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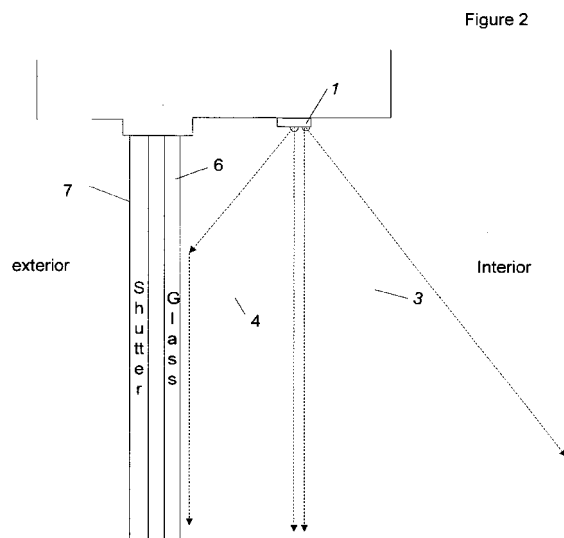
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(54) **Peripheral device that connects to home alarm systems and serves the global protection of an opening through magnetic switches and motion sensors**

(57) The invention is a peripheral device that connects to home alarm systems and aims to the global protection of an opening (door / window), and to make the residential alarm systems more friendly to the user. It monitors the magnetic switches which are installed in the construction (window glass and shutter) of the door/window, it checks the window glass for a possible break through motion sensors, it detects the presence of external magnetic fields that are strong enough to disable the magnetic switches and it protects against any malicious short wiring of the alarm zone. It receives power from the alarm's control center and it has a trivial consumption of about 2mA. It requires no modification to the existing wiring of the house. It runs a special software so that no alarm can be caused by the excitation motion sensors from inside the house but only when someone breaks the glass from the outside and pass through the opening. False alarms from excitations that can occur from the exterior of the house , such as for lightning, has also been obliterated. In addition, the device enables the system to distinguish whether the opening of the window glass/ shutter has been made from inside or outside of the house and thus enabling the tenant to open a door or a window from inside without the alarm going off. From this point strong algorithms start covering various scenarios in order to give the tenant a maximum of flexibility. The ultimate goal is that the security system should not restrict tenant's everyday live and so it will remain armed 24 hours a day. In addition, it gives the opportunity to choose between a smart operation as described above and a conventional system, which prohibits any dealing in construction by handling the control center's keyboard (any center that supports dual terminal resistance).



Description

[0001] This invention constitutes a peripheral device that connects to the control center of a home alarm system and aims in detecting conditions of a breaking through a door/window. It combines information from two motion sensors and two magnetic switches. The purpose of the invention is to close in security gaps that exist in the method of perimeter protection using magnetic switches and help the residential alarm systems become more user-friendly.

[0002] Today, magnetic switches are used in most home alarm systems for the protection of the perimeter. Referring to the advantages of this method we can cite the low cost, the reduced maintenance requirements, the longevity of switches, the reliable functioning, as well as the ability to provide protection while the occupants are inside their home. Major drawbacks are the significant security gaps and that they do not provide the distinctiveness of the location from which the door/window is opened. As a result these systems do not provide full protection against burglary and they also trap occupants inside their home.

[0003] There are already several patents in which motion detector signal processing is made in order that these devices become more reliable and the false alarms will be reduced. In such cases, the signals from the detectors operate in supporting one another to cause alarm. According to our knowledge there is no device in which a signal from a motion sensor can be either supportive or suppressive to the signal from the other sensor, depending on the sequence of stimulation. The combination of a motion sensor which suspends an alarm signal caused by magnetic switch opening exists in JP2170298 (HIROMICHI NAMIKOSHI). The invention, however, suffers from a major security gap because it does not protect the glass against breakage. This is very important because if a burglar breaks the glass of a window and the motion sensor device is triggered by this movement, it will suppress the alarm from the following opening of the window from the exterior of the house. In this case the invention JP2170298 (NAMIKOSHI HIROMICHI) would leave the burglar enter the house and the alarm would never sound. Therefore, in order to implement an application that will suspend alarm by movement within the home, care must be taken to protect the glass.

[0004] Although alarm systems had an explosive development in recent decades, concerning the technology and their capabilities, the undercurrent philosophy has remained constant, even though the requirements are no longer the same. The role to be played by residential security systems is different from that 30 years ago when their dynamic development begun. In the 1980s, most cases of burglary were happening when the occupants were absent, and therefore the purpose of a security system was the protection of home during that period. In the 1990s the cases of burglary in which the occupants were inside their home, but were dormant, increased consid-

erably. In 2010, the incidences of burglary with the occupants being inside their homes, awake, are multiplying. This happens probably because it is chosen deliberately by the burglars as they know that the alarms will be disabled. Many times these break-ins are combined with criminal acts. Now we believe that the role played by alarm systems is more important than ever. So on, their mission will be to protect the lives and the physical integrity of the occupants. In modern cities with strong social problems such as unemployment and illegal immigration, crime indices will constantly keep on growing. Citizens are invited to live their lives with their security systems armed. Consequently, the last should be made more user-friendly, in the sense that it should not cause impediments in every day life. The tenant should not be treated by the alarm system as a burglar ie door opening → alarm. This relationship should be changed to door opening from a burglar → alarm and door opening from the occupant → wait until the door is closed again. Therefore an ideal alarm system shall be able to distinguish the owner from a burglar. Up to a certain extent this is feasible with this invention, as the burglar opens a door from the exterior of the house and the occupant usually from the interior.

[0005] The method of protection via magnetic switches, while the most commonly used way of protecting homes, suffers from significant security gaps. So this method is vulnerable to following ways violation. 1) Effect of external magnetic field: the impact of a strong magnetic field, through an electromagnet from the outside of the window, can keep the switches closed even if a violation occurs. After the burglary, the door is closed and the magnet is removed. To resolve this problem, the balanced magnetic field switches are used in high-security applications. The disadvantages are the large size, the cost, and that they require perfect alignment during mounting, which if lost due to damage from use, they stop working. 2) Short-circuit: When the shutter of the window is open, the cables connecting switches to the control center may be exposed. Short circuit at this point can take switches out of the circuit. Solution to this problem are the switches with built-in terminal resistance which are costly. 3) Breaking the glass and pass through it without opening the construction: to address this problem using other peripherals such as vibration detectors and glass breaking detectors with sound. Both these devices under conditions can cause false alarms (e.g. the vibration sensor when a heavy vehicle passes near the house), or may fail to detect breaking (e.g. the breaking Detector with sound in a very noisy environment or when the burglar cuts the glass of the window). From the above we realize that even though various technical solutions have been found, there is no device that would solve the issue of protection of an opening integrately, and without drawbacks of the individual solutions above.

Advantages of the invention

[0006] The advantage of this invention is that it fills in all the security gaps of the method of perimeter protection of a house with magnetic switches, in a single integrated solution. Specifically, the device monitors the magnetic switches, the glass of the window and simultaneously detects the presence of additional magnetic fields that have enough strength to disable the magnetic switches. Furthermore, it is too small not to cause visual disturbance of the tenant and gives the opportunity to have the alarm system constantly armed without trapping the occupants inside the house. It also allows to change the alarm triggering conditions through manipulations on the existing keyboard of the control center. So when the owner wishes for example to sleep, he can convert the security system to a conventional one that any manipulation of a door/ window will cause an alarm. Finally it protects itself from potential short circuit using a built in terminal resistance. For the construction of the device, low cost materials can be used making it widely accessible to the public. The installation is very easy even in homes that already have alarm systems, without a change in the control center, the magnetic switches, or the wiring. The device is placed inline the course of the wires from the control center to the magnetic switches. Making use of cheap and small-sized magnetic traps, which can be installed in such a way as to be invisible from the inside of the home, it provides protection similar to the huge balanced magnetic field traps with built-in terminal resistance, which because of their deformity, they are no more used in homes and they have found application in closed cabinets and safes. Furthermore regarding the protection offered to the glass, it is certainly higher than the protection of the sound or vibration sensors because it is not affected by noise or vibration. The software of the device will signal an alarm when a human body crosses from outside to inside the house. Due to the great benefit of specialization to detect human body infrared radiation the system does not fail to detect a break in (high sensitivity), and does not give false alarms (high specificity). These two features cannot be attributed to the existing glass breaking detecting devices.

[0007] The innovative features of the device will be revealed through the description of the attached figures:

Fig 1 . This drawing presents the outer surface of the device (1) and the motion sensors (17) and (18). A special construction or a specific formulation of the surface of the box (1) of the device is marked with "X" (2). The main purpose is to restrict the visual fields of the sensors so that the space that is monitored by the device is divided into two parts: in space (3) that is supervised by the the sensor (17) and space (4) that is supervised by the sensor (18). There is no point in space that is monitored by both motion sensors.

Fig2. The drawing shows the functional orientation

of the device. Space (4) involves the largest possible surface of the glass (of the door/window), while space (3) extends towards the interior of the home, but it contains no point of the glass (6). So, when approaching the opening from inside the home, the tenant has to pass through space (3) firstly and space (4) secondly. Consequently the sensor (17) is triggered first and sensor (18) second.

Fig3. The drawing presents schematically the interconnection of electronic components inside the device (the standard model), as well as the interface with the control center (11) of the alarm system. The device consists of a microcontroller (23), two infrared motion sensors (17) (18), a relay (20), a led (22), a button (19), jumpers (21), a terminal resistor (end-of-line resistor, EOL) (24), a tamper switch (16) (for protection of the box for the device) and other elements necessary for the support, interface and the proper functioning of the above-mentioned items. The device is wired with : a) The zone wires from the control center (11). b) The power cables (12) that come from the alarm's control center (11). c) The 24 hours zone cables that support the tamper (16). d) The magnetic switches that are destined to the window glass and the shutter of the opening (8), (9) and (10). Looking at the drawing 3 we realize that the necessary wiring for the connection of the device to the control center consists of 4 cables, from which 2 are for the zone and 2 for the power. Using one cable for the negative, the necessary cables are reduced to 3. With the option of electronic components with very low consumption as low power regulator , microcontrollers with nanowatt technology and solid-state relay, the consumption of the device may be reduced to 300µA. In this case, the device can be powered directly from the zone cables which are usually operate on 3mA current without disrupting its operation. Therefore, the device can operate well with 2 cables if low-power components are selected. Wireless device variation can be easily manufactured with processor interfacing directly with a radiofrequencies subunit for encoded signal broadcast and with the addition of a power unit.

[0008] Magnetic switches (8) and (9) are discrete. The first one (8) is installed to the outer construction (shutter) that closes a window and it is connected only to terminal (14). Respectively switch (9) which is installed to the inner construction which carries the glass is connected to the terminal (15). In this way, microprocessor can distinguish when the inner or the outer construction of a window is opened/closed. In drawing 3 the switch (10), is one or more magnetic switches connected in parallel with the port (25). As the main program runs (37) the permissible status of the switch is open. When the switch is closed, the microprocessor causes an alarm. In other subroutines it may have another purpose as the initiation of other subroutines (fig 8 (47)). It can therefore be used as an

additional function switch such as when it is closed after the tenant has opened both constructions from inside of the home. The fig 4 A presents two different ways of installing the magnetic switch (10), which may coexist if one installs two magnetic switches connected in parallel with the port (25). In the first installation-way, the switch (10) is placed in proximity to the switch (9), in such a distance that is not affected by the field of the magnet. A burglar with simple means such as a compass, could detect the location of bogie magnet switch (9) and therefore the switch itself. Administering a strong magnetic field from the outside of the home will take the switch (9) out of order, but it will cause the closure of switch (10) and thus cause an alarm. The second way to install switch (10) and magnet (27) is to place them in such a relationship in order that during the opening of the closed construction, they will come into close proximity and the originally open switch (10) will close and cause an alarm. The arrow indicates the course of the opening. So even if someone succeeds in disabling switches (8) and (9), as the door/window opens the switch (10) will inevitably detect the magnet (27) and the alarm will go off. The advantages of using this method is that unlike the switches (8) and (9), the switch (10) is not detected from the exterior and it is protected by the motion detector (18). Alternatively instead of a reed switch, a hall effect sensor can be used too.

[0009] The relay (20) is connected in series to the terminals that accept the wires of the zone, in a normally open (N.O.) condition. So when the device is not powered, the zone (13) of the control center is opened. When the processor (23) closes the relay (20) and therefore the zone (13), with energy expenditure, it holds them closed until there is a condition that breeds an alarm. In this case the signal to relay (20) comes to zero and it returns to its original normally open status opening the zone (13) of the control center.

[0010] The operating principle of device as shown in the drawing 4B is the following: the microprocessor (23) which controls the relay (20), opens the zone (13) of the control center (11) thus causing alarm. The microprocessor (23) is equipped with software that allows the user to select the appropriate function of the device that best meets his/her needs by changing the settings of the jumpers (21). Each program requires different conditions to cause alarm (opening zone by the relay) and therefore provides the user with different permissions and therefore of a different 'quality' or 'level' of protection. Each program may use a different number of sensors (one, two, or even any) as well as different number of peripherals (one or two magnetic switches, with or without sensor for magnetic fields). The final number of rights and protection parameters (e.g. glass protection, protection against magnetic fields) which are provided by the device is specified by the program chosen by the user and by the peripherals that are connected to the device.

[0011] In figure 5A, a variation of the device is displayed that targets to more demanding users. It can be

installed as a peripheral device in control centers which support dual end of line resistor (dual end-of-line resistor, DEOL). As it is described below, this device variant has two relays and enables users to modify the conditions causing alarm, of all the peripheral devices that are installed in home, by handling the keyboard of the control center. The operating principle of the DEOL resistance is shown in draft 5. So far, the aim of this circuit was the omission of cabling for the device's tamper, resulting in a saving of time and materials during the installation of an alarm system. Opening the switch 1 (fig 5 B) implies a violation of the tamper. This constitutes an alarm condition in case which the control center is armed or when it is disarmed but the tamper protection is enabled. It is not an alarm condition when the control center is disarmed and the tamper protection disabled. When the switch 2 (fig 5B) is opened, resistance 2 enters the circuit and the whole resistance that is measured by the control center is the summation of the two resistors EOL1 + EOL2. This is an alarm treaty only when the control center is armed. In the variation of our device, the above layout is integrated with the difference that the switch 1 is substituted by the relay (20), while the switch 2 is substituted by the relay (29). The two relays (20), (29) are connected with the microprocessor (23) which controls their operation. The relay (20) binds only in a normally open condition, while the relay (29) can be connected in both ways, N.O. and N.C.. The existence of the relay (20) does not preclude the tamper switch (16) which can be connected in series. The conditions under which the relay (20) or the relay (29) are opened/closed, are programmed in the microprocessor, again with different subroutines which can be defined by the user. So potential scenarios that can occur are the following: 1) relay (29) opens each time a door is opened despite the triggering of the motion sensors, while the relay (20) is opened only when a door/window is opened from the exterior of the home or when there is an excitation firstly of the detector (18) and then of the detector (17). In this case when the tamper protection is activated and the control center disarmed, there is a clever system of 24-hour protection which enables the tenants to open and close their door/windows from the interior of the home. When the control center is armed, there is a conventional system that doesn't allow any manipulation of the structures of a door/window. 2) The relay (29) opens only in the case of treaties that brings on a possible breaking of the glass of a door/window. In this case we have a 24-hour protection on magnetic contacts while the glass is protected only when the system is armed. 3) The relay (29) opens only when the door/window is open and someone passes from the outside inwards. In this case we have 24 hour protection for the glass and the magnetic contacts. When the system is armed and if a door/window is open, the conditions of transit towards the interior of the home will trigger an alarm. So even if the door/window has been forgotten open, the home continues to be protected. 4) The relay (29) is opened and remains open during the opening of

the shutter. In this way, the tenant may be informed by the keyboard, when he arms the system, which openings have their shutters open. This function is particularly useful during night hours when doing the last check out at his home before falling asleep. These combinations of functions are indicative. The system is flexible enough to incorporate several more functions into the software which will be chosen according to the user protection needs by the usage of the device jumpers. Furthermore, a specific programming can be made in special cases or even the desirable program can be selected from a programs library. For this purpose, the device has a slot (30) for re-programming. This enables the demanding user or the installer, to design his own solution to protect an opening, which will be implemented by the developers of the company which will manage the invention. Due to the existence of this slot (30), on site programming can be made in case the current program/subroutines do not meet the user's desirable level of protection. Once the device is installed, the daily selection of alarm conditions is made from the keyboard of the central alarm system by enabling or disabling the tamper protection and the arming or disarming the system. So in everyday life, there are three possible choices, depending on the user's requirements for protection with the rights or prohibitions that he has selected during device's setup: 1) tamper protection disabled and alarm disarmed, 2) tamper protection enabled and 3) alarm armed. In the proceeding description of the drawings related to the operation of the device, the reference to the word 'alarm', marks the opening of the relay (20) in the basic version of the device. The opening of the relay (29) can be added to the flow charts at any point, thus creating a great number of functions, the reference of which at this point would create a multitude of drawings which would cause confusion. The purpose of the figures is to better understand the operation of the device and not to include all possible cases, which is practically impossible. Thus, this will be omitted. In practice, this option offers unlimited flexibility, which makes the device able to adapt to the wishes of the residents regarding the conditions causing alarm when the system is armed or when not. Furthermore, there is a port (31) for connecting two devices together. The interface is required in cases of large openings as in the drawing 5C. In this case the installation of the devices varies in the extent that only one of the two devices is connected to the control center (11), while the two devices are linked with cables (32).

[0012] Drawing 6 displays in the form of a flow chart the main program of the device that is common in any setting of the jumpers. At the launch of the device the switches' condition is checked (initial control) (33). Compulsory conditions for the continuation are a) at least one of the two magnetic switches located on the window glass (9) and the shutter (8) is closed (34) and b) switch (10) does not detect a magnetic field (35). These conditions ensure that the door or window is closed and that the installation of the device's magnetic field sensor (10) was

not placed in proximity to the magnetic switches (8), (9) so as to detect the fields of the coupled magnets and is therefore ineffective. If one of these conditions is not met, the relay (20) does not close the zone (13) and thus a fault zone is displayed on the keypad of the control center. If both conditions are met the relay closes the zone (36) and the device goes to the main function (37). The microcontroller then stores (38) the condition of magnetic switches (8) and (9) and then keep comparing it with the current one (39). Any change will bring an alarm. Alarm goes off also if the switch (10) is found closed. Having established that there is no alarm treaty from the magnetic switches the system checks the motion sensors and if there is an excitation (40), it calls the subroutines that has been preselected by the user by adjusting the jumper's settings (21). Indicatively, some of the subroutines are analyzed in the following paragraphs. In these subroutines, alarm can occur either by changing the state of switches or by certain patterns of motion sensors stimulation. Especially in the latter case, the conditions causing alarm by motion sensors are: a) stimulation of the sensor (18) with a duration above a predetermined value, and b) Sequential stimulation of the first sensor (18) regardless of its duration and then of the sensor (17).

[0013] Figure 7. This drawing shows the way in which the microcontroller processes the signals received by the two motion sensors in order to detect the presence of alarm conditions (eg breakage of glass or breach of the shutter). This subroutine is called since at least one of the two structures are closed and the state of the switches is the same as the saved one. Alternatively it can be called only when the glass is closed. The sensor (17) is used so that no false alarm occurs whenever a tenant is approaching the door/window from the interior of the house. Under certain conditions both sensors can cause an alarm. Of the two, however, only (17) can inhibit the alarm caused by sensor (18). So starting from where the two sensors are initially inactive and sensor (18) stimulation occurs which lasts over a predetermined time (41), an alarm is caused. If the duration of the stimulation is less than the one required (42) to cause alarm, the device continues its operation with the main program (37). If immediately after stimulation of sensor (18), sensor (17) is activated, the alarm goes off (43) regardless the duration of the stimulation of sensor (18). The stimulation (44) of the motion detector (17) when preceding the stimulation of sensor (18) inhibits the alarm. It also inhibits the alarm caused by the change of state (45) of the magnetic switches (8,9,10). The detector (17) causes an alarm, only when its stimulation follows the stimulation of sensor (18).

[0014] This way of protecting the glass through two motion sensors which inhibit or confirm each other depending on their exciting sequences, is innovative and highly reliable in its operation, because it does not give false alarms and it does not fail to detect the movement of the human body in such a short distance from the device's detectors. In addition it does not have the vulner-

ability of vibration detectors which, as their name says, are constructed to detect a vibration and not a violation, resulting in many false alarms. Instead, this invention is a system for detecting human body movement (since infrared detectors are designed to be stimulated by the body temperature) and is therefore fully specialized to detect the violation.

[0015] Figure 8. This subroutine assigns more rights to the user. The alteration lies at the point (46) of the chart. Stimulation of the detector (17) allows the user not only to approach the door/window but it gives him the right to change the status of the switches and even leave them both open (47). In other words, it entitles him to open the closed construction and leave it open. The microcontroller (23) holds the relay (20) closed and so no alarm is triggering from the control center. At this point a variation can be referred to, as the change of the status of switches should be allowed to follow a specific sequence (48) which suggests motion from the inside of the house to the outside. Therefore the window glass (6) should be opened first and then the shutter (7). With this variant, since the two structures are closed, no handling at the shutter (7), is allowed, if the glass (6) is shut, even if the sensor (17) is excited. The first subroutine can be used in door/windows which are opened by an electrical mechanism, while the second can be used for the simple ones that are opened by the tenant. When both structures (glass and shutter) are opened, the device goes into a standby mode while keeping the zone closed. When at least one of the two switches (8), (9) is closed, it continues the execution of the main program (37). In practice this means that with the central system being armed, the tenant is allowed to approach a door (from the interior), open the glass or /and the shutter and then close them again in any combination or leave them open for long as he wishes. The benefit of such a system can be perceived if one imagine a house where at each door / window one such devise is installed. In this case the residents can live with the house alarm system armed, but without them being trapped inside. They can handle their doors/windows without any restriction and as long as the protection of the house is concerned this has the following positive impacts a) the alarm system is armed for longer periods and so their homes are more protected, b) the system reads the tenant's intention to open a construction by detecting the movement toward it, and automatically it disables the protection for this opening, while the main system continues to protect the rest of the house that is not visually supervised by the tenant, c) each time the glass/shutter is closed, the protection is activated automatically, d) pointless routes toward and from the control center's keyboard are avoided for simple manipulation of the structures such as for example to open a window during a hot summer night. With this invention, residential alarm systems become really smart and in a way, they behave as they distinguish the burglar from the owner. There is no reason why the response of the alarm system to owner (who opens a window from the inside), must be

the same as the burglar (who opens it from the outside) . Taking into consideration the modern practice that implies alarm systems been linked to centers that accept signals, this invention saves them from extra noise caused by false alarms for example when one forgets to disarm his system before opening a window in the morning. An example of the function of the dual terminal resistance (DEOL) device is the following: the relay (29) breaks the circuit at point 2 (47). If the system is armed the alarm sounds, if not the internal process of opening the relay remains silent.

[0016] Figure 9. As far as the implementing protection is concerned, dr. 9 is the same with dr. 8 except that an additional right is granted. The user while stepping out of a door, may close the opening behind him. In this case, the device awaits the closed construction to be opened from the outside of the house (49). If the tenant is leaving home and he wants to activate the protection with him being outside of the house, he can perform a particular pattern of opening and closing of the closed structure (open and then close within a few sec). After this handling any attempt to open the door from the outside of the house will cause an alarm.

[0017] At this point it should be noted that if the installed device has one terminal resistor and the user has selected the program which gives him the opportunity to leave a door/window open , the device should be powered from the control center's terminals that give power only when the alarm system is armed. So when arming the central system, the devices that monitor open door/windows, will give a fault zone signal to the alarm keypad.

[0018] Figure 10. This subroutine demands 2 conditions in order to be called :a) Switches (8) and (9) is open and b) the tenant must push the button on the surface of the device or alternatively close the switch (10) when opening the door/window while the sensor (17) is triggered. Another way to start the subroutine is to detect a specific pattern of an open-close movement of the closed structure (open-closed-open of the door/window in specific time). By using this pattern the window or the door are used as function buttons of the device. When performing the subroutine of Figure 10 the system detects whether a passage from the outside to the inside of the house has happened and in that case the alarm sounds. The scenario covered by this drawing is as follows: The tenant, intending to renew the air of the house, opens the doors or the window closes and reopens it to the desired range. Alternatively presses the button of the device. Then he returns to the interior of the house. From that point if someone passes from outside to inside the house, the device detects the movement and causes an alarm. So with this system, the doors / windows can remain completely open without a reduction to the home's safety.

[0019] Figure 11 shows another function of the devise that provides security even when the doors are completely open and the tenant can pass freely to the outside and inside of his home. The initial choice of the function is

made by the jumpers settings and it is called at the point 47 of the drawing 8. Each time the device detects conditions of a passage to the exterior of the house, adds a value of 1 to a variable X, whose starting value is 0. When a passage from the outside inwards happens, it subtracts 1 point from the variable X. At the end of each cycle the value of X is checked. If it is found less than 0 the alarm goes off. The subroutine continues until one of the switches (8) and (9) is closed.

[0020] Figure 12 describes an operation without the use of infrared detectors. In this case fewer protections exist (not glass protection) as well as fewer rights (the user can not open both structures ,glass and shutter or either one if the other is already open). This chart shows the function of a more economic version of the device, without the motion detectors. This device provides the sole right to open the window glass when the shutter is closed. It also protects itself from external magnetic fields and from malicious short circuit

Claims

1. Peripheral device that connects to home alarm systems and aims to a global protection of a door/window through magnetic switches and motion sensors, **characterized in that** it consists of a microprocessor (23) running protection functions according to the device's jumpers (21) settings , 2 relays (20), (29), two motion sensors, (17) (18) electrically connected to the microprocessor, sockets (14), (15), (25) for the magnetic switches (8), (9) and (10), slot (31) used to interface with another device, slot (30) used for the reprogramming of the device, an indication led(22) and a button(19) for manually activating device's functions.
2. Peripheral device that connects to home alarm systems and aims to a global protection of a door/window through two magnetic switches and motion sensors (17) and (18) connected to the processor according to claim 1, **characterized by** the fact that these two motion sensors (17) and (18) are embedded in the device's box in such a way that their visual fields extend in opposite directions and therefore are distinct and not penetrating each other. This means that every point in space that is monitored by each of them is not included in the supervision of the other.
3. Peripheral device that connects to home alarm systems and aims to a global protection of a door/window through magnetic switches and motion sensors, which is enabled with 3 sockets (14), (15), (25) for receiving magnetic switches, (8) (9) and (10) according to claim 1, **characterized in that** when window glass and shutter are closed, the two switches (8) and (9) are coupled with their magnets and thus closed, while the third (10) or the others that are connected in parallel with it, are not affected by any magnetic field and so they are open.
4. Peripheral device that connects to home alarm systems and aims to a global protection of a door/window through magnetic switches and motion sensors, which has two relays (20), (29) associated with the microprocessor (23) according to claim 1, **characterized by** the fact that both relays lay in a special circuit so that relay (20) operate as a zone's (13) circuit breaker while the other (29) is connected in parallel with a resistor (28) connected in series with the zone (13), and it short-circuits or not this resistor. This circuit gives three different values to the current of zone (13).
5. Peripheral device that connects to home alarm systems and have two relays (20), (29), of which one (20) acts as a circuit breaker of zone (13) of the control center (11) and another (29) connected in parallel with a resistor (28) connected in series with the zone (13) and it short-circuits the resistor or not, giving three different values to the current of zone (13) according to claim 4, **characterized in that** the relay (20) connected in series with the zone (13) is in a normally open condition.
6. Operation method of peripheral device connected to home alarm systems that aims to a global protection of a door/window through magnetic switches and motion sensors, **characterized by** the installation's location (5) which is above or alongside the opening (6), (7) and by the software which is composed of a main program (37) and from subroutines (Drawing 8), and (Dr. 9), which are called from the main program when the two motion sensors (17) and (18) are stimulated.
7. Operation method of peripheral device connected to home alarm systems and installed adjacent to or above a door/window according to claim 6, **characterized in that** at the functional direction of the device, motion sensor's (17) optical field extends towards the interior of the house, while the second motion sensor's (18) field extends towards the door/window glass. Consequently, the motion sensor (17) is stimulated by movement in the area extending to the interior of the room (3) to the range of sensor capabilities and a plane passing through the device, perpendicular to the floor or inclined towards the interior of the house, while the other motion sensor (18) is stimulated by movement in the space defined by the level above and the door/window (6).
8. Operation method of peripheral device connected to home alarm systems , enabled with special software that comprises of the main program (37) and from subroutines (drawing 8) (drawing 9) which are called

from the main program when the motion sensors (17) and (18) are stimulated according to claim 6, **characterized in that** during the execution of the main program (37), any change in condition of magnetic switches (8), (9) and (10) will cause an alarm.

9. Operation method of peripheral device connected to home alarm systems, enabled with special software that comprises of the main program (37) and of sub-routines (drawing 8), (drawing 9) which are called from the main program when the motion sensors (17) and (18) are stimulated according to claim 6, **characterized by** the fact that there are minor subroutines called by specific patterns of opening and closing of the the magnetic switches. In this way the window glass and the shutter are used as functions buttons of the device and can enable the protection even from the outside of the house.
10. Operation method of peripheral device connected to home alarm systems, enabled with special software that comprises of the main program (37) and of sub-routines (drawing 8), (drawing 9) which are called from the main program when the motion sensors (17) and (18) are stimulated according to claim 6, **characterized in that** the initial stimulation sequence with the motion sensor (17) facing the inside of the house stimulating first and the motion sensor (18) facing the glass stimulating secondly, calls the subroutine (fig.8) during which no alarm sounds when changing the condition of magnetic switches (8), (9), (10) to any possible combination. This subroutine allows the opening of the door's/window's glass and shutter which are installed with the above mentioned magnetic switches and remain in their new situation for an indefinite period of time(47).
11. Operation method of peripheral device connected to home alarm systems in which the excitation sequence of motion sensor (17) which is facing the inside of the house and then the motion sensor (18) which is facing the door's/window's glass calls the subroutine (Fig.8) in which no alarm sounds when changing the state of the magnetic switches, (8) (9), (10) in any combination according to claim 10, **characterized in that** it allows the occupant to leave the house and close behind him the glass or the shutter, so the subroutine continues to run and in the subsequent change of the state of magnetic switches without prior stimulation of motion sensors, which happens when the tenant opens the closed construction from the exterior of the house to enter the interior (49), the alarm does not go off.
12. Operation method of peripheral device connected to home alarm systems and has special software that comprises of the main program (37) and from sub-routines (fig.8) (fig.9) which are called by the main

program when the two motion sensors (17) and (18) are stimulated according to claim 6, **characterized in that** the excitation of the motion sensor (18) which is pointing to the glass without prior stimulation of the motion sensor (17) which is facing the inside of the house, causes an alarm.

13. Home protection system through a home alarm control center and peripheral devices protecting openings (door/windows) via magnetic switches and motion sensors **characterized by** that the peripheral device collects and processes data from the associated magnetic switches, (8) (9) and (10) and built-in motion sensors, (17) (18) and if a burst treaty is found it signals to the control center (11) of home alarm system by changing the value of current of control center's zone (13).
14. Home protection system through a home alarm control center and peripheral devices protecting openings (door/windows) via magnetic switches and motion sensors that change the value of zone's current according to claim 13, **characterized in that** if eventually the control center(11) will sound an alarm depends on whether the value of the zone's (13) current which has been modulated by the peripheral device via the operation of the relays (20) and (29), is identical to the one that control center causes an alarm . In this way the user is enabled to select the situation or situations of zone (13) which will cause an alarm by handling the control center's (11) keyboard.

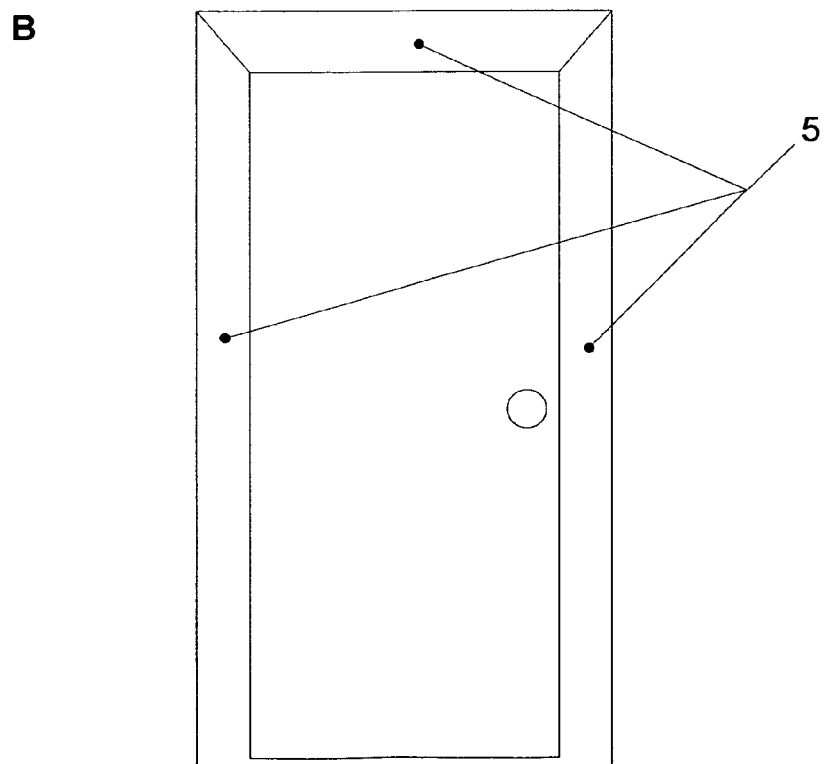
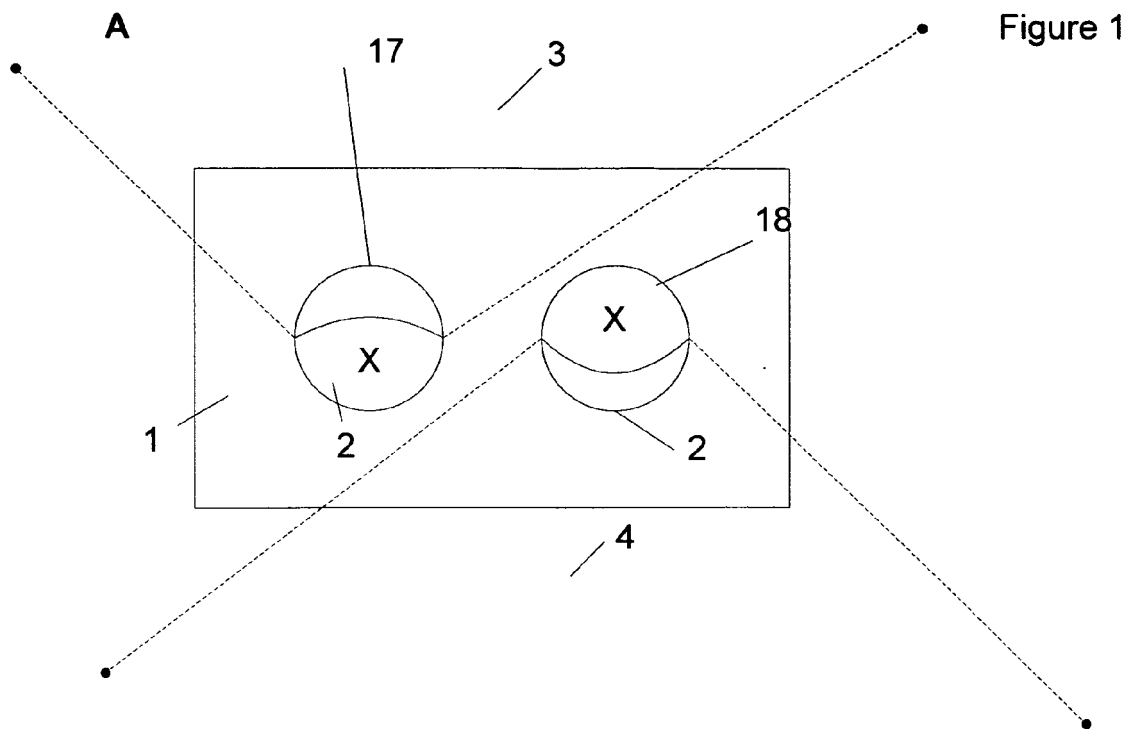


Figure 2

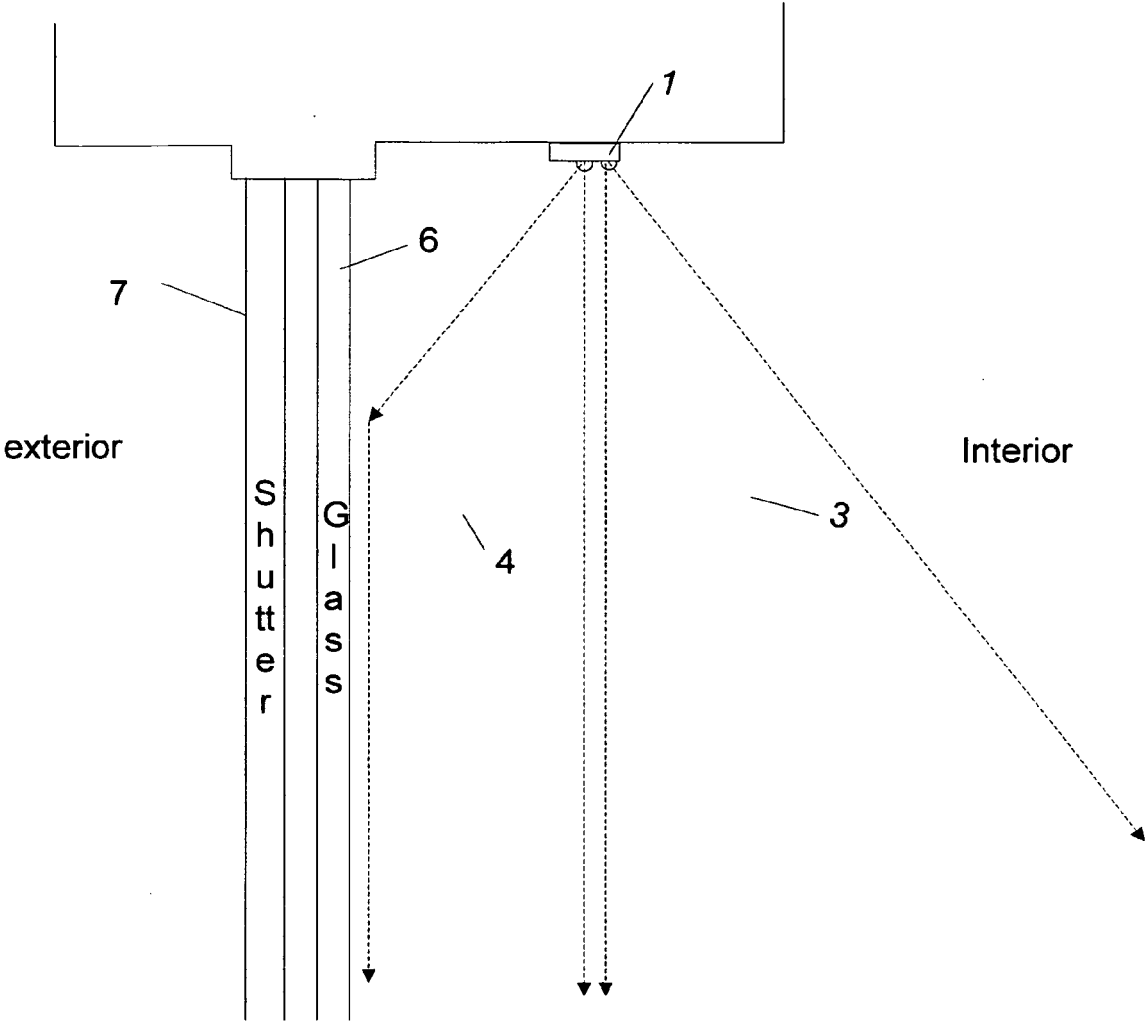
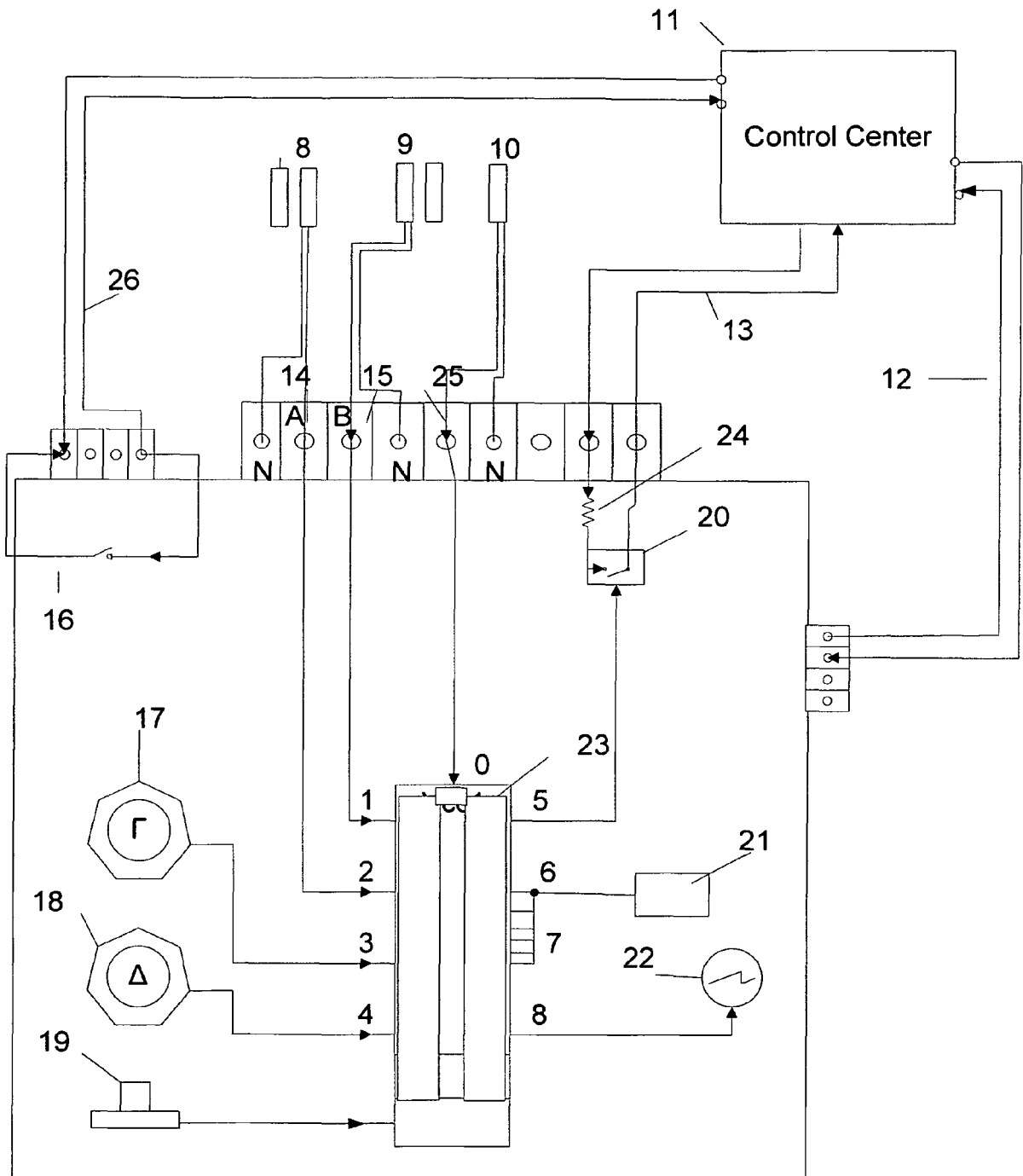


Figure 3



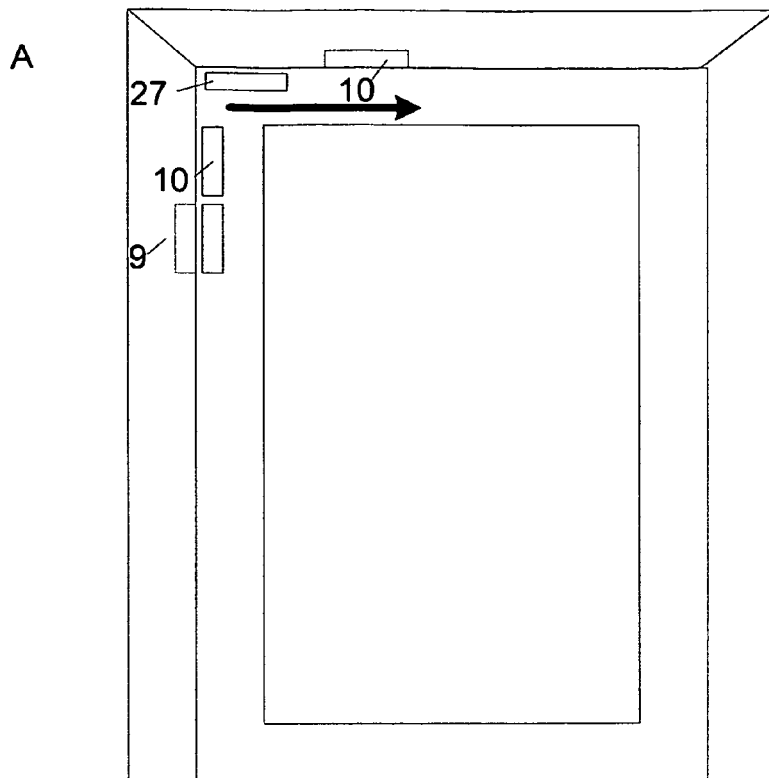


Figure 4

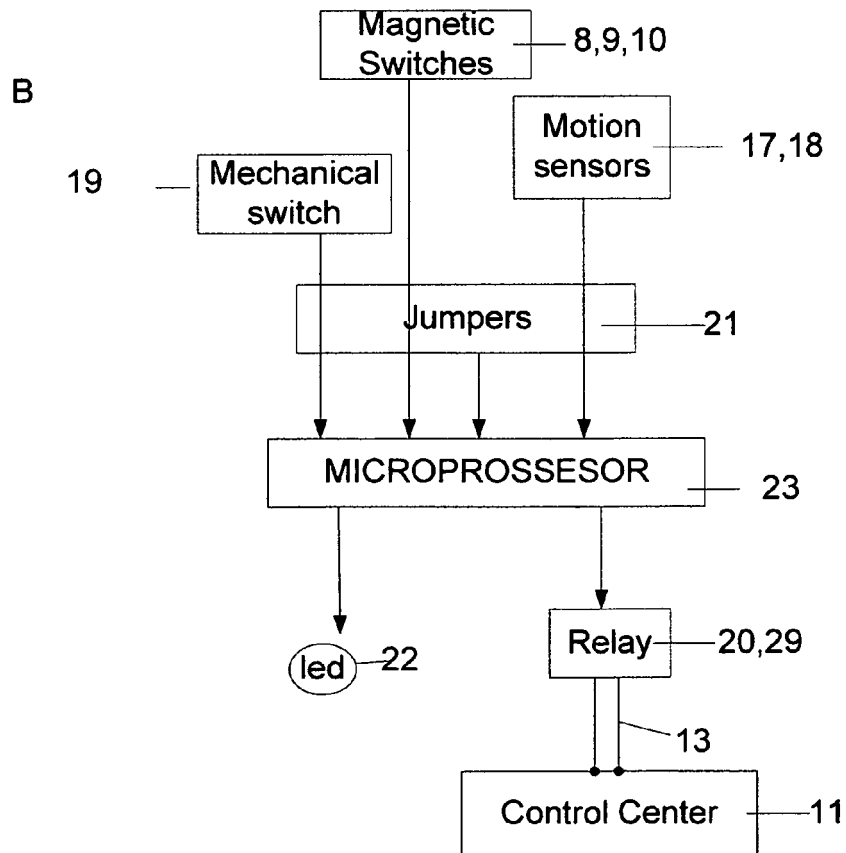


Figure 5

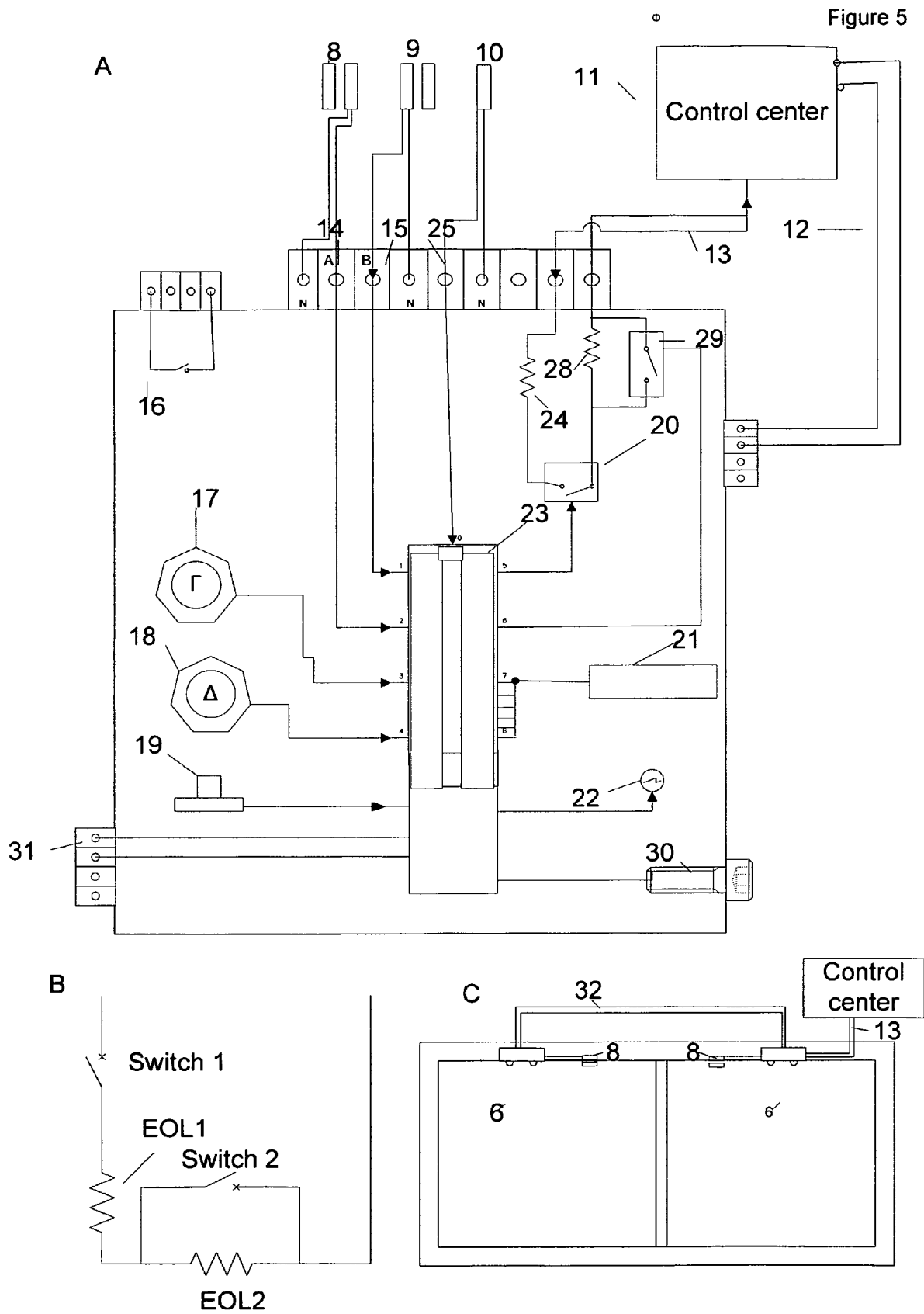


Figure 6

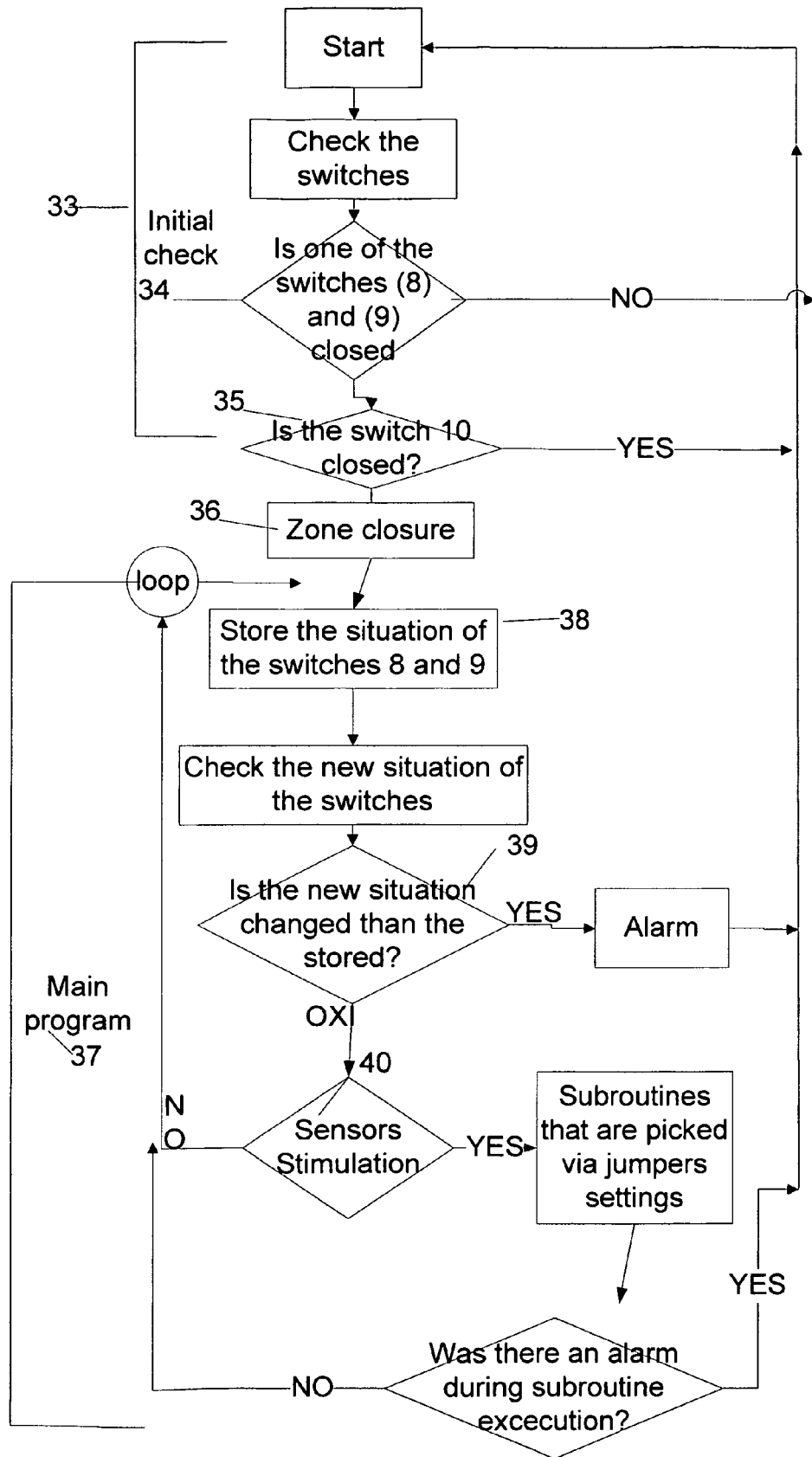


Figure 7

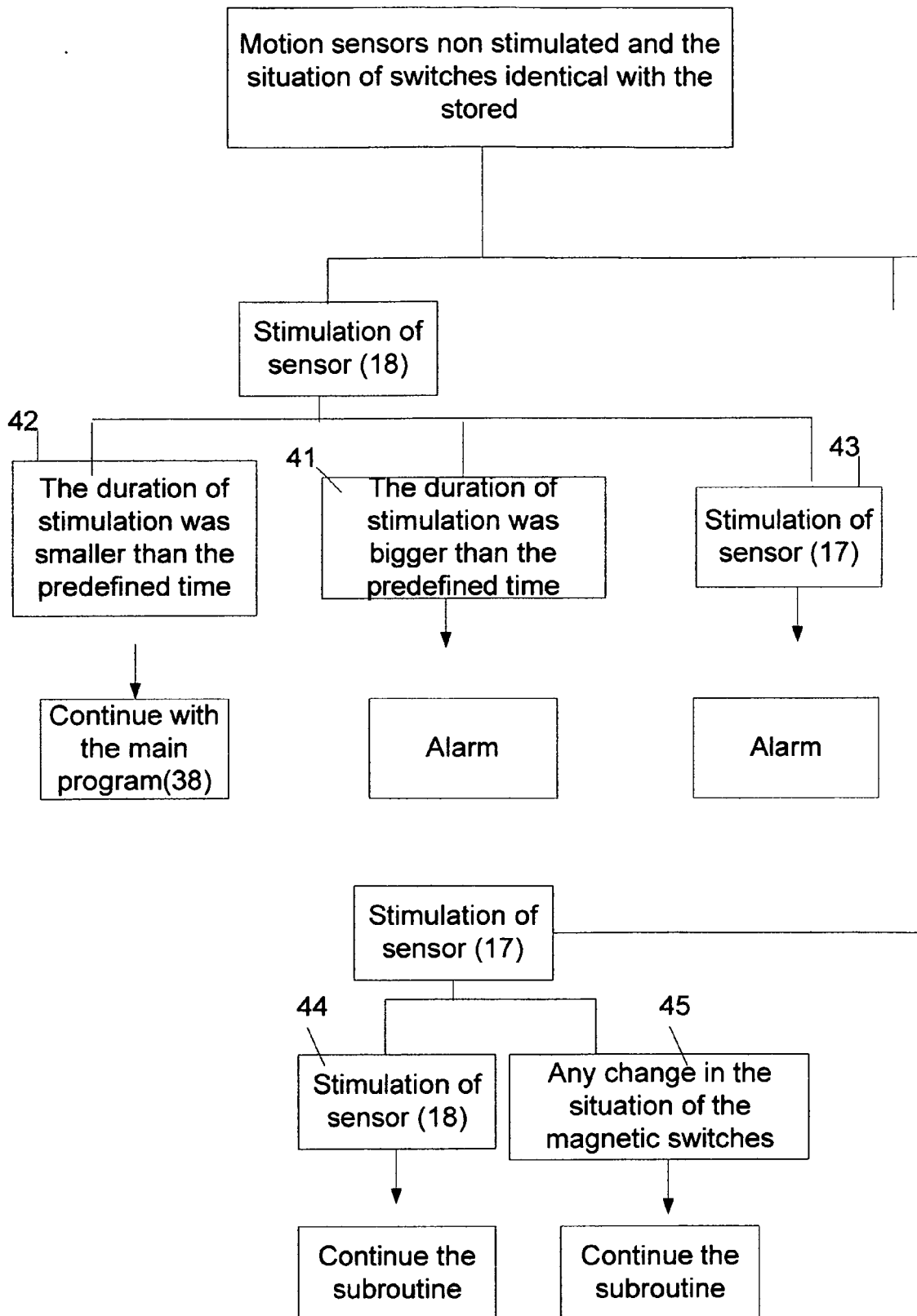


Figure 8

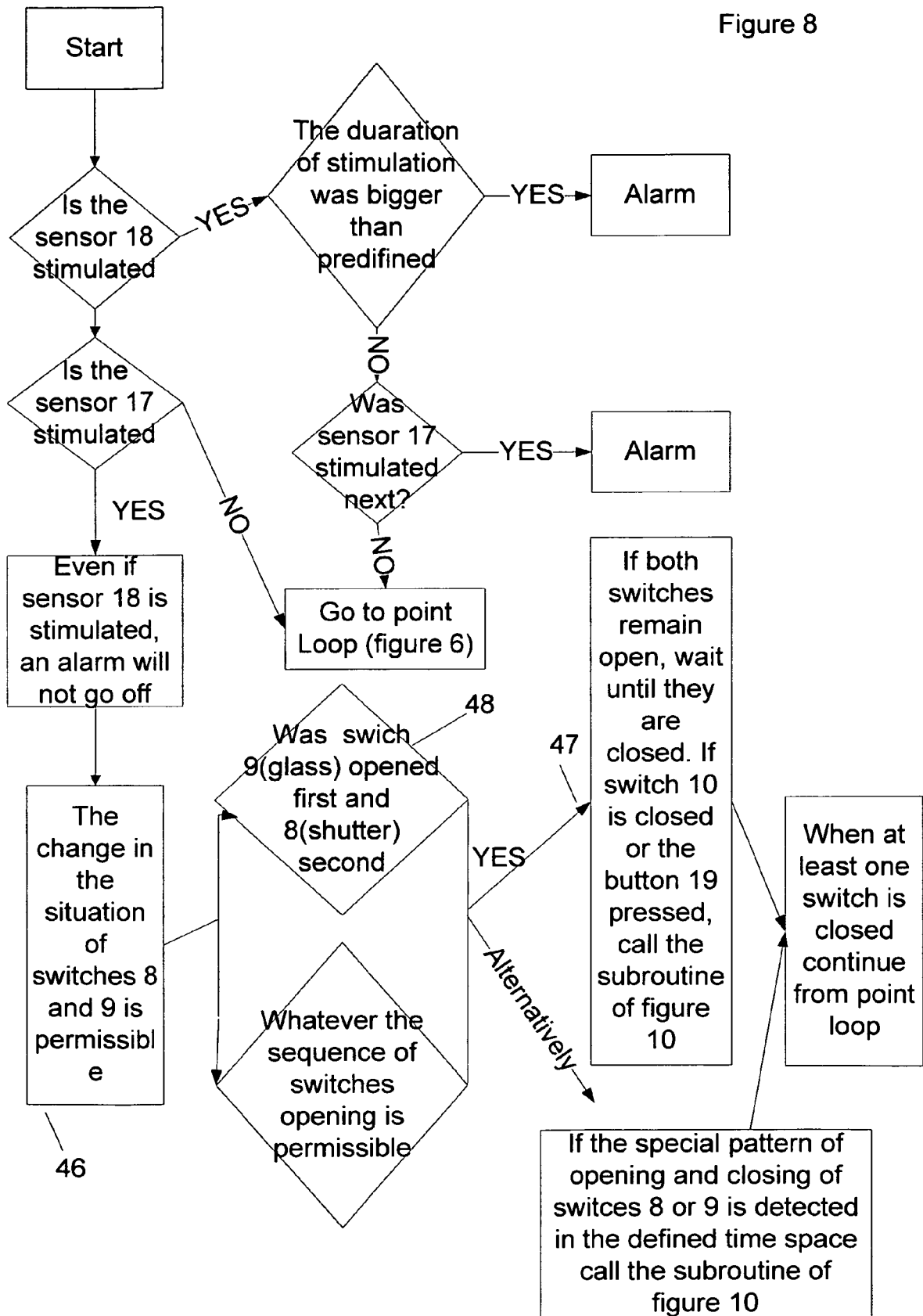


Figure 9

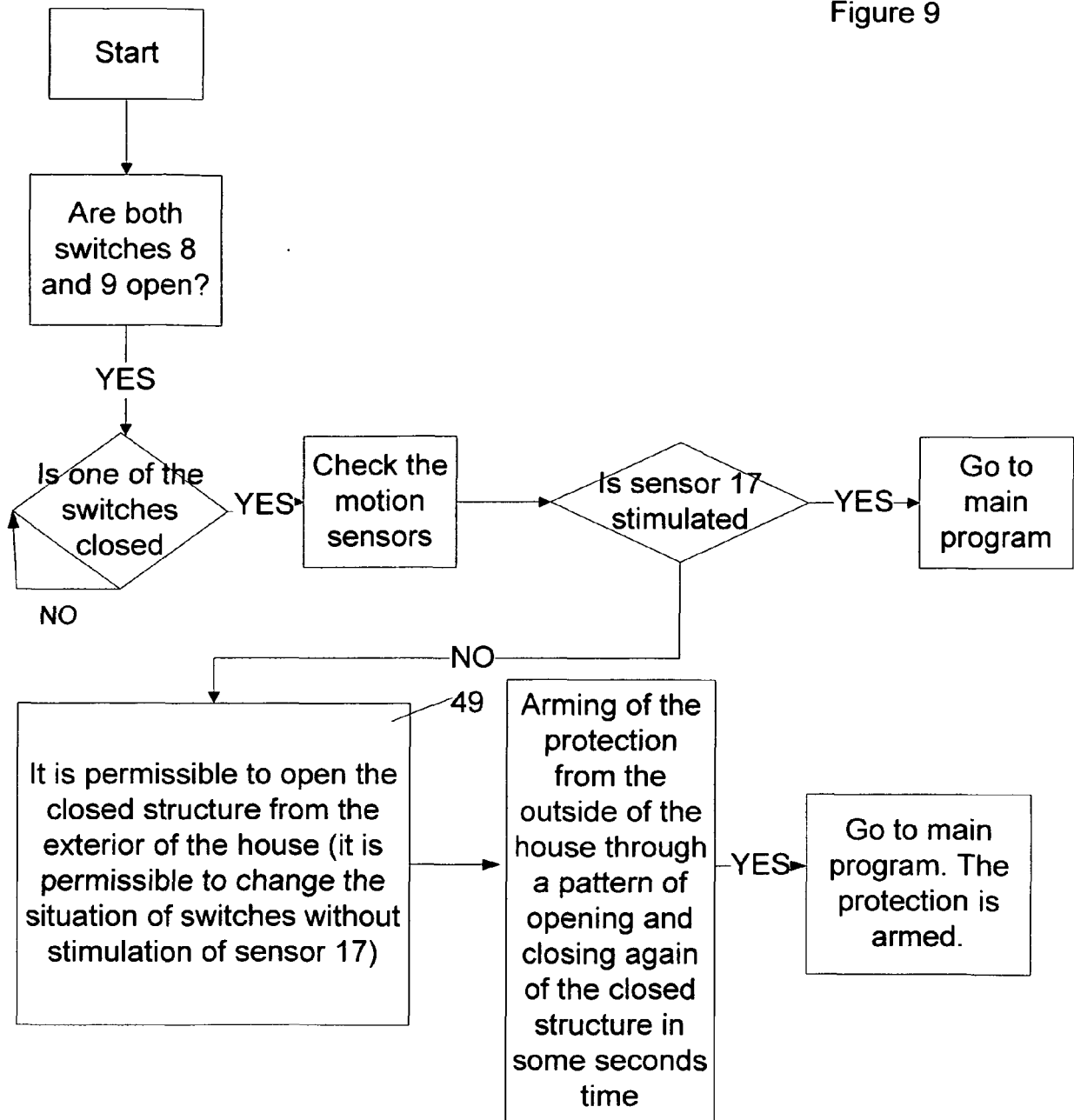


Figure 10

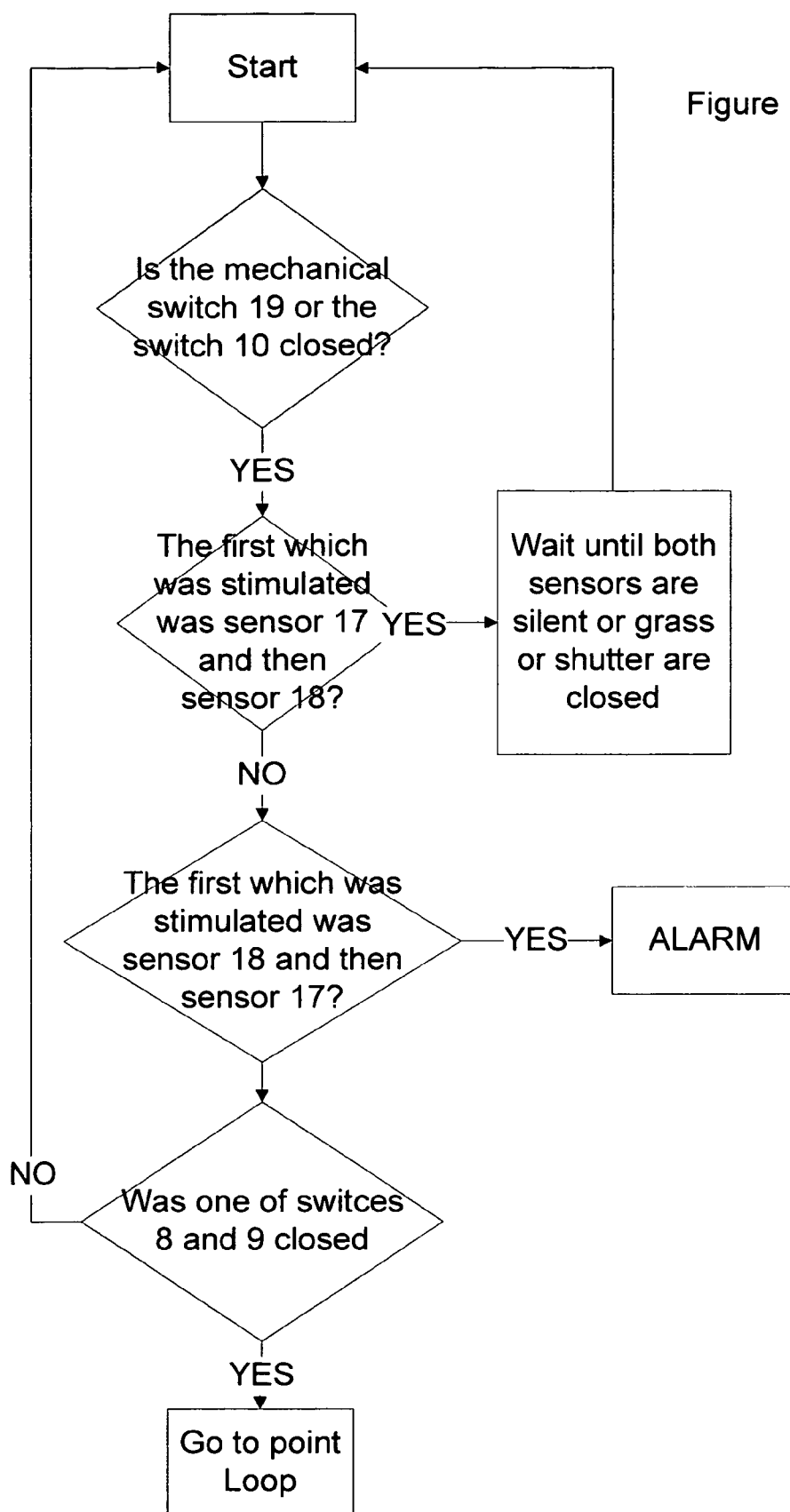


Figure 11

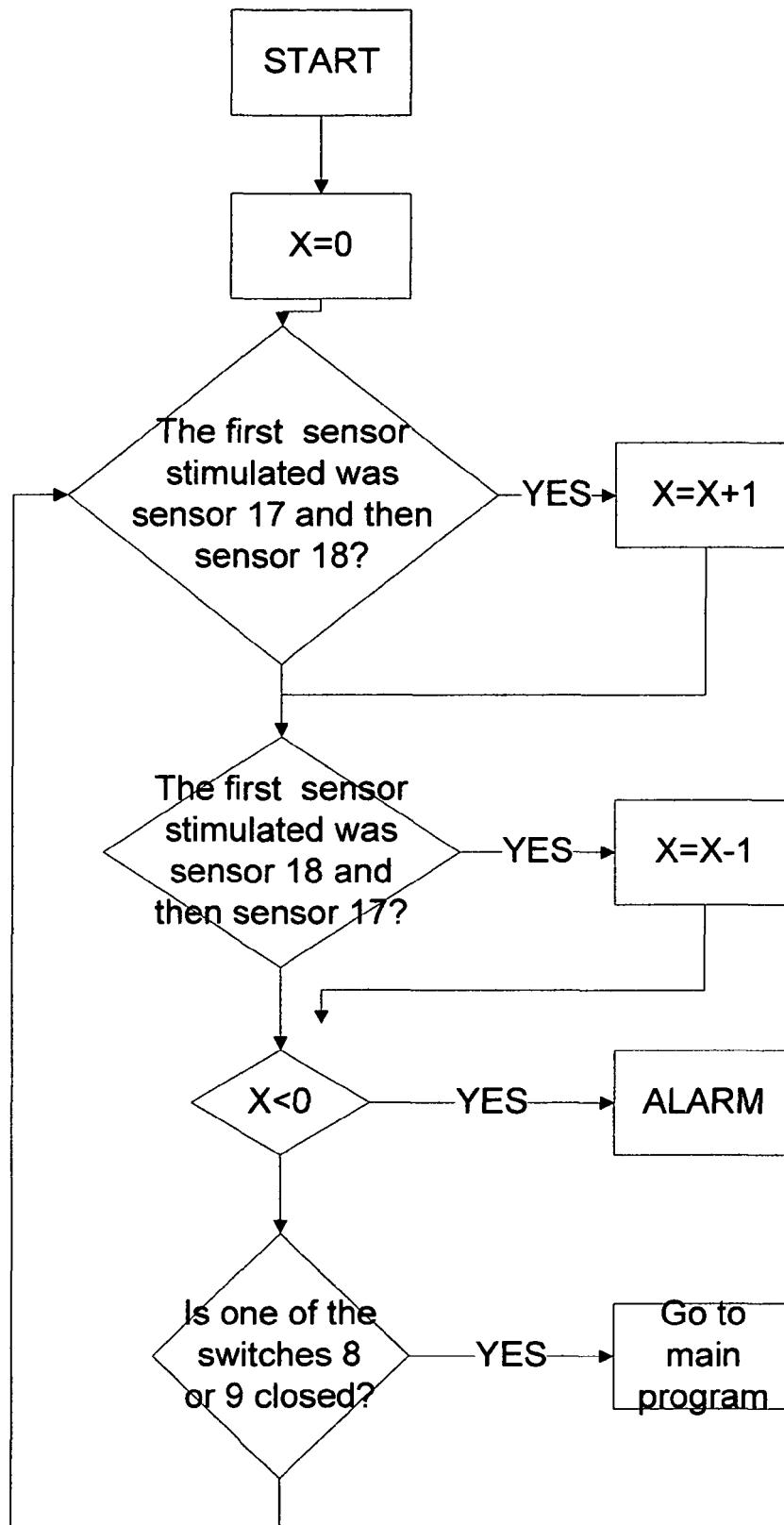
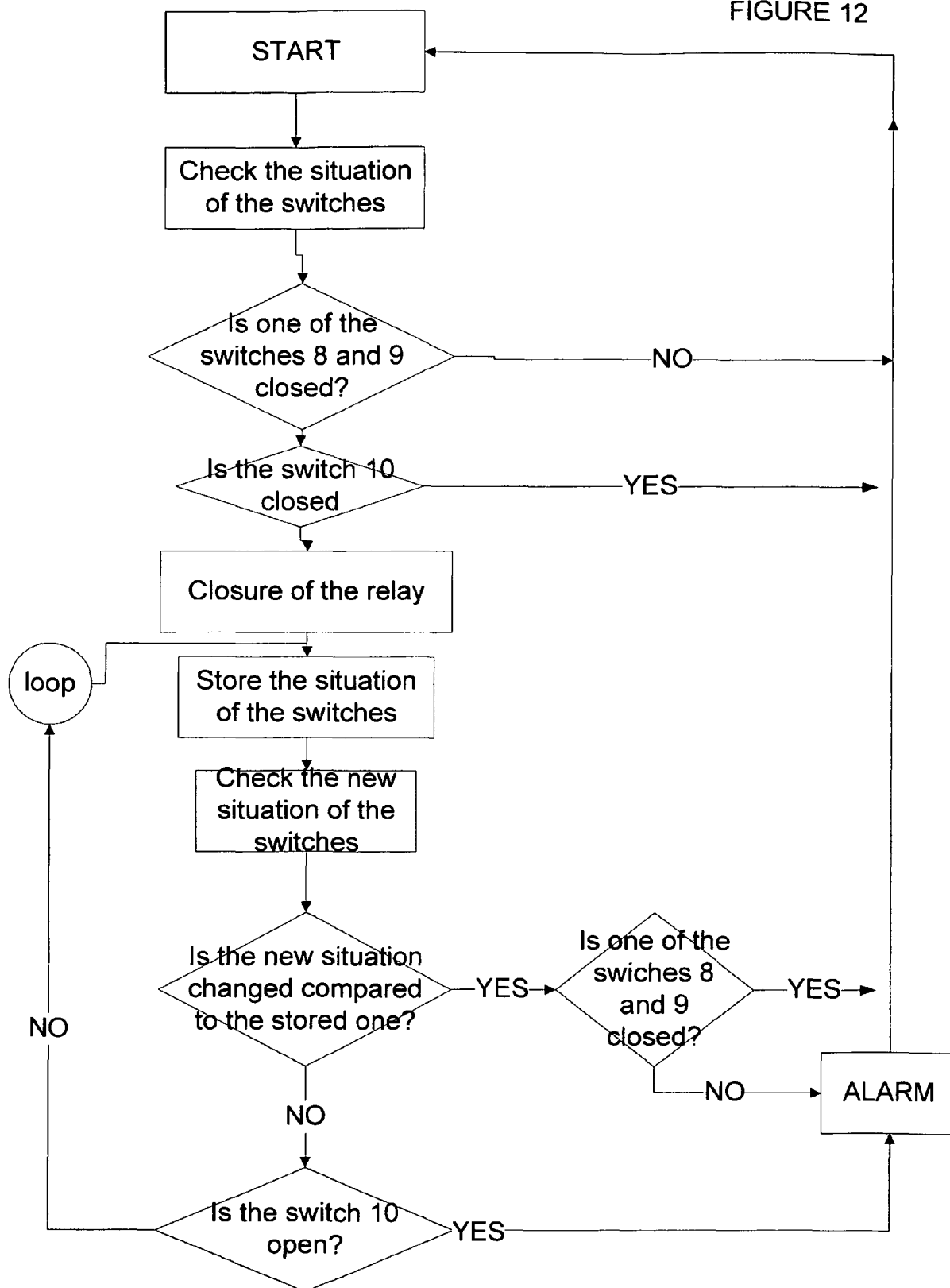


FIGURE 12



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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