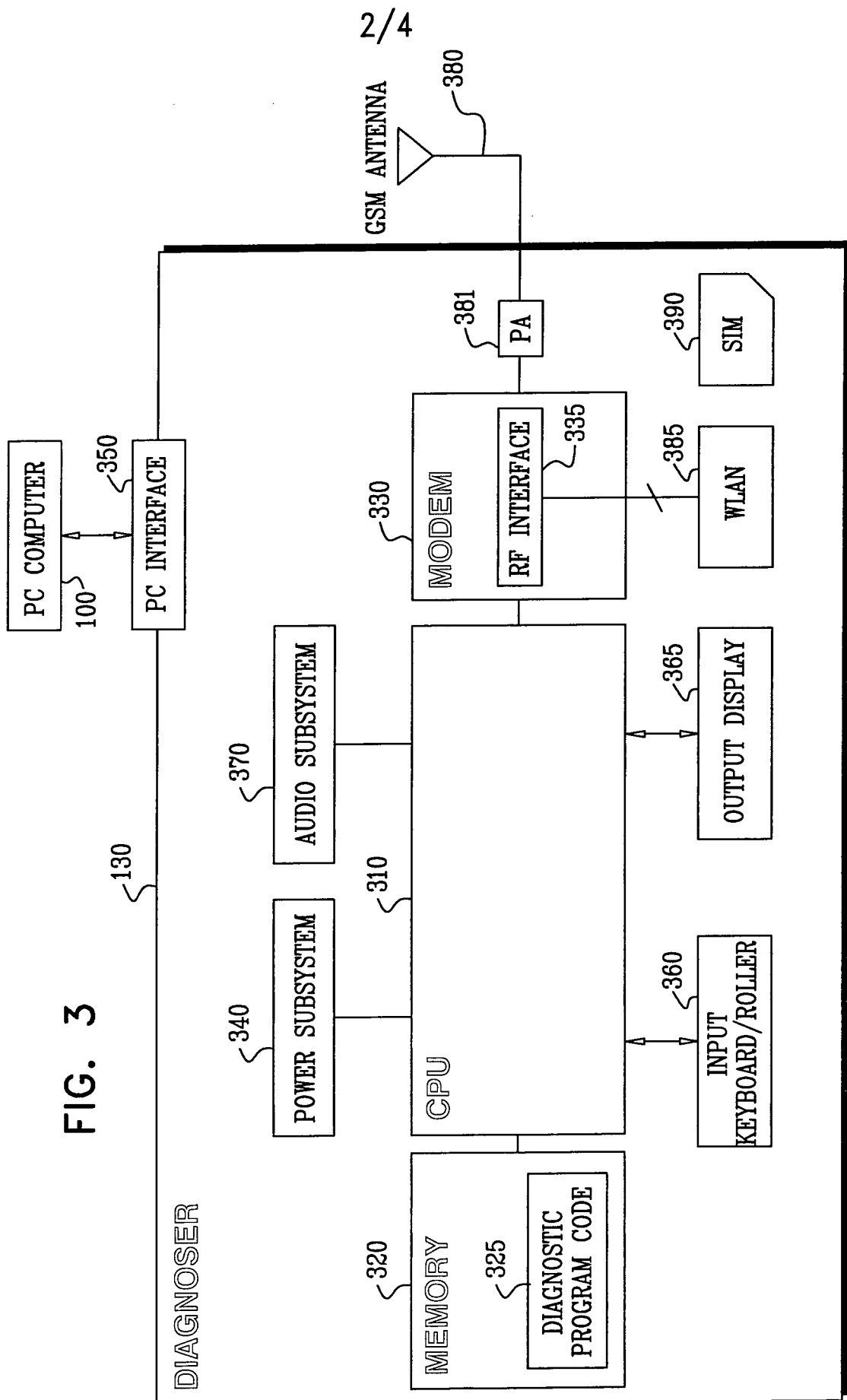


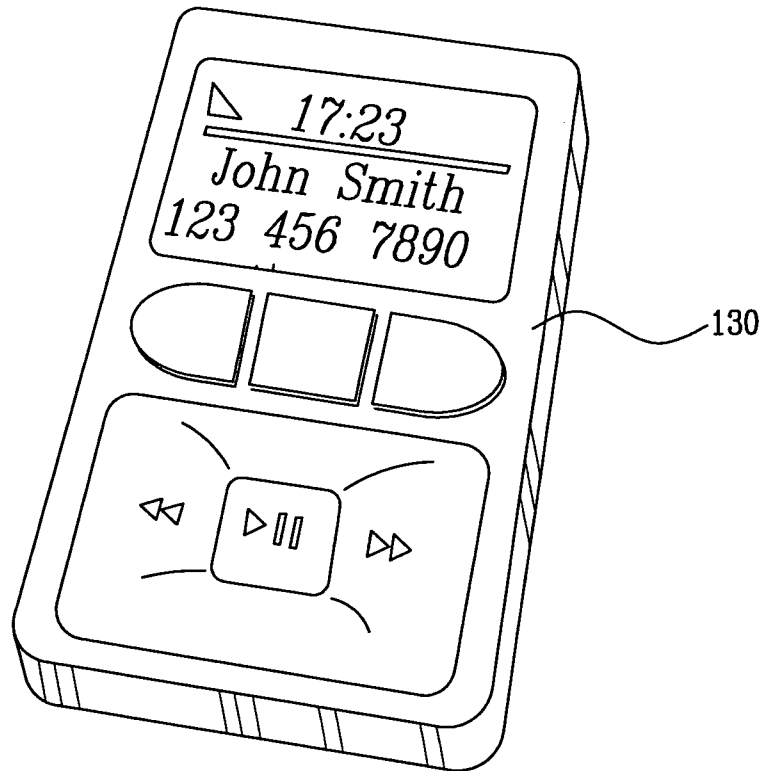
FIG. 2





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FIG. 4



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FIG. 5

