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Brunius

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- (54) **SECURITY SYSTEM FOR A BUILDING COMPLEX HAVING MULTIPLE UNITS**
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- (51) **Int. Cl.**⁷ **G08B 23/00**
- (52) **U.S. Cl.** **340/529; 340/539; 340/506; 340/527; 340/531**
- (58) **Field of Search** 340/529, 527, 340/528, 506, 531, 539

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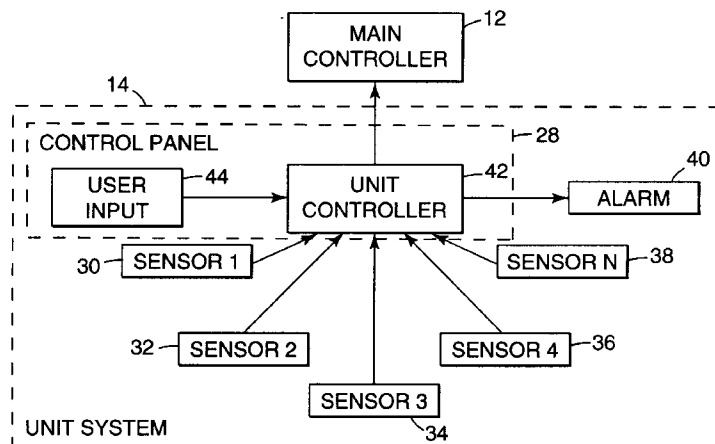
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(57) **ABSTRACT**

A security system and method for building complexes having multiple units provides enhanced resistance to intruder disablement, particularly for systems having a unit controller and user input device that are mounted within a common control panel. The system and method are useful with residential building complexes having residential units such as apartments and condominiums, and commercial building complexes having commercial units such as offices, businesses, or storage facilities. A unit controller communicates a unit alarm condition to a main controller located remotely from a respective unit. The unit alarm condition can be communicated via wireless communication. Also, the unit alarm condition is communicated without significant delay following the sensing of a security condition in the unit. For example, the unit controller can communicate the unit alarm condition to the main controller substantially immediately following sensing of the security condition. In this manner, the unit alarm signal is communicated to the main controller before an intruder is able to gain physical access to the control panel containing the unit controller. A user input device allows a user to enter information to invalidate the unit alarm condition communicated by the unit controller. If the unit alarm condition is not invalidated within a delay period, however, the main controller generates a main alarm condition and, sending notification to a security agency and activating a main alarm. The unit controller can be configured to activate an alarm within the unit in the event user input is not received within a second delay period. The system and method provide enhanced reliability and facilitate installation.

33 Claims, 2 Drawing Sheets



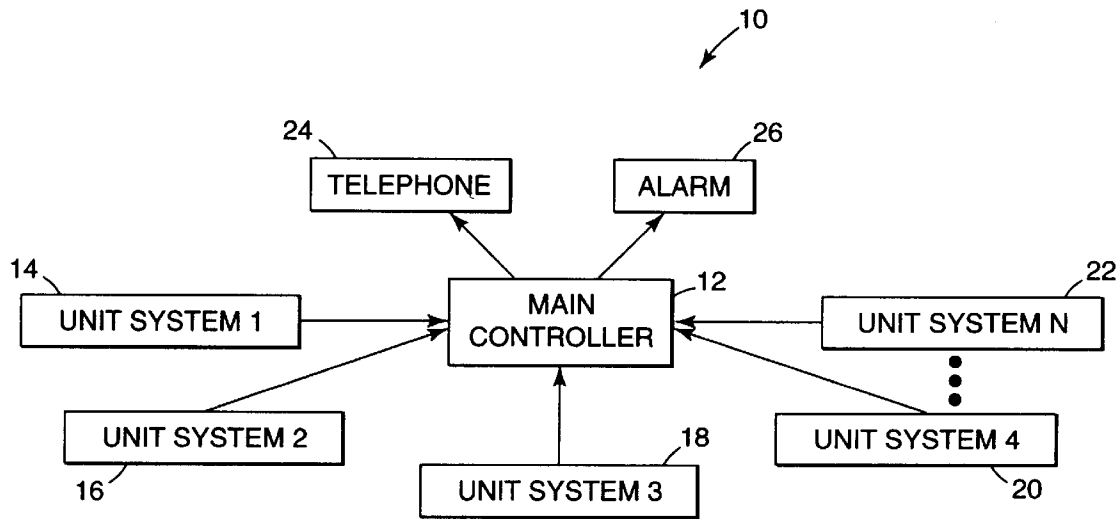


Fig. 1

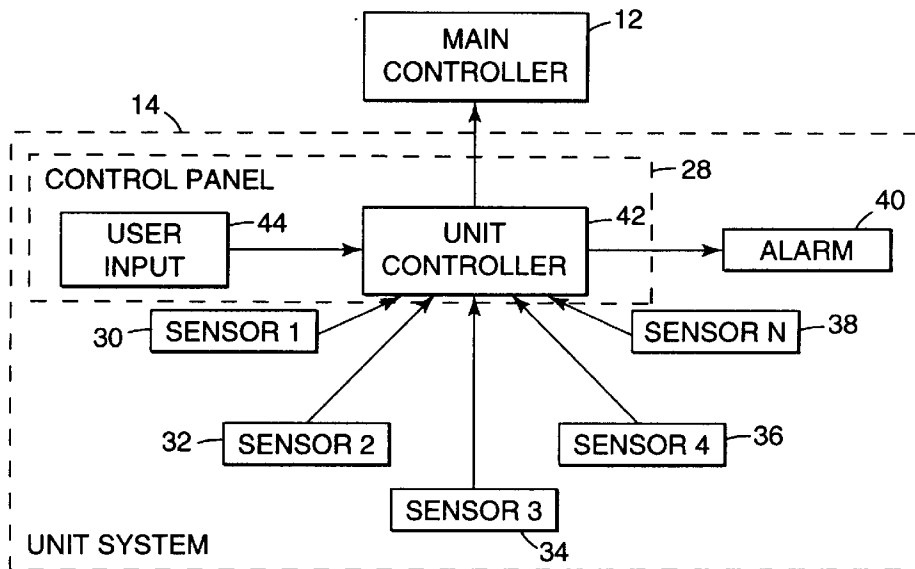


Fig. 2

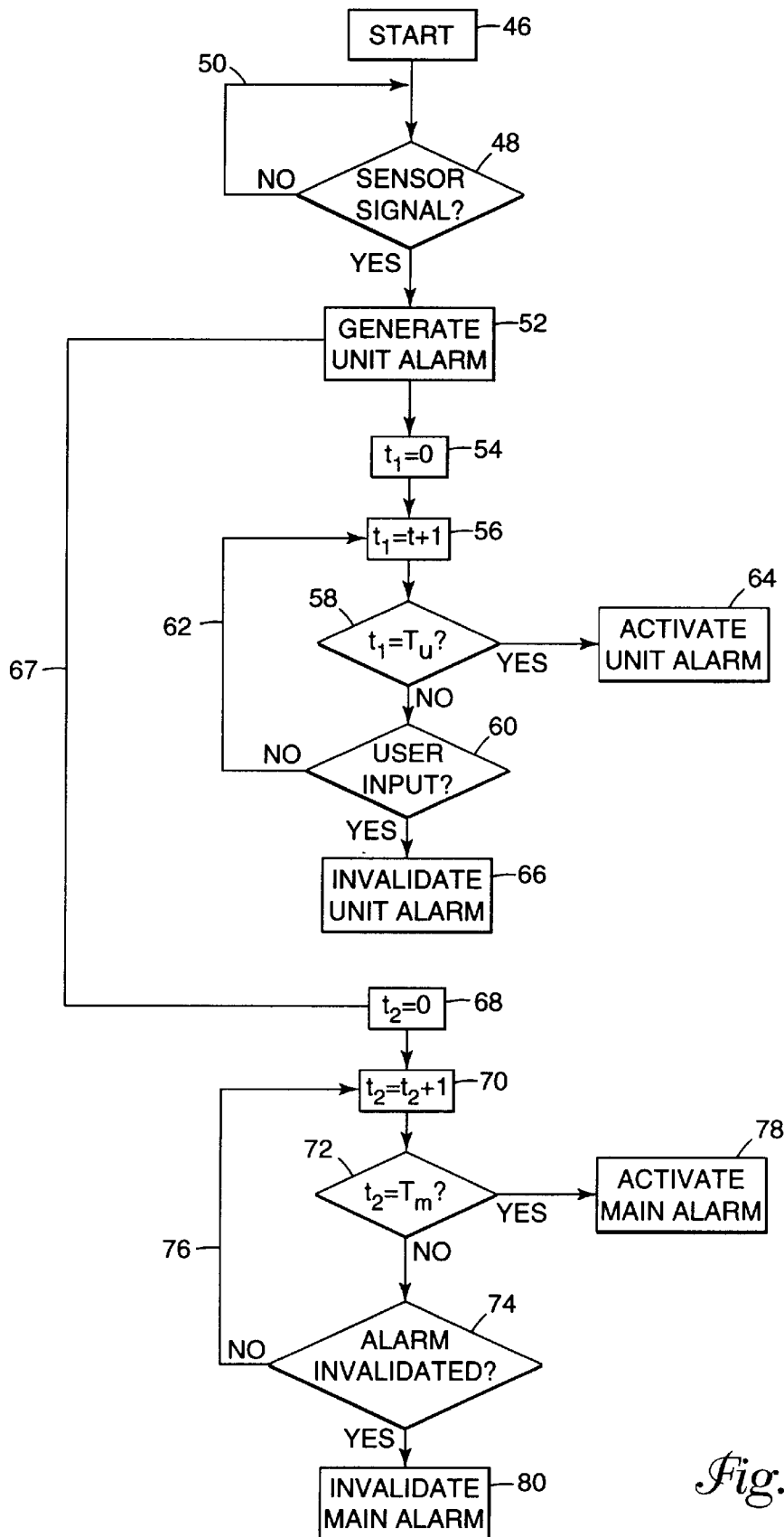


Fig. 3

**SECURITY SYSTEM FOR A BUILDING
COMPLEX HAVING MULTIPLE UNITS**

RELATED APPLICATION

This application claims priority of U.S. provisional appli-
cation Ser. No. 60/073,176 filed Jan. 30, 1998.

TECHNICAL FIELD

The present invention relates to security systems includ-
ing security systems useful in building complexes having
multiple units.

BACKGROUND INFORMATION

In a typical security system, a main controller communi-
cates with sensors positioned throughout a surveillance area,
such as a home or business, to monitor various security
conditions. For purposes of immunity from attack, the main
controller forms a control panel that often is housed in a
heavy, metal box. The control panel is typically placed in a
remote location in the surveillance area such as in a base-
ment or utility closet. The housing provides some degree of
protection against an intruder trying to disable the internal
circuitry for the main controller.

The sensors placed throughout the surveillance area may
include door/window sensors, passive infrared sensors for
motion, temperature sensors, and the like. Each sensor
includes a transmitter. When a change in condition is sensed,
the transmitter associated with a sensor transmits a sensor
signal. The sensor signal includes information conveying the
change in condition to the main controller. The sensor signal
also can be transmitted to the main controller by hardwired
communication. The various sensors are assigned zone
numbers present in the main controller according to specific
conditioning requirements.

The security system also includes a keypad or other user
input device that is placed remotely from the control panel
associated with the main controller. The keypad typically is
placed or located near the entrance door for the house. This
keypad may communicate with the main controller by
hardwired or wireless communication. In some cases, the
keypad may take the form of a portable, wireless unit that is
carried by the resident, e.g., on a keychain.

When the resident opens a door that is monitored by a
door/window sensor, the sensor transmits a sensor signal to
the main controller indicating that the door has been opened.
At that time, the main controller initiates a timer, giving the
homeowner a delay period in which the security system can
be disarmed using the keypad that is near the door. The delay
period is usually referred to as the entry delay. If the security
system is not disarmed within the entry delay, e.g., thirty
seconds, the main controller enters an alarm state and
generates an alarm signal. In response to the alarm
condition, the security system may sound an alarm. Also, the
main controller may be tied to a telephone system for the
purpose of notifying a security agency or police of the alarm
condition.

In the event an intruder enters the home and attempts to
disable the security system, he is faced with two levels of
difficulty. First, the main controller is located remotely from
the main entrance and keypad. Indeed, the main controller
often will be difficult to locate within the entry delay. Also,
the intruder may misdirect his efforts toward the hardwired
keypad next to the door, which will have no effect on the
function of the remote control panel. Second, the housing
containing the main controller will slow the intruder's

efforts to access the internal electronics, particularly if the
housing is formed from heavy metal. Thus, in a typical
security system, it is generally difficult for an intruder to
circumvent the system by disabling the main controller.

5 In security systems used for a building complex having
multiple units, however, the task of disabling the main
controller often is less daunting for an intruder. Unlike
singlehome security systems, a multiple-unit system typi-
cally includes a local, unit security system for each unit. An
apartment or condominium complex, for example, may
provide a unit security system for each residential unit. An
office building complex similarly may provide a unit securi-
10 ty system for each office suite. Other commercial building
complexes may include a unit security system for commer-
cial units such as businesses or storage facilities.

15 The local security system includes a unit controller and a
keypad or other user input device. Due to space and cost
limitations, however, the unit controller and keypad typi-
cally are physically integrated with one another in a com-
mon control panel. For ready access to the keypad by the
20 resident, the integrated control panel is installed near the
main door to the unit. Each unit security system has one or
more sensors to monitor, for example, the front door and any
accessible windows. In some cases, motion sensors also may
be provided. As in a single-home system, the sensors com-
25 municate with the unit controller by hardwired or wireless
communication.

Instead of a link to a main controller, each unit controller
has a direct telephone link to a remote security agency or
police. In the event a unit controller indicates an alarm
30 condition, it uses the telephone connection for notification.
Connection of each unit controller to the telephone system
is quite costly in terms of installation. For example, each unit
controller must be equipped with an RJ3 IX line seizure
device in order to take control of the telephone line for
35 communication purposes. The line seizure device must be
connected between the incoming telephone line and the first
telephone in the unit that connects to the line. As a result,
significant installation time is consumed by efforts to locate
and obtain access to the proper telephone line location
40 within the unit. Also, seizure of the telephone line by the
security system can tie up the local telephone line for the
unit, particularly in an emergency situation. As a further
concern, reliance on a telephone line makes the system
dependent on telephone service. Because telephone service
45 is typically disconnected when the unit is vacant, unit
vacancy renders the system inoperable and the unit particu-
larly vulnerable to intrusion.

The physical integration and accessible location of the
unit controller and keypad also makes multiple-unit security
systems more susceptible to disablement by intruders.
Specifically, intruders can disable the unit controller by
essentially smashing the common control panel upon entry
50 into the unit. When the intruder enters the unit through the
main door, an associated sensor communicates a sensor
signal to the unit controller. In response, the unit controller
initiates a delay timer for the entry delay to allow a resident
time to disable the security system. With its convenient
55 location, however, an intruder has sufficient time to smash
the control panel before expiration of the entry delay. As a
result, the unit controller can be disabled before an alarm
signal is sent via the telephone line. In other words, the unit
security system can be rendered inoperable by an intruder
before the alarm is activated.

SUMMARY

The present invention is directed to a security system and
method for building complexes having multiple units. Such

building complexes include residential building complexes having residential units such as apartments and condominiums, and commercial building complexes having commercial units such as offices, businesses, or storage facilities. Such a building complex also may include units in multiple buildings. The present invention provides enhanced resistance to intruder disablement, particularly for systems having a unit controller and user input device that are mounted within a common control panel.

In existing systems, it is possible for an intruder to disable the control panel before expiration of an applicable entry delay period, thereby preventing communication of a unit alarm condition, such as door entry, via the telephone line. In accordance with the present invention, however, the unit controller communicates the unit alarm condition to a main controller without significant delay following the sensing of a security condition in a respective unit. In particular, the unit controller preferably communicates the unit alarm condition to the main controller substantially immediately following sensing of the security condition. In this manner, the unit alarm signal is communicated to the main controller before the intruder is able to gain physical access to the control panel containing the unit controller.

The user input device allows a user to enter information or otherwise act to invalidate the unit alarm condition communicated by the unit controller. If the unit alarm condition is not invalidated within an entry delay period, however, the main controller generates a main alarm condition. Upon generation of the main alarm condition, the main controller can send notification to a security agency or police and activate a main alarm. Thus, efforts to disable the unit controller following entry into the unit are futile because the unit alarm signal has already been communicated to the main controller. The unit controller can be configured to activate an alarm within the unit in the event user input is not received within a second entry delay period maintained by the unit controller. In this manner, the unit controller, if operable, can operate to provide a unit alarm in conjunction with the notification or alarm activities initiated by the main controller.

In addition to improved reliability, the security system and method of the present invention offers significant installation advantages. For example, the unit controller preferably communicates with the main controller via wireless communication. Hard-wired communication is possible but less preferred. Also, the unit controller does not need to be connected to a telephone line. Instead, the main controller is connected to the telephone line and provides the link to a remote security agency or police. As a result, the unit controller does not require hardwired connections with the telephone line and, in particular, does require the cumbersome task of installing a line seizure device. Thus, the security system and method greatly facilitate installation of a system in each unit and significantly reduce the overall time and cost of installing security systems in multiple units.

As a further advantage, the security system and method of the present invention provide improved reliability for monitoring security conditions in vacant units. When a unit is vacant, telephone service ordinarily disconnected until the next occupancy. Thus, existing unit systems that rely on a telephone line connection are inoperable during vacancy. As a result, the vacant unit is vulnerable to intruder theft or vandalism or unauthorized occupancy, e.g., "squatting." With the system and method of the present invention, however, telephone service is not necessary for operation. Rather, the unit controller communicates with the main controller via wireless communication, and the main con-

troller maintains continuous telephone service. As a result, the system and method are equally effective during periods of unit vacancy.

In a first embodiment, the present invention provides a security system for a building complex having multiple units, the system comprising a main controller, a sensor for sensing a security condition in one of the units and generating a sensor signal indicative of the security condition, a unit controller for communicating a unit alarm signal to the main controller without significant delay following generation of the sensor signal, and a user input device for receiving user input to invalidate the unit alarm signal, the unit controller communicating an alarm invalidation signal to the main controller in response to the user input, wherein the main controller generates a main alarm signal in the event the unit controller does not communicate the alarm invalidation signal within a delay period following communication of the unit alarm signal.

In a second embodiment, the present invention provides a method for monitoring security in a building complex having multiple units, the method comprising sensing a security condition in one of the units, communicating a unit alarm condition to a controller located remotely from the unit in which the security condition is sensed, the unit alarm condition being communicated without significant delay following sensing of the security condition, monitoring user input to invalidate the unit alarm condition, invalidating the unit alarm condition in response to the user input, and indicating a main alarm condition in the event the unit alarm condition is not invalidated within a delay period following communication of the unit alarm condition.

In a third embodiment, the present invention provides a security system for a building complex having multiple units, the system comprising a sensor, located in one of the units, for indicating a security condition in the unit, a main controller located remotely from the unit in which the sensor is located, a unit controller, located in the unit in which the sensor is located, for communicating a unit alarm condition to the main controller substantially immediately following indication of the security condition, a unit alarm associated with the unit in which the sensor is located, a user input device for receiving user input indicating invalidation of the unit alarm condition, wherein the unit controller and at least a portion of the user input device are mounted in a common housing, the unit controller invalidating the unit alarm condition in response to the user input and activating the unit alarm in the event the user input is not received by the user input device within a unit delay period following indication of the unit alarm condition, wherein the main controller indicates a main alarm condition in the event the unit alarm condition is not invalidated by the unit controller within a main delay period following communication of the unit alarm condition the main controller, the main controller activating a main alarm upon indication of the main alarm condition.

In a fourth embodiment, the present invention provides a security system for a building complex having multiple units, the system comprising a plurality of unit controllers, each of the unit controllers being associated with one of the units and monitoring security conditions within the respective unit, the unit controllers generating unit alarm signals in response to sensed security conditions, a main controller, positioned remotely from the unit controllers, for receiving the unit alarm signals from the unit controllers.

The details of one or more embodiments of the invention are set forth in the accompanying drawings and the descrip-

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