

Description

Cybermedia Security Door Lock System

5 Technique Field

The invention relates to a cybermedia security door lock system (CSDL), which is used, for example, to monitor and/or control door or gate of high-class residential building, office building and private club.

10 Background art

1. High-class residential building

The security door lock system of art can be used to monitor or control
15 door or gate, for example, of high-class residential building. It includes an interphone device for call, wherein voice signal can be transmitted by using emulation signal via cable between home and gate of underground lobby. Whereas, the security door lock system may also include a black-and-white video monitor, which can show image of visitor outside gate, generally the
20 image can be transmitted as emulation signal to common antenna and shown in prescribed channel of ordinary TV set. When visitor arrives, he can key in room number to visit (or access password) and phone set at home will ring, occupant may pick up the phone to respond and open the gate after identifying the visitor. The security door lock system using current art needs
25 separate cable for voice in residential building and another cable for common antenna of building, which are difficult to be replaced and maintained. Furthermore, voice and image are transmitted respectively. Interphone is specialized in the security door lock system and can not be used as an ordinary phone to call someone and combined with ordinary phone.
30 Therefore, the security door lock system of art is inconvenience, and is resource and space-consuming.

In addition, property management company publicizes notice on paper in current residential building and office building, i.e. the notice is printed on paper and then stuck in lobby, notice board and elevator. This way of releasing notice lacks elegance, environmental friendliness and flexibility. Furthermore, this also causes hygienic problem since the paper can not be often cleaned up.

2. Office building

Generally there is a reception desk in current office building, visitor can enter gate after permission of receptionist. It is unsafe and waste of manpower and resource to allow visitor to enter after talking with receptionist face to face.

Content of invention

The aim of invention is to provide a cybermedia security door lock system, which is used to monitor and/or control door or gate in high-class residential building, office building and private club and communication with visitor, release advertisement and transmit information in order to overcome shortage of prior art. Particularly, it may use traditional PSTN phone, mobile phone, 3G phone and so on as Interphone device of the cybermedia security door lock system, and use display on phone set or TV set in home as monitor of the cybermedia security door lock system, so as to reduce space that security door lock system occupies in home and cost of the cybermedia security door lock system.

The cybermedia security door lock system of invention is an integrated system, including a display panel, an internet videophone, an interface control module, a door lock control system and a user response system. Improvement of invention is to set up connection between input device in building's lobby and occupant's phone via Internet.

According to invention, there is neither need to install a separate cable in building, nor to use specialized phone set in occupent's home.

Description of drawings

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Figure 1 is the schematic diagram of the cybermedia security door lock system of invention.

Figure 2 is the block diagram of the display keyboard of the cybermedia security door lock system of invention.

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Figure 3 is the enlarged block diagram of the display keyboard of the cybermedia security door lock system of invention.

Figure 4 is the schematic diagram of the door lock controller of the cybermedia security door lock system of invention.

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Figure 5 is the schematic diagram of the final product of above said door-lock controller.

Figure 6 is the general schematic diagram of the cybermedia security door lock system of invention.

Figure 7 is the schematic diagram of the cybermedia security door lock system of invention compared with current art.

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Figure 8 is the schematic diagram of the door lock controller of current art.

Figure 9 is the schematic diagram of notice sticking in building of current art.

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Figure 10 is the general schematic diagram of the cybermedia security door lock system of invention.

Figure 11 is the schematic diagram of the cybermedia security door lock system of invention.

Detailed embodiments

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The above said Internet protocol videophone can be implemented by using the existing Internet devices, without the need of additional phone set.

The above said interface-control module is connected to the above said display panel and the door lock control system, and used to collect information from display panel and control door lock. The said interface-control module is also connected to Internet service provider, and preserved as an interface with building security system, property management system and Octopus card system and so on.

The said interface control module includes an input device, a modem, a control module and an interface device. The said input device receives information inputted from display panel. When inputted information is a password, the said control module can verify the password. The door lock control system opens door to allow user coming in the building if the password is right. When inputted information is floor number and room number, the said control module can switch inputted information to internet service provider by modem and interface device and dial occupant's phone by softswitch of internet service provider, the said phone may be an IP phone, 3G mobile phone and PSTN phone or GSM, CDMA, WCDMA mobile phone. I.e. the cybermedia security door lock system of invention becomes an internet phone at this time, which allows interactive video communication between occupant and visitor and controls the door lock by Dual Tone Multi-Frequency (DTMF) signal. In addition, the said interface-control module can transmit visitor's information to security department of building for security purpose when dialing occupant's phone.

The phone number and floor information of occupant can be inputted by property management company or security department into the cybermedia security door lock system of invention for interconnection.

The CSDL of invention has two states: 1. advertisement playing state, 2. videophone state.

Specifically, the procedure of CSDL of invention is:

1. The CSDL stays in "advertisement playing state" when powered on, DVD decoder card reads out MP1, MP2, MP4 or JPG data from hard disk, which

is played by LCD driver board.

2. When visitor presses “visitor” key, the switch control board of the said control module forces DVD decoder card to switch to “videophone state”.

3. When visitor inputs floor unit by keyboard, for example “12A”, the
5 switch control board sends command to LCD to display “12A” on LCD.

3.1 If visitor presses “backspace” key, the switch control board sends command to videophone board to erase “12A” and return.

3.2 If visitor presses “cancel” key, the switch control board sends command to make decoder card switch to “advertisement playing state”.

10 3.3 If visitor presses “ok” key, then go to step 4.

4. The switch control board of system will find corresponding videophone number in it’s built-in storage, and the videophone board is in charge of connecting occupant to be communicated with. When communication begins, JPEG file is displayed to allow visitor watching occupant’s image.

15 5. During communication, the switch control board will check communication package and send command to open the door immediately if “#” or any presetted code key sent out by occupant is detected.

6. If occupant hangs up, the switch control board interrupts communication and switches to “advertisement playing state”.

20 If occupant to be visited is not home or there is no response to visitor’s call, visitor can leave message by using the keyboard on display panel.

The said door lock control system can be door lock control system used in art, which can unlock the door after occupant has verified the identity of
25 visitor via video or voice.

The above said display panel may be LCD panel or other types of displays, for example plasma display, CRT display and so on, which can show notice from property management company or advertisement in idle time,
30 the above said notice or advertisement may be in the format of JPG (Joint Picture Expert Group) or MPEG (Moving Picture Expert Group). The said idle time means that keyboard or phone of the above said cybermedia

security door lock system is not used by anyone.

The above said display panel includes a camera, which can capture image of user, the said camera can be CCD sensor or CMOS sensor, or other
5 kinds of cameras of current art, the said camera is preferably a color image sensor.

The said display panel includes also a speaker and a microphone in order to communicate with occupant. There is a keyboard on display panel
10 for users to input access password, floor number and room number. Generally the keyboard includes digit key "0-9", "*" key, "#" key and so on, also includes letter key "A-H", or "Input the password" key and "cancel" key. The said keyboard may be a keyboard with "T9 input method" enabled, which is similar to the keyboard of ordinary mobile phone to be used to input
15 letter or Chinese words via digit keys 0-9. The user can use keyboard to input information, for example, message or notice and advertisement of building. The said keyboard can utilize T9 input method, i.e. using 0-9 digit key to input English letters. If Chinese word library is added into the cybermedia security door lock system of invention, the keyboard can also be used to input
20 Chinese information as current mobile phone does. The manager of said cybermedia security door lock system, for example property management or security department, can use computer interface of the cybermedia security door lock system of invention to input compiled information, for example advertisement, notice and so on.

25 The said display panel also includes a card reader, which enables user to unlock door by card. The said card reader is compatible with Octopus card and can read personal information in Octopus card to identify whether user resides in building.

30 The said user-response system means the response device in user home or user hand, which can be implemented as telephone in home, for example

traditional wire phone, IP phone, IP videophone (Vphone), 3G phone or any PSTN (Public Switch Telephone Network) phone, without the limitation of boundary. The image showing at user side can be implemented by display of above said telephone or TV set in occupant's home, i.e. transmitting image captured by camera in lobby gate to occupant's home via television signal transmission line in building.

The scheme of invention can also be applied to reception, service and inquiry center and to be used by receptionist.

The improvement over prior art of the cybermedia security door lock system (CSDL) of invention is:

1. The above said CSDL includes an IP videophone with LCD panel

2. When system is idle, it will switch to display mode to play MPEG or JPEG files, so as to achieve message broadcasting.

3. When someone approaches the input device of system outside the lobby of residential building and presses the keyboard, the system will switch to dialing mode. For occupant, he can key in password or wave the card over reader of input device, door lock will be opened if password or card is correct. For visitor, he can key in floor number and room number of occupant's room, the system will automatically switch to IP videophone, mobile or PSTN phone which are pre-set by property management, the above said mobile phone may be any type of mobile phones, for example, 3G phone, 2G phone or other more advanced type of mobile phones. So occupant will be able not only to hear visitor's voice but also to watch his image.

As occupant identified visitor, he/she can press “#” key on phone set, DTMF (Dial Tone Multi-Frequency) signal will be sent from PSTN/mobile phone via Internet to CSDL. Then CSDL will verify that the key pressed is

“#” key and open the door lock accordingly.

The advantage of invention is that there is no geographic boundary, no IDD (International Dial) charge and occupant can interact with visitor through voice and video wherever occupant is. CSDL provides all information necessary to verify whether visitor is the right person. For example, you can communicate from Sydney of Australia with visitor and open the door or gate of home in Hongkong.

The Cybermedia Security Door Lock System of invention is extremely handy and practical, especially for the residential security door lock control system in lobby of residential building. It could also be used as a reception device for commercial office building, which can delivery point-to-point interactive video and voice between visitor and staff or employer via for example 3G mobile phone and Internet IP phone. And door lock could be opened via Internet.

The cybermedia security door lock system of invention provides a new design scheme for property developer of residential building, the cybermedia security door lock system of invention is not only a presentable and elegant kit, but also environment friendly and cost effective. There is no extra need for cabling work, voice and video signals are combined into a single unit to transfer, no extra handset is required. Besides, it can also be used as digital notice board and advertisement board since its' LCD panel can show notice or advertisement information.

The cybermedia security door lock system of invention is particularly in favor of Internet service provider (ISP), which can attract customers to subscribe broadband Internet service and/or IP videophone service or provide existing customers value added service (VAS), which can make profitable revenue for them.

For commercial office building, the cybermedia security door lock system of invention can replace receptionist in reception, inquiry or service center, which provides an efficient and low-cost application to inquire visitor.

5 The invention can significantly reduce cost of building construction, speed realization of e-home concept and bring new idea in designing the lobby of building.

10 The invention can be set up in old building or replace old system since extra cabling is difficult in old building.

Wherein, the existing 3G mobile phone or IP videophone, for example in Hong Kong, can be used during video communication.

15 Left side of figure 9 shows a input device of the cybermedia security door lock system of invention installed in lobby, figure 2 shows enlarged version of input device, wherein including a LCD display panel, an input keyboard, a speaker and a card reader.

20 The card reader may be contact magnetic card reader or contactless card reader. The card reader can also used as card reader of Octopus card. Octopus card is a kind of public transport IC card, which is also accepted by small stores as one of payment methods (to know more about the card, please see the website www.octopuscards.com).

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 The said input keyboard is similar to that of traditional door lock system and PSTN phone or mobile phone, including digit input key “0-9” and symbol key “#” and “*”. In addition, the said keyboard can be same as that of mobile phone, i.e. letters and symbols are included in keyboard and one key
30 can denote multiple letters or symbols (excluding digits), in order to input message, notice or advertisement information.

The said LCD display panel may be other type of display panels, for example LED display panel, plasma display, CRD display and so on. The size of display screen can be chosen according to actual requirement, from 1 inch to 9 inch or even larger display, such as 15, 17, 20-30,40 inch, can be used. Furthermore, if the size of display is large enough, the keyboard pattern can be popped up on display, the above said notice, advertisement information and message can be input via touch screen. The visitor can leave message via keyboard or touch screen to occupant to visit if occupant is not home.

Right side of figure 9 shows components of the cybermedia security door lock system installed in occupant's home, including a videophone, a mobile or PSTN phone and a display. The said display can be implemented as TV set in occupant's home or display on phone.

For example, visitor can key in 2001, "2001" means occupant living in room A of 20'th floor. The cybermedia security door lock system of invention will dial videophone, mobile phone (2G or 3G) or PSTN phone pre-set by occupant via Internet, occupant can pick up phone and communicate with visitor, visitor can watch the image of occupant via display panel in lobby. The occupant can open the door lock by pressing "#" key or other key on hand-hold phone set, or refuse visitor by pressing "power-off" key.

The following is specification of embodiment of a part of cybermedia security door lock system of invention:

LCD display screen

Size: height 550mm, width 415mm, thickness 31mm

Weight: 6.6kg

Power: 60W

LCD type: active matrix TFT color screen

Optimum resolution: 1280x1024

Color depth: 16.7M

Contrast ratio: 400:1

Average luminance: 250cd/m²

Average environment temperature: 0—45℃

Power control: VESA DPMS

5 **Working state: 70W (Maximum)**

Power-saving state: 8W (Maximum)

Output: alternating current 200V±10%

Input: 1.9Vrms

Audio response (Frequency response): (1.7Hz—20Hz) ±0.5dB

10 **Signal-to-noise ratio(dB): ≥95**

Distortion degree: ≤0.01%

Dynamic range (db): ≥95

Crosstalk (fundamental) (dB): ≥85

Output level Vpp: 1.0±0.2

15 **Signal-to-noise ratio of luminance: ≥56dB (excluding weight)**

Signal-to-noise ratio of chrominance: AM 60dB, PM ≥52dB

Differential phrase (DP): ≤2

Working life: 50, 000 hour

Size (Length*Width*Thickness): 560mm×417mm×32.5mm

20 **Net weight: 6Kg**

Synchronous transmission distance: ≤7m

FCC rule: CISPR 22 Class B Standard

IP video phone main board

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Supporting	ITU-T standard H.324 Signaling H.245 Channel multiplexing H.223
Video	Supporting ITU-T standard H.263 CIF resolution 352x288 pixels Max frame rate 15fps
Audio	Supporting ITU-T standard G.723.1

	Frequency response 50Hz-3.4KHz Full duplex Acoustic echo canceller
Camera	1/4 inch CCD Hi-resolution color Illumination(min): 1.0(20IRE), F2.0 Horizontal field of view: 50 degrees Vertical field of view: 39 degrees
Network	PSTN RJ 11 Transmission speed (max) 33.6Kbps(V.34) Communication mode: synchronous access
Electrical	Operating voltage: 12V, 5VDC Power consumption: 13 W (max) Input voltage: 100—240VAC compatible

Figure 3 is the structure block diagram of interface-control module of the cybermedia security door lock system of invention. It includes a LCD display panel driver, a graphic card, a DVD decoder, a power adaptor, various storage interfaces, an IP videophone mainboard, a door-lock controller, a phone-number storage and so on. Figure 4 is the apparent schematic diagram of interface control module of final product.

Figure 5 is the schematic diagram of IP video phone connected to 3G mobile phone, PSTN phone and normal mobile phone. Figure 10 is the block diagram showing various components in detail.

The cybermedia security door lock system of invention includes an IP phone integrated with LCD panel, with a built-in SIP video phone mainboard. It connects to Internet and registers on softswitch.

Via softswitch, it will be able to communicate with 3G networks via 3G gateway, which will translate digital package into 3G protocols and send to 3G handset.

It will also be able to call Public Switch Telephone Network (PSTN) via CISCO AS5300 that translates digital package into analogy signal and send to normal phone or mobile.

5 It will also be able to communicate with other SIP devices like IP videophone within an IP network.

The Door Lock Controller may be embedded or separated, which monitors whole conversation and detects Dial Tone Multi-Frequency (DTMF) package sent from 3G, mobile, normal phone or SIP devices. It will translate the said DTMF signal and convert it into ASCII code, which could be “#”, “*” or any single key or their combination or combination of phone set keyboard, and compare it with preset key. It will open the door lock if matching.

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As shown in figure 5 and 10, a gate, a door-lock controller and a cybermedia security door lock system of invention are disposed in lobby. The cybermedia security door lock system of invention is connected to Internet (service provider), which provides softswitch and gateway connected with phone, to dial an IP call. Therefore, the cybermedia security door lock system of invention provides communication service between visitor and occupant via internet, occupant can use ordinary PSTN phone, mobile phone or 3G mobile phone and so on, and visitor can use display panel of the cybermedia security door lock system of invention as phone set.

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Figure 6 shows the cybermedia security door lock system of invention in the form of block diagram. Wherein, interface control module may also be connected to security phone of building, which can be achieved by disabling original controller of security door lock system, the interface control module may also dial phone and monitor of security office via internet phone to enable the guard of building to monitor visitors. The cybermedia security door lock system of invention is connected to occupant by connecting to Internet.

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Figure 7 is the schematic diagram of traditional security door lock system, which shows an input keyboard in lobby and a communication device in occupant's home. The said communication device in occupant's home includes a specialized phone set and a TV set, the TV set may show visitor's image captured by camera, but image and audio signal are transmitted separately.

Figure 8 shows the case of notice of current building being stuck in notice board of lift and lobby.

Figure 11 is the schematic diagram of the cybermedia security door lock system of invention, wherein meanings of various symbols is:

1. Digital storage, which may be a hard disk, contain a storage card with USB interface, for example CF card and so on, used to store password of door lock and table mapping occupant's room number to occupant's phone number.

2. LCD screen, which is LCD display panel.

3. Microphone, which is used to input user's voice.

4. Camera, which is CCD or CMOS camera and used to collect user's video information.

5. Speaker, which is used to output voice.

6. Keyboard, which may be any format of keyboard, for example the same as the keyboard of mobile phone, may also includes A-H letter key, the said keyboard can be used to input English or Chinese information by using T9 input method.

7. Card reader, which is connected to the interface control module and used to input user's information by the way of reading card.

8. USB/C card interface

9. DVD decoder card, which may be any appropriate format of DVD decoder.

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10. Power supply, which supplies power to LCD display panel.

11. 220V power outlet, which is used to connect civil electrical network.

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12. 12V 4A transformer, which is used to transform civil electrical network voltage to voltage fit for the cybermedia security door lock system of invention.

13. Clock board, which provides clock voltage signal of 12/5/-12 V.

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14. LCD driver board, which is used to drive LCD display board.

15 IP videophone board, video control and communication connection, which are used to be connected to website of internet service provider by Ethernet interface and dial occupant's phone by using softswitch provided by Internet service provider so as to form IP phone or Vfone phone.

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16. Ethernet interface, which is connection with Internet.

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17. Switch control board, which is used to read information from keyboard, connect inputted information with occupant's phone number stored in storage together and send them to mainboard of IP videophone. It is also fit for bridging communication and detecting whether for example “#” key is pressed so as to open lock.

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18. Door lock control interface, which is used to connect controller used to

open or close door lock.

The said IP videophone board, Ethernet interface and switch control board may be integrated into the interface control module of invention.

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Claims

1. A kind of cybermedia security door lock system, including a display panel, an interface control module, a door lock control system and a user response system, wherein the said interface control module sets up connection between the said display panel and user response system by Internet in order to make the said display panel and user response system forming an Internet phone, the said user response system can make lock open or close by controlling the said door lock control system via the said interface control module

2. The cybermedia security door lock system according to claim 1, wherein the said display panel includes a display, a speaker and a keyboard.

3. The cybermedia security door lock system according to claim 2, wherein the said display is a LCD display.

4. The cybermedia security door lock system according to claim 2, wherein the said display is a plasma display.

5. The cybermedia security door lock system according to claim 2, wherein the said display is a CRT display.

6. The cybermedia security door lock system according to claim 2, wherein the said keyboard includes 0-9 digit key and *, # key

7. The cybermedia security door lock system according to claim 6, wherein the said keyboard includes A-H letter key.

8. The cybermedia security door lock system according to claim 6 or 7, wherein the said keyboard include a keyboard with T9 input method enabled

9. The cybermedia security door lock system according to claim 9, wherein the said keyboard is a keyboard including Chinese input method.

10. The cybermedia security door lock system according to claim 1, wherein the said user response system includes a phone and a display.

11. The cybermedia security door lock system according to claim 10, wherein the said phone is an Internet protocol based phone.

12. The cybermedia security door lock system according to claim 12, wherein the said phone is a GSM or 3G, CDMA mobile phone.

13. The cybermedia security door lock system according to claim 10, wherein the said phone is a Public Switch Telephone Network phone.

14. The cybermedia security door lock system according to any one of claims 10-13, wherein the said display is a display on phone, and the said
5 phone has a camera.

15. The cybermedia security door lock system according to claim 1, wherein the said interface control module is connected to the said display panel and door lock control system in order to collect information inputted from display panel and send the door lock control signal to the said door lock
10 control system.

16. The cybermedia security door lock system according to claim 15, wherein the said interface control module is connected to an Internet service provider.

17. The cybermedia security door lock system according to claim 16,
15 wherein the said interface control module includes a input device, a modem, a control module and an interface device, the said input device is used to receive information inputted from the display panel.

Wherein, when inputted information is an access password, the said control module verifies whether password is right. The door lock control
20 system opens lock if the password is right to allow user to enter building.

When inputted information is floor number and room number inputted by a visitor, the said control module transmits information inputted from display panel to Internet service provider via a modem and an interface device, and dials the said occupant response system via softswitch provided
25 by the said Internet service provider. At this time the cybermedia security door lock system becomes an Internet phone, which allows video communication between occupant and visitor.

18. The cybermedia security door lock system according to claim 17, wherein the said interface control module can input visitor information into security department of building for security purpose when dialing occupant's
30 phone.

19. The cybermedia security door lock system according to any one of

claims 15-17, wherein the said interface control module also includes an interface connected with building security system, property management system, intelligent identity card or octopus card system.

5 20. The cybermedia security door lock system according to claim 1, wherein the said display panel includes a card reader.

 21. The cybermedia security door lock system according to claim 20, wherein the said card reader is a IC card reader, contactless card reader or magnetic card reader.

10 22. The cybermedia security door lock system according to claim 1, wherein the said display panel is a multimedia player used to play static text information, notice or dynamic video.

 23. The cybermedia security door lock system according to claim 22, wherein the said dynamic video is in the format of MPEG or JPEG.