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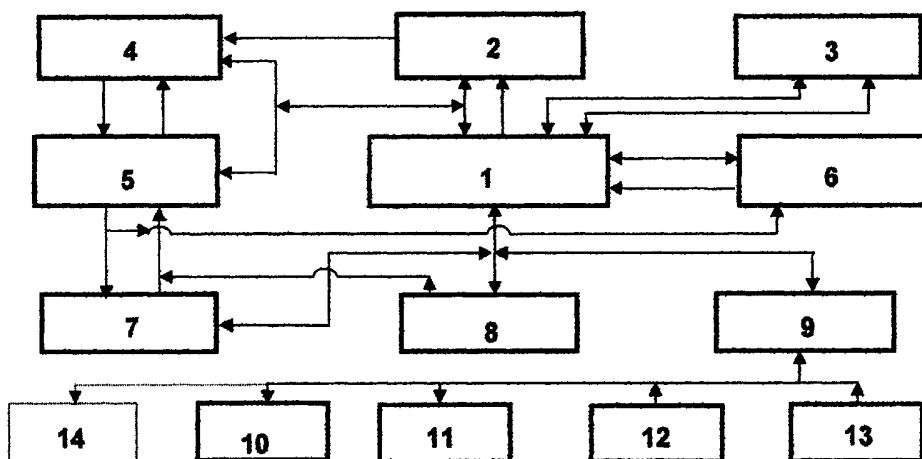
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(54) Title: VEHICLE ALARM AND CONTROL SYSTEM THROUGH CELLULAR TELEPHONY

(54) Título: SISTEMA ALERTADOR Y RECEPTOR DE COMANDO A TRAVES DE TELEFONIA CELULAR APLICADO A ALARMAS PARA VEHICULOS



(57) Abstract: Apply for the patent of the Command Alert and Receiver system through Cellular Telephony applied to vehicle alarms. The system consists of an integrator between regular alarms and cellular mobile voice systems. This system has the following main functions: a) to alert the vehicle owner and third parties that the alarm was activated, regardless of the place where the vehicle is located; b) to advise three or more people or entities about the danger situation through a silent alarm; and c) the user, when responding to the alert call can block the vehicle electronic system by impeding it to turn it on or off if started. The system consists of: a) a micro controller (1), b) a dialing interface (2); c) a data memory (3); d) a cellular transmitter/receiver (4); e) a communication interface (5); f) a dtmf tone decoder (6); g) an audio digital recorder (7); h) a tone generator (8); and i) an external interface (9). The internal interface (9) consists of four modules which enables external communication as follows: a) an electronic vehicle blockage system (10); b) visual light indicator (11); c) a silent alarm (12) and d) an alarm (13).

[Continúa en la página siguiente]



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Declaración según la Regla 4.17:

- *sobre la calidad de inventor (Regla 4.17(iv)) sólo para US*

Para códigos de dos letras y otras abreviaturas, véase la sección "Guidance Notes on Codes and Abbreviations" que aparece al principio de cada número regular de la Gaceta del PCT.

(57) Resumen: La solicitud de Patente de Invención Sistema Alertador y Receptor de Comandos a través de Telefonía Celular aplicado a Alarmas para Vehículos, el cual es un integrado entre las alarmas convencionales y el sistema de transmisión de telefonía celular, que tiene como funciones básicas el de: a) alertar al dueño del vehículo y a terceros que la alarma se activó, sin importar donde se encuentre; b) avisar por medio de una alarma silenciosa, a terceras personas o entidades la existencia de una situación de peligro; y c) el usuario al responder al llamado de alerta puede bloquear el sistema eléctrico o electrónico del vehículo impidiendo que prenda o apagarlo si esta prendido. El sistema está conformado por: a) Un microcontrolador (1); b) Una interfase de marcación (2); c) Una memoria de datos (3); d) Un emisor/receptor celular (4); e) Una interfase de comunicación (5); f) Un decodificador de tonos dtmf (6); g) Una grabación digital (7); h) Un generador de tonos (8) y i) Una interfase exterior (9). La Interfase exterior (9) se compone de cuatro módulos, los cuales permiten la comunicación con el medio exterior, y son: a) bloqueo eléctrico y/o electrónico del vehículo (10); b) indicador visual (11); c) alarma silenciosa (12) y d) alarma (13).

VEHICLE ALARM AND CONTROL SYSTEM THROUGH CELLULAR TELEPHONY

5 PURPOSE

Apply for the patent of the Command Alert and Receiver system through Cellular Telephony applied to vehicle alarms. The system consists of an integrator between regular alarms and cellular mobile voice systems. This system has the following main functions: a) to alert the vehicle owner and third parties that the alarm was activated, regardless of the place where the vehicle is located; b) to advise three or more people or entities about the danger situation through a silent alarm; and c) the user, when responding to the alert call can block the vehicle electronic system by impeding it to turn it on or off if started.

INVENTION BACKGROUND

At present, there are vehicle alarms available, which are actuated at the time the locks are opened or violated generating a loud sound, so that it can be heard by any person at a specific short distance.

DISADVANTAGES OF THE PREVIOUS INVENTION

25

Those vehicle alarms currently available in the market are as follows:

- The alarm scope is to cover just a specific and short distance.

30

- With the alarms, the vehicle owner can only perceive that the alarm has been activated, but he needs to travel to the place where the vehicle is located .

5 INVENTION ADVANTAGES

The patent application for the Command Alert and Receiver system through Cellular Telephony applied to vehicle alarms has the following advantages with respect to the technical ones:

10

- The system enables to alert the owner of the vehicle and third parties that the alarm is activated, regardless of the place where it is located.

15

- The system allows to advise three or more people or entities about the dangerous situation by means of a silent alarm.

- The user, when responding to the alert call, can block the system electronically and/or electrically by impeding to turn it on or off if
20 ignited.

- The alert system scope is limited only to a cellular telephony server range, which is virtually limited.

25

- The need of a receiver is obvious since we start are based on the premise that 90% of the vehicle owners hold a cellular telephone.

- The system is absolutely personalized.

- Since it is a two way communication system, there are assorted possibilities between the owner and the vehicle.

5 LIST OF ATTACHED FIGURES

Figure 1. Block diagram of the Command Alert and Receiver system through Cellular Telephony applied to vehicle alarms

10 DESCRIPTION OF THE INVENTION

The patent application for the Command Alert and Receiver system through Cellular Telephony applied to vehicle alarms as it may be seen in Figure 1, consists of: : a) a micro controller **1**, b.) a dialing
15 interface **2**; c) a data memory **3**; d) a cellular transmitter/ receiver **4**;
e) a communication interface **5**; f) a dtmf tone decoder **6**; g) an audio digital recorder **7**; h) a tone generator **8**; and i) an external interface **9**.

20 The micro controller **1**, is in charge of the system operation, which communicates through control lines and data and controls the other components. Besides, it makes the necessary decisions depending on the situations that may arise.

25 With the dialing interface **2**, the micro controller **1** can dial telephone numbers that are programmed in the system.

Telephone numbers to which the system should dial and the programming user password are stored in the data memory **3**.

The cellular transmitter/receiver **4** is the device used to make and receive calls.

- 5 The micro controller **1** uses the communication interface **5** to receive and send audio signals (tones and voice) to the transmitter/receiver **4**.

10 The dtmf tone decoder **6** converts dtmf tones received from the audio signal in codes that the micro controller **1** can interpret.

The audio message that sends the alarm is digitally stored in the digital recording module **7**. This message may be re-recorded as many times as required.

15

By means of the tone generator **8**, the micro controller generates confirmation tones, validation and refusal of different commands.

20 The external interface **9** consists of four modules, which enables external communication as follows: a) an electronic vehicle blockage system **10**; b) visual light indicator **11**; c) a silent alarm **12** and d) an alarm **13**.

25 The visual light indicator **11**, indicates to the user if the system is active, by blocking the vehicle or turning it off. When it is active, and the vehicle is not blocked, the indicator **11** is on.

When the vehicle is blocked, the indicator blinks, and when the indicator deactivates, it turns off.

The silent alarm **12** receives the alarm switch signal and indicates this to the micro controller **1** the emergency situation, so that it can start making the different calls involved in this process.

5

The alarm **13** detects when the vehicle alarm is activated and sends the signal to the micro controller **1** to start the alert process. This module has a detector indicating what type of alarm the vehicle has.

10 There is the option to use an external alert module **14**, which is connected to the system and it is optionally activated when the vehicle is turned off once the call is made or when the vehicle is turned off after dialing the system. At the time the alarm is activated, the parking lights start blinking and the horn sounds in the
15 same manner. This module does not activate when the vehicle is turned off after the system has been called by actuating the silent alarm.

OPERATION MODE

20

The Command Alert and Receiver system through Cellular Telephony applied to vehicle alarms subject of this patent application operates as follows:

25 Through the external interface **9**, the micro controller **1** detects that the alarm **13** is activated and the dialing process to advise that something abnormal is taking place starts. This process is described below:

- 1) It reads the first telephone number it is going to dial on the data memory **3**.
 - 2) It generates the necessary codes for the dialing interface **2**.
- 5
- 3) From the dialing interface **2**, codes are sent to the cellular transmitter/receiver **4**, which generates the calls to the programmed telephones.
- 10
- 4) The communication interface activates **5** to enable audio in and out.
 - 5) The digital recording unit **7** is enabled to send the message through the call that is being made.
- 15
- 6) The micro controller **1** turns on a timer, which regulates the maximum on hold time in the event the call cannot be made or a voice mail machine answers.
- 20
- 7) The dtmf decoder **6** is ready to receive the dtmf tones sent from the answering telephone.
 - 8) When the call is completed, the system remains on hold for the dtmf tones sent in order to determine the action to be taken. The dtmf tone decoder **6** receives the dtmf tones and converts them so that the micro controller **1** interprets them:
- 25
- a) If code **1#** is received, the system blocks the vehicle both electronically and electrically through a blocking module **10**

that belongs to the external interface **9** and stops the dialing process. Then the alert module **14** activates itself to sound the horn and turns on the vehicle parking lights.

5 b) If code **2#** is received, the system blocks the vehicle both electronically and electrically through a blocking module **10** that belongs to the external interface **9**, and keeps dialing; that is, it dials the second number if it has dialed the first number and there is no answer; then it dials the third one if it
10 has dialed the second one and so on; if it has dialed the last number it re-starts the cycle.

c) If code **3#** is received, the system activates the alert module **14** to start sounding the horn in intervals as well as the
15 parking lights.

d) If code **9#** is received, the system stops the dialing process and leaves your vehicle in the conditions it is at that particular
20 time.

If the call is not completed, it does not take place or a voice mail machine answers, the dialing process continuous.

If the system does not receive any tone during the timer's duration,
25 it hangs off and dials the next telephone number in the list. This condition is present for the alarm **13** and the silent alarm **12**.

In order to activate the silent alarm **12**, the hidden switch is activated, the switch is detected by the micro computer **1** through

the external module. Once the system determines if the silent alarm **12** was activated, it follows this process:

- 5 1) It reads the second telephone number it is going to dial on the data memory **3**. It never dials the first number recorded.

- 2) It generates the necessary codes for the dialing interface **2**.

- 10 3) From the dialing interface **2**, codes are sent to the cellular transmitter/receiver **4**, which generates the calls to the programmed telephones.

- 4) The communication interface activates **5** to enable audio in and out.

- 15 5) The digital recording unit **7** is enabled to send the message through the call that is being made.

- 6) The micro controller **1** turns on a timer, which regulates the maximum on hold time in the event the call cannot be made or a voice mail machine answers.

- 20 7) The dtmf decoder **6** is ready to receive the dtmf tones sent from the answering telephone.

- 25 8) When the call is completed, the system remains on hold for the dtmf tones sent in order to determine the action to be taken. The dtmf tone decoder **6** receives the dtmf tones and converts them so that the micro controller **1** interprets them:

- 5 a) If code **1#** is received, the system blocks the vehicle both electronically and electrically through a blocking module **10** that belongs to the external interface **9** and stops the dialing process. This blockage is made at intervals to simulate a failure in the vehicle and not an intentional blockage. It has an on and off cycle. The alert module **14** does not activate.
- 10 b) If code **2#** is received, the system blocks the vehicle both electronically and electrically through a blocking module **10** that belongs to the external interface **9**, and keeps dialing; that is, it dials the third number if it has dialed the second number and there is no answer; then it dials the fourth one if it has dialed the third one and so on; if it has dialed the last
- 15 number it re-starts the cycle. The blockage in this process is made at intervals to simulate a failure in the vehicle and not an intentional blockage. It has an on and off cycle. The alert module **14** does not activate.
- 20 c) If code **9#** is received, the system stops the dialing process and leaves your vehicle in the conditions it is at that particular time.

25 If the call is not completed, it does not take place or a voice mail machine answers, the dialing process continuous.

If the system does not receive any tone during the timer's duration, it hangs off and dials the next telephone number in the list. This condition is present for the alarm **13** and the silent alarm **12**.

In order to personalize and utilize the functions or commands of the Command Alert and Receiver system through Cellular Telephony applied to vehicle alarms subject of this patent, the following steps
5 need to be followed:

1) It dials the system, which answers automatically giving the message that has been recorded previously. The message is stopped when pressing any key and it sends a dtmf tone.
10

2) The password, which consists of 4 digits, must be dialed. It is preceded by a * and it ends with the #. If the correct password is dialed, the confirmation tone is heard. It consists of three high frequency successive tones. If the password is incorrect, a
15 refusal tone, which consists of three low frequency tones, is heard.

3) Once the key is accepted, different functions that are used to personalize and manage the system can be accessed.
20

Each time any key is pressed, an acceptance tone is heard indicating the dtmf tone was received.

When a function is selected, an acceptance tone, which is the
25 combination of the three successive high frequency tones, is heard.

If a non existing option is pressed, a refusal tone, which is the combination of the three successive low frequency tones, is heard.

When completing any function, the system remains on hold of another function. If more time than the time assigned by the timer passes without activating any function or without sending any dtmf tone, the system hangs off and it remains on hold.

5

The functions and commands used by the the Command Alert and Receiver system through Cellular Telephony applied to vehicle alarms of the current Patent application are as follows:

- 10 1* This function is used to listen to the pre-recorded message in the system. When the message ends, a tone indicating that the message ended, is heard, but it can be still listened until exiting that function by pressing #.
- 15 2* This function is used to record a personalized message that is sent by the system when activated. After pressing the function code, the confirmation tone is received and the recording mode is immediately available. You must speak loudly and clearly . There are 10 s to record the message. When the message ends, * must
- 20 be pressed. In order to have a better recording, you must locate yourself at more than 20 m far from the system.
- 25 3* By means of this function, the first telephone number can be stored in the system memory. After pressing *3, the telephone number is dialed and it ends with #. At this time, you have to hold until a confirmation tone is heard indicating that the telephone is recorded properly (2s to 3s) . This telephone number is the first one dialed by the alarm system when the alarm 13 is activated.

- 4* This function is similar to the previous one. With this function, the second telephone number that is dialed when the alarm **13** is activated is stored in the memory system and the first number is dialed when the silent alarm is activated. The operation as in the previous case is 4*, accepts a telephone number of maximum 11 digits, # holds for confirmation tone (2s to 3s).
- 5* With this function and the following one, other numbers that the system dials when the alarm or the silent alarm **12** activates is stored. In any case, cellular telephone number or a fixed telephone number can be recorded. The procedure for all is the same and is as follows: 5* telephone number (maximum 11 digits) # hold on for confirmation tone (2s to 3 s).
- 6* Another telephone number that the system dialed when the alarm or the silent alarm **12** is stored. 6* telephone number (maximum 11 digits) #hold on for confirmation tone (2s to 3 s).
- 7* It provides the possibility that the vehicle can be blocked either electronically or electrically, or not, when the silent alarm **12** is activated. When function 7*1 is used, it allows that with command 1# or 2.# the vehicle can be blocked when the silent alarm **12** is activated. If 7*0 is used, the system do not allow the vehicle to be blocked when the silent alarm **12** is activated and command 1# or 2# is pressed.
- 8* This function can help to change the users password. The procedure to followed is 8* new password # new password # hold on for confirmation tone (2s to 3s). The new password must be

repeated twice so that becomes valid and is recorded in the system memory.

5 If you forget the password, you must follow this procedure: you dial the system and once it answers, you press the silent alarm button for 5 s. After this, the system starts a programming process and the password is changed by a new one.

10 9* This function helps to unblock the vehicle either electronically or electrically when it is blocked by a call originated by the alarm **13** or the silent alarm **12**. 9* is dialed and hold on for confirmation tone (2s to 3s).

15 0* The system brings this function to fully deactivate it and neither a call by alarm **13** nor a silent alarm **12** is generated. Upon activating this function, the system executes it and stops the communication immediately. To activate the system is necessary to use function 9*. When the system is inactive, the visual indicator turns off.

20

** When the user wants to block the vehicle, it calls the system and activates this function. At the time when it is activated, a confirmation tone is heard followed by a refusal and another confirmation one. The vehicle is blocked immediately and it would not change its status unless function 9* is used. When the vehicle is blocked, the light indicator starts to blink.

25

#* This function helps to activate the alert module **14** and the vehicle is blocked either electronically or electrically. An interval tone

indicating that module **14** is active is heard. In order to turn off the module, # must be presses for one second.

LIST OF REFERENCE SIGNS USED

1. Micro controller
2. Dialing interface
- 5 3. Data Memory
4. Cellular Transmitter/ Receiver
5. Communication Interface
6. Dtmf tone decoder
7. Audio digital recording
- 10 8. Tone generator
9. External interface
10. Vehicle electronic and/or electrical module
11. Visual indicator
12. Silent Alarm
- 15 13. Alarm
14. Alert Module

CLAIMS

1. The main features of the Command Alert and Receiver system
5 through Cellular Telephony applied to vehicle alarms of replevy 1
are: a) a micro controller 1, b.) a dialing interface 2; c) a data
memory 3; d) a cellular transmitter/ receiver 4; e) a
communication interface 5; f) a dtmf tone decoder 6; g) an audio
digital recorder 7; h) a tone generator 8; and i) an external
10 interface 9.
2. The main features of the Command Alert and Receiver system
through Cellular Telephony applied to vehicle alarms of replevy 1
has an external interface 9 which consists of four modules
15 enabling external communication as follows: a) an electronic
and/or electric vehicle blockage system 10; b) a visual light
indicator 11; c) a silent alarm 12 and d) an alarm 13.
3. The main features of the Command Alert and Receiver system
20 through Cellular Telephony applied to vehicle alarms of replevy 1
has an external interface 9 which consists of four modules
enabling external communication as follows: through the external
interface 9, the micro controller 1 detects that the alarm 13 is
activated and the dialing process to advise that something
25 abnormal is taking place starts. This process is described below:
- a) It reads the first telephone number it is going to dial on the
data memory 3.

- b) It generates the necessary codes for the dialing interface **2**.
- c) From the dialing interface **2**, codes are sent to the cellular transmitter/receiver **4**, which generates the calls to the programmed telephones.
- 5
- d) The communication interface activates **5** to enable audio in and out.
- 10
- e) The digital recording unit **7** is enabled to send the message through the call that is being made.
- f) The micro controller **1** turns on a timer, which regulates the maximum on hold time in the event the call cannot be made or
- 15
- a voice mail machine answers.
- g) The dtmf decoder **6** is ready to receive the dtmf tones sent from the answering telephone. When the call is completed, the system remains on hold for the dtmf tones sent in order to
- 20
- determine the action to be taken and converts them so that the micro controller **1** interprets them.
4. The main features of the Command Alert and Receiver system through Cellular Telephony applied to vehicle alarms of replevy **3**
- 25
- has a micro controller **1** that according to the code received it acts as follows:
- a) If code **1#** is received, the system blocks the vehicle both electronically and electrically through a blocking module **10**

that belongs to the external interface **9** and stops the dialing process.

5 b) If code **2#** is received, the system blocks the vehicle both electronically and electrically through a blocking module **10** that belongs to the external interface **9**, and keeps dialing; that is, it dials the second number if it has dialed the first number and there is no answer; then it dials the third one if it has dialed the second one and so on; if it has dialed the last
10 number it re-starts the cycle.

c) If code **3#** is received, the system activates the alert module **14** to start sounding the horn in intervals as well as the parking lights.

15

d) If code **9#** is received, the system stops the dialing process and leaves your vehicle in the conditions it is at that particular time.

20 5. The main features of the Command Alert and Receiver system through Cellular Telephony applied to vehicle alarms of replevy **2** has a silent alarm **12** that is activated by actuating a hidden switch, which is detected by the micro controller **1** through the external interface **9** and follows this process:

25

a) It reads the second telephone number it is going to dial on the data memory **3**.

b) It generates the necessary codes for the dialing interface **2**.

c) From the dialing interface **2**, codes are sent to the cellular transmitter/receiver **4**, which generates the calls to the programmed telephones.

5

d) The communication interface activates **5** to enable audio in and out.

e) The digital recording unit **7** is enabled to send the message through the call that is being made.

10

f) The micro controller **1** turns on a timer, which regulates the maximum on hold time in the event the call cannot be made or a voice mail machine answers.

15

g) The dtmf decoder **6** is ready to receive the dtmf tones sent from the answering telephone. When the call is completed, the system remains on hold for the dtmf tones sent in order to determine the action to be taken and converts them so that the micro controller **1** interprets them.

20

6. The main features of the Command Alert and Receiver system through Cellular Telephony applied to vehicle alarms of replevy **5** has a micro controller **1** that acts according to the code it receives:

25

a) If code **1#** is received, the system blocks the vehicle both electronically and electrically through a blocking module **10** that belongs to the external interface **9** and stops the dialing

process. This blockage is made at intervals to simulate a failure in the vehicle and not an intentional blockage. It has an on and off cycle. The alert module **14** does not activate.

5 b) If code **2#** is received, the system blocks the vehicle both electronically and electrically through a blocking module **10** that belongs to the external interface **9**, and keeps dialing; that is, it dials the third number if it has dialed the second number and there is no answer; then it dials the fourth one if it
10 has dialed the third one and so on; if it has dialed the last number it re-starts the cycle. The blockage in this process is made at intervals to simulate a failure in the vehicle and not an intentional blockage. It has an on and off cycle. The alert module **14** does not activate.

15

c) If code **9#** is received, the system stops the dialing process and leaves your vehicle in the conditions it is at that particular time.

20 7. The main features of the Command Alert and Receiver system through Cellular Telephony applied to vehicle alarms of replevies **3 and 5** has a system that allows to program telephone numbers for dialing when either alarm **13** or the silent alarm **12** is activated.

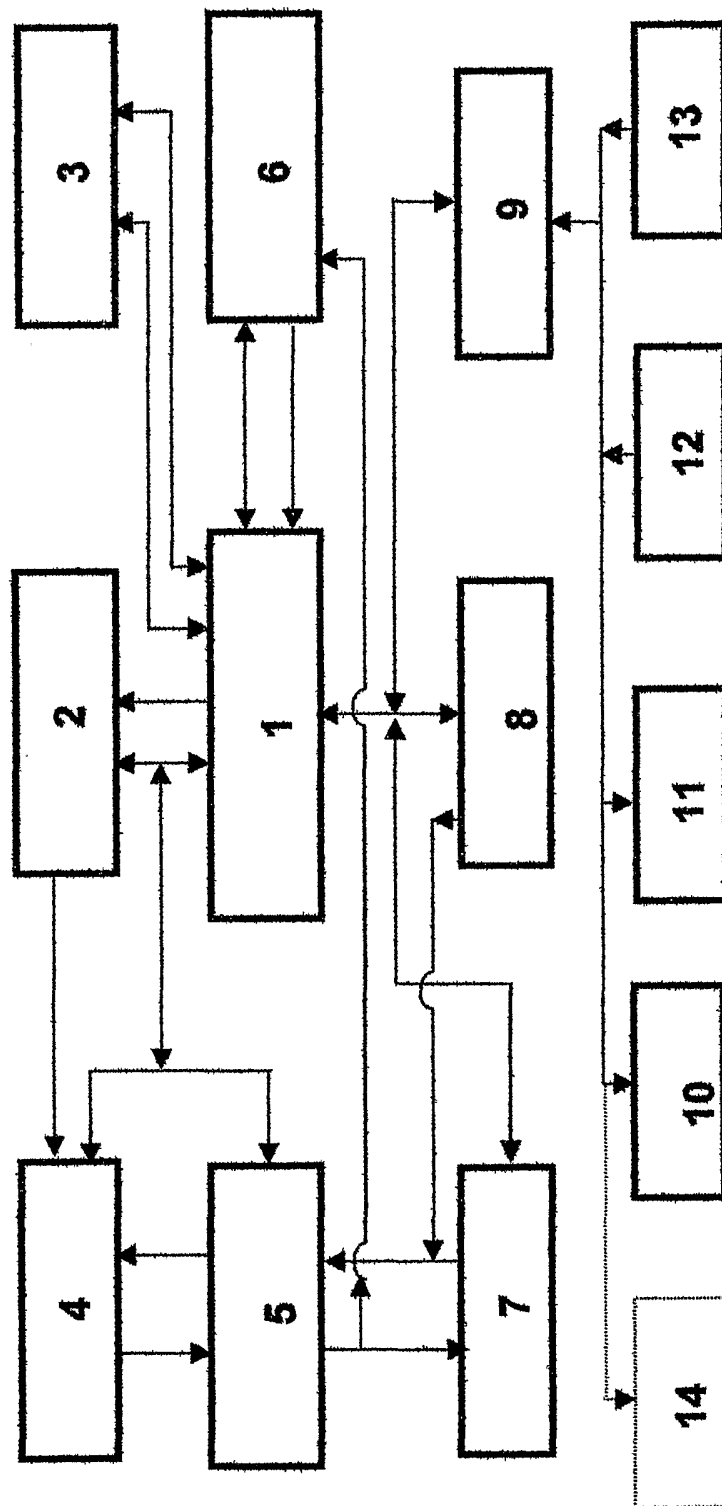
25

8. The main features of the Command Alert and Receiver system through Cellular Telephony applied to vehicle alarms of replevies **3 and 5** has a system that if it does not receive any tone during the time allocated to the timer, it hangs off and dials the next

telephone number in the list; this conditions may be evidenced with both the alarm **13** and the silent alarm **12**.

- 5 9. The main features of the Command Alert and Receiver system through Cellular Telephony applied to vehicle alarms of replevies **3** and **5** has a system that continues with the dailing process. If the call cannot be completed or there is no answer or a voice mail machine answers, the dialing system continues.

FIGURA 1



INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 01/02799

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G08B25/01 B60R25/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G08B B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 918 180 A (DIMINO MICHAEL) 29 June 1999 (1999-06-29)	1,2
A	column 4, line 60 -column 5, line 12 column 9, line 4 - line 32 ---	3-9
X	EP 0 449 471 A (CLIFFORD ELECTRONICS INC) 2 October 1991 (1991-10-02)	1,2
A	figure 1 page 5, line 13 - line 20 page 5, line 42 - line 48 page 8, line 18 - line 50 page 9, line 41 - line 49 page 10, line 1 - line 48 --- -/--	3-9

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
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INTERNATIONAL SEARCH REPORT

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