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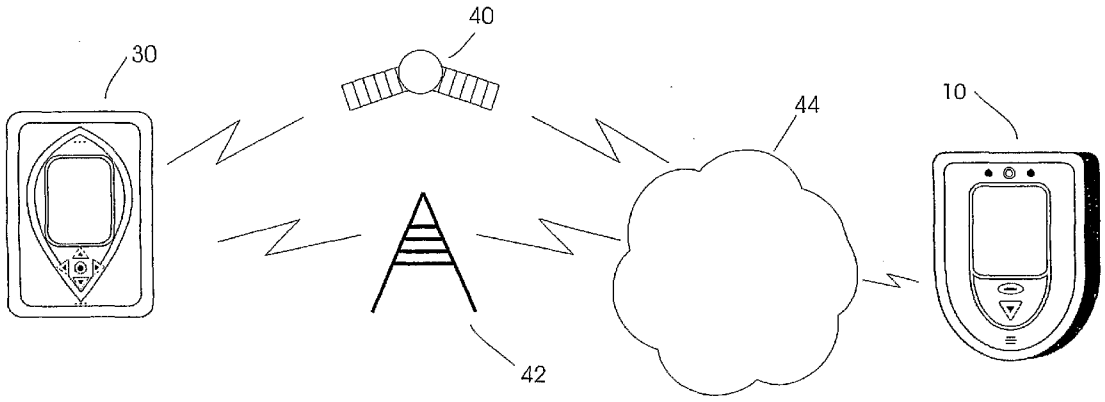
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(54) **Title:** DIGITAL DOOR MONITORING AND OPERATION SYSTEM



(57) **Abstract:** A system which comprises a first module that comprises a housing which enables the first module to be mounted on a wall. The system further comprises a central processing unit which is mounted in the housing, a communication unit which is mounted in the housing and which is electrically connected to the central processing unit and where the communication module is adapted to communicate with a second module, the second module preferably being a portable module. Furthermore, the system comprises a display unit mounted in an opening of the housing of the first module and is electrically connected to the central processing unit, the display unit receiving display information from said central processing unit. Finally, the system comprises a memory unit which is electrically connected to the central processing unit, the memory unit comprising information to be selectively displayed on the display unit.

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Digital door monitoring and operation system

The present invention relates to a technique for sending information between two locations, where one of these locations are fixed and the other is mobile, also the present invention relates to an apparatus for carrying out this technique. The present invention also relates to a system and method for remotely and/or automatically allowing access to dwellings and houses.

Wireless doorbells and the like have been described in previous publications, such as US 5,428,388, US 5,303,300, US 6,185,294, US 5,428,388, US 6,532,004, WO 02/061706, WO 02/09363, US 2003/0013503, US 2005/0007451, US2003/021325, US 2004/0257336, US2004/0132489, WO 03/028375. Reference is made to all of the above mentioned patent publications and all are hereby included in the present specification by reference in their entirety for all purposes.

According a first aspect of the present invention a wireless doorbell or surveillance system comprises:

a first module including:

a first housing having a front surface and including fixation means for mounting and fixating the first housing so a to present the front surface in a substantially vertical orientation,

a first microprocessor included in the first housing,

a first sound sensing device mounted in the first housing, the first sound sensing device being electrically connected to the first microprocessor for sending a first digitised audio signal to the first microprocessor in response to receipt of a first sound signal,

a first sound generating device mounted in the first housing, the first sound generating device being electrically connected to the first microprocessor for receiving and converting a second digitised audio signal from the first processor into a second sound signal,

a first camera device mounted at the first housing for registering the appearance of a person in front of the camera device, the camera device being

electrically connected to the first microprocessor and being capable of generating a first video signal for transmission to the first microprocessor,

a first telephone module for sending and receiving data corresponding to speech and video information over a public telephone network, the first telephone module being electrically connected to the first microprocessor,

the first microprocessor packing the first digitised audio signal and the first video signal in a first data stream, the first microprocessor sending the first data stream to the first telephone module, the first microprocessor receiving a second data stream from the telephone module, the second data stream including a second audio signal, the first microprocessor unpacking the second data stream and sending the second digitised audio signal to the first sound generating device,

the wireless doorbell or surveillance system further comprising:

a second module including:

a second housing,

a second microprocessor included in the second housing,

a second sound sensing device mounted in the second housing, the second sound sensing device being electrically connected to the second microprocessor for sending a second digitised audio signal to the second microprocessor in response to receipt of the second sound signal,

a second sound generating device mounted in the second housing, the second sound generating device being electrically connected to the second microprocessor for receiving and converting the first digitised audio signal from the second microprocessor into the first sound signal,

a second telephone module for sending and receiving data corresponding to speech and video information over a public telephone network, the second telephone module being electrically connected to the second microprocessor,

a first display device mounted in the second housing, the first display device being electrically connected to the second microprocessor for receiving and displaying the first video signal, and

the second microprocessor packing the second digitised audio signal in a second data stream, the second microprocessor sending the second data stream to the second telephone module, the second microprocessor receiving the first data

stream from the second telephone module, the first data stream including the first audio signal and the first video signal, the second microprocessor unpacking the first data stream and sending the first digitised audio signal to the second sound generating device and sending the first video signal to the first display device.

The apparatus according to the present invention is preferably employed in houses or dwellings such as in multi-storey buildings, highrises or single-family houses for a visiting person to establish a contact to a resident of the house. More specifically the apparatus may enable the visiting person to contact a specific individual of the household, e.g. in a family comprising two parents and two children, each of the parents and each of the children may have their own receiver module, when a visitor comes to their house the visitor is able to contact the sought after individual without disturbing the other family members. In the embodiment of the present invention requiring a plurality of receiver modules only one base module or outer sensor module is required.

According to a first feature of the present invention the first module further comprises:

a second display device mounted in the first housing, the second display being electrically connected to the first microprocessor.

According to a second feature of the present invention the second module further includes:

a second camera device mounted in the second housing for registering the appearance of a second person in front of the second camera device, the second camera device being electrically connected to the second microprocessor and being capable of generating a second video signal for transmission to the second microprocessor, the second microprocessor packing the second video signal with the second digitised audio signal into the second data steam, and

the second display displaying the second video signal.

According to a third feature of the present invention the first module further includes:

a list of names displayed on the second display, and

a first plurality of switch means mounted on the first housing for addressing a specific name on the list, each of the switch means being electrically connected to the first microprocessor,

the system further includes:

a second plurality of the second including any of the features specified above, each of the second modules corresponding to a specific name on the list,

the switch means instructing the first microprocessor to send the first data stream to the specific second module corresponding to the specific name addressed by the switch means via the first telephone module.

According to a fourth feature of the present invention the first camera and the first sound sensing device is activated by operating at least one of the switch means.

According to a fifth feature of the present invention the first telephone module is an ISDN module, alternatively any other module complying with a fixed line standard, further alternatively a UMTS, GPRS, EDGE, WAP or any other module compliant with a mobile phone standard.

According to a sixth feature of the present invention the second telephone module is a GSM module, alternatively a UMTS, GPRS, EDGE, WAP or any other module compliant with a mobile phone standard, alternatively a module complying with a fixed line standard.

Alternatively the first and/or the second telephone module may be compliant with a satellite based telephone network standard.

According to a seventh feature of the present invention the first module and/or the second module further comprises a memory module for storing messages, such as a flash memory module, the memory module being electrically connected to the second microprocessor.

A second aspect of the present invention relates to a system that may comprise:

a first module comprising a housing enabling the first module to be mounted on a wall,

a central processing unit mounted in the housing,

a communication unit mounted in the housing and being electrically connected to the central processing unit, the communication module adapted to communicate with a second module, the second module preferably being a portable module,

a display unit mounted in an opening of the housing of the first module and being electrically connected to the central processing unit, the display unit receiving display information from the central processing unit,

a memory unit being electrically connected to the central processing unit, the memory unit comprising information to be selectively displayed on the display unit.

The first module may be formed from a plastic material, e.g. by moulding or casting. The first module may be mounted on a wall, e.g. a wall in close vicinity of a door, and the first module is intended to be used as a door surveillance or monitoring system.

The display may show text information, e.g. surnames and addresses of persons in an apartment building, e.g. "Mr. Jones, 2nd floor". A person arriving at the door and wishing to come into contact with a person, such as Mr. Jones, then uses the system to contact that particular person. In one embodiment this could be done by the person operating an input means whereafter a piece of software in the central processing unit establishes contact from the first module to a second module, which could be a mobile phone, a portable phone or any other portable communication unit. The person living in the specific apartment or house is then notified of the arrival of a visitor. In a further embodiment further discussed below, the person living in the apartment or house may then, e.g. via the portable second unit, operate a lock to open the door without being in physical contact with the door. Alternatively the person living in the apartment or house may simply walk to the door to open it.

In a still further embodiment of the present invention the communication module may be adapted to receive an electrical or optical signal from a cable. In a presently preferred embodiment of the present invention, the electrical or optical signal is a

television signal comprising teletext. The central processing unit may then receive the television signal and display the teletext on the display unit. Preferably a specific page or a number of specific pages is displayed. The page or pages may comprise information specifically relevant to dwellers, occupants or tenants in the house or apartment building on which the system is mounted.

Advantageously the communication unit may comprise two modules, a first module for receiving the electrical signal and a second module for communicating with the second unit. The communication unit may comprise further modules, either as logical modules in a larger physical module or as separate physical modules.

In a specific embodiment the second module of the communication module may be a wireless communication module. The wireless communication module may then receive information or signals from a transmitter placed in a remote location, e.g. a mobile phone mast or transmitter station.

In a further advantageous embodiment of the present invention a specific channel of the television signal is displayed on the display. The central processor may include a software implementation of a selection unit for selecting a specific channel from the television signal. The system may further comprise an adaptable filter or channel selector unit for selecting a specific channel at a specific frequency or frequency band.

More advantageously the system may further comprise a plurality of operation buttons mounted in corresponding openings of the housing and electrically connected to the central processing unit. Alternatively the display unit may be a pressure sensitive display unit. Further alternatively the system may comprise a combination of buttons and pressure sensitive display unit. The buttons and/or pressure sensitive display unit may be used for a person visiting to select who of the residents he or she wishes to contact. The information regarding the individual or individuals living e.g. in a specific apartment may be represented by text and/or image and/or video and/or sound. For the visually impaired the buttons and/or housing may be provided with Braille or the like. A sound or speech message may

be played in response to a button or the display unit being activated. E.g. a welcoming message stored in the memory may be played.

When the device is mounted on a wall, generally there are longer periods where it is not being operated than when it is. Advantageously the device may include a software program for controlling the display unit. The software may change the information on the display, depending on when the last time a button or the touch or pressure sensitive screen or display unit was used. Also, when a button or the pressure sensitive display unit is being operated the software may change to display from a interval signal or screen saver signal to the intended display of information regarding the person or persons living in the building. Specifically the central processor may in a first instance detect operation of one of the operation buttons or the pressure sensitive display unit and the central processor may then send name information to be displayed on the display unit, and in a second instance detects when time since last operation of one of the operation buttons or the pressure sensitive display unit exceeds a threshold. In one embodiment the central processor sends pictures or visual identification of the individuals living in the apartment building or house to be displayed on the display.

When the system is not actively being used by a visitor other information may be displayed. In the second instance mentioned above the central processing unit may display a specific television channel or a specific page of teletext on the display when the threshold is exceeded. When the system has not been used for a while other information may be displayed, this could be information relevant for the people living in the building, e.g. information from other tenants, information on when garbage containers are being emptied, if renovation work is going on, or when the stairs are being cleaned next etc.. Also, the display may be used to show a television channel, such as a channel from a tenants' association or the like. This television channel may be used to distribute information relevant to the tenants, such as the information mentioned above.

In a basic embodiment of the present invention the display unit may be an LCD display unit. The LCD display is currently a cost efficient unit, but other types of

display technology may be used, e.g. new emerging technologies which are also cheep and possible durable.

More advantageously the display unit includes a back-light unit. Also a timer unit for controlling operation of the back-light unit may be included. The back-light unit is used for lighting the display, e.g. when it is dark outside. Also, the back-light unit may be switched on when a button or the pressure sensitive display unit is being activated. In strong or moderate sunlight the display may be difficult to see or read.

In a specifically advantageous embodiment the system may be electrically connected to a door lock, the door lock being operated from a locked state to an unlocked state in response to a signal from the central processing unit. The may be operated via the second module, e.g. after the tenant or resident has verified that the person visiting is allowed to enter, thus allowing the person living in the apartment or house to open the door without having to walk or run to the door.

Additionally the wireless module may be a mobile phone unit, such as a GSM unit.

In a further specifically advantageous embodiment the system may be operatively connected to an alarm system comprising an audible alarm and a communication module for communicating with an external alarm central. The alarm may be activated if it is detected that the door is opened without permission. Additionally video surveillance may be added to the system, as well as motion detection, smoke detection, heat detection or other intrusion or hazard detection. The system may be able to communicate with a manned central where from an alarm may be send to a person, such as a guard, fire station or police station or the like, who may then react to the alarm.

Most advantageously the door lock may be operated via a mobile unit in communication with the communication unit of the system. This, as mentioned above, is contemplated to allow a person living in the house or apartment to open the door without being near the door, also including that the person is not even in the house or apartment. This is contemplated to allow a resident or tenant to e.g.

open the door for a plumber, carpenter or the like without being home, e.g. when at work. Further, the mobile unit may be in the possession of a person not living in or otherwise being associated with the household to be granted access to the house or apartment. This may be done on a temporary basis, e.g. instead of handing out a key that may be copied.

The operation of the door lock from a mobile unit may be achieved by communication via SMS or text messages from the carrier of the mobile unit, e.g. to send a message with a password to a specific address or number, where after the door lock may be operated from a locked state to an open state. The granting of the password may then be time-limited so that the person having the password will not be able to enter later. This thus eliminates to misuse of keys being copied and later used for stealing or the like.

In some embodiments of the present invention the mobile unit may communicate with the communication unit via a GSM network or a short-range wireless communication means. Wherein the short-range wireless communication means may include an infrared communication means or a bluetooth communication means or DECT communication means or WLAN communication means.

In a further basic embodiment of the present invention the system may further comprise a microphone electrically connected to the central processor. Still further the system may comprise a loudspeaker electrically connected to the central processor. The microphone and/or loudspeaker allows for audio communication between the two persons. Further the system may comprise a digital camera unit electrically connected to the central processor. The camera is contemplated to allow visual identification of the person visiting. This is further contemplated to increase the security of e.g. elderly or invalid persons. In two alternative embodiments the digital camera unit may be a digital still camera unit or a digital video camera unit. In some cases the camera unit may be able to act as both a still camera and a motion video camera, as a video may be construed as a sequence of still images.
The second aspect of the present invention may include any of the features mentioned in relation to the second aspect, and the first aspect of the present

invention may include any of the features mention in relation to the second aspect of the present invention.

The above mentioned features and aspect of the present invention will become more obvious when the present invention will be described in detail with reference to the drawings, in which

Fig. 1 is a schematic view of the first module for outside placement,

Fig. 2 is a schematic view of the second module,

Fig. 3 is a schematic view of the communication between the different modules of the present invention,

Fig. 4 is a schematic block diagram of the electrical connections of the elements of the outer sensing module, and

Fig. 5 is a schematic block diagram of the electrical connections of the elements of the receiver module.

Fig. 1 is a schematic view of a durable, weather resistant outer sensor module according to the present invention. The outer sensor module is designated the reference numeral 10 and comprises an audio sensing device 12, an optical sensing device 14, a display 16, a number of input devices 18 and an audio output device 20.

The audio sensing device 12 may be constituted by a microphone, preferably a microphone having a small cross section compared to the overall size of the outer sensing module 10. The microphone is either coupled to or includes an analogue-to-digital converter for converting the audio signal into a digital signal. Alternatively the analogue-to-digital converter may be built into a microprocessor or microcontroller.

The optical sensing device 14 may be constituted by a digital video camera unit, preferably having a small aperture compared to the overall dimension of the outer sensing module 10. The camera 14 records images or video in either black and white or a number of colours. The optical sensing device 14 is preferably connected to a microprocessor. The camera is preferably only active or activated when the visitor has initiated an attempt to contact a resident, a camera constantly monitoring

the external of a building may be considered as an invasion of privacy of people walking by, and may even in some countries be illegal. An option to use the present invention as a constant monitoring device may however be included.

The video camera unit may be placed in a spaced apart relation to the outer sensing module 10, e.g. if the outer sensing module 10 is mounted on the side of the door frame the camera may be mounted on the door itself, however it may be advantageous to place the camera 14 on or very near to the outer sensing module 10 where the visitors attention is probably directed while operating the outer sensing module 10. Other placement possibilities are also possible.

The display 16 may be constituted by a liquid crystal display (LCD) displaying text or images, such as text in black and white or other two colour combinations and/or images in black and white, grey scale or colours, such as 16 colours, such as 256 colours, 16 bit colour or 32 bit colour or more. Alternatively, the display 16 may be substituted with labels, such as cardboard labels, each corresponding to a specific input device 18, such as a button indicating which individual the outer sensing module 10 should contact. In the preferred embodiment of the present invention the display 16 is used only to display a list of names of individuals living in the house or building that the outer sensor module 10 is mounted on.

The display 16 may be used to display an image of the resident or individual living at the selected address, either as a still image or alternatively as a live video feed of the resident or individual living at the apartment, preferably shown in real time.

In the presently preferred embodiment of the present invention the display 16 is used to display a list of names of residents or names of companies. The button 20 is used as scroll button scrolling or shifting the list until the button 18 is pressed to initiate the attempt to communicate with the individual corresponding to the name on the list.

The display 16 may be illuminated from within the housing, thereby avoiding unwanted glare or reflections from a lamp mounted displaced from the display 16.

The illumination may be continuos. Alternatively the display 16 may be illuminated when a visitor presses a button, or further alternatively the illumination may be based on the detection of motion in front of the camera or by detecting the amount of light received by the camera thereby determining when it is too dark for an individual to read the information on the display 16.

In the presently preferred embodiment of the present invention, the outer sensing module 10 comprises two buttons 18 and 20 working in co-operation with the display 16 enabling a visitor to navigate through a list of individuals living inside the house or building, such as multi-storey building, an apartment building, a single-family house, a semi-detached house, a town house, terrace house or rowhouse, that the outer sensing module 10 is mounted on, in the present context the individual or individuals on the list may be a list of individuals working at in a specific building, also the list may be a list of company names for a visitor to contact a representative of a specific company or place of business, such as in a building comprising multiple offices wishing to control the ingress of visitors, such as clients and collaborators.

The visitor may then communicate with the individual or alternatively leave a voice mail, by speaking into the microphone 12. The individual on the other side may communicate the visitor through the speaker 22 enabling the individual and the visitor to communicate using voice. Preferably the camera 14 is used for the visitor to be identified by the resident, i.e. an elderly person having difficulties or hesitations opening the door may more easily identify visitors such as nursing personnel, cleaning people or, more importantly, family members and possibly enabling them to avoid opening the door to thieves and robbers.

Fig. 2 is a schematic view of a receiver module according to the present invention, the receiver module is designated the reference numeral 30. The receiver module 30 comprises a speaker 32, a display or screen 34, control buttons 36 and a microphone 38. The individual or resident operating the receiver module 30 receives an image from the outer sensor module 10 that is displayed on the display or screen 34 enabling the resident or operator to identify the visitor outside.

The receiver module 30 may be constituted by a device such as a mobile phone, alternatively by another mobile device such as a PDA having a module for connection to the telephone network, either may use telephone standards such as GSM, UMTS, CDMA or any other standard for connecting the device to a mobile or satellite based network. The satellite networks may be networks such as the Iridium or Inmarsat networks. Alternatively IP-telephony may be used.

The receiver unit 10 receives images and sound from the outer sensing module 10 and displays the images or video sequences on the screen 34 and outputs the voice or sound on the speaker 32. The resident communicates with the person of the other side by speaking into the microphone 38.

The receiver may include a menu based set-up system enabling a plurality of residents in the same location, such as an apartment or a household, to specify individual ringing tones to each individual in the household, thereby enabling each individual to only respond to inquiries directed to themselves. In an alternative embodiment of the present invention, the household including several family members, each family member may have their own receiver enabling direct connection to the specific individual of the household. As the receiver is connected to a telephone network such as a GSM based network or a satellite based network, connection front door to the individual in the household is independent of the actual physical location of the individual of the household as long as this individual is in position of a receiver according to the present invention.

If the individual of the household is in a situation where this individual does not wish to be contacted, the present invention provides a possibility for the visitor to leave a voice and/or video message for the individual in the household the visitor wishes to contact. The individual in the household may then at a later time retrieve this message or possibly receive the message, i.e., as a multimedia message directly to the receiver. Alternatively the message is stored in the receiver or alternatively stored on a digital storage media located at a service provider, such as a telephone company.

The communication between the outer sensing module and the receiver module is preferably compressed and preferably also encrypted thereby preventing others from spying on the communication between the visitor and the individual in the household. Since communication on the GSM network is already encrypted the encryption may be omitted. The data packages or data steam is then transmitted across the telephone network. The outer sensor module may be connected to the telephone network by using ISDN or any other fixed-wire access to the telephone network. Alternatively, the connection from the outer sensing module to the telephone network may be a mobile phone network or a satellite based network.

The receiver module also functions as a normal mobile phone or satellite telephone enabling the resident to be contacted anywhere where the coverage of the mobile phone network or satellite telephone network provides adequate coverage.

The outer sensor module 10 may be powered by an external power source, such as 220 VAC in Europe or 110 VAC in other countries and may have a built-in transformer for transforming the power into low voltage. Alternatively, solar panels or batteries may power the outer sensor module 10. The receiver module 30 is preferably powered by a rechargeable battery pack, and may be fitted with a power inlet for a recharging the batteries while the batteries are still in the receiver module.

In an alternative embodiment of the present invention, the receiver modules 30 may be placed at a fixed location, e.g. the receiver modules 30 may include means for placing the receiver module 30 on a table or any other substantially horizontal surface, alternatively the receiver module may include fixation means for fixating the receiver module 30 to a substantially vertical surface such as a wall. The receiver module 30 may be powered by an external power source, such as by 220 VAC or 110 VAC.

The receiver module 30 may optionally be fitted with a camera device for the visitor to see video of the individual he or she trying to visit a person living in a house on

which the receiver module 30 is mounted. The camera may be a video camera or a still camera, and may further record images in colour or black-white/greyscale.

In a still further alternative embodiment of the present invention the receiver module 30 may be employed as a surveillance device if fitted with a camera device as described above. The camera may then be used as a motion detector or for continual surveillance by forwarding the images recorded by the camera to a designated alternative destination preferably a mobile device such as a mobile phone, alternatively a number of receiver modules 30 may forward images or video signals to the same destination enabling a complete or near complete surveillance of a house or apartment. This allows the resident to alert the proper authorities. The receiver module 30 or the mobile device may store the video and/or sound recording for later viewing to facilitate the prosecution and/or apprehension of the burglar. Also the surveillance function may be used to survey a nanny or nurse. Also the receiver modules may send video and sound between two or more receiver modules, and may then be employed, e.g., for monitoring ones own children, alternatively the receiver modules may be used to conduct conferences between residents of the house or high rise.

Fig. 3 is a schematic diagram of the communication between the outer sensing module 10 and the portable receiver module 30.

As discussed previously the outer sensing module 10 may be connected to a fixed wire telephone network 44 or a mobile phone network, such as a GSM network or a satellite based network.

The receiver module 30 is connected to a mobile network 42 preferably a GSM-based network, alternatively a satellite based network 40, enabling the receiver unit to be contacted practically regardless of its location, but dependant on the coverage of the network.

Fig. 4 is a schematic block diagram of the basic elements of the outer sensing module 10 illustrating the electrical connections between the microprocessor or

central processing unit 56 and the peripherals described above, namely the sound sensing device 12 and the sound generating device 22, the optical sensing device 14 and the display device 16, the input device 52 such as buttons, a keyboard or touch-screen inputs and the telephone module 54.

Fig. 5 is a schematic block diagram of the elements of the receiver module 30, illustrating the electrical connections between the microprocessor or central processing unit 58 and the peripherals described above, namely the sound sensing device 38 and the sound generating device 32, the video camera 60 and the display device 34, the input device 36 such as buttons, a keyboard or touch-screen inputs and the telephone module 62. The stippled line indicates that the video camera 60 is optional and not required in the preferred embodiment of the present invention.

The receiver module 10 may be connected to a locking and/or unlocking mechanism on the door allowing a person carrying the portable receiver module 30 to unlock the door when a visitor arrives at the door. Also, the system may allow a person, such as a carpenter, plumber or other craftsman, to enter a person's house without the person actually being at home. This may be achieved by allocating a temporary access code to the craftsman, e.g. by giving the craftsman a code, which he may send to the system via SMS or alternatively by allowing the craftsman to identify himself or herself in relation to the system by using his or her mobile phone the built-in wireless data transfer, e.g. bluetooth. Further alternatively, the craftsman may enter a code or password directly on the outer sensor module, e.g. by a touch sensitive screen or key pad. Still further, the system may incorporate facial recognition software or other biometric devices for recognising individuals. The access code may have a time limit within which it is active, e.g. a day, an afternoon or a longer period of time. The system may include a log in which dates and times at which the access code is used is stored for later inspection or retrieval.

The system may be connected to one or more surveillance cameras, providing visual surveillance of the area surrounding the dwelling or house on which the system is located. The surveillance cameras may include automatic detection of motion allowing the cameras to act as alarm systems and when a change or motion

is detected, a message may be sent to the portable device bringing the change or movement to the attention of the person living in the house.

The cameras may be controlled by the portable device allowing the person carrying the portable device to enable or disable the cameras as well. Also, the cameras may provide a life feed to the portable device allowing the person to perform a visual inspection of the area surrounding the house or even inside the house.

As mentioned above, the system may be used as a security system sending a message in form of e.g. an SMS, MMS or e-mail, including an image or video sequence from the surveillance cameras placed inside or outside the house during the possible break-in in the house. The system may further be connected to an alarm central having qualified personnel for contacting the police so that the persons attempting to break into the house may be apprehended.

As a number of persons may have access to the house via the system, e.g. a carpenter and a plumber, the system may include the possibility of logging entries and exits from the house, which log may be sent to a person's mobile phone, PDA or e-mail, so that the person living in the house may have a record of persons entering and exiting his or her house.

The outer module may include a display for displaying the name of the residents of the house. Also, the display may display images of the persons living in the house. This may also assist in persons visiting the house to contact specific individuals of the household, each of the individuals having their own mobile device. This is contemplated to allow e.g. parents to not be disturbed when children or adolescents have visitors coming over.

When a visitor arrives at the door and attempt to contact a specific individual or several individuals of the household, a system may send a message to that person's mobile device, e.g. by sending an SMS, MMS or e-mail when that person or those persons are not able to respond to the visitor. The specific individual may be in a meeting, in a bath or occupied with other things.

The outer sensing module may include a key pad for entering messages from visitors included in the above-mentioned message, information of an SMS, MMS, e-mail or other type of message. Alternatively or additionally, the outer sensing module may include a camera as described elsewhere, which camera may allow a visitor to leave a video message, which may be included in the message sent to the specific individuals' mobile device. Alternatively, the outer sensing module may be connected to a storage device, upon which the video message, text message or voice message may be stored until the user retrieves the message for reading, viewing or listening.

As a visitor tries to contact an individual, the visitor may be connected to the individual via the outer sensing module, which may be connected to the telephone network or internet allowing the person to talk to the individual on his or her mobile device, which is also connected to the telephone network, mobile phone network or internet.

When a visitor arrives at the door of a house and attempts to contact a resident of that house, the visitor may be presented with a message indicating that the individual is being contacted. Meanwhile, a piece of music is being played. Alternatively, a welcome speech may be played such as a message instructing the person how to leave a message for the individual being contacted.

As the system may be used as a door key allowing residents of the house to enter the house, the system may be used for storing a message to a person entering the house, e.g. from a parent to a child or the other way round. The messages may be stored in the outer sensing module or a storage device placed inside the house, e.g. on a computer or the like.

Other sensing devices may be built into the outer sensing module, such as a temperature monitoring system, an air pressure monitoring system, wind direction measuring systems, moisture sensing systems and the like. These measurements

may be displayed on the outer sensing module, stored on a storage device or sent to a mobile device, such as a mobile device.

The device may further include a card reader or numerical keyboard for a person visiting to identified him or her self. The card reader may be a chipcard reader or magnet strip reader or RFID reader. The person may enter a PIN code using the keyboard. Alternatively a person may enter a code via SMS, MMS or the like.

The device or system may be connected to a doorlock, e.g. a mechanical lock or a magnetic lock. The lock may be controlled from the system or device mounted on the wall. The system or unit may include a timed relay which may operate the lock after a specific time period, e.g. configurable from 1 to 99 seconds.

Preferably the system may be configured by a separate device, e.g. a PDA, a laptop or a mobile phone. The interface to configure the device may be implemented so that the device is configured using SMS or text messages from a mobile phone. Alternatively the device may be configured via an HTML page, e.g. via an Ethernet port in the device, or a page stored on a central server and the device being in communication with the server e.g. via the internet or a direct phone/modem connection.

The system or device may advantageously comprise an electronic log over entries, e.g. so that it may be possible to identify the last person to enter the house or building, e.g. in case there was a burglary or arson and thereby allow identification of possible witnesses.

One embodiment of the present invention is contemplated to comprise a processor with an ARM9 core where LINUX is used for the operation system. The display being a Winstar LCD with a resolution of 320x240 pixels and an active area of 5,76 cm x 7,68 cm. The display includes LED backlight. The unit comprise analogue microphone and speaker amplifier, DTMF decoder chip, buttons power supply and driver for a magnetic lock.

An alternative to LINUX is Windows CE or a proprietary system.

The system may include a coaxial cable connection to receive a signal from e.g. a digital set-top box or directly from cable TV or local area TV, i.e. a TV signal distributed from a common antenna system in an apartment building, which may be supplemented with additional channels. In some embodiments the signal received is in the area 0-1000 MHz, or even above.

The present invention may be characterised by the following points:

1. A wireless doorbell or surveillance system comprising:

a first module including:

a first housing having a front surface and including fixation means for mounting and fixating said first housing so a to present said front surface in a substantially vertical orientation,

a first microprocessor included in said first housing,

a first sound sensing device mounted in said first housing, said first sound sensing device being electrically connected to said first microprocessor for sending a first digitised audio signal to said first microprocessor in response to receipt of a first sound signal,

a first sound generating device mounted in said first housing, said first sound generating device being electrically connected to said first microprocessor for receiving and converting a second digitised audio signal from said first processor into a second sound signal,

a first camera device mounted at said first housing for registering the appearance of a person in front of said camera device, said camera device being electrically connected to said first microprocessor and being capable of generating a first video signal for transmission to said first microprocessor,

a first telephone module for sending and receiving data corresponding to speech and video information over a public telephone network, said first telephone module being electrically connected to said first microprocessor,

said first microprocessor packing said first digitised audio signal and said first video signal in a first data stream, said first microprocessor sending said

first data stream to said first telephone module, said first microprocessor receiving a second data stream from said telephone module, said second data stream including a second audio signal, said first microprocessor unpacking said second data stream and sending said second digitised audio signal to said first sound generating device,

said wireless doorbell or surveillance system further comprising:

a second module including:

a second housing,

a second microprocessor included in said second housing,

a second sound sensing device mounted in said second housing, said second sound sensing device being electrically connected to said second microprocessor for sending a second digitised audio signal to said second microprocessor in response to receipt of said second sound signal,

a second sound generating device mounted in said second housing, said second sound generating device being electrically connected to said second microprocessor for receiving and converting said first digitised audio signal from said second microprocessor into said first sound signal,

a second telephone module for sending and receiving data corresponding to speech and video information over a public telephone network, said second telephone module being electrically connected to said second microprocessor,

a first display device mounted in said second housing, said first display device being electrically connected to said second microprocessor for receiving and displaying said first video signal, and

said second microprocessor packing said second digitised audio signal in a second data stream, said second microprocessor sending said second data stream to said second telephone module, said second microprocessor receiving said first data stream from said second telephone module, said first data stream including said first audio signal and said first video signal, said second microprocessor unpacking said first data stream and sending said first digitised audio signal to said second sound generating device and sending said first video signal to said first display device.

2. The wireless doorbell or surveillance system according to point 1, wherein said first module further comprises:

a second display device mounted in said first housing, said second display being electrically connected to said first microprocessor.

3. The wireless doorbell or surveillance system according to point 2, wherein said second module further includes:

a second camera device mounted in said second housing for registering the appearance of a second person in front of said second camera device, said second camera device being electrically connected to said second microprocessor and being capable of generating a second video signal for transmission to said second microprocessor, said second microprocessor packing said second video signal with said second digitised audio signal into said second data steam, and

said second display displaying said second video signal.

4. The wireless doorbell or surveillance system according to point 2 or 3,

said first module further including:

a list of names displayed on said second display, and

a first plurality of switch means mounted on said first housing for addressing a specific name on said list, each of said switch means being electrically connected to said first microprocessor,

said system further including:

a second plurality of said second modules according to any of the points 1 to 3, each of said second modules corresponding to a specific name on said list,

said switch means instructing said first microprocessor to send said first data stream to said specific second module corresponding to said specific name addressed by said switch means via said first telephone module.

5. The wireless doorbell or surveillance system according to point 4 or 5, wherein said first camera and said first sound sensing device is activated by operating at least one of said switch means.

6. The apparatus according to any of the preceding points, wherein said first telephone module is an ISDN module, alternatively any other module complying with a fixed line standard, further alternatively a UMTS, GPRS, EDGE, WAP or any other module compliant with a mobile phone standard.

7. The apparatus according to any of the preceding points, wherein said second telephone module is a GSM module, alternatively a UMTS, GPRS, EDGE, WAP or any other module compliant with a mobile phone standard.

8. The apparatus according to any of the preceding points wherein said first module further comprises a memory module for storing messages, such as a flash memory module, said memory module being electrically connected to said second microprocessor.

9. A wireless access system comprising:

a first module including:

a first housing having a front surface and including fixation means for mounting and fixating said first housing so a to present said front surface,

a first microprocessor included in said first housing,

a first sound sensing device mounted in said first housing, said first sound sensing device being electrically connected to said first microprocessor for sending a first digitised audio signal to said first microprocessor in response to receipt of a first sound signal,

a first sound generating device mounted in said first housing, said first sound generating device being electrically connected to said first microprocessor for receiving and converting a second digitised audio signal from said first processor into a second sound signal,

a first camera device mounted at said first housing for registering the appearance of a person in front of said camera device, said camera device being electrically connected to said first microprocessor and being capable of generating a first video signal for transmission to said first microprocessor,

a first telephone module for sending and receiving data corresponding to speech and video information over a public telephone network, said first telephone module being electrically connected to said first microprocessor,

said first microprocessor packing said first digitised audio signal and said first video signal in a first data stream, said first microprocessor sending said first data stream to said first telephone module, said first microprocessor receiving a second data stream from said telephone module, said second data stream including a second audio signal, said first microprocessor unpacking said second data stream and sending said second digitised audio signal to said first sound generating device,

a locking mechanism located on a door, said locking mechanism being controllable by a signal sent from said first module allowing said locking mechanism to switch between a locked and an open state.

10. The wireless access system according to point 9, wherein said system further comprises any of the features of any of the points 1-8.

Claims:

1. A system comprising:

a first module comprising a housing enabling said first module to be mounted on a wall,

a central processing unit mounted in said housing,

a communication unit mounted in said housing and being electrically connected to said central processing unit, said communication module adapted to communicate with a second module, said second module preferably being a portable module,

a display unit mounted in an opening of said housing of said first module and being electrically connected to said central processing unit, said display unit receiving display information from said central processing unit,

a memory unit being electrically connected to said central processing unit, said memory unit comprising information to be selectively displayed on said display unit.

2. The system according to claim 1, wherein said communication module is adapted to receive an electrical or optical signal from a cable.

3. The system according to claim 2, wherein said electrical or optical signal is a television signal comprising teletext.

4. The system according to claim 3, wherein said central processing unit received said television signal and displays said teletext on said display unit.

5. The system according to any of the claims 1-4, wherein said communication unit comprises two modules, a first module for receiving said electrical signal and a second module for communicating with said second unit.

6. The system according to claim 5, wherein said second module of said communication module is a wireless communication module.

7. The system according to any of the claims 3-6, wherein a specific channel of said television signal is displayed on said display.

8. The system according to any of the claims 1-7, further comprising a plurality of operation buttons mounted in corresponding openings of said housing and electrically connected to said central processing unit.

9. The system according to any of the claims 1-7, wherein said display unit is a pressure sensitive display unit.

10. The system according to any of the claims 1-9, wherein said central processor in a first instance detects operation of one of said operation buttons or said pressure sensitive display unit and said central processor sends name information to be displayed on said display unit, and in a second instance detects when time since last operation of one of said operation buttons or said pressure sensitive display unit exceeds a threshold.

11. The system according to claim 10, wherein in said second instance said central processing unit displays a specific television channel or a specific page of teletext on said display when said threshold is exceeded.

12. The system according to any of the claims 1-11, wherein said display unit is an LCD display unit.

13. The system according to any of the claims 1-12, wherein said display unit includes a back-light unit.

14. The system according to claim 13, further including a timer unit for controlling operation of said back-light unit.

15. The system according to any of the claims 1-14, wherein said system is electrically connected to a door lock, said door lock being operated from a locked state to an unlocked state in response to a signal from said central processing unit.

16. The system according to any of the claims 6-15, wherein said wireless module is a mobile phone unit, such as a GSM unit.

17. The system according to any of the claims 1-16, wherein said system is operatively connected to an alarm system comprising an audible alarm and a communication module for communicating with an external alarm central.

18. The system according to any of the claims 15-17, wherein said door lock is operated via a mobile unit in communication with said communication unit of said system.

19. The system according to claim 18, wherein said mobile unit communicates with said communication unit via a GSM network or a short-range wireless communication means.

20. The system according to claim 19, wherein said short-range wireless communication means is an infrared communication means or a bluetooth communication means or DECT communication means or WLAN communication means.

21. The system according to any of the claims 1-20, wherein said system further comprises a microphone electrically connected to said central processor.

22. The system according to any of the claims 1-21, wherein said system further comprises a loudspeaker electrically connected to said central processor.

23. The system according to any of the claims 1-22, wherein said system further comprises a digital camera unit electrically connected to said central processor.

24. The system according to claim 23, wherein said digital camera unit is a digital still camera unit or a digital video camera unit.

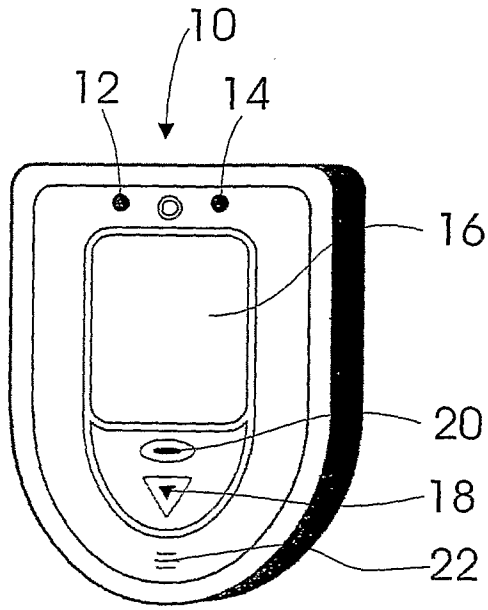


Fig. 1

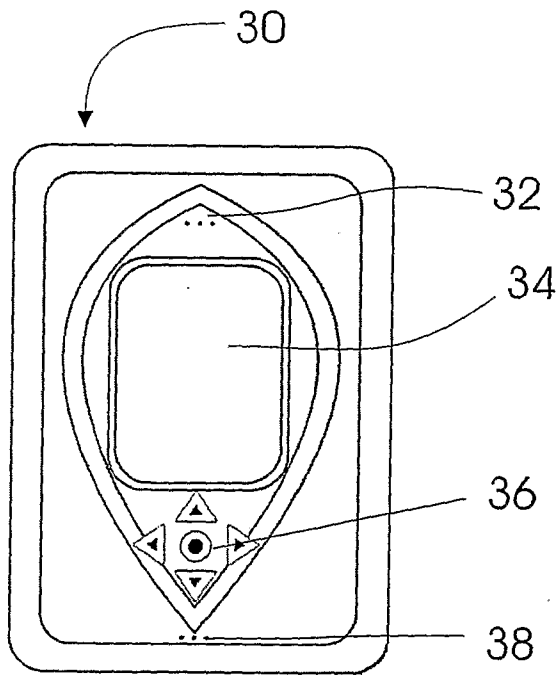


Fig. 2

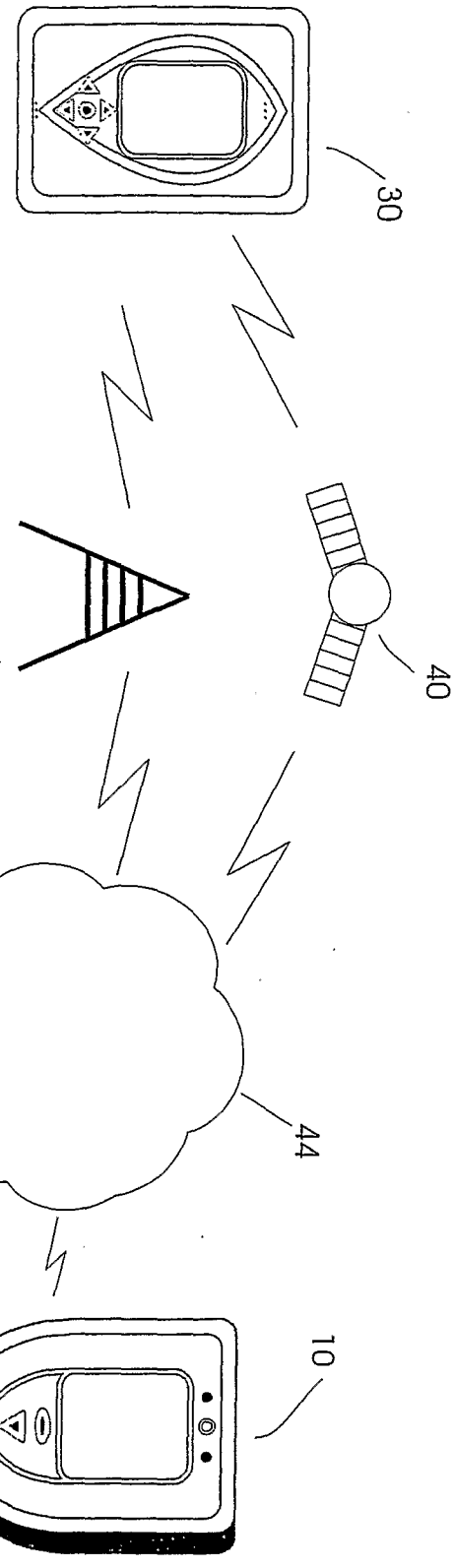


Fig 3

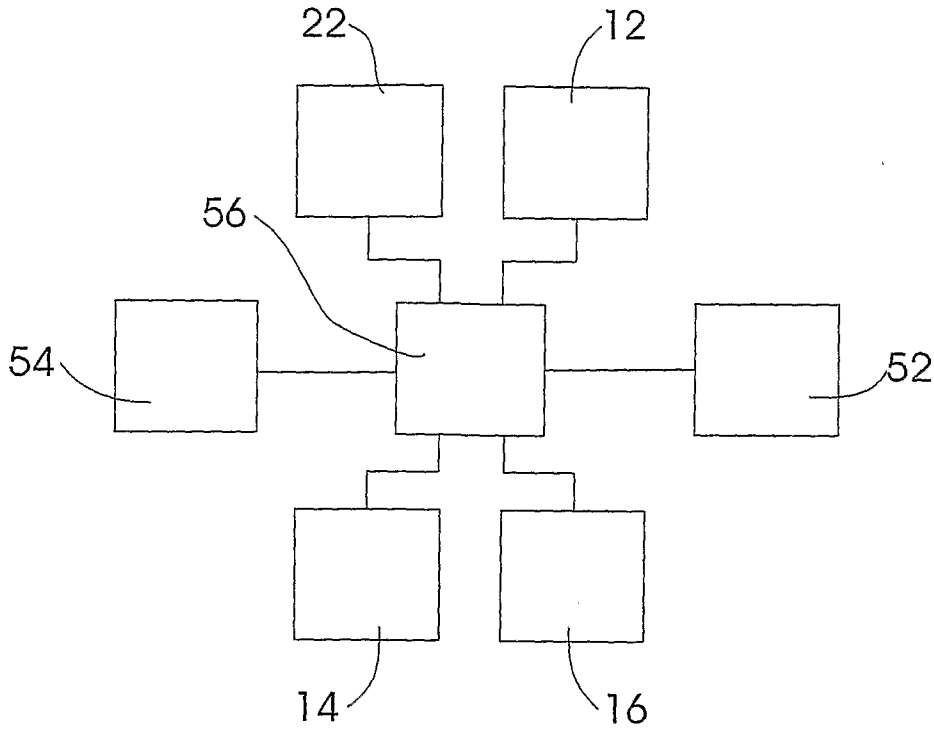


Fig. 4

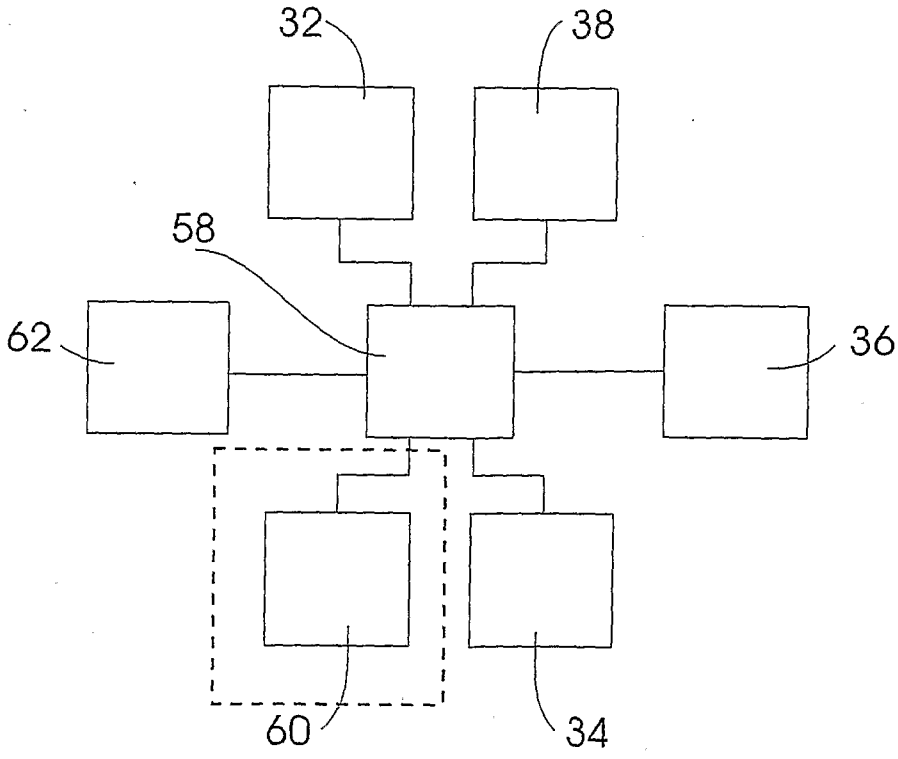


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2007/000266

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04N7/18

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

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 02/085019 A (CAVES DE LISSE AS [NO]; ROESJOE ENDRE [GB]) 24 October 2002 (2002-10-24) page 5, line 15 - page 7, line 3 page 7, line 30 - page 9, line 18 page 10, lines 4-13 page 11, lines 29-32 page 13, lines 3-19 page 14, lines 1-4 figures 1-3	1,2,5,6, 8,12-14, 17-24 3,4,7, 9-11,15, 16
Y	GB 2 285 365 A (COSMIC COMMERCIAL SERVICES LIM [HK]) 5 July 1995 (1995-07-05) page 9, line 21 - page 11, line 20 figures 1-4,8-15	9-11,15, 16

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[X] Further documents are listed in the continuation of Box C.

[X] 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

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"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

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"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	Date of mailing of the international search report
15 August 2007	20/09/2007

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Van der Zaal, Robert

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2007/000266

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 42 25 365 A1 (EICHNER KLAUS WERNER PROF DR I [DE]; SCHWAGER ARIBERT PROF DR ING H [D) 3 February 1994 (1994-02-03) column 2, line 59 - column 3, line 27 figures 2,4	3,4,7

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/DK2007/000266

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		NO 20011883 A	14-10-2002
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