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Patent	Patentes
Health Permit	Registros Sanitarios
Software	Soporte Lógico
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Señor
JEFE DIVISIÓN DE NUEVAS CREACION
SUPERINTENDENCIA DE INDUSTRIA Y
E. S. D.

SECRETARÍA DE INDUSTRIA Y COMERCIO

3-67054-00004-0000

1980 NUECREACIONE
REGDEPOSITO
19

REF: EXPEDIENTE: 05-70054

TITULO: "SISTEMA TRANSMISOR RECEPTOR DE RADIOFRECUENCIA ASK MEDIANTE MICROCONTROLADOR"

ACTUACIÓN: RESPUESTA A EXAMEN DE PATENTABILIDAD

Estimados señores:

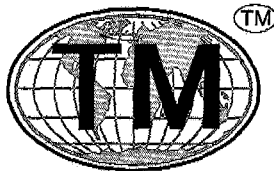
CARLOS ORLANDO MAYA RODRÍGUEZ, mayor de edad, vecino de esta ciudad, identificado con la Cédula de Ciudadanía No. 17.117.818 expedida en Bogotá, Abogado titulado en ejercicio y portador de la Tarjeta Profesional No. 17.402 del Consejo Superior de la Judicatura, obrando en calidad de apoderado del señor PAULO CESAR REALPE MUÑOZ, según poder debidamente conferido y legalizado, adjunto a las diligencias administrativas de la referencia.

Encontrándome dentro del término legal comparezco para responder el oficio de Requerimiento No. 15054 notificado en noviembre 22 de 2007 del cual se solicitó Prórroga, para el Examen de Patentabilidad emanado de esa Oficina, y con fundamento en el Artículo 45 de la Decisión 486 de 2.000 de C.A.N. damos respuesta en los siguientes términos.

1. Claridad de la solicitud:

Para atender el requerimiento y sugerencias del señor examinador respecto a la claridad de la solicitud y según el Art. 28 y 30 de la Decisión 486 se presenta:

- 1.1.- El Capítulo descriptivo se reorganiza, conforme a los requerimientos del señor examinador, sin que se ampliara el alcance de la invención, de acuerdo con lo señalado en el artículo 34 de la Decisión 486).
- 1.2.- Se modifica el pliego reivindicatorio en el que se hace claridad a la invención, de acuerdo con la nueva memoria descriptiva la que se ajusta a los límites impuestos por la descripción original, por lo que



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no exceden el alcance de la invención, cumpliendo de esta forma con lo exigido en los artículo 14 y 21 de la Decisión 486 de la C.A.N.

1.3.- Se aportan los dibujos que corresponden a las figuras 1, 2, 3 y 4.

1.4. Por las modificaciones realizadas en la memoria descriptiva y el nuevo capítulo reivindicatorio, se presenta un nuevo TITULO, así: "SISTEMA DE BLOQUEO ELECTRÓNICO POR RADIOFRECUENCIA DIGITAL."

Por lo antes expuesto, ruego a usted dar por subsanado dicho requerimiento, sin perjuicio de lo cual desde ya nos acogemos a lo dispuesto por el inciso segundo del artículo 45 de la decisión 486 de la Comunidad Andina de Naciones que a la letra dice: "(...) Cuando la oficina nacional competente estimare que ello es necesario para los fines del examen de patentabilidad, podrá notificar al solicitante dos o más veces (...)"

NOTIFICACIONES

Mi poderdante y yo recibiremos notificaciones en la Secretaría de su Despacho o en mi Oficina de Abogado ubicada en la Carrera 13A No. 28-38 Ofc. 246 MZ. 2 Parque Central Bavaria de la ciudad de Bogotá D.C.

Del señor Jefe,

CARLOS ORLANDO MAYA RODRÍGUEZ
No.17.117.818 expedida en Bogotá,
T.P No. 17.402 del C.S.J.

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SISTEMA DE BLOQUEO ELECTRÓNICO POR RADIOFRECUENCIA DIGITAL

ESFERA TECNOLÓGICA

La presente invención se refiere al campo de la electrónica, particularmente al campo de las alarmas para vehículos, carros y motocicletas, evita que se deba activar el sistema de bloqueo debido a que se esta recibiendo la señal que genera el transmisor

El equipo se encuentra en el sector de la electrónica digital y el subsector es la seguridad antirrobo destinada tanto para carros como para motocicletas.

ESTADO DE LA TECNICA

En el mercado existe: Alarma Electrónica Antirrobo y Antiatraco Para Motocicletas, no afecta el cableado, con bloqueo para impedir que encienda el vehículo, sirena; Alarma Audiovox con Sensor de Movimiento con sensor de 8 niveles, pera alarma; Seguro personalizado corriente el encendido con una clave personal; Alarma de Bloqueo Central y 4 Puertas.

Se conoce en el mercado productos sobre seguridad vehicular tanto para carros como para motocicletas con las siguientes características:

- Personalizar el sonido de la sirena (16 sonidos programables)
- Encendido y apagado del motor de la moto a control remoto
- Sistema code Hopping (anti-clonación)

- Modulo de alarma y control remoto a prueba de agua
- Función INMOVILIZADOR
- Posibilidad de operación con pulsador manual
- Rearmado y armado automático al cerrar el switch de ignición
- Función búsqueda
- Función pánico
- Sensor de impacto interno con sensibilidad ajustable con control remoto
- Función valet (anulación temporal de sistema)
- Activación y desactivación silenciosa
- Programación y anulación de funciones por control remoto
- No pierde la programación al descontar la batería
- Puede bloquear el sistema de encendido aun si ha desconectado la batería
- Activación de luces programable para economizar las carga de la batería
- Cuenta con LED indicador de estado
- Sistema Anti Atraco por ausencia del control remoto (Proximidad)
- Manejo a control remoto de armado y desarmado del sistema
- Manejo con el pulsador manual de armado y Valet del sistema
- Señal audible de armado y desarmado del sistema
- Sensor de impacto incorporado
- Admite batería auxiliar externa
- Para motos con batería de 6V o 12V
- Encendido del motor de la moto a control remoto.
- Modulo de Alarma a prueba de agua.
- Armado silencioso.
- Función de aviso de sobre paso de vehículos.
- Técnica FSK, gran estabilidad anti-interferencias.
- Dos mandos LCD multicolor con cuatro botones de función.
- Información del estado de la moto en el LCD del mando.
- Arranque y desconexión del motor de la moto por control remoto.

- Aviso por vibración, luz y sonido.
- Pantalla LCD retroiluminada.
- Aviso de estado de batería del mando.
- Reloj y alarma en el mando.
- Alarma universal
- Alarma de dos sentidos
- Central inteligente con microprocesador
- Sistema antisecuestro
- Corte de encendido
- Auto armado
- Sensor perimetral por microondas de activación
- Ajuste de sensibilidad
- Función de ahorro de batería

DIVULGACIÓN DE LA INVENCION

El principal problema técnico que se solucionó es evitar que el propietario del vehículo deba activar el sistema de bloqueo ya que este sistema esta recibiendo a cada instante la señal que genera el transmisor que posee el dueño del vehículo. Para que este sistema se desactive (cuando se habla desactivar se refiere a que el vehículo se apague), existen dos medios diferentes, que se pierda la señal entre el transmisor y el receptor o la otra opción es que el mismo dueño active el sistema una determinada distancia pulsando el botón.

Otro problema técnico solucionado es la incorporación de una batería recargable en el control del transmisor con su respectivo cargador de batería, evitando así la compra de baterías nuevas.

Para averiguar el estado de la batería recargable el control remoto tiene incorporado un diodo emisor de luz activado por

un pulsor que indica el nivel de energía de la batería recargable.

Lo nuevo es que este sistema es silencioso emplea además una señal de radiofrecuencia digital a 418 MHz. El sistema funciona por presencia mientras esta activado, sin necesidad de pulsarlo ni oponer resistencia en caso de hurto.

Esta invención se relaciona con un circuito que consta de dos partes; el transmisor y receptor de radiofrecuencia (RF). El transmisor envía una serie de pulsos de modulación digital de amplitud o ASK (Amplitud Shift Keying) codificada y continua mediante la ayuda de un microcontrolador (IC1) y el transmisor de RF (IC2).

Evitar el cambio de baterías del transmisor por el continuo uso que se le da en el momento en que se encuentra encendido el vehículo.

Incluir una batería recargable de Ni-Cd de 9 V y un cargador para baterías de teléfonos celulares.

El equipo consta de dos partes: El transmisor y receptor de radiofrecuencia digital.

El transmisor posee los siguientes componentes: Una batería Ni-Cd 9 V, un microcontrolador Flash, resistencias, condensadores cerámicos, led, pulsadores, switch, zener como regulador de voltaje y un modulo de radiofrecuencia digital ASK a 433 Mhz.

El receptor posee los siguientes componentes: Una batería 12 V, un microcontrolador Flash, resistencias, condensadores electrolíticos y cerámicos, rele, transistores npn, regulador de voltaje, un modulo de radiofrecuencia digital ASK a 433 Mhz y un led indicador de encendido.

La aplicación esta destinada únicamente a la prevención del hurto de vehículos. El producto posee las siguientes características:

- Transmisión de señales por modulación ASK para baja interferencia
- Apagado y encendido por proximidad
- Bloqueo silencioso
- Cargador de Baterías de Ni-Cd
- Batería recargable
- Códigos para activación de la moto
- Led indicador de carga de la batería

La relación entre los componentes es en formato digital de 8 bits tanto para el receptor como para el transmisor.

BREVE DESCRIPCIÓN DE LAS FIGURAS

La estructura del circuito se ilustra según las:
figura 1 del circuito transmisor y la
figura 2 del circuito receptor
figura 3 transmisor
figura 4 receptor

MEJOR MANERA DE REALIZAR LA INVENCION

El circuito transmisor correspondiente a la figura 1 se compone de los siguientes elementos:

La batería recargable de Níquel-Cadmio de 9 voltios 19 proporciona la energía necesaria para que funcione correctamente el circuito.

Un Jack 11 cuya función principal es cargar la batería de Níquel-Cadmio mediante un cargador que va conectado a este y abrir el circuito restante en el momento en que se conecte el cargador.

Un pulsador 12 que verifica el estado de la batería Níquel-Cadmio cuando este se presiona.

Un diodo emisor de luz o LED 13 que mediante su intensidad luminosa especifica en nivel de energía que posee la batería de Níquel-Cadmio.

Un Switch 14 que permite proporcionarle o no energía a todo el circuito del transmisor.

Un condensador 15 cuya función es filtrar el voltaje eliminando los posibles ruidos que posea la batería.

La resistencia 16 que proporciona una corriente deseable para que el LED 13 se ilumine con una potencia óptima.

La resistencia 17 como limitador de corriente y potencia al resto del circuito.

Un diodo Zener 18 cuya función principal es fijar el voltaje a un nivel estable y que no exceda el valor requerido para el funcionamiento del circuito.

El microcontrolador PIC12F629 19 que representa el cerebro del circuito cuya función es recibir la orden y posterior envío de pulsos codificados al transmisor de radiofrecuencia digital.

Una antena de cobre 20 como elemento para irradiar energía electromagnética proveniente del transmisor.

El transmisor de radiofrecuencia digital 21 TLP-434A a 418 MHz cuya función es recibir los pulsos digitales provenientes del microcontrolador 19 y enviando al espacio señales de modulación digital de amplitud o ASK.

La resistencia de pull-up 22 que permite el estado lógico a la entrada del microcontrolador 19.

El pulsador 23 cuya función es enviar un estado lógico alto al microcontrolador cuando este se pulsa.

El circuito receptor correspondiente a la figura 2 se compone de los siguientes elementos:

La batería de 12 voltios 24 propia del vehículo proporciona la energía necesaria para que funcione correctamente el circuito.

Un condensador 25 cuya función es filtrar el voltaje eliminando los posibles ruidos que posea la batería.

La resistencia 26 como limitador de corriente y potencia al resto del circuito.

Un diodo Zener 27 cuya función principal es fijar el voltaje a un nivel estable y que no exceda a un valor requerido para el funcionamiento del circuito.

Un condensador 28 cuya función es filtrar aun más los posibles ruidos generados por los elementos anteriores a este.

El microcontrolador PIC12F629 29 que representa el cerebro del circuito cuya función es recibir los pulsos provenientes

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del receptor de radiofrecuencia y posterior orden para que se encienda el relé.

Una antena 30 como elemento para capturar la energía electromagnética proveniente del transmisor.

El receptor de radiofrecuencia digital 31 RLP-434A a 418 MHz cuya función es recibir mediante la antena la señal proveniente del transmisor, demodularlo y entregar pulsos digitales al microcontrolador 29.

La resistencia 31 que proporciona la corriente mínima para encender el transistor 32.

El arreglo darlington conformado por dos transistores 32 y 33 para amplificar la corriente y encender el relé.

Un diodo emisor de luz o LED 34 que permite identificar si el relé se encuentra en estado abierto o cerrado.

La resistencia 35 que proporciona una corriente deseable para que el LED 34 se ilumine con una potencia optima.

Un diodo rectificador 36 cuya función es evitar que la corriente proveniente de la batería se devuelva por los transistores y pueda dañar al microcontrolador.

El relé 37 cuya función es permitir cerrar o abrir un switch que se encuentra interiormente.

Un terminal 38 el cual se conecta al sistema eléctrico del vehículo.

Para iniciar el envío de información este dispone de un pulsador (S3) normalmente abierto, en el momento en que este

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daños al resto de componentes cuando se inicia la carga de la batería.

El switch que posee el transmisor evita que este consuma carga en el momento en que no se utilice el sistema ahorrando de una manera efectiva la energía que posee la batería.

Como puede observarse el equipo electrónico esta basado en dos componentes principales, el transmisor y receptor de RF tal como se observa en la figura 3 y 4 respectivamente.

Figura 3. Transmisor

El transmisor comprende una tarjeta de envío de señales de radiofrecuencia digital conectada al pin 6 del microcontrolador, además un pulsador conectado al pin 7 del microcontrolador, la batería esta conectada en los pines 1 y 8 respectivamente, el led indicador de funcionamiento se encuentra conectado en serie con el pulsador. Por ultimo el Jack que permite la recarga de la batería se encuentra en paralelo con esta.

Figura 4. Receptor

El receptor comprende una tarjeta receptor de señales digitales conectada al pin7 del microcontrolador, la batería esta conectada a un regulador de voltaje en paralelo y este a su vez conectado con el pin1 y pin 8 del microcontrolador. Dos transistores en serie son conectados al pin 7 del microcontrolador, el rele se conecta a la salida de los transistores y a la batería. Por ultimo un led indicador de activación se conecta a la salida de los transistores.

transmisor del receptor, dicho receptor dispone de un tiempo para recibir pulsos y si dichos pulsos no llegan al receptor hace que el microcontrolador desactive el relé apagando el sistema.

5. Sistema conforme a la reivindicación 1 caracterizado porque el circuito transmisor comprende los siguientes componentes: una batería recargable Ni-Cd de 9 voltios, un pulsador que verifica el nivel de la batería, un interruptor para alimentar el sistema, un diodo Zener regulador de voltaje, un microcontrolador, un pulsador que inicia o cancela el envío de señales, un módulo transmisor de radiofrecuencia y una antena.
6. Sistema conforme a la reivindicación 1 caracterizado porque el circuito receptor comprende los siguientes componentes: una batería de 12 voltios, un filtro condensador, un diodo Zener regulador de voltaje, un microcontrolador, un módulo receptor de radiofrecuencia, un arreglo de transistores Darlington, un relé y una antena.

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RESUMEN

La presente invención es un sistema de bloqueo electrónico por radiofrecuencia digital para ser usado en vehículos y evitar que se deba activar el sistema de bloqueo, debido a que se está recibiendo a cada instante la señal que genera el transmisor.

Esta invención se relaciona con un circuito que consta de dos partes; el transmisor y receptor de radiofrecuencia (RF). El transmisor envía una serie de pulsos de modulación digital de amplitud o ASK (Amplitud Shift Keying) codificada y continua mediante la ayuda de un microcontrolador (IC1) y el transmisor de RF (IC2).

La invención tiene como objetivo principal proporcionar un equipo electrónico que evite el robo de motos o carros usando técnicas de radiofrecuencia digital a distancia.



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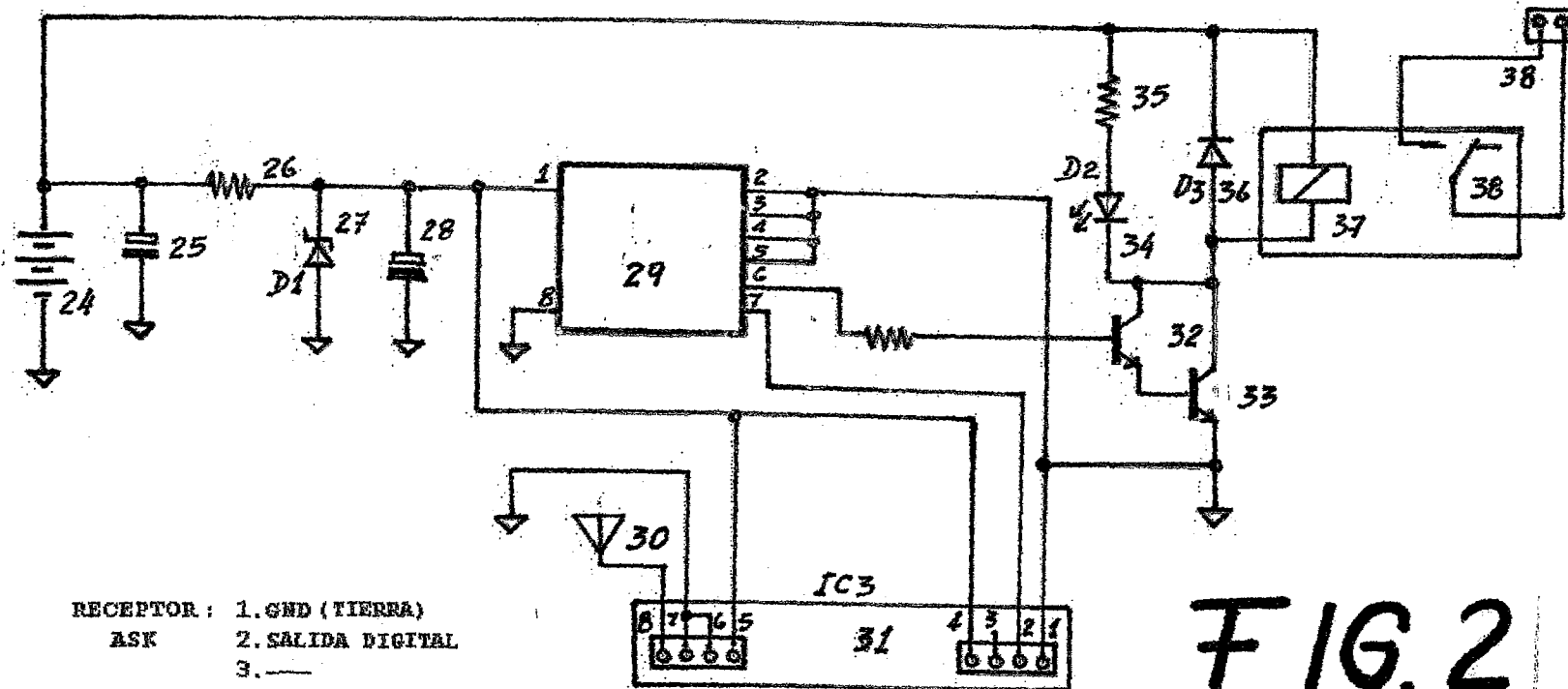


FIG. 2

Fig.3

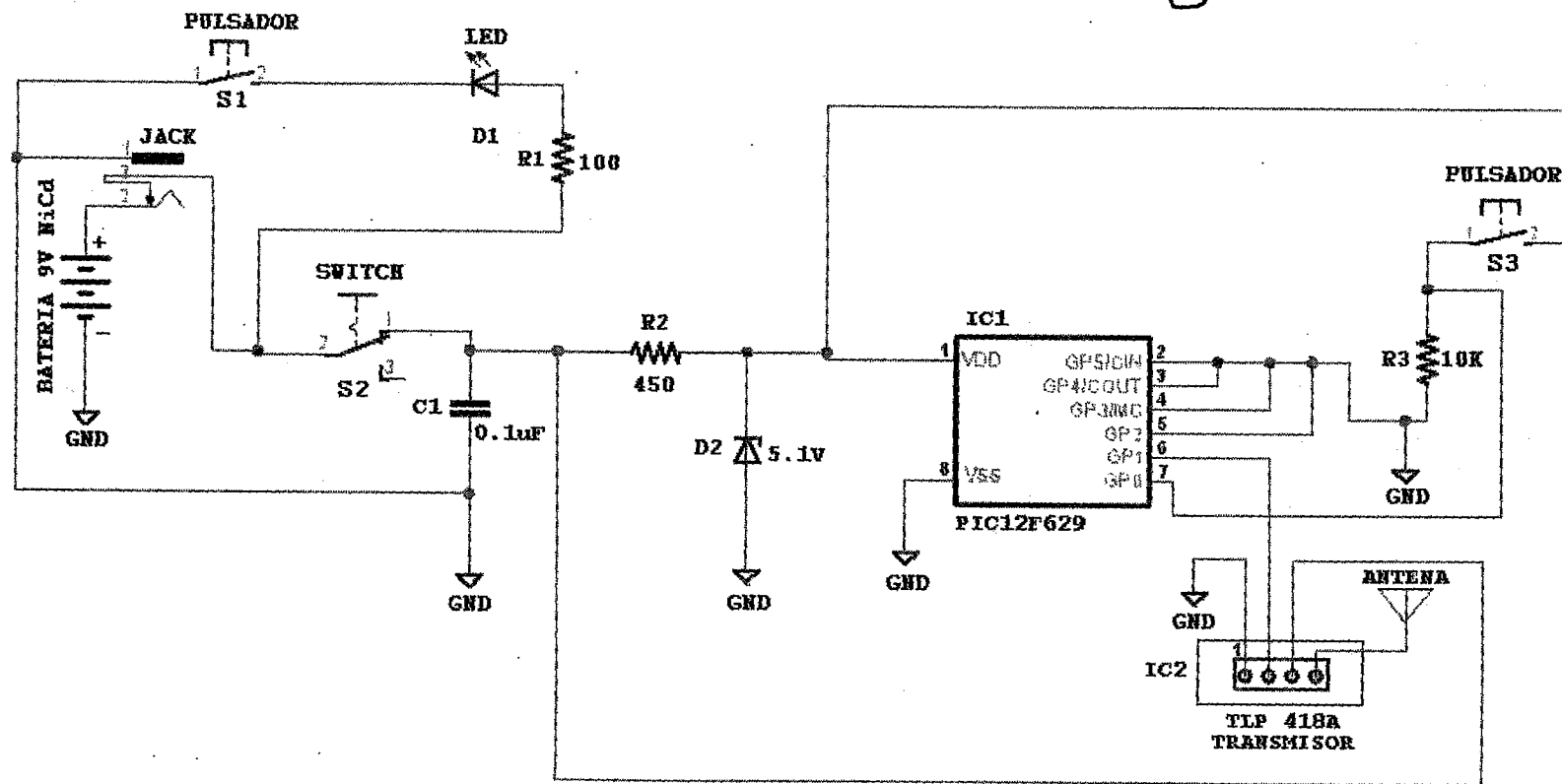
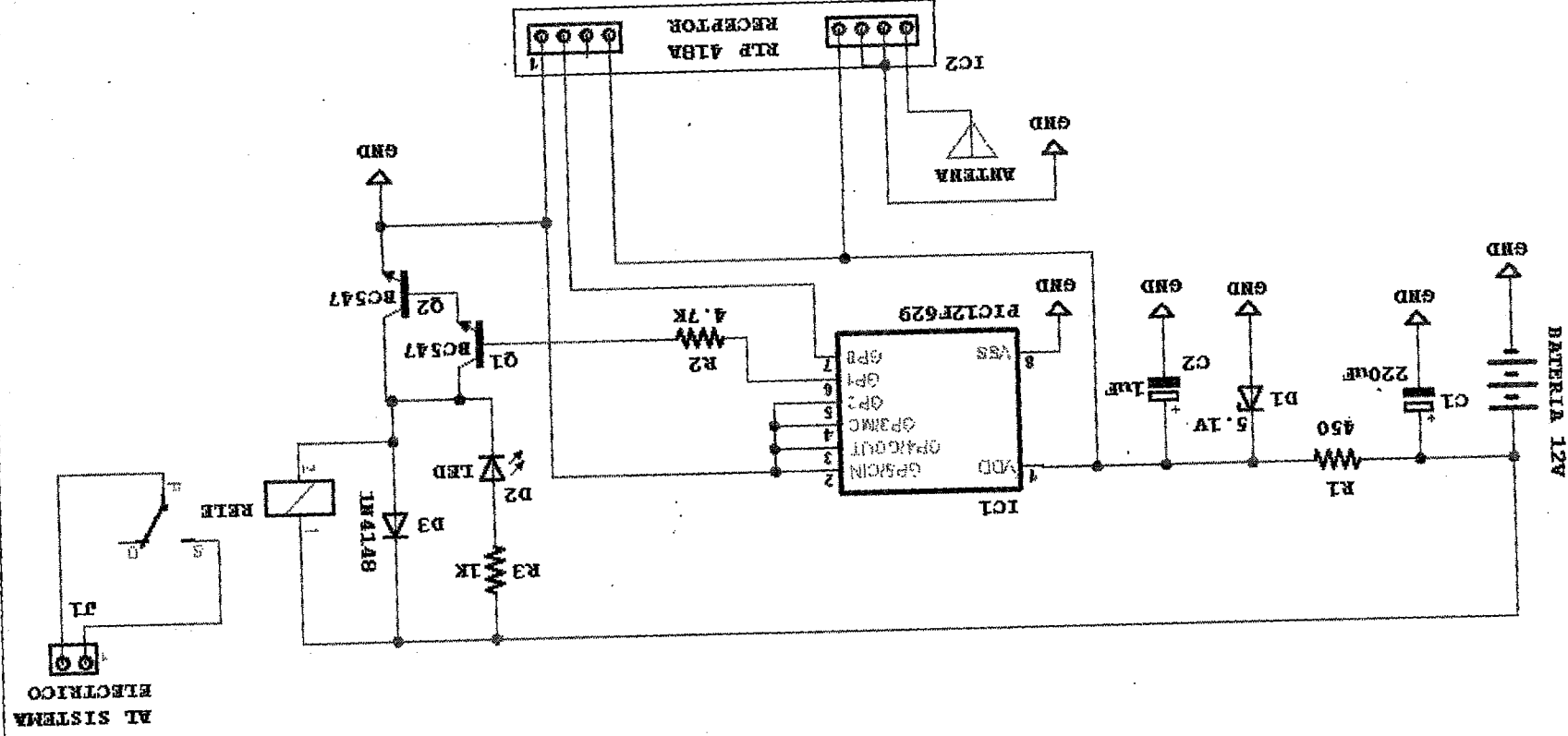


Fig. 4



AL SISTEMA
ELECTRICO

12V

United States Patent [19] Vogel

[11] Patent Number: 4,769,825
[45] Date of Patent: Sep. 6, 1988

[54] COMMUNICATIONS TRANSMISSION SYSTEM FOR ELECTROMAGNETIC WAVES

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and Munich, Fed. Rep. of Germany

[21] Appl. No.: 906,210

[22] Filed: Sep. 12, 1986

[30] Foreign Application Priority Data

Sep. 17, 1985 [DE] Fed. Rep. of Germany 3533156

[51] Int. Cl.⁴ H04B 7/08

[52] U.S. Cl. 375/40; 371/68;
375/58; 375/100; 455/69; 455/138

[58] Field of Search 455/8; 10, 52, 69, 116,
455/137, 138, 140, 343; 375/38, 40, 100, 58;
371/8, 68.

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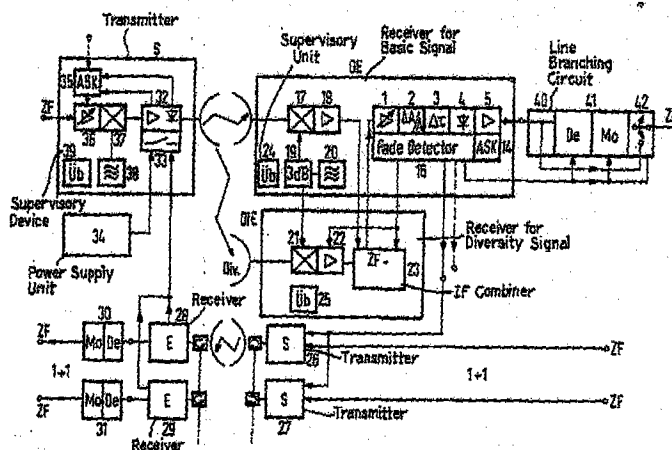
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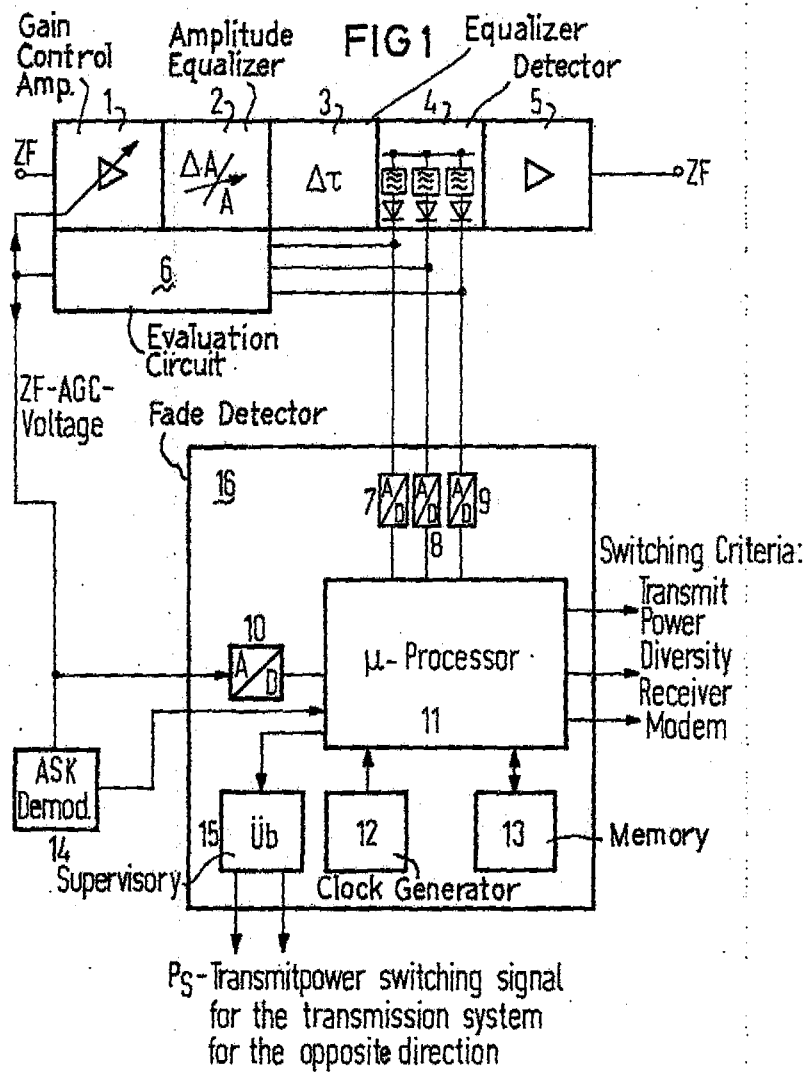
Primary Examiner—Benedict V. Safourek
Attorney, Agent, or Firm—Hill, Van Santen, Steadman &
Simpson

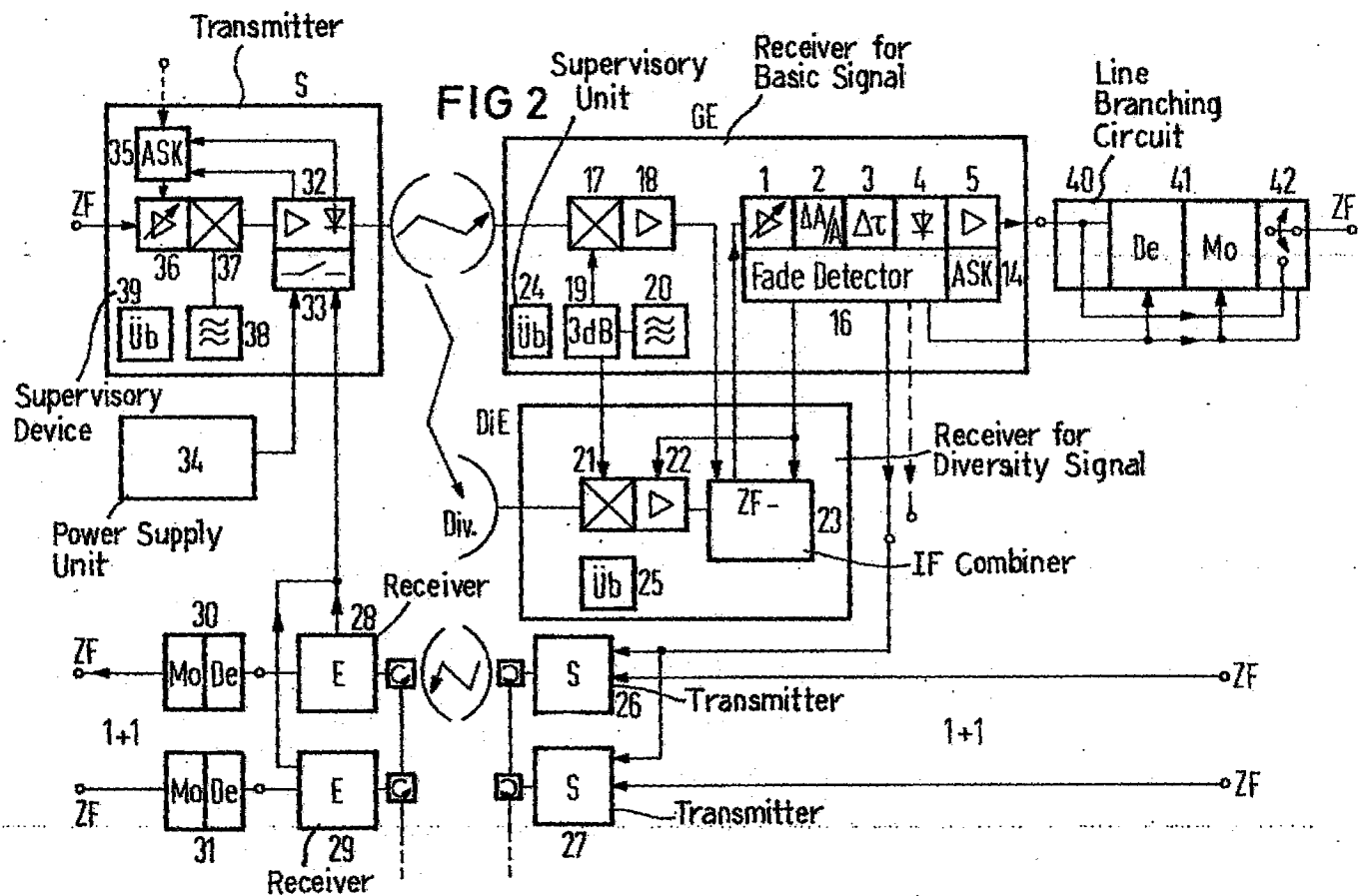
[57] ABSTRACT

A communication transmission system for electromag-
netic waves comprising a transmitter, transmitting and
receiving antenna with a radio link hop therebetween
and a receiver having an associated diversity receiver.
When there is no access to energy supply, network
energy is supplied from batteries, solar systems and
other power supplies which have limited power and are
expensive. So as to provide energy saving operation of
a system, a digital system is created and the invention
provides a fade detector in the receiver for fast recog-
nition of fading and which produces signals correspond-
ing to the weighted switching thresholds that are de-
rived for the connection of the diversity receiver which
had previously been disconnected so as to reduce power
consumption and for setting by reducing or increasing
the transmission power or for the IF through connect-
ing by way of a plurality of radio link hops or for the
compensation or cancellation thereof.

6 Claims, 3 Drawing Sheets

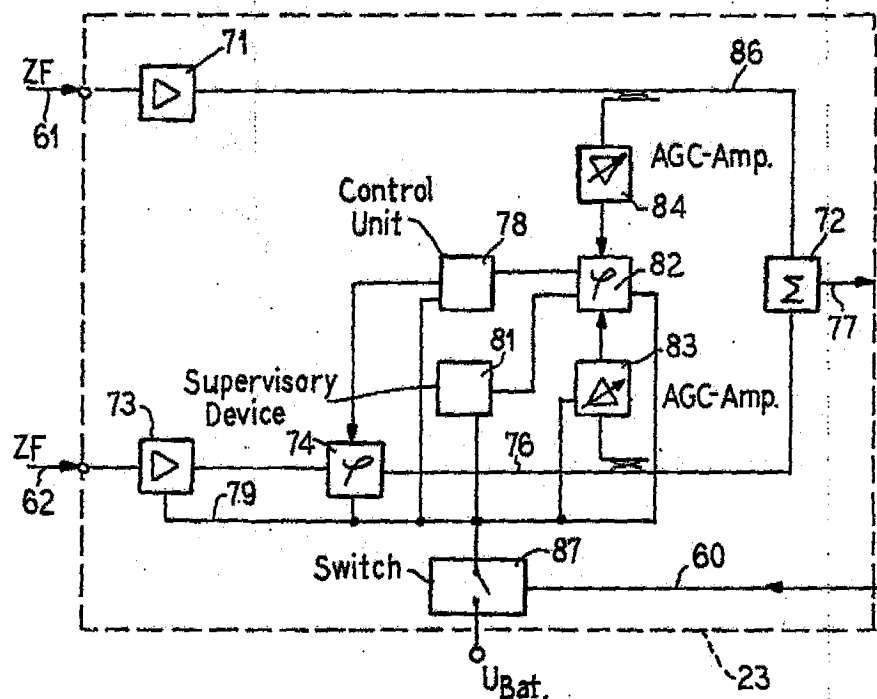






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FIG 3



COMMUNICATIONS TRANSMISSION SYSTEM FOR ELECTROMAGNETIC WAVES

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates in general to communication transmission systems for electromagnetic waves comprising a transmitter in which the signal to be transmitted is modulated onto a carrier and to the transmission and reception antennas with a radio link hop lying between them and to a receiver which includes an allocated diversity receiver in which the received signal is converted into an IF level and is demodulated.

2. Description of the Prior Art

On radio links which do not have access to energy supply networks, radio systems are supplied by way, for example, by solar systems, wind generators or by diesel generators. High acquisition and operating costs of such systems require that the lowest possible power consumption of the radio apparatus occur. For analog FM systems and digital systems up to 34M bits per second an adequately low power consumption can be achieved with standard systems concepts. For solar systems, for example, power consumption can be less than 300 watts for two way 1+1 connections without significant departure from the CCIR quality demands for transmission systems. Fast digital systems as, for example, 140M bits per second present a number of problems and these require adaptive base band equalizers and space diversity because of their sensitivity to fading and also are dependent on fast logic which require high power consumption.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a solution for communication transmission systems which operate on auxiliary power and from which fast digital systems as well as low capacity digital systems can be operated in energy saving manner.

It is a feature of the present invention to provide a detector for fast recognition of fade phenomena for example, flat fade and IF amplitude distortion which are provided at the receiver and switching thresholds are weighted according to the fade phenomena derived from the signals thereof and supplying switching criteria for the interruption free connection or disconnection of the diversity receiver as is required, from the momentary fading situation for reducing fade distortions.

As an advantageous development of the invention, the switching thresholds for the transmitter power adjustments are derived from the signals of the fade detector and are derived such that the previously reduced transmission power of the radio link hop is boosted to normal transmission power for defined fading events and switching thresholds for IF through connection by way of a plurality of radio link hops and their compensation or cancellation are obtained from the signals of the fade detector. These signals are derived from the signals of the fade detector such that the regenerating and for example, adaptively fading equalizing modem previously disconnected so as to reduce operating power are bridged in the IF range by a branching at the input and an IF switch at the output are again connected so as to prevent possible increasing distortion during fading on the basis of the full equalizing and regenerating effect of the modem.

The invention results from realization that no fade exists during the majority of the transmission time on the radio link hops. The devices are operating at levels greater than necessary during this time. In the invention, the power consumption of the system can be greatly reduced either individually or combined in various ways in fade free time without deteriorating the quality of the transmission. On the basis of early recognition of the critical fade in a time before the appearance of the first bit errors depending on the serious fade, power reduction can be eliminated and adequate power to eliminate the bit errors can be applied. The invention is also capable of allowing errors to be avoided according to different weighted threshold criteria without errors building up during switchover.

Other objects, features and advantages of the invention will be readily apparent from the following description of certain preferred embodiments thereof taken in conjunction with the accompanying drawings although variations and modifications may be effected without departing from the spirit and scope of the novel concepts of the disclosure and in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block circuit diagram of the receiver portion for fade recognition and deriving the control criteria;

FIG. 2 is a block circuit diagram illustrating the transmitter and receiver devices of a communication transmission system with fade control according to the invention and

FIG. 3 is a detailed view of the I.F. combiner.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 illustrates the IF portion of the receiver of the communication transmission system and includes the devices for the recognition of fading, for example, in the IF signal. The IF portion includes an IF gain control amplifier 1 which supplies an output to an IF amplitude equalizer 2. A group delay equalizer 3 receives the output of the amplitude equalizer 2 and supplies an output to a detector 4. An output amplifier 5 receives the output of the detector 4 and supplies the IF signal to an IF output terminal. The amplitude equalizer 2 is controlled by detector signals from an evaluation circuit 6 which receives the detected signals from the detector.

The detector 4 detects signal amplitude slope distortions and quadratic distortions and so on which have their origin in fading activities. These signals can be simultaneously employed for the recognition of fade phenomena. In the system, the detector 4 normally controls the IF amplitude equalizer 2 through the evaluation circuit 6 such that amplitude slope distortions, parabolic distortions, cubic distortions and under given conditions distortions of the IF amplitude frequency response of a higher order caused by radio link hop echoes are equalized by appropriate regulating units in the amplitude equalizer 2. The detector signals also simultaneously control the IF controlled gain amplifier 1 for compensating of flat fade caused by the radio link hop.

The IF AGC signal of the evaluator circuit 6 for the IF control gain amplifier 1 which for example, indicates the radio attenuation for example, in dB linear fashion and the signals of the detector 4 which measure the signal power at a plurality of frequencies distributed

over the signal spectrum are supplied by way of analog to digital converters 10 and/or 7, 8 and 9 and more if necessary to a microprocessor 11 which receives a clock input from a clock generator 12 and receives its work program and data from a memory 13. Also the microprocessor 11 is supplied with the signals of a ASK demodulator 14 which is also connected to the evaluator circuit 6. The unit composed of the microprocessor 11, the analog to digital converters 7, 8, 9 and 10, the clock generator 12, the memory 13 and a supervisory 15 means which is connected to the microprocessor 11 is identified below as a fade detector 16. According to the work program prescribed for the processor 11 switch thresholds for the transmission power, diversity receiver and MODEM are derived by corresponding weighting of the data such that, for example, the speed of the changes is coveighted. Switchover signals are produced at the output.

The following example will show the significance of the consideration of the speed of the changes. Given, for example, particularly fast changes in the automatic gain control AGC and sloped amplitude positions, the engagement of the modem and diversity receivers must be started at an especially early time so as to avoid errors due to the fast fade occurrence. The reason for this is that the switchover requires time and the fade distortions must not deteriorate such during this time that bit errors accumulate before the connection of the modem and diversity receiver has been carried out. For this case, for example, 2 dB amplitude slope distortion would be selected as the switchover threshold. Given slow fade events, the threshold by comparison could be shifted by the processor to 6 dB amplitude slope distortion for the diversity receiver which would still be error free since the adaptive modem—switched at 2 dB threshold would cancel the distortion leveled by the adaptive IF amplitude equalizer 2. Lower station power consumption and fewer switching actions are the result.

FIG. 2 shows the transmitter and receiver devices of a communication transmission system including the control and monitoring devices for fade phenomena. A receiver GE for the basic signal and a receiver DiE for the diversity signal are provided at the receiver side as shown. Both receivers are connected to antennas. The IF portion of the basic receiver GE comprising the fade detector 1, 2, 3, 4, 5, 14, 16 as well as the regulating and evaluating devices for the switching thresholds essentially correspond to the circuit portion illustrated in FIG. 1. The receiver includes a receiving mixer 17 which receives the output of the antenna and also receives the output of an oscillator 20 which is supplied through a 3 dB coupler 19. The oscillator 20 also supplies a signal through this 3 dB coupler 19 to a receiving mixer 21 in the diversity receiver DiE branch. The output signals of the receiving mixers 17 and 21 in the basic receiver GE and the diversity receiver DiE are respectively supplied through amplifiers 18 and 22 to IF combiner 23 which has its output connected to the input of the IF controlled gain amplifier 1 in the IF portion of the basic receiver GE. Supervisory devices in the basic receiver GE and diversity receiver DiE are indicated by reference numerals 24 and 25. The control signals or respectively the switchover signals generated by the fade detector 16 are conducted through control lines to the corresponding elements. A first control line leads to the IF combiner 23 and to the amplifier 22 in the diversity receiver DiE. Disconnection of the diversity receiver DiE occurs with this control and this is

only required in the fade case for signal improvement distortion.

The control signal generated by the fade detector 16 for decreasing and increasing the transmission power is transmitted to the transmit side in the opposite direction and is transmitted by way of transmitters 26 and 27 of the 1+1 protected transmission circuit shown in the exemplary embodiment. The associated receivers 28 and 29 of the 1+1 backup circuit receives the control signals through appropriate antenna from the transmitters 26 and 27 and supply them to a control signal receiver 33 for the switching action of the transmit power level of the transmitter amplifier 32 of the transmitter S. The receiver 33 is also connected at the same time to a power supply unit 34 and a loss free control of the operating points of the transmitter amplifier is initiated in 33. The transmitter amplifier 32 receives the RF signal through a controllable IF pre-amplifier 36 which supplies an output to a mixer 37 which supplies an RF input signal to the transmitter amplifier 32. The mixer 37 receives an input from an oscillator 38 and an ASK modulator 35 supplies an input to the controllable pre-amplifier 36 and receives outputs of the transmission amplifier 32. A supervisory device 39 monitors functions in the transmitter S.

The decreasing or increasing of the transmission power is thus to be monitored at the receiver side. This occurs in a simple way on the basis of a low frequency as, for example, 500 Hz through 1 KHz with ASK modulation of the transmitted power by means of the ASK modulator 35 such that the modulation is impressed on the transmitted power in the low frequency gain control loop of the IF pre-amplifier 36. The ASK modulation is demodulated on the receiver side by the fast gain control loop of the IF AGC amplifier 1 of FIG. 1 and detected and evaluated in the demodulator device 14 (FIG. 1) and it is canceled out of the intermediate frequency and thus eliminated. This prevents faulty forwarding the ASK modulation to the following eventually IF through connected radio link hops.

For signal protection purposes the transmit power switching signal from 16 is transmitted in parallel on the transceivers 26/28 and 27/29.

The execution of the boost of the transmitted power can be acknowledged at the receiver side for supervisory purposes. The accomplished action of boosting the transmit power of 32 is transmitted back to the receive side with ASK modulation 35 and demodulated in the receive side 16. A failure of the acknowledgment to arrive at the receiver can lead to a signal to the supervisory unit 24 and, thus, indicate a fault.

The receiver portion of the basic receiver GE supplies an output as illustrated in FIG. 2 to a line branching circuit 40 which supplies an output to a demodulator/modulator 41 which in turn supplies an output to a switch 42. With corresponding control signals of the fade detector 16 the modem 41 can be bypassed and in other words the IF signal from GE can be through connected to the next transmitter or can remain engaged on the basis of switchable thresholds identified in the microprocessor 11 (FIG. 1). An IF through connection can occur over a plurality of radio link hops. To reduce system power consumption the modem is switched off during the IF through connection phase.

FIG. 3 illustrates the IF combiner 23 shown in FIG. 2 which receives an input on line 61 from the receiver GE from the output of the amplifier 18 and an input on line 62 from the output of amplifier 22 of the diversity

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receiver. Line 61 is connected to an amplifier 71 which is connected to a first input of an adding device 72. The line 62 is connected to an amplifier 73 which supplies an output to a phase controller 74 which supplies an output to line 76 which is connected as a second input to the adder 72. The output of the adder is supplied to line 77 which is connected as the input to the amplifier 1 in the receiver GE. A control unit 78 supplies an input to the phase controller 74 to vary the phase shift and the phase controller 74 receives an input on line 79 which is also supplied to the amplifier 73 and to the control unit 78. A supervisory device 81 receives an input from line 79 and supplies an input to a phase controller 82 which also receives an input from a control unit 78 and from an automatic gain control amplifier 83 which also receives an input from line 79. The phase controller 82 supplies an output to line 79. The automatic gain control amplifier 84 is coupled to line 86 and the automatic gain control amplifier 83 is coupled to line 76. The fade detector 16 supplies an input on line 60 to a switch 87 which receives an input from a voltage source U_{Bat} . Also, incorporated by reference is U.S. Pat. No. 4,386,435 which discloses a known circuit showing an I.F. combiner. In the known circuit of U.S. Pat. No. 4,386,435, the I.F. signals of two receiving branches including a basic signal and the diversity signal are supplied to an adding device either directly or through a phase shifter. Signal components are coupled from both signal paths and the signal components are supplied by way of amplifiers to a phase detector which supplies a control signal for a phase shifter in one signal path. A supervisory device is also associated with the phase detector. The supply voltage U_{Bat} is supplied to the individual elements of the diversity receiver and the I.F. combiner by way of a switch which is driven by an output signal of the fade detector 16.

I claim as my invention:

1. A communication transmission system for electromagnetic waves, comprising a first transmitter at a first location in which the signal to be transmitted is modulated onto a carrier, a first receiver spaced from said transmitter, a transmitting antenna connected to said first transmitter, a receiving antenna connected to said first receiver, a diversity receiver near said first receiver for receiving a diversity signal, a further receiving antenna connected to said diversity receiver, means for

converting the received signals in said first receiver and said diversity receiver to IF signals, means for combining said IF signals, a fade detector which receives outputs from said means for combining, for rapid recognition of different fading phenomena as, for example, flat fade and IF amplitude distortions and said fade detector producing a switching signal when fading occurs, a switching means receiving said switching signal and connected to said diversity receiver to reduce power consumption by disconnecting said diversity receiver from the combiner when it is affected by fading.

2. A communication transmission system according to claim 1, including, a second transmitter located near said first receiver and said diversity receiver and connected to receive an output of said fade detector so as to transmit a control signal to said first transmitter, a second receiver mounted near said first transmitter and receiving a signal from said second transmitter, and power control means receiving an output of said second receiver and supplying an output to said first transmitter so as to control its power output.

3. A communication transmission system according to claims 1 or 2 wherein said first receiver includes a modem which is disconnected during fade-free conditions so that said communications transmission system can operate at a low power level.

4. A communication transmission system according to claims 1 or 2 wherein said fade detector includes a microprocessor which evaluates the signals received by said first and said diversity receivers and produces the output switching signal, a clock generator connected to said microprocessor, and a memory which contains data and a program connected to said microprocessor.

5. A communication transmission system as claimed in claim 4, in which said fade detector for recognizing fading phenomena consists of a detector for adaptive IF-amplitude distortion correction contained in the IF-section of said first contained in the IF-section of said first receiver, and the output signal of said detector are fed to said micro-processor.

6. A communication transmission system according to claim 2 characterized in that said control signal transmitted to said first transmitter is acknowledged by said first transmitter and transmitted to said first receiver.

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US005438312A

United States Patent [19][11] Patent Number: **5,438,312**

Lewis

[45] Date of Patent: **Aug. 1, 1995**[54] **ANTI-LOCKOUT SYSTEM**[76] Inventor: **James Lewis, 615 W. Chilton St., Chandler, Ariz. 85224**[21] Appl. No.: **229,750**[22] Filed: **Apr. 19, 1994**[51] Int. Cl.⁶ **B60Q 1/00**[52] U.S. Cl. **340/457; 340/457.1; 340/542; 340/539; 307/10.1; 70/263**[58] Field of Search **340/457, 539, 457.1, 340/542, 522; 307/9.1, 10.1; 70/57, 262, 263, 264, DIG. 49**[56] **References Cited****U.S. PATENT DOCUMENTS**

4,096,468 6/1978 Kopera, Jr. 340/457.1
 4,419,712 12/1983 Shimizu 361/172
 4,428,024 1/1984 Mochida et al. 361/172
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 4,709,777 12/1987 Metz 180/286
 4,789,831 12/1988 Hook et al. 340/52 D
 4,811,013 3/1989 Akutsu 340/825.31

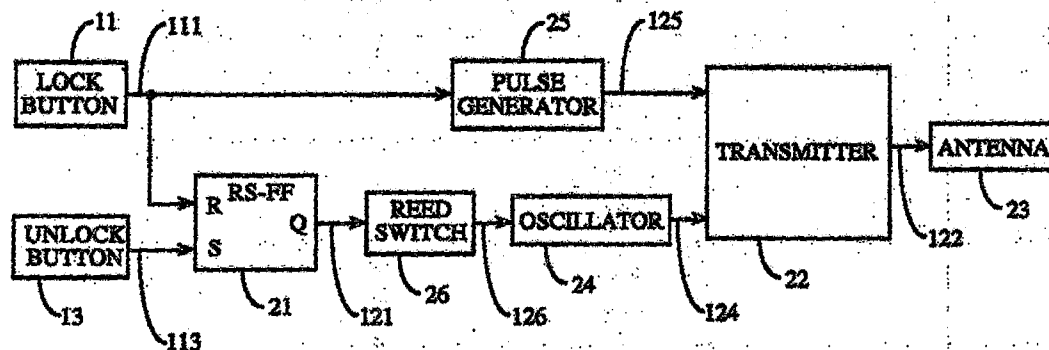
Primary Examiner—Donnie L. Crosland

13 Claims, 5 Drawing Sheets

Attorney, Agent, or Firm—Sandra L. Etherton

[57] **ABSTRACT**

An electronic system for preventing keys from being locked inside a vehicle. An ignition or door key houses a wireless transmitter which can send a signal to lock or unlock the vehicle doors. As a driver approaches a locked car, the unlock button on the transmitter is pressed, thereby unlocking the doors. Upon exiting the vehicle, a driver may inadvertently lock himself out of the vehicle if the doors are manually locked when the door key is inadvertently left somewhere inside the car. To prevent lock-out, an oscillating unlock signal is automatically sent from the transmitter to the electronic door locks. Simultaneously an alarm sounds to alert the driver that the keys are still in the car. The driver returns to the vehicle, opens the doors which have been automatically unlocked, and retrieves the keys. Upon retrieval of the keys, the driver again exits the vehicle, locks the doors manually or electronically, and presses the lock button to stop the alarm and end the transmission of the oscillating unlock signal.



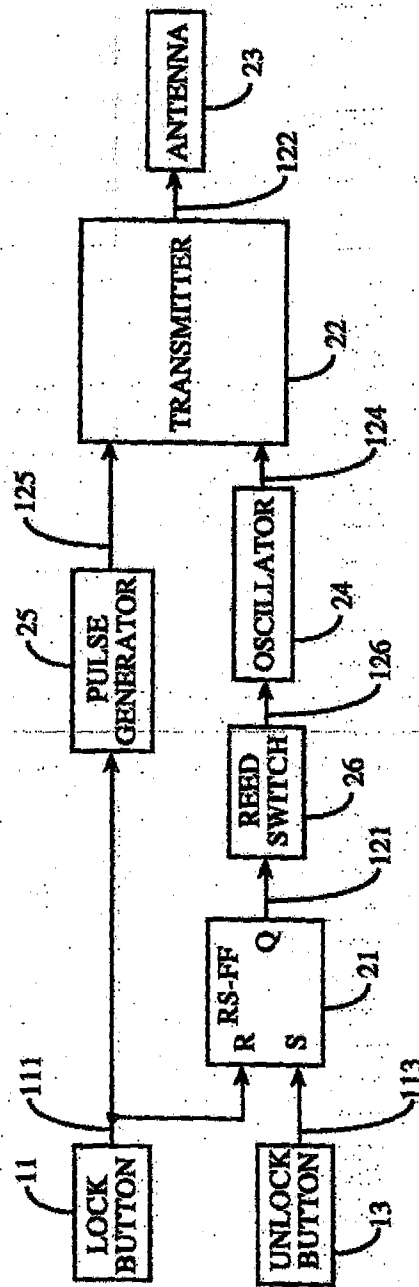


Fig. 2

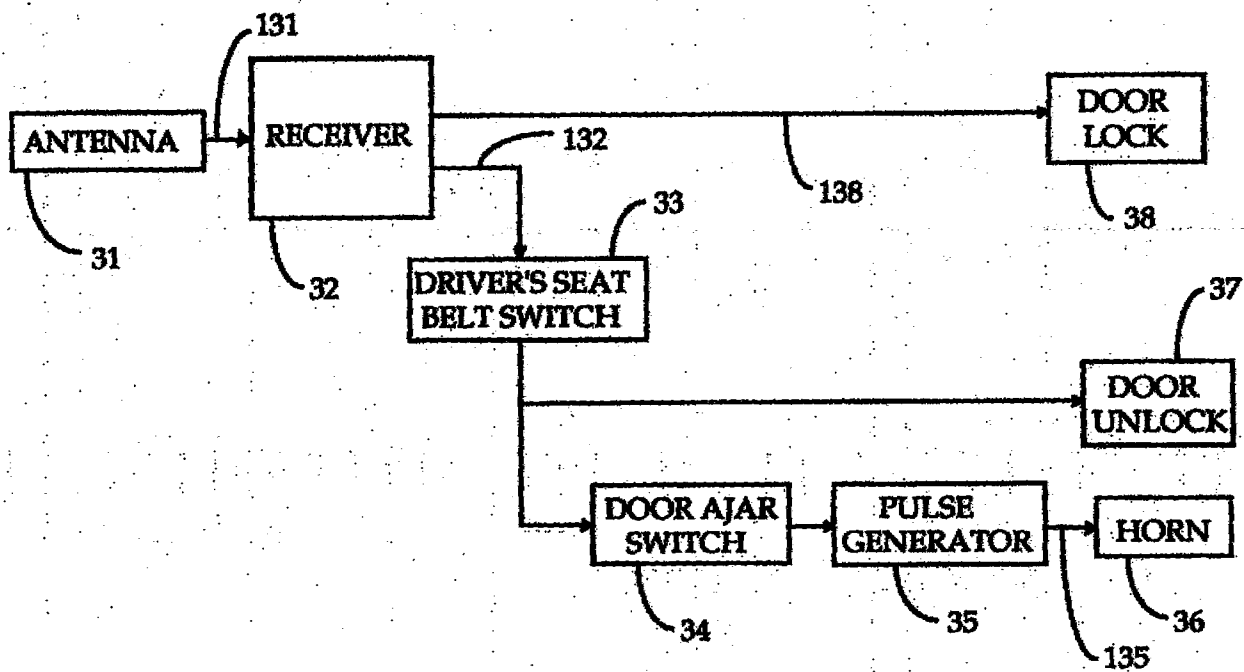


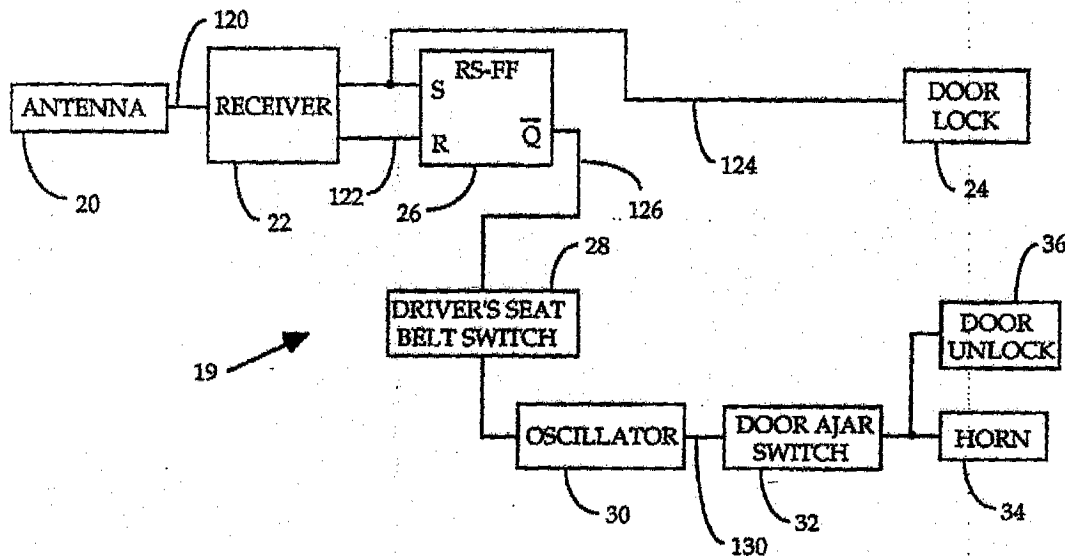
Fig. 3



US005600302A

United States Patent [19][11] **Patent Number:** **5,600,302****Lewis**[45] **Date of Patent:** **Feb. 4, 1997**[54] **VEHICLE-BASED ANTI-LOCKOUT SYSTEM**4,789,851 12/1988 Hoik et al. 180/286
4,811,013 3/1989 Akutsu 340/875.3[76] **Inventor:** James Lewis, 615 W. Chilton St.,
Chandler, Ariz. 85224**Primary Examiner**—Donnie L. Crosland
Attorney, Agent, or Firm—Parsons & Goltry; Robert A.
Parsons; Michael W. Goltry[21] **Appl. No.:** 496,426[22] **Filed:** Jun. 29, 1995[57] **ABSTRACT****Related U.S. Application Data**[63] Continuation-in-part of Ser. No. 229,750, Apr. 19, 1994, Pat.
No. 5,438,312.[51] **Int. Cl.⁶** B60Q 1/00[52] **U.S. Cl.** 340/457; 340/457.1; 340/539;
340/542; 307/10.1; 70/263[58] **Field of Search** 340/457, 457.1,
340/542, 539, 522; 307/9.1, 10.1; 70/57,
262, 263, 264, DIG. 49[56] **References Cited****U.S. PATENT DOCUMENTS**4,096,468 6/1978 Kopers 340/457.1
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4,672,375 6/1987 Mochida et al. 340/825.31
4,709,777 12/1987 Metz 180/286

An electronic system for preventing keys from being locked inside a vehicle. An ignition or door key houses a wireless transmitter which can send a signal to lock or unlock the vehicle doors. As a driver approaches a locked car, the unlock button on the transmitter is pressed, thereby unlocking the doors. Upon exiting the vehicle, a driver may inadvertently lock himself out of the vehicle if the doors are manually locked when the door key is inadvertently left somewhere inside the car. To prevent lock-out, an oscillating unlock signal is automatically output to the electronic door locks. Simultaneously an alarm sounds to alert the driver that the keys are still in the car. The driver returns to the vehicle, opens the doors which have been automatically unlocked, and retrieves the keys. Upon retrieval of the keys, the driver again exits the vehicle, locks the doors manually or electronically, and presses the lock button to stop the alarm and end the transmission of the oscillating unlock signal.

16 Claims, 3 Drawing Sheets

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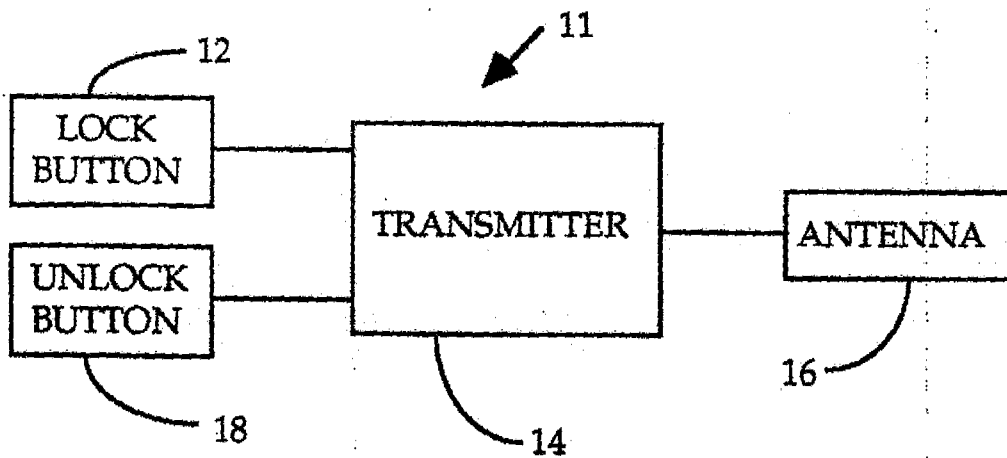


Fig. 1

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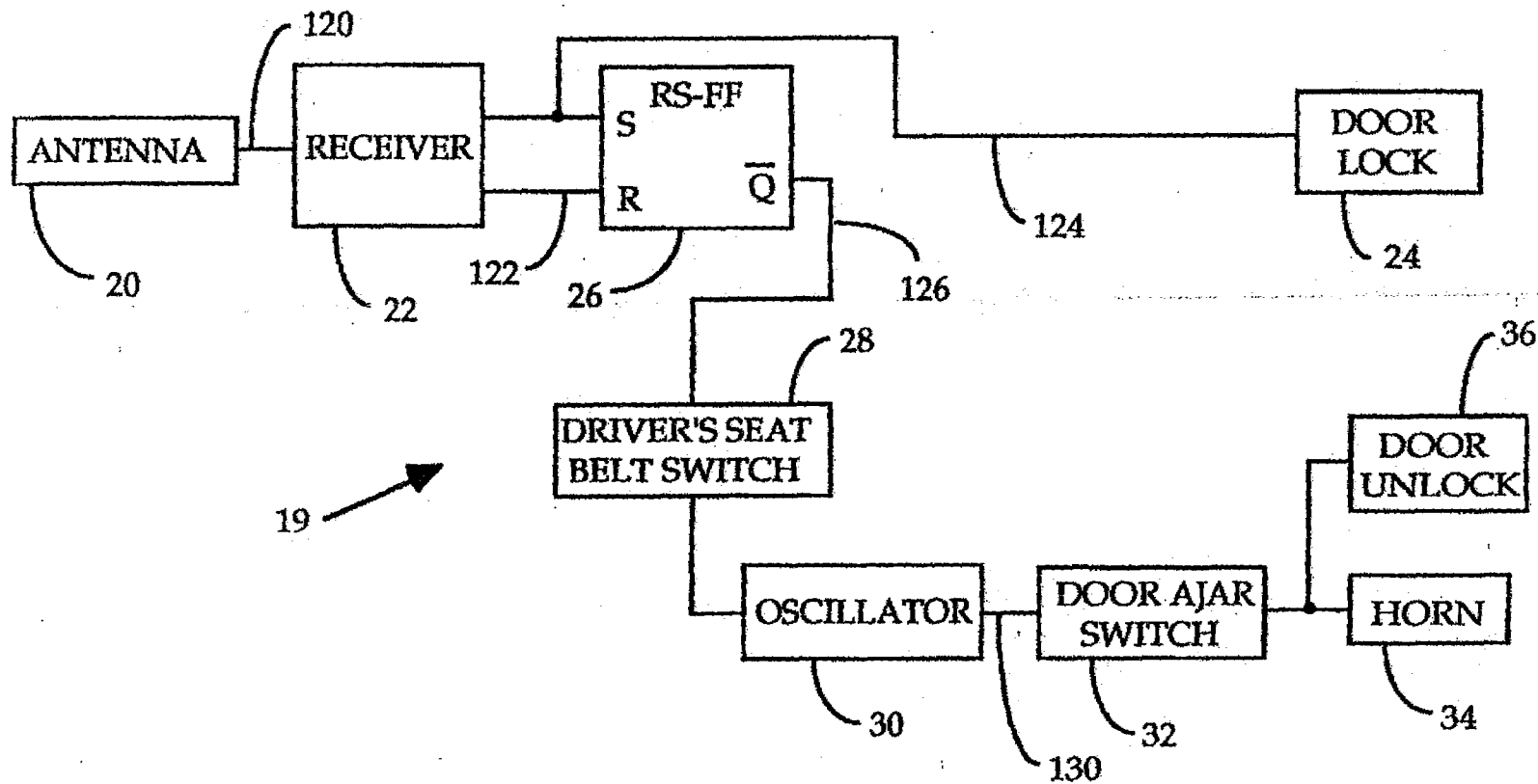


Fig. 2

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VEHICLE-BASED ANTI-LOCKOUT SYSTEM

This is a continuation-in-part of application Ser. No. 08/229,750 filed Apr. 19, 1994 now U.S. Pat. No. 5,438,312.

BACKGROUND OF THE INVENTION

This invention relates generally to a system that prevents keys from inadvertently being locked in a vehicle. More particularly this invention relates to an electronic system in which an alarm sounds and vehicle doors automatically unlock when the keys have been left anywhere inside the vehicle.

To the chagrin of automobile drivers, it is easy to lock ignition and door keys in a vehicle, thus locking the driver out. This occurs when the driver leaves the keys in the car, exits the car, and locks the doors without a key by manually manipulating the latch or electronically engaging the locks. While most drivers find this embarrassing and annoying, locking the keys in the car can also be dangerous if a small child or animal is locked inside.

For safety reasons, young children are often strapped into a safety seat for travel. It is likely that the child does not know how to unlatch the safety seat belts or is not dexterous enough to do it. Similarly such a child may not be able to unlock a car door from the inside, even if not strapped into a safety seat. If a driver inadvertently locks the car keys in the car while the child is inside, a precarious situation arises. The child can't get out and the driver can't get in.

As is often the case, drivers with small children may drive a van or station wagon. A common scene is to finish shopping and return to the car with groceries and a child. Before loading the groceries, the passenger compartment is unlocked with the keys and the child is placed in the car seat. The driver then goes to the trunk or rear of the van to load the groceries. The rear door is opened and because the driver wants to use two hands to load, the car keys are set down in the car. After the groceries are loaded, the driver slams the trunk or door tightly for security, locking the door by habit, only to realize in horror that the groceries, child and keys are now securely locked in the car.

A similar situation may arise if an animal is in the car when the driver exits the vehicle and inadvertently locks the keys in the car. Moreover, even if the driver leaves the doors unlocked, an active animal may inadvertently lock the doors by stepping on the door lock button or plunger, thereby locking itself in the car.

Aside from the embarrassment to the driver, and the subsequent expense and wasted time to call for police or a locksmith to unlock the door, the safety of the child or animal can become of great concern. If the vehicle is turned off, as is normally the case when keys are locked in the car, the interior environment of the vehicle is not controlled. In desert areas, the interior temperature of a closed vehicle can reach 140 degrees in a matter of minutes. Likewise in cold areas, the interior temperature can drop to sub-freezing temperatures in a very short time. These temperature extremes can be life-threatening to humans and animals locked in the car.

The prior art has endeavored to create devices which prevent car keys from being locked in a car, generally known as anti-lockout devices. However, these devices were not created to prevent life-threatening conditions to vehicle occupants. Instead they were developed to alert the driver that the ignition keys were still in the ignition upon the driver's exit and, if not retrieved, to disable the locking

mechanisms. U.S. Pat. Nos. 55 4,709,777, 4,789,851, 4,428, 024 and 4,419,712 describe variations on an electronic door lock interlock which senses the presence of a key in the ignition. When the key is in the ignition and the driver attempts to lock the doors, an alarm sounds and the locking mechanism is disabled. These devices work as anti-lockout devices only if the key has been left in the ignition. A driver would be locked out if the keys were left anywhere else in the car but the ignition, like the floor, on the seat, or in the trunk.

Instead of unlocking the car doors automatically when the keys have been left inside, other prior art inventions for keyless entry systems automatically lock the doors to prevent theft of the vehicle or its contents. These devices do not prevent or solve the situation where a child is locked in a car and, in fact, aggravate it. Keyless entry systems do not require keys to operate door locks, and use remote control technology to electronically operate door locks and the like. Instead of a key to insert in a mechanical lock, the driver carries a transmitter to signal the locks to engage electronically. Anti-lockout devices have been designed into this wireless technology so that if a transmitter is locked in the car, the driver may still enter with a key or by entering a preset code. For example, U.S. Pat. No. 4,672,375 describes a keyless entry system that alerts the driver if the transmitter has been left in the car. If the driver does not retrieve the transmitter, the doors automatically lock, the keyless entry system is disabled, and the car can be entered only with a key.

Anti-lock devices are well known in the prior art. However, until now, these devices served to alert the driver only if the key has been left in the ignition. If the keys are removed from the ignition, but still left somewhere in the car, the prior art devices are ineffective. Therefore, it is an object of this invention to overcome the problems of prior art and provide an anti-lockout system which will prevent the doors from locking if the keys have been left in the car, regardless of their location within the car. It is a further object of this invention to enable a driver to re-enter the car to retrieve the car keys if they have been left in the car. It is a further object of this invention to provide a system which will alert the driver that the keys have been left in the car so that the keys can be retrieved and the doors locked.

BRIEF SUMMARY OF THE INVENTION

This patent discloses an electronic system for preventing keys from being locked inside a vehicle. A vehicle key is attached to a wireless transmitter which can send a signal to lock or unlock the vehicle doors. To enter a car normally, a driver approaches a locked car and presses the unlock button on the transmitter, which in turn unlocks the doors. To exit a car normally, the driver exits the car with keys in hand, and locks the doors by transmitting a lock signal or otherwise engaging the locks.

However, a driver may inadvertently lock himself out of the vehicle if he exits and locks the doors manually when the key is inadvertently left somewhere inside the car. To prevent lock-out in such a situation, an oscillating unlock signal is automatically output to the electronic door locks as soon as the driver's seat belt is unbuckled and a door is closed. After a few seconds delay, if the lock button on the transmitter is not pressed, an alarm sounds to alert the driver that the keys are still in the car. The driver may then return to the vehicle, open the doors which have automatically been kept unlocked, and retrieve the keys. Upon retrieval of the

keys, the driver again exits the vehicle, locks the doors manually or electronically, and presses the lock button to stop the alarm and end the output of the oscillating unlock signal. The car is secured and the driver has the keys in hand.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram showing the general circuit arrangement of the transmitter.

FIG. 2 is a block diagram showing the general circuit arrangement of the vehicle-mounted receiver.

FIG. 3 is a flow chart of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the accompanying drawings, FIG. 1 illustrates the transmitter circuitry. Preferably the transmitting/receiving process is based on standard radio frequency remote control technology, commonly known in the prior art, with improvements that implement the invention. FIG. 1 illustrates the transmitter circuitry 11 for the present invention. A lock button 12 is depressed to instruct a transmitter 14 to transmit a signal to a remote receiver to lock the doors. An unlock button 18 is depressed to instruct the transmitter 14 to transmit a signal to the remote receiver to unlock the doors. An antenna 16 may be employed for signal transmission. The transmitter 14 generates the appropriate signal and the antenna 16 emits it. The same button may be used to transmit both signals, depending on the circuitry used for the lock/unlock button which is known in the art. The transmitter circuitry 11 can be housed in a key holder separate from the keys of the car, but still attached to them. U.S. Pat. No. 5,220,319 describes such a key holder for a remote control transmitter.

Discrete circuits may be used for the transmitter circuitry 11, but it would be advantageous to add the necessary circuitry to an existing microcontroller or application specific integrated circuit (ASIC), as the transmitter housing should be quite small. Other possible embodiments of the transmission circuitry 11 such as a programmable logic device (PLD) or a field programmable gate array (FPGA) would be recognized by those skilled in the art. The transmission is powered by a battery, preferably a lithium or NiCad battery, known for their small size and long life.

FIG. 2 shows the general circuit arrangement of the preferred embodiment of the vehicle-mounted section of the present invention or receiver circuitry 19. The receiver circuitry 19 is based on standard remote control and electronic door lock technology, known commercially, with improvements that implement the invention. A receiver 22 receives a signal 120, either lock or unlock, and outputs a second lock 124 or a second unlock 122 signal, respectively. An antenna 20 may be used for signal reception.

A latch or memory element 26 stores the state or status of the receiver circuitry 19 as either false (e.g. locked) or true (e.g. unlocked). The state of the memory element 26 is determined by the second lock signal 124 and second unlock 122 signals output by the receiver 22. A standard door lock mechanism 24 is activated and the memory element 26 is set to false when the second lock signal 124 is output. The memory element 26 is set to true when the second unlock signal 122 is output by the receiver. The latch 26 shown in FIG. 2 is preferably a reset-set flip-flop (referred to as RS-FF), but those skilled in the art will recognize other embodiments for it, such as an SC, D- or JK flip-flop, a register in

a microprocessor, or logic gates. The output 126 of the latch 26 becomes active when the state is true.

An oscillator 30 generates an oscillating unlock signal 130 when the output of the latch becomes active. The driver's presence in the car is tested via a driver's seat belt switch 28. Preferably, when the seat belt is buckled (indicating the driver's presence in the car), the driver's seat belt switch 28 is open and the oscillating unlock signal 130 is inhibited. However, if the seat belt is unbuckled, the driver's seat belt switch 28 is closed and the oscillating unlock signal 130 activates a standard door unlock mechanism 36 and the vehicle horn 34 or other audible alarm mechanism.

Preferably, a door ajar switch 32 is interposed between the latch 26 and the horn 34 and door unlock mechanism 36. The door ajar switch 32 allows the driver to unlock the vehicle and open the door (e.g. while loading groceries in the vehicle) without repeatedly sounding the horn 34 and unlocking the doors 36. The preferred embodiment of FIG. 2 shows the driver's seat belt switch 28 connected between the latch 26 and oscillator 30 and shows the door ajar switch 32 connected between the oscillator 30 and the horn 34 and door unlock mechanism 36. However, the switches 28 and 32 may be connected in any location after the latch 26 to inhibit the oscillator 30 from outputting the oscillating unlock signal 130. When the state of the memory element 26 is true, the doors are closed, and the driver's seat belt is unbuckled, the oscillator 30 outputs the oscillating unlock signal 130 with a duty cycle to remind the driver every few seconds to press the lock button 12.

FIG. 3 illustrates the method embodied by this invention for preventing keys from being locked in a vehicle. The system is at rest 48 (in a stable state) only after the lock button has been depressed 40, the lock signal is transmitted 42, the lock signal is received 44, and the doors are locked and the memory element is set to false 46.

When the unlock button is depressed 150, the system is in a constantly unstable state. First, the unlock signal is transmitted 52 and received 54 and the memory element is set to true. If the seat belt is not buckled 58 the oscillator will continually output an oscillating unlock signal 60. If the door is closed 62 the horn will also be sounded 64 and the doors will be unlocked 66. The unstable unlocked state prevents the driver from leaving the key in the vehicle and manually locking the doors, by repeatedly unlocking the doors and sounding the horn to alert the driver to retrieve the key. The unstable unlocked state distinguishes this invention from the prior art because no affirmative action such as pressing an automatic door lock button is required to alert the driver. An affirmative action (i.e. pressing the lock button 12 on the transmitter circuitry 10) is required to prevent the system from alerting the driver. This improves safety by requiring the driver to retrieve the key from the vehicle before locking it, thus allowing the driver to always be able to unlock the vehicle when needed.

The improvements embodied by this invention relate to the process of unlocking vehicle doors. In this invention, the unlock signal output by the oscillator is an oscillating duty cycle, whereby the doors are repeatedly unlocked and the horn repeatedly sounded until the unlock signal is stopped by one of several actions. This process requires not only an affirmative action to lock the doors, but enables the unlock signal until it, too, is affirmatively stopped. This combination of actions prevents the keys attached to the transmitter circuitry from being locked in the car. These objectives are achieved with the anti-lockout system described above and in the accompanying drawings. Variations and modifications



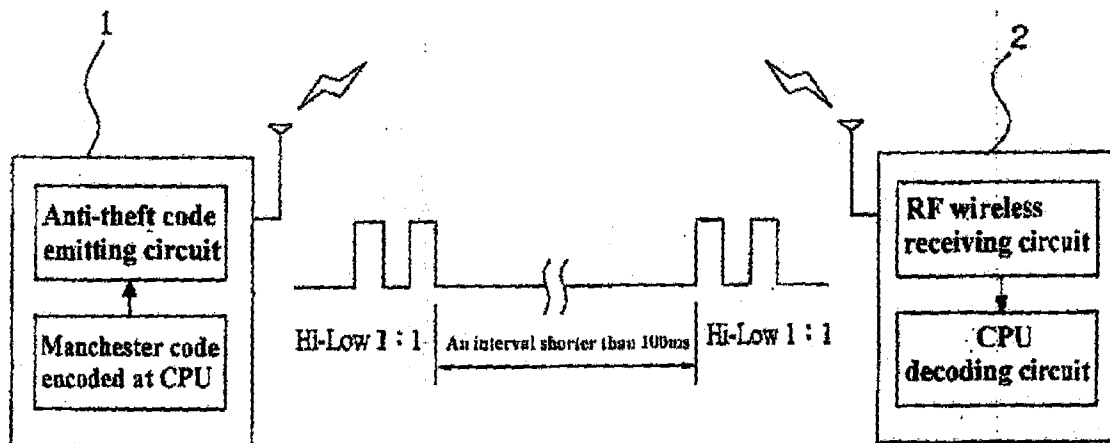
US 20050151627A1

(19) **United States**(12) **Patent Application Publication**
Chen(10) **Pub. No.: US 2005/0151627 A1**(43) **Pub. Date: Jul. 14, 2005**(54) **WIRELESS ANTI-THEFT DEVICE**(52) **U.S. Cl. 340/426.1; 340/539.1; 341/173**(75) **Inventor: Tse-Hsing Chen, Taipei Shien (TW)**

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(73) **Assignee: Shu-Chen LU**(21) **Appl. No.: 10/748,261**(22) **Filed: Dec. 31, 2003****Publication Classification**(51) **Int. Cl.⁷ B60R 25/10**(57) **ABSTRACT**

A wireless anti-theft device mainly includes a host having a power-supply voltage-stabilizing circuit, an anti-theft coding and CPU circuit, a host control circuit, an emitting circuit, a host receiving circuit, and an I/O socket; and a wireless siren being internally provided with a power-supply voltage-stabilizing circuit, an RF wireless receiving circuit, a decoding and CPU circuit, and an anti-theft voicing and driving circuit. The anti-theft coding and CPU circuit generates Manchester anti-theft code having a Hi-Low ratio of 1:1, so that the wireless siren could quickly and accurately analyze received data code to emit precise warning sound.



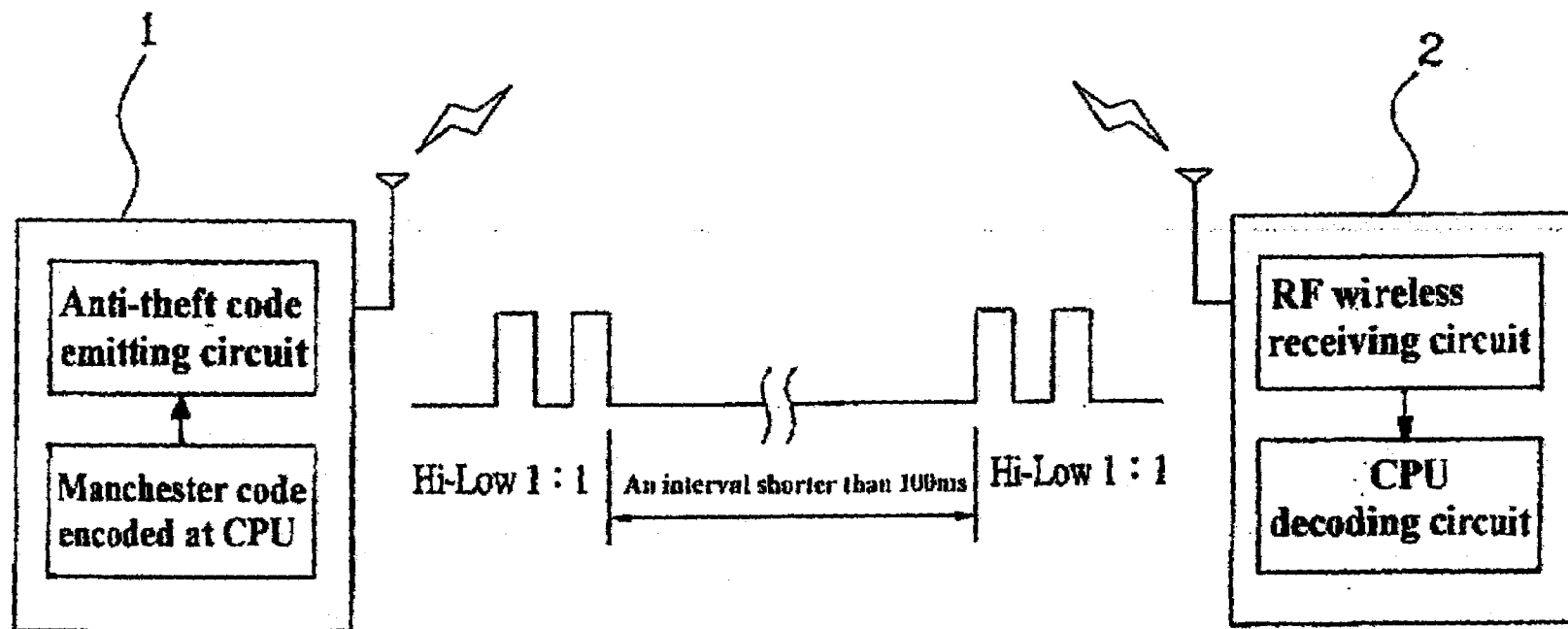


FIG.2

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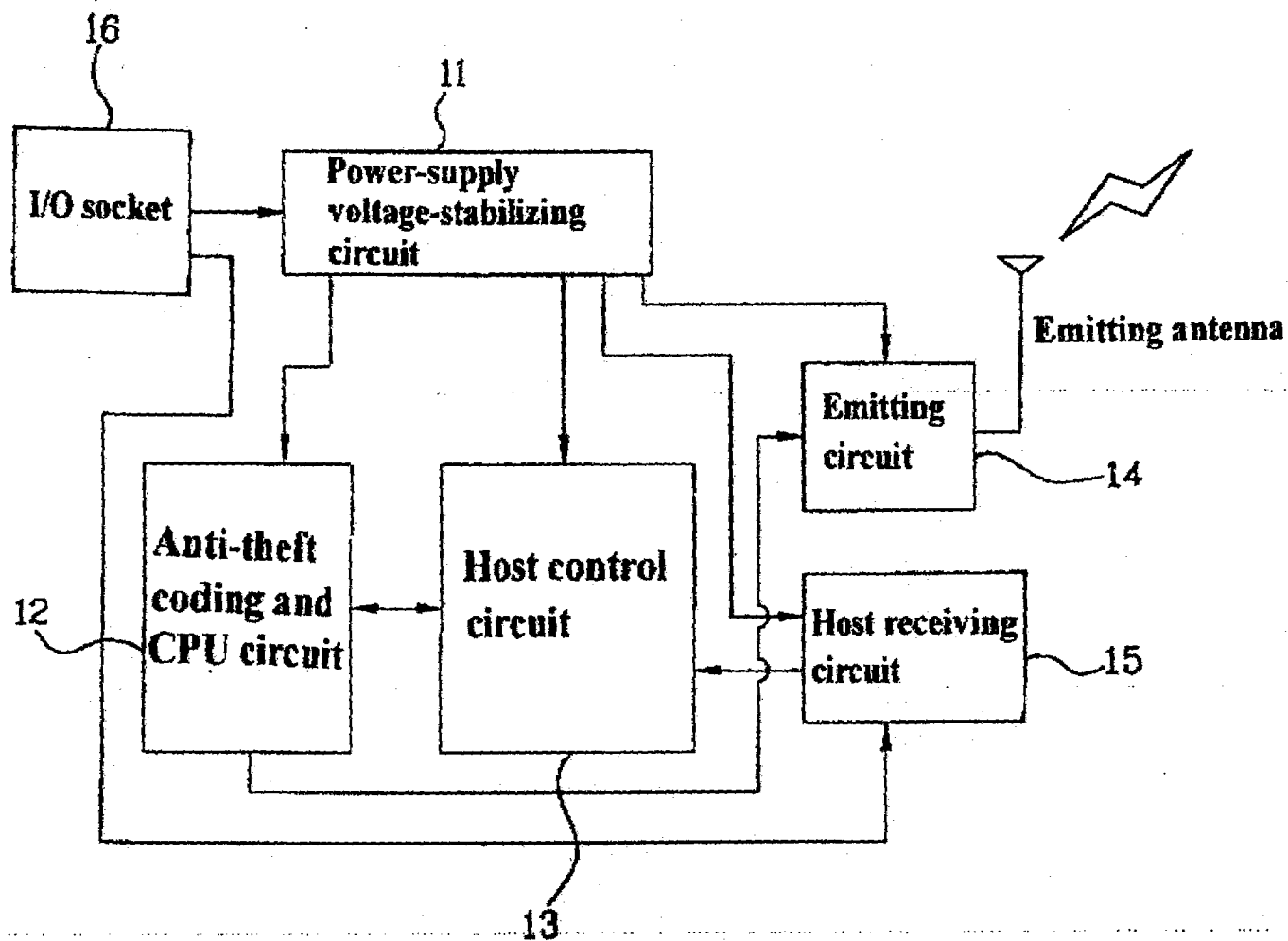


FIG. 3

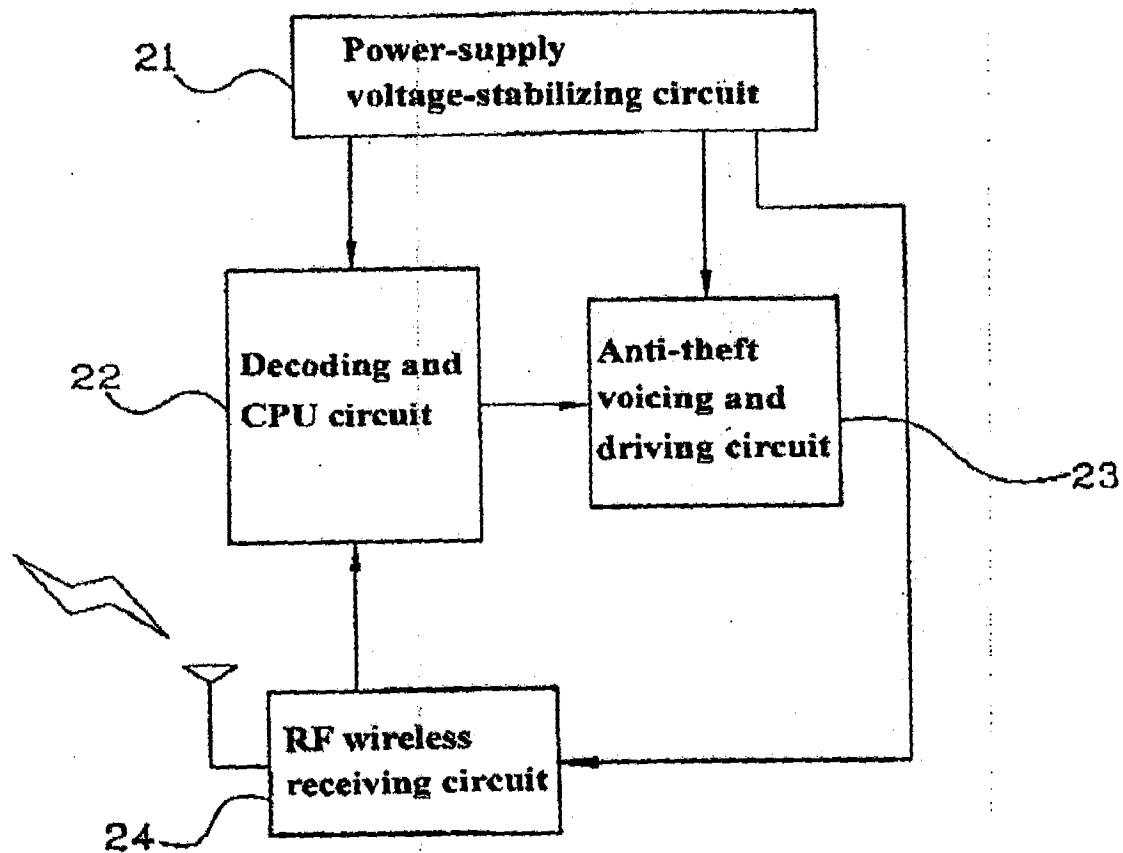


FIG. 4

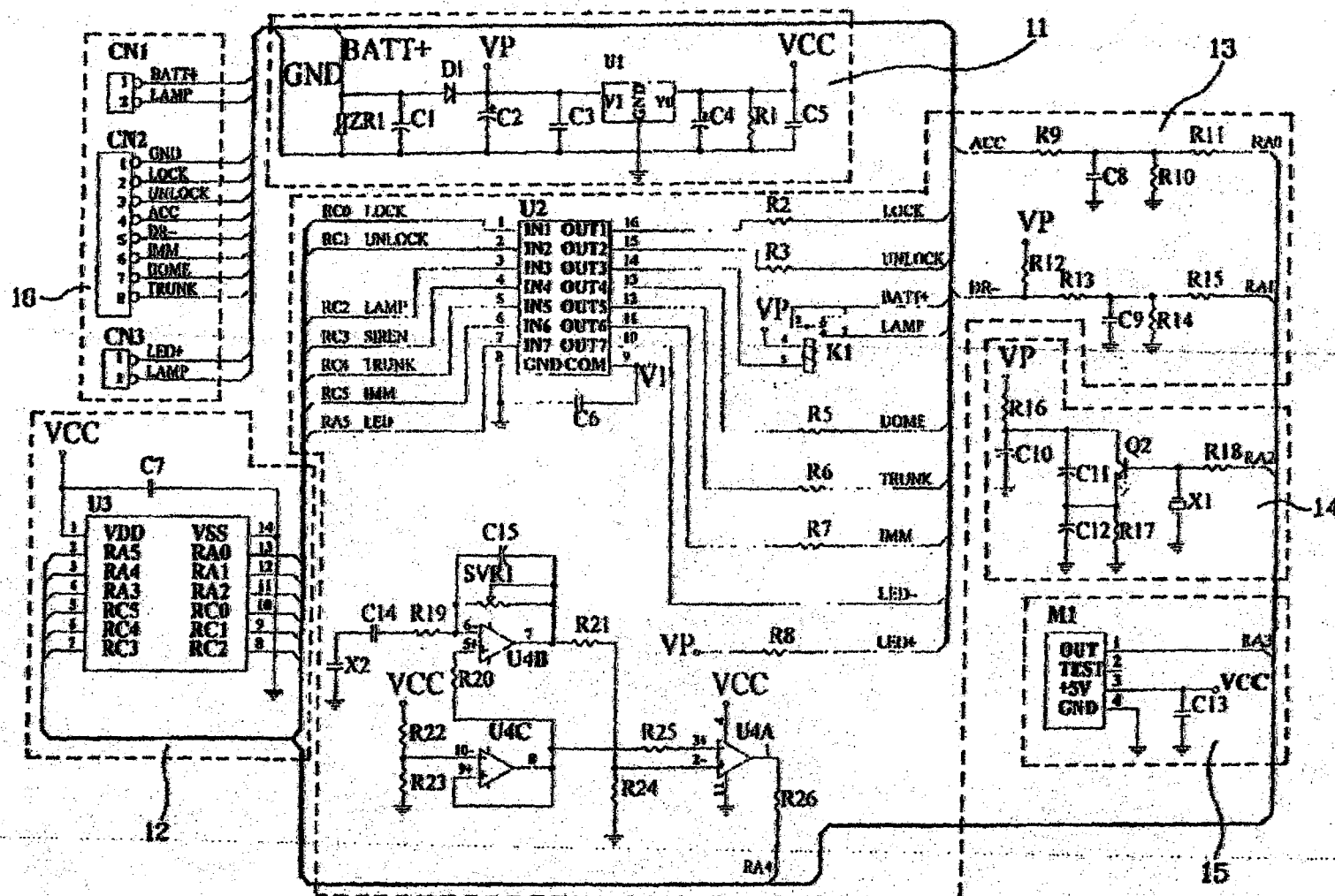


FIG. 5

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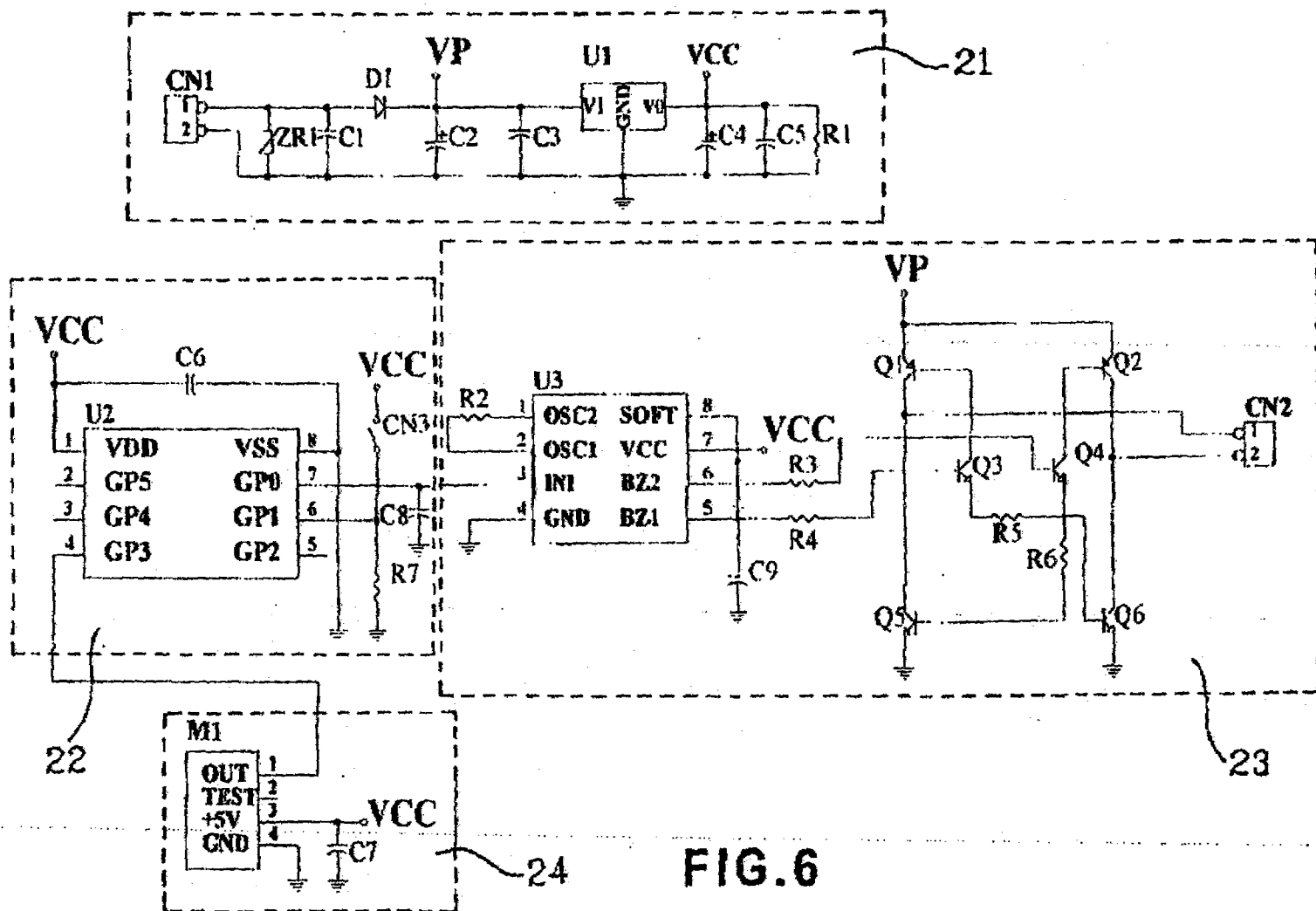


FIG. 6

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WIRELESS ANTI-THEFT DEVICE

FIELD OF THE INVENTION

[0001] The present invention relates to a wireless anti-theft device, and more particularly to a wireless anti-theft device that uses Manchester code having a Hi-Low ratio of 1:1 to transmit data code, so that a wireless siren controlled by a host of the device is able to quickly and accurately analyze the received data code to emit precise warning sound without interfering with or being interfered by other similar devices.

BACKGROUND OF THE INVENTION

[0002] Most currently commercially available car anti-theft devices may be divided into two types according to the manner of installation thereof. The first type includes a host that is mounted in a car. In this case, an output wire for an anti-theft speaker of the device is extended from an interior of the car through a steel fire wall into an engine chamber of the car. The second type includes a host that is mounted in the engine chamber of a car. In this second case, door open/close wires and other in-car detection wires of the car are extended from the engine chamber through the fire wall into the car.

[0003] In both of the above two installation manners, it is necessary to extend wires of the anti-theft device and other initially provided wires of the car through the fire wall. To prevent exhaust and wastewater from flowing into the car via wire mounting holes on the fire wall, most car manufacturers would seal these holes after the wiring of the car is completed, or purposefully provide an S-shaped fire wall, resulting in high difficulties in extending the wires of the anti-theft device through the fire wall and increased installation time and labor. And, it would inevitably spoil or damage the original airtight and watertight ability of the fire wall as well as the wires originally provided with the car, if the wires of the anti-theft device are forced through the fire wall.

[0004] Generally, the fire wall may be extended through by way of connecting copper cord along the engine, directly drilling holes on the fire wall, etc. All these ways of extending through the fire wall will result in incomplete airtight and watertight ability of the fire wall, and increased installation time and labor. Particularly, most newly designed cars in the market have a double-layer fire wall that further increases the difficulty in wiring the anti-theft device. Even if the drilled holes on the fire wall may be sealed again, they would adversely affect an overall appearance of the car body. And, most car buyers would not accept such defects on a new car.

[0005] To solve the problem of extending wires through the fire wall, wireless anti-theft devices have been developed. However, the currently available wireless anti-theft devices typically include a host mounted in the car, and the host loads all numbered signals on a 12V wire of the car, so that the wiring initially provided on the car is utilized to transmit coded signals to a battery in the engine chamber. And, a decoder and sound control means are additionally provided on an anti-theft speaker. However, to distinguish the coded signals of the anti-theft device from noises on the wiring of the car, a relatively complicate circuitry for data

analysis and data control must be provided, which results in largely increased cost to lower the consumers' interest in buying the car.

[0006] FIG. 1 shows a conventional encoding and decoding IC currently available in the market. As can be seen from FIG. 1, the encoding and decoding IC uses a data transmission form with a Hi-Low ratio thereof being 1:3 or 3:1, both of which are non-equal ratios, and a relatively long interval, usually longer than 50 ms, between two sets of data codes. The long interval together with various kinds of signals in the air makes the transmission of data code in the form of non-equal Hi-Low ratio subjected to problematic representation of different functions, such as setting anti-theft state, releasing anti-theft state, door not closed, anti-theft function has been activated, etc. For example, the anti-theft device might emit one or one and a half short sounds while it was set to emit two short sounds of, for example, 50 ms each, at an interval of 50 to 100 ms. Or, the anti-theft device might emit only two or two and a half short sounds while it was set to emit three short sounds. That is, the conventional wireless anti-theft device has the problem of indicating incorrect functions.

[0007] It is therefore tried by the inventor to develop an improved wireless anti-theft device to eliminate the problems existed in the conventional products for the same purpose.

SUMMARY OF THE INVENTION

[0008] A primary object of the present invention is to provide a wireless anti-theft device that does not damage the car body structure when being installed on a car, permits largely reduced circuitry design cost, and enables a wireless siren controlled by a host of the device to quickly analyze data code received from the host without interfering with or being interfered by other similar devices to ensure quick and accurate operation of the wireless anti-theft device.

[0009] To achieve the above and other objects of the present invention, the wireless anti-theft device of the present invention mainly includes a host having a power-supply voltage-stabilizing circuit, an anti-theft coding and CPU circuit, a host control circuit, an emitting circuit, a host receiving circuit, and an I/O socket; and a wireless siren being internally provided with a power-supply voltage-stabilizing circuit, an RF wireless receiving circuit, a decoding and CPU circuit, and an anti-theft voicing and driving circuit. The anti-theft coding and CPU circuit generates Manchester anti-theft code, a Hi-Low ratio of which is 1:1, so that the wireless siren could quickly and accurately analyze any received data code to emit precise warning sound.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The structure and the technical means adopted by the present invention to achieve the above and other objects can be best understood by referring to the following detailed description of the preferred embodiments and the accompanying drawings, wherein

[0011] FIG. 1 schematically shows the manner of data transmission by a conventional encoding IC;

[0012] FIG. 2 schematically shows the operating manner of a wireless anti-theft device according to the present invention;

[0013] FIG. 3 is a block diagram of a host of the wireless anti-theft device of the present invention;

[0014] FIG. 4 is a block diagram of a wireless siren of the wireless anti-theft device of the present invention;

[0015] FIG. 5 is a circuit diagram for the host of the wireless anti-theft device of the present invention; and

[0016] FIG. 6 is a circuit diagram for the wireless siren of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0017] Please refer to FIGS. 2 to 4, in which a wireless anti-theft device according to the present invention is shown. The wireless anti-theft device of the present invention mainly includes a host 1 and a wireless siren 2.

[0018] The host 1 includes a power-supply voltage-stabilizing circuit 11 for supplying power to different components of the host 1, an anti-theft coding and CPU circuit 12 for generating a Manchester anti-theft code having a Hi-Low ratio of 1:1, a host control circuit 13 for controlling the operation of different components of the host, an emitting circuit 14 for emitting an anti-theft signal, a host receiving circuit 15 for receiving a remote controlling signal, and an input/output (I/O) socket 16 for electrically connecting to a power receptacle on a car.

[0019] The wireless siren 2 is internally provided with a power-supply voltage-stabilizing circuit 21 for supplying power to different components of the wireless siren 2, an RF wireless receiving circuit 24 for receiving an RF anti-theft signal from the host 1, a decoding and CPU circuit 22 for decoding and comparing the received anti-theft signal; and an anti-theft voicing and driving circuit 23 for generating warning sound and anti-theft control.

[0020] To overcome the problems existed in the data transmission by the above-mentioned conventional encoding and decoding IC using a Hi-Low ratio of 1:3 or 3:1, the present invention sets the data code to the Manchester code having a Hi-Low ratio of 1:1, and an interval between two sets of data codes is shorter than 100 ms, as shown in FIG. 2, so that the wireless siren 2 controlled by the host 1 is able to accurately analyze the anti-theft signal within a very short time and thereby emits correct warning sound.

[0021] FIG. 5 is a circuit diagram for the host of the wireless anti-theft device of the present invention. As shown, the anti-theft coding and CPU circuit 12 couples and protects codes via R18; and X1SAW, which serves as an oscillation amplitude of an emitting frequency, is amplified by Q2; oscillations C11/C12/C10 are emitted from an antenna via R16; and R17 is a bias voltage of Q2.

[0022] FIG. 6 is a circuit diagram for the wireless siren 2 of the present invention. As shown, U2 is the decoding and CPU circuit 22, U3 is a voice IC, which together with Q1, Q2, Q3, Q4, Q5, Q6, and other peripheral circuits forms the anti-theft voicing and driving circuit 23 for driving the wireless siren 2 to emit sound depending on the decoded data code.

[0023] With the above arrangements, as shown in FIGS. 2 to 6, an existing CPU of the host 1 is used to encoding the Manchester code. Therefore, the conventional coding circuit

is omitted to save the circuit cost, and the output driving circuit that is otherwise required in the prior art is eliminated and replaced with the code emitting circuit 14. The data code in the form of Manchester code is transmitted via air to the RF wireless receiving circuit 24 of the wireless siren 2, and is checked at the decoding and CPU circuit 22. When the received code is determined as correct, an anti-theft speaker is driven according to the content of the data code to emit sound. In this manner, the anti-theft device of the present invention may be installed without damaging the car structure, and the wireless siren 2 controlled by the host 1 can accurately analyze the data code within short time to precisely emit one, two, three, or four times of short sound at differently set intervals. The problem of incorrectly emitted sounds, such as one half short sound or one and a half short sound, can therefore be avoided. The present invention also effectively reduces interferences by or with other similar anti-theft devices to enable quick and accurate control of the anti-theft operation thereof.

[0024] In brief, the wireless anti-theft device has at least the following advantages:

[0025] 1. The installation of it in a car would not damage the structure of the car.

[0026] 2. It uses its CPU to encode the Manchester Code having a Hi-Low ratio of 1:1, and may therefore have a circuitry to be designed at largely reduced cost.

[0027] 3. It enables accurate analysis of data code within very short time to minimize interference with or by other similar devices.

[0028] The present invention has been described with a preferred embodiment thereof and it is understood that many changes and modifications in the described embodiment can be carried out without departing from the scope and the spirit of the invention that is to be limited only by the appended claims.

What is claimed is:

1. A wireless anti-theft device, comprising:

a host having a power-supply voltage-stabilizing circuit for supplying power to different components of said host, an anti-theft coding and CPU circuit for generating data code in the form of Manchester anti-theft code having a Hi-Low ratio of 1:1, a host control circuit for controlling operations of different components of said host, an emitting circuit for emitting an anti-theft signal, a host receiving circuit for receiving a remote signal, and an input/output (I/O) socket for electrically connecting to a power receptacle on a car; and

a wireless siren being internally provided with a power-supply voltage-stabilizing circuit for supplying power to different components of said wireless siren, an RF wireless receiving circuit for receiving an RF anti-theft signal from said host, a decoding and CPU circuit for decoding and comparing said anti-theft signal received by said RF wireless receiving circuit; and an anti-theft voicing and driving circuit for generating warning sound and anti-theft control;

whereby said wireless siren controlled by said host is able to accurately analyze said data code within very short time, so that interference of said wireless anti-theft device with or by other similar devices is effectively

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**SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISIÓN DE NUEVAS CREACIONES**

2020
Bogotá, D.C.,

Abogado
CARLOS ORLANDO MAYA RODRIGUEZ

ASUNTO

Radicación 05-70054
Trámite 002
Evento 001
Actuación 430
Oficio 9654
Folios 027

Patente de Invención



Patente de Modelo de Utilidad



Vía Nacional



Vía PCT (fase nacional)



Cap. I



Cap. II



Como resultado del examen de fondo, realizado con fundamento en el artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le comunica:

1. Documentos estudiados

- 1.1. Descripción: Folios: 6 a 10 como se radicó inicialmente
Folios: 27 a 36 capítulo modificado
- 1.2. Reivindicaciones: Folios: 11 a 12 como se radicó inicialmente
Folios: 37 a 38 pliego modificado
- 1.3. Dibujos: Folios: 40 a 43 Adjuntados con la respuesta
- 1.4. Rta. del Solicitante: Folios: 25 a 43

2. Objeto de la invención

La presente solicitud se titula "SISTEMA DE BLOQUEO ELECTRONICO POR RADIOFRECUENCIA DIGITAL", Folio N° 26.

El objeto de la presente solicitud de patente consiste en un sistema de alarma para vehículos, carros y motocicletas, que evita que el propietario del vehículo deba activar el sistema de bloqueo ya que el sistema esta recibiendo constantemente la señal la señal que genera el transmisor que posee el dueño del vehículo.

De otra parte, el pliego reclama: un sistema de bloqueo electrónico por radiofrecuencia digital que comprende un circuito de dos partes, relacionado en las reivindicaciones 1 a 6.

El objeto de la solicitud definido anteriormente se clasificó en la IPC H04B 14/00.

3. Claridad de la solicitud

3.1. Reivindicaciones (artículo 30 D 486)

Como respuesta al oficio anterior, el señor representante envió un nuevo capítulo reivindicatorio en el cual únicamente se cambió el preámbulo de la primera reivindicación. Este cambio NO subsana las objeciones presentadas en el mencionado oficio, por lo cual se le reitera al señor representante que se debe dar una respuesta que aclare los requerimientos o que subsane las objeciones encontradas, ya que tal como se había dicho antes, el pliego reivindicatorio NO presenta suficientes elementos de carácter técnico que puedan definir la invención.

Como se había dicho anteriormente, la reivindicación 1 NO presenta elementos de carácter técnico, sino que presenta características propias de un procedimiento de transmisión de datos, lo cual NO es una característica técnica de un sistema de bloqueo electrónico. Un sistema eléctrico como este, debe definirse por medio de las configuraciones circuitales tanto del transmisor como del receptor.

Las reivindicaciones dependientes deben aclarar o especificar características técnicas contenidas en la reivindicación principal, como en este caso la reivindicación principal NO presenta características técnicas, las dependientes necesariamente deben reformularse.

Finalmente reiteramos, que si la invención se refiere a un aparato eléctrico o electrónico, el pliego reivindicatorio debe especificar la relación existente entre los componentes del aparato. Es el presente caso, el sistema de bloqueo, debe ir definido por los circuitos y tipos de conexiones que se presentan tanto en el transmisor, como en el receptor, NO simplemente presentar una enumeración de componentes sin especificar ningún tipo de relación, tal como se ha presentado en las reivindicaciones 5 y 6.

Por los motivos anteriores, el pliego reivindicatorio calificado no cumple los requisitos de claridad exigidos en el Art. 30 de la Decisión.

4. Reivindicaciones relativas a un uso o a un uso distinto (artículos 14 y 21 D 486)

Dado que la respuesta al oficio No. 15054 aportada por el señor solicitante, no presento ningún cambio sustancial en el pliego reivindicatorio, las objeciones planteadas en el oficio anterior con respecto al no cumplimiento de lo estipulado en los artículos 14 y 21, se mantienen.

La oficina queda en espera de un pronunciamiento del señor representante con respecto a este punto.

5. Determinación del Estado de la Técnica

Considerando que la fecha de presentación de la solicitud es del 15 de julio del 2005, se buscaron documentos del estado de la técnica relacionados, con fecha de publicación anterior a esta. Se realizó búsqueda de documentos relevantes dentro del estado de la técnica, entendiendo como estado de la técnica la definición provista en el Art. 16 D 486, y las excepciones fijadas en el Art. 17 de la misma.

No obstante, la solicitud presenta problemas de claridad, uso y patentabilidad, se realizó una búsqueda parcial la cual se complementara una vez se realicen los

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ajustes a la solicitud.

Se encontró como anterioridades los documentos relacionados a continuación que pueden afectar la patentabilidad del objeto de la presente solicitud:

N°	Documento*	Título	Fecha de publicación
D1	US4769825	COMMUNICATIONS TRANSMISSION SYSTEM FOR ELECTROMAGNETIC WAVES	1988-09-06
D2	US5438312	ANTI-LOCKOUT SYSTEM	1995-08-01
D3	US5600302	VEHICLE-BASED ANTI-LOCKOUT SYSTEM	1997-02-04
D4	US2005/0151627	WIRELESS ANTI-THEFT DEVICE	2005-07-14

*los documentos mencionados se anexan al expediente

6. Análisis de patentabilidad (artículo 14 D486)

En cumplimiento del Art. 14 D486 se procedió a evaluar los requisitos de novedad, nivel inventivo y aplicabilidad industrial, con el fin de establecer la patentabilidad de la invención reivindicada de la solicitud en estudio.

6.1. Novedad (artículo 16 D486)

El requisito de novedad se evaluó por comparación entre lo solicitado y los documentos citados en el numeral 5. Para el examen de novedad NO se tuvo en cuenta características NO técnicas tales como el manejo, procesamiento de datos y usos, puesto que la solicitud se trata de un producto y debe definirse como tal.

La reivindicación 1 se refiere a un sistema de bloqueo electrónico por radiofrecuencia, el cual consta de los siguientes componentes:

- Un circuito transmisor, que cuenta con un microcontrolador
- Un circuito receptor, que tiene un microcontrolador

La anterioridad D1 se refiere a un sistema de comunicación para ondas electromagnéticas que comprende un transmisor en el cual la señal a ser transmitida es modulada, y un receptor en el cual la señal es demodulada. Este sistema consta de:

- Un transmisor S el cual cuenta con un modulador ASK 35 y un dispositivo de supervisión 39 (Fig. 2)
- Un circuito receptor GE que tiene un circuito demodulador 41, dispositivos de supervisión 24 y 25, y un mezclador IF 23 el cual tiene una unidad de control 78 (Figs. 2 y 3)

Adicionalmente el sistema presentado en el documento D1 contienen los siguientes elementos:

Transmisor: un interruptor de control 33, una unidad de potencia 34, un modulo transmisor 35 y antenas para conectar con el receptor (col. 3 línea 45).

Receptor: un a fuente de voltaje U_{BAT} (Fig. 3, col. 5 líneas 33 a 34), mezcladores para la señal de entrada 17 y 21, en combinación con amplificadores 18 y 22, una unidad de control (Figs. 1 y 3), un modulo receptor 14, 16 y 41 (Fig. 2), un interruptor de

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salida 42 y antenas de acople con el transmisor (col. 3 línea 45).

Como se ve el documento D1 contiene todos los elementos característicos de la presente solicitud, por lo cual esta no tiene novedad.

Los documentos D2 y D3 se refieren a un sistema para desbloquear las puertas de un vehículo cuando se quedan las llaves adentro del vehículo. Este sistema tiene las siguientes características (los numerales y las referencias corresponden al documento D3):

- Un circuito de transmisión 11, el cual contiene un microcontrolador o alguna aplicación específica de circuitos integrados ASIC (col. 3 líneas 36 a 40). El circuito transmisor esta acoplado a una antena 16.
- Un circuito receptor 19. Este circuito cuenta con una antena 20, acoplada a un receptor 22. En este circuito las señales de bloqueo o desbloqueo puede registrarse en un microprocesador (col 4 línea 1).

Por estos motivos, los documentos anteriores (D2 y D3) también contienen los elementos característicos de la solicitud, por lo cual afectan la novedad de esta.

La solicitud de patente D4, se refiere a un dispositivo inalámbrico antirrobo, este dispositivo esta caracterizado por:

- Un circuito transmisor 1, conformado por una unidad de procesamiento para la codificación antirrobo 12, un circuito de control 13, un fuente de voltaje 11 y un circuito de emisión 14 acoplado a una antena de emisión (Fig. 3). En la figura 5 del mismo documento se puede ver que la fuente de alimentación cuenta con interruptores de alimentación 16, un diodo zener ZR1 y un regulador de voltaje U1.
- Un circuito receptor 2, que tiene los siguientes elementos: un circuito receptor de RF 24, una unidad de procesamiento para la decodificación 22, un modulo de manejo del circuito antirrobo 23, y una fuente de alimentación 21 (Fig. 4). La figura 6 muestra adicionalmente los componentes de la fuente 21 entre los que están: condensadores C1, C2 y C3 para el filtro de la fuente, un diodo zener ZR1 y un regulador de voltaje U1. La figura 6 también especifica el circuito 23, el cual contiene una serie de transistores Q1 a Q6, los cuales manejan la salida del circuito.

Como se ve este documento contiene todos los elementos característicos de la solicitud, por lo cual afecta la novedad de la misma.

Es claro que el objeto solicitado no presenta ninguna ventaja o efecto novedoso con respecto al estado del arte, por consiguiente se considera que el objeto de la solicitud no tiene Novedad y no cumple con los requisitos del artículo 14 de la decisión.

7. Conclusión:

Los requisitos de patentabilidad de la presente solicitud se encuentran afectados así:

N°	Documento N°	Reivindicaciones Afectadas	Requisito que Afecta
D1	US4769825	1 a 6	Novedad
D2	US5438312	1 a 4	Novedad

D3	US5600302	1 a 4	Novedad
D4	US2005/0151627	1 a 6	Novedad

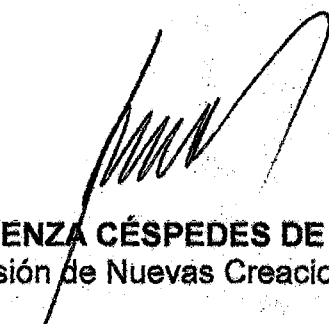
8. Respuesta a los argumentos del solicitante:

Los argumentos presentados por el solicitante como respuesta al oficio No. 15054, fueron considerados, y se tuvieron en cuenta para realizar el examen de fondo, presentado en los párrafos anteriores.

Se le recomienda al señor solicitante el replanteamiento del capítulo reivindicatorio teniendo en cuenta las observaciones anteriores, donde se defina la invención por características estructurales o de función. También se le recuerda al señor solicitante que el replanteamiento de esos apartes NO podrá implicar una ampliación de la protección que correspondería a la divulgación contenida en la solicitud inicial, de acuerdo a lo que establece el artículo 34 de la Decisión 486.

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de sesenta días contados a partir de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2 Literal e) del capítulo quinto del título primero de la Circular Única No. 10 de 2001.


ALIX CARMENZA CÉSPEDES DE VERGEL
 Jefe de División de Nuevas Creaciones

El anterior requerimiento fue notificado por fijación en lista, de fecha
24 JUL 2008

CONCEPTO TECNICO No. 2026	EXAMINADOR TÉCNICO Código No. 202082
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