INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
31 January 2002 (31.01.2002)

(PCT)

(10) International Publication Number
WO 02/09372 A1

(51) International Patent Classification*: H04L 12/66

(21) International Application Number:
PCT/KR01/01175

(22) International Filing Date:
10 July 2001 (10.07.2001)

(25) Filing Language:
English

(26) Publication Language:
English

(30) Priority Data:
2000/42142


(72) Inventors; and
Inventors/Applicants (for US only): LIM, YoungSoon [KR/KR]; World Apt. 120 Dong 1803, Ho 308 Bul No
Dong Seo Gu, In Cheon 404-270 (KR). OH, YoungHwan
[KR/KR]; 203 Ho HanYang Villa 23-8, Sang Moon 2 Dong,
Do Bong Gu, Seoul 132-032 (KR).

(74) Agent: YOON, EuiSeop; YOONIS & CO, 3F Namdo
Bldg., 823-24 Yoksam-dong, Kangnam-gu, Seoul 135-080
(KR).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LI,
LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX,
MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL,
TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published: with international search report

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.

(54) Title: INTERNET VIDEO PHONE

(57) Abstract: The internet video phone of the present invention, comprises a speech path network for transferring an analog voice signal of a user to a party; a serial communication means for connecting to the personal computers; a voice codec for coding the analog voice signal inputted from the speech path network into a digital voice signal, outputting the digital voice signal to the serial communication means, decoding the digital voice signal received through the serial communication means, and outputting the decoded digital voice signal to the speech path network; a mode setting key; and a control means for connecting the speech path network to a public switched telephone network through telephone lines if the mode setting key is set to a PSTN mode, and, if the mode setting key is set to an internet mode, connecting the speech path network to the voice codec to connect to the personal computers.
INTERNET VIDEO PHONE

TECHNICAL FIELD

The present invention relates to a telephone technology using the internet, and more particularly to an internet video phone capable of connecting to personal computers.

BACKGROUND ART

In general, internet phone services are services which enable voice communications by using a worldwide-scale communication infrastructure of the internet instead of the public switched telephone network(PSTN) of guaranteeing a speech quality with static switching by the PSTN, that is, a circuit switched network, and a 64Kbps-fixed bandwidth provided.

Here, the internet has difficulties in guaranteeing the speech quality since it is a packet switching network for dynamic routing and provides best-effort type services, but the internet phone of carrying out diverse functions tends to gradually spread with merits of enabling long-distance calls with low prices and creating various forms of services.

The internet phone services are classified into the personal computer to personal computer(PC-to-PC), PC-to-phone, phone-to-PC, and phone-to-phone type services.

Describing in detail the above, in the PC-to-PC type service, two users who wish to communicate use internet-accessible multimedia computers as internet phone terminals. The computers may be connected to LANs or telephone lines through modems to use the internet through an internet service provider(ISP). CODEC and software of a transmitting-side computer performs voice signal sampling, compression, and packet steps, and a received voice signal is reproduced through a sound card of a receiving-side computer.

In the PC-to-phone type service, if a personal computer is connected to an internet phone gateway first and a telephone number of a party desired for communications is notified to the gateway, the gateway interprets it and connects to the telephone of the party through the existing PSTN.
In the phone-to-PC type service, if a subscriber to the existing PSTN connects to an internet phone gateway and provides information on a party to be communicated to the gateway, the internet phone gateway connects to a corresponding PC through the internet for communications.

The phone-to-phone type service is a method of enabling the communications between the existing telephones through the internet, in which a user connected to the PSTN connects to a nearby gateway by using an existing telephone, goes through a step of identifying a transmitter for user authentication and payment, and inputs a telephone number of a party. Thereafter, if a transmitting-side gateway converts the telephone number of the party to a packet and transmits the packet to a gateway closest to the receiving side through the internet, the receiving-side gateway converts the packet to a general telephone number and then sends a call to a party through a general telephone network.

If connection settings between two users are completed through the above steps, voice data is coded in the gateway and transmitted through the internet, and then the coded voice data is decoded in a gateway at a party, reproduced to a voice signal to be sent to the telephone network.

In the meantime, in such conventional internet phone services, the internet phone services using PCs (PC-to-PC or PC-to-phone) are most widely used, but the internet phone services using the PCs have a problem in that they cause inconvenience to general users who get used to the uses of general telephones.

Further, in case that PC-reception internet phone service users are not in a reception-waiting state, callers can not connect to receivers, so there exists a problem in that a telephone connection rate becomes very low.

**DISCLOSURE OF INVENTION**

The present invention has been devised to solve the above problems, so it is an object of the present invention to provide an internet video phone of enabling users to carry out communications by using the public switched telephone network (PSTN) and to facilitate the use of
internet video phone services by using personal computers through connections to the personal computers.

Further, it is another object of the present invention to provide an internet video phone capable of supporting video communications and video chatting.

In order to achieve the above objects, an internet video phone, connected to personal computers accessible to the internet and for providing users with connection environments for internet phone services, comprises a speech path network for transferring an analog voice signal of a user to a party; a serial communication means for connecting to the personal computers; a voice codec for coding the analog voice signal inputted from the speech path network into a digital voice signal, outputting the digital voice signal to the serial communication means, decoding the digital voice signal received through the serial communication means, and outputting the decoded digital voice signal to the speech path network; a mode setting key; and a control means for connecting the speech path network to a public switched telephone network through telephone lines if the mode setting key is set to a PSTN mode, and, if the mode setting key is set to an internet mode, connecting the speech path network to the voice codec to connect to the personal computers.

**BRIEF DESCRIPTION OF THE DRAWINGS**

The above objects and other advantages of the present invention will become more apparent by describing in detail a preferred embodiment thereof with reference to the attached drawings, in which:

FIG. 1 is a view for schematically showing a structure of a communication network using an internet video phone according to an embodiment of the present invention;

FIG. 2 is a block diagram for showing a structure of an internet video phone according to an embodiment of the present invention;

FIG. 3 is a flow chart for showing a process for establishing calls with general telephones by an internet video phone according to an embodiment of the present invention;

FIG. 4 is a flow chart for showing a process for establishing calls
with personal computers by an internet video phone according to an embodiment of the present invention;

FIG. 5 is a flow chart for showing a process carried out in an internet video phone according to an embodiment of the present invention; and

FIG. 6 is a flow chart for showing a process carried out in a personal computer connected to an internet video phone according to an embodiment of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

Hereinafter, a preferable embodiment of the present invention will be described in detail with reference to the accompanying drawings.

FIG. 1 is a view for schematically showing a structure of a communication network for an internet video phone according to an embodiment of the present invention. In FIG. 1, reference numerals a and b denote internet video phone users according to an embodiment of the present invention, c denotes a general PC user using an internet video phone service by using a sound card, and d denotes a general telephone user.

Here, the reference numerals a to d may denote callers who make calls or receivers who receive calls respectively. In the embodiment of the present invention, the reference numeral a is supposed to be a caller, and b, c, and d are supposed to be receivers, in order to describe a call establishment process.

An internet video phone 110 according to the present invention is connected to a personal computer(PC) 130 for a serial communication, and is also connected to an USB camera 120, a handset 102, a headset 104, an earphone set(not shown), a general telephone 106, and so on. The PC 130 connected with the internet video phone 110 has a PC body 132 and a monitor 134, and the PC body 132 is installed with a PC communication software according to the present invention, provided with modem/LAN card for connections to the USB port and a network, and connected to the internet 140. In the meantime, the camera and headset can be connected in a wireless manner by using a wireless technology of Blue Tooth, and the internet video phone 110 and PC 130 can be also
connected in a wireless manner by using the wireless technology of Blue Tooth. Further, the camera and internet video phone can be constructed in one body.

The internet 140 is connected to the public switched telephone network (PSTN) 160 through a gateway 154 of a call center. In general, sites, which provides internet video phone services including a VoIP gateway, are referred to as the call center, for example, dialpad and the like, and the sites can include a web server 152 for providing homepages and a video phone server 156 for providing video phone services.

The caller a can communicate with another internet phone user b, PC user c, and general telephone user d by using the internet video phone according to the present invention. That is, the caller a connects to a call center 150 by using the PC 130 to which an internet video phone is connected and then is connected to an internet video phone 110 of a party via a PC 130 of a party for communications with the receiver b and for communications with the general telephone user d via the PSTN 160 through the call center 150. At this time, one PC is connected to another PC through IP, so a party IP should be known. Since the IP is changed whenever connected in case of connections by using an ISP, it should be noted that connections can be available only with PCs logged in the call center. Further, communications are carried out by using sound cards in the conventional PC-to-PC type service, but the present invention enables users to communicate as in general telephones by using the internet video phone 110 connected to the PC 130. A reference numeral 130 denotes a general PC terminal enabling communications by using sound cards.

Further, users can carry out video communications or video chatting with parties by using the USB camera 120 and a PC monitor 134 connected to the internet video phone according to the present invention.

Furthermore, in the internet video phone according to the present invention, users can view party’s images through a TV, a monitor TV, and other display devices. Accordingly, the users can carry out video communications while proceeding with their own PC jobs, as well as store communications contents and images done with their parties in PCs or analog video systems. At this time, the users can store automatic
response messages as well as transmit messages to desired parties through time reservations.

In addition, the PC stores a communication list of its own or provides a function of logging use times, and enables voices and images of the communications and video communications of its own to be stored in it. Further, the PC provides a security function through a password authentication upon use.

FIG. 2 is a block diagram for showing a structure of an internet video phone according to an embodiment of the present invention. The internet video phone according to an embodiment of the present invention, as shown in FIG. 2, includes a key pad 111, a microcomputer (MPU) 112, a memory 113, a DTMF generator 114, speech path network 115, a ring detector 110, a ringer 117, a voice codec, an USB communication unit 119, an internet on/off key K1, a scroll key K2, and a hook switch HOOK S/W.

The internet video phone according to an embodiment of the present invention is divided into an internet mode of transmitting voice data by using the internet 140 and a PSTN mode of transmitting a voice signal by using the PSTN 160. The mode settings can be made with the internet on/off key K1. The internet mode operates if the internet on/off key K1 turns on, the internet mode operates, and the PSTN mode operates if the internet on/off key K1 turns off. The scroll key K2 is for scrolling menu items of a search window in an up/down manner when operating the internet mode. The users of the internet video phone can search an existing internet call center through the scroll key K2, enabling, at this time, a site with a less load of lines to be selected by inquiring into a line state of each internet call center in real time.

Installed in the speech path network 115 are jacks 102a, 104a, and 106a for connecting with the handset 102, headset 104, earphone set (not shown), general telephone 106, and so on. A microphone and a speaker, not shown, can be connected to the jacks 102a, 104a, and 106a for inputting and outputting voices. Further, the speech network 115 performs a 2W-4W conversion for connecting to telephone lines as well as a caller transmits to lines a DTMF signal generated from the DTMF generator 114 by pressing the key pad. According to the present invention, connections
are made in a four-line way in which transmissions and receptions are separated from the voice codec 118, to thereby transmit and receive an analog voice signal. Even though not shown in drawings, the speech path network 115, as known, can perform various functions related to telephone calls, including a microphone amplifier for amplifying a microphone signal, a transmission signal attenuator for adjusting a transmission level according to a control signal, a transmission signal amplifier for amplifying a microphone signal, a DTMF signal, a transmitter output signal, and so on, a reception signal amplifier for amplifying a received voice, a side-tone prevention network for preventing a side tone, a reception signal attenuator for attenuating a reception signal according to a control signal, a speaker amplifier for amplifying a signal to be outputted to speakers, a peak limiter, a transmission signal level detector, a reception signal level detector, a comparator, an attenuation controller, and so on.

The DTMF generator 114 generates a corresponding DTMF signal if the key pad 111 is pressed for dialing in the PSTN mode, and the ring detector 116 detects a ring signal received from telephone lines. The key pad 111 has numbers from 0 to 9 and symbols of * and #, and the DTMF generator generates a DTMF signal according to a pressed key on the key pad. In the meantime, since the numbers of the key pad 111 should be transmitted to a PC in a coded binary digit form rather than the DTMF signal, the numbers are processed in a different way according to modes, that is, the internet mode or PSTN mode.

The hook switch HOOK S/W, if the handset hangs up in the PSTN mode(ON HOOK), connects telephone lines(Tip, Ring) to the ring detector 116, and, if the handset hangs on, connects the telephone lines to the speech path network 115 to transfer a dial tone. The hook-on or hook-off state can be converted according to a control signal inputted from the microcomputer(MPU) 112. Further, the hook-on or hook-off of the hook switch HOOK S/W is transferred to the microcomputer 112 in the internet mode. Although not shown in drawings, a separate key connected to the microcomputer 112 in the internet mode can be used as a hook switch.

The voice codec 118 codes and converts to a digital signal an analog transmission voice signal of the speech path network 115,
decodes and converts to an analog voice signal the digital voice data received from the network, and outputs the converted analog voice signal to the speech path network 115.

The USB communication unit 119 is for connecting to the PC 130 by using an USB port, and an USB port is also provided for connecting the USB camera 120. Here, the USB, which stands for Universal Serial Bus, is a personal computer interface standard for connecting peripheral devices. In the USB standard, the USB port provides a 12Mbyte transmission rate at maximum, and can connect with 127 peripheral devices at maximum such as a mouse, keyboard, printer, modem, speaker, joystick, camera, and so on.

The memory 113 stores software and various data for providing functions according to the present invention, and the microcomputer 112 executes the software stored in the memory 113 to control entire internet video phone functions. The ringer 117 may operate together with a lamp not shown, notify of an incoming call by lighting only the lamp instead of ringing a bell if a ring signal is detected from telephone lines upon communications in the internet mode.

Even though not shown in FIG. 2, display devices may be added such as various lamps(LED) for indicating the operation states of the internet video phone to external and liquid crystal displays(LCDs) capable of indicating graphics or images in the microcomputer 112.

FIG. 3 is a flow chart for showing a process for establishing calls with general telephones(between the caller a and the receiver d in FIG. 1) by an internet video phone in the internet mode according to an embodiment of the present invention. Shown in FIG. 3 is a signal flow from a caller, internet video phone, PC, internet, call center, PSTN, general telephone, up to a receiver.

The caller a in FIG. 1 who use the internet video phone according to the present invention hooks off to request a telephone connection to the internet video phone 110. The internet video phone 110 activates a PC communication software of the PC 130 in a serial communication or in a wireless communication based on the Blue Tooth wireless technology. The PC 130 activates the PC communication software, an application program, installed therein, in order to provide internet video phone
services according to requests of the internet video phone 110, and then provides a search window for searching a company, that is, a call center, of providing the internet video phone services. If a call center is selected from the search window, a connection is made between the PC 130 and the call center 150 by the PC communication software, and the caller dials by using the internet video phone 110. The PC 130 transfers to the call center dialing information received through the internet video phone 110, the call center 150 interprets the dialing information and requests the PSTN 160 to set up a call to a receiver side through the gateway 154.

Accordingly, a switching system of the PSTN 160 provides a ring signal to the general telephone 106 of the corresponding receiver. When a bell sound of an incoming call based on the ring signal is heard, the call receiver d lifts a telephone receiver to hook off, so a connection is made from the internet video phone 110 to the general telephone 106, enabling the caller a and the call receiver d to communicate to each other.

After the communication, if the caller hooks on, the internet video phone 110 requests the PC 30 to cut off the connection. Accordingly, the PC 130 requests the call center 150 to terminate the connection as well as releases the connection. In such a connection release step, the call center 150 can record charge information and the like.

FIG. 4 is a flow chart for showing a process for establishing calls with personal computers(between the caller a and the call receiver c in FIG. 1) by an internet video phone in the internet mode according to an embodiment of the present invention. Shown in FIG. 4 is a signal flow from a caller, internet video phone, PC, internet, call center, internet, PC, and to a call receiver.

A caller(the reference numeral a in FIG. 1) using the internet video phone according to the present invention hooks off to request the internet video phone 110 to connect a telephone connection. The internet video phone 110 activates a PC communication software of the PC 130 in a serial communication. The PC 130 activates the PC communication software of an application program installed in the PC in order to provide internet video phone services according to the request of the internet video phone 110 and then provides a search window for searching a company, that is, a call center, which provides the internet video phone
services. If a call center is selected through the search window, a connection is made between the PC 130 and the call center 150 by a PC communication software, and the caller a dials by using the internet video phone 110. The PC 130 transfers to the call center 150 the dialing information received through the internet video phone, and the call center 150 interprets the dialing information and provides a ring signal to a call receiver side 130' through the internet. If a bell sound of the incoming call based on a ring signal is heard and the call receiver c hooks off with a headset connected to the PC 130' in a wire or wireless manner, a connection is made between the internet video phone 110 and the PC 130' and then the caller a and the call receiver c can communicate each other. If the communication is completed and the caller hooks on, the internet video phone 110 requests the PC 130 to terminate the connection, so the PC 130 releases the connection.

FIG. 5 is a flow chart for showing a process carried out in an internet video phone according to an embodiment of the present invention.

First of all, the internet video phone 110 enables communications to be made to parties as in general telephones by using the public switched telephone network(PSTN mode) as well as using the internet(internet mode), so either of the two modes is required to be set. To do so, there exists an internet on/off key K1. The internet mode operates if the internet on/off key K1 turns on, and the PSTN mode, which operates as in general telephones, operates if the internet on/off key K1 turns off.

In FIG. 5, steps S503 and S504 show the operations of the PSTN mode, steps S505 to S510 indicate an originating call processing steps in the internet mode, steps S516 to S519 indicate a terminating call processing steps in the internet mode, and steps S513 to S515 indicate communication steps, respectively.

If a caller hooks off to communicate with a party, a set mode is judged. If it is judged as the PSTN mode, a dial tone is provided by connecting the internet video phone to a switching system through the public switched telephone network, and if dialing is made through the key pad, a connection is made between a party and a call S503 and S504. A further description on the operations of the PSTN mode will be omitted.
since the operations are the same as those in general telephones. However, in the present invention, despite during a call in the internet mode, if a ring signal is received from the PSTN network, it is notified through a lamp and the like.

If a set mode is judged as the internet mode S501 and S503, the internet video phone communicates with the PC 130 through the USB communication unit 119, drives a communication software in the PC S505 to S507, and the driven PC communication software automatically provides a search window in order to enable a user to select a call center out of plural call centers.

A caller selects a call center by using the key pad or a scroll key, and inputs a party telephone number, ID, or the like he or she wish to connect to S508 and S509. As stated above, a party IP should be known in the PC-to-PC type service in the internet video phone, and, since the IP changes upon connections in case that a common ISP is used, a connection can be made only to logged-in parties by registering at a corresponding call center. In case of inputting a party telephone number, a connection is made to a party by connecting to the public switched telephone network through a gateway at a call center 150. At this time, in case that the party has an overseas telephone number, that is, an international call, it is preferable that a connection is made to an overseas call center having a contract with a home call center through the internet and then another connection is made to an overseas public switched telephone network through an overseas gateway.

If the connection is successfully made, communications are made, and, after the communications are completed, when a caller or a receiver hooks on, the connection is cut off and terminated. If the connection fails in the internet mode, after resetting the mode to the PSTN mode, redialing can be automatically made with the telephone number dialed just before S510 to S515.

In the meantime, if a ring signal is received through the public switched telephone network, the ring detector 116 of the internet video phone detects and notifies the microcomputer 112 of it, and, accordingly, the microcomputer 112 operates the ringer 117 to ring the bell. If a ring signal of notifying of an incoming call from the PC is received, a bell rings
in the same manner to notify that there comes a call. If absence is set when a ring is received, an automatic answering message is stored, the ringer 117 operates to ring the bell, and, if hooked off, communications can be made S505, and S516 to S519.

FIG. 6 is a flow chart for showing a process carried out in a personal computer according to an embodiment of the present invention.

As shown in FIG. 6, if an Invoke signal is received from the internet video phone, the PC communication software is activated S601 and S602, the activated PC communication software judges whether an originating call is made, and, if the originating call is on the way, performs steps S607 to S619, and, if a call is incoming, performs steps S604 to S606.

If a call is originating, a communication path to the internet video phone is set, and a search window is displayed on the monitor screen to make a connection with a call center S603 and S607. Displayed on the search window are the title, URL, and the like of call centers for providing internet video phone services. Accordingly, a call center can be selected by moving up and down the scroll key K2. At this time, a call center can be selected by using the key pad, and a desired call center can be selected while viewing menus by using the up/down scroll key S608 to S610.

If a call center is selected through the internet video phone, a connection is made with a corresponding call center, a party number (dial information) is inputted from the internet video phone S611 and S612. In general, if a party is a subscriber to a general telephone connected to the PSTN network in the dial step, a telephone number is inputted, and, in case of a PC, an ID or IP should be inputted. Further, in case of using a shortcut key, the dial is interpreted, an original number is extracted and the dial information is transferred to a call center S613 to S615. In certain circumstances, by processing a call center and a party telephone number at one time, a connection step can be much more simplified.

If a connection works out by a call center, the internet video phone can be connected to a party for communications S616 and S617. At this time, it is judged whether a video communication is enabled with a party. If the video communication is enabled, a packet is formed according to certain procedures with video data received through the USB camera and
voice data of a caller received through an internet phone, and the packet is transferred to a call center. With separations of the packets received from the network, the video data is sent to a video card side and the voice data is transferred to the internet video phone. As stated above, according to the present invention, video communications can be made by using the USB camera. At this time, the USB camera can be installed by connecting to an USB port of a monitor, but, in the embodiment of the present invention, the USB camera is connected to an USB port of the internet video phone. Further, it may be necessary to form a packet from an audio data stream and a video data stream according to certain procedures for a video telephone. Preferably, doing so, the standardized procedures such as the H.323 protocol recommended by the ITU-T can be applied. The H.323 protocol is a standard proposal defining overall protocols necessary to realize a multimedia conference system including audio, video, and data on a LAN for which a service quality is not corrected, which has a high possibility to be chosen as a standard of the internet video phone.

As stated above, if a terminating signal is received from the internet video phone after a caller and a receiver complete communications, the PC communication software is also switched over to a waiting state after releasing the connection S618 and S619.

In the meantime, if an incoming call signal is received from the internet, a ring signal is transferred to the internet video phone, and, if a hook-off signal is received from the internet video phone, the internet video phone is connected to a party and communication steps are processed S604 to S606 and S617 to S619.

**INDUSTRIAL APPLICABILITY**

As stated above, the present invention has an advantage in that the use of the internet video phone is natural by providing environments similar to actual telephones in the internet video phone services of the PC-to-PC type or the PC-to-phone type in use of the internet video phone connected to PCs. In particular, connections using the public switched telephone network (PSTN) is possible in the internet video phone according to the present invention, so that, in case that the internet is
unstable, re-connections are available by using the public switched telephone network. Further, the present invention has an effect that video communications are also possible with a simple structure.

Furthermore, the present invention has an effect that video communication and chatting for the users of the internet video phone can be supported.
CLAIMS

What is claimed is:

1. An internet video phone connected to personal computers accessible to the internet and for providing users with connection environments for internet phone services, comprising:
   a speech path network for transferring an analog voice signal of a user to a party;
   a serial communication means for connecting to the personal computers;
   a voice codec for coding the analog voice signal inputted from the speech path network into a digital voice signal, outputting the digital voice signal to the serial communication means, decoding the digital voice signal received through the serial communication means, and outputting the decoded digital voice signal to the speech path network;
   a mode setting key; and
   a control means for connecting the speech path network to a public switched telephone network through telephone lines if the mode setting key is set to a PSTN mode, and, if the mode setting key is set to an internet mode, connecting the speech path network to the voice codec to connect to the personal computers.

2. The internet video phone as claimed in claim 1, further comprising an USB camera connected to the serial communication means, wherein the serial communication means is in an USB communication type.

3. The internet video phone as claimed in claim 2, wherein the USB camera is constructed in one body with the internet video phone.

4. The internet video phone as claimed in claim 1, wherein communications are carried out with the personal computers by using wireless communications based on wireless technologies of Blue Tooth rather than using the serial communication means.

5. The internet video phone as claimed in claim 1, wherein at least one or more of a handset, headset, earphone set, and general telephone may be connected to the speech path network.

6. The internet video phone as claimed in claim 1, further
comprising a display means for indicating operation states.

7. The internet video phone as claimed in claim 1, further comprising a ring detector for detecting a ring signal from a key pad, DTMF generator, and telephone lines for dialing in the PSTN mode.

8. The internet video phone as claimed in claim 1, further comprising a scroll key for searches in an internet mode and a key input means for dialing.

9. The internet video phone as claimed in claim 1, wherein the control means, in case of failing to set a call in an internet mode, sets the mode to an PSTN mode and automatically carries out redialing.

10. The internet video phone as claimed in claim 1, wherein images of a party are displayed through a TV, a monitor TV, and predetermined display devices.

11. The internet video phone as claimed in claim 1, further comprising a scroll key for selecting sites having less line loads by inquiring into line states in real time.

12. The internet video phone as claimed in claim 1, wherein the personal computers provide a list of communications and a log function for use times, and provide functions for storing voice and video of communications and video communications.
Fig. 5

START

S501 SET MODE

S502 INTERNET MODE?

S505 YES
Ringing reception?

S506 NO

S507 PC COMMUNICATION S/W invoke?

S508 SELECT A CALL CENTER

S509

NO

HOOK OFF?

YES

S503 PSTN MODE?

S504 NO

OPERATE AS A GENERAL TELEPHONE USING A PSTN NETWORK

NO

S510 CONNECTION SUCCESSFUL?

S511 SET THE PSTN MODE

YES

S512 AUTOMATIC DIALING

NO

HOOK ON?

YES

S513 CONNECT

S514

NO

HOOK OFF?

YES

S515 CUT OFF

END

S516 ABSENCE?

S517 STORE AN AUTOMATIC RESPONSE MESSAGE

S518 OPERATE A RINGER

S519
Fig. 6

START

S601

PC COMMUNICATION S/W invoke ?

NO

S602

PC COMMUNICATION S/W ACTIVATION

YES

S603

CALL ORIGINATING?

NO

S607

PROVIDE A CALL CENTER SEARCH WINDOW

YES

S608

SCROLL KEY ?

NO

S610

SELECT A CALL CENTER?

NO

S611

CALL CENTER CONNECTION

S612

DIAL INFORMATION RECEPTION

S613

SHORTCUT DIAL?

NO

S614

DIAL INTERPRETATION

S615

TRANSFER THE DIAL INFORMATION TO THE CALL CENTER

NO

S616

CONNECTION SUCCESSFUL?

YES

S617

CONNECT THE INTERNET VIDEO PHONE TO A PARTY

S618

CUT-OFF RECEPTION ?

NO

YES

S619

CONNECTION RELEASE

END
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 H04L 12/66

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)

IPC7 H04L 12/00-12/66, H04M 11/00

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

Korean Patents and applications for inventions since 1990

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

WPI, PAJ "INTERNET", "PSTN", "VIDEO", "PHONE", "COMPUTER"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>KR 2000-24294 A (GOING SYSTEM INDUSTRY CO LTD) 6 MAY 2000 See the all document.</td>
<td>1, 4-7</td>
</tr>
<tr>
<td>Y</td>
<td>KR 99-78707 A (MTEK MISION CO LTD) 5 NOVEMBER 1999 See the all document.</td>
<td>1-3, 5, 7, 10, 12</td>
</tr>
<tr>
<td>A</td>
<td>KR 98-55671 A (LG ELECTRONICS INC) 25 SEPTEMBER 1998 See the all document.</td>
<td>1-12</td>
</tr>
<tr>
<td>A</td>
<td>US 5889774 A (EFUSION INC) 30 MARCH 1999 See the all document.</td>
<td>1-12</td>
</tr>
</tbody>
</table>

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 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

Date of the actual completion of the international search

24 SEPTEMBER 2001 (24.09.2001)

Date of mailing of the international search report

24 SEPTEMBER 2001 (24.09.2001)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, Dusan-dong, Seo-gu, Daejeon Metropolitan City 305-701, Republic of Korea
Facsimile No. 82-42-472-7140

Authorized officer

KIM, Byung Woo

Telephone No. 82-42-481-5695

Form-PCT/ISA/2.10 (rev. 7/99)