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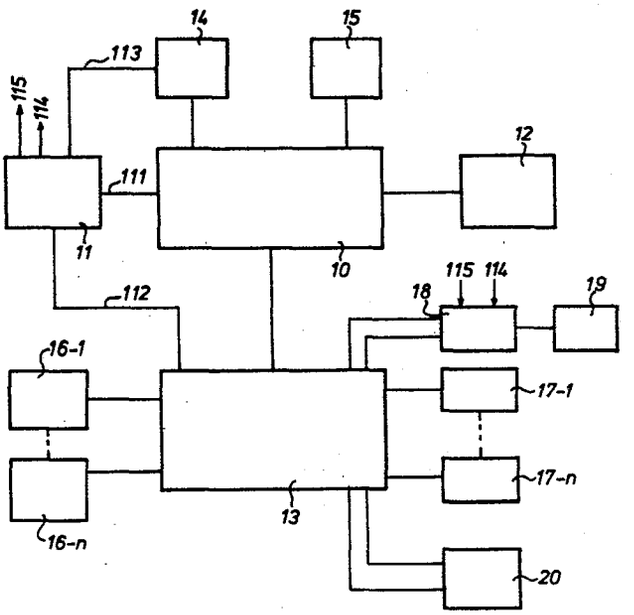
## (54) Safeguarded lockable container, particularly case for transporting money and securities.

(57) The invention relates to a safeguarded, lockable container comprising a microprocessor device provided with at least one microprocessor (10), a memory member (12) connected thereto, in which a safeguarding programme is stored, an input/output member (13) connected to the microprocessor and a tempering member (11) connected to the microprocessor and to the input/output member for producing a first temper signal (111) having the system frequency of the microprocessor, a second temper signal (112) having a given frequency for scanning the inputs of the input/output member and a third temper signal (114) having a frequency which fixes a given count-down time decrement, a plurality of status guarding members (16–1 . . . 16–n) connected to respective inputs of the input/output member and a plurality of alarm producers (17–1 . . . 17–n) connected to respective outputs of the input/output member, the output signal of at least one of the status guarding members signalling whether the container is safely locked in which under control of the safeguarding programme, during continuous signalling of the safely locked state of the container the microprocessor diminishes a period of time defined in the safeguarding programme by the count-down time decrements and as soon as or after the period of time is counted down to zero instant or as soon as at least one of the status guarding members signals that the container gets into an unsafe state

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it actuates at least one output of the input/output member connected to a respective alarm producer so that this alarm producer is energized, whilst without actuating anyone of the outputs of the input/output member connected to the respective alarm producer the microprocessor stops counting down after the container has been opened in accordance with the safeguarding programme.

# Safeguarded lockable container, particularly case for transporting money and securities.

The invention relates to a safeguarded, lockable container.

The invention has for its object to improve the safeguarding of the transport of, for example, money and values, in particular the transport of money and values in a case which has to be brought, for example, by a messenger from an armoured car to, for example, a bank.

According to a first aspect of the invention there is to this end provided a container of the kind set forth in the preamble which is characterized in that it comprises a microprocessor device having at least one microprocessor, a memory member connected thereto in which a safeguarding programme is stored, and input/outpu member connected to the microprocessor and a tempering member connected to the microprocessor and to the input/output member for generating a first temper signal having the system frequency of a microprocessor, a second temper signal having a given frequency for scanning the inputs of the input/output member and a third temper signal having a frequency which fixes a given count-down time decrement, a plurality of status guarding members connected to respective inputs of the input/output member and a plurality of alarm producers connected to respective outputs of the input/output member, in which the output signal of at least one of the status guarding members signals whether

the container is safely locked and under the control of the safeguarding programme and during continuous signalling of the safely locked state of the container the microprocessor diminishes a period of time defined in the safeguarding programme by the count-down time decrements and as soon as or after the count-down has reached the zero instant or as soon as at least one of the status guarding members signals that the container gets into an unsafe state at least one output of the input/output member connected to a respective alarm producer is actuated so that this alarm producer is energized, whilst without actuating anyone of the outputs of the input/output member connected to a respective alarm producer the microprocessor stops counting down after the container is opened in accordance with the safeguarding programme.

Instead of counting down the basic period of time fixed in the safeguarding programme by the count-down time decrements determined by the frequency of the third temper signal with the associated alarm generation at a zero instant, a zero instant may, of course, be used as a start for counting up by count-up time increments determined by the requency of the third temper signal with the associated alarm generation when a period of time fixed in the safeguarding programme is counted up. However, for several reasons counting down by count-down time decrements is preferred, inter alia because counting down to a zero instant (00 : 00) excludes any ambiguity with regard to the period of time or transit time fixed in the safeguarding programme, which may be a standard as will be described more fully hereinafter, or may be keyed or written by the messenger.

According to a second aspect the invention provides a container of the kind set forth in a premable which is characterized in that it comprises a locking member for locking the container in order to generate a locking signal in the locked state of the container, a time setting member for generating a time signal which is representative of a given period of time, a time-base member for producing a time-base signal of a given frequency, a time count-down member connected to the locking member, to the time-base member and to the time setting member in order to count down, after reception of the locking signal, from the period of time determined by the time setting signal by time decrements determined by the time-base signal as long as the time count-down member continues recei-

ving the locking signal and an alarm member for producing an alarm signal when or after the time count-down member has counted down to a zero instant.

The invention will now be explained in detail with reference to the drawing, in which

Fig. 1 is a block diagram of electronic and electric members to be arranged in or on the container,

Fig. 2 is a detailed circuit diagram of the blocks of Fig. 1,

Fig. 3 is a simplified block diagram of the electronic safeguarding device to be arranged in or on the container with the use of a microprocessor and

Fig. 4 shows in a drastically simplified form the design of a case carrying securities.

In a first, practical embodiment of the invention the container employed as a case is provided with a plurality of display elements, for example the well-known red light emitting, 7-segment display elements and/or liquid crystal display elements, as the case may be, an additional lock switch for selecting the form of alarm and/or signalling and three push-button switches for setting each a period of time to be discussed hereinafter, whilst furthermore the container may be equipped with a chain with a wrist band and inside with a wire loop and a magnetic contact to constitute a detection loop to be described later. Moreover, for safeguarding the case in this embodiment a so-called smoke cartridge was chosen.

Referring to Fig. 1 reference numeral 1 designates a locking member, reference numeral 2 a time setting member and reference numeral 3 a time-base member. The output signal of the locking member, the time-setting member as well as of the time-base member is applied to a count-down member designated by reference numeral 4, the output signal of the locking member 1 being designated by reference numeral 101, the output signal of the time-setting member by reference numeral 102 and the output signal of the time-base member by reference numeral 103. The output signal of the time count-down member 4 is applied to an alarm member referenced 5 and is designated by reference numeral 104. The output signal of the alarm signal 5 referenced 105, termed the alarm signal hereinafter, is applied, in one embodiment of the container in accordance with the invention, to a member for energizing a smoke cartridge desig-

nated by reference numeral 6. In this embodiment of the invention the alarm member is connected to the aforesaid detection loop designated schematically by reference numeral 7, the output signal of which is referenced 107.

The locking member 1 may be provided with a lock having at least one electric switching element to permit of locking the container and of generating a locking signal 101 in the locked state of the container. This signal is preferably a bivalent signal, which may be high when the container is locked, which may be represented by a logic 1, whereas with the above assumptions it represents a logic 0 when the container is not locked. When the time count-down member receives a logic 1, it will know that the container is locked, whereas when the time count-down member 4 receives a logic 0, it will know that the container is not locked.

Obviously the lock provided with at least one electric or electronic switching element, for example, a contact lock has to be accessible externally of the container in order to permit of locking the container with a key. There may furthermore be provided an additional key switch to select a form of alarm, for example, a smoke cartridge alone or a combination of, for example, a smoke cartridge and a sirene signal.

The time-base member 3 produces a time-base signal 103, which may be an A.C. signal of, for example, 1 Hz so that, as will be discussed later, the time count-down member can count down in time decrements of 1 second.

The time setting member 2 generates a time signal 102, which is representative of a given period of time. It is important to note that the time-setting member comprises a plurality of switching elements, which are accessible, like the contact lock of the locking member 1, externally of the container in order to set occasionally a given lapse of time with the aid of, for example, one switching element, for example, push-buttons, one deactivating the others, or given combinations of switching elements. In the first case a given lapse of time is allotted to each switching element. In a preferred embodiment of the time-setting member 2 the time signal 102 depends on only one depressed key provided on the container. By a first push-button a lapse of time of, for example, 5 minutes can be

set, by the second push-button a lapse of time of 10 minutes and by the third push-button a lapse of time of 15 minutes. Preferably the time signal 102 is a binary code of a given number of bits, in the case of the three push-buttons, for example, 2 bits, in which case, for example, the binary code 0, 1 corresponds to a lapse of time of 5 minutes, the binary code 0,1 to a lapse of time of 10 minutes and the binary code 11 to a lapse of time of 15 minutes. Said binary codes can be simply produced by means of three flipflops connected to one another and to the push-buttons, which will be discussed hereinbelow with reference to Fig. 2.

The time count-down member 4 receives the locking signal, which is a bivalent signal, the time signal 102 being a binary code and the time-base signal 103, which is an alternating-current signal of a frequency of 1 Hz. Starting from the period of time set by the time-setting member, for example, 5 minutes, the time count-down member counts down in time decrements of 1 second so that counting down is true to time. Of course, time counting down may be performed, as an alternative, in a manner not true to time. Moreover, the time signal 102 may be an analogue signal rather than a digital signal.

The time count-down member 4 starts counting down only when the signal 101 is at the logic level 1, which is representative of the locked state of the container. Then the time count-down member counts down starting from the period of time set by the time-setting member by time decrements of 1 second until an instant zero. For this purpose the time count-down member may be equipped with count-down circuits connected in series, one for seconds, one for tens of seconds, one for minutes any one for tens of minutes. When adjusting the time count-down circuits of the period of time with the aid of the time signal 102 carry signals will flow from one time count-down circuit to the other, whereas during counting down initiated by the locking member 1 borrow signals will be generated in the opposite sense. When the time count-down member has counted down to the zero instant, it will generate a signal 104 which is representative of the termination of the subtraction.

The time count-down member 4 may be connected to a display member 8 comprising, for example, four display elements so that a set period of time up to 60 minutes can be displayed. During counting down

the time count-down member 4 will cause the display member to advance every one second so that after a set period of time of 15.00 after one time decrement 14.59 is indicated and so on. In this way the count-down is visualized. The time count-down member 4 may furthermore be connected to a display member 9 for rendering the coutn-down audible, for example, by a tick of a loudspeaker at every time decrement. The display elements have, of course, to be arranged on the container and this also applies to any loudspeaker or buzzer used for an audible count-down.

The alarm member 5 may be designed so that immediately after the reception of the alarm signal 104 from the time count-down member 4 or of an output signal 107 being representative of an interruption of the detection loop a signal 105 is produced which, in this embodiment, energizes a member 6 for breaking up the smoke cartridge. It should be noted that the reception of only one of the signals 104 or 107 is a primary condition for the ignition of a smoke cartridge so that the detection loop operates independently of the operation or the non-operation of the time count-down member. The detection loop may comprise a chain on the case and a wire loop and a magnet contact inside the case.

In a further embodiment of the invention the alarm member 5 is provided with an alarm delay circuit which becomes operative when the time count-down member 4 has counted down to the zero instant and provided the locking member 1 has not stopped generating the locking signal, that is to say, the case is still locked to produce an audible and/or visible signal, for example, a persistent buzzer signal for a given delay period, for example, 60 seconds, whilst when said delay period has elapsed, the alarm signal is as yet produced if within said 60 seconds the alarm condition has not been eliminated. Consequently when within said 60 seconds the lock of the locking member 1 is opened in the normal way the smoke cartridge will not be ignited.

Most blocks of Fig. 1 will now be described with reference to Fig. 2, which illustrates a practical embodiment.

Referring to Fig. 2, VCC represents a positive feed voltage and GND earth potential. The circuit elements associated with one and the same block are surrounded by a dot-and-dash outline having the same reference numeral as used for a corresponding block in Fig. 1.

As shown in Fig. 2, the locking member 1 comprises a circuit element S1, which co-operates with a lock (not shown) and a flipflop circuit formed by the NAND gates 10 and 11. The output signal of the NAND gate 10 is the locking signal 101 and the output signal of the NAND gate 11 is the logic inverse signal there of, indicated by $\overline{101}$. When the case is locked, the lid 101 is in the logic state 1.

The time-setting member 2 of Fig. 2 comprises push-buttons D1, D2 and D3 for setting by push-button D1 a given time T, by push-button D2 twice said time: 2T and by push-button D3 three times said period: 3T. As is shown the three push-buttons D1 to D3 are connected to three flip-flops formed by the NAND gates, 21, 22, the NAND gates 23, 24 and the NAND gates 25, 26. The output of NAND gate 25 is the least significant bit of the binary code obtained by the push-buttons D1 to D3 and designated by A0. The output of NAND gate 26 is indicated by A1 and it is the least significant but last but one of the binary code A0 in the next binary number. The 2-bit code A0, A1 of the flipflop formed by the NAND gates 25 and 26 is applied to the less significant bit address lines of the programmable dead memory 27. The more significant but (A2, A3, A4) address lines of the programmable dead memory 27 are set by the circuit elements S1 to S3. In the preferred embodiment shown in Fig. 2 the three more significant bit address lines of the programmable dead memory 27 are, therefore, internally present, whereas the two less significant bit address lines of the programmable dead memory 27 are set externally by means of the push-buttons D1 to D3.

The time count-down member of Fig. 2 comprises the cascade-connected time count-down elements 41 to 44. By the write lines W1 to W4 of the programmable dead memory 27 the minutes are written in the time count-down element 43 and by the write lines W5 to W9 the tens of minutes are written in the time count-down element 44. To the inputs of NAND gate 45 are fed both the time-base signal 103 and the locking signal 101 so that when the case is locked, the time-base signal is admitted to the first count-down element 41, which is indicated by 103' so that after locking the case on the basis of the period of time set by the push-buttons D1 to D3 the time count-down element 41 starts counting down by time decrements of 1 second, whilst the time count-down element 42

counts tens of seconds. Between the count-down elements 41 to 44 carry signals and borrow signals indicated by 01 to 03 and L1 to L4 are transferred.

The count-down elements 41 to 44 have a BCD output which is converted by the coding elements 81 to 84 into 7-segment code outputs for the respective display elements 85, 86, 87 and 88. The audible display member 9 is formed by a loudspeaker 92 driven by a transistor 91. Reference character R designates a reset signal for holding the time count-down member 4 in the zero state when it has counted down to the zero instant, said reset signal R being generated by the alarm member. The NOR gate 46 and the NAND gate 47 connected as an inverter of the count-down member 4 serve to hold the count-down elements 41 to 44 in a reset state, when either the reset signal R is applied thereto or a signal $\overline{101}$ is in the logic state 1, which is characteristic of the fact that the case is not locked. The NOR gate 48 serves to allow the passed time-base signal 104' to pass as long as the count-down elements 41 to 44 are not maintained in the reset state.

Referring to Fig. 2, the borrow signals L1 to L4 of the count-down elements 41 to 44 are applied to NOR gates 51, 52 of the alarm member 5, the output of said NOR gates being fed to a NAND gate 53, the output of which together with the locking signal 101 of the locking member being fed to a flipflop formed by the NAND gates 54 and 55, the output of NAND gate 55 being connected to the inverter NAND gate 56, which generates the aforesaid reset signal R. In fact, the circuitry formed by the gates 51 to 56 is an alarm identifying circuit. The reset signal R is also applied to a NAND gate 57, which allows the time-base signal 103 and 103' passed by the NAND gate 45 to pass provided the signal 101 is in the logic state 1. The reset signal R is furthermore applied to a buzzer 502 driven by a transistor 501 to actuate the buzzer when the reset state is reached, that is to say, at the zero instant of the time count-down member. The output signal of the NAND gate 57 is fed to the 60-divider counters 58 and 59. After 60 seconds the flipflop formed by the NAND gates 60 and 61 is changed over, upon which the NAND gate 62 generates the alarm signal 105 and will continue generating the same. An input of NAND gate 62 is furthermore connected to the detection

loop 7, which operates only when the locking signal 101 is fed thereto owing to the NAND gate 71. The detection loop proper is represented by the normally closed switch S7. With the aid of an additional gate at the gate 71 it can be ensured that in the discontinuous state of the detection loop or the safeguard the latter cannot be switched on.

This embodiment of the safeguarded, lockable container in accordance with the invention is used as follows: When the case is open, the desired time can be chosen by means of the push-buttons, after which the cassette can be placed in the container and the wrist band can be put on. The last manipulation is locking the container, which automatically starts the safeguard of the container. The display members show the count-down of the time, whilst in addition a tick can be heard, which means that the safeguarding device operates satisfactorily. If on the way the container is robbed, the chain of the detection loop is drawn out of the container and the smoke cartridge will be activated. The same occurs when the container is mechanically damaged. The smoke cartridge is also activated when switching off is not again performed within the set time on the understanding that after the termination of the set time 60 seconds are still available to switch off. During these last 60 seconds a signal, preferably a continuous buzzer signal will be audible.

The foregoing embodiments described with reference to Figs. 1 and 2 of the safeguarded, lockable container in accordance with the invention, or at least the electronic safeguard thereof, are based on discrete, logic subassemblies. However, in accordance with a second aspect of the invention a microprocessor device is employed instead, the quality of the protection can be further improved, which will be illustrated in the following, detailed description of this aspect of the invention with reference to Figs. 2 and 3 of the drawing.

Referring to Fig. 3 reference numeral 10 designates a microprocessor, for example, of the type 6502. To the microprocessor 10 is connected a memory member 12 comprising at least one dead memory (EPROM), for example, of the type 2732 and at least one freely accessible memory (RAM) of, for example, the type 6116. In the dead memory of the memory member 12 is stored an interactive basic safeguard programme, which will be referred to later. To the microprocessor 10 is furthermore connected

an input/output member 13, for example, of the type 6520. To the microprocessor 10 and the input/output member 13 is connected a tempering member 11 inter alia for producing a first temper signal 111 of the system frequency,in this case about 1 MHz of the microprocessor and a second temper signal 112 of a given frequency, for example, 60 Hz in order to scan every 1/60th second all inputs of the input/output member 13 by means of an interruption/demand routine (IRQ routine). The inputs of the input/output member 13 have connected to them a plurality of status monitoring members 16i (i = 2... n) in order to signal to the microprocessor, as will be described later in this description, whether the container is safely locked, efforts are made to rob the container or to open it unauthorized or the container is not opened in accordance with the safeguarding programme. A number of the outputs of the input/output member 13 are connected to a number of alarm producers 17-i (i = 1... n), for example, a sirene or a smoke cartridge. A further number of the outputs are connected to a sound producer 19, for example, a buzzer, by means of an addressable selection member 18, for example, an analogue multiplexer as well as of a blocking member 20, which may be formed by a plurality of solenoids for locking the safety lock to be described hereinafter and the money or security cassette also to be described hereinafter. To the microprocessor are furthermore connected a keyboard 14 and a visual display device 15. The keyboard is preferably a hexadecimal keyboard having 16 keys (0 to F) whilst the visual display member 15 is preferably a liquid crystal display device, in which the characters are built up by dots in a matrix preferably comprising two lines of 16 characters. The tempering member 11 generates a further signal 113 of a frequency of, for example, about 1 kHz for rattle-free fixation of the keyboard 14. Finally the tempering member produces the temper signals 114 and 115 of, for example, 1 Hz and 7.5 Hz respectively, the signal of the frequency of 1 Hz determining the count-down time decrements to be described later (or analogue count-up time increments less preferred in a variant which will not be discussed further), whilts the latter temper signals are fed to the analogue multiplexer 18.

It is emphasized here that the block diagram of Fig. 3 described above is drastically simplified. For example, the input and out-

put buffers for the inputs and outputs respectively of the input/output member 13 as well as, for example, the coder for the keyboard and so on are omitted.

Fig. 4 shows the container, particularly the transport case in its most essential form and provided with some components already referred to in the discussion of the block diagram of the electronic safety device. The container is designated by reference numeral 20. Reference numeral 21 designates the electronic compartment, 22 the smoke cartridge compartment and 23 the transport compartment. The electronic compartment 21 accommodates the major part of the electronic safety device, for example, the sirene 17-i, the keyboard 14 and the visual display member 15. Moreover, the electronic compartment may be provided on the underside with charging contacts for an accumulator charger supplying the energy for the electronic safety device. The transport compartment 23 receives the money or security cassette and it is closed by a lid 24 and locked by means of a safety lock 27 shown quite schematically. The smoke cartridge compartment accommodates the smoke cartridges and the associated ignition resistors. Reference numeral 25 designates a smoke blowing opening and reference numeral 26 designates an opening for blowing smoke inwards, a particular for blowing smoke out of the smoke cartridge compartment into the cassette placed in the transport compartment, in which case, of course, the bottom of the cassette should have a corresponding opening.

Referring back to Fig. 3, a status monitoring member 16 may have one or more lid contacts in order to emit, when the lid 24 is closed, a confirming signal by means of the input/output member 13 to the microprocessor 10. A further status monitoring member 16 may comprise at least one electric contact of the safety lock 27 to signal to the microprocessor whether the lock is in the closed state. When the two aforesaid status monitoring members 16 emit a conformative signal, the container with the lid 24 is locked by the safety lock 27. Of course, safeguarding the container only has sense when there is anything to be safeguarded i.e. when a cassette containing money or other values or the like is placed in the container. For this reason there is provided a third status monitoring member 16 comprising a detector, for example, a microswitch to detect

whether the cassette is put in. Where hereinafter reference is made to safe locking of the container this is to be understood to mean that the output signals of the aforesaid three status monitoring members 16 are all conformative, which implies that the cassette is present and the lid is locked on the container by means of the safety lock.

A further status monitoring member 16 comprises a conductor pattern which co-operates with the externally accessible walls of the container in order to produce a conformative signal upon the interruption of said conductor pattern. In a practical embodiment the conductor pattern may be arranged on the inner side of the externally accessible walls of the container or printed wiring may be provided on the same side of the walls, in which case, of course, the partial conductor patterns have to be relatively connected. The latter status monitoring member 16 provides a safeguard, for example, when the container should be pierced.

As stated above, the container, in particular a value transport case, is carried by a person. In order to enable detection whether the distance between this person and the transport case becomes too large, for example, in the case of robbery, this person is equipped with a preferably simple transmitter emitting a constant carrier wave signal, whilst a status monitoring member 16 comprises a receiver supplying a denying signal as long as the carrier wave signal is received. If, however, the distance between the transmitter and the receiver becomes too large, the status monitoring member concerned will supply a confirmative signal so that the microprocessor 10 will signal that the distance between the messenger and the value transport case is inadmissibly large. Otherwise many other status monitoring members may be used, for example, a voltage monitor, for example, in the form of a sensitive comparator to indicate when the accumulator voltage drops below an impermissible value. The aforesaid charging contacts 22 can then be used to charge the accumulator(s) before starting the transport.

A practical embodiment comprises three alarm producers 17-i to wit an electronic sirene, a smoke cartridge applying an unerasable or hardly erasable colour to the contents of the cassette in the container and a smoke cartridge for blowing out signalling smoke. Otherwise

also the alarm producers may be chosen differently, for example, an optical eye-catching display member.

In a practical embodiment the blocking member 20 comprises two solenoids, one for the safety lock and one for the cassette. After the container is safely locked, the safety lock and the cassette are bolted within a given short time of, for example, 2 seconds; this bolted state can be obviated only when the container is opened in accordance with the safeguarding programme, which means, as will be discussed hereinafter, that the safety lock is opened with a key and a given control-code is tapped. Assuming the transport container has to be brought by a messenger from a money transport car to a bank, the messenger can safely lock the container in the car and, whilst leaving his key and the specific control-code apart from the standard or emergency control-code to be described hereinafter in his memory, he can carry the transport container to the bank where the same key is available so that by means of the latter key and the said control-code the transport container can be opened in accordance with the safeguarding programme.

The sound producer and in a practical case the buzzer 19 serves the buzzer 19 serves to render the count-down audible as will be discussed hereinafter; this is otherwise analogue to the count-down in the container having discrete logic circuits. There is furthermore indicated the delay time of, for example, 60 Hz with a variation of the frequency of the driving signal to the buzzer of, for example, 1 Hz to 7.5 Hz, that is to say, the frequences of the temper signals 114 and 115 of the tempering member 11.

Hereinbelow the operation as well as the use of a safeguarded, lockable container provided with a microprocessor will be described more fully.

After the connection of the safeguarding device, particularly the microprocessor device comprising at least the microprocessor, the memory member, the input/output member and the tempering member, the initializing phase starts. In this initial phase first the microprocessor and the input/output member are initialized after which the memory member, in particular the freely accessible memory and the dead memory are tested in order of succession. In a practical embodiment the accomplishment of

the initialization of the microprocessor and the input/output member is intimated to the operator by the energization of the buzzer 19 by the 1 Hz temper signal 114 of the tempering member 11 by means of the analogue multiplexer 18. When the freely accessible memory is found to be correct, the 7.5 Hz temper signal is allowed to pass via the analogue multiplexer 18 to the buzzer 19, whereas in the opposite case the analogue multiplexer 18 supplies a direct-current signal to the buzzer 19, which will thus sound continuously. If the freely accessible memory is correct and if thereafter also the dead memory is correct, the analogue multiplexer 18 switches off the buzzer, whereas in the opposite case the buzzer 19 produces an uninterrupted sound. Subsequently the initialization is performed in accordance with the programme, particularly with respect to the several variables such as the standard transit or transport time, as the case may be, the delay time and the standard control-code, which will be discussed later.

After the initializing phase briefly described above, the safeguarding device reaches the so-called first user phase in which the condition of the container or transport case is a passive one and a number of functions can be carried into effect by means of the keyboard as follows. The first function by which the safeguarding device gets into the first user phase is that in which the conditions of the status monitoring member 16-i are visible on the visual display member 15. Only by this first function of the first user phase the container or transport case can pass to the active condition or else the second user phase.

When the container is not brought in the manner to be described hereinafter into the second user phase, the safeguarding device goes over to a second function in which by means of the keyboard the standard control-code, which is preferably the same for all transport cases, can be replaced by a specific control-code for the messenger concerned, which is required to put an active transport case into the passive state. This code may comprise at the most six digits and is visible for a short time after its initiation, for example, for 4 seconds on the visual display member.

Then the safeguarding device goes over to a third function in which again with the aid of the keyboard the standard transit time of,

for example, 15 minutes, which may again apply to all transport cases, can be changed, in which case the introduction of a zero period of time or of a minimum transit time by programmatic blocking would not be accepted, the same applying to a period of time exceeding the maximum transit time.

By a fourth function, by means of the keyboard, the sirene, the buzzer and the visual display member can be tested for satisfactory operation. By a fifth and sixth function, by means of the keyboard, a short explanation of the operation and the use of the transport case can be given line by line on the visual display member in a first and a second language respectively.

By a seventh function a selection can be made with respect to the alarm producers to be actuated, for example, a combination of the sirene and smoke blown to the inside and to the outside or the sirene and only smoke blown to the outside.

Finally the safeguarding device returns to its first function in which, as stated above, the container can be switched to the active state. The safeguarding device becomes active by placing the cassette in the container, by closing the lid, by bolting the lid to the container by means of a key and the safety lock, when all status monitoring members give safe signals. The sole function of the keyboard in the second user phase is the change-over of the safeguarding device to the passive state by tapping the control-code. In order to enhance the safe guard the device gets into the passive state only when by means of a different key both the lid and the safety lock are unbolted and the correct control-code is written.

The present specification will now be concentrated on the second user phase, that is to say, the active state of the safeguarding device.

When the safeguarding device is made active, this is directly indicated on the visual display device, for example, by the change of the indication "out" into the indication "on", whilst at the same time there appears the indication of the specific or standard transit time, for example, "15:00". Moreover, the visual display member gives at all times an indication of the condition of the status monitoring members, for

example, "fault 3", from which the messenger knows that "fault 3" means that the system voltage for the microprocessor is too low. A further fault may be that the microprocessor has encountered an illegal status and has reset itself, in which case the standard control-code has to be used for switching on the correct passive state of the container. Moreover, at all times the function of the device is indicated, for example, "f0" for the first function i.e. the function in which the container can be switched to the active condition.

After the change-over of the container to the active state and when the indication "On" and "15:00" appear on the visual display member, the buzzer is energized once per second and the transit time indication synchronously steps from "15:00" to "14:59" and so forth. The count-down is, therefore, visible and audible. Preferably an alarm delay time is included in the standard safeguarding programme so that when the instant indicated by "00:00" is reached, without the container being switched over to the passive state in accordance with the safeguarding programme, there appears, for example, the indication "fault 5" on the visual display member, whilst the buzzer starts sounding at the sharply penetrating frequency of 7.5 Hz, after which 60 seconds are available to switch the container into the passive state. If within these 60 seconds the container is not opened in accordance with the safeguarding programme, the sirene will sound, colouring smoke will be blown into the cassette and/or signalling smoke will be blown out in accordance with the selected programmed alarm producer. As the case may be the count-down of the alarm delay time may also be visualized on the visual display member.

If on the contrary within the transit time the control-code is written and the safety lock is opened, not any alarm producer will be energized. Apart from the possibility of direct unbolting of the cassette by the control-code, an alternative possibility is to unbolt the cassette only afterwards by means of the keyboard.

With regard to the illegal state of the microprocessor a so-called "watchdog pulse" is used in conjunction with a monostable multivibrator, which receives a pulse via an output of the input/output device. If this pulse is too slow or if it is lacking, the monostable

multivibrator applies a pulse to the NMI input of the microprocessor, which is thus reset and the indicators are freshed up.

The visual display device also indicates as a fault function when a smoke cartridge is activated or the sirene is activated so that, for example, if the sirene has sounded, but not smoke is blown out, it can be assessed whether the safeguard device itself has failed or whether energization of the output concerned of the input/output device has failed to ignite a smoke cartridge.

When the distance between the messenger and the transport case becomes too large, the buzzer will emit, for example, a continuous tone and if said distance is not reduced to an extent such that the status monitoring members signal to the microprocessor that the transmitter-receiver contact is restored, the selected alarm producers are actuated after a given period of time, for example, 30 seconds, which will also be the case though without delay when, for example, the container is pierced. As an alternative, instead of using a transmitter/receiver circuit, a detection loop may be used as in the embodiments first described, said loop being fastened to the wrist chain so that the messenger is connected with the container. The interruption of the detection loop will also lead to an immediate alarm.

Moreover active touching of the keys of the keyboard can be rendered audible by the buzzer which may sound, for example, for 1/3 second in this case.

The figures used in the claims are only meant to explain more clearly the intention of the invention and are not supposed to be any restriction concerning the interpretation of the invention.

CLAIMS:

1. A safeguarded, lockable container characterized in that it comprises: a microprocessor device having at least one microprocessor, a memory member connected thereto in which a safeguarding programme is stored, an input/output member connected to the microprocessor and a tempering member connected to the microprocessor and to the input/output member for generating a first temper signal having the system frequency of the microprocessor, a second temper signal having a given frequency for scanning the inputs of the input/output member and a third temper signal having a frequency fixing a specific time count-down decrement; a plurality of status monitoring members connected to respective inputs of the input/output member and a plurality of alarm producers connected to the respective outputs of the input/output member, the output signal of at least one of the status monitoring members signalling whether the container is safely locked and under the control of the safeguarding programme and in the case of continuous signalling of the safe locking of the container the microprocessor, starting from a period of time fixed in the safeguarding programme, reduces this period by the time count-down decrements and, as soon as or after the count-down has reached a zero instant or as soon as at least one of the status monitoring members

signals that the container gets into an unsafe state, it actively switches at least one output of the input/output member connected to the alarm producer conerned so that this alarm producer is energized, whilst without activating any of the outputs of the input/output member connected to the alarm producer concerned the microprocessor stops counting down after the container is opened in accordance with the safeguarding programme.

2. A safeguarded, lockable container characterized in that it comprises: a microprocessor device provided with at least one microprocessor, a memory member connected thereto in which a safeguarding programme is stored, an input/output member connected to the microprocessor and a tempering member connected to the microprocessor and to the input/output member for producing a first temper signal having the system frequency of the microprocessor, a second temper signal having a given frequency for scanning the inputs of the input/output member and a third temper signal having a frequency fixing a specific time count-up increment, a plurality of status monitoring members connected to respective inputs of the input/output member and a plurality of alarm producers connected to respective outputs of the input/output member, in which the output signal of at least one of the status monitoring members signals whether the container is safely locked and, under the control of the safeguarding programme and in the case of continuous signalling of the safely locked state of the container, the microprocessor counts up the time by time increments and, as soon as or after counting up has reached a period of time fixed in the safeguarding programme or as soon as at least one of the status monitoring members signals that the container gets into an unsafe state, it actively switches at least one output of the input/output member connected to the alarm producer conerned so that this alarm producer is energized, whilst without activating any output of the input/output member connected to the respective alarm producer the microprocessor stops counting up after the container is opened in accordance with the safeguarding programme.

3. A container as claimed in Claim 1 or 2, in which the container comprises a lid and a contact lock co-operating herewith, characterized in that a first status monitoring member comprises a detector to detect whether the lid is closed and a second status monitoring member

comprises at least one contact of the contact lock to detect whether the container is locked, whilst confirmative output signals of the first as well as of the second status monitoring member signal to the microprocessor that the container is safely locked.

4. A container as claimed in Claim 3 in which the container furthermore comprises a space to accommodate a cassette, characterized in that a third status monitoring member comprises a detector to detect whether a cassette is placed in the container, whilst confirmative output signals of the first, second and third status monitoring members signal to the microprocessor that the container is safely locked.

5. A container as claimed in anyone of the preceding Claims characterized in that the memory member comprises at least one dead memory in which a standard safeguarding programme is stored and at least one freely accessible memory and the container furthermore comprises an externally accessible keyboard and an externally visible visual display member for interaction by means of the freely accessible memory with the standard safeguarding programme.

6. A container as claimed in Claim 5 characterized in that opening of the container in accordance with the safeguarding programme implies: opening by means of the contact lock of the container and/or tapping a given control-code on the keyboard both within the period of time fixed in the safeguarding programme.

7. A container as claimed in Claim 5 and/or 6 characterized in that in the unlocked state of the container, by means of the keyboard, a standard control-code in the standard safeguarding programme can be replaced by a specific control-code and/or the period of time stored in the standard safeguarding programme can be replaced in a similar manner by a specific period of time longer than the minimum and shorter than the maximum period of time.

8. A container as claimed in anyone of Claims 5 to 7 characterized in that the keyboard is a 14-key, hexadecimal keyboard and/or the visual display member is a liquid-crystal display device having two lines of 16 characters.

9. A container as claimed in anyone of the preceding Claims characterized in that one of the status monitoring members comprises a receiver which supplies a signal to a respective input of the input/out-

put member upon a loss of contact between the receiver and a transmitter to be carried by the person transporting the container.

10. A container as claimed in anyone of the preceding Claims characterized in that one of the status monitoring members is provided with a conductor pattern which co-operates with an externally accessible wall of the container in order to generate a signal when the conductor pattern is interrupted.

11. A container as claimed in anyone of Claims 4 to 9 and/or 10 characterized in that counting down or up is visible on the visual display member and the respective signal is applied to an input of the input/output member.

12. A container as claimed in anyone of the preceding Claims characterized in that the alarm producers comprise an electronic sirene and at least one smoke cartridge.

13. A container as claimed in Claim 12 characterized in that one smoke cartridge co-operates with an opening in the container leading to the outside of the container and a further smoke cartridge co-operates with an opening in the cassette placed in the container, the smoke cartridges being ignited by thermally co-operating resistors receiving thereto a sufficiently high current via respective outputs of the input/output member.

14. A container as claimed in Claim 12 or 13 characterized in that the container is provided with an electronics compartment for accommodating the keyboard, the visual display member, the electronic sirene and further electronic components, a smoke cartridge compartment for holding the smoke cartridges and a transport compartment that can be closed by a lid and locked by the contact lock and that is adjacent the smoke cartridge compartment, whilst the partition between the smoke cartridge compartment and the transport compartment in which the cassette has to be placed has an opening for blowing smoke into the cassette registering with the opening in the cassette.

15. A container as claimed in anyone of Claims 5 to 14 characterized in that by means of the keyboard, when the container is not locked, a selection can be made among the alarm producers for energization in the event of unsafety.

16. A container as claimed in Claims 9 and 14 characterized in that the electronics compartment adjacent the transport compartment is separated therefrom by a sealing rubber which includes a metal forming the aerial for the receiver of the status monitoring member concerned.

17. A container as claimed in anyone of Claims 3 to 16 characterized in that the container is furthermore provided with solenoids in order to, after the container is safely locked, bolt the contact lock and/or the cassette placed in the container until the container is opened in accordance with the safeguarding programme.

18. A container as claimed in anyone of the preceding Claims characterized in that as soon as the count-down has reached the zero instant the microprocessor, starting from a second, essentially shorter period of time stored in the safeguarding programme, reduces the same by the time count-down decrements and as soon as the count-down has reached a second zero instant the microprocessor actively switches at least one output of the input/output member connected with a respective alarm producer, which is thus energized.

19. A container as claimed in anyone of the preceding Claims characterized in that as soon as the period of time stored in the safeguarding programme has been fully counted up the microprocessor, starting from a second, appreciably shorter period of time stored in the safeguarding programme, continues counting up by the time count-up increments and as soon as the first plus the second period of time have been fully counted up the microprocessor actively switches at least one output of the input/output member connected to the respective alarm producer, which is thus energized.

20. A container as claimed in anyone of the preceding Claims characterized in that it is furthermore provided with a buzzer which renders the count-down or count-up audible by emitting a sound of a given frequency.

21. A container as claimed in Claim 18 or 19 and 20 characterized in that during counting down or counting up in the second period of time the buzzer emits a sound of a frequency which differs from that of the sound emitted during counting down or counting up in the first period of time.

22. A safeguarded, lockable container characterized in that it comprises a locking member for locking the container in order to generate a locking signal in the locked state of the container, a time setting member for generating a signal representative of a given period of time, a time-base member and a time setting member in order to, after the reception of the locking signal starting from the period of time set by the time signal count down by time decrements determined by the time base signal as long as the time count-down member continues receiving the locking signal and an alarm member for producing an alarm signal when or after the time count-down member has counted down to a zero instant.

23. A container as claimed in Claim 22 characterized in that the time setting member comprises a plurality of circuit element accessible from the outside of the container, each circuit element having allotted to it a given period of time, a logic circuitry connected to the circuit elements and producing a binary code of a given number of bits dependent on the circuit element which is energized and a programmable dead memory, in which at least a number of the address lines are connected to the output of the logic circuitry.

24. A container as claimed in Claim 23 characterized in that in the programmable dead memory a number of less significant bit address lines equal to the number of bits of the binary code are connected to the output of the logic circuitry and the remaining address lines are preset by means of circuit elements accessible internally of the container.

25. A container as claimed in anyone of the preceding Claims characterized in that it is furthermore provided with an externally visible display member connected to the count-down member in order to visualize the count-down.

26. A container as claimed in anyone of the preceding Claims characterized in that it is furthermore provided with an externally audible display member connected to the time count-down member in order to render the count-down audible.

27. A container as claimed in anyone of the preceding Claims characterized in that the alarm member comprises an alarm delay circuit which becomes operative when the time count-down member has counted down to a zero instant and provided the locking member has not stopped gene-

rating the locking signal in order to produce an audible and/or visible indication after a given time delay and to produce the alarm signal after the termination of the time delay.

28. A container as claimed in anyone of the preceding Claims characterized in that it comprises furthermore a detection loop connected to the alarm member in order to cause the alarm member to produce the alarm signal independently of the count-down of the time count-down member in the event of interruption of the detection loop.

29. A container as claimed in anyone of the preceding Claims characterized in that it furthermore comprises a member which, in response to the alarm signal, energizes a smoke cartridge and/or generates a sirene signal and/or any other optical and/or accoustic signal.

30. A time setting member apparently intended for use in a container as claimed in anyone of the preceding Claims.

31. A time count-down member apparently intended for use in a container as claimed in anyone of Claims 22 to 29.

32. An alarm member apparently intended for use in a container as claimed in anyone of Claims 22 to 29.

33. A security transport case provided with externally accessible circuit elements or a keyboard and/or visual display elements or a visual display member and/or accumulator charging terminals.

34. A security transport case comprising a transport compartment with a lid for accommodating a cassette, an electronics compartment for accommodating an essential part of the electronic safeguarding device and a smoke cartridge compartment for holding at least one smoke cartridge, whilst an outer wall of the smoke cartridge compartment may have at least one smoke blowing opening and the wall between the smoke cartridge compartment and the transport compartment may have at least one opening for blowing in smoke.

35. A security cassette for accommodation in a container as claimed in Claim 34 characterized in that it has an opening registering with the opening for blowing in the smoke.

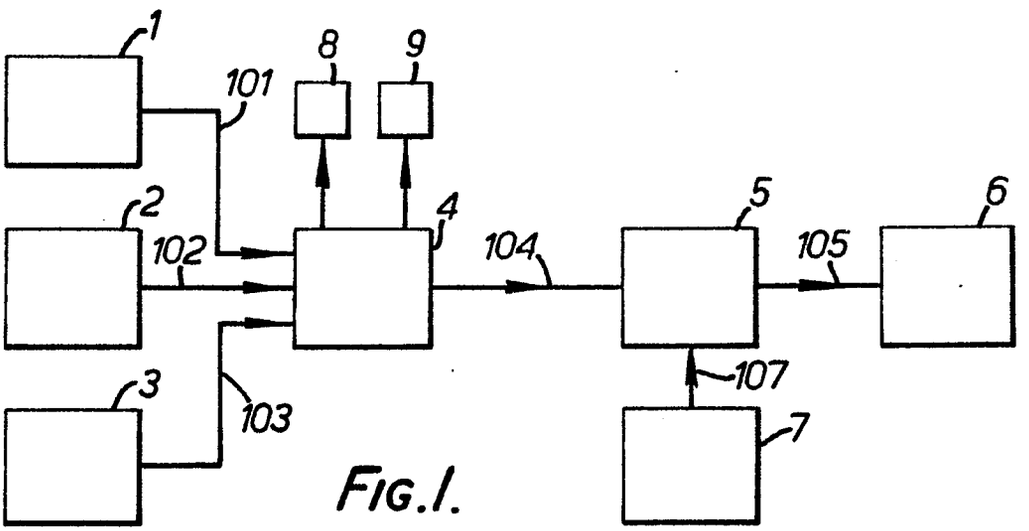


FIG.1.

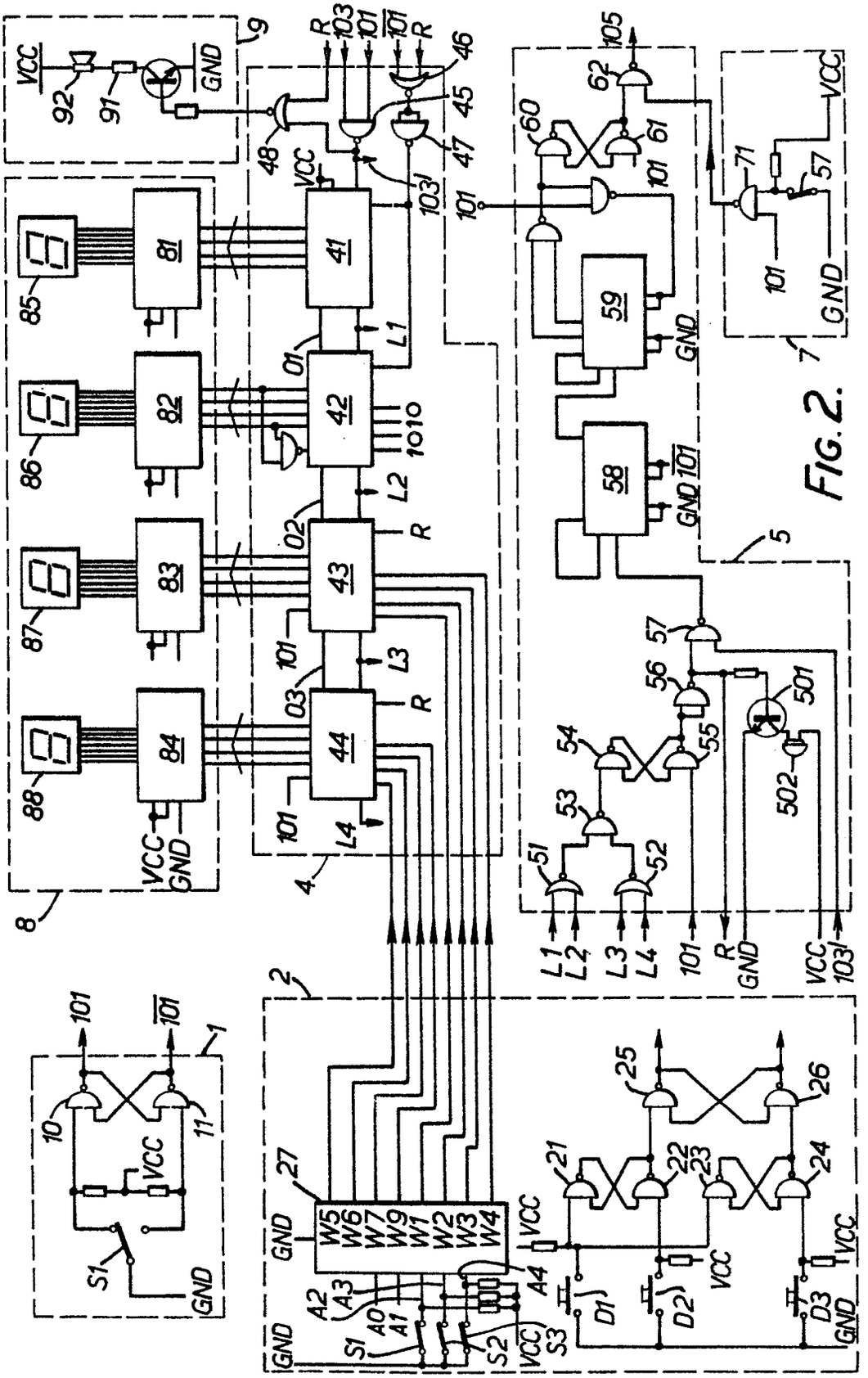
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FIG. 2.

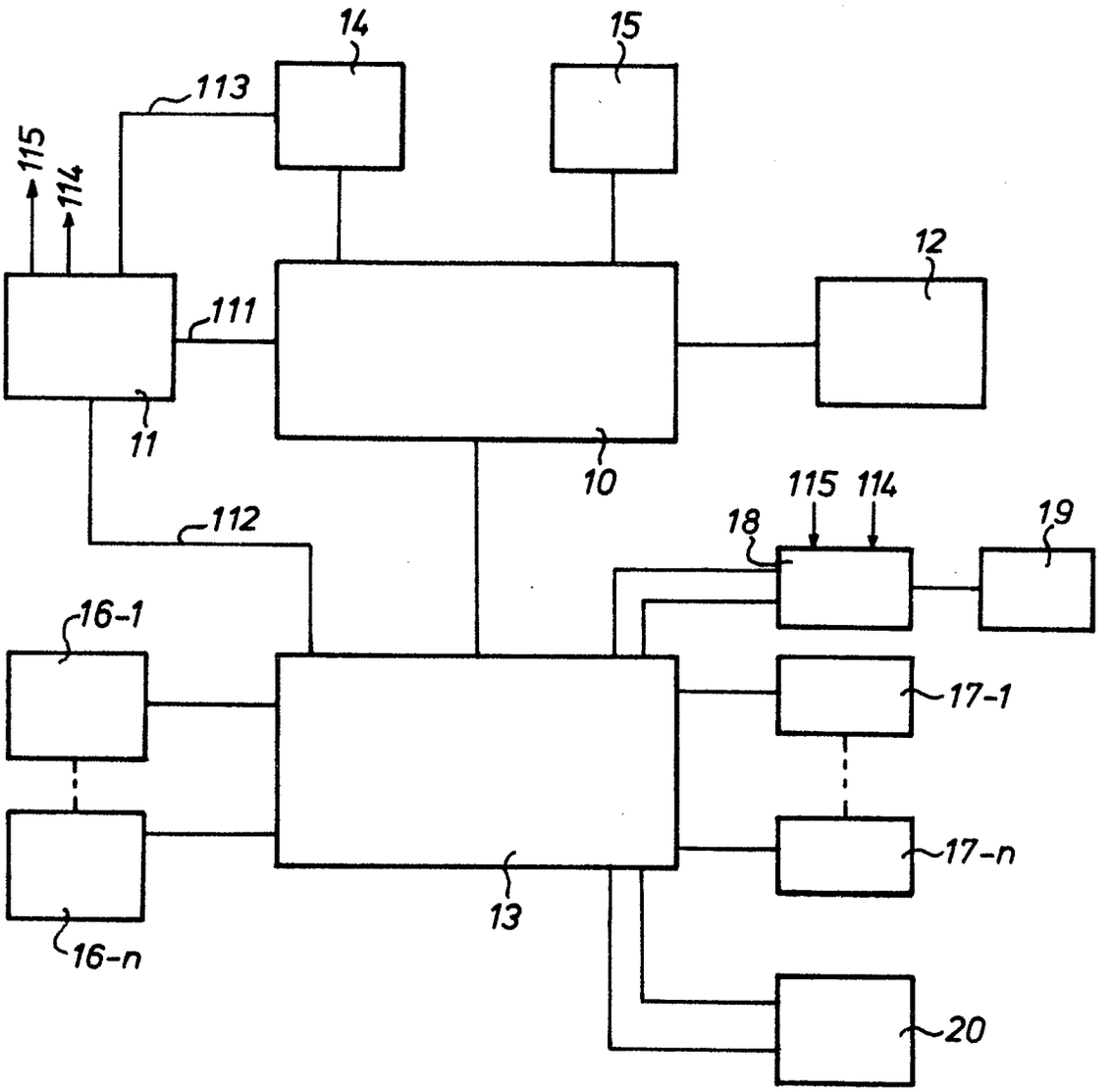
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FIG. 3.

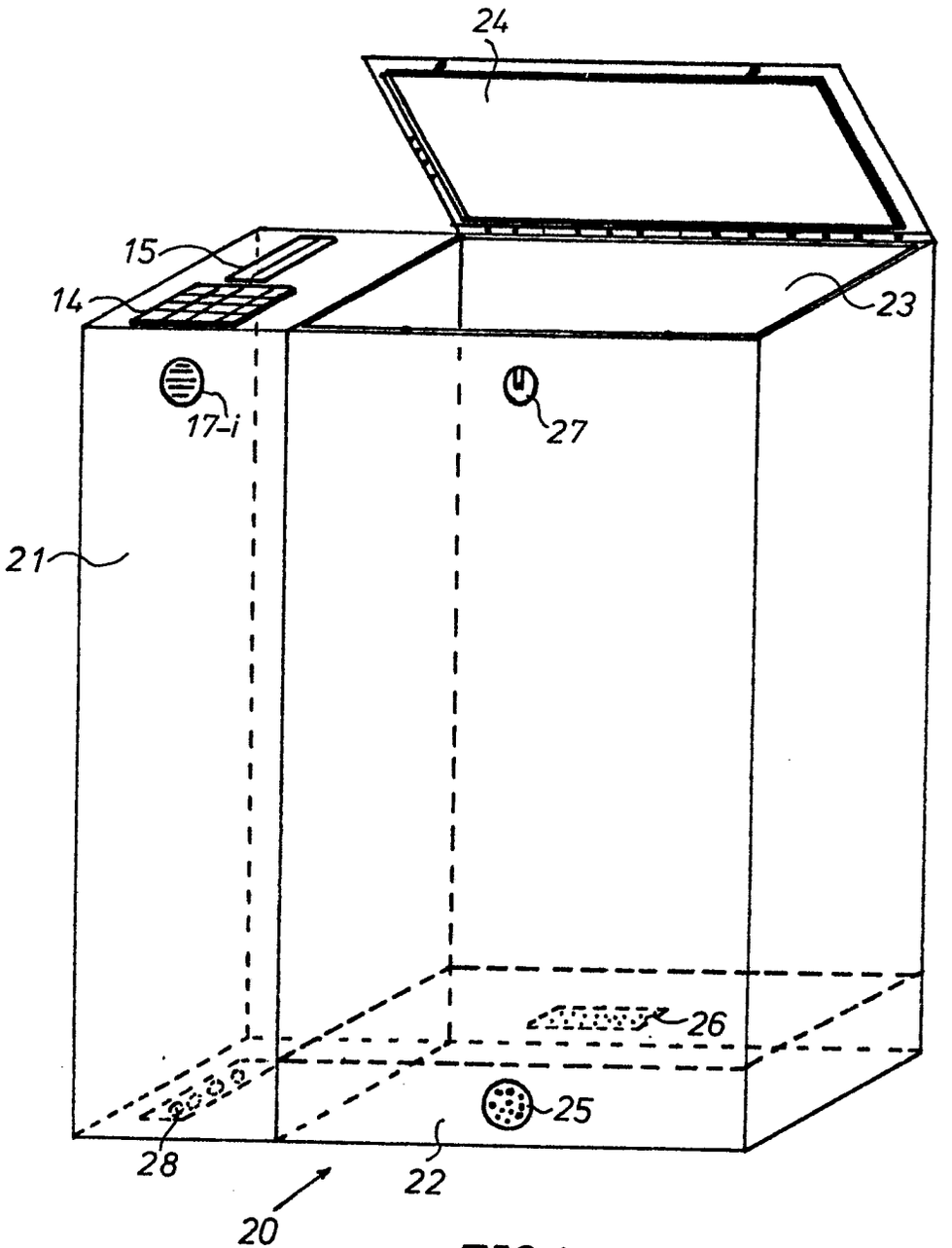


FIG.4.

European Patent Office

# EUROPEAN SEARCH REPORT

Application number

EP 82 20 1454

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl. ³) |
|---|---|---|---|
| Y | DE-A-2 926 153 (GEHRER)<br>* Page 5, line 1- page 13, line 17; figure * | 1-3,5-7,10,12-15,18,19,22-32 | G 08 B 13/14<br>G 08 B 15/02<br>A 45 C 13/24 |
| Y | US-A-4 325 089 (HSU)<br>* Column 4, lines 29-60; figure 4 * | 1-3 | |
| A | US-A-4 337 462 (LEMELSON)<br>* Column 2, line 16 - column 5, line 30; figures 1-3 * | 1,2,5 | |
| A | FR-A-2 457 526 (SECURITON)<br>* Claims * | 1,2,5 | TECHNICAL FIELDS SEARCHED (Int. Cl. ³) |
| A | DE-A-2 827 193 (VOGELSANGER)<br>* Claims * | 1-3,12-15,22 | G 08 B<br>A 45 C |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 27-07-1983 | REEKMANS M.V. |

CATEGORY OF CITED DOCUMENTS

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L : document cited for other reasons

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